

USER'S MANUAL
Of
Intel G31 Express Chipset
&
Intel ICH7 Chipset
Based

M/B for LGA 775 Quad Core Ready
Intel Core Processor Family

No. G03-MI5G31SVM-F

Rev: 1.0

Release date: April, 2010

Trademark:

*** Specifications and Information contained in this documentation are furnished for information use only, and are subject to change at any time without notice, and should not be construed as a commitment by manufacturer.**



Environmental Safety Instruction

- Avoid the dusty, humidity and temperature extremes. Do not place the product in any area where it may become wet.
- 0 to 40 centigrade is the suitable temperature. (The figure comes from the request of the main chipset)
- Generally speaking, dramatic changes in temperature may lead to contact malfunction and crackles due to constant thermal expansion and contraction from the welding spots' that connect components and PCB. Computer should go through an adaptive phase before it boots when it is moved from a cold environment to a warmer one to avoid condensation phenomenon. These water drops attached on PCB or the surface of the components can bring about phenomena as minor as computer instability resulted from corrosion and oxidation from components and PCB or as major as short circuit that can burn the components. Suggest starting the computer until the temperature goes up.
- The increasing temperature of the capacitor may decrease the life of computer. Using the close case may decrease the life of other device because the higher temperature in the inner of the case.
- Attention to the heat sink when you over-clocking. The higher temperature may decrease the life of the device and burned the capacitor.

Environmental Protection Announcement

Do not dispose this electronic device into the trash while discarding. To minimize pollution and ensure environment protection of mother earth, please recycle.



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Chapter 1

Introduction of Intel G31 Motherboard Series

1-1 Features of motherboard

The Intel G31 chipset motherboard series are based on the latest Intel G31 Express Chipset and Intel ICH7 Chipset technology which supports Intel LGA775 Pentium D, Pentium 4, Celeron D, Conroe CPU and Intel Pentium H7 CPU under the 65W; Intel® Core 2 Quad Processor (Intel® Core 2 Quad series support only one CPU, could it be possible that other CPU above the 65W limitation) , Intel® Pentium® Dual Core Processor, Intel® Celeron Dual Core Processor, Intel® Celeron 400 Processor and Intel® Core 2 Duo Processor with Intel® Hyper-Threading Technology and fully supports the future 45nm processors. The motherboard is optimized to deliver innovative features and professional desktop platform solution with the advantages of the new generation dual core Intel® Core 2 Duo® Processor for those who demand the best experience of personal computing.

The motherboards implement Intel G31 Express Chipset which supports Front Side Bus 1333MHz of data transferring. The motherboard supports dual-channel DDRII 533/DDRII 667/DDRII 800 memory module with capacity expandable to 4GB. The motherboard is embedded with ICH7 chipset of providing one parallel Ultra ATA 100 interface for one IDE drives and two serial ATA2 interface of 3Gb / s data transfer rate for two serial ATA devices.

The G31 motherboard series offer one PCI-Express x16 graphics slot of 4Gbyte/sec data transfer rate at each relative direction which gets 3.5 times of bandwidth more than AGP 8X and up to 8Gbyte/sec peak concurrent bandwidth at full speed to guarantee the ultimate GPU computing performance. One 32-bit PCI slot guarantees the rich connectivity for the I/O of peripherals. The motherboards are designed of tackling the profuse multimedia requirements nowadays.

The motherboards provide 10/100 Ethernet LAN function by using the PCI-E megabit LAN. The embedded Realtek ALC662 chipset is fully compatible with Sound Blaster Pro standards providing HD Audio 6-CH CODEC offers you with the home cinema quality and satisfying software compatibility.

Embedded USB controller as well as capability of expanding to 6 of USB2.0 functional ports delivering 480Mb/s of rich connectivity, these motherboards meet the demands of future USB peripherals which are also equipped with hardware monitor function on system to monitor and protect your system and maintain your non-stop business computing.

Some special features---**CPU Thermal Throttling/CPU Vcore 7-shift/OC-CON** in this motherboard are designed for power user to use the over-clocking function in more flexible ways. But please be caution that the over-clocking maybe causes the fails in system reliabilities. This motherboard provides the guaranteed performance

and meets the demands of the next generation computing. But if you insist to gain more system performance with variety possibilities of the components you choose, please be careful and make sure to read the detailed descriptions of these value added product features, please get them in the coming section.

1-1.1 Special Features of Motherboard

CPU Thermal Throttling Technology--- (The CPU Overheat Protection Technology)

To prevent the increasing heat from damage of CPU or accidental shutdown while at high workload, the CPU Thermal Throttling Technology will force CPU to enter partially idle mode from 87.5% to 12.5% according to preset CPU operating temperature in BIOS (from 40°C to 90°C). When the system senses the CPU operating temperature reaching the preset value, the CPU operating bandwidth will be decreased to the preset idle percentage to cool down the processor. When at throttling mode the beeper sound can be optionally selected to indicate it is in working.

CPU Vcore 7-Shift--- (Shift to Higher Performance)

The CPU voltage can be adjusted up by 7 steps for the precisely over-clocking of extra demanding computing performance.

