GA-7PCSLX GA-7PCSLX

LGA1356 socket motherboard for Intel® Xeon® series processors

User's Manual

Rev. 1001

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Documentation Classifications

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

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

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

Table of Contents

Во	x Conten	ıts			.5
G/	A-7PCSL	Moth	erbo	pard Layout	.6
G/	A-7PCSL	X Mo	ther	poard Layout	.9
Ch	apter 1 l	Hardv	vare	Installation	12
		1-1		allation Precautions	
	,	1-2		duct Specifications	
		1-3		alling the CPU and CPU Cooler	
		1-3		Installing the CPU	
		1-3	-	Installing the CPU Cooler	
	,	1-4	Inst	alling the Memory	
		 1-4	-1	Dual/3 Channel Memory Configuration	
		1-4	-2	Installing a Memory	
	,	1-5	Bac	k Panel Connectors	
	,	1-6		rnal Connectors	
	,	1-7		per Setting	
Ch				up	
0.		D-1		Main Menu	
	-	2-2		anced Menu	
	2	2-2 2-2		PCI Configuration	
		2-2		Trusted Computing (Optioanl)	
		2-2	_	CPU Configuration	
		2-2	-3-1	CPU Power Management Configuration	
		2-2		Runtime Error Logging	
		2-2	!-5	SATA Configuration	67
		2-2	!-6	SAS Configuration	68
		2-2	:-7	Super IO Configuration	
		2-2	8	Serial Port Console Redirection	71
	2	2-3	Chi	oset Menu	74
		2-3		North Bridge Configuration	
				IOH Configuration	
		2-3	-1-2	DIMM Information	
		2-3	_	South Bridge Configuration	
	2	2-4		urity Menu	
	2	2-5		ver Management Menu	
		2-5	-1	System Information	
		2-5	-2	BMC LAN Configuration	85

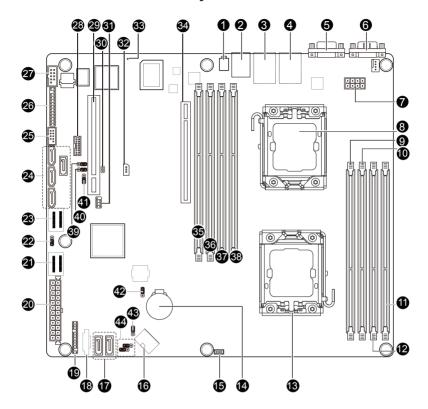
	2-5	-3 System Event Log	86
	2-6	Boot Option Menu	87
	2-7	Boot Manager	88
	2-8	Exit Menu	89
Chapter 3	Appei	ndix	91
			Ω1

Box Contents

- ✓ GA-7PCSL/GA-7PCSLX/GA-7PCSLN motherboard
- ✓ Driver CD
- ☑ Two SATA cables
- ☑ I/O Shield

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

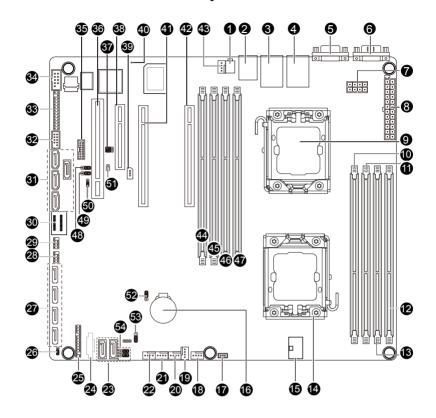
GA-7PCSL Motherboard Layout



Hom	Code	Description
Item 1	Code	Description ID switch
2	ID_SW MLAN	
3		BMC Management LAN port
ა 4	USB_LANB1	LAN1 port (top) / USB ports (bottom)
	USB_LANB2	LAN2 port (top) / USB ports (bottom)
5	VGA_1	VGA port
6	COM1	Serial port
7	CPU1_FAN	CPU1 fan cable connector
8	P12V_AUX2	8 pin power connector
9	CPU1	Intel LGA1356 socket (Secondary CPU)
10	DDR3_P0_C1	Channel C slot 1 (for primary CPU)
11	DDR3_P0_C0	Channel C slot 0 (for primary CPU)
12	DDR3_P0_A0	Channel A slot 0 (for primary CPU)
13	DDR3_P0_B0	Channel B slot 0 (for primary CPU)
14	CPU0	Intel LGA1356 socket (Primary CPU)
15	CPU0_FAN	CPU0 fan connector
16	BAT	CMOS battery
17	SKU_KEY1	PBG A SKU Select connector
18	SYS_FAN4	System fan connector
19	SYS_FAN3	System fan connector
20	SYS_FAN2	System fan connector
21	SYS_FAN1	System fan connector
22	P12V_AUX1	8 pin power connector
23	SATA0/1	SATA 6Gb/s connectors
24	PMbus_CN_1	PM Bus connector
25	BP_1	HDD back plane connector
26	ATX1	24-pin power connector
27	MINISAS_2	Mini SAS connector (SATA 3.0Gb/s signal)
28	SSB_ME2	ME enable/disable jumper
29	MINISAS_1	Mini SAS connector
30	SAS0~3	SAS connectors
31	F_USB1	Front USB connector
32	FP_1	Front panel connector
33	COM2	Serial cable connector
34	TPM_MEZZ1	TPM connector
35	PCI_1	PCI slot (32bit/33MHz)
36	JP5	Chassis intrusion jumper
37	SCU_SGPIO	SCU SGPIO connector
38	PCIE_3	PCI-E slot 3 (x8 slot / x4 signal)
39	IPMB	IPMB connector
40	BMC_LED1	BMC Firmware Readiness LED
41	PCIE_2	PCI-E slot 2 (x16 slot / x8 signal)
42	PCIE_1	PCI-E slot 1 (x16 slot)
43	DDR3_P1_D0	Channel A slot 0 (for secondary CPU)
44	DDR3_P1_E0	Channel B slot 0 (for secondary CPU)
45	DDR3_P1_F0	Channel C slot 0 (for secondary CPU)

46	DDR3_P1_F1	Channel C slot 1 (for secondary CPU)
47	PASSWORD	Clear password jumper
48	BIOS_RVCR	BIOS recovery jumper
49	SSB_ME1	ME enable/disable jumper
50	CLR_CMOS	Clear CMOS jumper
51	BIOS_WP	BIOS write protect jumper
52	SATA_DOM0/SATA_DOM1	SATA0/1 port DOM support jumper

GA-7PCSLX Motherboard Layout



Item	Code	Description
1	ID_SW	ID switch
2	MLAN	BMC Management LAN port
3	USB_LANB1	LAN1 port (top) / USB ports (bottom)
4	USB_LANB2	LAN2 port (top) / USB ports (bottom)
5	VGA_1	VGA port
6	COM1	Serial port
7	P12V_AUX2	8 pin power connector
8	ATX1	24-pin power connector
9	CPU1	Intel LGA1356 socket (Secondary CPU)
10	DDR3_P0_C1	Channel C slot 1 (for primary CPU)
11	DDR3_P0_C0	Channel C slot 0 (for primary CPU)
12	DDR3_P0_A0	Channel A slot 0 (for primary CPU)
13	DDR3_P0_B0	Channel B slot 0 (for primary CPU)
14	CPU0	Intel LGA1356 socket (Primary CPU)
15	P12V_AUX1	8 pin power connector
16	BAT	CMOS battery
17	SKU_KEY1	PBG A SKU Select connector
18	CPU0_FAN	CPU0 fan connector
19	SYS_FAN4	System fan connector
20	SYS_FAN3	System fan connector
21	SYS_FAN2	System fan connector
22	SYS_FAN1	System fan connector
23	SATA0/1	SATA 6Gb/s connectors
24	PMbus_CN_1	PM Bus connector
25	BP_1	HDD back plane connector
26	SSB_ME2	ME enable/disable jumper
27	SATA2/3/4/5	SATA 3Gb/s connectors
28	SATA_SGPIO	SATA SGPIO coneector
29	SCU_SGPIO	SCU SGPIO connector
30	MINISAS_1	Mini SAS connector
31	SAS0~3	SAS connectors
32	F_USB1	Front USB connector
33	FP_1	Front panel connector
34	COM2	Serial cable connector
35	TPM_MEZZ1	TPM connector
36	PCI_1	PCI slot (32bit/33MHz)
37	ROMST_FRB3	Force to Stop FRB3 Timer jumper
38	PCIE_3	PCI-E slot 3 (x8 slot / x4 signal)
39	IPMB	IPMB connector
40	BMC_LED1	BMC Firmware Readiness LED
41	PCIE_2	PCI-E slot 2 (x16 slot / x8 signal)
42	PCIE_1	PCI-E slot 1 (x16 slot)
43	CPU1_FAN	CPU1 fan connector
44	DDR3_P1_D0	Channel A slot 0 (for secondary CPU)
45	DDR3_P1_E0	Channel B slot 0 (for secondary CPU)

46	DDR3_P1_F0	Channel C slot 0 (for secondary CPU)
47	DDR3_P1_F1	Channel C slot 1 (for secondary CPU)
48	PASSWORD	Clear password jumper
49	BIOS_RCVR	BIOS recovery jumper
50	SSB_ME1	ME enable/disable jumper
51	JP5	Chassis intrusion jumper
52	CLR_CMOS	Clear CMOS jumper
53	BIOS_WP	BIOS write protect jumper
54	SATA_DOM0/SATA_DOM1	SATA0/1 port DOM support jumper



CAUTION! If a SATA type hard drive is connected to the motherboard, please ensure the jumper is closed and set to **2-3 pins** (Normal mode), in order to reduce any risk of hard disk damage. Please refer to Page 49 for SATA_DOM0 and SATA_DOM1 jumper setting instruction.

