

## Chapter 2

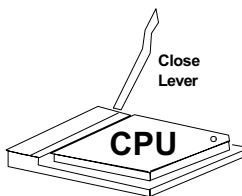
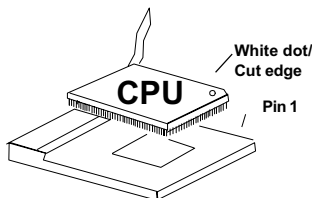
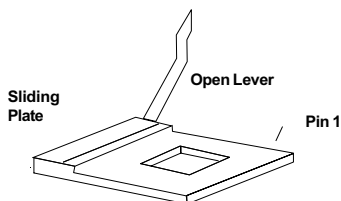
### HARDWARE INSTALLATION

#### Central Processing Unit: CPU

The mainboard operates with **Intel® Pentium® III (FC-PGA)/VIA CynixIII processor**. The mainboard uses a CPU socket called Socket 370 for easy CPU installation. The CPU should always have a Heat Sink and a cooling fan attached to prevent overheating.

#### CPU Installation Procedures

1. Pull the lever sideways away from the socket. Then, raise the lever up to a 90-degree angle.
2. Locate Pin 1 in the socket and look for the white dot or cut edge in the CPU. Match Pin 1 with the white dot/cut edge. Then, insert the CPU. It should insert easily.
3. Press the lever down to complete the installation.



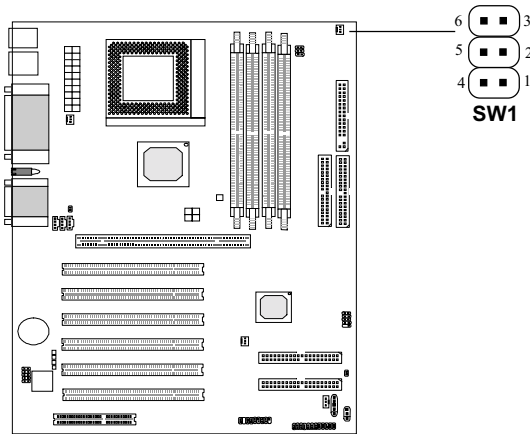
### **CPU Core Speed Derivation Procedure**

The mainboard CPU Bus Frequency can be set through BIOS setup.

**If**    CPU Clock    = 100MHz  
         Core/Bus ratio    = 7  
**then** CPU core speed    = Host Clock x Core/Bus ratio  
                                 = 700MHz

Overclocking Jumper: SW1

Overclocking is operating a CPU/Processor beyond its specified frequency. SW1 jumper is used for overclocking.

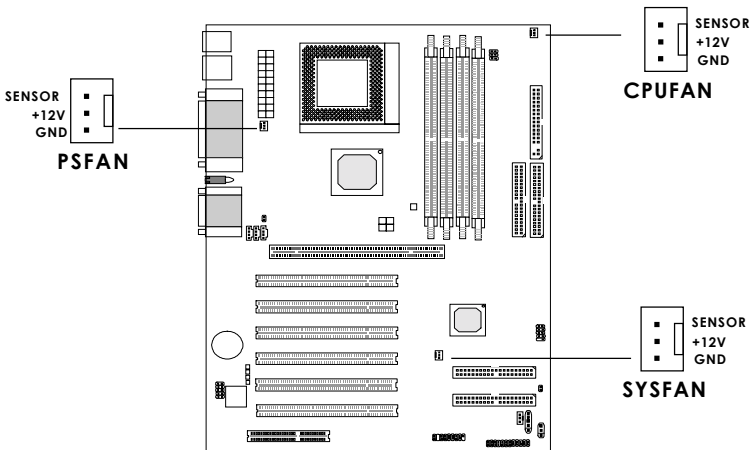


SW1	Function
	Auto
	66.6→100 133→100
	133→66.6 100→66.6
	100→133

**Note:** If you used this jumper for overclocking, you also need to modify the CPU Bus ratio through BIOS.

## Fan Power Connectors: CPUFAN, SYSFAN & PSFAN

These connector support system cooling fan with + 12V. It supports three pin head connector. When connecting the wire to the connector, always take note that the red wire is the positive and should be connected to the +12V, the black wire is Ground and should be connected to GND. If your mainboard has System Hardware Monitor chipset on-board, you must use a specially designed fan with speed sensor to take advantage of this function.



