USER'S MANUAL

Of

Intel 41 Express and ICH7 Chipset Based

M/B for LGA775 Quad Core Ready

Intel Core Processor Family

TABLE OF CONTENT

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.

Chapter 1

Introduction of Intel G41 Motherboard Series

1-1　　Features of Motherboard

The G41 Express and ICH7 chipset motherboard series are based on Intel G41 Express chipset and ICH7 chipsets technology which supports the innovative 45nm and 65nm Quad-Core, Dual-Core Intel® Core 2 Quad, Core 2 Duo processors, Intel® Pentium Dual Core, Intel® Celeron Dual Core Conroe processors and Intel® Celeron 400 Conroe-L processors.

The G41 Express and ICH7 chipset Based motherboard series deliver the revolutionary levels of performance enabling vivid, high-definition experiences and multi-tasking responsiveness from state-of-the-art Intel dual-core and quad-core technologies through the high bandwidth of dual channel DDRIII 800 / 1066MHz system memories which are expandable to 4 GB and the next generation PCI Express interface for the latest AMD and NVIDIA graphics card . The G41 Express and ICH7 chipset motherboard series are absolutely the ultimate solution for game enthusiasts and applications, and it also meets the demanding usage of computing of gaming, multimedia entertainment and business applications.

The INTEL G41 Express and ICH7 chipset motherboard series are embedded with ICH7 chipset of providing four serial ATA2 interface of 3.0 Gb / s data transfer rate for four serial ATA devices.

The G41 Express and ICH7 chipset Based motherboard provides Gigabit LAN function by using the Realtek RTL8111DL PCI Gigabit LAN which supports 10M / 100M / 1Gbps data transfer rate. Embedded 8-channel ALC888 HD Audio Codec is fully compatible with Sound Blaster Pro® standards that offer you with the home cinema quality and absolutely software compatibility.

The G41 Express chipset based motherboard series offer one PCI-Express2.0 x16 by 16lane graphics slots which get 7 times of bandwidth more than AGP8X. This graphics slot offers 8 Gbyte/sec data transfer rate at each relative direction and up to 16Gbyte/sec concurrent bandwidth at full speed. Two 32-bit PCI slots guarantee the rich connectivity for the I/O of peripherals.

Embedded USB controllers as well as capability of expanding to 8 of USB2.0 functional ports delivering 480Mb/s bandwidth of rich connectivity, these motherboards meet the future USB demands 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 Smart Fan/ CPU Vcore X-shift/3D Audio* 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 may cause the failure in system reliability. 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 to 90). 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 Smart Fan--- The Noise Management System
It's never been a good idea to gain the performance of your system by sacrificing its acoustics. CPU Smart Fan Noise Management System is the answer to control the noise level needed for now-a-day's high performance computing system. The system will automatically increase the fan speed when CPU operating loading is high, after the CPU is in normal operating condition, the system will low down the fan speed for the silent operating environment. The system can provide the much longer life cycle for both CPU and the system fans for game use and business requirements.

CPU Vcore X-Shift--- Shift to Higher Performance
The CPU voltage can be adjusted up by 8 stages for the precisely over-clocking of extra demanding computing performance.

