

AN51R

Socket 754

**AMD Athlon™ 64 Processor
Based DDR MAINBOARD**

User's Manual

Shuttle® AN51R

Socket 754

AMD Athlon™ 64 Processor

Based DDR Mainboard

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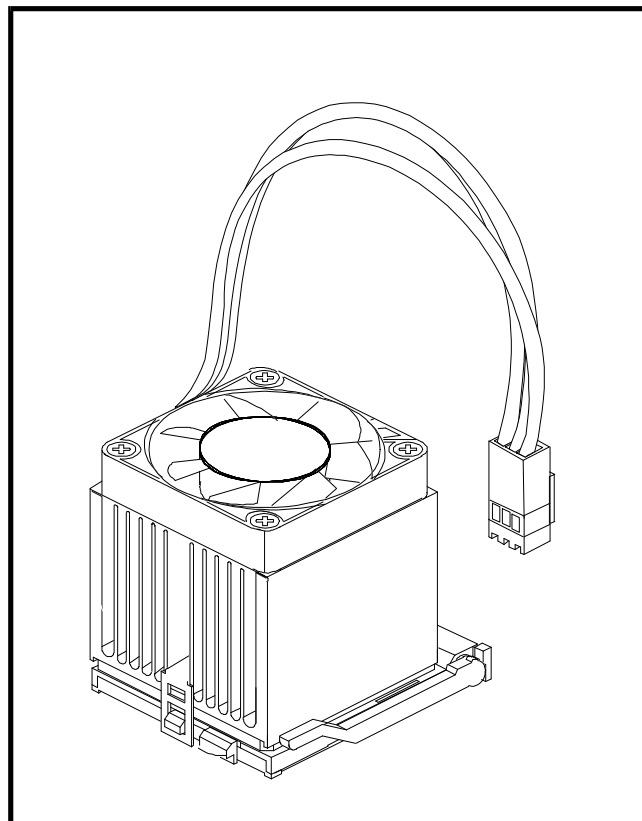
General Notice: Other product names used in this manual are ascribed to their respective owners and acknowledged.

WARNING

Thermal issue is highly essential for processors with a speed of 600MHz and above. Hence, we recommend you to use the CPU fan qualified by AMD or motherboard manufacturer. Meanwhile, please make sure CPU and fan are securely fastened well. Otherwise, improper fan installation not only gets system unstable but also could damage both CPU and motherboard because insufficient thermal dissipation.

If you would like to know more about thermal topic please see **AMD website** for detailed thermal requirement through the address:

<http://www.amd.com>



NOTICE

If you've changed your CPU or overclocked your system, the system may fail to boot up, even with a Clear CMOS jumper physically resetted. The reason is that NVIDIA's new nForce2 chipset introduces a way to reset a Clear CMOS jumper without removing a chassis. Please follow the steps listed below:

1. Turn off your computer and unplug the power cable. Reconnect it after 30 seconds;
2. Press <Insert> and then press your computer's start button. Continue holding <Insert> until the system begins the POST (Power-On Self Test);
3. Immediately press to enter the BIOS;
4. Select 'Load Optimized Defaults' to return your system to a bootable condition; then select 'SAVE to CMOS and EXIT';
5. Reboot your system.

Moreover, if your system fails to boot up after you reset the CPU FSB, select "SAVE to CMOS and EXIT" in the BIOS. After the system restarts, there is on screen a message warning you not to reset or turn off your computer:

Warning! New setting is updating now
Do not Reset or Shutdown the system

Your system works after the BIOS is updated.

Statement of Shuttle Mainboard via the EMI Test

Shuttle mainboards have been via the EMI test in terms of series of regulations: EN55022/ CISPR22/AS/NZS3548 Class B, EN55024 (1998/AS/NZS), EN4252.1 (1994), EN61000, ANSI C63.4 (1992), CFR47 Part 15 Subpart B, and CNS13438 (1997). The items tested are illustrated as follows:

(A) Voltage: AC 110V/60HZ & AC 230V/50HZ

(B) Tested Product Information:

Product Name: PC Mainboard

Status: Sample

Model Name: AN51R

S/N: N/A

CPU:

External Frequency: 200 MHz 3000+ / 3200+

Mouse Port: one port with 6 pins

Keyboard Port: one port with 6 pins

Parallel Port: one port with 25 pins

Serial Port: one ports with 9 pins respectively

1394 Port: one port with 6 pins

Mic-In & Center/Bass & Line-In & Rear-Out & SPDIF-Out & Front-Out Ports : one port for each

LAN Port: one port with 8 pins (10Mbps/ 100Mbps)

USB Port: four ports with 4 pins respectively

DIMM Memory (optional): DDR 400 256 MB*2

Power Cable: Detachable and Shielded (with a GND pin)

Monitor: CRT

Maximum Resolution: 1280 X 1024 V:60Hz

All CPUs have completely been tested, and values offered by the worst EMI combination of CPU external frequency are listed as follows:

Test Mode	External Frequency	CPU
1	200 MHz	3200+

(C) Remedy for the Tested Product & Its EMI Interference:

Remedy: N/A

EMI Interference:

Crystal: 14.318MHz(X1)/25.00 KHz(X9)/32.768 MHz(X2)/24.576 MHz(X3)/
25.000 MHz(X6)/24.576 MHz(X7)

Clock Generator: Zu1

(D) Supported Host Peripherals:

Host Peripheral	Product Name	Model Name
#1	Case	AN51R
#2	Power Supply (300W)	ENP-0730
#3	Maxtor HDD (40GB)	D740X-6L
#4	CODE DVD Player	DVD-116

(E) Notices for Assembling Computers:

1. Cases should be made of iron or other metal that has good electric conductivity.
2. Cylinders in a case should be made of metal, and as having a mainboard mounted in a case, make sure screws are all utilized and fastened on a mainboard.
3. An I/O shielding should be contacted with I/O metallic parts of a mainboard.
4. Cables should appropriately be arranged and fixed in a case. Follow instructions:
 - Leave IDE cables not crossed upon CPU and SDRAM;
 - Leave power cables minimum in length, and not crossed upon a mainboard;
 - Leave CPU fan cables minimum in length, and not near CPU;
 - Leave cables on panels and other spare cables tied in a computer case.
5. Make sure an EMI shielding attached to a case has properly been installed.
6. Make sure a 5.25" or 3.5" FDD and screws are fastened to an EMI shielding.
7. Make sure a case is closely in contact with EMI connected points.
8. Make sure there is no cleft in a case which is not deformed.
9. Make sure a PCI or AGP door is bound to a case.
10. Make sure cables of other devices (fans or some others) are fixed in a case.

Important Safety Information

SAFETY INSTRUCTIONS

1. Please read these safety instructions carefully.
2. Please keep this User's Manual for later reference.
3. Please disconnect this equipment from AC outlet before cleaning. Don't use liquid or sprayed detergent for cleaning.
4. For pluggable equipment, the socket-outlet shall be installed near the equipment and shall be easily accessible.
5. Please keep this equipment from humidity.
6. Lay this equipment on a reliable surface when install. A drop or fall could cause injury.
7. Do not leave this equipment in an environment unconditioned, it may damage the equipment.
8. The openings on the enclosure are for air convection hence Protect the equipment from overheating. **DO NOT COVER THE OPENINGS.**
9. Make sure the voltage of the power source when connect the equipment to the power outlet.
10. Place the power cord such a way that people can not step on it. Do not place anything over the power cord. The power cord must be rated for the product and for the voltage and current marked on the product's electrical ratings label. The voltage and current rating of the cord should be greater than the voltage and current rating marked on the product.
11. All cautions and warnings on the equipment should be noted.
12. If the equipment is not use for long time, disconnect the equipment from mains to avoid being damaged by transient over-voltage.
13. Never pour any liquid into ventilation openings, this could cause fire or electrical shock.
14. **CAUTION:** The computer is provided with a battery-powered real-time clock circuit. There is a danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent type recommended by the manufacture. Discard used batteries according to the manufacturer's instructions.

**CAUTION : RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN
INCORRECT TYPE. DISPOSE OF USED BATTERIES
ACCORDING TO THE INSTRUCTIONS**

15. THE COMPUTER IS PROVIDED WITH CD DRIVES COMPLY WITH APPROPRIATE SAFETY STANDARDS INCLUDING IEC 60825.

CLASS 1 LASER PRODUCT

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1 INTRODUCTION

1.1 To Different Users

First-Time DIY System Builder

Welcome to the DIY world! Building your own computer system is not as difficult as you may think. To make your first computer DIY experience successful, right from the start, we have designed Chapter 3 Hardware Installation in a step-by-step fashion for all the first-time DIY system builders. Prior to installation, we suggest you read the whole manual to gain a complete understanding of your new AN51R mainboard.

Experienced DIY User

Congratulate on your purchase of the AN51R mainboard. You will find installing your new AN51R mainboard is quite easy. Bundled with an array of onboard functions, the highly-integrated AN51R mainboard provides you with a total solution to build the stablest and most reliable system. Referring to section 3.2 Jumper Settings and Chapter 4 Software Utility, you will find how to work out your new mainboard. Chapter 5 BIOS Setup also contains the relevant information on how to tune up your system to achieve higher performance.

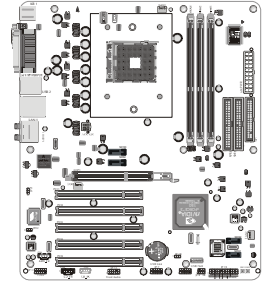
System Integrator

You have wisely chosen AN51R to construct your system. AN51R incorporates all the state-of-the-art technology of the nForce3 250 chipset from nVIDIA. Each integrates the most advanced functions you've ever found in a compact ATX board.

1.2 Item Checklist:

Check all items with your AN51R mainboard to make sure nothing is missing. A complete package should include:

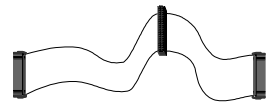
- ✳ One Shuttle AN51R Mainboard



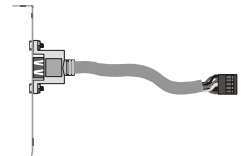
- ✳ One ATA 133/100/66 Ribbon Cable



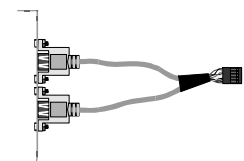
- ✳ One Floppy Ribbon Cable



- ✳ One piece of one port 1394 Cable



- ✳ One Twin-Port USB Cable



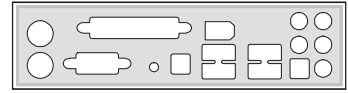
- ✳ One piece of Serial ATA Cable



- ✳ Two pieces of Serial ATA Power Cord



★ I/O Shielding

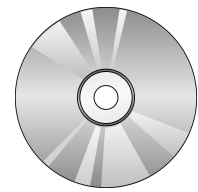


★ AN51R User's Manual
NVIDIA RAID User's Manual



★ One Bundled CD-ROM, including:

- AN51R user's and nVIDIA raid manuals in PDF format
- DirectX9 Utility Driver
- nVIDIA Chipset Driver
- Broadcom Giga Lan Driver
- nVIDIA USB2.0 Driver
- Award Flashing Utility



2 FEATURES

AN51R mainboard is dedicatedly designed for demanding PC users who desire high performance and maximum intelligent features in a compact package.

2.1 Specifications

- ★ **CPU Support**

AMD Athlon™64 on 754-pin SMT Socket.

- ★ **Chipset**

nVIDIA nForce3 250 Single Chip for AMD Athlon64 CPU.

- ★ **Jumperless CPU Configuration**

Soft-configuration FSB (The FSB speed is software configurable from 200MHz to 280MHz in the Ratio/Voltage Control of BIOS setup program).

- ★ **Integrated Serial-ATA (SATA) Interface**

It compliants with SATA specification.

It supports dual channel SATA, 1.5 Gb/s per channel and power down capabilities.

- ★ **External RSPI Serial-ATA PHY Interface (Marvell 3020)**

It compliants with SATA specification.

It supports dual channel SATA, 1.5 Gb/s per channel and power down capabilities.

- ★ **AC'97 Audio**

Realtek ALC650 include SPDIF-IN function.

It compliants with AC97 2.2 specification.

5.1-Channel output but Line-in & Mic-in are shared with Rear-out & Center/Bass that can be setting by device panel under OS.

Rear-out & Center/Bass have two set independent header which aren't shared with any function.

It supports CD-IN/AUX-IN/Front Audio Panel/SPDIF-IN connectors & headers. nForce 3 250 chipset build-in SPDIF-OUT that support pass-through function.

- ★ **Versatile Memory Support**

Three 184-pin DIMM slots to support up to 3.2GB bandwidth for PC1600, PC2100, PC2700, PC3200 compliant with DDR SDRAM module.

System memory supports 64/128/256/512Mb technologies up to 3GB capacity max and 1GB per DIMM.

★ **AGP Expansion Slot**

Provides single 1.5V 8x AGP slot which supports 4X / 8X AGP devices.

★ **PCI Expansion Slots**

It provides five PCI slots and supports 5788 Gigabit Lan (GbE)/VT6307 2 ports IEEE 1394 firewire on board.

★ **8 USB 2.0/1.1 Interface Onboard**

4X USB ports on back panel and two extended USB headers (4 ports) on front panel.

★ **Gigabit Ethernet Controller (BCM5788KFB)**

10/100/1000 Mbps operation rate. Support Wake-on-Lan (WOL) function.

★ **IEEE 1394 (VT6307)**

Compliant with 1394 OHCI specification revision V1.0 and V1.1. Support 400Mb/s, 200Mb/s, 100Mb/s data transfer rate.

★ **I/O Interface**

Provides a variety of I/O interfaces:

- 1 x PS/2 Mouse
- 1 x PS/2 Keyboard
- 1 x Serial port
- 1 x Parallel port
- 1 x Clear CMOS button
- 1 x SPDIF-In port
- 1 x 1394 port
- 4 x USB ports
- 1 x Gigabit Lan port
- 1 x Mic-In port
- 1 x Center /Bass Out port
- 1 x Line-In port
- 1 x Rear-Out port
- 1 x SPDIF-Out port
- 1 x Front-Out port

*** PCI Bus Master IDE Controller Onboard**

Two Ultra DMA 133/100/66/33 bus master dual-channel IDE ports support up to two IDE devices (one Master and one Slave per channel).

The IDE bus implements data transfer speeds to 133/100/66/33 Mb / Sec and also supports PIO mode 0, 1, 2, 3, 4.

80-pin cable backward compatible legacy ATAPI devices, ATAPI IDE CD-ROM, CD-R, CD-RW and LS-120 supports.

*** ATX Power Supply Connector**

ATX power supply unit can be connected to the onboard 20-pin ATX power connector, and 4-pin ATX power connector. The unit supports Suspend and Soft-On/Off modes by the dual-function power button.

*** Advanced Configuration and Power Interface**

Features four power-saving modes: S1 (Snoop), S3 (Suspend to RAM), S4 (Suspend to DISK), and S5 (Soft-Off). ACPI provides more efficient energy-saving features controlled by your operating system that supports OS Direct Power Management (OSPM) functionality.

*** System BIOS**

Provides licensed Award BIOS V6.0 PG on the 4Mb Flash ROM, and supports Green PC, Desktop Management Interface (DMI).

*** Form Factor**

System board conforms to the Full ATX specification.

Board dimension: 305 x 244 (mm).

