GA-6FXSV2
Xeon Processor Motherboard

USER′S Manual

Xeon® Processor Motherboard
Rev. 1001

* The WEEE marking on the product indicates this product must not be disposed of with user's other household waste and must be handed over to a designated collection point for the recycling of waste electrical and electronic equipment!!

* The WEEE marking applies only in European Union's member states.

Table of Contents

Item Checklist

- ☑ The GA-6FXSV2 motherboard
- ☑ Serial ATA cable x 2
- ☑ I/O Shield Kit
- ☑ CD for motherboard driver & utility
- ☑ The GA-6FXSV2 quick reference guide

* The items listed above are for reference only, and are subject to change without notice.

Chapter 1 Introduction

1.1. Considerations Prior to Installation

Preparing Your Computer

The motherboard contains numerous delicate electronic circuits and components which can become damaged as a result of electrostatic discharge (ESD). Thus, prior to installation, please follow the instructions below:

1. Please turn off the computer and unplug its power cord.
2. When handling the motherboard, avoid touching any metal leads or connectors.
3. It is best to wear an electrostatic discharge (ESD) cuff when handling electronic components (CPU, RAM).
4. Prior to installing the electronic components, please have these items on top of an antistatic pad or within a electrostatic shielding container.
5. Please verify that the power supply is switched off before unplugging the power supply connector from the motherboard.

Installation Notices

1. Prior to installation, please do not remove the stickers on the motherboard. These stickers are required for warranty validation.
2. Prior to the installation of the motherboard or any hardware, please first carefully read the information in the provided manual.
3. Before using the product, please verify that all cables and power connectors are connected.
4. To prevent damage to the motherboard, please do not allow screws to come in contact with the motherboard circuit or its components.
5. Please make sure there are no leftover screws or metal components placed on the motherboard or within the computer casing.
6. Please do not place the computer system on an uneven surface.
7. Turning on the computer power during the installation process can lead to damage to system components as well as physical harm to the user.
8. 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.

Instances of Non-Warranty

1. Damage due to natural disaster, accident or human cause.
2. Damage as a result of violating the conditions recommended in the user manual.
3. Damage due to improper installation.
4. Damage due to use of uncertified components.
5. Damage due to use exceeding the permitted parameters.
6. Product determined to be an unofficial Gigabyte product.

1.2.   Features Summary

Form Factor	• 9.6″ x 9.6″ Micro ATX size form factor, 6 layers PCB
CPU	• Supports single Intel® LGA1156 (socket H1) processor
	• Support Lynnfield (Quad-core) processor
	• Enhanced Intel SpeedStep Technology (EIST) & Demand Based Switch (DBS)
	• Support Intel Virtualization Technology (VT)
Chipset	• Intel® 3420 Chipset
Memory	• 6 x DIMM slots support DDR3 1066/1333
	• Dual channel memory architecture
	• Support 1066/1333 memory
	• Support Unbuffered DDR3 ECC DIMM
I/O Control	• Windbond W83627DHG-P Super I/O
Expansion Slots	• 1 PCI slots 32-Bit/33MHz (5V)
	• 1 PCI-Express x16 slot (Gen2 x16 bandwidth)
	• 1 PCI-Express x8 slot (Gen2 at x8 bandwidth)
	• 1 PCI-Express x8 slot (Gen2 at x4 signal)
	• 1 PCI-Express x4 slot (Gen2 at x1 signal)
SATA RAID Controller	• Intel® 3420 SATA Controller
	• Supports 6 independent SATA 3.0 Gb/s with Intel Software RAID 0,1,5,10
On-Board VGA	• ServerEngines Pilot II with 32MB DDR2 memory
On-Board LAN	• Intel® 82574L GbE controller and Intel® 82578DM PHY support dual Gigabit Ethernet ports
Internal Connector	• 1 x 24-pin ATX power connector
	• 1 x 8-pin ATX power connector
	• 6 x SATA 3.0Gb/s connectors
	• 1 x Serial connector (COM)
	• 1 x USB 2.0 connectors for additional 2 ports by cable
	• 1 x front panel connector
	• 4 x System fan cable connector
Rear Panel I/O	• P/S 2 Keyboard and Mouse connectors
	• 1 x Serial port
	• 2 x USB 2.0 dual-port connector
	• 1 x VGA connector
	• 2 x RJ45 LAN ports

	•	1 x 10/100 LAN port (for server management)
Hardware Monitor	•	Winbond W83627DHG-P controller
	•	Enhanced features with CPU Vcore, DDR3 1.5V, VCC3 (3.3V), 12V, 5V, and System Temperature Values viewing
	•	CPU/System Fan Revolution Detect
	•	CPU shutdown when overheat
BIOS	•	Phoenix BIOS on 16Mb flash RAM
Additional Features	•	Supports S4, S5 under Windows Operating System
	•	AC Recovery
	•	Supports Console Redirection
	•	Supports 4-pin Fan controller

** The entire specificaiton provided herein are for reference only. The specification may differ by the motherboard model.

