USER'S MANUAL
Of
Nvidia MCP78S
Based

M/B For Socket AM2+ Quad Core

AMD Processor

NO.G03-PN78SM3 -F

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Trademark:

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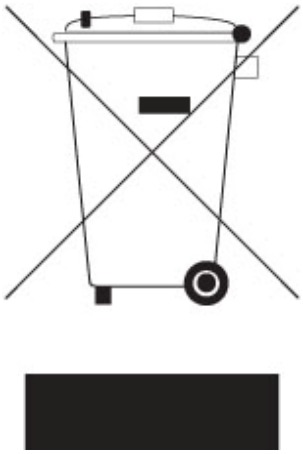
Environmental Protection Announcement

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 MCP78S Motherboards

1-1 Features of motherboard

The MCP78S chipset motherboard series are based on the latest MCP78S Chipset which supports the innovative 64-bit AMD Socket AM2+ dual core multi-tasking Socket AM2+ Athlon64 X2 processors. With an integrated low-latency high-bandwidth DDRII memory controller and a highly-scalable Hyper Transport technology-based system bus up to HTT 3.0. MCP78S Platform Processor Chipset motherboard series deliver the outstanding system performance and professional desktop platform solution with the advantages of new generation 64-bit AMD Socket AM2+ and Socket AM2 AMD Phenom™ FX, AMD Phenom™ ， Athlon64 FX ， Athlon64 X2，Athlon64 & Sempron processors.

The MCP78S Series motherboards support new generation Socket AM2+ processors with an integrated DDRII memory controller for Dual channel DDRII400/ DDRII533 /DDRII667 /DDRII800 DDRII Module up to 8.0GB. Moreover, the motherboard provides also extra 1 Ultra ATA interface for one IDE device of 133 MB / s data transfer rate and six serial ATA interface of 3.0 Gb / s data transfer rate.

The MCP78S motherboards provide 10/100/1000 LAN function withRealTek8211B PCI-E Gigabit LAN which supports 10/100/1000Mbps data transfer rate. And the embedded Azalia 8-channel Audio CODECALC883 is fully compatible with Sound Blaster Pro standards that offer you with the home cinema quality and satisfying software compatibility.

The MCP78S Series motherboards deliver outstanding value and performance for gamers. This high bandwidth architecture in the MCP78S chipset is with the flexibility for single or dual card or three cards configurations. The MCP78S chipset provide 1 x16@16 lane PCI Express 2.0 slot to support simultaneous operation of graphics card for astonishing performance with brilliant and intense 3D graphics. This PCI-Express2.0 x16@16 deliver up to 8Gbyte/sec data transfer rate at each relative direction. One PCI Express x1 I/O slot offers 512 Mbyte/sec concurrently, over 3.5 times more bandwidth than PCI at 133Mbye/sec, tackling the most demanding multimedia tasks nowadays .The MCP78S motherboards also carry two32-bit PCI slots to guarantee the rich connectivity for the I/O peripheral devices.

Hybrid SLI® technology, based on NVIDIA’s industry-leading SLI technology, delivers multi-GPU (graphics processing unit) benefits when an NVIDIA® motherboard GPU is combined with an NVIDIA discrete GPU（GeForce8400GS and GeForce8500GT only）. Hybrid SLI increases graphics performance with GeForce® Boost and provides intelligent power management with HybridPower™. GeForce Boost turbocharges the performance of NVIDIA discrete GPUs when combined with NVIDIA motherboard GPUs. Plug any NVIDIA Hybrid SLI-enabled GPU into any NVIDIA Hybrid SLI-enabled motherboard to enjoy additive performance and more for your money. HybridPower™ unleashes graphics performance when needed and switches to quiet, low-power quiet operation for everyday computing. Plug any NVIDIA Hybrid SLI-enabled GPU into any NVIDIA Hybrid SLI-enabled motherboard for the ultimate control. Dial up performance for demanding 3D games and applications; reduce noise and power consumption for everyday computing tasks

like browsing the Web, word processing, or watching HD videos.

Embedded USB controllers as well as capability of expanding to 10 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 Vcore 7-shift / CPU Smart Fan / 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℃ 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. (For detail operating please read Section 3-11 Bi-turbo Configuration)

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 7-Shift--- (Shift to Higher Performance)
The CPU voltage can be adjusted up by 31 steps for the precisely over-clocking of extra demanding computing performance.