Solid Capacitors -- (High-polymer Solid Electrolysis Aluminum Capacitors)

The working temperature is from 55 degrees Centigrade below zero to 125 degrees Centigrade, Solid capacitors possess superior physical characteristics that can be while reducing the working temperature between 20 degrees Centigrade each time, intact extension 10 times of effective product operation lives, at not rising degrees Centigrade of working temperatures each time a relative one, life of product decline 10% only too.

1-2 Specification

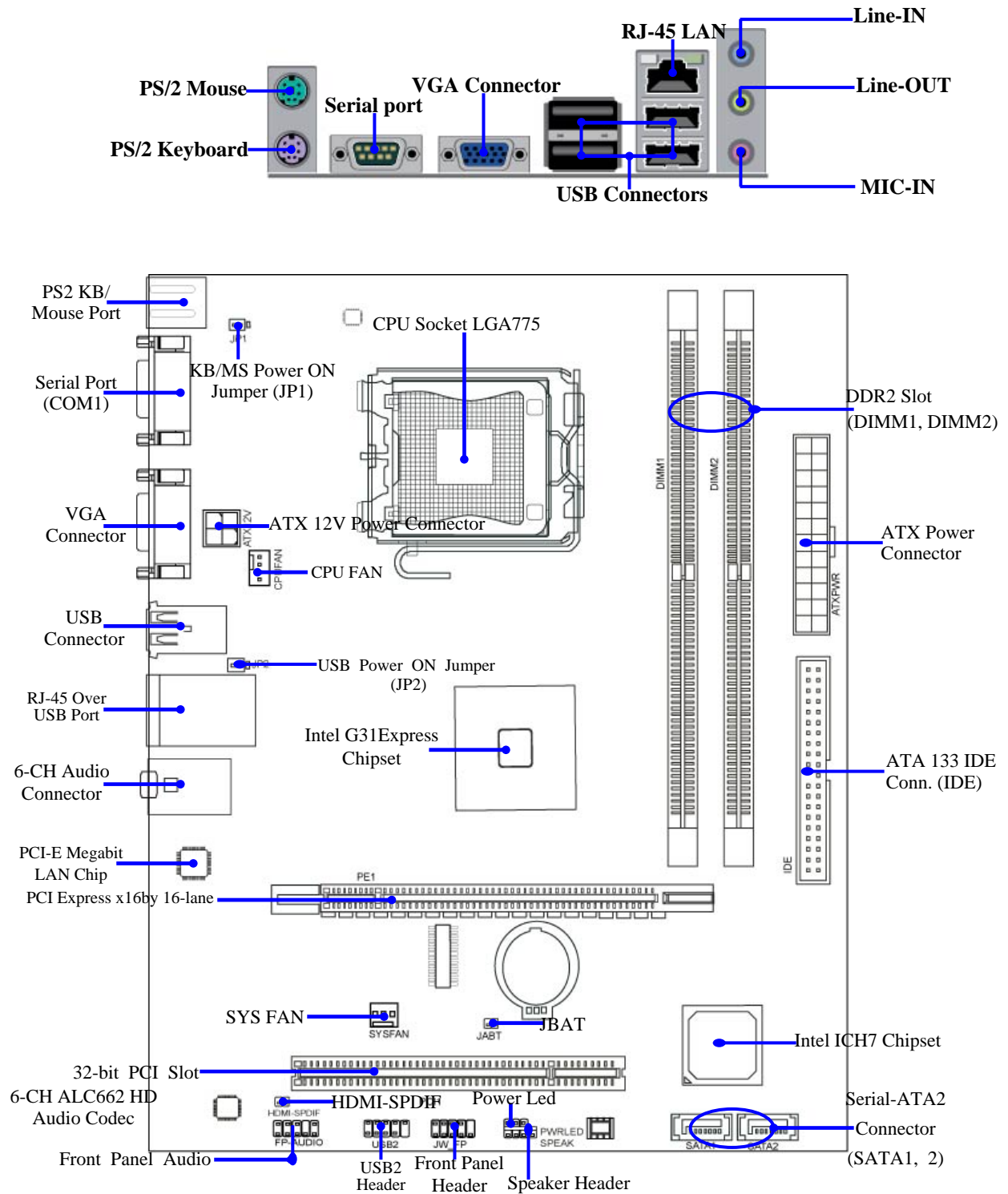
Spec	Description
Design	<ul style="list-style-type: none">● Micro ATX Form Factor; PCB size: 22.5*17.1cm
Chipset	<ul style="list-style-type: none">● Intel G31 Chipset● Intel ICH7 Chipset
CPU Socket (LGA775)	<ul style="list-style-type: none">● Support Intel LGA775 Pentium D, Pentium 4, Celeron D, Conroe CPU and Intel Pentium H7 CPU.● Intel® Core 2 Quad Processor (Intel® Core 2 Quad series support only one CPU, could it be possible that other CPU above the 65W limitation) , Intel® Pentium® Dual Core Processor, Intel® Celeron Dual Core Processor, Intel® Celeron 400 Processor and Intel® Core 2 Duo Processor● Suggest the power of the CPU should be below 65W● Support FSB Frequency 533/667/800/1066/1333MHz
Memory Socket	<ul style="list-style-type: none">● 240-pin DDRII RAM module socket x 2● Support Dual channel DDRII 533/DDRII 667/DDRII 800 MHz RAM Module and which is expandable to 4GB
Expansion Slots	<ul style="list-style-type: none">● PCI-Express x16 slot 1pcs.● 32-bit PCI slot 1pcs
Integrate IDE and Serial ATA2	<ul style="list-style-type: none">● One PCI IDE controller that supports PCI Bus Mastering, ATA PIO/DMA and the ULTRA DMA 33/66/100 functions that deliver the data transfer rate up to 100 MB/s; two Serial ATA2 ports each provides 3.0 Gb /sec data transfer rate
LAN	<ul style="list-style-type: none">● Integrated PCI-E 10/100 LAN chip● Support Fast Ethernet LAN function of providing 10Mb / 100Mb data transfer rate
HD Audio	<ul style="list-style-type: none">● Realtek ALC662 6-CH HD Audio Codec integrated● Audio driver and utility included
BIOS	<ul style="list-style-type: none">● AMI 8MB DIP Flash ROM
Multi I/O	<ul style="list-style-type: none">● PS/2 keyboard and PS/2 mouse connectors`● Serial port x1● VGA connector X1● USB 2.0 connector x 4, header x1● RJ-45 LAN connector X1● Audio connector x1 (Line-in, Line-out, MIC)● Hard Disk connector x1● SATA connector x2● Front Panel Audio header x1● HDMI-SPDIF header x1