1.3.   GA-6FXSV2 Motherboard Component

No	Code	Description
1.	U1	CPU
2.	U2	Intel 3420 chipset
3.	U28	ServerEngine Pilot II
4.	U40	VGA memory
5.	U19	Intel 8578DM PHY
6.	U21	Intel 82574L GbE controller
7.	U45	SMSC 8700 management 10/100 PHY
8.	U23	BMC firmware
9.	U23	BIOS Flash ROM
10.	COM1	Com port cable connector
11.	USB2	USB cable connector
12.	SATA0-3	SATA cable connectors
13.	SATA4	SATA cable connector
14.	SATA5	SATA cable connector
15.	FAN1	CPU fan cable connector
16.	FAN2	System fan cable connector
17.	FAN3	System fan cable connector
18.	FAN4	System fan cable connector
19.	DIMM1/3/5	Channel A DDR3 socket
20.	DIMM2/4/6	Channel B DDR3 socket
21.	F_PANEL	front panel connector
22.	KB_MS	Keyboard and mouse connectors
23.	COM2_VGA	Serial port and VGA port
24.	GLAN1	Gigabit LAN port + USB ports
25.	GLAN2	Gigabit LAN port + USB ports
26.	BMC_LAN	Server management 10/100 LAN port
27.	ATX	24 pin ATX power connector
28.	ATX_CPU	8 pin ATX power connector
29.	PCI1	PCIe2.0 (5.0GT/s), x 8 Slot
30.	PCI2	PCIe2.0 (2.5GT/s), x 4 Slot (x1 signal)
31.	PCI3	PCIe2.0 (5.0GT/s), x 16 Slot (**Share with PCI1)
32.	PCI4	PCIe2.0 (2.5GT/s), x 8 Slot (x4 signal)
33.	PCI5	PCI 32bit/33MHz slot
34.	BAT	CMOS battery
35.	CLR_CMOS	Clear CMOS jumper
36.	BIOS_WP	BIOS write protect Jumper
37.	PASSWORD	Set Supervisor Password jumper
38.	SATA RAID	Enable SATA RAID jumper
39.	BIOS_RVCR	BIOS recovery jumper
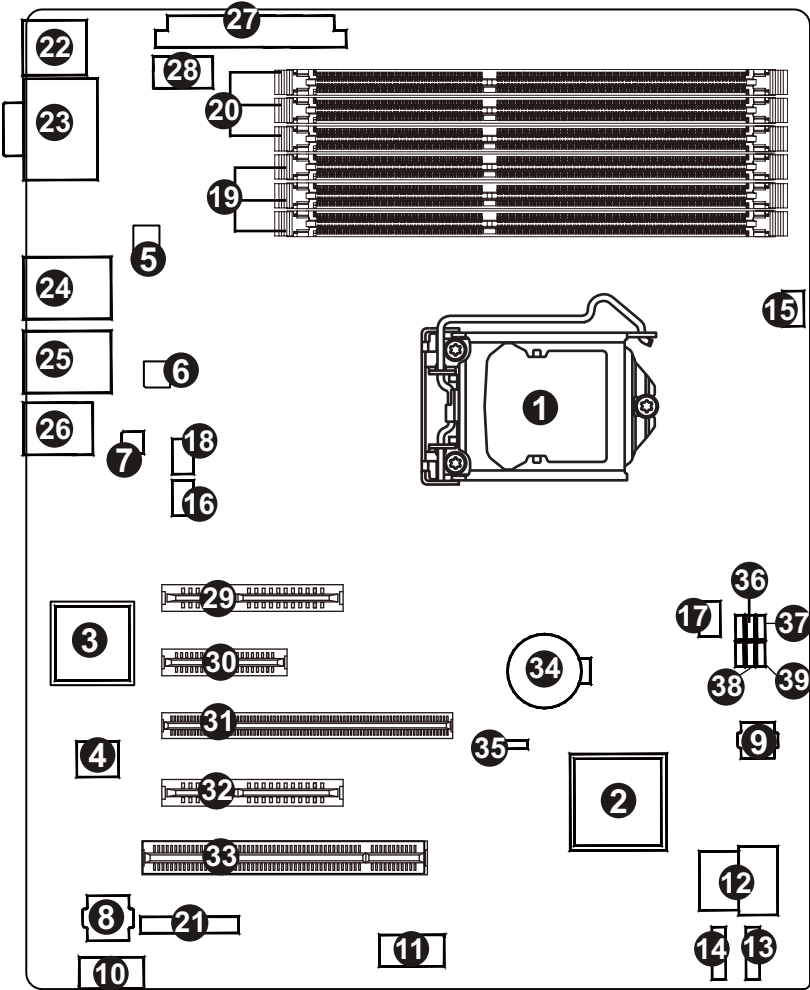
Chapter 2 Hardware Installation Process