**CPUFAN:** Processor Fan

**SYSFAN:** System Fan

**PSFAN:** Power Supply Fan

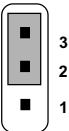
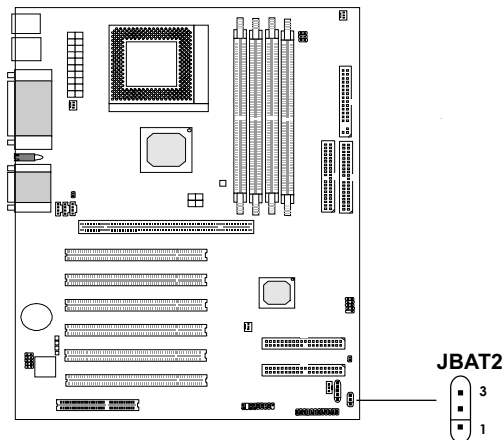
For fans with fan speed sensor, every rotation of the fan will send out 2 pulses. System Hardware Monitor will count and report the fan rotation speed.

**Note:**

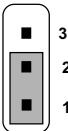
1. Always consult vendor for proper CPU cooling fan.
2. CPU FAN supports the FAN control. You can install PC Alert utility. This will automatically control the CPU FAN Speed according to the actual CPU temperature.

**Clear CMOS Jumper: JBAT2**

A battery must be used to retain the mainboard configuration in CMOS RAM. Short 1-2 pins of JBAT2 to store the CMOS data.



**Clear Data**



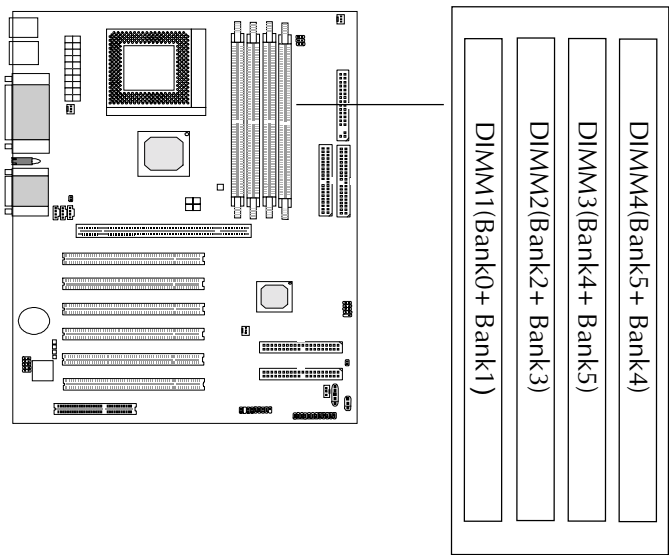
**Save Data**

**Note:** You can clear CMOS by shorting 2-3 pin, while the system is off. Then, return to 1-2 pin position. Avoid clearing the CMOS while the system is on, it will damage the mainboard. Always unplug the power cord from the wall socket.

# Memory Installation

## Memory Bank Configuration

The mainboard supports a maximum memory size of 512MB: It provides four 168-pin **unbuffered** DIMMs (Double In-Line Memory Module) sockets. It supports 32MB to 512MB DIMM memory module.



## Memory Installation Procedures

### A. How to install a DIMM Module

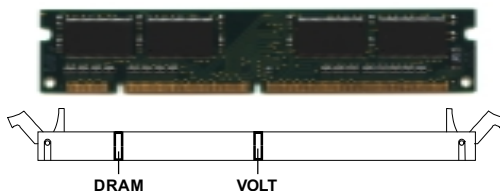


**Single Sided DIMM**



**Double Sided DIMM**

1. The DIMM slot has 2 Notch Keys “VOLT and DRAM”, so the DIMM memory module can only fit in one direction.
2. Insert the DIMM memory module vertically into the DIMM slot. Then push it in.



3. The plastic clip at the side of the DIMM slot will automatically close.

### **Memory Population Rules**

1. Supports only SDRAM DIMM.
2. To operate properly, at least one 168-pin DIMM module must be installed.
3. This mainboard supports Table Free memory, so memory can be installed on DIMM1, DIMM2, DIMM3 or DIMM4 in any order.
4. Supports 3.3 volt DIMM.
5. The DRAM addressing and the size supported by the mainboard is shown at the next page.

**Note:** It is not recommended to install a Double Side DIMM module to DIMM 3 and DIMM 4 at the same time as this will not function properly. To make use of DIMM 3 and DIMM 4 at the same time, insert a Single Side DIMM module to each of them. Please use the same type or model of SDRAM. Moreover, you should always use DIMM 3 if you have only one Single Side DIMM module. Installing it on DIMM 4 is not allowed and this will not function properly. Refer to the table below for proper combination.