OC-CON ---（High-polymer Solid Electrolysis Aluminum Capacitors）
The working temperature is from 55 degrees Centigrade below zero to 125 degrees Centigrade, OC-CON 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

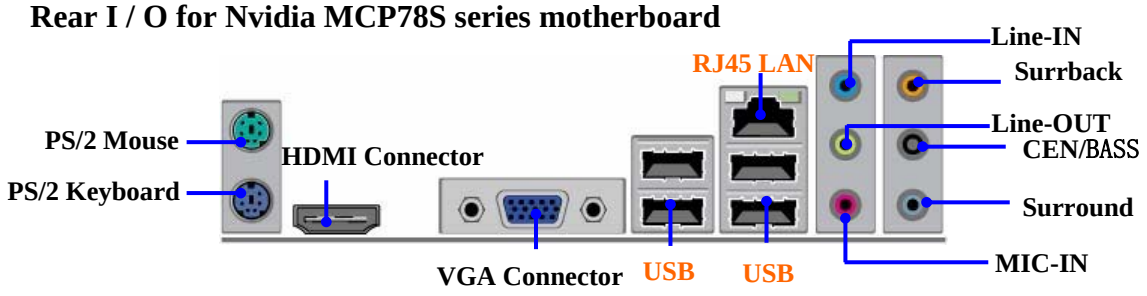
Spec	Description
Design	● ATX form factor 4 layers PCB size: 22.0 cm*24.4cm
Chipset	● MCP78S single Chipset
CPU Socket AM2+	● Support 64bit AMD Athlon64 940-Pin package utilizes Flip-Chip Pin Grid Array package processor ● Support for future AMD Athlon64 940-pin Dual –Core Athlon 64x2 processor, Athlon 64 & Sempron Processors with HTT Frequency 1GHz and the latest AMD Phenom™ FX, AMD Phenom™ processors with HTT 3.0.
Memory Socket	● 240-pin DDRII Module socket x 4 ● Support 4pcs DDRII400/DDRII533/DDRII667/DDRII800 Modules Expandable to 8.0GB ● Dual channel supported
Expansion Slot	● 1 pcs PCI-Express x16 16 lane ● 1pcs PCI-Express x1 slot ● 32-bit PCI slot x 2pcs
Integrate IDE and Serial ATA2 RAID	● One IDE controllers support PCI Bus Mastering, ATA PIO/DMA and the ULTRA DMA 33/66/100/133 functions that deliver the data transfer rate up to 133 MB/s for 2 IDE Devices and for 6 Serial ATA2 ports providing 300 MB/sec data transfer rate with RAID 0, 1, 5 , 10 ,JBOD functions
Gigabit LAN	● Integrated RealTek8211B PCI-E GigabitLAN. ● Support Fast Ethernet LAN function of providing 10Mb/100Mb/1000 Mb/s data transfer rate
8 CH-Audio	● Realtek ALC883 Azalia 8-channel Audio Codec integrated ● Support 8-channel 3D surround & Positioning Audio ● Audio driver and utility included
BIOS	● Award 8MB Flash ROM BIOS
Multi I/O	● VGA Connector ● HDMI Connector ● PS/2 keyboard and PS/2 mouse connectors ● USB2.0 port x 4 and headers x 3 ● RJ45 LAN Connector x1 ● Audio connector x2 (Line-in, Line-out, MIC/ 8CH Audio) ● Floppy disk driver connector x1 ● Hard disk driver connector x 1 ● Serial port header x1 ● HDMI-SPDIF header x1