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

GA-7PCSL

GA-1F COL	
CPU	Enhanced Intel SpeedStep Technology (EIST) & Demand BasedSwitch (DBS) Enhanced Intel SpeedStep Technology (EIST)
Chipset •	Intel® C600 (Patsburg) Chipset
Memory •	8 x 1.5V DDR3 DIMM sockets supporting up to 64 GB of systemmemory * Due to Windows 32-bit operating system limitation, when more than 4 GB of physical memory is installed, the actual memory size displayed will be less than 4 GB. 8 x 1.35V DDR3L DIMM sockets supporting up to 32 GB of system memory 3 channel memory architecture
•	Support for 800/1066/1333/1600 memory modules
•	Support for ECC RDIMM/ UDIMM memory modules
LAN •	2 x Intel® 82574L supports 10/100/1000 Mbps
Expansion Slots	1 x PCI Express x8 slot, running at x8 (PCIE_2) 1 x PCI Express x8 slot, running at x4 (PCIE_3) 1 x PCI slot 32-Bit/33MHz (PCI_1)
Onboard Graphics	ASPEED® AST2300 supports 16MB VRAM
Storage Interface	 4 x SATA 3Gb/s connectors (SAS0/1/2/3/via SCU) 1 x Mini-SAS connector (disabled, can be enabled for 4 x SAS/SATA 3Gb/s ports via upgrade ROM) 2 x SATA 6Gb/s connectors (SATA0/1) 4 x SATA 3Gb/s connectors (SATA2/3/4/5) Support for Intel RSTe SATA RAID 0, RAID 1
USB •	 Up to 6 USB 2.0/1.1 ports (4 on the back panel, 2 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
	 4 x SATA 3Gb/s connectors (SAS0~3)
	2 x mini SAS 3Gb/s connectors
	2 x SATA 6Gb/s connectors
	1 x PSMI header
	2 x CPU fan header
	4 x System fan header
	1 x Front panel header
	◆ 2 x USB 2.0/1.1 headers
	1 x Serial port header
	1 x SPGIO header
Rear Panel I/O	◆ 4 x USB 2.0/1.1 ports
	◆ 2 x RJ-45 port
	◆ 1 x COM port
	◆ 1 x VGA port
	1 x ID Switch button
I/O Controller	ASPEED® AST2300 BMC chip
Hardware 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 the CPU/system cooler you install.
BIOS	1 x 64 Mbit flash
	• AMI BIOS
Form Factor	CEB Form Factor; 12 inch x 10.5 inch, 6 layers PCB

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

GA-7PCSI X

GA-/PCSLX	
CPU	 Support for Dual Intel® Xeon® Sandy-bridge-EN 2S processors in 1356 socket Intel® Xeon® Quad Core in LGA 1356 socket Supports QuickPath Interconnect up to 8GT/s Enhanced Intel SpeedStep Technology (EIST) & Demand BasedSwitch (DBS) Enhanced Intel SpeedStep Technology (EIST) Support Intel Virtualization Technology (VT)
Chipset	◆ Intel® C600 (Patsburg) Chipset
Memory	8 x 1.5V DDR3 DIMM sockets supporting up to 64 GB of systemmemory Due to Windows 32-bit operating system limitation, when more than 4 GB of physical memory is installed, the actual memory size displayed will be less than 4 GB. 8 x 1.35V DDR3L DIMM sockets supporting up to 32 GB of system memory 3 channel memory architecture
	• Support for 800/1066/1333/1600 memory modules
	Support for ECC RDIMM/ UDIMM memory modules
LAN	2 x Intel® 82574L supports 10/100/1000 Mbps
Expansion Slots	 1 x PCI Express x16 slot, running at x16 (PCIE_1) 1 x PCI Express x8 slot, running at x8 (PCIE_2) 1 x PCI Express x8 slot, running at x4 (PCIE_3) 1 x PCI slot 32-Bit/33MHz (PCI_1)
Onboard Graphics	◆ ASPEED® AST2300 supports 16MB VRAM
Storage Interface	 Intel® C600 controller 4 x SATA 3Gb/s connectors (SAS0/1/2/3/via SCU) 1 x mini SAS connector (4 SATA ports (3Gb/s)/optional with Upgrade ROM attached) 4 x SATA 3Gb/s connectors (SATA2/3/4/5) 2 x SATA 6Gb/s connectors (SATA0/1) Support for Intel RSTe SATA RAID 0, RAID 1
USB	 Up to 6 USB 2.0/1.1 ports (4 on the back panel, 2 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
	4 x SATA 3Gb/s connectors (SAS0/1/2/3)
	1 x mini SAS 3Gb/s connector
	 4 x SATA 3Gb/s connectors (SATA2/3/4/5)
	2 x SATA 6Gb/s connectors
	1 x PSMI header
	2 x CPU fan header
	4 x System fan header
	1 x Front panel header
	• 2 x USB 2.0/1.1 headers
	1 x Serial port header
	1 x SPGIO header
Rear Panel I/O	◆ 4 x USB 2.0/1.1 ports
	◆ 2 x RJ-45 port
	• 1 x COM port
	◆ 1 x VGA port
	1 x ID Switch button
I/O Controller	◆ ASPEED® AST2300 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 the CPU/system cooler you install.
BIOS	1 x 64 Mbit flash
	AMI BIOS
Form Factor	CEB Form Factor; 12 inch x 10.5 inch, 8 layers PCB

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

1-3 Installing the CPU and CPU Cooler

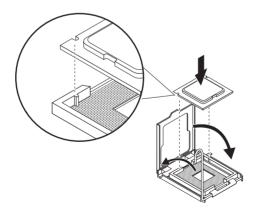


Read the following guidelines before you begin to install the CPU:

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

1-3-1 Installing the CPU

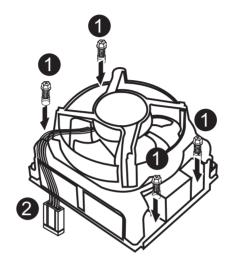
- Step 1. Raise the metal locking lever on the socket.
- Step 2. Remove the plastic covering on the CPU socket.
- Step 3. Lift the metal cover.
- Step 4. Insert the CPU with the correct orientation. The CPU only fits in one orientation.
- Step 5. Please replace the metal cover and push the metallever back into locked position.



1-3-2 Installing the CPU Cooler

Follow the steps below to correctly install the CPU cooler on the motherboard.

- Step 1. Attach the heat sink clip to the processor socket.
- Step 2. Secure the cooing fan with screws..
- Step 3. Connect processor fan can cable to the processor fan connector.



1-4 Installing the Memory



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

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

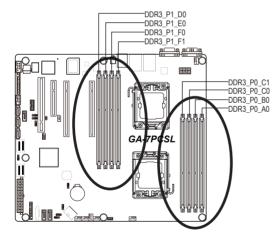
1-4-1 Dual/3 Channel Memory Configuration

This motherboard provides eight DDR3 memory sockets and supports Dual/3 Channel Technology. After the memory is installed, the BIOS will automatically detect the specifications and capacity of the memory. Enabling Dual Channel memory mode will double the original memory bandwidth.

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

Channel A: DDR3_P0_A0, DDR3_P1_D0 Channel B: DDR3_P0_B0, DDR3_P1_E0

Channel C: DDR3_P0_C0, DDR3_P0_C1, DDR3_P1_F0, DDR3_P1_F1



	Channel A	Channel B	Channel C
U-DIMM	DDR3_P0_A0 DDR3_P1_D0	DDR3_P0_B0 DDR3_P1_E0	
	Single-Rank	Single-Rank	Single-Rank
	Dual-Rank	Dual-Rank	Dual-Rank

	Channel A	Channel B	Channel C
R-DIMM	DDR3_P0_A0 DDR3_P1_D0	DDR3_P0_B0 DDR3_P1_E0	
TC-DIIVIIVI	Single-Rank	Single-Rank	Single-Rank
	Dual-Rank	Dual-Rank	Dual-Rank
	Quad-Rank	Quad-Rank	Quad-Rank

Due to CPU limitation, read the following guidelines before installing the memory in Dual or 3 Channel mode **Dual Channel--**

- 1. Dual Channel mode cannot be enabled if only one DDR3 memory module is installed.
- When enabling Dual Channel mode with two or four modules, it is recommended that memory of th same capacity, brand, speed, and chips be used. When enabling Dual Channel mode with two memory modules, be sure to install them in the DDR3_P0_C0 and DDR3_P0_C1 sockets for primary CPU; install DDR3_P1_F0 and DDR3_P1_F1 for secondary CPU.