<b>DIMM1</b>	<b>DIMM2</b>	<b>DIMM3</b>	<b>DIMM4</b>
<b>DS/SS</b>	<b>DS/SS</b>	<b>DS</b>	<b>X</b>
<b>DS/SS</b>	<b>DS/SS</b>	<b>SS</b>	<b>SS</b>
<b>DS/SS</b>	<b>DS/SS</b>	<b>X</b>	<b>DS</b>
<b>DS/SS</b>	<b>DS/SS</b>	<b>SS</b>	<b>X</b>

**DS:** Double Side DIMM

**SS:** Single Side DIMM

**X:** None/Cannot be installed

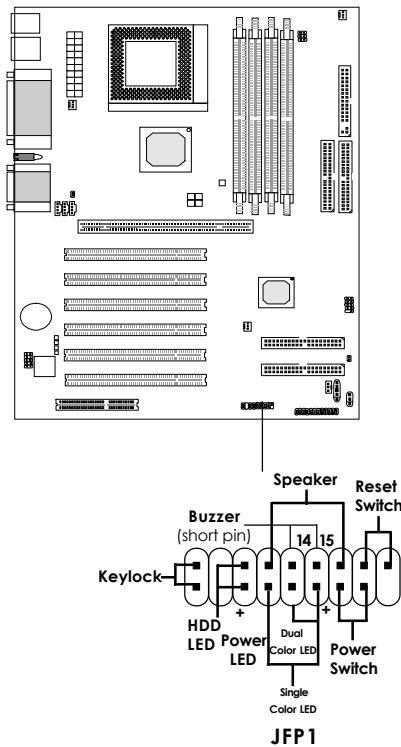


Table 2.3-1 SDRAM Memory Addressing

DIMM Capacity	# of Devices/ DIMM	# of Sides	Dram Tech.	Front Side Population		Back Side Population		Row	Bank	Column
				Count	Config	Count	Config			
0		N/A		Empty		Empty		N/A	N/A	N/A
32MB	16	DS	16Mb	8-	2Mb x8	8-	2Mb x8	11	1	9
32MB	4	SS	64Mb	4-	4Mb x16			12	2	8
48MB	12	DS	64/16Mb	4-	4Mb x16	8-	2Mb x8	12	2/1	8
64MB	8	DS	64Mb	4-	4Mb x16	4-	4Mb x16	12	2	8
64MB	8	SS	64Mb	8-	8Mb x8			12	2	9
64MB	4	SS	128Mb	4-	8Mb x16			12	2	9
96MB	12	DS	64Mb	8-	8Mb x8	4-	4Mb x16	12	2	9/8
96MB	8	DS	128/64Mb	4-	8Mb x16	4-	4Mb x16	12	2	9/8
128MB	16	DS	64Mb	8-	8Mb x8	8-	8Mb x8	12	2	9
128MB	8	DS	128Mb	4-	8Mb x16	4-	8Mb x16	12	2	9
128MB	8	SS	128Mb	8-	16Mb x8			12	2	10
128MB	4	SS	256Mb	4-	16Mb x16			13	2	9
192MB	12	DS	128Mb	8-	16Mb x8	4-	8Mb x16	12	2	10/9
192MB	16	DS	128/64Mb	8-	16Mb x8	8-	8Mb x8	12	2	10/9
256MB	16	DS	128Mb	8-	16Mb x8	8-	16Mb x8	12	2	10
256MB	8	DS	256Mb	4-	16Mb x16	4-	16Mb x16	13	2	9
256MB	8	SS	256Mb	8-	32Mb x8			13	2	10
512MB	16	DS	256Mb	8-	32Mb x8	8-	32Mb x8	13	2	10

**Case Connector: JFP1**

The Keylock, Power Switch, Reset Switch, Power LED, Speaker and HDD LED are all connected to the JFP1 connector block.



### **Power Switch**

Connect to a 2-pin push button switch. This switch has the same feature with JRMS1.

### **Reset Switch**

Reset switch is used to reboot the system rather than turning the power ON/OFF. Avoid rebooting while the HDD LED is lit. You can connect the Reset switch from the system case to this pin.

### **Power LED**

The Power LED is lit while the system power is on. Connect the Power LED from the system case to this pin. There are two types of LED that you can use: 3-pin single color LED or 2-pin dual color LED(ACPI request).

- a. 3 pin single color LED connect to pin 4, 5, & 6. This LED will lit when the system is on.
- b. 2 pin dual color LED connect to pin 5 & 6.

**GREEN**Color:           Indicate the system is in full on mode.

**ORANGE**Color:        Indicate the system is in suspend mode.

### **Speaker**

Speaker from the system case is connected to this pin.

If on-board Buzzer is available:

Short pin 14-15:       On-board Buzzer Enabled.

Open pin 14-15:       On-board Buzzer Disabled.