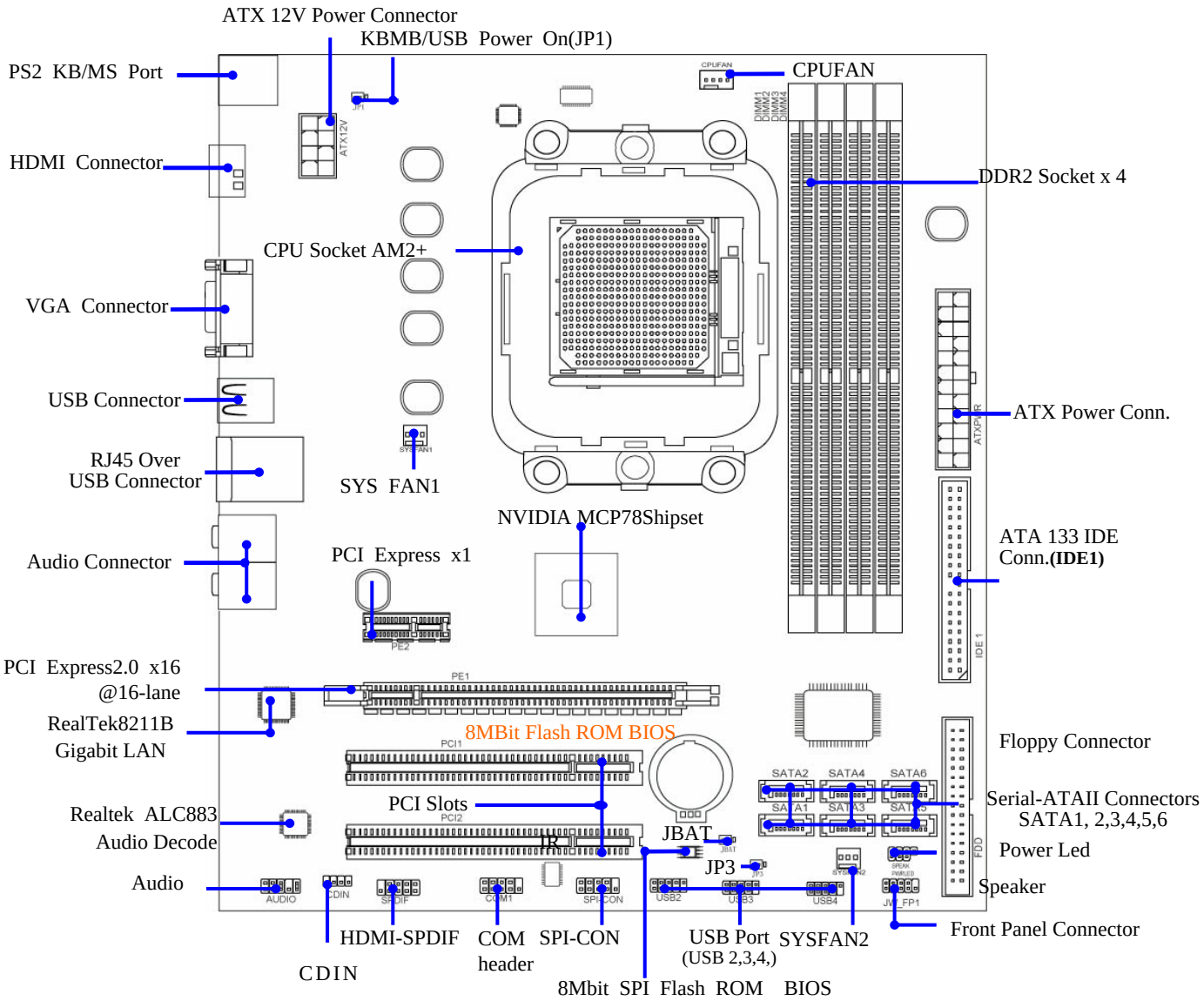
1-3 Item Checklist

☑ MCP 78S Platform Processor Chipset based motherboard
☑ SATA Cable
☑ IDE Cable
☑ User's Manual
☑ CD for motherboard utilities
☑ Back panel Shield

1-4 Layout Diagram

Rear I / O for Nvidia MCP78S series motherboard





Chapter 2
Hardware Installation

WARNING!	Turn off your power when adding or removing expansion cards or other system components. Failure to do so may cause severe damage to both your motherboard and expansion cards.

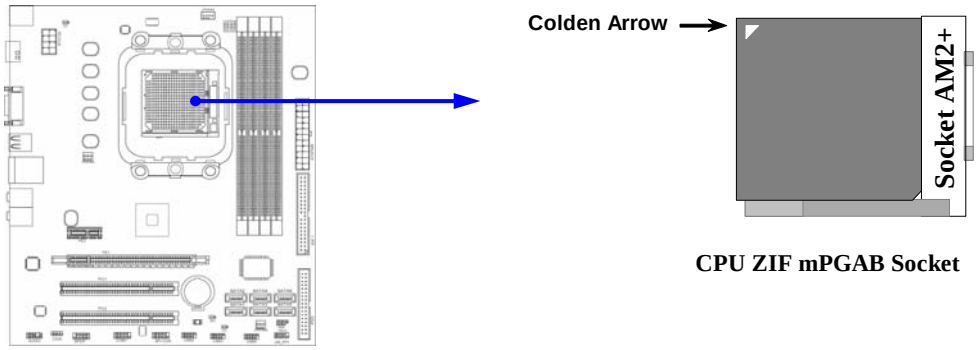
2-1 Install Athlon64 Socket AM2+ CPU

This motherboard provides a 940-pin surface mount, Zero Insertion Force (ZIF) socket, referred to as the mPGA940 socket supports AMD AM2+ processor in the 940 Pin package utilizes Flip-Chip Pin Grid Array 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!	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.

To install a CPU, first turn off your system and remove its cover. Locate the ZIF 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.



CPU ZIF mPGAB Socket

When you put the CPU into the ZIF socket, No force required to insert of the CPU, and then press the level to locate position slightly without any extra force.

2-2 Install Memory

This motherboard provides four 240-pin DDR2 DUAL INLINE MEMORY MODULES (DIMM) socket for DDR2 memory expansion available from minimum memory volume of 128MB to maximum memory volume of 4.0GB DDR SDRAM.