3D Audio
OP with two-stage Butterworth filter and quadruple noninverting amplifier enhances bass effect under the 100MHz range to perfect audio effect, brings you stunning shock experience in video game, true-to-life simulated feeling when watching films and the greatest touch as that in the concert.
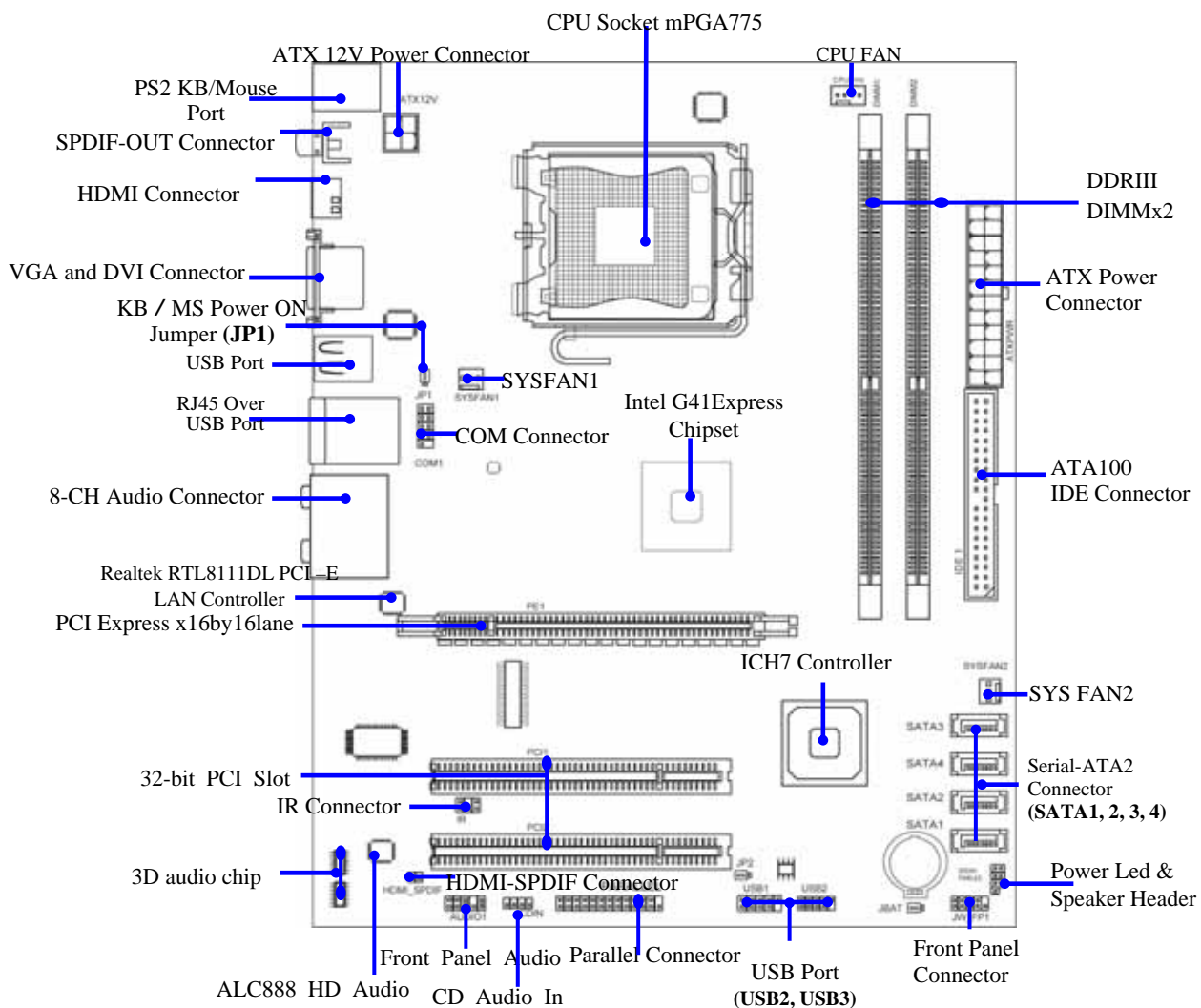
1-2   Specification

Spec	Description
Design	● Micro-ATX form factor 4 layers PCB size: 24.5x21.0cm
Chipset	● Intel G41 Express Chipset ● Intel ICH7 chipset
CPU Socket LGA775	● Support 45nm and 65nm Quad-Core, Dual-Core Intel® Core 2 Quad, Core 2 Duo processors, Intel® Pentium Dual Core, Intel® Celeron Dual Core Conroe processors and Intel® Celeron 400 Conroe-L processors 775-Land LGA Package utilizes Flip-Chip Land Grid Array (FCLGA) package processor ● Support FSB Frequency 1333MHz
Memory Socket	● DDR3 Module socket x 2 ● Support 2pcs DDRIII 800 /DDRIII 1066MHz DDRIII modules expandable to 4 GB ● Support Dual channel function
Expansion Slot	● PCI-Express x16by16lane slot 1pcs ● 32-bit PCI slot x 2 pcs
Integrated Serial ATA2	● The Intel ICH7 supports four Serial ATA ports provide 3.0 Gb/sec data transfer rate.
Gigabit LAN	● Integrated Realtek RTL8111DL PCI Gigabit LAN function. ● Supports Fast Ethernet LAN function provide 10Mb/100Mb/ 1Gb /s data transfer rate.
8CH-Audio	● RealtekALC888 8-channel HD Audio Codec integrated ● Support 8-channel 3D surround & Positioning Audio ● Audio driver and utility included
BIOS	● Award 8MB DIP Flash ROM
Multi I/O	● PS/2 keyboard and PS/2 mouse connectors ● S/PDIF Out connector x1 ● VGA connector x1 ● HDMI connector x1 (HDMI and DVI connector can not be used at the same time) ● DVI connector x1 ● USB2.0 port x 4 and headers x2 ● RJ45 LAN connector x1 ● Audio connectorx1 (8CH Audio) ● SATA Connector x4 ● HDMI-SPDIF header x1 ● IR header ● Serial Port headerx1 ● Parallel header x1