## 2.1. Installing Processor and CPU Heat Sink

Before installing the processor and cooling fan, adhere to the following cautions:

⚠️ **CAUTION**

1. The processor will overheat without the heatsink and/or fan, resulting in permanent irreparable damage.
2. Never force the processor into the socket.
3. Apply thermal grease on the processor before placing cooling fan.
4. Please make sure the CPU type is supported by the motherboard.
5. If you do not match the CPU socket Pin 1 and CPU cut edge well, it will cause improper installation. Please change the insert orientation.
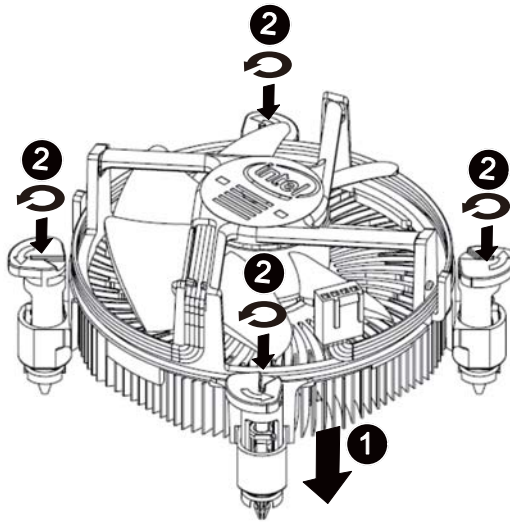
2.1.1. Installing CPU

Step 1 Raise the metal locking lever on the socket.
Remove the plastic covering on the CPU socket.
Insert the CPU with the correct orientation. The CPU only fits in one orientation.

Step 2 Replace the metal cover.

Step 3 Push the metal lever back into locked position.
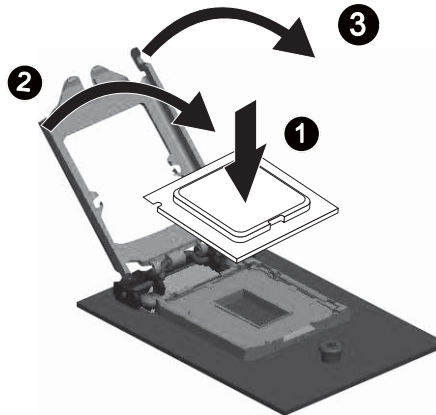
2.1.2. Installing Cooling FAN

Step 1   Attach the cooling fan on the processor socket.

Step 2   Turning and push vertically the push pin as arrow direction shown.

Step 3   Connect processor fan cable connector to the processor fan connector.

2.2.   Installing memory modules

⚠ **CAUTION**

Before installing the memory modules, please comply with the following conditions:
1.   Please make sure that the memory is supported by the motherboard. It is recommended to use the memory with similar capacity, specifications and brand.
2.   Before installing or removing memory modules, please make sure that the computer power is switched off to prevent hardware damage.
3.   Memory modules have a foolproof insertion design. A memory module can be installed in only one direction. If you are unable to insert the module, please switch the direction.

The motherboard supports DDR3 memory modules, whereby BIOS will automatically detect memory capacity and specifications. Memory modules are designed so that they can be inserted only in one direction. The memory capacity used can differ with each slot.