1-3 Item Checklist

- ☒ Intel G31 Platform Processor Chipset based motherboard
- ☒ CD for motherboard utilities
- ☒ User's Manual
- ☒ Cable for IDE
- ☒ Cable for Serial ATA Port
- ☒ Back panel

1-4 Layout Diagram

Rear I / O for Intel G31



Chapter 2

Hardware Installation

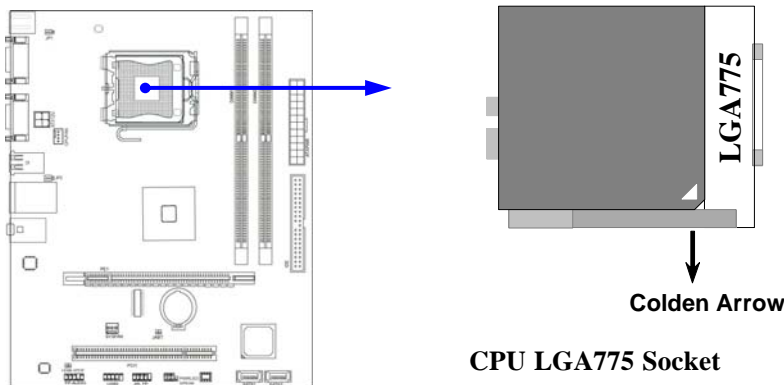
2-1 Install LGA 775 Supported Intel Processor

This motherboard provides a 775-pin surface mount, LGA775 Land Grid Array socket, referred to as the LGA775 socket supports Intel compatible processor in the 775 Pin package utilizes Flip-Chip Land Grid Array (FC-LGA) package technology.

The CPU that comes with the motherboard should have a cooling FAN attached to prevent overheating. If this is not the case, then purchase a correct cooling FAN before you turn on your system.

WARNING! 1. Be sure that there is sufficient air circulation across the processor's heatsink and CPU cooling FAN is working correctly, otherwise it may cause the processor and motherboard overheat and damage, you may install an auxiliary cooling FAN, if necessary.
2. Suggest the power of CPU should below 65w to work stably.

To install a CPU, first turn off your system and remove its cover. Locate the LGA775 socket and open it by first pulling the level sideways away from the socket then upward to a 90-degree angle. Insert the CPU with the correct orientation as shown below. The notched corner should point toward the end of the level. Because the CPU has a corner pin for two of the four corners, the CPU will only fit in the orientation as shown.



2-2 Install Memory

This motherboard provides two 240-pin DDR2 DUAL INLINE MEMORY MODULES (DIMM) socket for DDR2 memory expansion to maximum memory volume of 4GB.

Valid Memory Configurations

Bank	240-Pin DIMM	PCS	Maximum Capacity
Bank 0, 1 (DIMM1)	DDRII 533/DDRII 667/DDRII 800	X1	2GB
Bank 2, 3 (DIMM2)	DDRII 533/DDRII 667/DDRII 800	X1	2GB
Total	System Memory (Max.2GB)	2	4GB