*** Advanced Features**

- Low EMI - Built in spread spectrum. Unused PCI/SDRAM slots are shut off by the automatic clock for reducing EMI.
- Dual Function Power Button - The system can be in any of the two states: one is Suspend mode and the other is Soft-Off mode. Pushing the power button for less than 4 seconds places the system into Suspend mode. When the power button is pressed for longer than 4 seconds, the system will enter Soft-Off mode.
- Modem Ring Power-On - The system can be powered on automatically by the activation of modem ringing.
- CPU Multiplier Setting - This item allows users to adjust CPU Multiplier in BIOS.

-
- CPU/RAM/AGP Voltage Setting - These items allow users to adjust CPU/RAM/AGP Voltage in BIOS.

*** Intelligent Features**

- Voltage Monitoring - Monitors various voltages of key elements, such as the CPU, and other critical system voltage levels to ensure a stable current passing through mainboard components.
- Fan Status Monitoring - To prevent the CPU from overheating, the CPU fan is monitored by RPM, with which the cooling fan is required.
- Temperature Monitoring - This item allows users to make sure whether the CPU or system runs under a suitable temperature.

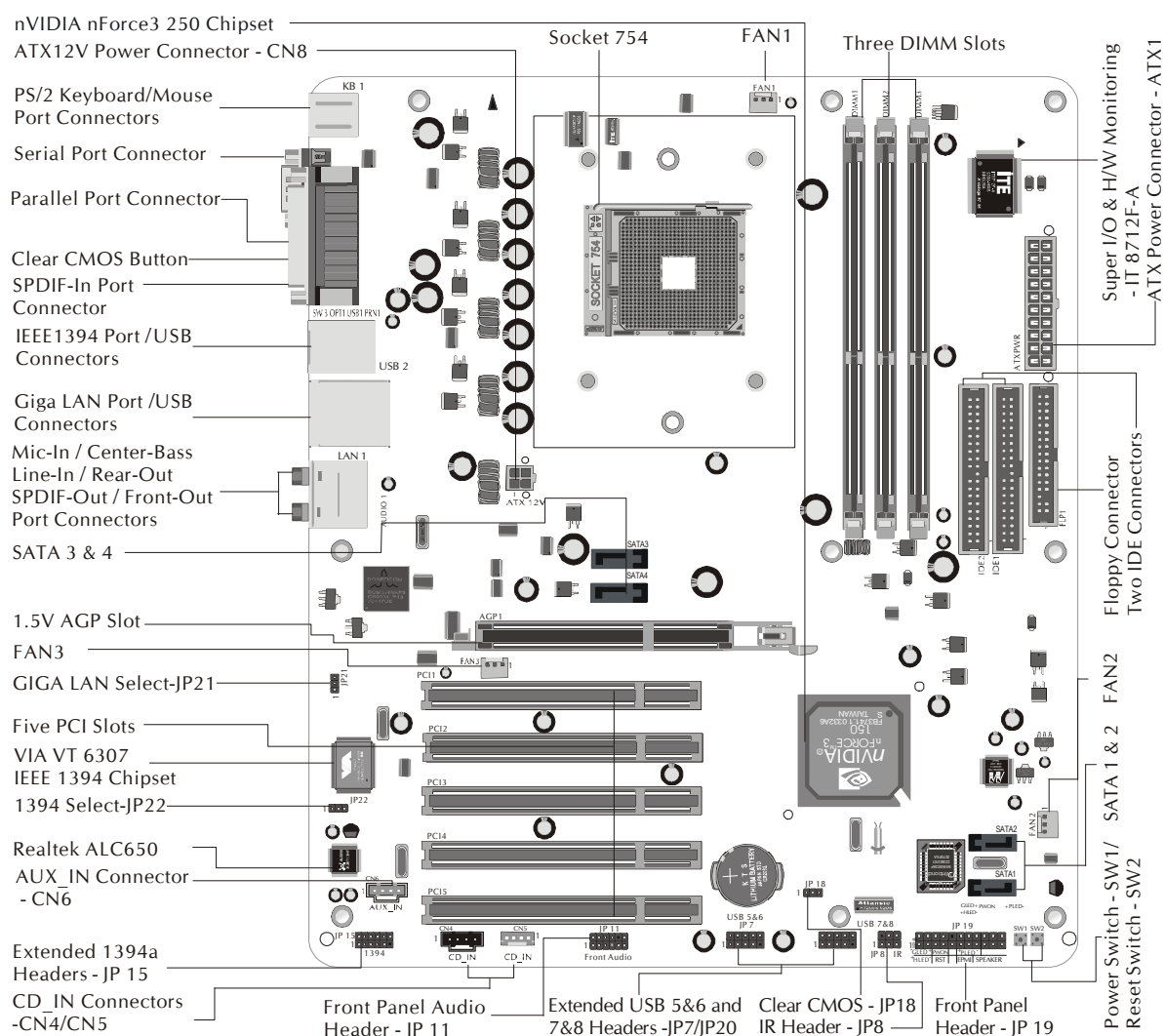
3 HARDWARE INSTALLATION

Before removing/installing any of these devices: CPU, DIMMs, Add-On Cards and Cables, please unplug the onboard power connector.

This section outlines how to install and configure your mainboard. Referring to the following mainboard layout helps you identify various jumpers, connectors, slots and ports.

3.1 Step-by-Step Installation

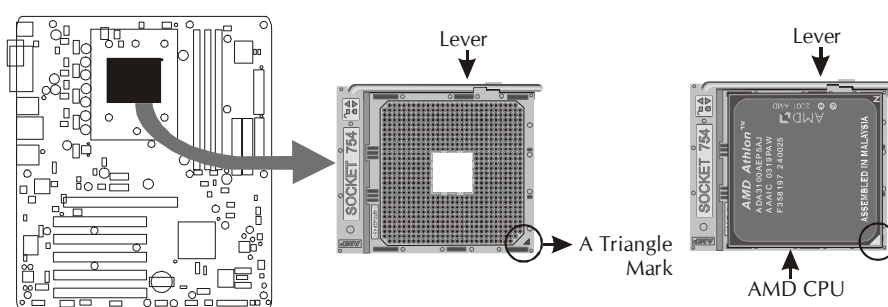
Accessories Of AN51R



Step 1

Install the CPU

1. Locate the CPU ZIF (Zero Insertion Force) socket on the upper-right sector of your mainboard (between the back panel connectors and the DIMM memory slots).
2. Pull the CPU ZIF socket lever slightly sideways away from the socket to unlock the lever, and then bring it to an upwardly vertical position.
3. Place your AMD Athlon™ 64 processor in the socket. Note that the CPU's edges have been purposely designed non-symmetrically to prevent from inserting the processor in the wrong direction. The following diagram demonstrates the correct placement of the CPU in the ZIF socket.



4. Slightly push the AMD Athlon™ 64 processor into the socket without applying excessive force while making sure there is no gap between CPU and socket. Then lower the socket-lever all the way down to its horizontal position and lock it to secure the CPU in place.
5. The AMD Athlon™ 64 processor requires a set of heatsink/fan to ensure proper cooling of the processor. If heatsink/fan have not been already mounted on your CPU, you must purchase the heatsink/fan separately and have it installed. Plug the cable through the heatsink/fan in the CPU fan power connector located nearby. Note that there are several types of CPU fan connectors. Normally, if your mainboard supports the hardware monitoring function, a 3-pin fan power connector should allow your system to detect the CPU fan's speed. The CPU fan can also run with a 2-pin fan power connector, however, detection of CPU fan's speed is not supported. Another type of CPU fan may feature a large 4-pin fan power connector, which does not support CPU fan's speed detection and must be directly connected to the system's power supply unit. Please refer to the following diagram.

Step 2

Set Jumpers

The default jumper settings have been set for the common usage standard of this mainboard. Therefore, you need not to reset the jumpers unless you require special adjustments as the following case:

Clear CMOS Setting

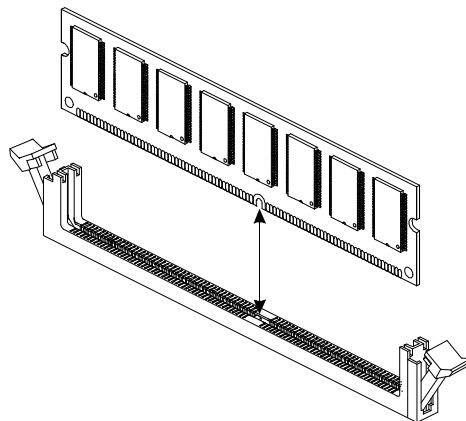
For first-time DIY system builders, we recommend that you not change the default jumper settings if you are not quite familiar with the mainboard configuration procedures. The factory-set default settings are tuned for optimum system performance. For advanced users who prefer to customize their system, section 3.2 Jumper Settings provides the detailed information on how to configure your mainboard manually.

Step 3

Install DDR SDRAM System Memory

To install memory, insert DDR SDRAM memory module(s) in the DIMM banks. Note that DDR SDRAM modules are directional and will not go in the DIMM banks if they are not properly oriented. After the module is fully inserted into the DIMM bank, lift the clips of both sides of the DIMM bank to lock the module in place.

DDR SDRAM



Step 4

Install Internal Peripherals in System Case

Before you place the mainboard into your system case, we recommend that you first assemble all the internal peripheral devices into the computer housing, including, but not limited to, the hard disk drive (IDE/HDD), floppy disk drive (FDD), CD-ROM drive, and ATX power supply unit.

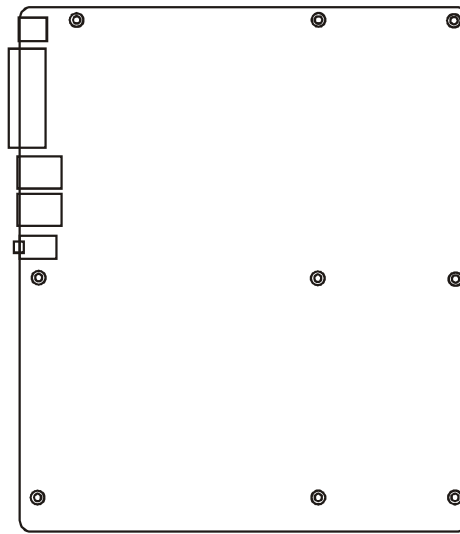
To install IDE & FDD drives, follow these procedures:

1. Set the required jumpers on each device according to the instructions provided by the manufacturer. (IDE, HDD, and CD-ROM have to set jumpers to Master or Slave mode depending on whether you install more than one device of each kind.)
2. Connect the IDE cable and FDD cable on the back panel of the internal peripheral devices to the corresponding headers on board. Note that the cable should be oriented with its colored stripe (usually red or magenta) connected to pin#1 of the IDE or FDD connector on the mainboard and on the device as well.
3. Connect an available power cable from your system power supply unit to the back panel of each peripheral device. Note that the power cable is directional and cannot fit in if not properly positioned.

Step 5

Mount the Mainboard on the Computer Chassis

1. You may find there are a lot of mounting holes on your computer chassis and mainboard. To match the holes on both properly, the key point is to make the back panel of the mainboard in a close fit with your system case, as shown below.



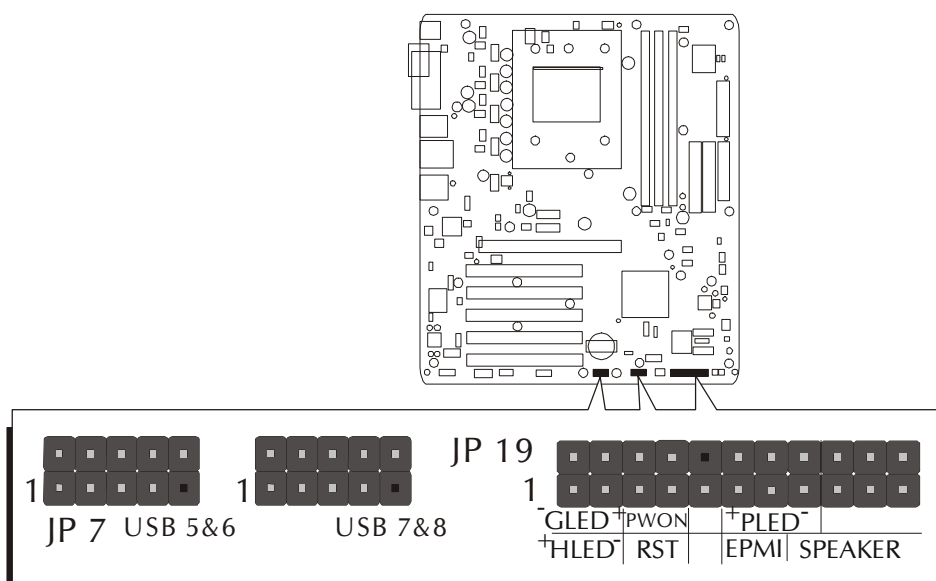
2. Position the studs between the chassis and the mainboard. The studs are used to fix the mainboard and to keep a certain distance between them, for avoiding any electrical shorts in-between.
(If your computer case is already equipped with mounting studs, you need to tighten the screws to attach the mainboard.)

Note: In most computer housings, you can find 4 or more holes to place studs for fixing the mainboard. If there aren't enough matching holes, screw at least 4 studs to ensure the proper attachment of the mainboard.

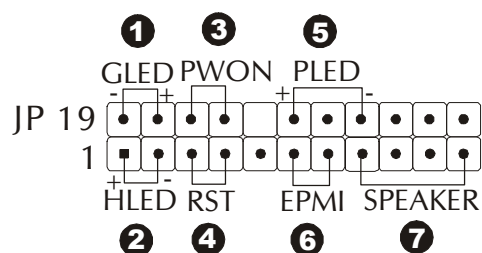
Step 6

Connect Front Panel LEDs/Switches/Speaker/USBs

You can find there are several cables existing in the system case and originating from the front panel devices (HDD LED, Green LED, Reset switch, PC Speaker and USB devices etc.). These cables serve to connect the front-panel LEDs, switches, speaker and USB connectors to the mainboard's front-panel connectors group, as shown below.