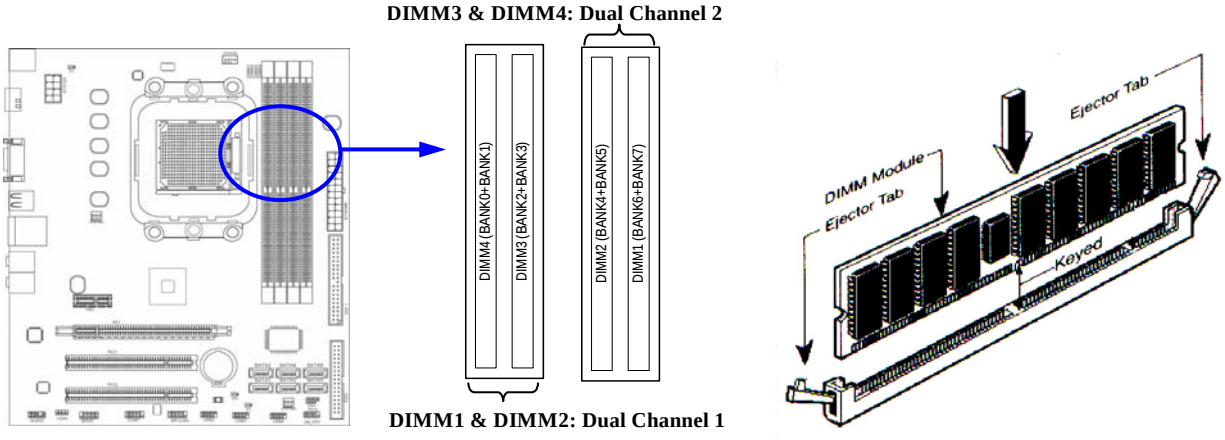
Valid Memory Configurations

Bank	240-Pin DIMM	PCS	Total Memory
Bank 0, 1 (DIMM1)	DDR2 667/DDR2 800/DDR2 1066*	X1	128MB~2.0GB
Bank 2, 3 (DIMM2)	DDR2 667/DDR2 800/DDR2 1066*	X1	128MB~2.0GB
Bank 4, 5 (DIMM3)	DDR2 667/DDR2 800/DDR2 1066*	X1	128MB~2.0GB
Total	System Memory (Max 8.0GB)	4	128MB~8.0GB

Dual channel Limited!

1. Dual channel function only supports when 2 DIMM Modules plug in either both DIMM1 & DIMM2or DIMM3 &DIMM4, or four DIMM Modules plug in DIMM1~DIMM4.
2. DIMM1 & DIMM2, or DIMM3& DIMM4 must be the same type, same size, same frequency for dual channel function.

Install DDR SDRAM modules to your motherboard is not difficult, you can refer to figure below to see how to install a 240-Pin DDR2 667/DDR2 800/DDR2 1066 SDRAM module.

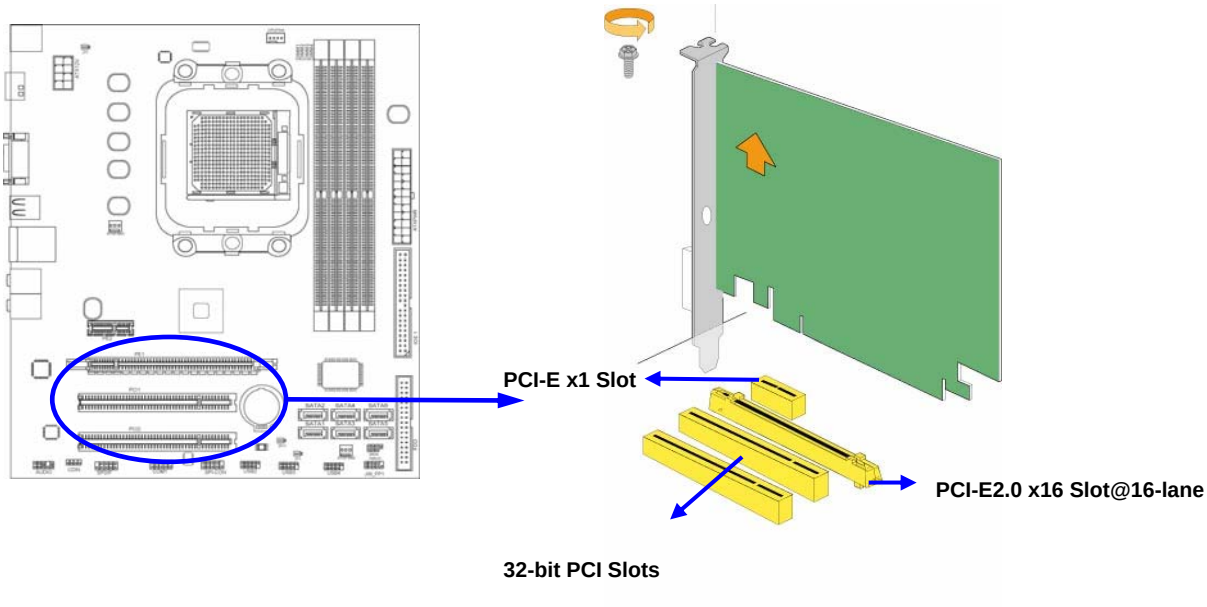


Graph 2-4

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

One PCI-Express2.0 x16@16 lane graphic slot offer 8Gbyte/sec data transfer rate at each relative direction and up to 16Gbyte/sec concurrent bandwidth at full speed. Fully compliant to the *PCI Express Base Specification revision2.0*, support PCI Express VGA card, and other PCI Express device.One x1 PCI Express Slot offer 512Mbyte/sec concurrently over 3.5 times more bandwidth than PCI at 133Mbye/sec, tackling the most demanding multimedia tasks nowadays. Two 32-bit PCI slots guarantee the rich connectivity for the I/O of peripherals.