Channel B memory socket
Channel A memory socket
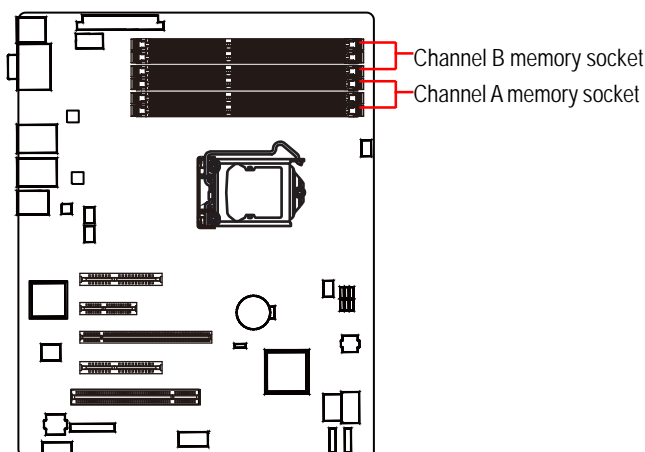
Installation Steps:

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! DIMM must be populated in order starting from DIMM1/DIMM3/DIMM5 socket.

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.
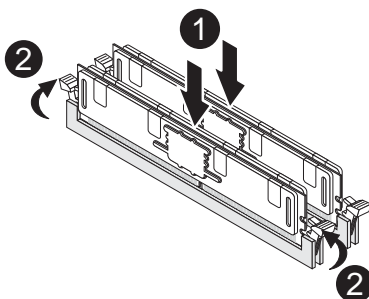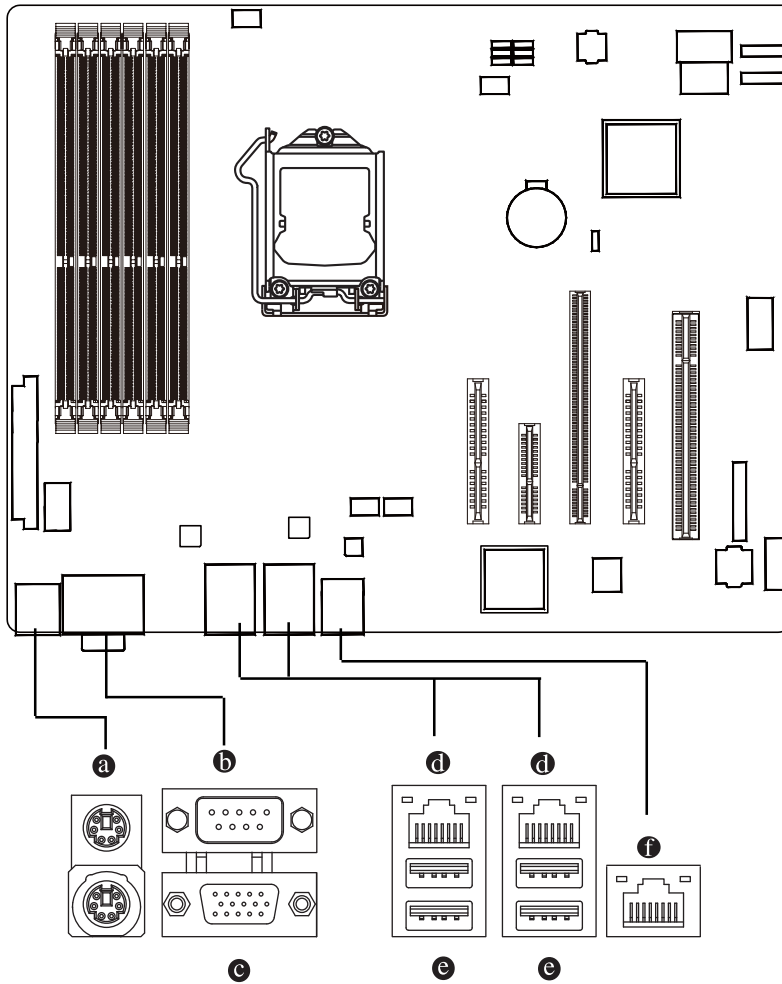
Memory Population Table

	Channel A			Channel B		
	DIMM1	DIMM3	DIMM5	DIMM2	DIMM4	DIMM6
R-DIMM	✓					
	✓	✓				
	✓	✓	✓			
	✓			✓		
	✓	✓		✓		
	✓	✓	✓	✓		
	✓	✓		✓	✓	
	✓	✓	✓	✓	✓	
	✓	✓	✓	✓	✓	✓
U-DIMM	✓					
	✓	✓				
	✓			✓		
	✓	✓		✓		
	✓	✓		✓	✓	

2.3.   Connect ribbon cables, cabinet wires, and power supply

2.3.1. I/O Back Panel Introduction

ⓐ PS/2 Keyboard and PS/2 Mouse Connector

To install a PS/2 port keyboard and mouse, plug the mouse to the upper port (green) and the keyboard to the lower port (purple).