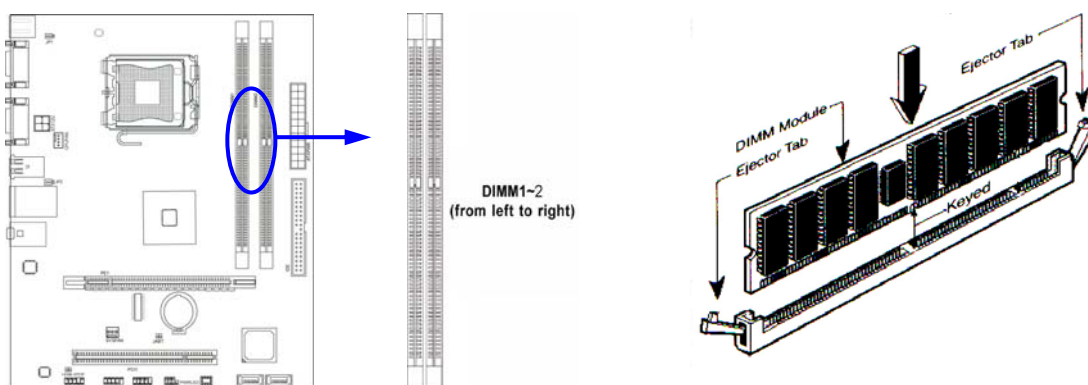
Recommend DIMM Module Combination

1. **One DIMM Module ----Plug in DIMM1**
2. **Two DIMM Modules---Plug in DIMM1 and DIMM2 for Dual channel function**

For Dual channel Limited!

1. Dual channel function only supports when 2 DIMM Modules plug in both DIMM1 & DIMM2.
2. DIMM1 & DIMM2 must be the same type, same size, and same frequency for dual channel function.

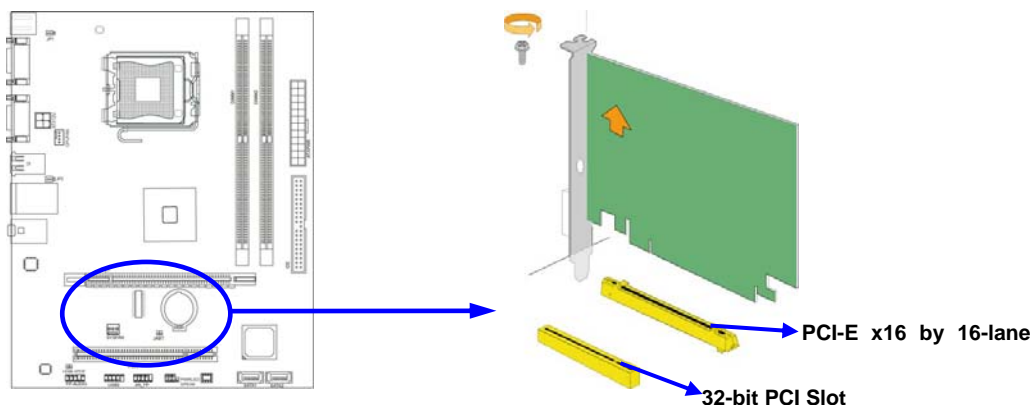
Install DDR2 SDRAM modules to your motherboard is not difficult, you can refer to figure below to see how to install a 240-Pin DDR2 533/DDR2 667/DDR2 800 SDRAM module.



NOTE! When you install DIMM module fully into the DIMM socket the eject tab should be locked into the DIMM module very firmly and fit into its indentation on both sides.

2-3 Expansion Cards

The G31 motherboard series offer one PCI-Express x16 graphics slot of 4Gbyte/sec data transfer rate at each relative direction which gets 3.5 times of bandwidth more than AGP 8X and up to 8Gbyte/sec peak concurrent bandwidth at full speed to guarantee the ultimate GPU computing performance. One 32-bit PCI slot guarantees the rich connectivity for the I/O of peripherals. The motherboards are designed of tackling the profuse multimedia requirements nowadays.



Chapter 3

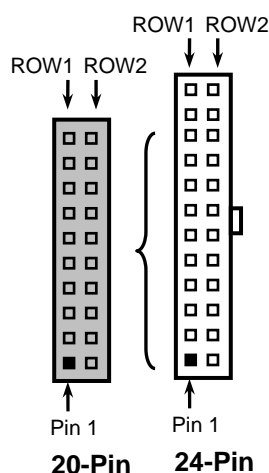
Connectors and Headers

3-1 Connectors

(1) Power Connector (24-pin block): ATXPWR

ATX Power Supply connector:

This is a new defined 24-pins connector that usually comes with ATX case. The ATX Power Supply allows using soft power on momentary switch that connect from the front panel switch to 2-pins Power On jumper pole on the motherboard. When the power switch on the back of the ATX power supply turned on, the full power will not come into the system board until the front panel switch is momentarily pressed. Press this switch again will turn off the power to the system board.



PIN	ROW1	ROW2
1	3.3V	3.3V
2	3.3V	-12V
3	GND	GND
4	5V	Soft Power On
5	GND	GND
6	5V	GND
7	GND	GND
8	Power OK	-5V
9	+5V (for Soft Logic)	+5V
10	+12V	+5V
11	+12V	+5V
12	+3V	GND

- ** We recommend that you use an ATX 12V Specification 2.0-compliant power supply unit (PSU) with a minimum of 350W power rating. This type has 24-pin and 4-pin power plugs.
- ** If you intend to use a PSU with 20-pin and 4-pin power plugs, make sure that the 20-pin power plug can provide at least 15A on +12V and the power supply unit has a minimum power rating of 350W. The system may become unstable or may not boot up if the power is inadequate.
- ** Please refer to Figure 1 for 20-pin power plug connection. Power plug and motherboard power connectors has adopted key design to avoid installation mistake through connection can be made easily if in the proper direction. If the installation direction is incorrect and you make the connection by force both the board and the power supply can be burned. Please see to it that the direction is correct during installation.