### **HDD LED**

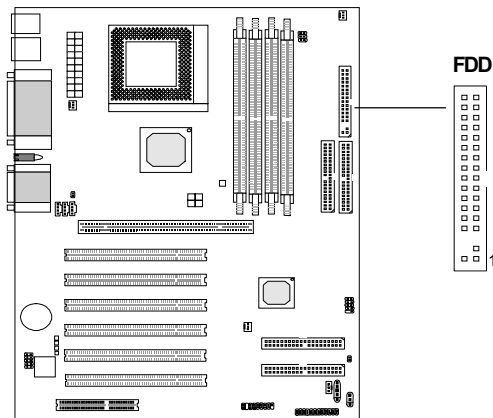
HDD LED shows the activity of a hard disk drive. Avoid turning the power off while the HDD led is lit. You can connect the HDD LED from the system case to this pin.

### **Keylock**

Keylock allows you to disable the keyboard for security purposes. You can connect the keylock to this pin.

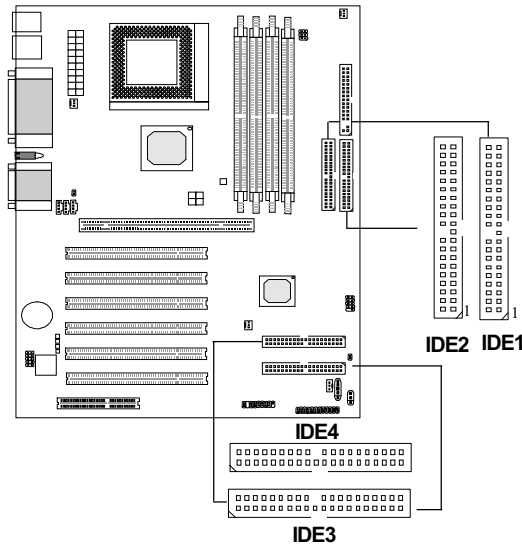
**Floppy Disk Connector: FDD**

The mainboard also provides a standard floppy disk connector FDD that supports 360K, 720K, 1.2M, 1.44M and 2.88M floppy disk types. This connector supports the provided floppy drive ribbon cables.



## Hard Disk Connectors: IDE1 ~ IDE4

The mainboard has a 32-bit Enhanced PCI IDE and Ultra DMA 33/66/100 controller that provides PIO mode 0~4, Bus Master, and Ultra DMA/33/66/100 function . You can connect up to four hard disk drives, CD-ROM, 120MB Floppy (reserved for future BIOS) and other devices. These connectors support the provided IDE hard disk cable.



### For 815EP-Pro

There are two HDD connectors (IDE1 & IDE2) on 815EP Pro mainboard.

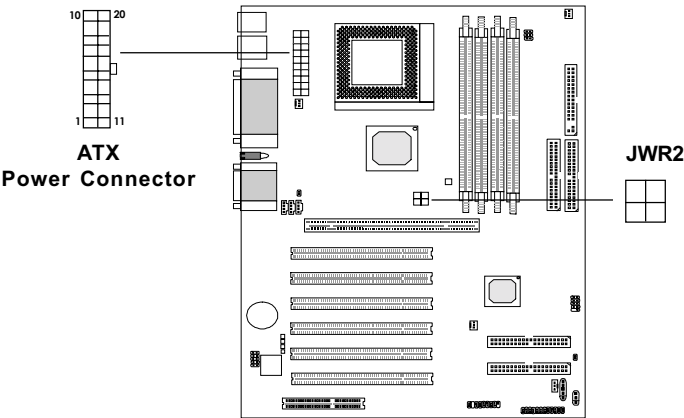
### For 815EP Pro-R

There are four HDD connectors (IDE1, IDE2, IDE3, IDE4) on 815EP Pro-R mainboard. IDE3 & IDE4 are provided for IDE RAID function. Please refer to IDE RAID user's manual for more information on IDE RAID function.

Power Supply

ATX 20-pin Power Connector: JWR

This connector supports the power button on-board. Using the ATX power supply, functions such as Modem Ring Wake-Up and Soft Power Off are supported by this mainboard. This power connector supports instant power on function which means that system will boot up instantly when the power connector is inserted on the board.



*Note: JWR2 is the power connector for AGP Pro card. Only for 815EP Pro-R.*

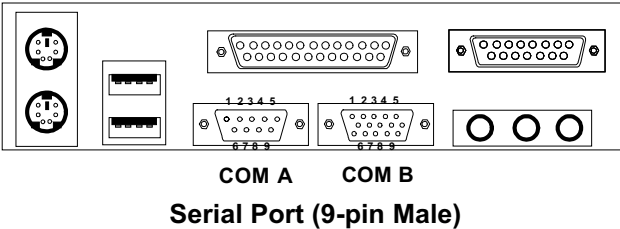
PIN DEFINITION

PIN	SIGNAL	PIN	SIGNAL
1	3.3V	11	3.3V
2	3.3V	12	-12V
3	GND	13	GND
4	5V	14	PS_ON
5	GND	15	GND
6	5V	16	GND
7	GND	17	GND
8	PW_OK	18	-5V
9	5V_SB	19	5V
10	12V	20	5V

**Warning:** Since the mainboard has the instant power on function, make sure that all components are installed properly before inserting the power connector to ensure that no damage will be done.