1-3 Item Checklist

☑ Intel G41 Express and ICH7 chipset based Motherboard

☑ User's Manual

☑ CD for motherboard utilities

☑ SATA Cable

☑ I/O Back Panel Shield

1-4 Layout Diagram

CPU Socket mPGA775

ATX 12V Power Connector

CPU FAN

PS2 KB/Mouse Port

SPDIF-OUT Connector

HDMI Connector

DDRIII DIMMx2

VGA and DVI Connector

ATX Power Connector

KB MS Power ON Jumper (**JP1**)

USB Port

SYSFAN1

RJ45 Over USB Port

Intel G41Express Chipset

COM Connector

ATA100 IDE Connector

8-CH Audio Connector

Realtek RTL8111DL PCI-E LAN Controller

PCI Express x16by16lane

ICH7 Controller

SYS FAN2

SATA3

SATA4

Serial-ATA2 Connector (**SATA1, 2, 3, 4**)

SATA2

32-bit PCI Slot

SATA1

IR Connector

3D audio chip

HDMI-SPDIF Connector

Power Led & Speaker Header

ALC888 HD Audio

Front Panel Audio

CD Audio In

Parallel Connector

USB Port (**USB2, USB3**)

Front Panel Connector

Chapter 2
Hardware Installation

WARNING! Turn off your power when installing system components. Failure to do so may cause severe damage to both your motherboard and the components.

2-1 Install Intel LGA775 Socket CPU

This motherboard provides a 775-pin DIP, LGA775 Land Grid Array socket, referred to as the LGA775 socket supports Intel Pentium 4 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.

NOTED! **1.**Be sure that there is sufficient air circulation across the processor's heat sink 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. We suggest to use CPU under 65W power consumption.

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.

Colden Arrow
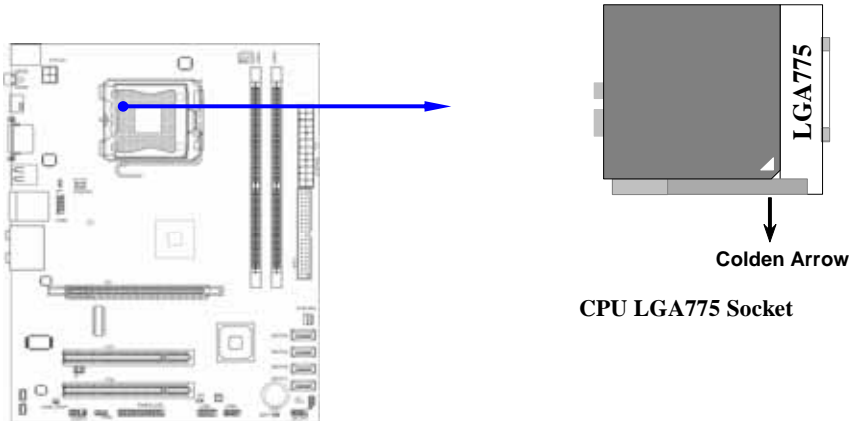
CPU LGA775 Socket

When you install the CPU into the LGA775 socket, there's no force required CPU insertion; then presses the level to locate position slightly without any extra force.

2-2   Install Memory

The motherboards provide two 240-pin DDRIII DUAL INLINE MEMORY MODULES (DIMM) slots for DDRIII memory expansion available from minimum memory size of 1GB to maximum memory size of 4GB DDRII SDRAM.

Valid Memory Configurations of 2-DIMM Design Motherboard

Memory Module	240-Pin DIMM	PCS	Total Memory
DIMM1	DDRIII800/DDRIII1066	X1	1GB~2 GB
DIMM2	DDRIII800/DDRIII1066	X1	1GB~2 GB
Total	System Memory (Max. 4GB)	2	1GB~4 GB

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 either both DIMM1 & DIMM2.
2. DIMM1 & DIMM2 must be the same type, the same size, and the same frequency for dual channel function.