3 Channel

- 1. 3 Channel mode cannot be enabled if only one or two DDR3 memory modules are installed.
- When enabling 3 Channel mode with three, four or six modules, it is recommended that memory of the same capacity, brand, speed, and chips be used. When enabling 3 Channel mode with three

memory modules, be sure to install them in the DDR3_P0_A0, DDR3_P0_B0 and DDR3_P0_C0 sockets for primary CPU; install DDR3_P1_D0, DDR3_P1_E0 DDR3_P1_F0 for secondary CPU. When enabling 3 Channel mode with four memory modules, be sure to install them in the DDR3_P0_A0, DDR3_P0_B0, DDR3_P0_C0, and and DDR3_P0_C1 sockets for primary CPU; install DDR3_P1_D0, DDR3_P1_E0, DDR3_P1_F0, and DDR3_P1_F1 for secondary CPU

1-4-2 Installing a Memory

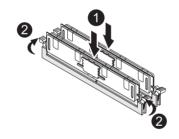


Before installing a memory module, make sure to turn off the computer and unplug the power cord from the power outlet to prevent damage to the memory module.

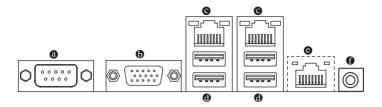
Be sure to install DDR3 DIMMs on this motherboard.

Installation Step:

- Step 1. Insert the DIMM memory module vertically into the DIMM slot, and push it down.
- Step 2. Close the plastic clip at both edges of the DIMM slots to lock the DIMM module.
- Note: For dual-channel operation, DIMMs must be installed in matched pairs.
- Step 3. Reverse the installation steps when you wish to remove the DIMM module.



1-5 Back Panel Connectors



Serial Port

Connects to serial-based mouse or data processing devices.

Video Port

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

RJ-45 LAN Port

The Gigabit Ethernet LAN port provides Internet connection at up to 1 Gbps data rate. The following describes the states of the LAN port LEDs.

USB 2.0/1.1 Port

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

KVM Server Management 10/100 LAN Port

The LAN port provides Internet connection with data transfer speeds of 10/100Mbps.

ID Switch Button

This button provide the selected unit idenfication function.



Connection	10	41			
Connection	1/5beei	uL	.=	U.	

	<u>'</u>
State	Description
Orange	1 Gbps data rate
Green	100 Mbps data rate
Off	10 Mbps data rate

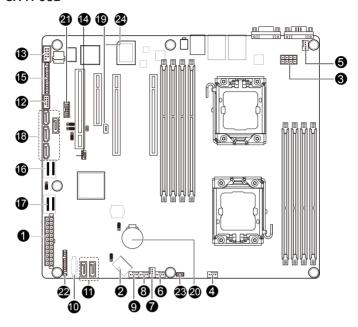


State	Description
Blinking	Data transmission or receiving is occurring
On	No data transmission



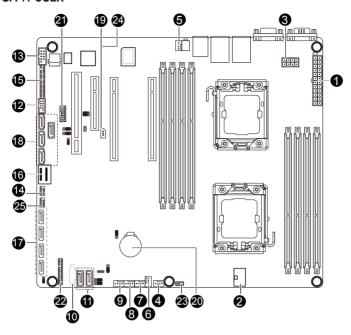
- When removing the cable connected to a back panel connector, first remove the cable from your
 device and then remove it from the motherboard.
- When removing the cable, pull it straight out from the connector. Do not rock it side to side to
 prevent an electrical short inside the cable connector.

1-6 Internal Connectors GA-7PCSL



1)	ATX1	13)	COM2
2)	P12V_AUX1	14)	SCU_SGPIO
3)	P12V_AUX2	15)	FP_1
4)	CPU0_FAN (for primary CPU)	16)	MINISAS_1
5)	CPU1_FAN (for seconary CPU)	17)	MINISAS_2
6)	SYS_FAN4 (System Fan)	18)	SAS0/1/2/3
7)	SYS_FAN3 (System Fan)	19)	IPMB
8)	SYS_FAN2 (System Fan)	20)	BAT
9)	SYS_FAN1 (System Fan)	21)	TPM_MEZZ1
10)	PMbus_CN_1	22)	BP_1
11)	SATA0/1	23)	SKU_KEY1
12)	F_USB1	24)	BMC_LED1

GA-7PCSLX



1)	ATX1	14)	SCU_SGPIO
2)	P12V_AUX1	15)	FP_1
3)	P12V_AUX2	16)	MINISAS_1
4)	CPU0_FAN (for primary CPU)	17)	SATA2/3/4/5
5)	CPU1_FAN (for seconary CPU)	18)	SAS0/1/2/3
6)	SYS_FAN4 (System Fan)	19)	IPMB
7)	SYS_FAN3 (System Fan)	20)	BAT
8)	SYS_FAN2 (System Fan)	21)	TPM_MEZZ1
9)	SYS_FAN1 (System Fan)	22)	BP_1
10)	PMbus_CN_1	23)	SKU_KEY1
11)	SATA0/1	24)	BMC_LED1
12)	F_USB1	25)	SATA_SGPIO
13)	COM2		



Read the following guidelines before connecting external devices:

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

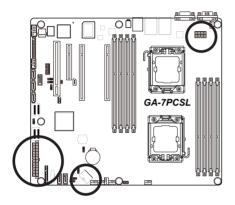
1/2/3) ATX1/P12V AUX1/P12V AUX2

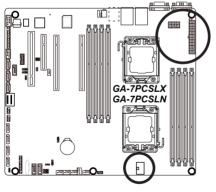
(2x4 12V Power Connector and 2x12 Main Power Connector)

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



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







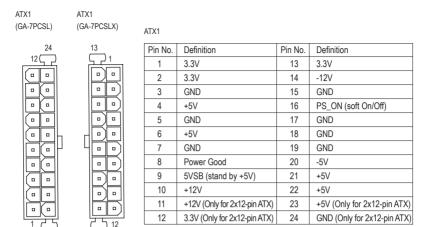


P12V/ ALIY1

FIZV_AUA	k I
Pin No.	Definition
1	GND
2	GND
3	GND
4	GND
5	P12V_DDR3_CPU0
6	P12V_DDR3_CPU0
7	P12V_CPU0
8	P12V_CPU0

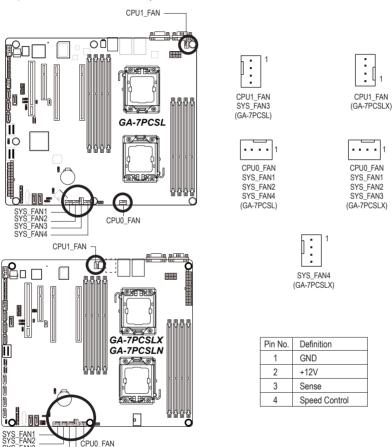
P12V AUX2

Pin No.	Definition
1	GND
2	GND
3	GND
4	GND
5	P12V_DDR3_CPU1
6	P12V_DDR3_CPU1
7	P12V_CPU1
8	P12V_CPU1



4/5/6/7/8/9) CPU0_FAN/CPU1_FAN/SYS_FAN4/SYS_FAN3/SYS_FAN2/SYS_FAN1 (CPU Fan/System Fan Headers)

The motherboard has a 4-pin CPU fan header (CPU_FAN1/2), a 4-pin (FAN4) system fan headers. Most fan headers possess a foolproof insertion design. When connecting a fan cable, be sure to connect it in the correct orientation (the black connector wire is the ground wire). The motherboard supports CPU fan speed control, which requires the use of a CPU fan with fan speed control design. For optimum heat dissipation, it is recommended that a system fan be installed inside the chassis.

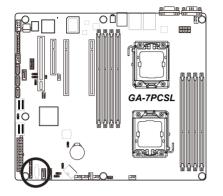




SYS_FAN3 SYS_FAN4

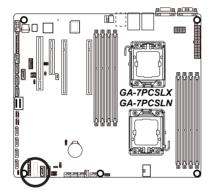
- Be sure to connect fan cables to the fan headers to prevent your CPU and system from overheating. Overheating may result in damage to the CPU or the system may hang.
- These fan headers are not configuration jumper blocks. Do not place a jumper cap on the headers.