ⓑ 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.

ⓓ Gigabit LAN Ports

The LAN port provides Internet connection of Gigabit Ethernet with data transfer speeds of 10/100/1000Mbps.

ⓔ USB Port

Before you connect your device(s) into USB connector(s), please make sure your device(s) such as USB keyboard, mouse, scanner, zip, speaker...etc. have a standard USB interface. Also make sure your OS supports USB controller. If your OS does not support USB controller, please contact OS vendor for possible patch or driver updated. For more information please contact your OS or device(s) vendors.

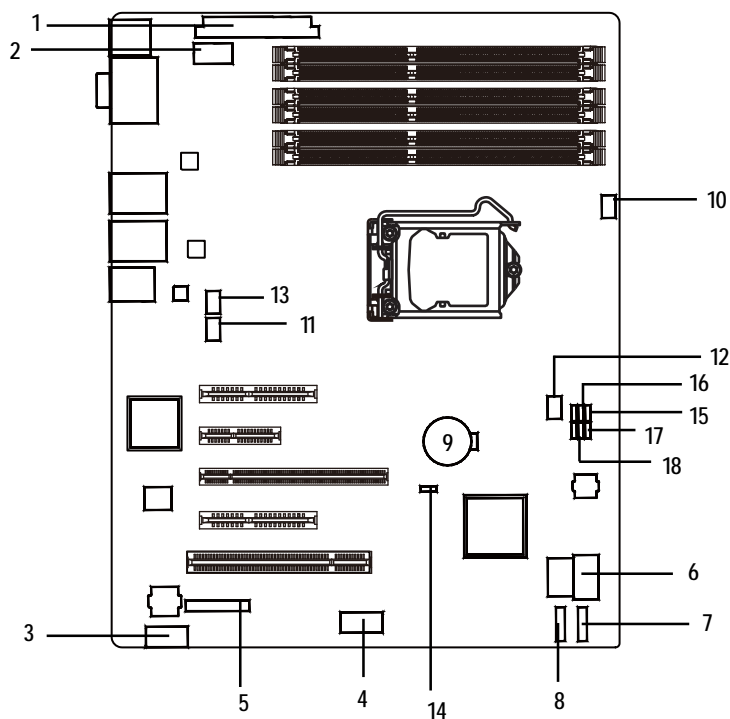**ⓕ KVM Server Management 10/100 LAN Port**

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

LAN LED Description

LED2 (Green/Yellow) ➤ ◀ LED1 (Green)

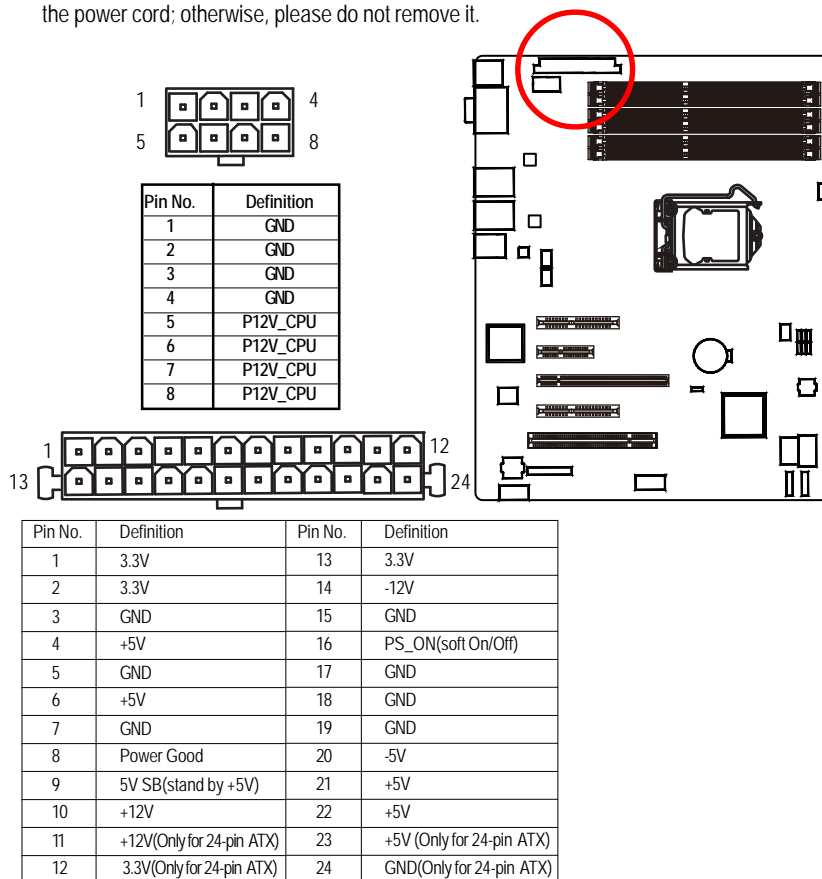| Name	Color	Condition	Description
LED1	Green	ON	LAN Link / no Access
	Green	BLINK	LAN Access
	-	OFF	Idle
LED2	-	OFF	10Mbps connection
	Green	BLINK	Port identification with 10 Mbps connection
	Green	ON	100Mbps connection
	Green	BLINK	Port identification with 100Mbps connection
	Yellow	ON	1Gbps connection
	Yellow	BLINK	Port identification with 1Gbps connection