Generally, installing DDR SDRAM modules to your motherboard is very easy, you can refer to figure 2-4 to see what a 240-Pin DDRIII 800/1066 SDRAM module looks like.
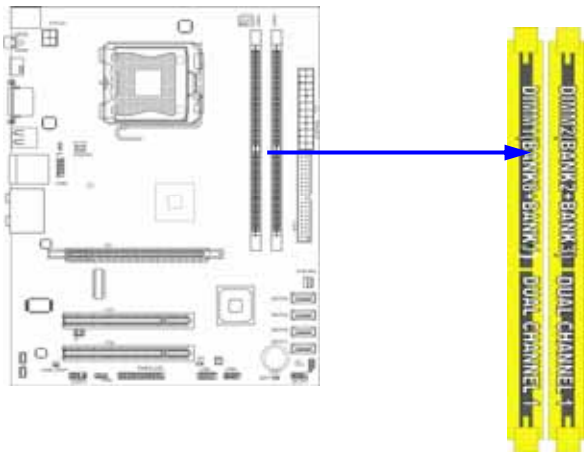
Figure 2-4

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 indention on both sides

2-3 Expansion Cards

The G41 Express chipset based motherboard series offer one PCI-Express2.0 x16 by 16lane graphics slots which get 7 times of bandwidth more than AGP8X. This graphics slot offers 8 Gbyte/sec data transfer rate at each relative direction and up to 16Gbyte/sec concurrent bandwidth at full speed. Two 32-bit PCI slots guarantee the rich connectivity for the I/O of peripherals.
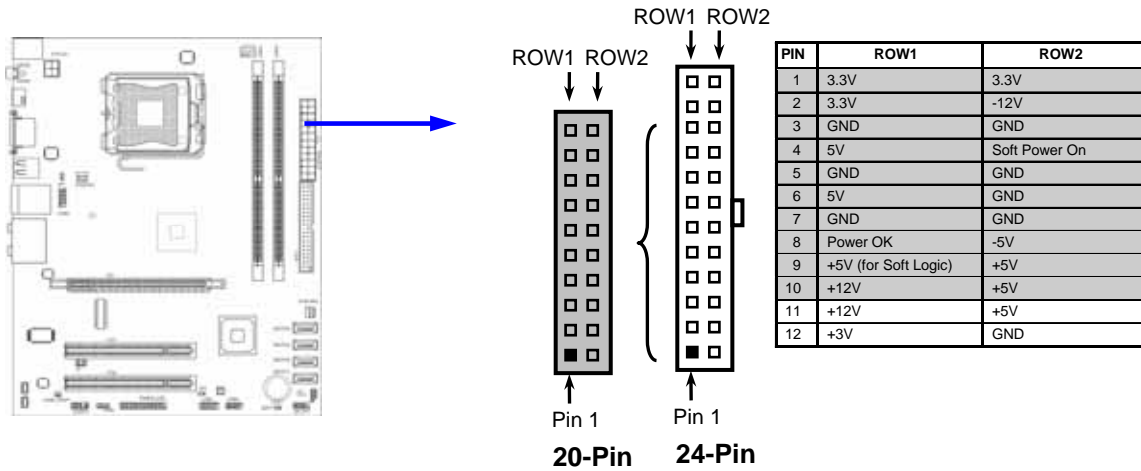