10) PMbus_CN_1 (Power management connector)



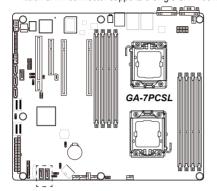


Pin No.	Definition
1	SMB CLK
2	SMB DATA
3	SMB Alert
4	GND Sense
5	3.3V Sense



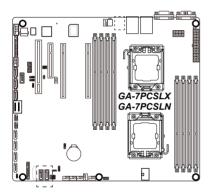
11) SATA0/1 (SATA 6Gb/s Connectors)

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





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



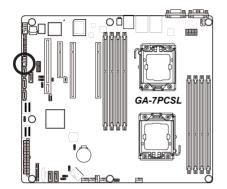


- A RAID 0 or RAID 1 configuration requires at least two hard drives. If more than two hard drives are configured, the total number of hard drives must be an even number.
- A RAID 10 configuration requires four hard drives.

(Note) When a RAID configuration is built across the SATA 3Gb/s channels, the system performance of the RAID configuration may vary depends on the devices are connected.

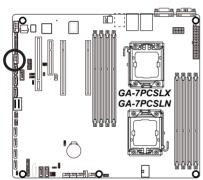
12) F_USB1 (USB Headers)

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



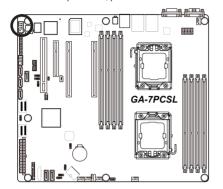


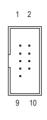
Pin No.	Definition
1	Power (5V)
2	Power (5V)
3	USB DX-
4	USB DY-
5	USB DX+
6	USB DY+
7	GND
8	GND
9	No Pin
10	NC



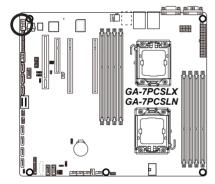
13) COM2 (Serial Port Header)

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



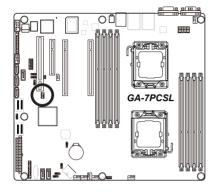


Pin No.	Definition
1	NDCD-
2	NDSR-
3	NSIN
4	NRTS-
5	NSOUT
6	NCTS-
7	NDTR-
8	NRI-
9	GND
10	No Pin



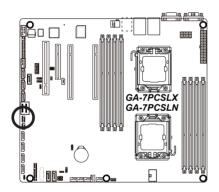
14) SCU SGPIO (SCU SGPIO Header)

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



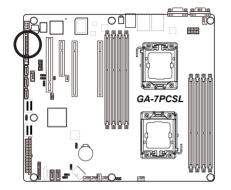


Pin No.	Definition
1	SGPIO_SAS1_DATAIN
2	No Pin
3	SGPIO_SAS1_DATAOUT
4	GND
5	GND
6	SGPIO_SAS1_LOAD
7	NC
8	SGPIO_SAS1_CLOCK



15) FP_1 (Front Panel Header/GA-7PCSL)

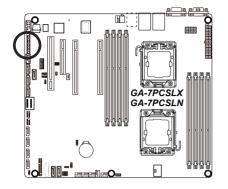
Connect the power switch, reset switch, speaker, chassis intrusion switch/sensor and system status indicator on the chassis to this header according to the pin assignments below. Note the positive and negative pins before connecting the cables.





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

15) FP_1 (Front Panel Header/GA-7PCSLX)





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

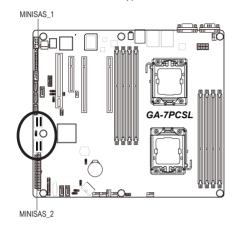
The front panel design may differ by chassis. A front panel module mainly consists of power switch, reset switch, power LED, hard drive activity LED, speaker and etc. When connecting your chassis front panel module to this header, make sure the wire assignments and the pin assignments are matched correctly.

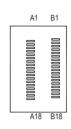
16) MINISAS 1 (Mini SAS cable connector)

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

17) MINISAS_2 (Mini SAS cable connector with SATA 3Gb/s signal/GA-7PCSL Only)

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





MINISAS_1

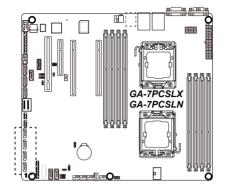
Pin No.	Definition	Pin No.	Definition
A1	GND	B1	GND
A2	RX0+	B2	TX0+
A3	RX0-	В3	TX0-
A4	GND	B4	GND
A5	RX1+	B5	TX1+
A6	RX1-	В6	TX1-
A7	GND	B7	GND
A8	SIB7	B8	SIB0
A9	SIB3	В9	SIB1
A10	SIB4	B10	SIB2
A11	SIB5	B11	SIB6
A12	GND	B12	GND
A13	RX2+	B13	TX2+
A14	RX2-	B14	TX2-
A15	GND	B15	GND
A16	RX3+	B16	TX3+
A17	RX3-	B17	TX3-
A18	GND	A18	GND

MINISAS 2

WIINIOAO_Z			
Definition	Pin No.	Definition	
GND	B1	GND	
RX0+	B2	TX0+	
RX0-	В3	TX0-	
GND	В4	GND	
RX1+	B5	TX1+	
RX1-	В6	TX1-	
GND	B7	GND	
SIB7	B8	SIB0	
SIB3	В9	SIB1	
SIB4	B10	SIB2	
SIB5	B11	SIB6	
GND	B12	GND	
RX2+	B13	TX2+	
RX2-	B14	TX2-	
GND	B15	GND	
RX3+	B16	TX3+	
RX3-	B17	TX3-	
GND	B18	GND	
	GND RX0+ RX0- GND RX1+ RX1- GND SIB7 SIB3 SIB4 SIB5 GND RX2+ RX2- GND RX3+ RX3-	GND B1 RX0+ B2 RX0- B3 GND B4 RX1+ B5 RX1- B6 GND B7 SIB7 B8 SIB3 B9 SIB4 B10 SIB5 B11 GND B12 RX2+ B13 RX2- B14 GND B15 RX3+ B16 RX3- B17	

17) SATA2/3/4/5 (SATA 3Gb/s Connectors)

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

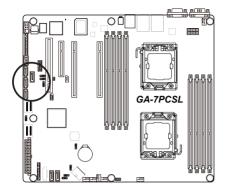




Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

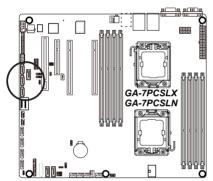
18) SAS0/1/2/3 (SAS cable connectors)

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

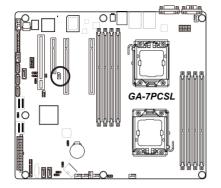




Pin No.	Definition
1	GND
2	TX+
3	TX-
4	GND
5	R-
6	R+
7	GND

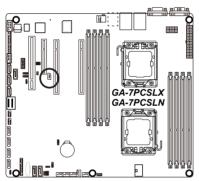


19) IPMB (IPMB connector)



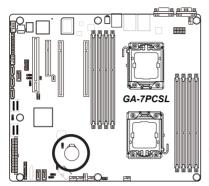


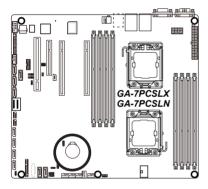
Pin No.	Definition
1	SCL
2	GND
3	SDA



20) 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.







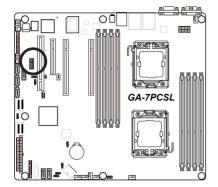
You may clear the CMOS values by removing the battery:

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



- Always turn off your computer and unplug the power cord before replacing the battery.
- · Replace the battery with an equivalent one. Danger of explosion if the battery is replaced with an incorrect model.
- Contact the place of purchase or local dealer if you are not able to replace the battery by yourself or uncertain about the battery model.
- When installing the battery, note the orientation of the positive side (+) and the negative side (-) of the battery (the positive side should face up).
 - Used batteries must be handled in accordance with local environmental regulations.