Chapter 3
Connectors，Headers &Jumper Setting

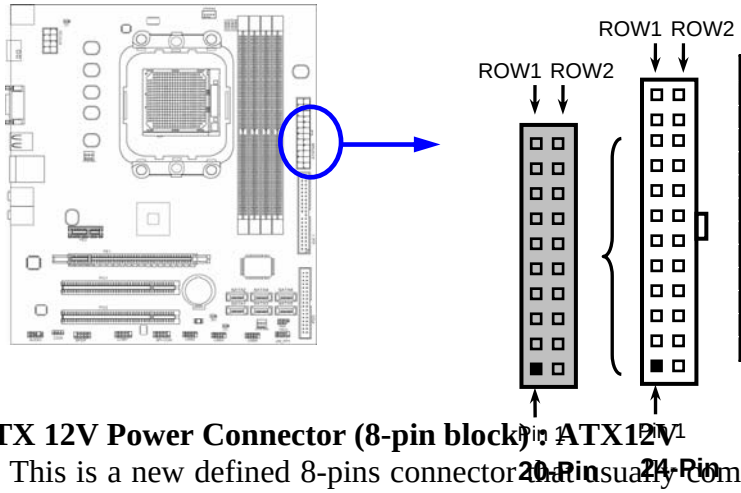
3-1 Connectors

(1) Power Connector (24-pin block) : ATXPWR1

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.

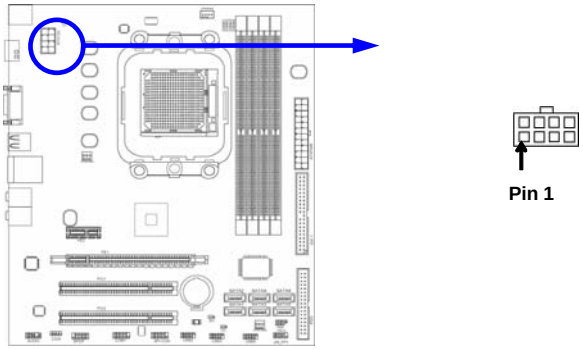
** If you intend to use a PSU with 20-pin and 4-pin power plugs, make sure that the 20-pin power plug can provide at least 15A on +12V and the power supply unit has a minimum power rating of 350W. The system may become unstable or may not boot up if the power is inadequate.



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

(2) ATX 12V Power Connector (8-pin block) : ATX12V

This is a new defined 8-pins connector that usually comes with ATX Power Supply. The ATX Power Supply which fully supports Socket 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:US1,UL4 for USB

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

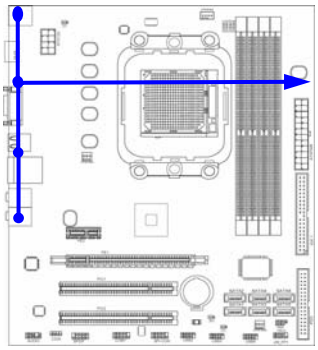
(5) LAN Port connector: UL4 for RJ45 LAN

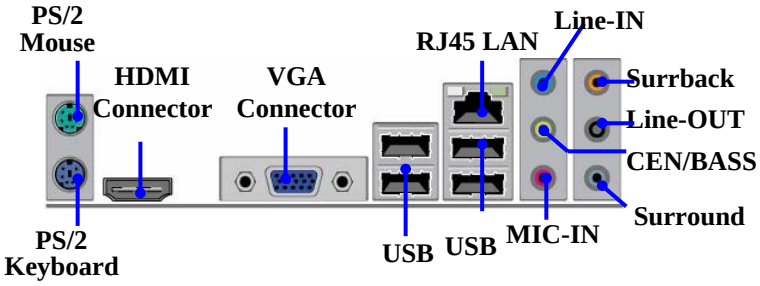
This connector is standard RJ45 connector for Network. It supports 10M/100Mb/1000Mb s data transfer rate

(6) Audio Line-In, Lin-Out, MIC, Surrback, Surround, CEN/BASS Connector: AUDIO1&SURROUND1

These Connectors are 6 Phone-Jack for LINE-OUT, LINE-IN, MIC, Surrback, Surround, CEN/BASS audio connections.

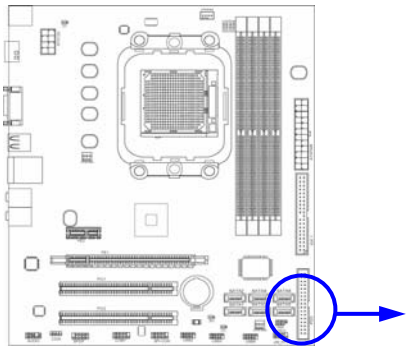
Line-in : (BLUE)	Audio input to sound chip
Line-out : (GREEN)	Audio output to speaker
MIC : (PINK)	Microphone Connector
Surrback : (ORANGE)	Audio output to speaker-Rear speaker out
CEN/BASS : (BLACK)	Audio output to speaker-Center/Subwoofer speaker out
Surround: (GRAY)	Audio output to speaker-Side speaker out

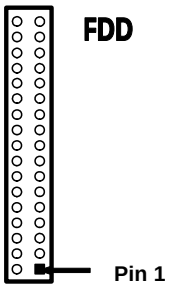




(7) Floppy drive Connector (34-pin block): FDD

This connector supports the provided floppy drive ribbon cable. After connecting the single plug end to motherboard, connect the two plugs at other end to the floppy drives.