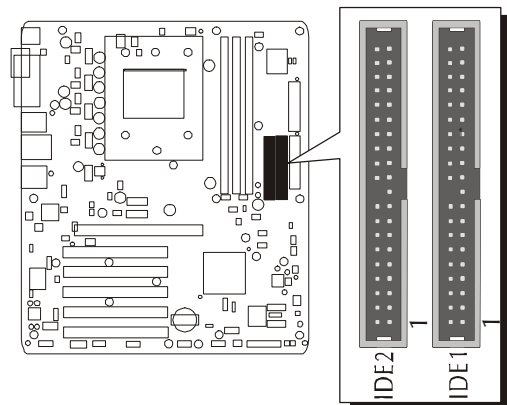
1. Green LED (GLED)
2. HDD LED (HLED)
3. ATX Soft Power On/Off (PWON)
4. Hardware Reset Switch (RST)
5. Power LED (PLED)
6. Hardware System Management Interface (EPMI)
7. PC Speaker (SPEAKER)
8. Extended USB 5&6 and 7&8 Headers



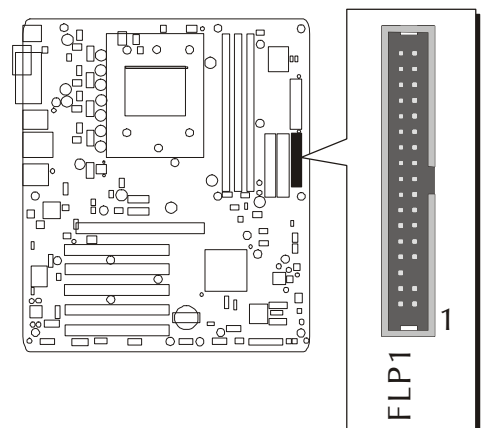
Step 7

Connect IDE and Floppy Disk Drives

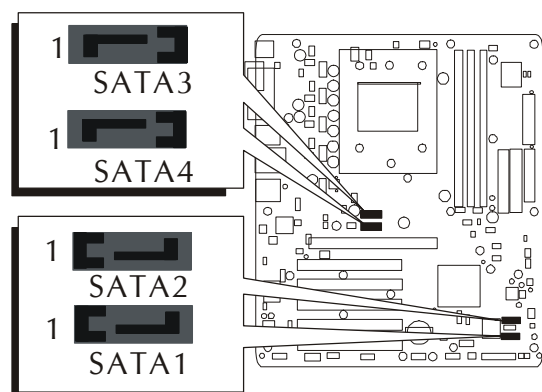
1. IDE cable connectors



2. Floppy cable connector



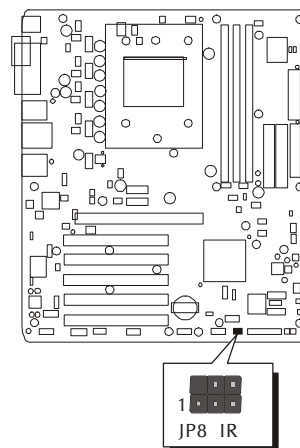
3. Serial ATA Connectors (SATA #1 ~ 4)



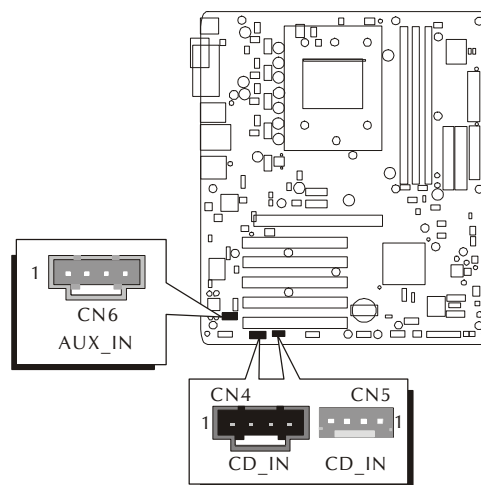
Step 8

Connect Other Internal Peripherals

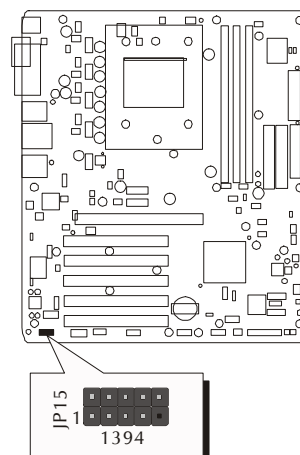
1. IR header (JP8)



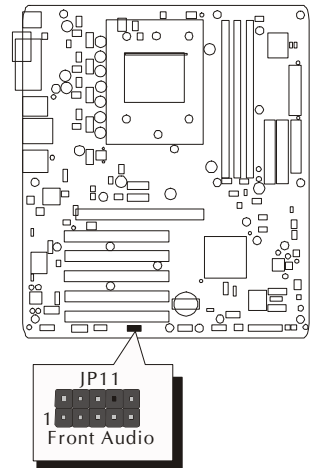
2. Audio CD_IN connectors (CN4/CN5);
Audio AUX_IN connector (CN6)



3. 1394 header (JP15)



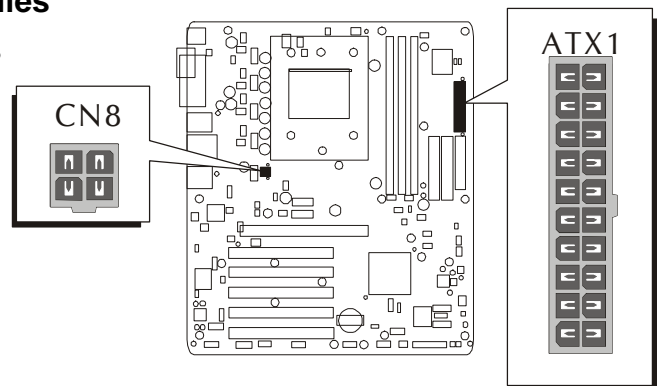
4. Front Panel Audio Header (JP11)



Step 9

Connect the Power Supplies

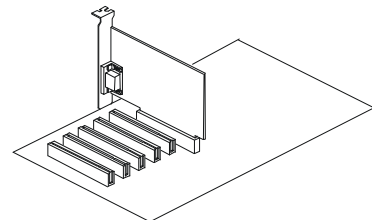
1. System power connectors (ATX1/CN8)



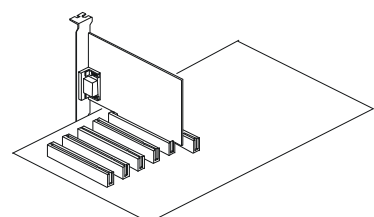
Step 10

Install Add-On Cards in Expansion Slots

1. Accelerated Graphics Port (AGP) Card



2. PCI Card

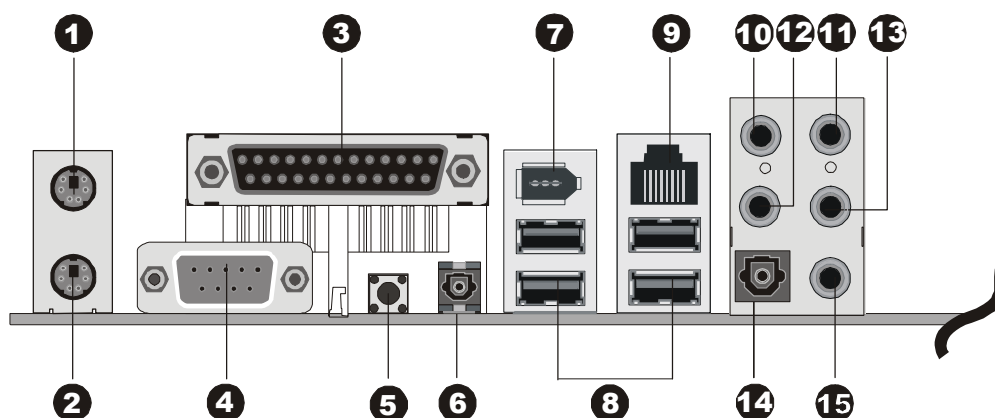
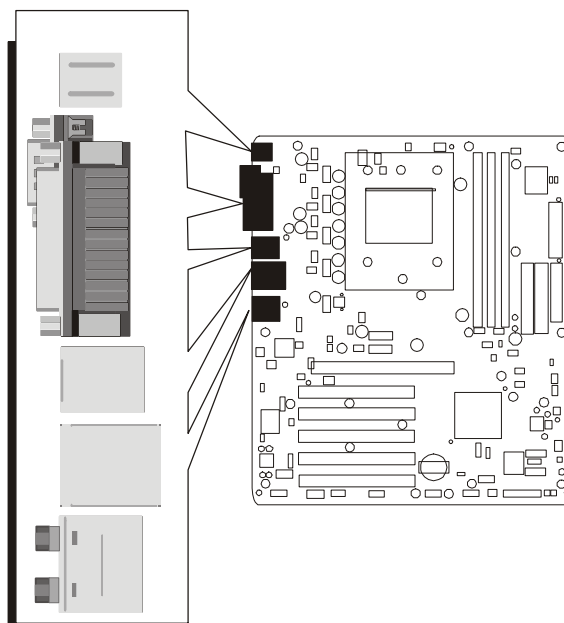


Step 11

Connect External Peripherals to Back Panel

You are now ready to connect the external peripherals to your system's back panel.

1. PS/2 Mouse Port
2. PS/2 Keyboard Port
3. LPT1 Port
4. COM1 Port
5. Clear CMOS Button
6. SPDIF-In Port
7. 1394 Port
8. USB2.0 /1.1 Port #0 ~ 3
9. Gigabit Lan Port
10. 5.1-Channel Mic-in Port
11. 5.1-Channel Center/Bass Port
12. 5.1-Channel Line-In Port
13. 5.1-Channel Rear-Out Port
14. SPDIF-Out Port
15. 5.1-Channel Front-Out Port



Step 12

System Boot Up For the First-Time

To ensure your system completely and correctly installed, please refer to the above installation steps once again before first booting up your system.

1. Insert a system-bootable floppy disk (DOS 6.2X, Windows 9X/NT, or others), which contains the FDISK and FORMAT utilities.
2. Turn on the system power.
3. First, you need to use the FDISK utility to create a primary partition of the hard disk. You can also add an extended partition if your primary partition does not use all of the available hard disk space. If you choose to add an extended partition, you will have to create one or more logical partitions to occupy all the space available to the extended partition. The FDISK utility will assign a drive letter (i.e. C:, D:, E:,.....) to each partition shown in the FDISK program. After the FDISK procedure, reboot your system by using the same disk.

Note: DOS 6.2X and Windows 95A can only support up to 2.1GB of HDD partition. If you use the FDISK utility with one of the operating systems mentioned above, you can only install your HDD into any partitions no larger than 2.1GB.

4. Now, use the FORMAT utility to format all the partitions you've created. When formatting the primary partition (C:), key in the command, "FORMAT C:/S."

Note: FORMAT C:/S can transfer all the necessary boot system files into the primary partition of your hard disk. Afterwards, your HDD will become a bootable drive.

5. Install all the necessary drivers for CD-ROM, Mouse, etc.
6. Setup the complete operating system according to your OS installation guide.

Step 13

Install Drivers & Software Components

Please note that all the system utilities and drivers are designed for Win 9x/2000/ME/NT/XP operating systems. Make sure your operating system is already installed before running the installation programs on CD-ROM.

1. Insert the AN51R bundled CD-ROM into your CD-ROM drive. The auto-run program will display the main installation window on screen.
2. Choose "Install Mainboard Software Driver."
3. Choose "Install DirectX9 Utility Driver" and complete it.
4. Choose "Install nVIDIA Chipset Driver" and complete it.
5. Choose "Install Broadcom Giga LAN Driver " and complete it.
6. Choose "Install nVIDIA USB2.0 Driver " and complete it.
7. Choose "Install AN51R user's/nVIDIA Raid Manual" and complete it.
8. Exit from the autorun drivers installation program.

3.2 Jumper Settings

Several hardware settings are made through the use of mini jumpers to connect jumper pins on the mainboard. Pin #1 could be located at any corner of jumpers, and the corner with a white right angle stands for Pin #1. There are several types of Pin #1 as shown below:

3-pin and multi-pin (> 3) jumpers shown as follows:

Pin #1 to the left:



Pin #1 on the top:





Pin #1 to the right:



Pin #1 on the bottom:



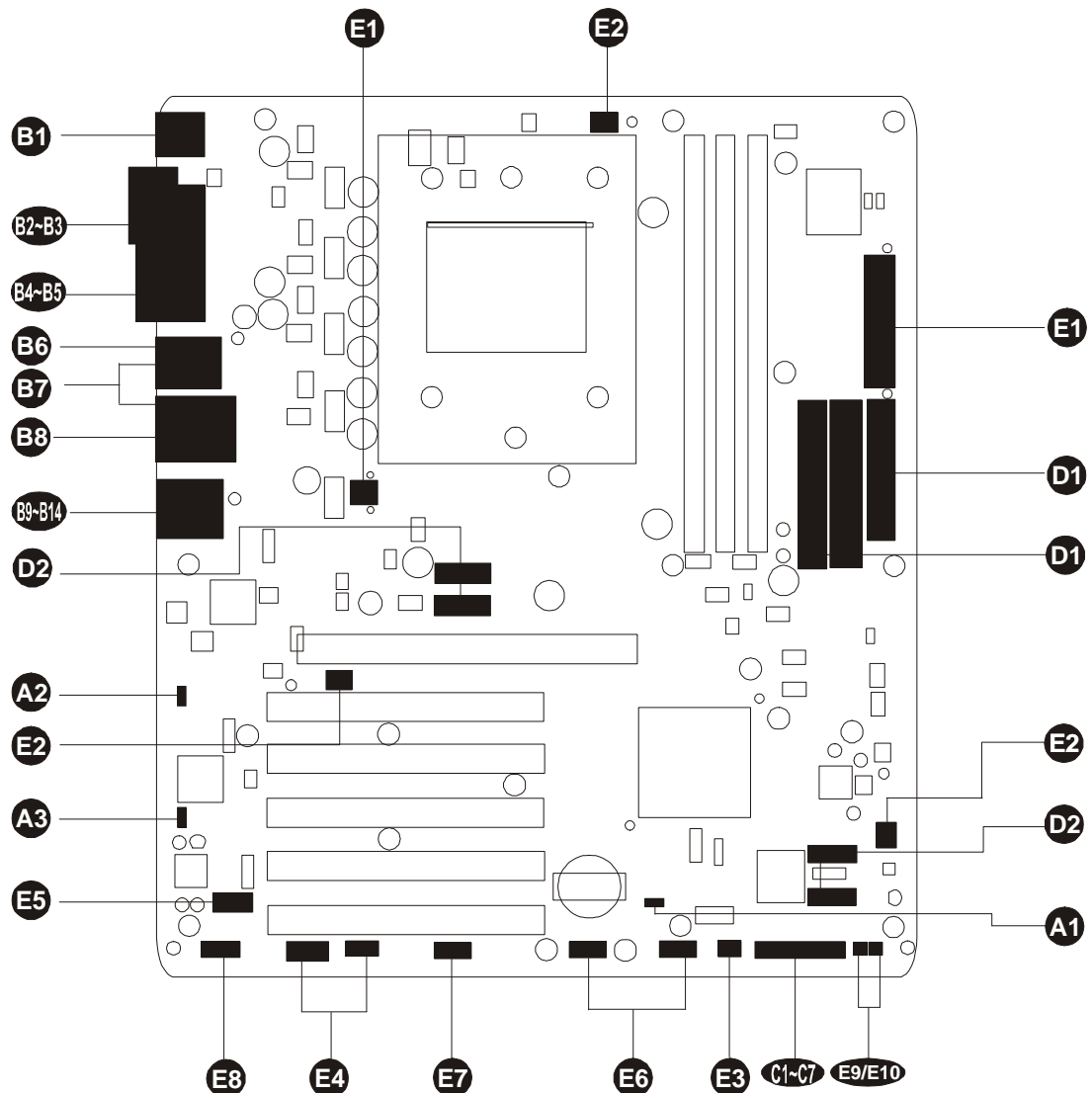
Jumpers with two pins capped are shown as  for Close [On] or  for Open [Off]. To do this, please place a plastic mini cap on the desired pair of pins.

Caution!

1. Do not remove the mainboard from its antistatic protective packaging until you are ready to install it.
2. Carefully hold the mainboard by its edges and avoid touching its components. When putting the mainboard down, place it on top of its original packaging film, with the component side up.
3. Wear an antistatic wrist strap or take other suitable measures to prevent electrostatic discharge (ESD) as handling this equipment.

Jumpers & Connectors Guide

Refer to the mainboard layout on page 12 and this section to help you identify jumpers, slots, and connectors along with their assigned functions.



CPU/Memory/Expansion Slots

Socket 754 : CPU socket for AMD Athlon™ 64 , 754-pins processor.

DIMM1/2/3 : Provides three DIMM slots for 64, 128, 256, 512 MB, and supports up to 3GB capacity max and 1GB per DIMM.
(The total installed memory does not exceed 4GB.)

AGP : One AGP slot supports up to 8X AGP device.