2.4. Connectors and Jumper Setting Introduction

1. ATX
2. ATX_CPU
3. COM1
4. USB2 (USB cable connector)
5. F_PANEL
6. SATA0-3 (SATA data cable connectors)
7. SATA4 (SATA data cable connector)
8. SATA5 (SATA data cable connector)
9. BAT (CMOS Battery)

10. FAN1 (CPU fan connector)
11. FAN2 (System fan connector))
12. FAN3 (System fan connector)
13. FAN4 (System fan connector)
14. CLR_CMOS
15. PASSWORD
16. BIOS_WP
17. BIOS_RVCR
18. SATA_RAID

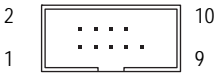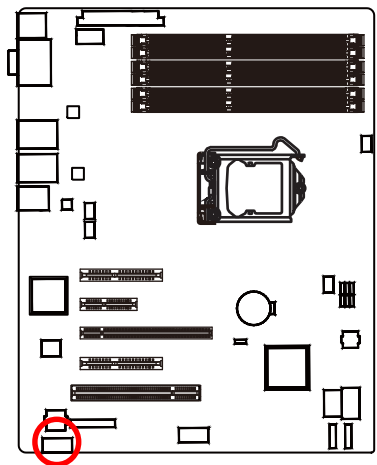## 1/2) ATX/ATX_CPU (24-pin/ 8-pin ATX power connectors)

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, please make sure that all components and devices are properly installed. Align the power connector with its proper location on the motherboard and connect tightly.

The ATX_12V power connector mainly supplies power to the CPU. If the ATX_12V power connector is not connected, the system will not start.

Caution! Please use a power supply that is able to support the system voltage requirements. It is recommended that a power supply that can withstand high power consumption be used (350W or greater). If a power supply is used that does not provide the required power, the result can lead to an unstable system or a system that is unable to start. If you use a power supply that provides a 24-pin ATX power connector, please remove the small cover on the power connector on the motherboard before plugging in the power cord; otherwise, please do not remove it.
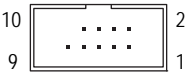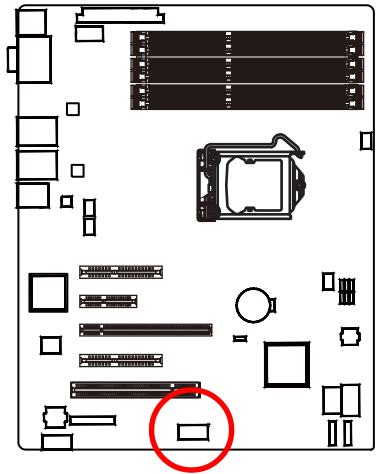

Pin No.	Definition
1	GND
2	GND
3	GND
4	GND
5	P12V_CPU
6	P12V_CPU
7	P12V_CPU
8	P12V_CPU

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

3) COM1

| Pin No.	Definition
1	DCD-
2	SIN2
3	SOUT2
4	DTR2-
5	GND
6	DSR2-
7	RTS2-
8	CTS2-
9	RI2-
10	NC

4) USB2 (USB cable connector)

Be careful with the polarity of the front USB connector. Check the pin assignment carefully while you connect the front USB cable, incorrect connection between the cable and connector will make the device unable to work or even damage it. For optional front USB cable, please contact your local dealer.