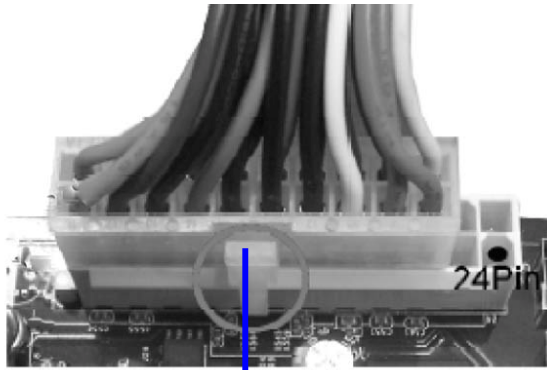


Figure 1: 20-pin power plug

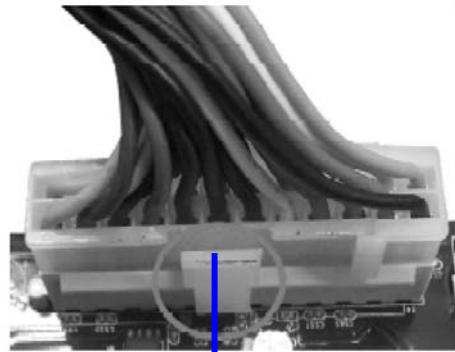
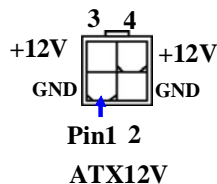
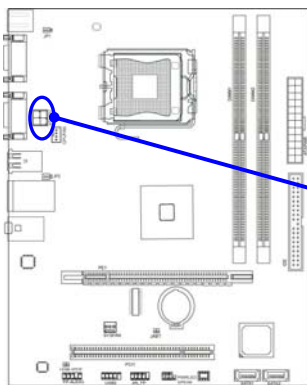


Figure 2: 24-pin power plug

(2) ATX 12V Power Connector (4-pin block): ATX12V

This is a new defined 4-pins connector that usually comes with ATX Power Supply. The ATX Power Supply which fully supports Intel LGA 775 processor must including this connector for support extra 12V voltage to maintain system power consumption. Without this connector might cause system unstable because the power supply can not provide sufficient current for system.



(3) PS/2 Mouse & PS/2 Keyboard Connector: KB

The connectors are for PS/2 keyboard and PS/2 Mouse.

(4) USB Port connector: USB1, UL1

The connectors are 4-pin connectors that connect USB devices to the system board.

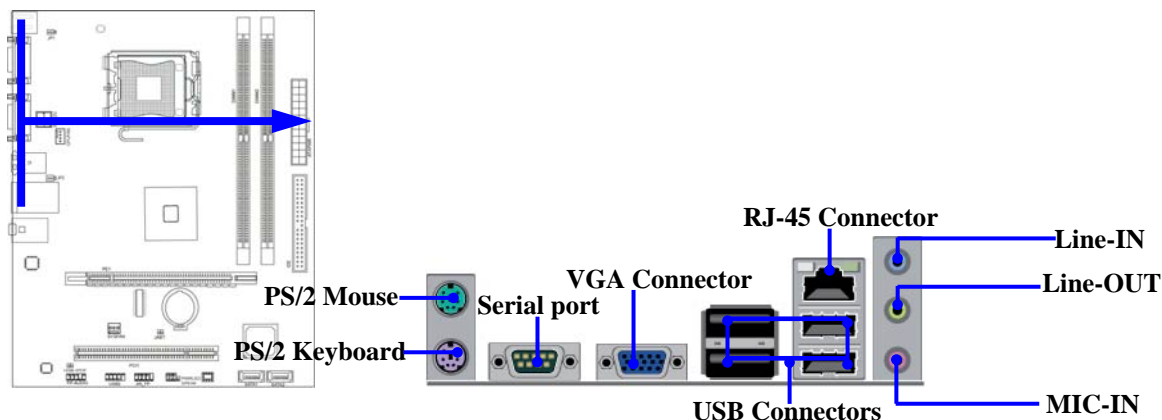
(5) LAN Port connector: UL1

This connector is standard RJ45 connector for Network.
The USBLAN1 support 10M/100M/1000M bps (optional) data transfer rate.

(6) Audio Line-In, Lin-Out, MIC Connector: AUDIO

This Connector is 3 phones Jack for LINE-OUT, LINE-IN, and MIC.