PCI-E 2.0 x16 Slot

32-bit PCI Slot
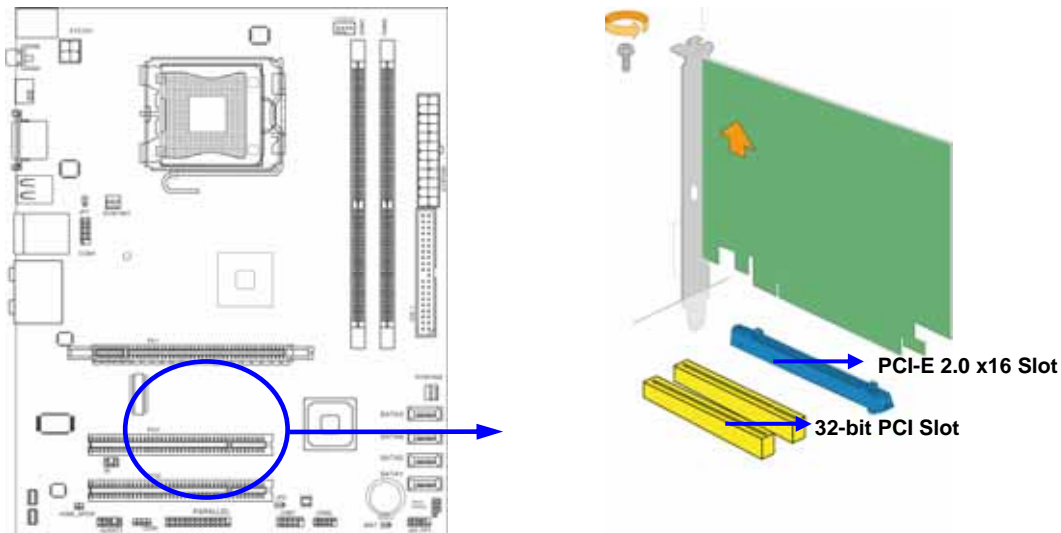
Chapter 3
Connectors, Headers & Jumpers Setting
3-1 Connectors
(1) Power Connector (24-pinblock): ATXPWR

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.

** 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.

ROW1 ROW2

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

Pin 1

Pin 1

20-Pin   **24-Pin**

(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 AM2 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: USB port from USB1/ UL1

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

**(5)   LAN Port connector: RJ-45 connector from UL1**

This connector is standard RJ-45 connector for Network. The   connector   support 10M/100Mbps/1Gb data transfer rate.

(6)   Audio Line-In, Lin-Out, MIC, RS-OUT, CS-OUT, SS-OUT Connector : AUDIO
These Connectors are 6 Phone-Jack for LINE-OUT, LINE-IN, MIC, RS-OUT, CS-OUT, SS-OUT audio connections.

Line-in: (BLUE)   Audio input to sound chip
Line-out: (GREEN)   Audio output to speaker
MIC: (PINK)   Microphone Connector
RS-OUT: (BLACK)   Rear-Surround audio output
CS-OUT: (ORANGE)   Center/ Subwoofer audio output
SS-OUT: (GRAY)   Side-Surround audio output
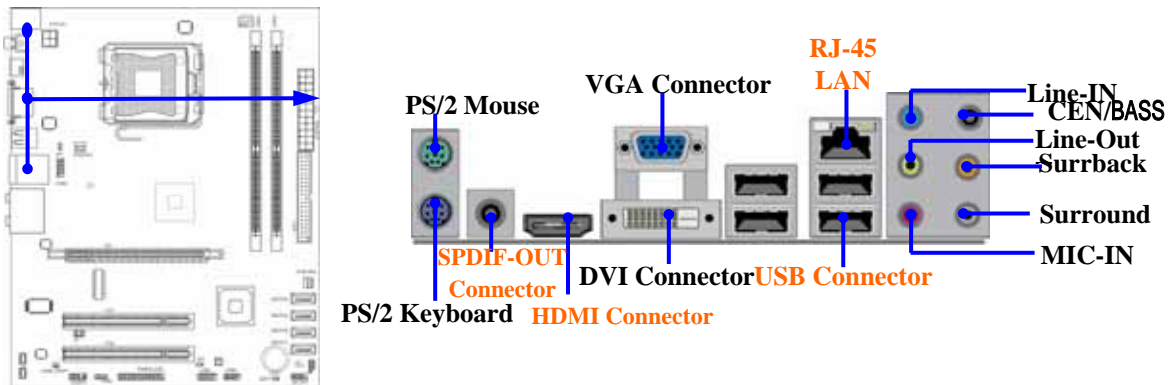
(7) D-Sub 15-pin Connector: VGA
VGA is the 15-pin D-Subminiature female connector; it is for the display devices, such as the CRT monitor, LCD monitor and so on.

(8)   High-Definition Multimedia Interface: HDMI
This point-to-point interface is for audio and video signals designed as a single-cable solution for home theater and consumer electronics equipment.

(9)   SPDIF Out connectors: SPDIF_Out
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.

plugs at other end to the floppy drives.