21) TPM_MEZZ1 (TPM Module)

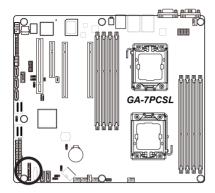


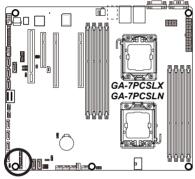


Pin No.	Definition
1	CLK_33M_TPM
2	P_3V3_AUX
3	LPC_RST_DEBUG
4	P3V3
5	LPC_LAD0
6	IRQ_SERIAL
7	LPC_LAD1
8	TPM_DET_N
9	LPC_LAD2
10	NC
11	LPC_LAD3
12	GND
13	LPC_FRAME_N
14	GND

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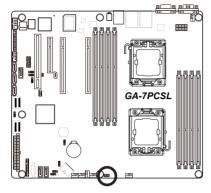
22) BP1 (Back Plane Board Hearder)





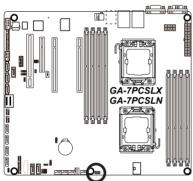
Pin No.	Definition
1	AST2300_SCGCLK
2	FM_THROTTLE_AND_N
3	AST2300_SGLD
4	IQO_FAN_12v_GATE_N
5	AST2300_SGDOUT
6	GND
7	KEY
8	RresetL_BRB
9	GND
10	BP_ALED_N
11	BP_LED_G_N
12	GND
13	AST2300_SGDIN
14	ASSESS#_LED_BPB
15	GND
16	SMB_BPB1_DATA
17	GND
18	SMB_BPB1_CLK
19	GND
20	BP_HDD_TYPE
21	P_3V3_AUX
22	FAN_TYPE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

23) SKU_KEY1 (Patsburg Upgrade ROM Hearder)

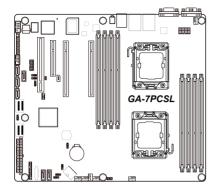




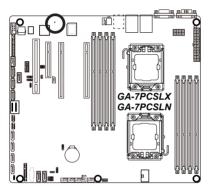
Pin No.	Definition
1	GND
2	FM_PBG_DYN_SKU_KEY
3	GND



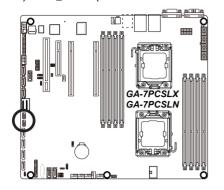
24) BMC_LED1 (BMC Firmware Readiness LED)



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



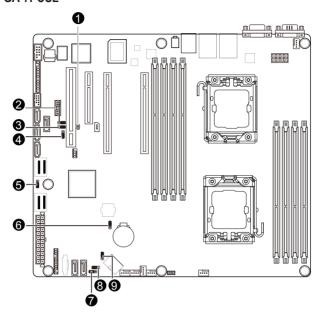
25) SATA_SGPIO (SATA SGPIO Header/GA-7PCSLX Only)





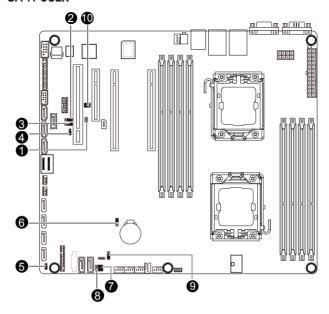
Pin No.	Definition
1	SGPIO_SAS1_DATAIN
2	No Pin
3	SGPIO_SAS1_DATAOUT
4	GND
5	GND
6	SGPIO_SAS1_LOAD
7	NC
8	SGPIO_SAS1_CLOCK

1-7 Jumper Setting GA-7PCSL



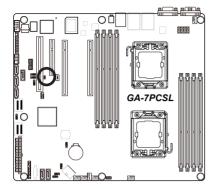
1)	JP5	6)	CLR_CMOS
2)	PASSWORD	7)	SATA_DOM1
3)	BIOS_RVCR	8)	SATA_DOM0
4)	SSB_ME1	9)	BIOS_WP
5)	SSB_ME2		

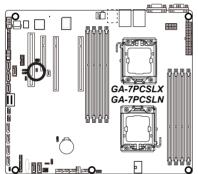
GA-7PCSLX



1)	JP5	6)	CLR_CMOS
2)	PASSWORD	7)	SATA_DOM1
3)	BIOS_RCVR	8)	SATA_DOM0
4)	SSB_ME1	9)	BIOS_WP
5)	SSB_ME2	10)	ROMST_FRB3

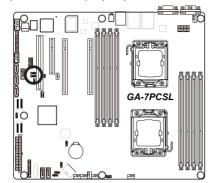
1) JP5 (Case Open Intrusion Jumper)





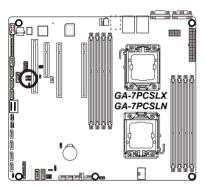
- Open: Normal operation. (Default setting)
- Close: Enable chassis intrusion alert.

2) PASSWORD (Skip Supervisor Password Jumper)

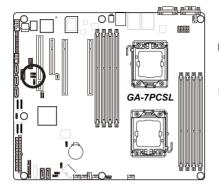


1-2 Close: Normal operation. (Default setting)

2-3 Close: Skip supervisor password.



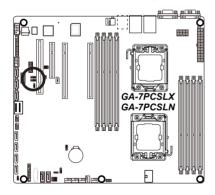
3) BIOS_RVCR (BIOS Recovery Jumper/GA-7PCSL)



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

2-3 Close: BIOS recovery mode.

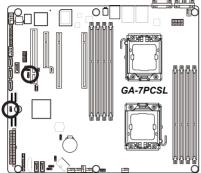
3) BIOS_RCVR (BIOS Recovery Jumper/GA-7PCSLX)

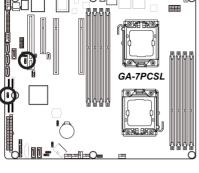


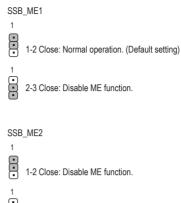
1-2 Close: Normal operation. (Default setting)

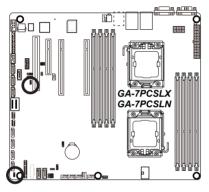
2-3 Close: BIOS recovery mode.

4/5) SSB_ME1/SSB_ME2 (ME enable/disable Jumper)





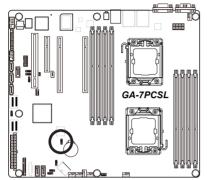




2-3 Close: Normal operation. (Default setting)

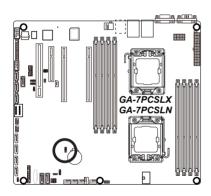
6) CLR CMOS (Clearing CMOS Jumper)

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



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

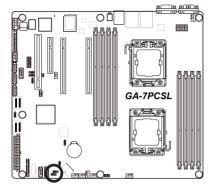
2-3 Close: Clear CMOS data





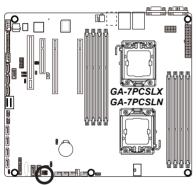
- Always turn off your computer and unplug the power cord from the power outlet before clearing the CMOS values.
- After clearing the CMOS values and before turning on your computer, be sure to remove the jumper cap from the jumper. Failure to do so may cause damage to the motherboard.
- After system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

7/8) SATA_DOM0/1 (SATA DOM Jumper)

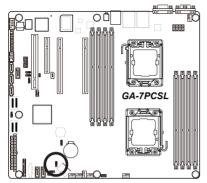




2-3 Close: Normal mode. (Default setting)



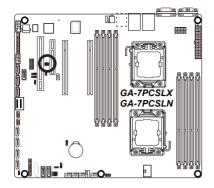
9) BIOS_WP (BIOS Write Protect Jumper)



GA-7PCSLX GA-7PCSLN

- 1-2 Close: Normal operation.
- 2-3 Close: Enable BIOS write protect function.
 (Default setting)

10) ROMST_FRB3 (Force to Stop FRB3 Timer Jumper/GA-7PCSLX Only)





Pin No.	Definition
1	SGPIO_IBMC_DOUT_PD
2	BMC_FRB3_SB3V
3	SGPIO_IBMC_DATOUT
4	BMC_R_FRB3
5	p_3V3_AUX
6	GND

	1-3 Close: Normal ROM Strap
•••	2-4 Close: Normal operation.
•••	4-6 Close: Force to stop FRB3 Timer.

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 "Load Optimized Defaults" section in this chapter or introductions of the battery/
 clearing CMOS jumper in Chapter 1 for how to clear the CMOS values.)

BIOS Setup Program Function Keys

<←><→>	Move the selection bar to select the screen	
< Nove the selection bar to select an item		
<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.)

■ Chipset

This setup page includes all the submenu options for configuring the function of North Bridge and South Bridge.

(ex: Auto detect fan and temperature status, automatically configure hard disk parameters.)

■ Security

Change, set, or disable supervisor and user password. Configuration supervisor password allows you to restrict access to the system and BIOS Setup.

A supervisor password allows you to make changes in BIOS Setup.

A user password only allows you to view the BIOS settings but not to make changes.

■ Server Management

Server additional features enabled/disabled setup menus.

■ Boot Options

This setup page provides items for configuration of boot sequence.

■ Boot Manager

This setup page provides configuration of boot up devices.

■ Exit

Save all the changes made in the BIOS Setup program to the CMOS and exit BIOS Setup. (Pressing <F10> can also carry out this task.)

Abandon all changes and the previous settings remain in effect. Pressing <Y> to the confirmation message will exit BIOS Setup. (Pressing <Esc> can also carry out this task.)

2-1 The Main Menu

Once you enter the BIOS Setup program, the Main Menu (as shown below) appears on the screen. Use arrow keys to move among the items and press <Enter> to accept or enter other sub-menu.