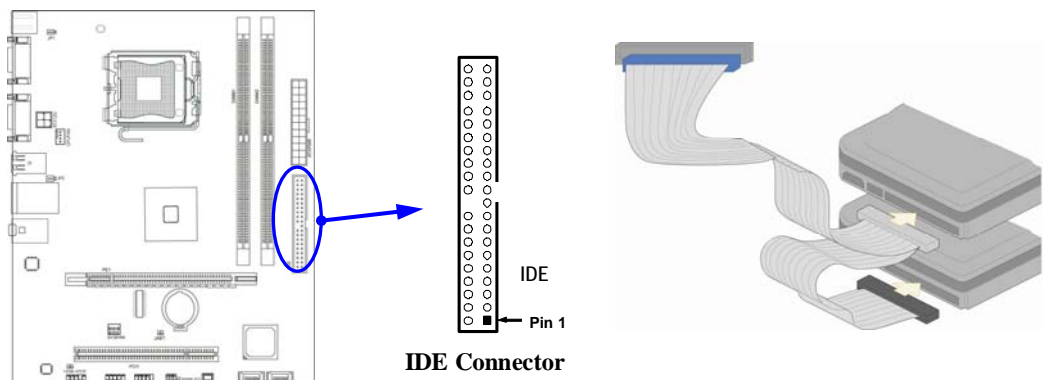
Line-in: (BLUE)	Audio input to sound chip
Line-out: (GREEN)	Audio output to speaker
MIC: (PINK)	Microphone Connector



(7) Primary IDE Connector (40-pin block): IDE

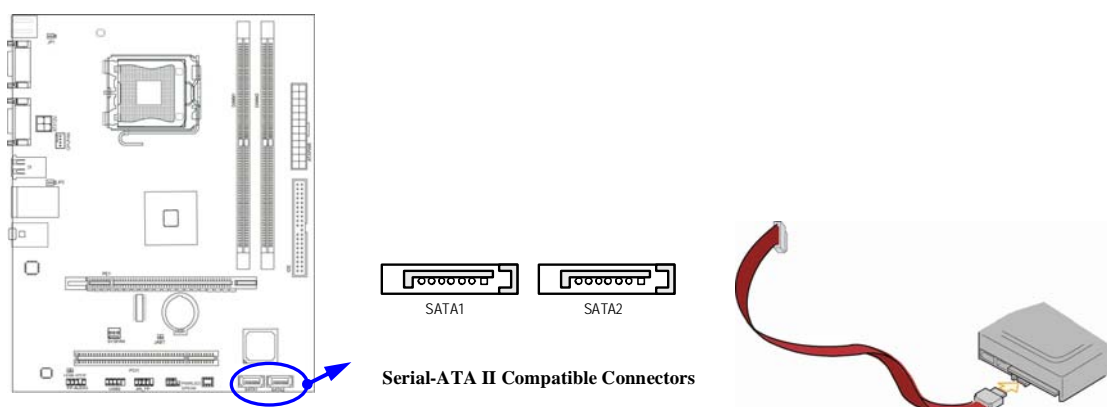
This connector connects to the next set of Master and Slave hard disks. Follow the same procedure described for the primary IDE connector. You may also configure two hard disks to be both Masters using one ribbon cable on the primary IDE connector and another ribbon cable on the secondary IDE connector.

- Two hard disks can be connected to each connector. The first HDD is referred to as the “Master” and the second HDD is referred to as the “Slave”.
- For performance issues, we strongly suggest you don’t install a CD-ROM or DVD-ROM drive on the same IDE channel as a hard disk. Otherwise, the system performance on this channel may drop.



(8) Serial-ATA Port connector: SATA1 / SATA2

These connectors support the provided Serial ATA and Serial ATA2 IDE hard disk cable to connecting the motherboard and serial ATA hard disk.



(9) Serial COM Port: COM1

COM1 is the 9-pin connector. The On-board serial port can be disabled through BIOS setup.

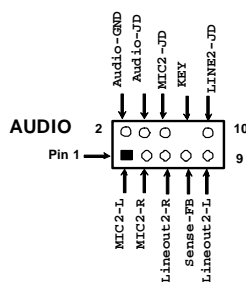
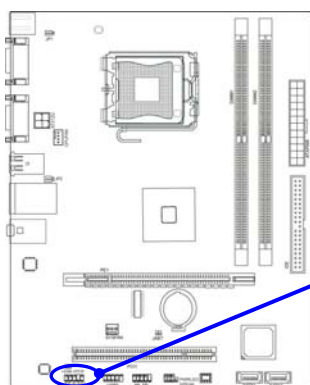
(10) VGA Connector (15-pin D-Sub) Connector: VGA

VGA is the 15-pin D-Subminiature female connector for display monitor.

3-2 Headers

(1) Line-Out/MIC Header for Front Panel (9-pin): FP_AUDIO

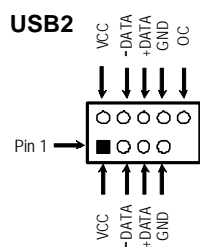
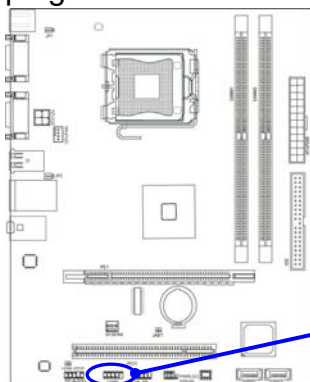
This header is connected to Front Panel Line-out, MIC connector with cable.