(10) Serial-ATA Port connector: SATA1~SATA4

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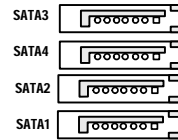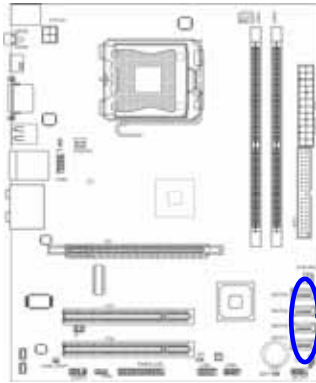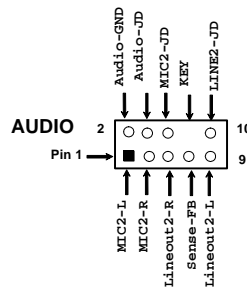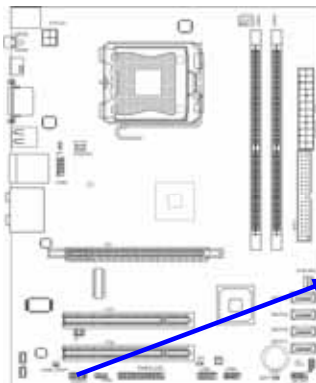

Serial-ATA1 & 2 Compatible Connectors

3-2 Headers

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

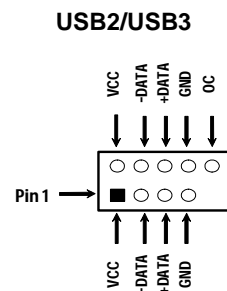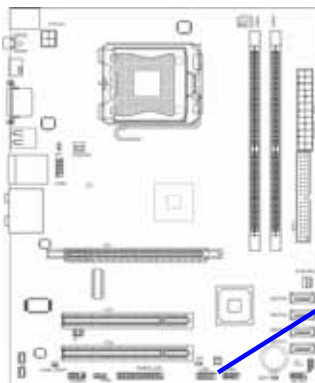These headers connect to Front Panel Line-out, MIC connector with cable.

Line-Out, MIC Headers

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

USB2 / USB3

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 lift 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.

System Case Connections
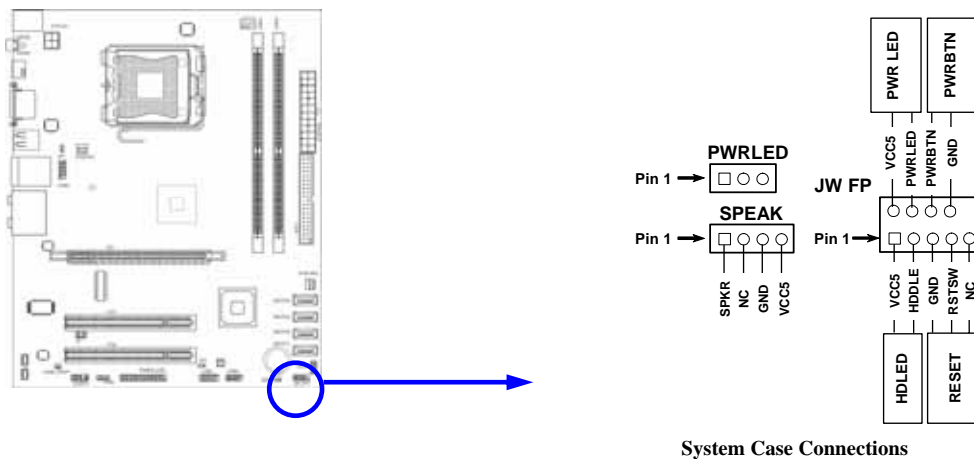
(8) FAN Power Headers: SYSFAN1, SYSFAN2 (3-pin), CPUFAN (4-pin)

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.
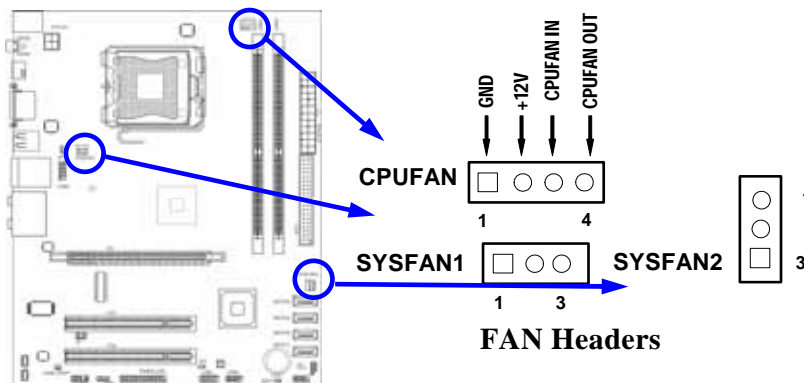
FAN Headers
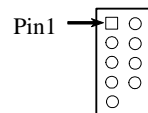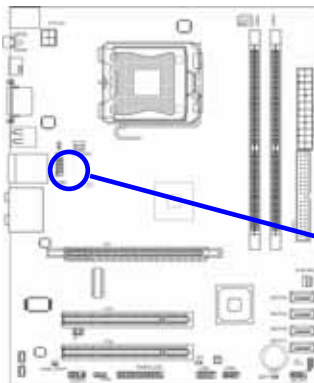
(9) CD Audio-In Headers (4-pin): CDIN1