Main Menu Help

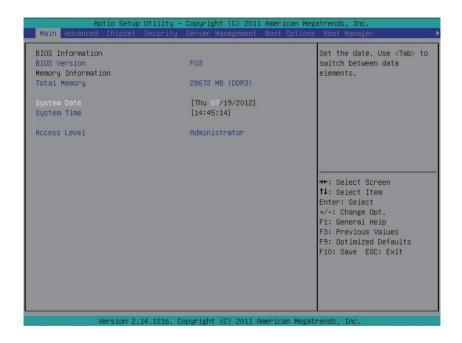
The on-screen description of a highlighted setup option is displayed on the bottom line of the Main Menu.

Submenu Help

While in a submenu, press <F1> to display a help screen (General Help) of function keys available for the menu. Press <Esc> to exit the help screen. Help for each item is in the Item Help block on the right side of the submenu.



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



→ BIOS Version

Display version number of the BIOS setup utility.

→ Memory

Determines how much total memory is present during the POST.

→ System Date

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

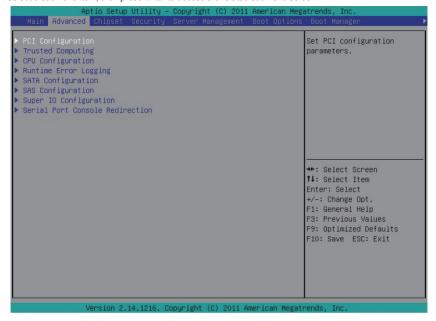
☐ System Time

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

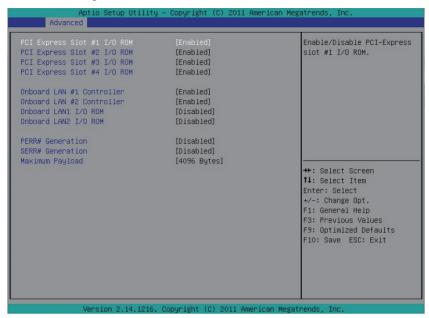
Display the current accessing level information.

2-2 Advanced Menu

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



2-2-1 PCI Configuration



PCI Express Slot 1/2/3/4 Option ROM

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

→ Onboard LAN1/2 Controller

Enable/Disable Onboard LAN controller.

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

→ LAN1/2 Option ROM

Enable/Disable onboard LAN1 device and initialize device expansion ROM.

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

PERR Generation

When this item is set to enabled, PCI bus parity error (PERR) is generated and is routed to NMI. Options available: Enabled/Disabled. Default setting is **Disabled**.

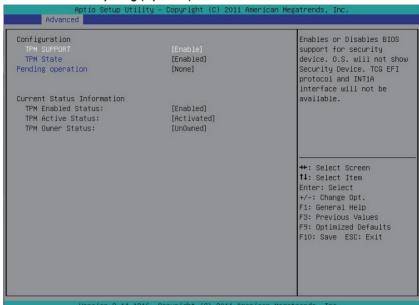
SERR Generation

When this item is set to enabled, PCI bus system error (SERR) is generated and is routed to NMI. Options available: Enabled/Disabled. Default setting is **Disabled**.

Maximum Playload

Set maximum playlooad for PCI Express Device or allow system BIOS to select the value. Options available: Auto/128 Bytes/256 Bytes/512 Bytes/1024 Bytes/2048 Bytes/4096 Bytes. Default setting is **4096 Bytes**.

2-2-2 Trusted Computing (Optioanl)



→ TPM Support

Select Enabled to activate TPM support feature.

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

→ TPM State

Select Enabled to activate TPM State function.

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

Pending Operation

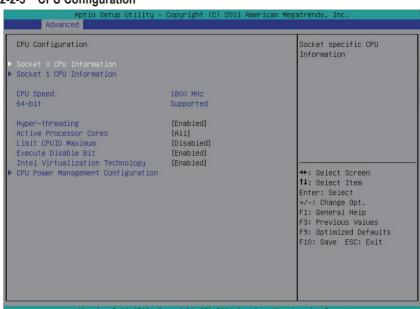
Determine the action when operation is pending.

Options available: None. Default setting is None.

☐ Current Status Information

Display current TPM status information.

2-2-3 CPU Configuration



Socket O CPU Information		
Genuine Intel(R) CPU @ 1.80GHz CPU Signature Microcode Patch Max CPU Speed Min CPU Speed Min CPU Speed Processor Cores Intel HT Technology Intel VT—x Technology L1 Data Cache L2 Cache L3 Cache	206d2 8000020c 1800 MHz 1200 MHz 8 Supported Supported 32 KB x 8 32 KB x 8 256 KB x 8 20480 KB	++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save ESC: Exit

Advanced Socket 1 CPU Information Genuine Intel(R) CPU @ 1.80GHz CPU Signature Microcode Patch Max CPU Speed 1800 MHz 1200 MHz Min CPU Speed Processor Cores Supported Supported Intel HT Technology Intel VT-x Technology 32 kB x 8 L1 Data Cache 32 kB x 8 L1 Code Cache L2 Cache 256 KB x 8 →+: Select Screen L3 Cache ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save ESC: Exit

→ Socket 0/1 Information

□ CPU Signature

Displays the processor ID information.

Microcode Patch

Display Microcode patch.

Max CPU Speed

Display the maximum processor speed.

Min CPU Speed

Display the minimum processor speed.

Processor Cores

Display the information of the processor core.

Intel HT Technology

Display Intel Hyper Threading Technology function support information.

Display Intel Virtualization Technology function support information.

☐ Cache Information

Display the information of L1 Data Cache.

☐ L1 Code Cache

Display the information of L1 Code Cache.

□ 12 Cache

Display the information of L2 Cache per Core.

→ L3 Cache

Display the information of total L3 Cache per socket.

→ CPU Speed

Display the current installed CPU speed.

→ 64-bit

Display the supported information of installed CPU.

Hyper-threading

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

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

→ Limit CPUID Maximum

When enabled, the processor will limit the maximum COUID input values to 03h when queried, even if the processor supports a higher CPUID input value.

When disabled, the processor will return the actual maximum CPUID input value of the processor when queried.

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

□ Execute Disable Bit

When enabled, the processor prevents the execution of code in data-only memory pages. This provides some protection against buffer overflow attacks.

When disabled, the processor will not restrict code execution in any memory area. This makes the processor more vulnerable to buffer overflow attacks.

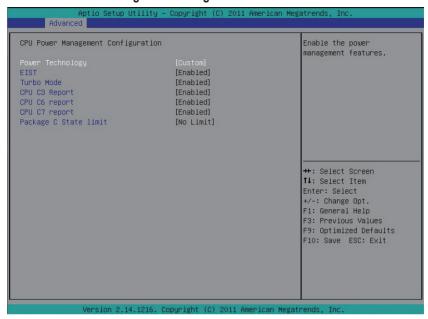
Options available: Enabled/Disabled. Default setting is Enabled.

→ Intel Virtualization Technology

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

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

2-2-3-1 CPU Power Management Configuration



→ CPU Management

→ Power Technology

Configure the power management features.

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

□ EIST (Enhanced Intel SpeedStep Technology)

Conventional Intel SpeedStep Technology switches both voltage and frequency in tandem between high and low levels in response to processor load.

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

→ Turbo Mode

When this feature is enabled, the processor can dynamically overclock one or two of its four processing cores to improve performance with applications that are not multi-threaded or optimized for quad-core processors.

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

→ CPU C3/C6 Report (Note)

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

Options available for C3 Report: ACPI C2/ACPI C3/Disabled. Default setting is Disabled.

Options available for C6 Report: Enabled/Disabled. Default setting is **Enabled**.

→ CPU C7 Report (Note)

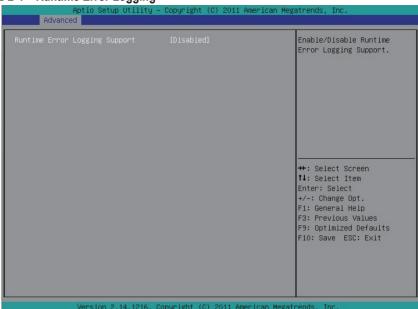
Allows you to enable or disable the CPU C7 (ACPI C3) report. Options available: Enabled/Disabled. Default setting is **Enabled**.

Configure state for the C-State package limit.

Options available: C0/C1/C6/C7/No Limit. Default setting is **No Limit**.

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

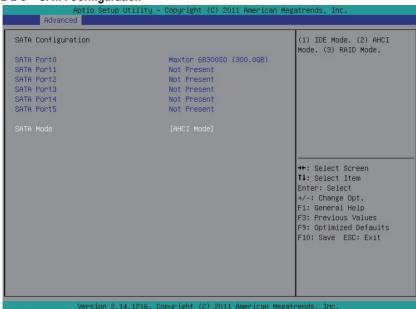
2-2-4 Runtime Error Logging



Enable/Disable Runtime error logging support.

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

2-2-5 SATA Configuration



→ SATA Port 0/1/2/3/4/5 (Note)

Press [Enter] to view the installed HDD devices.