PCI : Five 32-bit PCI expansion slots.

Jumpers

A1	JP18	: Clear CMOS setting
A2	JP21	: Giga LAN setting
A3	JP22	: 1394 setting

Back Panel Connectors

B1	MS	: PS/2 mouse port
B1	KB	: PS/2 keyboard port
B2	LPT 1	: Parallel port
B3	COM1	: Serial port
B4	Clear CMOS	: Clear CMOS button
B5	SPDIF-In	: SPDIF-In port
B6	1394	: IEEE1394 Port
B7	USB	: USB ports 0/1/2/3
B8	Lan Port	: Gigabit Lan Port
B9	MIC-In	: Mic-In port
B10	Center/Bass	: Center/Bass port
B11	Line-In	: Line-In port
B12	Rear-Out	: Rear-Out port
B13	SPDIF-Out	: SPDIF-Out port
B14	Front-Out	: Front-Out port

Front Panel Connectors

C1	HLED	: HDD LED
C2	GLED	: Green LED
C3	RST	: Hardware reset switch
C4	PWON	: ATX power on/off switch
C5	EPMI	: EPMI connector
C6	PLED	: Power LED
C7	SPEAKER	: Speaker connector

Internal-Peripheral Connectors

D1	IDE1	: IDE primary interface (dual-channel)
D1	IDE2	: IDE secondary interface (dual-channel)
D1	FLP1	: Floppy disk drive interface
D2	SATA1/2/3/4	: Serial ATA1/2/3/4 interface

Other Connectors


E1	ATX1/CN8	: ATX power supply connectors
E2	FAN1	: CPU fan connector
E2	FAN2/FAN3	: System fan connectors
E3	JP8	: IR header
E4	CN4/CN5	: Audio CD_IN connectors
E5	CN6	: Audio AUX_IN connector
E6	JP7/JP20	: Extended USB header
E7	JP11	: Front-Panel Audio header
E8	JP15	: 1394 header
E9	SW1	: PWRON button
E10	SW2	: RESET button




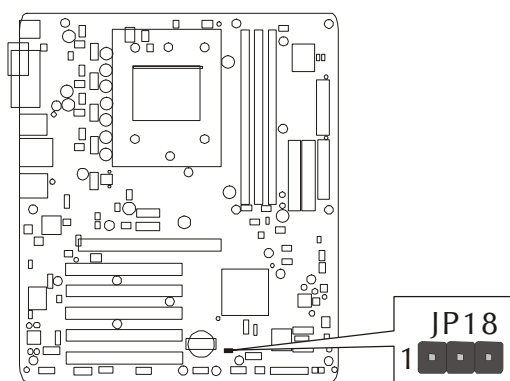
Jumpers

A1 Clear CMOS Setting (JP18)

JP18 is used to clear CMOS data. Clearing CMOS will result in permanently erasing previous system configuration settings and the original factory-set system settings.

1  Pin 1-2 (Default)

1  Pin 2-3 (Clear CMOS)



- Step 1. Turn off the system power (PC--> Off).

Step 2. Remove the ATX power cable from the ATX power connector.

Step 3. Remove the jumper cap from pins 1-2.

Step 4. Place the jumper cap on pins 2-3 for a few seconds.

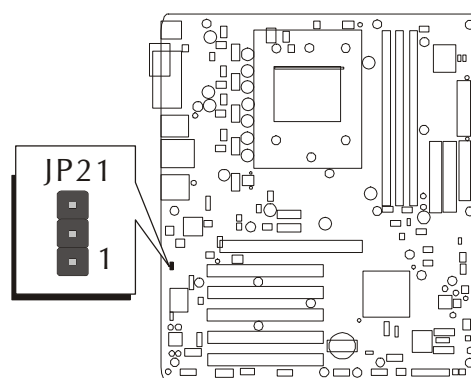
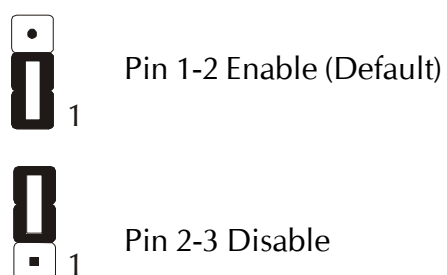
Step 5. Restore the jumper cap to pins 1-2.

Step 6. Plug the ATX power cable into the ATX power connector.

Step 7. Turn on the system power (PC--> On).

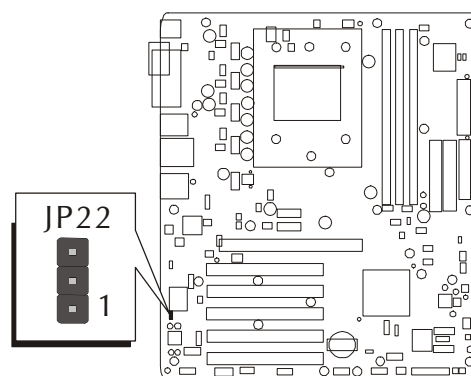
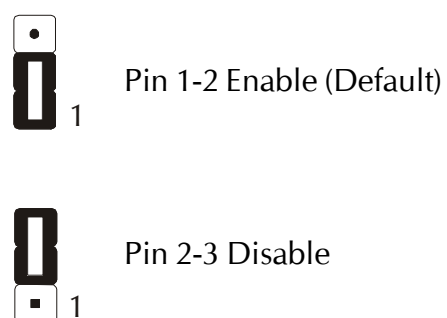
A2 Giga LAN Setting (JP21)

JP21 is used to set Giga LAN.



A3 1394 Setting (JP22)

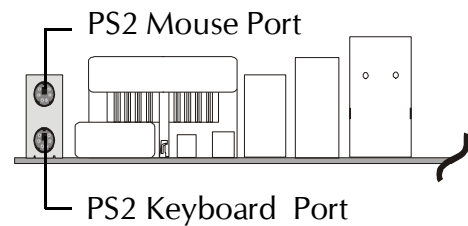
JP22 is used to set 1394.



Back Panel Connectors

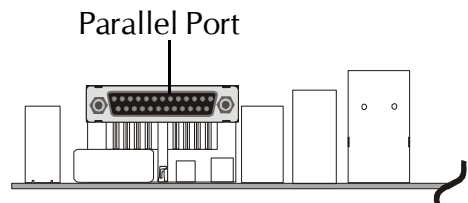
B1 PS/2 Mouse & PS/2 Keyboard Port Connectors

Two 6-pin female PS/2 Mouse & Keyboard connectors are located on the rear panel of the mainboard. In a desktop computer, the PS/2 Mouse connector is situated on the top of the PS/2 Keyboard connector. In a tower computer, the PS/2 Mouse connector is located on the rightside of the PS/2 Keyboard connector.



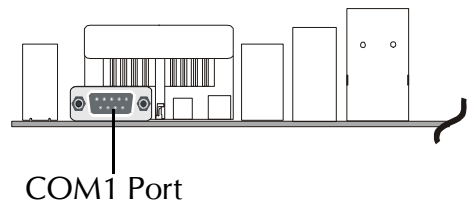
B2 Parallel Port Connector

One DB25 female parallel connector is located on the rear panel of the mainboard. Plug the cable from your parallel device (printer, scanner, etc.) into this connector.



B3 COM1 Port Connector

Attach serial device cables to the DB9 serial ports COM1 at the back panel of your computer.



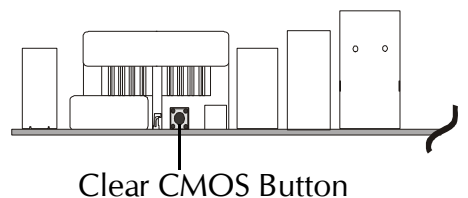
B4 Clear CMOS Button

Please follow the steps as below:

Step 1. Turn off the system power (pc->off).

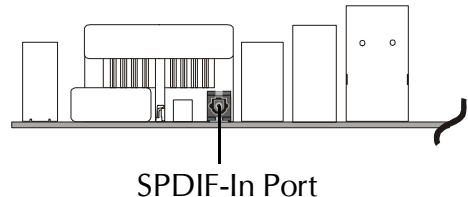
Step 2. Remove ATX Power cable from ATX Power connector.

Step 3. Push the button for a few seconds.



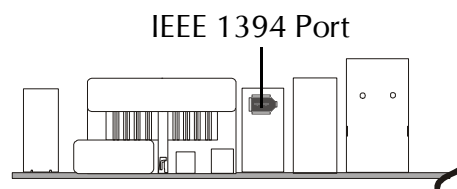
B5 SPDIF-In Port Connector

SPDIF-In connector can convey digital audio data from optic fiber.



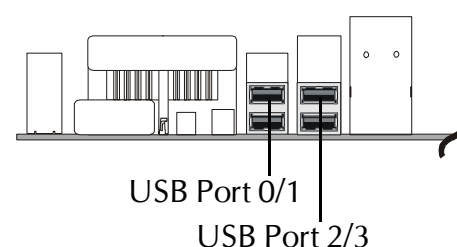
B6 IEEE 1394 Port Connector

This mainboard offers one 1394 port on back-panel. Plug device jack into an available 1394 connector.



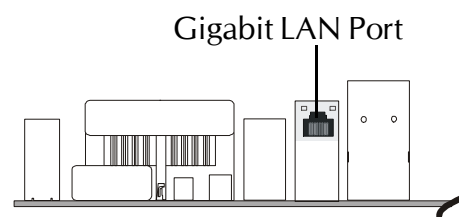
B7 USB Port Connectors

This mainboard offers 4 USB ports on back-panel. Plug each USB device jack into an available USB0 ~ USB3 connector.



B8 Gigabit LAN Port Connector

This mainboard can accommodate one device on LAN. Attach a LAN cable to the LAN port at the back-panel of your computer.



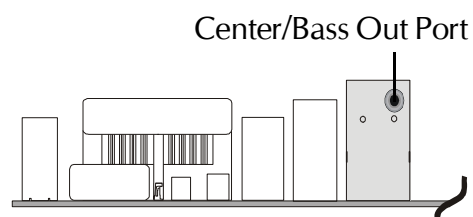
B9 Mic-In Port Connector

Mic-In is a 1/8-inch jack that provides a mono input. It can use a dynamic mono or stereo microphone with a resistance of not more than 600 Ohms.



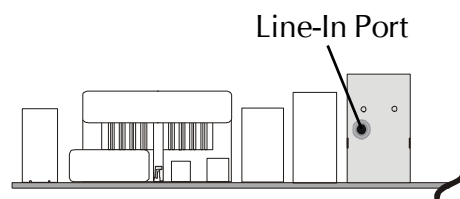
B10 Center/Bass Out Port Connector

Center/Bass is a stereo output port through which the combined signal of all internal and external audio sources on the board is output. It can be connected to 1/8-inch TRS stereo headphones or to bass/center amplified speakers.



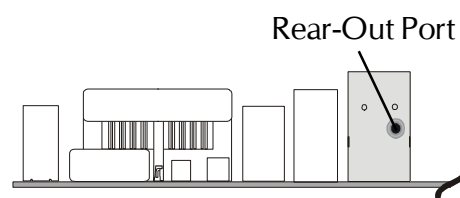
B11 Line-In Port Connector

Line-In is a stereo line-level input port that accepts a 1/8-inch TRS stereo plug. It can be used as a source for digital sound recording, and a source to be mixed with the output, or both.



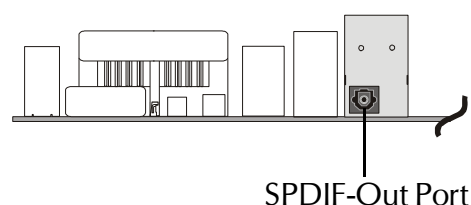
B12 Rear-Out Port Connector

Rear-Out is a stereo line-level input port that accepts a 1/8-inch TRS stereo plug. It can be used as a source for digital sound recording, and a source to be mixed with the output, or both.



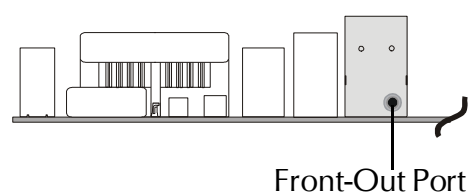
B13 SPDIF-Out Port Connector

SPDIF-Out connector can convey digital audio data to digital decoder.



B14 Front-Out Port Connector

Front-Out is a stereo output port through which the combined signal of all internal and external audio sources on the board is output. It can be connected to 1/8-inch TRS stereo headphones or to amplified speakers.



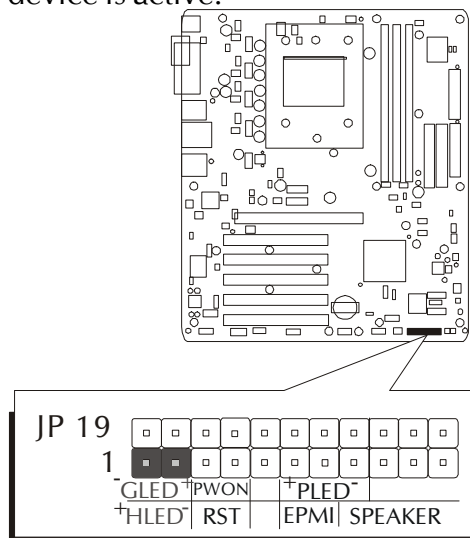
C1

Attach a connector cable from the IDE device LED to the 2-pin (HLED) header. The HDD LED lights up whenever an IDE device is active.

Pin Assignments:

1= HDD LED+

3= HDD LED-



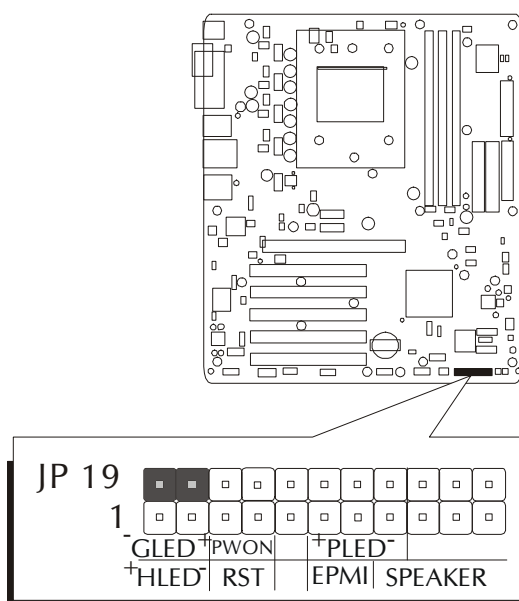
C2

The Green LED (GLED) indicates that the system is currently in one of the power saving modes (Doze/Standby/Suspend). When the system resumes to the normal operation mode, the Green LED will go off. Attach a 2-pin Green LED cable to the (GLED) header.

Pin Assignments:

2= GRLED-

4= GRLED+



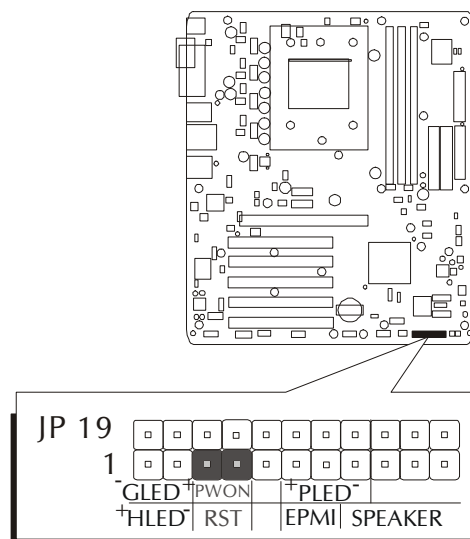
③ Hardware Reset Connector (RST)

Attach a cable to the 2-pin (RST) header. Pressing the reset switch causes the system to restart.