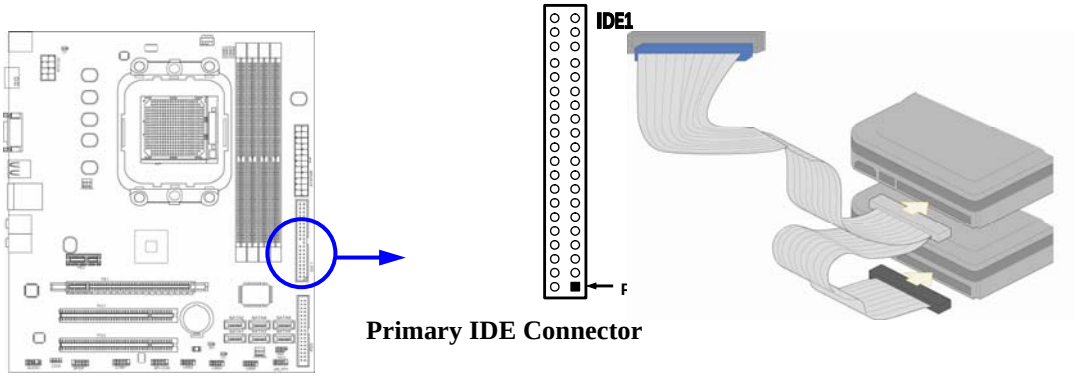




Floppy Drive Connector

(8) Primary IDE Connector (40-pin block): IDE1

This connector supports the provided IDE hard disk ribbon cable. After connecting the single plug end to motherboard, connect the two plugs at other end to your hard disk(s). If you install two hard disks, you must configure the second drive to Slave mode by setting its jumpers accordingly. Please refer to the documentation of your hard disk for the jumper settings.

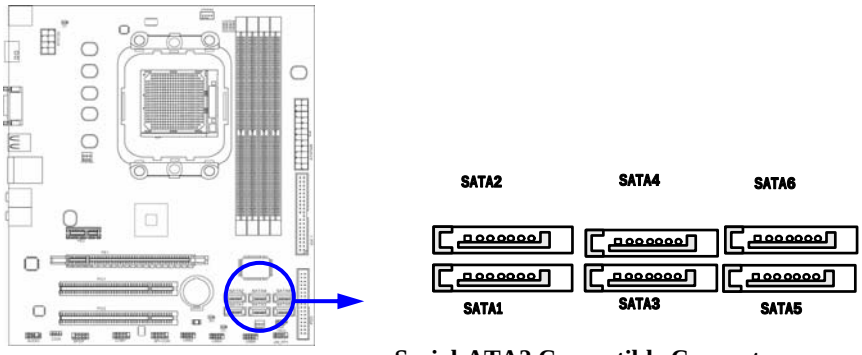


Primary IDE Connector

- 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.

(9) Serial-ATAII Port connector: SATA1, SATA 2, SATA3, SATA4, SATA5, SATA6

This connector supports the provided Serial ATA2 IDE hard disk cable to connecting the motherboard with serial ATAII hard disk.



Serial-ATA2 Compatible Connectors

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

VGA connector is the 15-pin D-subminiature female connector; it is for the display devices, such as the CRT monitor, LCD monitor and so on.

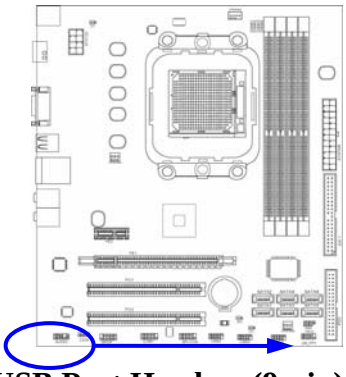
(11)HDMI connector ： HDMI

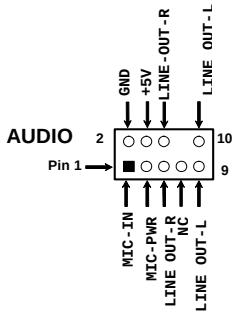
This point-to –point interface is for audio and video signals designed as a single-cable solution for home theater and consumer electronics equipments.