CDIN are the connectors for CD-Audio Input signal.   Please connect it to CD-ROM CD-Audio output connector.

CDIN
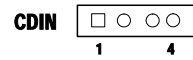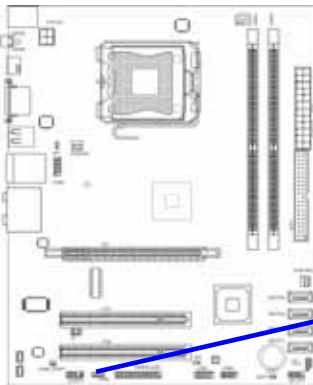
CD Audio-In Headers
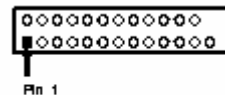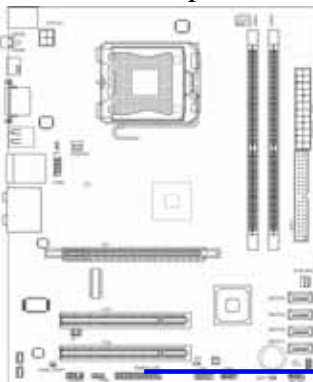
(10) Serial COM Port Header: COM1

COM1 is the 9-pin block pin-header.

Pin1

Serial COM Port 9-pin Block

**(11) Parallel Port header (25-pin): PARALLEL**

The onboard parallel port header is a 25-pin connector for connecting devices such as old-fashioned printer.

Pin 1

PARALLEL Connector

**(12) IR infrared module Headers (5-pin): IR**

This connector supports the optional wireless transmitting and receiving infrared module. You must configure the setting through the BIOS setup to use the IR function.

IR

GND IRRX

2 ○ ○ 6
Pin 1 → ○ ○ ○ 5

NC VCC5 IRTX
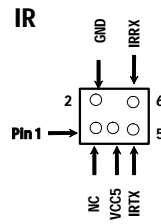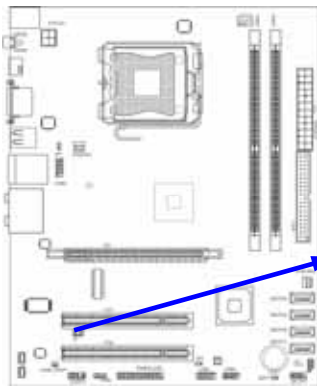
IR infrared module Headers

(13)   HDMI_SPDIF_Out header: SPDIF_Out

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.

SPDIF

HDMI_SPDIF_OUT → ☐ ○ ← GND

1   2
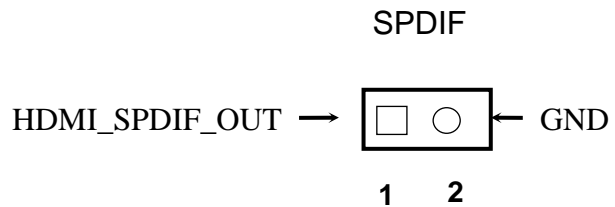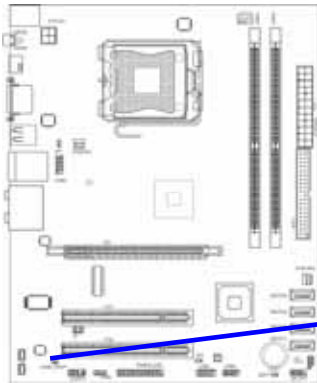
3-3 Jumper Setting