Line-Out, MIC Headers

(2) USB Port Headers (9-pin): USB2

These headers are used for connecting the additional USB port plug. By attaching an option USB cable, your can be provided with two additional USB plugs affixed to the back panel.



USB Port Headers

(3) Speaker connector: SPEAK

This 4-pin connector connects to the case-mounted speaker. See the figure below.

(4) Power LED: PWR LED

The Power LED is light on while the system power is on. Connect the Power LED from the system case to this pin.

(5) IDE Activity LED: HD LED

This connector connects to the hard disk activity indicator light on the case.

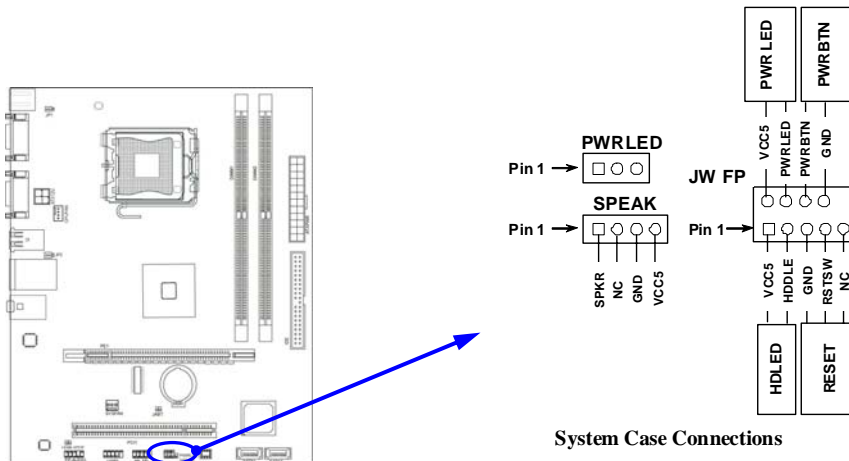
(6) Reset switch lead: RESET

This 2-pin connector connects to the case-mounted reset switch for rebooting your computer without having to turn off your power switch. This is a preferred

method of rebooting in order to prolong the life of the system's power supply. See the figure below.

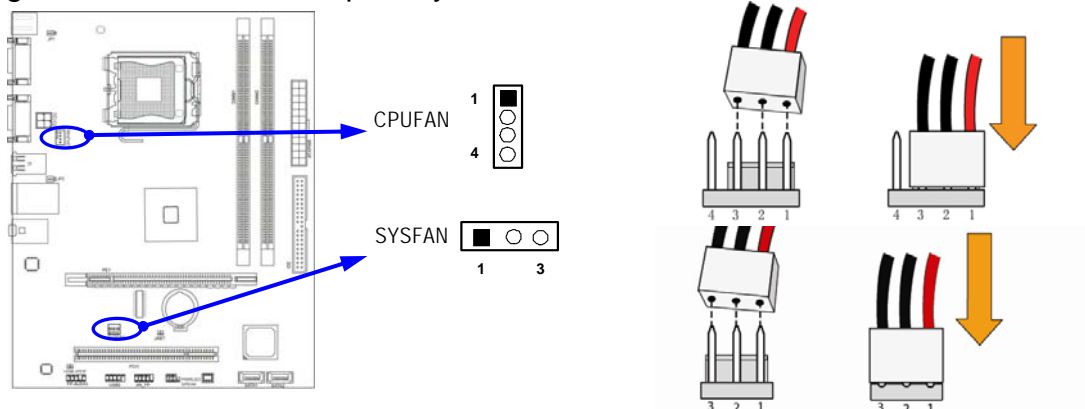
(7) Power switch: PWR BTN

This 2-pin connector connects to the case-mounted power switch to power ON/OFF the system.



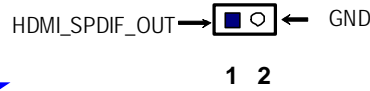
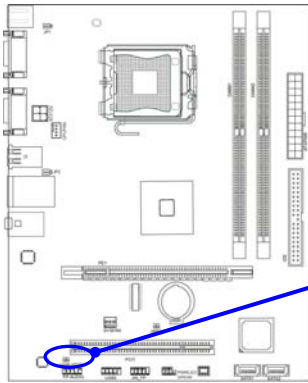
(8) FAN Power Headers: SYSFAN (3-pin), CPUFAN (4-pin)

These connectors support cooling fans of 350mA (4.2 Watts) or less, depending on the fan manufacturer, the wire and plug may be different. The red wire should be positive, while the black should be ground. Connect the fan's plug to the board taking into consideration the polarity of connector.