3-2 Headers

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

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

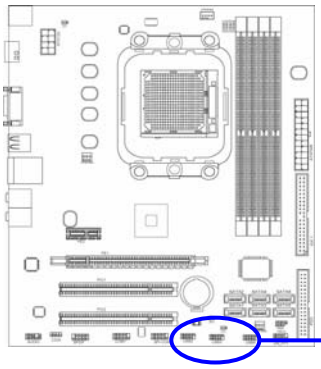


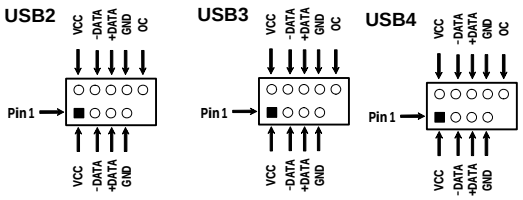


Line-Out, MIC Headers

(2) USB Port Headers (9-pin): USB2/USB3/USB4

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

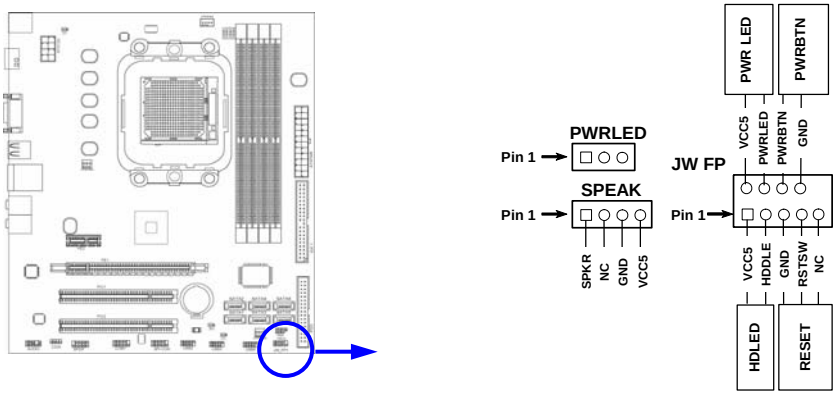
This connector connects to the hard disk activity indicator light on the case.

(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

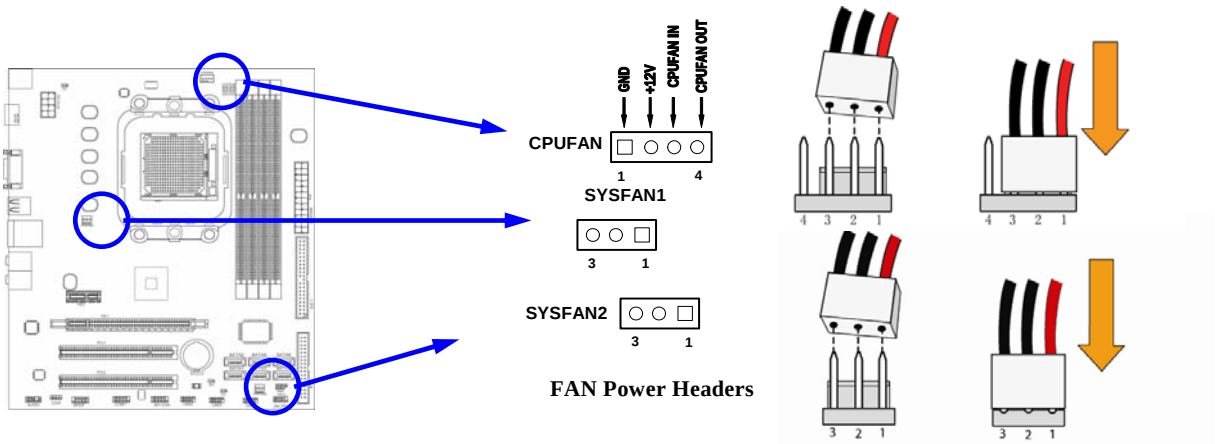
This 2-pin connector connects to the case-mounted power switch to power ON/OFF the system.



System Case Connections

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

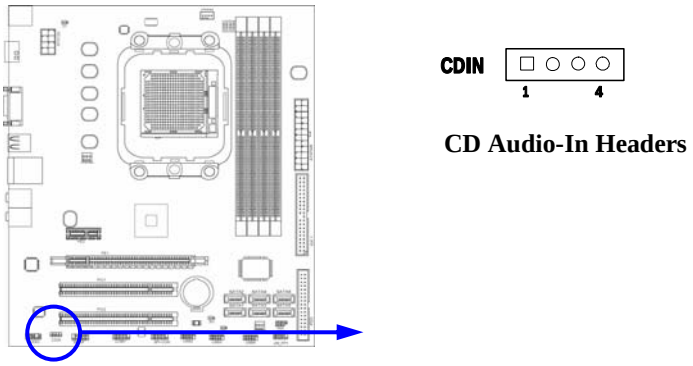
These connectors support cooling fans of 350mA (4.2 Watts) or less, depending on the fan manufacturer, the wire and plug may be different. The red wire should be positive, while the black should be ground. Connect the fan's plug to the board taking into consideration the polarity of connector.



FAN Power Headers

(9) CD Audio-In Headers (4-pin): CDIN

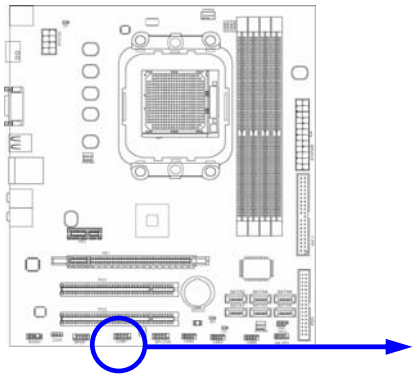
CDIN are the connectors for CD-Audio Input signal. Please connect it to CD-ROM CD-Audio output connector.

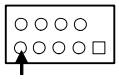


CD Audio-In Headers

(10) Serial COM Port header: COM1

COM1 is the 9-pin block pin-header. The On-board serial port can be disabled through BIOS SETUP. Please refer to Chapter 3 “INTEGRATED PERIPHERALS SETUP” section for more detail information.