→ SATA Mode

Select the on chip SATA type.

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

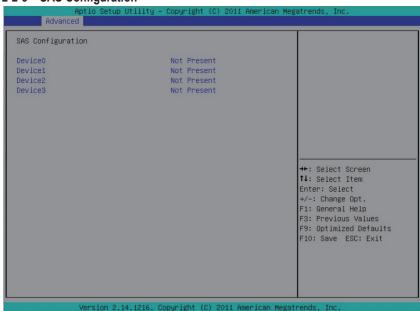
RAID Mode: When set to RAID, the SATA controllerenables both its RAID and AHCI functions. You will be allows access the RAID setup utility at boot time.

AHCI 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/AHCI/Disabled. Default setting is AHCI Mode.

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

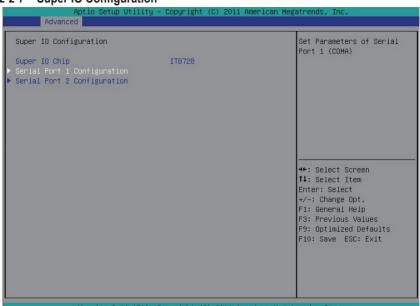
2-2-6 SAS Configuration



→ Device 0/1/2/3 (Note)

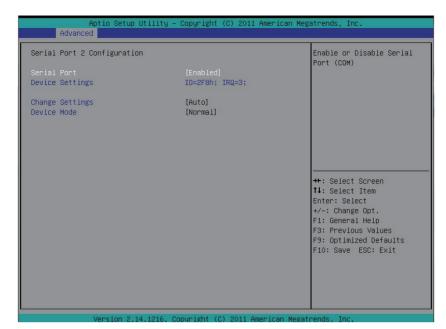
Press [Enter] to view the installed HDD devices.

2-2-7 Super IO Configuration



Version 2.14.1216. Copyright (C) 2011 American Megatrends. Inc.

Serial Port 1 Configuration		Enable or Disable Serial
Serial Port Device Settings	[Enabled] IO=3F8h; IRQ=4;	Port (COM)
	[Auto] [Normal]	
		++: Select Screen ↑1: Select Item
		Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save FSC: Exit
		TIV. Save Esc. Exit



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

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

Device Settings

Displays the Serial Port 1/2 base I/O addressand IRQ.

Change Settings

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

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

IO=2F8h; IRQ=3.4.5.6.7.10.11.12 /IO=3E8h; IRQ=3.4.5.6.7.10.11.12/IO=2E8h; IRQ=3.4.5.6.7.10.11.12.

2-2-8 Serial Port Console Redirection

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc. The settings specify how the host computer and the COM1 remote computer (which the Console Redirection [Enabled] user is using) will exchange data. Both computers should have the [Disabled] Console Redirection same or compatible ▶ Console Redirection Settings settings. Serial Port for Out-of-Band Management/ Windows Emergency Management Services (EMS) Console Redirection [Disabled] ▶ Console Redirection Settings ++: Select Screen BMC SOL Serial Port Switch [Disabled] ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save ESC: Exit

Version 2.14.1216, Copyright (C) 2011 American Megatrends, Inc.

Getup Utility – Copyright (C) 2011 American Megatrends, Inc. Emulation: ANSI: Extended Console Redirection Settings ASCII char set. VT100: ASCII char set. VT100+: Terminal Type Bits per second Extends VT100 to support color, function keys, etc. Data Bits VT-UTF8: Uses UTF8 [8] [None] encoding to map Unicode Parity Stop Bits chars onto 1 or more bytes. Flow Control [None] VT-UTF8 Combo Key Support [Enabled] [Disabled] Recorder Mode [Disabled] Resolution 100x31 Legacy OS Redirection Resolution [80x24] →+: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save ESC: Exit

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.

□ Terminal Type

Select a terminal type to be used for console redirection.

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

→ Bits per second

Select the baud rate for console redirection.

Options available: 9600/19200/57600/115200.

Data Bits

Select the data bits for console redirection

Options available: 7/8.

→ Parity

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

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

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

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

Mark and Space Parity do not allow for error detection.

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

Stop Bits

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

Options available: 1/2.

→ Flow Control

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

Options available: None/Hardware RTS/CTS.

VT-UTF8 Combo Key Support

Enable/Disable VT-UTF8 Combo Key Support.

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

□ Recorder Mode

When this mode enabled, only text will be send. This is to capture Terminal data.

Options available: Enabled/Disabled.

→ Resolution 100x31

Enables or disables extended terminal resolution.

Options available: Enabled/Disabled.

Legacy OS Redirection Resolution

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

Options available: 80x24/80X25.

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

Serial Port for Out-of-Bnad Management/Windows Emerency Service (EMS)

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

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

Console Redirection Settings

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

→ 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

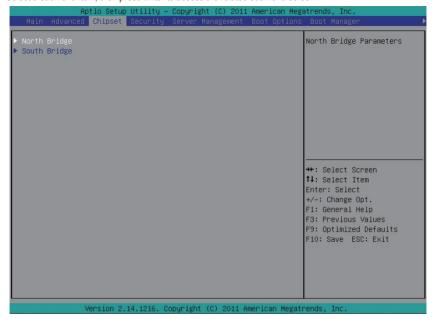
→ BMC SOL Serial Port Switch

Enabled: COM1 Switch to AST2300 SOL UART. Disabled: COM1 Switch to IT8728 SOL UART1.

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

2-3 Chipset Menu

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



2-3-1 North Bridge Configuration



☐ Compatibility RID

Enable/Disable Compatibility RID function.

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

☐ Total Memory

Determines how much total memory is present during the POST.

Current Memory Mode

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

Current Memory Speed

Displays the cuurent memory speed.

→ Memory Mode

Determine the memory mode.

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

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

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

When set to Sparing mode, a preset threshold of coorectable errors is used to trigger fail-over.

The spare memory is put online and used as active memory in place of the failed memory.

Options available: Indendent /Mirroring/ Lockstep/Sparing.

→ Numa

Enable/Disable Non Uniform Memory Access (NUMA) function.

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

DIMM Voltage

Configure the DIMM voltage.

Options available: Auto/ Force 1.5v/Force 1.35v. Default setting is Auto.

☐ Enforce DIMM

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

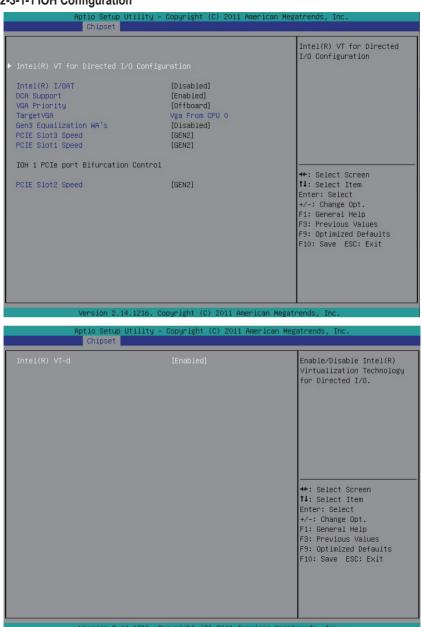
Options available: Enforce EN/Stretch EN/Enforce DIS. Default setting is **Enforce EN**.

☐ To clear ECC Flag.

When DDR3 Channel is maskoff after ECC multibit errors, it is required to clear ECC flag to make masked off channels be available

Options available: None/To clear ECC Flag when save and exit. Default setting is None.

2-3-1-1 IOH Configuration



→ IOH Configuration

Intel(R) VT for Directed I/O Configuration

☐ Intel(R) I/OAT

Enable/Disable Intel OAT Technology function.

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

→ DCA Support

Enable/Disable Direct Cache Access Support function.

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

→ VGA Priority

Define the display device priority.

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

→ Target VGA

Displays the information of Target VGA.

Gen3 Equalization WA's

Enable/Disable the support for Gen3 Equalization Workaround.

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

→ PCIE Slot1 Speed

Select PCIe slot 1 speed.

Options available: GEN1/GEN2/GEN3. Default setting is GEN2.

→ PCIE Slot3 Speed

Select PCIe slot 3 speed.

Options available: GEN1/GEN2/GEN3. Default setting is GEN2.

→ IOH 1 PCIe port Bifurcation Control

→ PCIE Slot2 Speed

Select PCIe slot 2 speed.

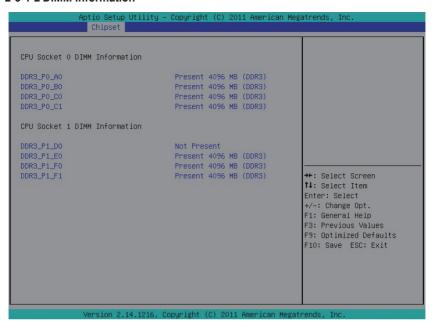
Options available: GEN1/GEN2/GEN3. Default setting is GEN2.