Pin Assignments:

5= Reset button

7= Ground



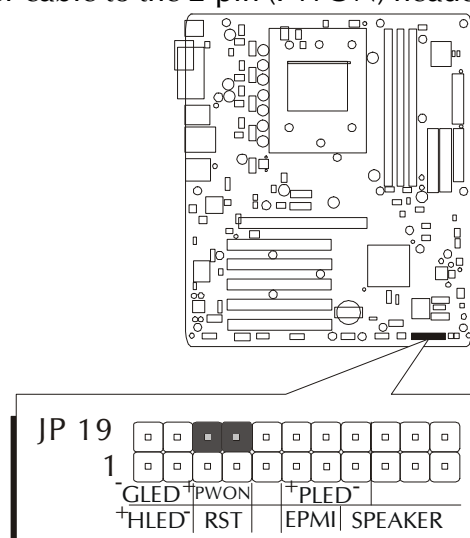
④ ATX Power On/Off Switch Connector (PWON)

The Power On/Off Switch is a momentary type switch used for turning on or off the ATX power supply. Attach a connector cable to the 2-pin (PWON) header on the mainboard.

Pin Assignments:

6= Power-on button

8= Ground



Note : Please notice all the LED connectors are directional. If your chassis's LED does not light up during running, please change it to the opposite direction.

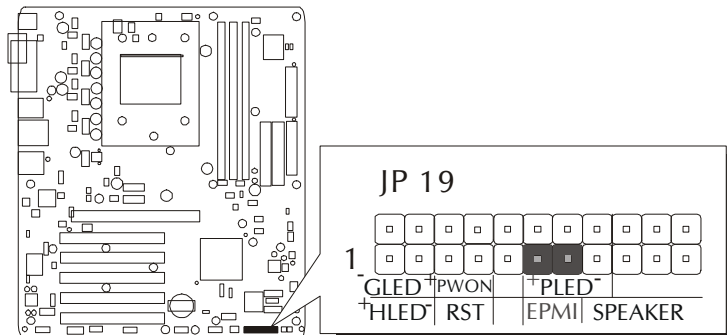
③ EPMI Connector (EPMI)

A Hardware System Management Interface (EPMI) header may be attached to a 2-pin momentary switch. Press the switch to force the system into a power saving mode; press it again to resume it to a normal operation situation.

Pin Assignments:

11= EXT-SMI

13= Ground



③ Power LED Connector (PLED)

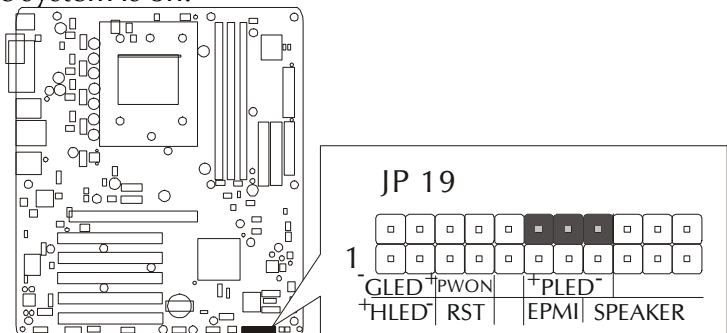
Attach a 3-pin Power LED connector cable to the (PLED) header. The power LED stays light while the system is on.

Pin Assignments:

12= Power LED+

14= NC

16= Ground



③ Speaker Connector (SPEAKER)

Attach a PC speaker cable to the 4-pin speaker connector (Speaker).

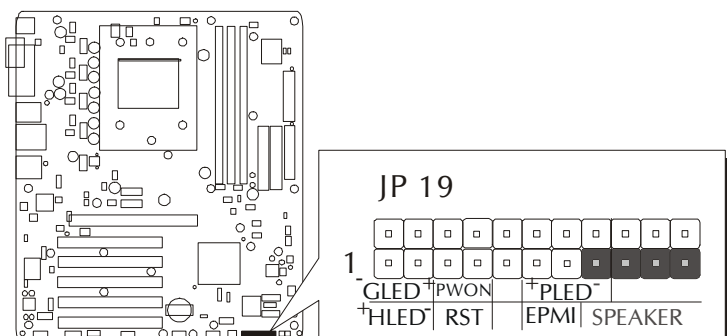
Pin Assignments:

15= Speaker out

17= NC

19= NC

21= VCC(5VSB)



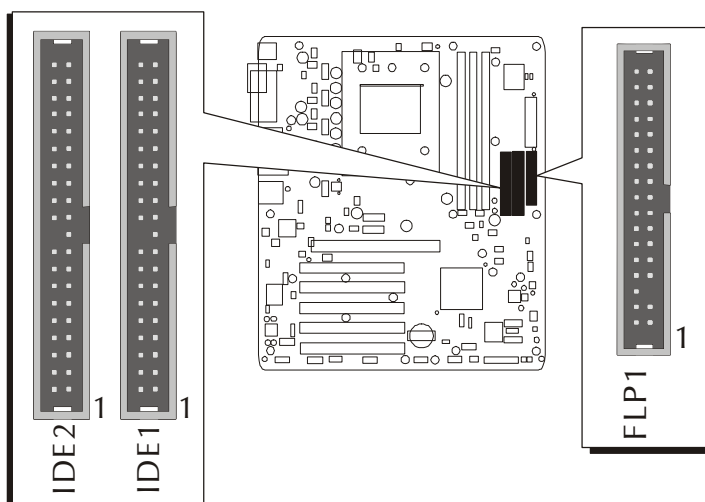
☞ Internal Peripherals Connectors

D1 Enhanced IDE, Floppy Connectors

The mainboard features two 40-pin dual-channel IDE device connectors (IDE1/IDE2) providing support for up to four IDE devices, such as CD-ROM and Hard Disk Drives (H.D.D.).

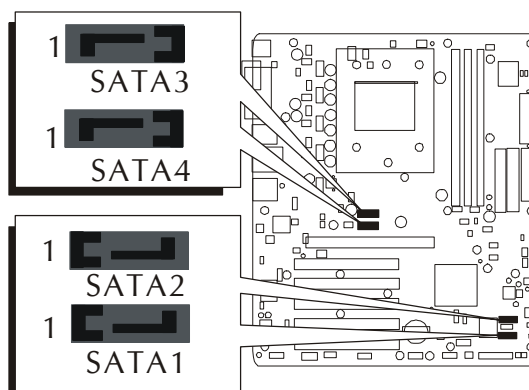
This mainboard also includes one 34-pin floppy disk controller (FDC) to accommodate the Floppy Disk Drive (FDD). Moreover, this mainboard comes with one 80-pin ATA 100/66/33 ribbon cable to connect to IDE H.D.D. and one 34-pin ribbon cable for F.D.D. connection.

Important:
Ribbon cables are directional, therefore, make sure to always connect with the red cable stripe on the same side as pin #1 of the IDE1/IDE2 or FDC connector on the mainboard.



D2 Serial ATA Connectors

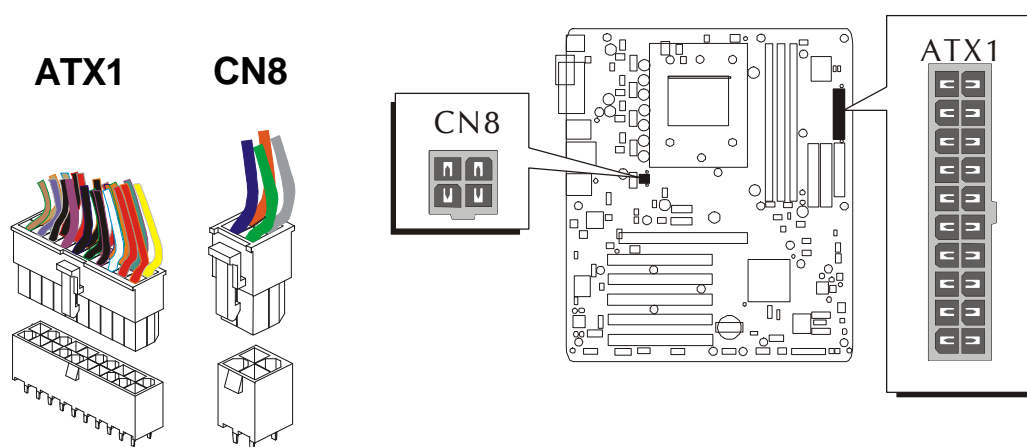
The Serial ATA is an evolutionary replacement for the Parallel ATA physical storage interface. Serial ATA is scalable and will allow future enhancements to the computing platform. The Serial ATA supports all ATA and ATAPI device, including CDs, DVDs, tapes devices, high capacity removable devices, zip drivers, and CDRW's. The Serial ATA interface supports data transfer rates up to 150MB/s.



☞ Other Connectors

ⓘ ATX Power Supply Connectors (ATX1/CN8)

This motherboard uses 20-pin ATX power header (ATX1), and comes with the other one header (CN8). Please make sure you plug each in the right direction. It is essential to have these two power supply connectors plugged or your system won't boot up.

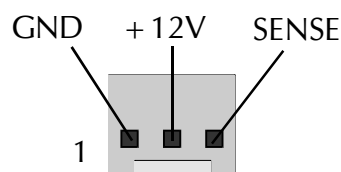


A traditional ATX system remains in the power-off stage when AC power resumes from power failure. However, it is inconvenient for a network server or workstation if there is not an UPS to execute power-on. Thus, this motherboard supports an AC Power Auto Recovery function to solve this problem. You may enable the function, "PWRON After PWR-Fail," in the sub-menu of "Power Management Setup" within the BIOS setup program.

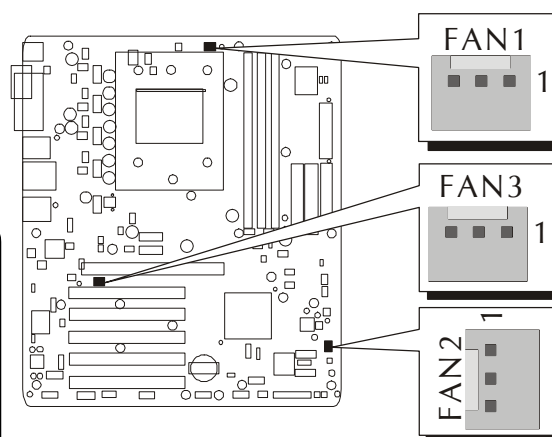
- | | |
|---------|---|
| Note 1: | The ATX power connector is directional and will not go in unless the guides match perfectly, making sure that pin#1 is properly positioned. |
| Note 2: | Make sure the latch of the ATX power connector clicks into place to ensure a solid attachment. |
| Note 3: | Your ATX power supply must be supplied to ACPI + 5V stand-by power and at least 720mA compatible. |
| Note 4: | Make sure your power supply have enough power for higher speed processor installed. |

CPU and System Fan Connectors (FAN1/2/3)

The mainboard provides three onboard 12V cooling fan power connectors to support the CPU (FAN1) and the system (FAN2 / FAN3) cooling fans.



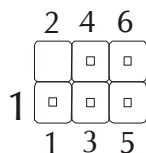
Note: Both cable wiring and type of plug may vary, which depend on the fan maker. Keep in mind that the red wire should always be connected to the +12V header and the black wire to the ground (GND) header.



IR Header (JP8)

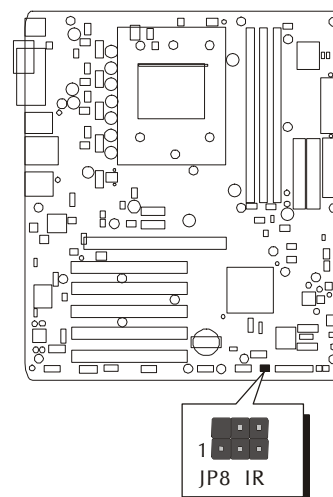
If you have an infrared device, this mainboard can implement IR transfer function. This mainboard supports Normal, IrDA, ASKIR, or SCR transfer modes. To enable this function, attach a 6-pin infrared device cable to the IR header (JP8). Please note that every pin is properly allocated. If not, your IR device may be damaged.

JP8



Pin Assignments:

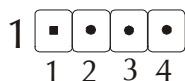
1 = N/C	2 = KEY
3 = VCC	4 = GND
5 = IRTX	6 = IRRX



E4 Audio CD_IN Connectors (CN4/CN5)

Ports CN4 (Black)/CN5 (White) can be used to connect stereo audio inputs from CD-ROM, TV-tuner or MPEG card.

CN 4



Pin Assignments:

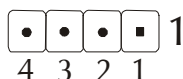
1 = CD In-Left

2 = Ground

3 = Ground

4 = CD IN-Right

CN 5



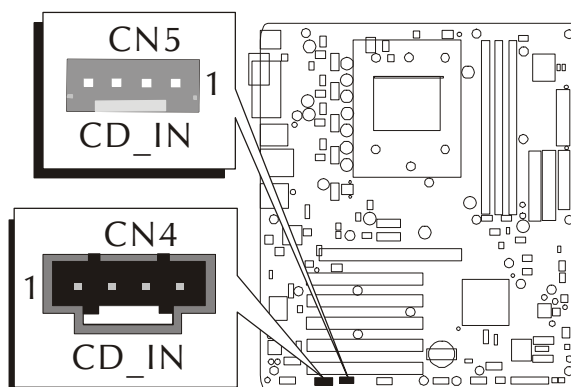
Pin Assignments:

1 = Ground

2 = CD-IN-Right

3 = Ground

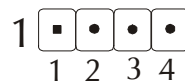
4 = CD In-Left



E5 Audio AUX_IN Connector (CN6)

Port CN6 (White) can be used to connect a stereo audio input from CD-ROM, TV-tuner or MPEG card.

CN 6



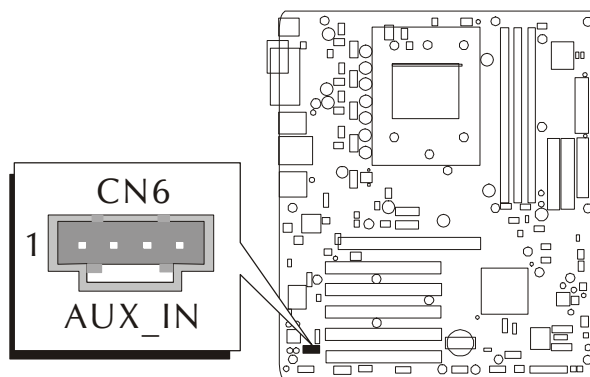
Pin Assignments:

1 = AUX-IN-Left

2 = Ground

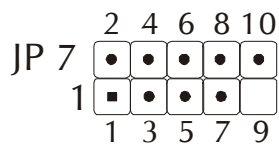
3 = Ground

4 = AUX-IN-Right



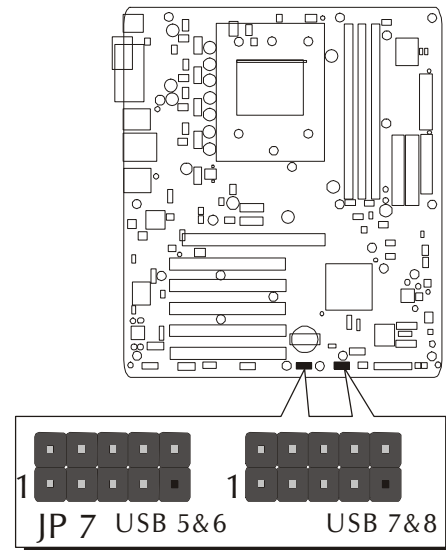
Extended USB Headers (JP7/JP20)

Headers JP7/JP20 (USB 5&6 and 7&8) are used to connect cables to USB connectors mounted on front panel or back panel. The USB cable is optional at the time of purchase.