(9) HDMI-SPDIF Out header: HDMI_SPDIF

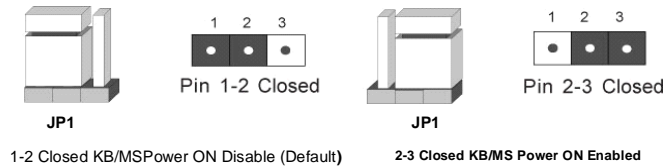
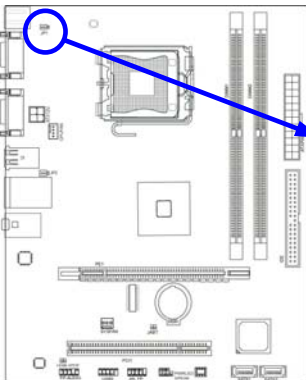
The SPDIF output is capable of providing digital audio to external speakers or compressed AC3 data to an external Dolby digital decoder. Use this feature only when your stereo system has digital input function. Some of the VGA Card need connect SPDIF-IN Connector, so its HDMI Port can make sounds.



HDMI_SPDIF Header

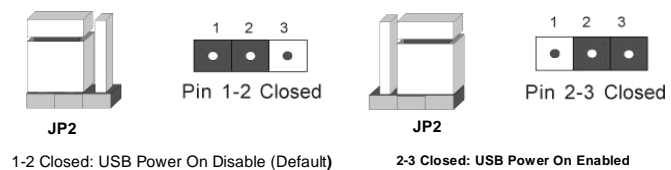
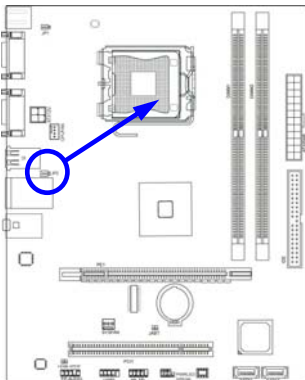
3-3 Jumper Setting

(1) Keyboard/Mouse Power-on Enabled/Disabled: JP1



Keyboard/Mouse Power On Setting

(2) USB Power-on Enabled/Disabled: JP2



USB Power On Setting

(3) CMOS RAM Clear (2-pin): JBAT

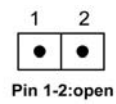
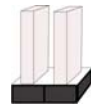
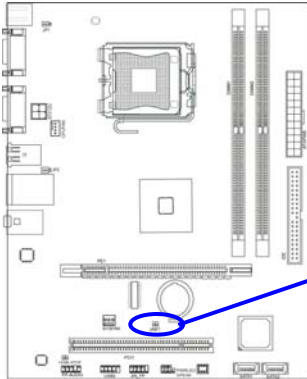
A battery must be used to retain the motherboard configuration in CMOS RAM, short 1-2 pins of JBAT to clear the CMOS data.

To clear the CMOS, follow the procedure below:

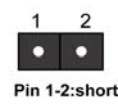
1. Turn off the system and unplug the AC power
2. Remove ATX power cable from ATX power connector
3. Locate JBAT and short pins 1-2 for a few seconds, if shorted with the jump cap, short for a few seconds then pull out the hat.
4. Connect ATX power cable back to ATX power connector

Note: When should clear CMOS

- 1. Troubleshooting**
- 2. Forget password**
- 3. After over clocking system boot fail**



Pin 1-2:open



Pin 1-2:short

JBAT

1-2 Open: Normal

1-2 Short: CMOS Clear

CMOS Clear Setting

Chapter 4

Useful Help

4-1 How to Update BIOS

- Step1.** Prepare a boot floppy disc. (You may make one by click START click RUN type SYS A: click OK)
- Step2.** Download upgrade tools and the latest BIOS files of the motherboard from official website and then make a copy of it to your bootable floppy disk after decompressing these files
- Step3.** Insert the disk into A: start your computer and then type in "A:\xxxxxx.BAT" (xxxxxxx being the file name of the latest BIOS)
- Step4.** Type Enter to update and flash the BIOS. The system will restart automatically when BIOS is upgraded.

4-2 Trouble Shooting

Problem	Solution
No power to the system to the all power light don't illuminate, fan inside power supply doesn't turn on.	1. Make sure power cable is security plugged in. 2. Replace cable. 3. Contact technical support.
System inoperative. Keyboard lights are on, power indicator lights are lit, and hard drive is spinning.	Using ever pressure on both ends of the DIMM, press down firmly until the module snaps into places.
System doesn't boot from hard disk drive, can be booted from optical drive.	1. Check cable running from disk to disk controller board. .Make sure both ends are securely plugged in, check the drive type in the standard CMOS setup. 2. Backing up the hard drive is extremely important .All hard disks are capable of breaking down at any time.
System only boots from optical drive .Hard disk can be read and applications can be used but booting from hard disk is impossible.	1. Back up date and applications files. 2. Reformat the hard drive. Reinstall applications and date using backup disks.
Screen message says "Invalid Configuration" or "CMOS Failure"	Review system's equipment .Make sure correct information on is in setup.
Can not boot system after installing second hard drive.	1. Set master /slave jumpers correctly. 2. Run SETUP program and select correct drive types. Call the drive manufacture for compatibility with other drives.