☐ Intel(R) VT-d

Enable/Disable Intel VT-d Technology function.

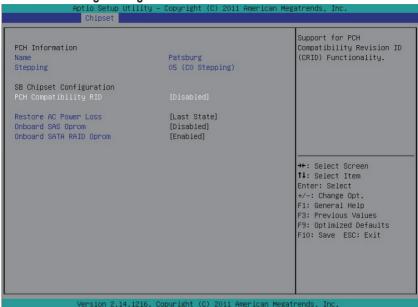
Options available: Enabled/Disabled. Default setting is Disabled.

2-3-1-2 DIMM Information



- → DIMM Information:
- □ DIMM Group: CPU Socket 0/1 DIMM Information
 CPU Socket 0: DDR_3_P0_A0/DDR_3_P0_b0/DDR_3_P0_c0/DDR_3_P0_C1 Status
 CPU Socket 1: DDR_3_P1_D0/DDR_3_P1_E0/DDR_3_P1_F0/DDR_3_P1_F1 Status
 The size of memory installed on each of the DDR3 slots.

2-3-2 South Bridge Configuration



→ PCH Information:

→ Name/Stepping Information

Displays the name and stepping information of the south bridge.

□ SB Chipset Configuration □

→ PCH Compatibility RID

Enable/Disable PCH Compatibility RID support.

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

☐ Restore on AC Power Loss (Note)

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

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

Deep Power off Mode

Enable/Disable Deep Power off Mode.

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

→ SCU devices

Enable/Disable Patsburg SCU devices.

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

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

○ Onboard SAS oprom

Enable/Disable onboard SAS option ROM.
Options available: Enabled/Disabled. Default setting is **Disabled**.

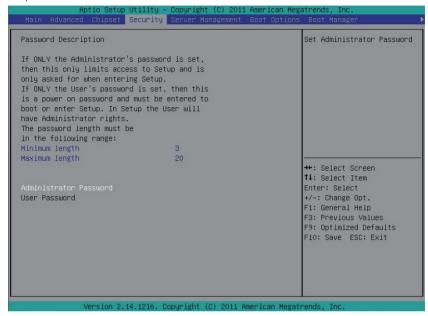
Onboard SATA RAID oprom

Enable/Disable onboard SATA RAID option ROM.

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

2-4 Security Menu

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



There are two types of passwords that you can set:

Administrator Password

Entering this password will allow the user to access and change all settings in the Setup Utility.

User Password

Entering this password will restrict a user's access to the Setup menus. To enable or disable this field, a Administrator Password must first be set. A user can only access and modify the System Time, System Date, and Set User Password fields.

Administrator Password Status

This parameter indicates whether a Administrator Password has been assigned.

→ User Password Status

This parameter indicates whether a user pass- word has been assigned.

To clear the password, press <Enter> on the password item and when requested for the password, press <Enter> again. The message "PASSWORD DISABLED" will appear, indicating the password has been cancelled.

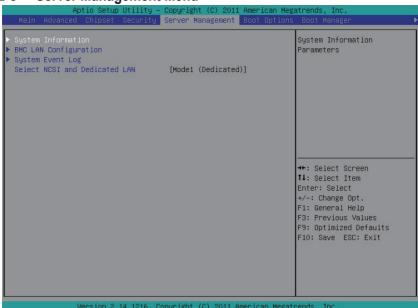
→ Set Administrator Password

Press Enter to configure the Administrator password.

Set User Password

Press Enter to configure the user password.

2-5 Server Management Menu



System Information

Displays basic system ID information, as well as BIOS version. Press Enter to access the related submenu.

→ BMC LAN Configuration

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

System Event Log

Press Enter to access the related system event log.

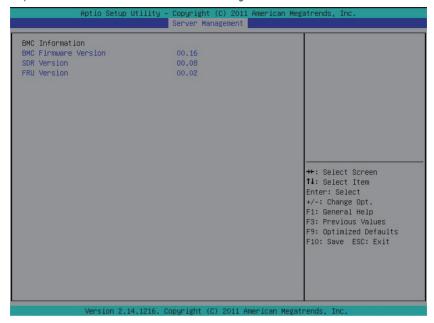
□ Select NCSI and Dedicated LAN

Switch NCSI and dedicated LAN and send KCS command.

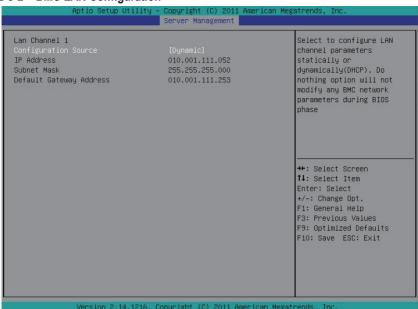
Options available: Mode2(NSCI)/ Mode1 (Dedicated).

2-5-1 System Information

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



2-5-2 BMC LAN Configuration



□ Configuration Source

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

Options available: Static/Dynamic/Do Nothing.

→ IP Address

Display IP Address information.

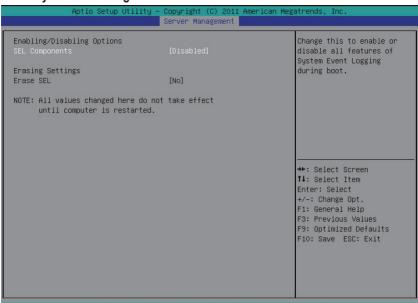
Display Subnet Mask information.

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

Default Gateway Address

Display Default Gateway Address information.

2-5-3 **System Event Log**



→ SEL Components

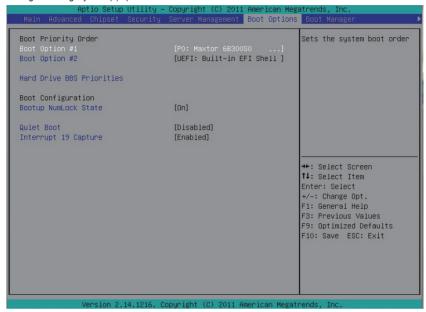
Enable/Disable all features fo system event logging during system boot. Options available: Enabled/Disabled.

Erasing Settings

Choose this option for erasing Smbios Event Log is done prior to any logging activation during reset. Options available: Yes/No.

2-6 Boot Option Menu

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



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

- UEFI device.
- 2. Hard drive.

Bootup NumLock State

Enable or Disable Bootup NumLock function.

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

→ Quiet Boot

Enables or disables showing the logo during POST.

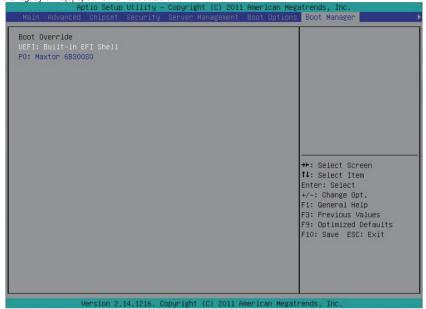
Options available: Enabled/Disabled. Default setting is Disabled.

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

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

2-7 Boot Manager

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

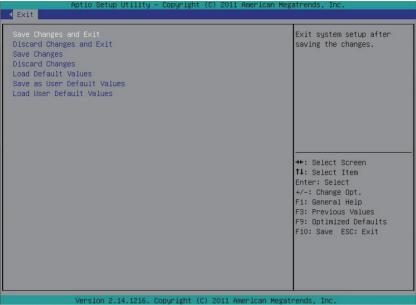


→ UEFI: Built-in EFI Shell

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

2-8 Exit Menu

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



→ Save Changes and Exit

Saves changes made and close the BIOS setup.

Options available: Yes/No.

Discard Changes and Exit

Discards changes made and close the BIOS setup.

Options available: Yes/No.

→ Save Changes

Saves changes made in the BIOS setup.

Options available: Yes/No.

Discard Changes

Discards all changes made in the BIOS setup.

Options available: Yes/No.

→ Load Default Values

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

Options available: Yes/No.

Saves as user default and close the BIOS setup.

Options available: Yes/No.

□ Load User Default Values

Loads the user default settings for all BIOS setup parameters.

Options available: Yes/No.

Chapter 3 Appendix

3-1 FAQ

Question	Answer
Why does when PCIE graphics card is used as	IKVM function can only be supported by using
default displaying device, iKVM video display always	onboard video out.
show "out of range"?	
Why does BMC featured server power on take longer	BMC featured server require BMC initialization before
time?	power on, please wait for BMC LED start to blink
	which indicates BMC initial process was completed
	the BIOS will start functioning.
For Dual Processor server platform, Do you need to	Yes, this Dual processor platform require both 8 pin
connect both 8 Pin Power supply connector to power	power connector for power supply else it will not
on?	power on.
Can you use E5-1400 series processor on Dual	No, E5-1400 series processor can only be used on
Processor EN server?	Single Processor EN server.