Pin No.	Definition
1	5V power
2	5V power
3	-FUSB4
4	-FUSB5
5	+FUSB4
6	+FUSB5
7	GND
8	GND
9	NC
10	NC

## 6) F_PANEL (2X12 Pins Front Panel connector)

Please connect the power LED, PC speaker, reset switch and power switch of your chassis
front panel to the F_PANEL connector according to the pin assignment above.
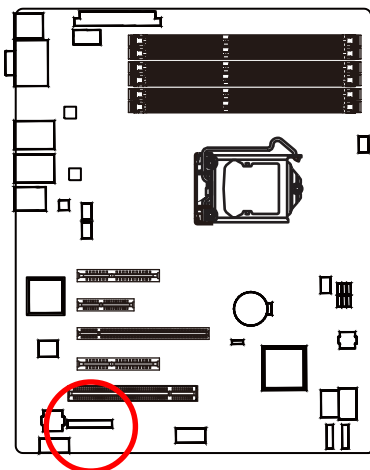
Pin No.	Signal Name	Description
1.	Power LED +	Power LED Signal anode (+)
2.	5V standby	Front panel power
3.	Pin removed	Pin removed
4.	N C	No connect
5.	Power LED -	Power LED Signal cathode(-)
6.	N C	No connect
7.	HD status LED+	Hard Disk LED Signal anode (+)
8.	N C	No connect
9.	HD status LED-	Hard Disk LED Signal cathode(-)
10.	N C	No connect
11.	Power on switch	Power button
12.	LAN1 active LED (-)	LAN1 active LED Signal cathode(-)
13.	GND	Ground
14.	LAN1 active LED (+)	LAN1 active LED Signal anode (+)
15.	Reset switch	Reset button Signal
16.	N C	No connect
17.	GND	Ground
18.	N C	No connect
19.	N C	No connect
20.	CASEOPEN	Chassis intrusion Signal
21.	N C	No connect
22.	LAN2 active LED (-)	LAN2 active LED Signal cathode(-)
23.	NMI switch	NMI switch Signal
24.	LAN2 active LED (+)	LAN2 active LED Signal anode (+)

6/7/8) SATA 0~5 (Serial ATA cable connectors)

SATA 3Gb/s can provide up to 300MB/s transfer rate. Please refer to the BIOS setting for the SATA 3Gb/s and install the proper driver in order to work properly.
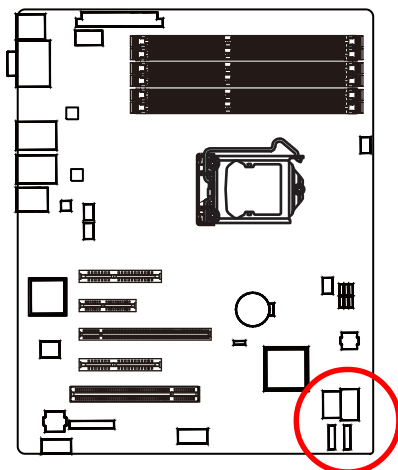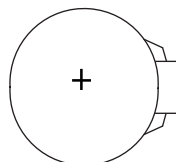
| Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

9) BAT (CMOSattery)

If you want to erase CMOS...
1.Turn OFF the computer and unplug the power cord.
2.Remove the battery, wait for 30 second.
3.Re-install the battery.
4.Plug the power cord and turn ON the computer.

CAUTION

❖ Danger of explosion if battery is incorrectly replaced.

❖ Replace only with the same or equivalent type recommended by the manufacturer.

❖ Dispose of used batteries according to the manufacturer's instructions.
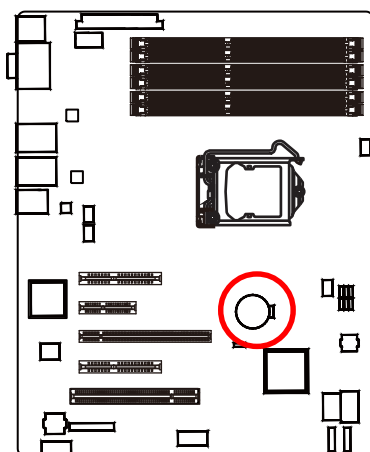
10~13) FAN1/2/3/4 (CPU fan/System fan cable connectors)

The cooler fan power connector supplies a +12V power voltage via a 3-pin/4-pin(CPU_FAN) power connector and possesses a foolproof connection design.

Most coolers are designed with color-coded power connector wires. A red power connector wire indicates a positive connection and requires a +12V power voltage. The black connector wire is the ground wire (GND).