**Serial Port Connectors: COM A and COM B**

The mainboard has two 9-pin male DIN connectors for serial port COM A & COM B. These ports are 16550A high speed communication ports that send/receive 16 bytes FIFOs. These connectors are allowed to be connected to mouse or modem cable.



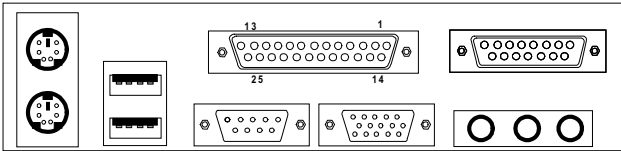
**PIN DEFINITION**

PIN	SIGNAL
1	<b>DCD</b> (Data Carry Detect)
2	<b>SIN</b> (Serial In or Receive Data)
3	<b>SOUT</b> (Serial Out or Transmit Data)
4	<b>DTR</b> (Data Terminal Ready)
5	<b>GND</b>
6	<b>DSR</b> (Data Set Ready)
7	<b>RTS</b> (Request To Send)
8	<b>CTS</b> (Clear To Send)
9	<b>RI</b> (Ring Indicate)

**Parallel Port Connector: LPT1**

The mainboard provides a 25 pin female centronic connector for LPT. A parallel port is a standard printer port that also supports Enhanced Parallel Port(EPP) and Extended capabilities Parallel Port(ECP). See connector and pin definition below:

**Parallel Port (25-pin Female)**  
**LPT 1**



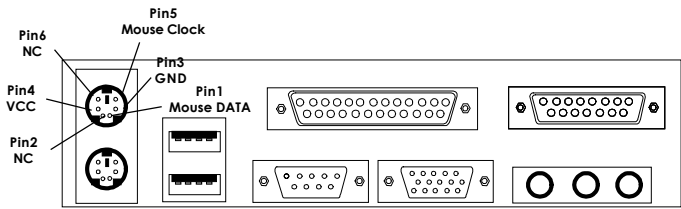
**PIN DEFINITION**

PIN	SIGNAL	PIN	SIGNAL
1	STROBE	14	AUTO FEED#
2	DATA0	15	ERR#
3	DATA1	16	INIT#
4	DATA2	17	SLIN#
5	DATA3	18	GND
6	DATA4	19	GND
7	DATA5	20	GND
8	DATA6	21	GND
9	DATA7	22	GND
10	ACK#	23	GND
11	BUSY	24	GND
12	PE	25	GND
13	SELECT		



**Mouse Connector: JKBMS1**

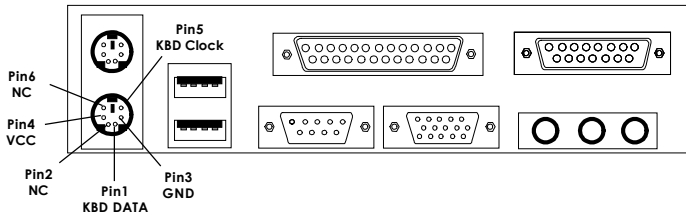
The mainboard provides a standard PS/2® mouse mini DIN connector for attaching a PS/2® mouse. You can plug a PS/2® mouse directly into this connector. The connector location and pin definition are shown below:



**PS/2 Mouse (6-pin Female)**

**Keyboard Connector: JKBMS1**

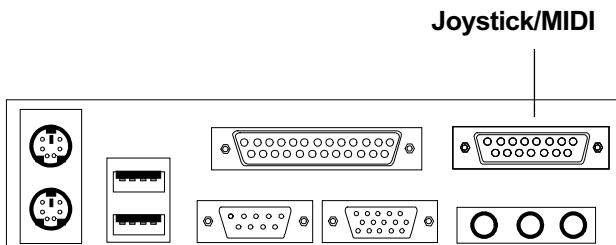
The mainboard provides a standard PS/2® keyboard mini DIN connector for attaching a keyboard. You can plug a keyboard cable directly to this connector.