(1)   Keyboard/Mouse/USB function Enabled/Disabled: JP1

JP1
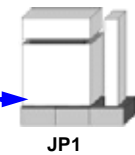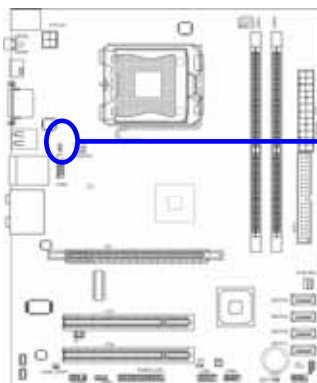
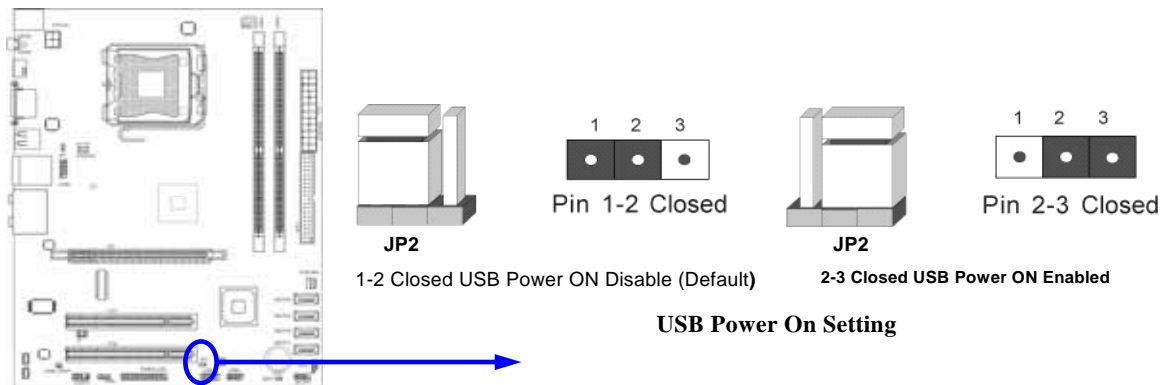Pin 1-2 Closed

1-2 Closed KB/MS/ USB Power ON Disable
(Default**)**

JP1

Pin 2-3 Closed

2-3 Closed KB/MS/ USB Power ON Enabled

Keyboard/Mouse & USB Power On Setting

(2) USB function Enabled/Disabled: JP2

JP2

Pin 1-2 Closed
1-2 Closed USB Power ON Disable (Default**)**

JP2

Pin 2-3 Closed
2-3 Closed USB Power ON Enabled

USB Power On Setting

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

A battery must be used to retain the motherboard configuration in CMOS RAM short 1-2 pins of JBAT to store 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 2-3 for a few seconds
4. Return JBAT to its normal setting by shorting pins 1-2
5. 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

JBAT

1
3
1-2 closed **Normal (Default)**

JBAT

1
3
2-3 closed **Clear CMOS**

CMOS RAM Clear Setting
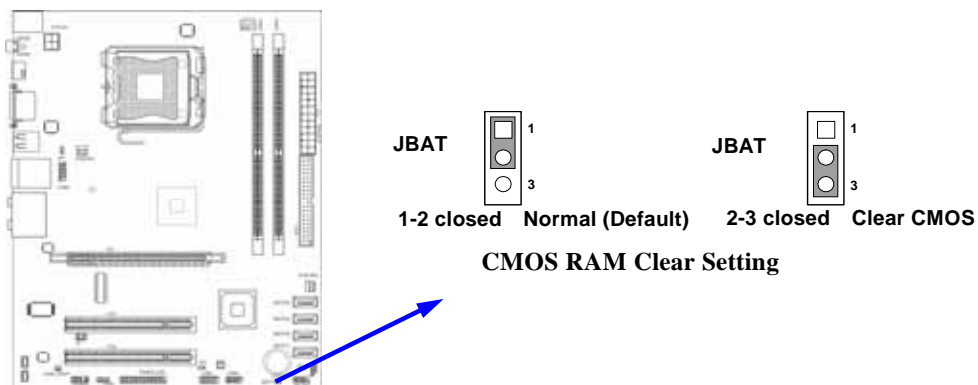
Chapter 4
Useful Help

4-1 How to Upgrade BIOS

STEP 1. Prepare a bootable floppy disk. (You may make one by click START click RUN type SYS A: click OK)

STEP 2. 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

STEP 3. Insert the disk into A: ,start your computer and then type in "A:\xxxxxx.BAT"(xxxxxxx being the file name of the latest BIOS)

STEP 4. 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.