Remember to connect the CPU/system fan cable to the CPU_FAN/SYS_FAN connector to prevent CPU damage or system hanging caused by overheating.
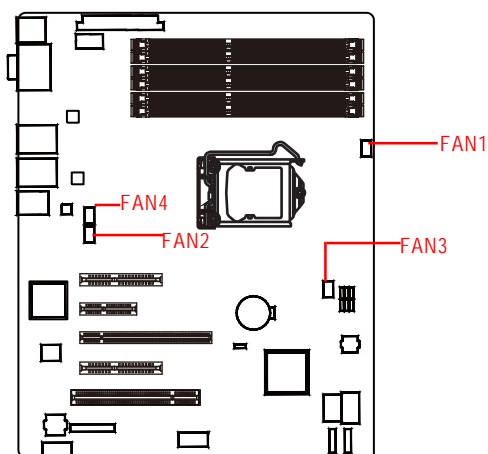
Pin No.	Definition
1	GND
2	12V
3	Sense
4	Control

Jumper Setting
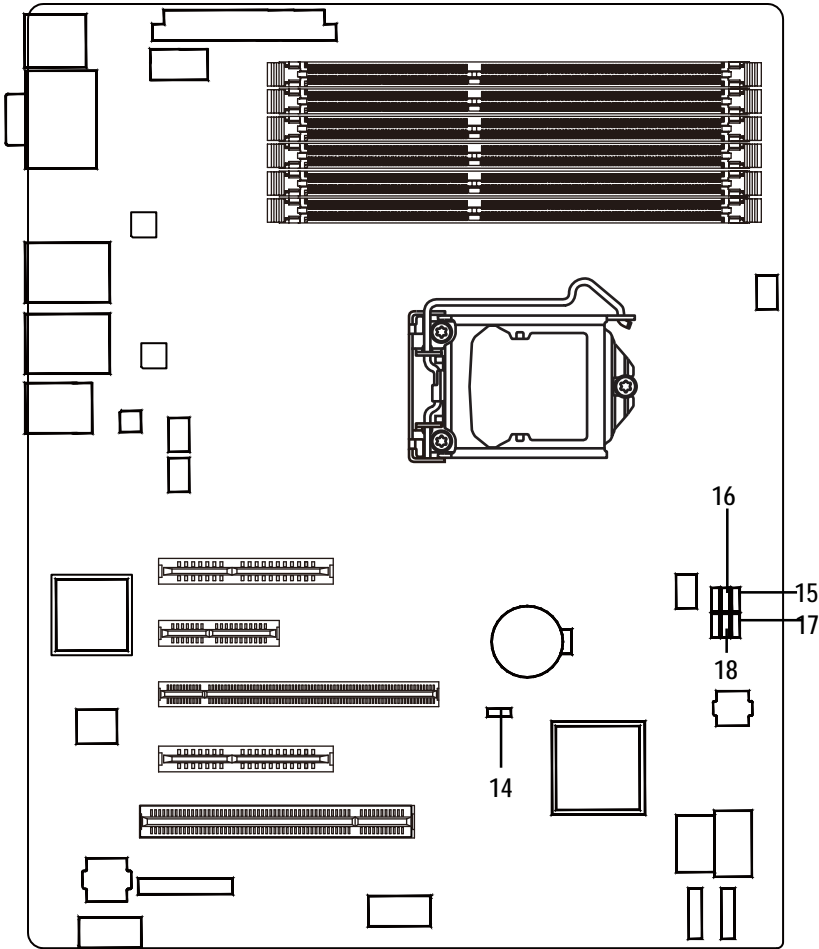
14) CLR_CMOS (Clear CMOS jumper)

You may clear the CMOS data to its default values by this jumper.
To clear CMOS, temporarily short 2-3 pin.

1-2 close: Normal operation (Default setting)

2-3 close: Clear CMOS

15) PASSWORD (Set Supervisor password jumper)

1-2 Close: Set Supervisor Password. (Default setting)

2-3 Close: Clear Supervisor Password in BIOS setup menu.

16) BIOS_WP (BIOS Write Protect jumper)

1-2 close: Normal power operation. (Default setting)

2-3 close: Enable BIOS protect function.

17) BIOS_RVCR (BIOS Recovery jumper)

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

2-3 close: Enable BIOS Recovery function.

18) SATA_RAID (Enable SATA RAID jumper)

1-2 close: Enable SATA RAID. (Default setting)

2-3 close: Disable SATA RAID.