**PS/2 Keyboard (6-pin Female)**

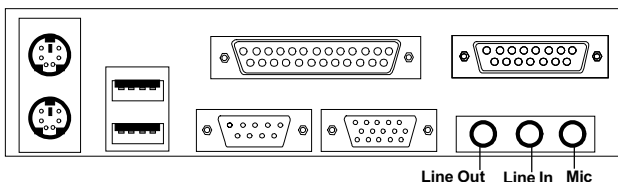
## Joystick/Midi Connectors

You can connect joystick or game pad to this connector.



## Audio Port Connectors

**Line Out** is a connector for Speakers or Headphones. **Line In** is used for external CD player, Tape player, or other audio devices. **Mic** is a connector for the microphones.



## 1/8" Stereo Audio Connectors

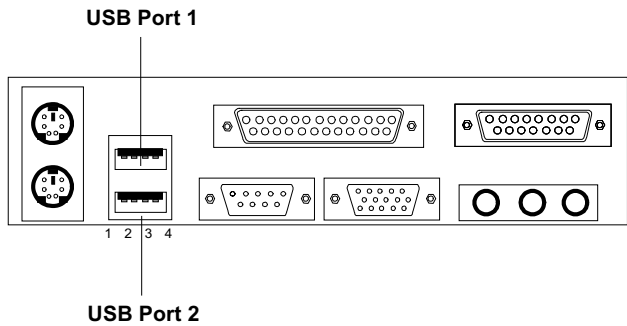
### For 815EP Pro-R

815EP Pro-R supports Audio Multi-Channel function. This allows you to change the Line In to 3,4 channel output and Line Out to 1, 2 channel output.

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**USB Connectors**

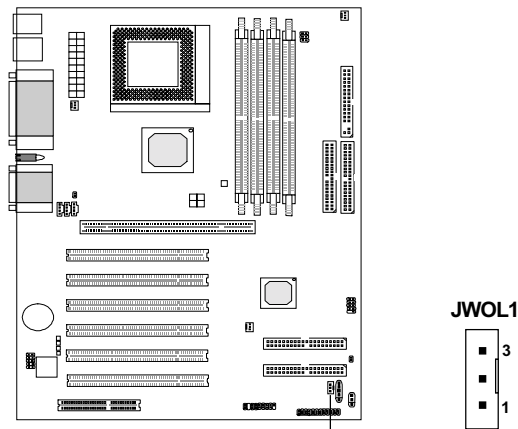
The mainboard provides a **UHCI(Universal Host Controller Interface)** **Universal Serial Bus root** for attaching USB devices like: keyboard, mouse and other USB devices. You can plug the USB device directly to this connector.



PIN	SIGNAL
1	VCC
2	-Data
3	+Data
4	GND

Wake-Up on LAN Connector: JWOL1

The JWOL1 connector is for use with LAN add-on cards that supports Wake Up on LAN function. To use this function, you need to set the “Wake-Up on LAN” to enable at the BIOS Power Management Setup.



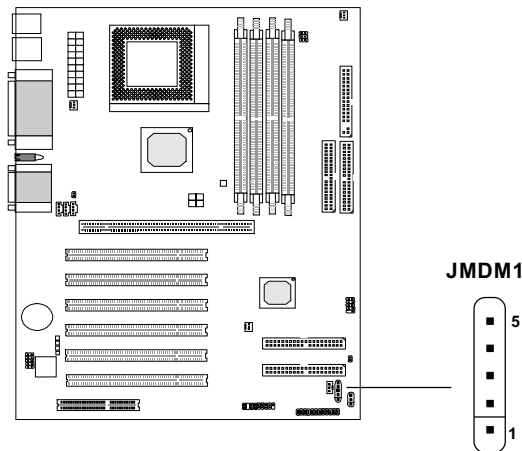
PIN	SIGNAL
1	5VSB
2	GND
3	MP_WAKEUP

**Note:** LAN wake-up signal is active “high”.

**Note:** To be able to use this function, you need a power supply that provide enough power for this feature. (Power supply with 750mA 5V Stand-by)

Modem Wake Up Connector: JMDM1

The JMDM1 connector is for use with Modem add-on card that supports the Modem Wake Up function.



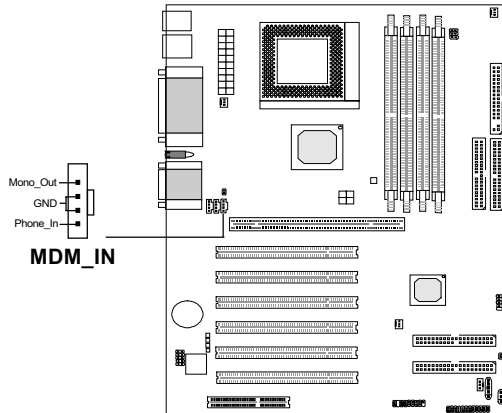
PIN	SIGNAL
1	NC
2	GND
3	MDM_WAKEUP
4	NC
5	5VSB