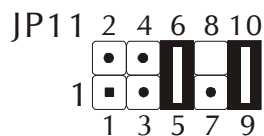
Pin Assignments:

1 = VCC	2 = VCC
3 = Data0-	4 = Data1-
5 = Data0 +	6 = Data1 +
7 = Ground	8 = Ground
9 = KEY	10 = N/C



Front Panel Audio Header (JP11)

This header allows users to install an auxiliary Front-Oriented Audio port for easier access. Either the Line-Out port connector on back panel or the front panel Audio header is available at the same time. If you would like to use this header on front panel, please remove all jumpers from it and install your special extra audio cable instead. Two mini jumpers must be setted on pins 5-6 and pins 9-10 when this header is not used.



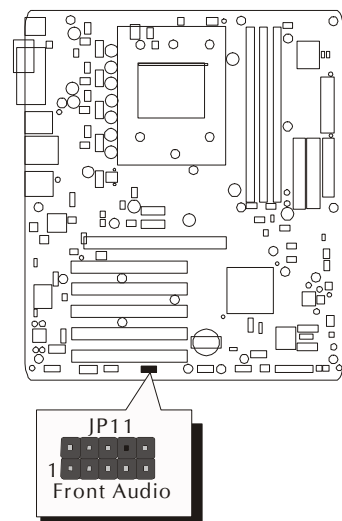
Pin Assignments:

1 = AUD_MIC	2 = AUD_GND
3 = AUD_MIC_VCC	4 = RESERVE
5 = AUD_FRONT_R	6 = AUD_RET_R
7 = HP_ON	8 = KEY
9 = AUD_FRONT_L	10 = AUD_RET_L

Default Setup:

Pin 5-6 : Short

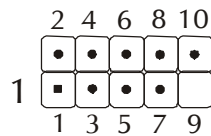
Pin 9-10 : Short



E8 IEEE1394 Connector (JP15)

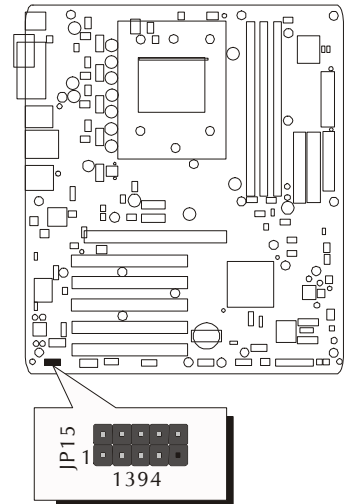
The header are used to connect the cable attached to 1394 connector which are mounted on front panel or back panel. But the 1394 cable is optional at the time of purchase.

JP 15



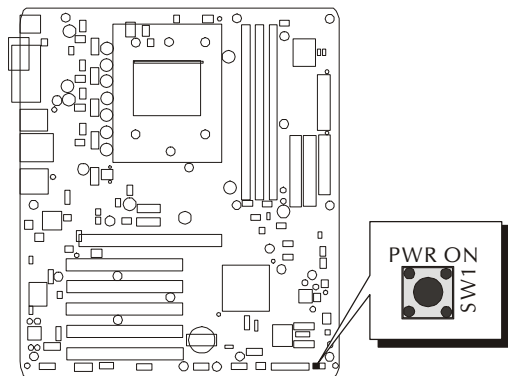
Pin Assignments:

1 = TPA +	2 = TPA-
3 = GND	4 = GND
5 = TPB +	6 = TPB-
7 = + 12V(fused)	8 = + 12V(fused)
9 = KEY	10 = GND



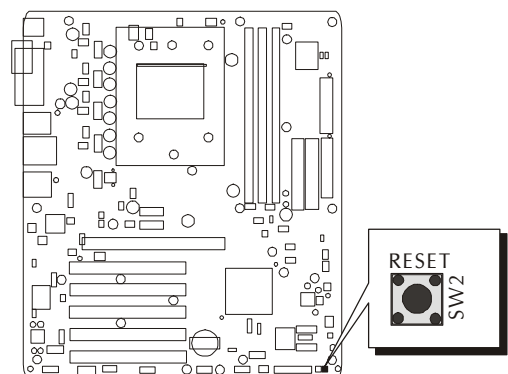
E9 Power Button (SW1)

The Power On/Off Switch is a momentary type switch used for turning on or off the ATX power supply.



E10 Reset Button (SW2)

Pressing the reset switch causes the system to restart.



3.3 System Memory Configuration

The AN51R mainboard has three 184-pin DIMM slots that allow you to install from 64MB up to 3GB of system memory. Each 184-pin DIMM (Dual In-line Memory Module) slot can accommodate 64MB, 128MB, 256MB, 512MB, and 1GB compliant 2.5V/2.6V single or double side 64-bit wide data path with or without ECC DDR-SDRAM modules. You do not need to set any jumper to configure memory since the BIOS utility can detect the system memory automatically. You can check the total system memory value in the BIOS Standard CMOS Setup menu. As stated previously, all DIMMs must operate at the same frequency. The default frequency is the lowest of all the DIMMs populated.

Note: The total installed memory does not exceed 3GB.

1. Memory Configurations:

Install memory in any or all of the banks. The combination shown as follows.

No. of dimms	DIMM1 ^{1,3}	DIMM2 ^{2,3}	DIMM3 ²	MAX SPEED
1	x8 single rank or x16	empty	empty	DDR 400
1	empty	x8 single rank or x16	empty	DDR 400
1	empty	empty	x8 single rank or x16	DDR 400
1	x8 double rank	empty	empty	DDR 400
1	empty	x8 double rank	empty	DDR 400
1	empty	empty	x8 double rank	DDR 400
2	x8 single rank or x16	x8 single rank or x16	empty	DDR 400
2	x8 single rank or x16	x8 double rank	empty	DDR 400
2	x8 single rank or x16	empty	x8 single rank or x16	DDR 400
2	x8 single rank or x16	empty	x8 double rank	DDR 400
2	x8 double rank	x8 single rank or x16	empty	DDR 400
2	x8 double rank	x8 double rank	empty	DDR 400
2	x8 double rank	empty	x8 single rank or x16	DDR 400
2	empty	x8 single rank or x16	x8 single rank or x16	DDR 333
2	empty	x8 single rank or x16	x8 double rank	DDR 200
2	empty	x8 double rank	x8 single rank or x16	DDR 200
2	empty	x8 double rank	x8 double rank	DDR 200
2	x8 double rank	empty	x8 double rank	DDR 400

No.of dimms	DIMM1 ^{1,3}	DIMM2 ^{2,3}	DIMM3 ²	MAX SPEED
3	x8 single rank or x16	x8 single rank or x16	x8 single rank or x16	DDR 333
3	x8 single rank or x16	x8 single rank or x16	x8 duoble rank	DDR 200
3	x8 single rank or x16	x8 duoble rank	x8 single rank or x16	DDR 200
3	x8 single rank or x16	x8 duoble rank	x8 duoble rank	DDR 200
3	x8 duoble rank	x8 single rank or x16	x8 single rank or x16	DDR 333
3	x8 duoble rank	x8 single rank or x16	x8 duoble rank	DDR 200
3	x8 duoble rank	x8 duoble rank	x8 single rank or x16	DDR 200
3	x8 duoble rank	x8 duoble rank	x8 duoble rank	DDR 200

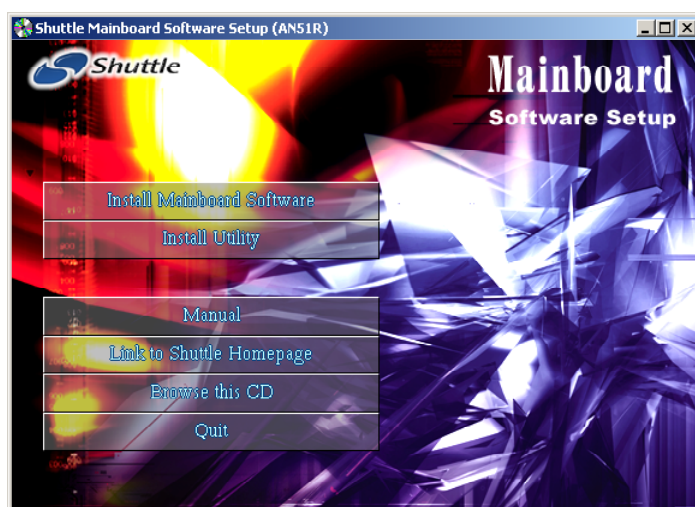
2. Upgrade Memory:

You can easily upgrade the system memory by inserting additional DDR SDRAM modules in available DIMM banks. The total system memory is calculated by simply adding up the memory in all DIMM banks. After upgrade, the new system memory value will automatically be computed and displayed in the field "Standard CMOS Setup" of BIOS setup program.

4 SOFTWARE UTILITY

4.1 Mainboard CD Overview

To start your mainboard CD disc, just insert it into your CD-ROM drive and the CD AutoRun screen should appear. If the AutoRun screen does not appear, double click or run D:\Autorun.exe (assuming that your CD-ROM drive is drive D:)



Navigation Bar Description:

- ☞ Install Mainboard Software - Installing DirectX9 Utility, nVIDIA Chipset Driver, Broadcom Giga LAN Driver and nVIDIA USB 2.0 Driver.
- ☞ Install Utility - Installing Acrobat Reader and Winflash Utility.
- ☞ Manual - Installing Acrobat Reader and AN51R user's manual in PDF format.
- ☞ Link to Shuttle Homepage - Link to shuttle website homepage.
- ☞ Browse this CD - Allows you to see contents of this CD.
- ☞ Quit - Close this CD.

4.2 Install Mainboard Software

Select using your pointing device (e.g. mouse) on the "Install Mainboard Software" bar to run into sub-menu.



The AN51R Software include:

- [4.2.A] Install DirectX9 Utility Driver
- [4.2.B] Install nVIDIA Chipset Driver
- [4.2.C] Install Broadcom LAN Driver
- [4.2.D] Install nVIDIA USB 2.0 Driver

4.2.A Install DirectX9 Utility Driver

Select using your pointing device (e.g. mouse) on the "Install DirectX9 Utility Driver" bar to install DirectX9 Utility driver.



Once you made your selection, a Setup window run the installation automatically.

When the copying files is done, make sure you reboot the system to take the installation effect.

4.2.B Install nVIDIA Chipset System Driver

Select using your pointing device (e.g. mouse) on the "Install nVIDIA Chipset Driver" bar to install chipset system driver.



Once you made your selection, a Setup window run the installation automatically.

When the copying files is done, make sure you reboot the system to take the installation effect.

Under Windows 98/ME, if the system doesn't have Serial-ATA harddisk, please don't install this RAID Utility.

4.2.C Install Broadcom Giga LAN Driver

Select using your pointing device (e.g. mouse) on the " Install Broadcom Giga LAN Driver" bar to install LAN driver .



Once you made your selection, a Setup window run the installation automatically.

When the copying files is done, make sure you reboot the system to take the installation effect.

4.2.D Install nVIDIA USB2.0 Driver

Select using your pointing device (e.g. mouse) on the "Install nVIDIA USB2.0 Driver" bar to install USB2.0 driver.



Once you made your selection, a Setup window run the installation automatically.

When the copying files is done, make sure you reboot the system to take the installation effect.

4.3A View the User's Manual

Insert the attached CD into your CD-ROM drive and the CD AutoRun screen should appear. If the AutoRun screen does not appear, double click on AutoRun icon in My Computer to bring up Shuttle Mainboard Software Setup screen.

Select using your pointing device (e.g. mouse) on the "AN51R Manual" bar.



Then Online Information windows will appear on your screen. Click on the "Install Acrobe Reader" bar if you need to install acrobe reader.

Then click on "AN51R Manual" bar to view user's manual.

4.3B View the NVIDIA RAID User's Guide

Insert the attached CD into your CD-ROM drive and the CD AutoRun screen should appear. If the AutoRun screen does not appear, double click on AutoRun icon in My Computer to bring up Shuttle Mainboard Software Setup screen.

Select using your pointing device (e.g. mouse) on the "NVIDIA RAID User's Guide" bar.



Then Online Information windows will appear on your screen. Click on the "Install Acrobe Reader" bar if you need to install acrobe reader.

Then click on "NVIDIA RAID User's Guide" bar to view user's manual.

5 BIOS SETUP

AN51R BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This information is stored in battery-backed RAM so that it retains the Setup information even if the system power is turned off.

The system BIOS is managing and executing a variety of hardware related functions in the system, including:

- System date and time
- Hardware execution sequence
- Power management functions
- Allocation of system resources

5.1 Enter BIOS

To enter the BIOS (Basic Input /Output System) utility, follow these steps:

- Step 1. Power on the computer, and the system will perform its POST (Power-On Self Test) routine checks.
- Step 2. Press key immediately, or at the following message:
Press DEL to enter SETUP, or simultaneously press <Ctrl>, <Alt>, <Esc> keys.

Note1. If you miss trains of words mentioned in step2 (the message disappears before you can respond) and you still wish to enter BIOS Setup, restart the system and try again by turning the computer OFF and ON again or by pressing the <RESET> switch located at the computer front panel. You may also reboot by simultaneously pressing the <Ctrl>, <Alt>, keys.

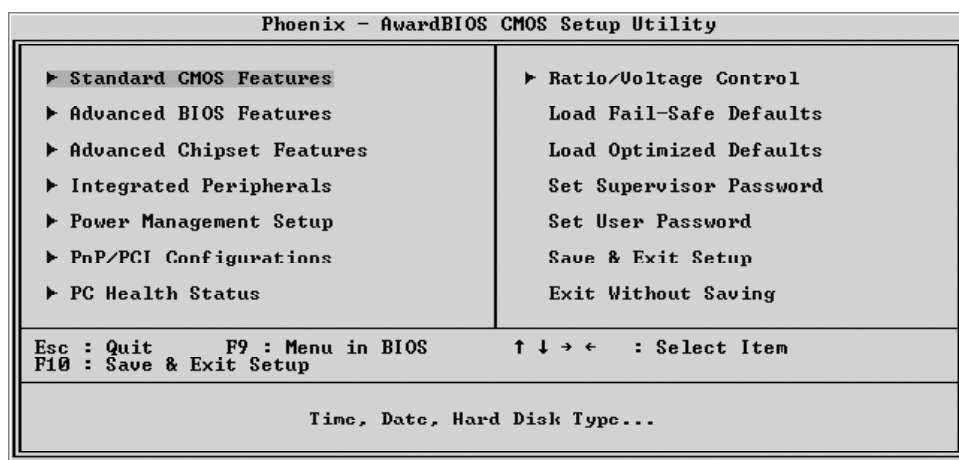
Note2. If you do not press the keys in time and system does not boot, the screen will prompt an error message, and you will be given the following options:

"Press F1 to Continue, DEL to Enter Setup"

- Step 3. As you enter the BIOS program, CMOS Setup Utility will prompt you the Main Menu, as shown in the next section.

5.2 The Main Menu

Once you enter the Award BIOS(tm) CMOS Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from several setup functions and two exit choices. Use the arrow keys to select among the items and press <Enter> to accept and enter the sub-menu.