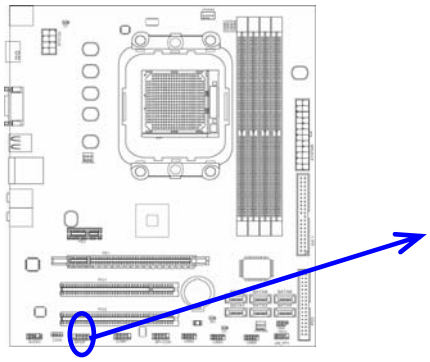


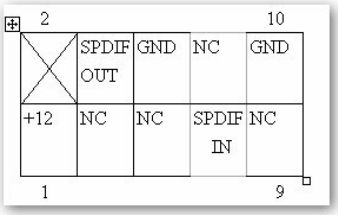
Pin1

Serial COM Port 9-pin Block

(11) HDMI-SPDIF header: SPDIF

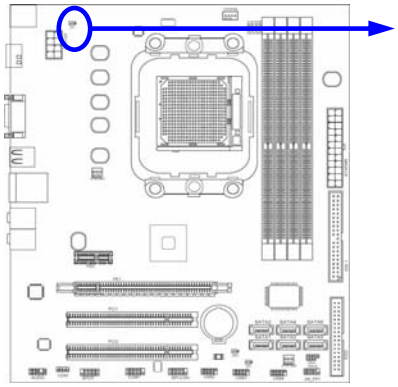
This connector is used for installing a digital coaxial optical daughter board or graphic card support HDMI.Pin 4-6 is for audio input.



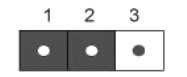


3-3 Jumper Setting

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

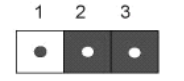


JP1



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

JP1



2-3 Closed KB/USB Power ON Enabled

Keyboard/Mouse & USB Power On Setting

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

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

To clear the CMOS, follow the procedure below:

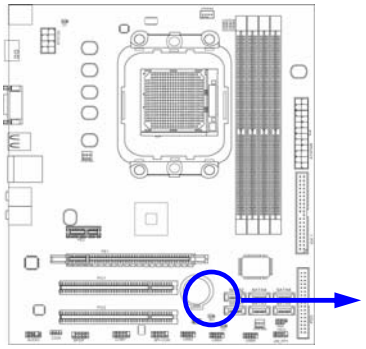
1. Turn off the system and unplug the AC power
2. Remove ATX power cable from ATX power connector
3. Locate JBAT and short pins 2-3 for a few seconds
4. Return JBAT to its normal setting by shorting pins 1-2
5. Connect ATX power cable back to ATX power connector

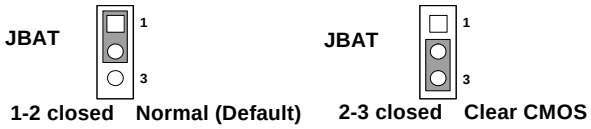
Note: When should clear CMOS

1. Troubleshooting

2. Forget password

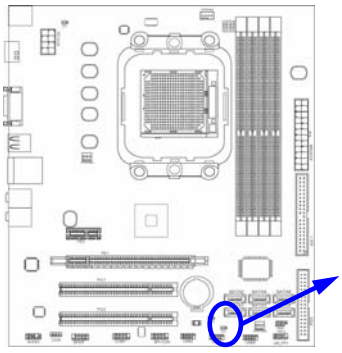
3. After over clocking system boot fail

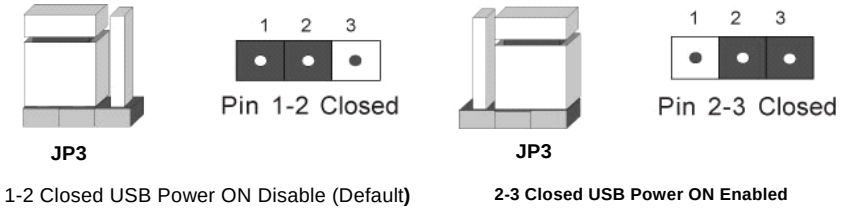




CMOS RAM Clear Setting

(3) USB function Enabled/Disabled: JP3





Keyboard/Mouse & USB Power On Setting

Chapter 4

USEFUL HELP

4-1 HOW TO UPDATE BIOS

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

STEP 2. Copy utility program to your boot disc. You may copy from DRIVER CD X:\FLASH\AWDFLASH.EXE or download from our web site.

STEP 3. Download and make a copy of the latest BIOS for 770 SERIES motherboard series from the web site to your boot disc.

STEP 4. Insert your boot disc into A:,
Start the computer, type "Awdflash A:\xxxxxx.BIN /SN/PY/CD/CH/WB/CC/R"
xxxxxx.BIN is the file name of latest BIOS

SN	means	don't save existing BIOS data
PY	means	renew existing BIOS data
CD	means	clear DMI data after programming
CH	means	update HOLE
WB	means	always programming BootBlock
CC	means	clear existing CMOS data
R	means	restart computer

STEP 5. Type ENTER to update and flash the BIOS, then the system will restart automatically.

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.