**Note:** Modem wake-up signal is active “low”.

**Note:** To be able to use this function, you need a power supply that provide enough power for this feature. (Power supply with 750mA 5V Stand-by)

## **Modem-In: MDM\_IN**

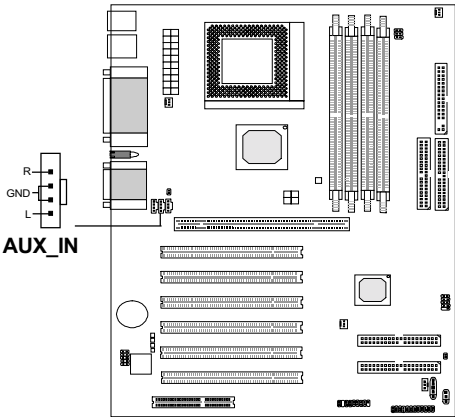
The connector is for Modem with internal voice connector.



Mono\_Out is connected to the Modem Speaker Out connector.  
Phone\_In is connected to the Modem Microphone In connector.

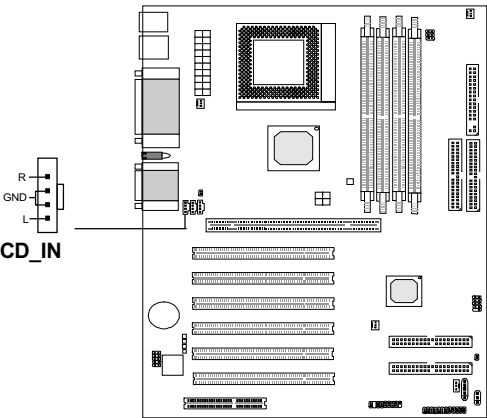
**AUX Line In Connector: AUX\_IN**

This connector is used for DVD Add on Card with Line In connector.



**CD-In Connector: CD\_IN**

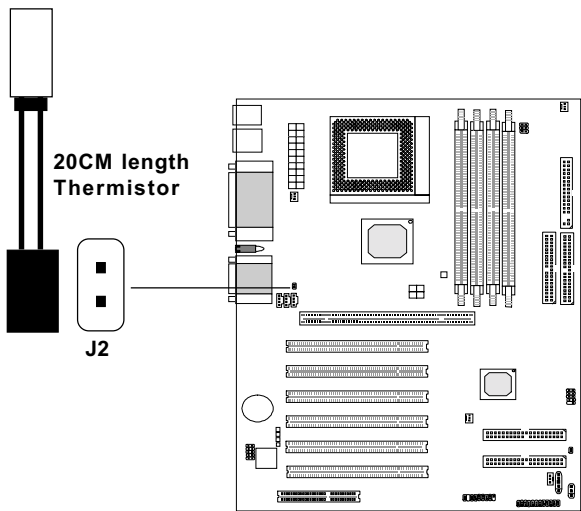
This connector is for CD-ROM audio connector.





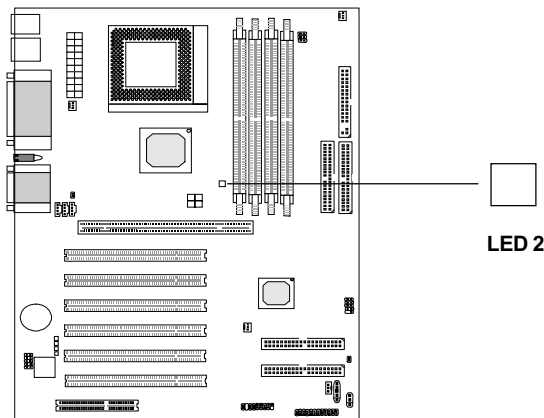
**TOP TECH. III: J2**

This is used to check the AGP chipset temperature on AGP card. The J2 is a 2-pin connector which can be inserted with a 20cm length thermistor. It is located near the chipset heatsink that monitors the chipset temperature. The BIOS setup for “TOP TECH III” should be set to enabled.



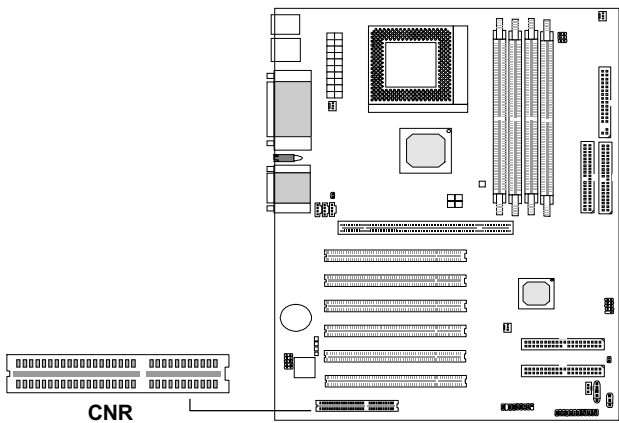
**LED 2**

The mainboard provides a Special Diagnostic LED for users to be aware of their mainboard conditions. LED 2 indicates the DIMM power. When LED 2 is powered on. Do not attempt to insert or remove the DIMM module.