Note that a brief description of each highlighted selection appears at the bottom of the screen.

Setup Items

The main menu includes the following main setup categories. Recall that some systems may not include all entries.

Standard CMOS Features

This menu displays the basic information about your system.

Advanced BIOS Features

Use this menu to set the advanced features available on your system.

Advanced Chipset Features

Use this menu to change the values in the chipset registers and optimize your system's performance.

Integrated Peripherals

Use this menu to specify your settings for integrated peripherals.

Power Management Setup

Use this menu to specify your settings for power management.

PnP/PCI Configurations

This option configures how PnP (Plug and Play) and PCI expansion cards operate in your system.

PC Health Status

This entry shows the current system temperature, voltage, and fan speed.

Ratio/Voltage Control

Use this menu to specify your settings for the ratio/voltage control.

Load Fail-Safe Defaults

Use this menu to install fail-safe defaults for all appropriate items in the setup utility.

Load Optimized Defaults

Use this menu to install optimized defaults for all appropriate items in the setup utility.

Set Supervisor Password

Use this menu to change, set, or disable supervisor/user password. It allows you to limit access to the system and Setup, or only to Setup.

Save & Exit Setup

Save the changes that you have made in the Setup Utility and exit the Setup Utility.

Exit Without Saving

Abandon all changes that you have made in the Setup Utility and exit the Setup Utility.



Standard CMOS Features

Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.

Phoenix - AwardBIOS CMOS Setup Utility Standard CMOS Features		
Date <mm:dd:yy> Time <hh:mm:ss>	Fri, Sep 19 2003 4 : 7 : 15	Item Help
▶ IDE Primary Master	[None]	Menu Level ▶
▶ IDE Primary Slave		Change the day, month, year and century
▶ IDE Secondary Master		
▶ IDE Secondary Slave	[None]	
Drive A	[1.44M, 3.5 in.]	
Drive B	[None]	
Video	[EGA/VGA]	
Halt On	[All , But Keyboard]	
Base Memory	640K	
Extended Memory	64512K	
Total Memory	65536K	
↑↓:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults		

Date (mm : dd : yy)

Set the system date. Note that if you are running a Windows OS, this items are automatically updated whenever you make changes to the Windows Date.

Time (hh : mm : ss)

Set the system time. The time is converted based on the 24-hour military-time clock. For example, 5:00:00 p.m. is 17:00:00.

IDE Primary/Secondary Master/Slave

Press <Enter> to enter the sub-menu of detailed options.

Drive A/DriveB

Select the type of floppy disk drive installed in your system.

- The choice: None, 360K, 5.25 in, 1.2M, 5.25 in, 720K, 3.5 in, 1.44M, 3.5 in, or 2.88M, 3.5 in.

Video

This item defines the video mode of the system. Leave this item at the default value.

- The choice: EGA/VGA, CGA 40, CGA 80, or MONO.

Halt On

This item defines the operation of the system POST (Power-On Self Test) routine. You can use this item to select which situation you want the BIOS to stop the POST process and notify you.

- The choice: All Errors, No Errors, All, But Keyboard, All, But Diskette, or All, But Disk/Key.

Base Memory/Extended Memory/Total Memory

These items are automatically detected by the system at start up time.
These are display-only fields. You can't make change to these fields.

IDE Adapters

The IDE adapters control the hard disk drive. Use a separate sub-menu to configure each hard disk drive.

IDE HDD Auto-Detection

Press <Enter> to auto-detect HDD on this channel. If detection is successful, it fills the remaining fields on this menu.

IDE Primary Master

Selecting 'Manual' lets you set the remaining fields on this screen and select the type of fixed disk.

- The choice: None, Auto, or Manual.

Access Mode

Choose the access mode for this hard disk.

- The choice: CHS, LBA, Large, or Auto.

Capacity

Note that the disk drive capacity (approx.) is usually slightly greater than the size of a formatted disk given by a disk checking program.

The following options are selectable only if the 'IDE Primary Master' item is set to 'Manual', and the 'Access Mode' item is set to 'CHS'.

Cylinder

Set the number of cylinders for this hard disk.

- Min = 0, Max = 65535

Head

Set the number of read/write heads.

- Min = 0, Max = 255

Precomp

Warning: Setting a value of 65535 means no hard disk.

- Min = 0, Max = 65535

Landing Zone

Set the Landing Zone size.

- Min = 0, Max = 65535

Sector

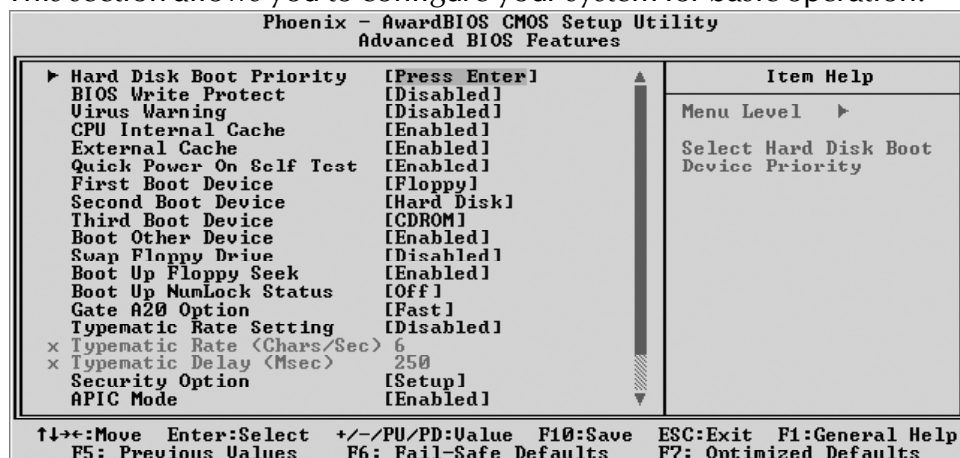
Number of sector per track.

- Min = 0, Max = 255



Advanced BIOS Features

This section allows you to configure your system for basic operation.



Hot Disk Boot Priority

This item let you select hot disk boot priority.

- The choice: Pri.Master/Slave, Sec.Master/Slave, USB HDD 0 ~ 2, Bootable Add-in Cards.

BIOS Write Protect

This item let you enable or disable the BIOS Write Protect.

- The choice: Enabled or Disabled.

Virus Warning

Allows you to choose the VIRUS Warning feature for IDE Hard Disk boot sector protection. Enable this item to prevent someone from writing data into this area.

Enabled Activates automatically when the system boots up, causing a warning message to appear when anything attempts to access the boot sector or hard disk partition table.

Disabled No warning message will appear when anything attempts to access the boot sector or hard disk partition table.

- The choice: Enabled or Disabled.

CPU Internal Cache

All processors that can be installed in this mainboard use internal level 1 (L1) cache memory to improve performance. Leave this item at the default value for better performance.

- The choice: Enabled or Disabled.

External Cache

Most processors that can be installed in this system use external level 2 (L2) cache memory to improve performance. Leave this item at the default value for better performance.

-
- The choice: Enabled or Disabled.

Quick Power On Self Test

Enable this item to shorten the power on testing (POST) and have your system start up faster. You might like to this item after you are confident that your system hardware is operating smoothly.

- The choice: Enabled or Disabled.

First/Second/Third Boot Device

Use these three items to select the priority and order of the devices that your system searches for an operating system at start-up time.

- The Choice: Floppy, LS120, Hard disk, CDROM, ZIP100, USB-FDD, USB-ZIP, USB-CDROM, Legacy LAN or Disabled.

Boot Other Device

If you enable this item, the system searches all other possible locations for and operating system if it fails to find one in the devices specified under the First, Second, and Third boot devices.

- The choice: Enabled or Disabled.

Swap Floppy Drive

If you have two floppy diskette drives in your system, this item allows you to swap the assigned drive letters so that drive A becomes drive B, and drive B becomes drive A.

- The choice: Enabled or Disabled.

Boot Up Floppy Seek

If this item is enabled, it checks the size of the floppy disk drives at start-up time. You don't need to enable this item unless you have a legacy diskette drive with 360k capacity.

- The choice: Enabled or Disabled.

Boot Up NumLock Status

This item defines if the keyboard Num Lock key is active when your system is started.

- The choice: Off or On.

Gate A20 Option

This item defines how the system handles legacy software that was written for an earlier generation of processors. Leave this item at the default value.

- The choice: Normal or Fast.

Typematic Rate Setting

If this item is enabled, you can use the following two items to see the typematic rate and the typematic delay settings for your keyboard.

- The choice: Enabled or Disabled.

Typematic Rate (Chars/Sec)

This item sets how many times the keystroke will be repeated in a second when you hold a key down.

- The choice: 6, 8, 10, 12, 15, 20, 24, or 30.

Typematic Delay (Msec)

Sets the delay time after a key is held down.

- The choice: 250, 500, 750, or 1000.

Security Option

If you have installed password protection, this item defines if the password is required at system start up, or if it is only required with a user tries to enter the Setup Utility.

- The choice: Setup or System.

APIC Mode

This option is used to enable or disable APIC (Advanced Programmable Interrupt Controller) functionality.

- The choice: Enabled or Disabled.

MPS Version Control For OS

Selects the operating system multiprocessor support version.

- The choice: 1.1 or 1.4

OS Select For DRAM > 64MB

This item is only required if you have installed more than 64 MB of memory and you are running the OS/2 operating system. Otherwise, leave this item at the default.

- The choice: Non-OS2 or OS2.

Small Logo(EPA) Show

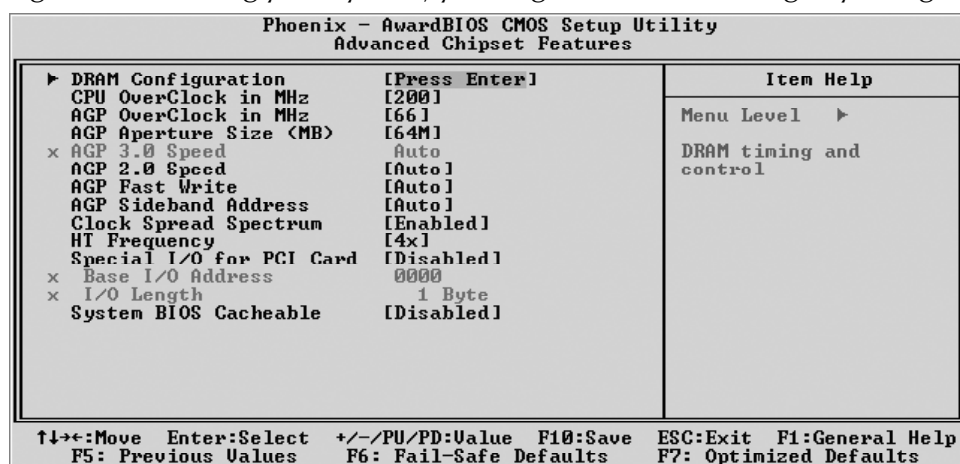
This item allows you to enable or disable the EPA Logo.

- The choice: Enabled or Disabled.

Advanced Chipset Features

This section allows you to configure the system based on the specific features of the installed chipset. This chipset manages bus speeds and access to system memory resources, such as DRAM and the external cache. It also coordinates communications between the conventional PCI bus. It states that these items should never need to be altered.

The default settings have been chosen because they provide the best operating conditions for your system. If you discovered that data was being lost while using your system, you might consider making any changes.



DRAM Configuration

Options are in its sub-menu.

Press <Enter> to enter the sub-menu of detailed options.

Max Memclock (Mhz)

Places an artificial memory clock limit on the system.

Memory is prevented from running faster than this frequency.

➤ The choice: Auto, 100, 133 or 166.

CAS# latency

When synchronous DRAM is installed, the number of clock cycles of CAS latency depends on the DRAM timing. Don't change this field from the default value specified by the system designer.

➤ The choice: Auto, CL = 2.0, CL = 2.5 or CL = 3.0.

RAS# to CAS# delay (tRCD)

This field let you insert a timing delay between the CAS and RAS probe signals, and you can use it when DRAM is written to, read from, or refreshed. Faster performance is gained in high speed, more stable performance, in low speed. This field is applied only when synchronous DRAM is installed in the system.

➤ The choice: Auto, 2 ~ 7 Bus Clocks.

Min RAS# active time (tRAS)

The item defines the numbers of cycles for RAS to be allowed to precharge.

- The choice: Auto, 5 ~ 15 Bus Clocks.

Row precharge Time (tRP)

If an insufficient number of cycles is allowed for the RAS to accumulate its charge before DRAM refresh, the refresh may be-incompleted, and the DRAM may fail to retain data. Fast gives faster performance; and Slow gives more stable performance. This field is applied only when synchronous DRAM is installed in the system.

- The choice: Auto, 2 ~ 6 Bus Clocks.

1T/2T Memory Timing

The item defines the memory timing for CPU version CG or after.

- The choice: Auto, 1T or 2T.

CPU OverClock in MHz

This item selects the CPU OverClock in MHz.

- The choice: 200 ~ 280.

AGP OverClock MHz

This item selects the AGP OverClock in MHz.

- The choice: 66 ~ 100.

AGP Aperture Size(MB)

Select the size of Accelerated Graphics Port (AGP) aperture.

The aperture is a portion of the PCI memory address range dedicated to graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation.

- The choice: 32M,64M,128M,256M or 512M.

AGP 3.0 Speed

This item allows you to set the AGP 3.0 Speed.

- The choice: Always Auto.

AGP 2.0 Speed

This item allows you to set the AGP 2.0 Speed.

- The choice: Auto, 1x, 1x2x or 1x2x4x.

AGP Fast Write

This item allows you to set the AGP Fast Write.

- The choice: Auto or Disabled.

AGP Sideband Address

This item auto/disable the AGP sideband addressing capability for AGP Card.

- The choice: Auto or Disabled.

Clock Spread Spectrum

This item allows you to set the Clock spread spectrum modulation.

- The choice: Enabled or Disabled.

HT Frequency

This item allows you to set the HT Frequency.

- The choice: 1X, 2X, 3X, 4X or 5X.

Special I/O for PCI Card

This item enable/disable the Special I/O for PCI Card.

- The choice: Enabled or Disabled.

Base I/O Address

This item allows you to set the Base I/O Address.

- The choice: 0000 ~ FFFF.

I/O Length

This item allows you to set the I/O Length.

- The choice: 1 Byte, 4 Bytes, 8 Bytes, 16 Bytes, 32 Bytes, 64 Bytes, 128 Bytes or 256 Bytes.

System BIOS Cacheable

Select Enable allows caching of the system BIOS ROM at F000h ~ FFFFFh, resulting in better system performance. However, if any program is written to this memory area, a system error may result.

- The choice: Enabled or Disabled.



Integrated Peripherals

Phoenix - AwardBIOS CMOS Setup Utility		
Integrated Peripherals		
▶ Onboard IDE Device	[Press Enter]	Item Help Menu Level ▶
▶ Onboard PCI Device	[Press Enter]	
▶ Onboard SuperIO Device	[Press Enter]	

Onboard IDE Device

Press <Enter> to enter the sub-menu of detailed options.

Raid Function Setup

Press <Enter> to enter the sub-menu of detailed options.

IDE RAID, IDE Channel 0/1 Master/Slave RAID or SATA/
SATA-2 Primary/Secondary Master RAID.

The item allows you to set raid function.

➤ The Choice: Enabled or Disabled.

OnChip IDE Channel 0/1

The chipset contains a PCI IDE interface with support to two IDE channels. Select Enabled to activate the primary/secondary IDE interface. Select Disabled to deactivate the primary/secondary interface.

➤ The Choice: Enabled or Disabled.

Primary/Secondary Master/Slave PIO

The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the two IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.

➤ The choice: Auto, Mode 0, Mode 1, Mode 2, Mode 3, or Mode 4.

Primary/Secondary Master/Slave UDMA

Ultra DMA implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver (Windows 95 OSR2 or a third-party IDE bus master driver). If both of your hard drive and your system software support Ultra DMA, select Auto to enable BIOS support.

➤ The choice: Auto or Disabled.

IDE Prefetch Mode

The onboard IDE drive interface support IDE prefetching for faster drive access. If you install a primary and/or secondary add-on IDE interface, set this field to Disabled if the interface does not support prefetching.

➤ The Choice: Enabled or Disabled.

Serial-ATA (External PHY)

This item allows you to enable or disable Serial-ATA (External PHY).

➤ The Choice: Enabled or Disabled.

Serial-ATA2 (Internal PHY)

The item allows you to enable or disable Serial-ATA2 (Internal PHY).

➤ The Choice: Enabled or Disabled.

IDE DMA transfer access

Use these items to enable or disable the IDE DMA transfer access that are integrated on the mainboard.

➤ The Choice: Enabled or Disabled.

IDE HDD Block Mode

Block mode is also called block transfer, multiple commands, or multiple sector read/write. If your IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block read/write per sector the drive can support.

➤ The Choice: Enabled or Disabled.

Onboard PCI Device

Press <Enter> to enter the sub-menu of detailed options.

Init Display First

This item is used to determine initial device when system power on.

➤ The choice: PCI Slot or AGP Slot.

OnChip USB

Do not disable this item if your system has a USB installed on the system board and you want to use it.

➤ The choice: Disabled, V1.1 + V2.0, or V1.1.

USB KB/Storage Support

Select Enabled if your system contains a Universal Serial Bus (USB) controller and you have a USB keyboard.

➤ The Choice: Enabled or Disabled.

OnChip Audio

This item allows you to control the OnChip Audio.

➤ The Choice: Auto or Disabled.

Broadcom Gb/FE LAN ROM

This item allows you to enable or disable the the Gb/FE LAN ROM.

- The Choice: Enabled or Disabled.

Onboard Super I/O Device

Press <Enter> to enter the sub-menu of detailed options.

Onboard FDC Controller

This item specifies onboard floppy disk drive controller. This setting allows you to connect your floppy disk drives to the onboard floppy connector.

- The choice: Enabled or Disabled.

Onboard Serial Port 1

The option is used to assign the I/O address and interrupt request (IRQ) for the onboard serial port 1 (COM1).

- The Choice: Disabled, 3F8-IRQ4, 2F8-IRQ3, 3E8-IRQ4, 2E8-IRQ3 or Auto.

Onboard Infrared Port

This option is used to assign the I/O address and interrupt request (IRQ) for the onboard infrared port.

- The Choice: Disabled, 3F8-IRQ4, 2F8-IRQ3, 3E8-IRQ4, 2E8-IRQ3, or Auto.

UART Mode Select

This item allows you to select an operating mode for the IrDA infrared.

- The choice: IrDA, ASKIR or SCR.

UR2 Duplex Mode

This item allows you to select the IR half or full duplex function.

- The choice: Full or Half.

Onboard Parallel Port

Allows you to determine an I/O address and interrupt request (IRQ) for the onboard parallel port.

- The choice: 378/IRQ7, 278/IRQ5, 3BC/IRQ7 or Disabled.

Parallel Port Mode

Select an operating mode for the onboard parallel port. Select SPP unless you are certain your system supports other modes.

- The choice: SPP, EPP, ECP or ECP + EPP.

ECP Mode Use DMA

When the parallel port mode is set to ECP, this item becomes seletable.

- The choice: 1 or 3.



Power Management Setup

The Power Management Setup allows you to configure your system to most effectively saving energy while operating in a manner consistent with your own style of computer use.

Phoenix - AwardBIOS CMOS Setup Utility		
Power Management Setup		
ACPI function	Enabled	Item Help
ACPI Suspend Type	[S1(POS)]	
Power Management	[User Define]	
Video Off Method	[DPMS Support]	
HDD Power Down	[Disabled]	
HDD Down In Suspend	[Disabled]	
Soft-Off by PBTN	[Instant-Off]	
PowerOn After Pwr-Fail	[Off]	
WOL(PME#) From Soft-Off	[Disabled]	
WOL(RI#) From Soft-Off	[Disabled]	
USB Resume from S3	[Disabled]	
Power-On by Alarm	[Disabled]	
x Day of Month Alarm	0	
x Time (hh:mm:ss) Alarm	0 : 0 : 1	
PS2 Keyboard Power ON	[Disabled]	
KB Power ON Password	[Enter]	
Hot Key Power ON	[Any Key]	
PS2 Mouse Power ON	[Disabled]	

↑↓←→: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

ACPI Function

This item defines the ACPI (Advanced Configuration and Power Management) feature that makes hardware status information available to the operating system, enables a PC to turn its peripherals on or off for improving the power management, and allows a PC turned on or off by external devices, so that a mouse or keyboard can wake up it.

ACPI Suspend Type

This item allows you to select sleep state when suspend. In the default, S1(POS), the suspend mode is equivalent to a software power down; S3(STR), to the system that shuts down with the exception of a refresh current to the system memory.

➤ The choice: S1(POS), S3(STR), or S1&S3.

Power Management

This item acts like a master switch for the power-saving modes and hard disk timeouts. If this item is set to Max Saving, power-saving modes occur after a short timeout. If it is set to Min Saving, power-saving modes occur after a longer timeout. If it is set to User Define, you can insert your own timeouts for the power-saving modes.

➤ The choice: Min Saving, Max Saving or User Define.

Video Off Method

This determines the manner in which the monitor is blanked.

V/H SYNC + Blank This selection will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer.

Blank Screen The item only writes blanks to the video buffer.

DPMS Support Initial display power management signaling.

➤ The choice: V/H SYNC + Blank, Blank Screen, or DPMS Support.

HDD Power Down

The IDE hard drive will spin down if it is not accessed within a specified length of time. Options are from 1 Min to 15 Min and Disabled.

- The choice: Disabled or 1 Min ~ 15 Min.

HDD Down In Suspend

The item allows you to enable or disable the HDD Down In Suspend.

- The choice: Enabled or Disabled.

Soft-Off by PBTN

Under ACPI you can create a software power down. In a software power down, the system can be resumed by Wake UP Alarms.

- The choice: Delay 4 Sec or Instant-Off.

PWRON After PWR-Fail

This item defines your computer to shut off or automatically restart.

- The choice: Former-Sts, Off or On.

WOL(PME#) From Soft-Off

If this item sets to Enabled, the system power will be turned on when the LAN port receives an incoming signal.

- The choice: Enabled or Disabled.

WOR(RI#) From Soft-Off

If this item is enabled, it allows the system to resume from a software power down or power-saving mode whenever there is an incoming call to an installed fax/modem. You have to connector the fax/modem to the mainboard.

- The choice: Enabled or Disabled.

USB Resume from S3

If you are using USB devices, and the ACPI Suspend Type is set to S3 or S1&S3, enable this item to have USB devices wake up the system from power saving mode.

- The choice: Enabled or Disabled.

Power-On by Alarm

When set to Enabled, the following four fields become available and you can set the date, hour, minute and second to turn on your system.

- The choice: Enabled or Disabled.

Day of Month Alarm

This item selects the alarm date.

- [dd] ➤ Key in a DEC number: Min = 0, Max = 31.

Time(dd : hh : mm) of Alarm

This item selects the alarm time.

- [hh] ➤ Key in a DEC number: Min = 0, Max = 23.

- [mm] ➤ Key in a DEC number: Min = 0, Max = 59.

- [ss] ➤ Key in a DEC number: Min = 0, Max = 59.

PS2 Keyboard Power ON

Set a key to awaken the system from a PS2 keyboard.

- The choice: Password, Hot KEY or Disabled.

KB Power ON Password

Press <Enter> to set a password to awaken the system from a keyboard.

Hot Key Power ON

Set a key to awaken the system from a keyboard.

- The choice: Any Key or Ctrl-F1 ~ F12.

PS2 Mouse Power ON

Set a key to awaken the system from a PS2 mouse.

- The choice: Enabled or Disabled.



PnP/PCI Configurations

This category configures how PnP and PCI operate in your system.

Phoenix - AwardBIOS CMOS Setup Utility	
PnP/PCI Configurations	
Reset Configuration Data	[Disabled]
Resources Controlled By	[Auto(ESCD)]
x IRQ Resources	Press Enter
PCI/VGA Palette Snoop	[Disabled]

Item Help
Menu Level ▶
Default is Disabled.
Select Enabled to
reset Extended System
Configuration Data
(ESCD) when you exit
Setup if you have
installed a new add-on
and the system
reconfiguration has
caused such a serious
conflict that the OS
cannot boot

↑↓: Move Enter: Select +/~/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Reset Configuration Data

When enabled, any PnP configuration data stored in the BIOS will be cleared from memory, with new data created.

- The choice: Enabled or Disabled.

Resources Controlled By

As stays auto(ESCD), the system will dynamically allocate resources to PnP devices as they are required. As set to manual, the following item become available.

- The choice: Auto(ESCD) or Manual.

IRQ Resources

When the previous item is set to manual, this item allows you respectively assign an interruptive type for IRQ-3, 4, 5, 7, 9, 10, 11, 12, 14, and 15.

- The choice: PCI Device or Reserved.

PCI/VGA Palette Snoop

The item is designed to solve problems caused by some non-standard VGA cards.

- The choice: Enabled or Disabled.



PC Health Status

Phoenix - AwardBIOS CMOS Setup Utility PC Health Status	
CPU Voltage AGP Voltage 3.3V VIN +5V VIN +12V VIN -12V VIN RAM Voltage 5V SBVIN Voltage Battery System Temperature CPU Temperature FAN1 Speed FAN2 Speed FAN3 Speed	Item Help Menu Level ▶
↑↓←→: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults	

The following items provide you with information about the system's current operating status. You cannot make changes to one of them.

<u>CPU Voltage</u>	<u>AGP Voltage</u>	<u>3.3V VIN</u>
<u>+5V VIN</u>	<u>+12V VIN</u>	<u>-12V VIN</u>
<u>RAM Voltage</u>	<u>5V SBVIN</u>	<u>Voltage Battery</u>
<u>System Temperature</u>	<u>CPU Temperature</u>	<u>FAN1 Speed</u>
<u>FAN2 Speed</u>	<u>FAN3 Speed</u>	



Ratio/Voltage Control

Phoenix - AwardBIOS CMOS Setup Utility Ratio/Voltage Control	
CPU Ratio Select [Auto] CPU Voltage Select [Auto] RAM Voltage Select [Auto] AGP Voltage Select [Auto] Chipset Voltage Select [Auto]	Item Help Menu Level ▶
↑↓←→: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults	

CPU Ratio Select

This item allows you to adjust CPU Ratio.

- The choice: Auto, X4 800 MHz, X5 1000 MHz, X6 1200 MHz ~ X20 4000 MHz.

CPU Voltage Select

This item allows you to adjust CPU Voltage.

- The choice: Auto, 0.800V ~ 1.700V.

RAM Voltage Select

This item allows you to adjust RAM Voltage.

- The choice: Auto, 2.70 V, 2.80V or 2.90 V.

AGP Voltage Select

This item allows you to adjust AGP Voltage.

- The choice: Auto, 1.60 V, 1.70V or 1.80 V.

Chipset Voltage Select

This item allows you to adjust chipset Voltage.

- The choice: Auto, 1.70 V, 1.80V or 1.90 V.



Load Fail-Safe Defaults

When you press <Enter> on this item, you will get a confirmation dialog box with a message similar to:

Load Fail-Safe Defaults (Y/N) ? N

Pressing 'Y' loads the BIOS default values for the most stable, minimal performance system operations.



Load Optimized Defaults

When you press <Enter> on this item, you will get a confirmation dialog box with a message similar to:

Load Optimized Defaults (Y/N) ? N

Pressing 'Y' loads the default values that are factory-set for optimal performance system operation.



Set Supervisor/User Password

The screenshot shows the Phoenix - AwardBIOS CMOS Setup Utility interface. It is a text-based menu with two columns of options. The left column includes: Standard CMOS Features, Advanced BIOS Features, Advanced Chipset Features, Integrated Peripherals, Power Management Setup, PnP/PCI Configurati, and PC Health Status. The right column includes: Frequency/Voltage Control, Load Fail-Safe Defaults, Load Optimized Defaults, Set Supervisor Password (highlighted with a grey bar), Set User Password, and Exit Saving. A dialog box titled 'Enter Password:' is overlaid on the screen. At the bottom, there are instructions: Esc : Quit, F9 : Menu in BIOS, F10 : Save & Exit Setup, and arrow keys for Select Item. The title bar at the bottom reads 'Change/Set/Disable Password'.

Steps to set supervisor/user password are described as follows:

New Password Setting:

1. While pressing <Enter> to set a password, a dialog box appears to ask you enter a password.
2. Key in a new password. The password can not exceed eight characters.
3. System will request you to confirm the new password again.
4. When completed, new code takes effect.

No Password Setting:

If you want to disable the password, just press <Enter> as a password input is requested.

If You Forget Password:

If you forget the password, the only way to access the system is to clear the CMOS memory. Please refer to page 28 on clear CMOS setting.

Save & Exit Setup

Pressing <Enter> on this item asks for confirmation:

SAVE to CMOS and EXIT (Y/N)? Y

Pressing "Y" stores the selections made in the menus of CMOS - a special section of memory that stays on after you turn your system off. The next time you boot your computer, the BIOS configures your system according to the Setup selections stored in CMOS. After saving the values the system is restarted again.

Exit Without Saving

Pressing <Enter> on this item asks for confirmation:

Quit Without Saving (Y/N)? N

This allows you to exit from Setup without storing in CMOS any change. The previous selections remain in effect. This exits from the Setup utility and restarts your computer.

Appendix A. Update Memory Configurations:

Unbuffered DIMM Support

No.of dimms	DIMM 1	DIMM 2	DIMM 3	Max Speed 1T	Max Speed 2T
1	SS			DDR 400	DDR 400
1		SS		DDR 400	DDR 400
1			SS	DDR 400	DDR 400
1	DS			DDR 400	DDR 400
1		DS		DDR 400	DDR 400
1			DS	DDR 400	DDR 400
2	SS	SS		DDR 400	DDR 400
2	SS	DS		DDR 400	DDR 400
2	SS		SS	DDR 400	DDR 400
2	SS		DS	DDR 400	DDR 400
2	DS	SS		DDR 400	DDR 400
2	DS	DS		DDR 400	DDR 400
2	DS		SS	DDR 400	DDR 400
2		SS	SS	DDR 333	DDR 400
2		SS	DS	DDR 200	DDR 400
2		DS	SS	DDR 200	DDR 400
2		DS	DS	DDR 200	DDR 333
2	DS		DS	DDR 400	DDR 400
3	SS	SS	SS	DDR 333	DDR 400
3	SS	SS	DS	DDR 200	DDR 333
3	SS	DS	SS	DDR 200	DDR 333
3	SS	DS	DS	DDR 200	DDR 333
3	DS	SS	SS	DDR 333	DDR 333
3	DS	SS	DS	DDR 200	DDR 333
3	DS	DS	SS	DDR 200	DDR 333
3	DS	DS	DS	DDR 200	DDR 333

SS: x8 single rank or x16

DS: x8 double rank