**CNR (Communication Network Riser)**

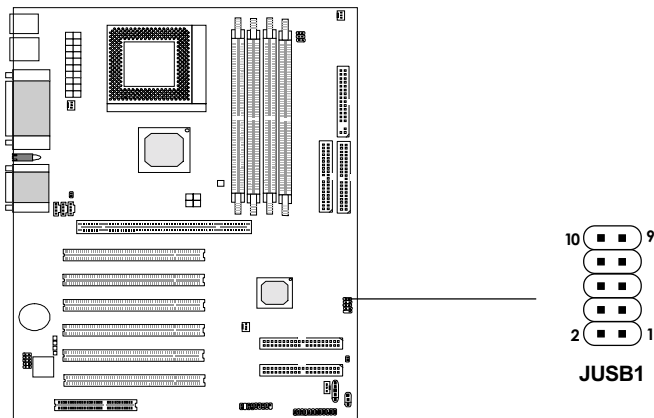
The Communication Network Riser specification is an open industry-standard specification that defines a hardware scalable Original Equipment Manufacturer (OEM) mainboard riser board and interface, which supports multi-channel audio, V.90 analog modem, phone-line based networking and 10/100 Ethernet based networking.



USB Front Connector: JUSB1

A. For 815EP Pro

The mainboard provides a front Universal Serial Bus connector.



Pin	Description	Pin	Description
1	VCC	2	GND
3	USB2-	4	GND
5	USB2+	6	USB3+
7	GND	8	USB3-
9	GND	10	VCC

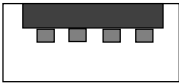
B. For 815EP Pro-R

The mainboard provides a **front Universal Serial Bus connector** with USB PC to PC Network Function. Two cables (**USB A to B Cable & USB Bracket Cable**) are provided for the function.

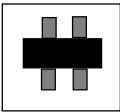
*(Please refer to the Appendix for more information on USB PC to PC Network Function and driver installation..)*

**Follow the steps below to connect the cables:**

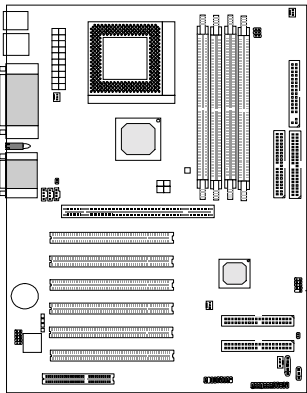
1. Find the “B Type Connector” on the two cables.
2. Connect the “B Type Connector” on the “USB A to B Cable” to the same connector on the “USB Bracket Cable”.
3. Connect the “A Type Connector” on the USB Bracket Cable to another computer’s USB connector (without USB PC to PC function).
4. Connect the “A Type connector” on the USB Bracket Cable to the front pin header (JUSB1) on the mainboard. Pay attention to the orientation. The header has a special design for the wrong orientation.



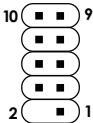
**USB Connector  
A Type**



**USB Connector  
B Type**



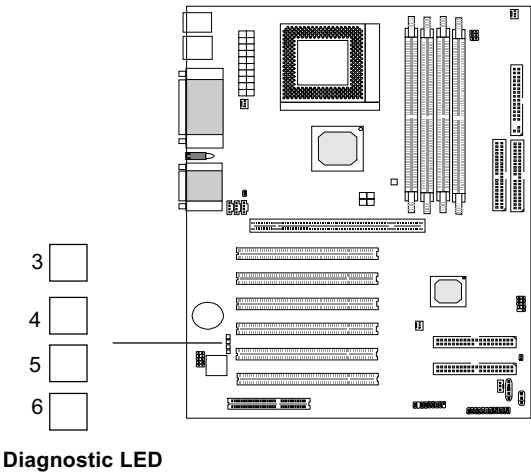
Pin	Description	Pin	Description
1	VCC	4	GND
3	USB2-	6	USB3+
5	USB2+	8	USB3-
7	GND	10	VCC
9	GND		



**JUSB1**

**Diagnostic LED**

The mainboard provides a Special Diagnostic LED for users to be aware of their mainboard conditions. The LED helps user determine the problem of the mainboard.



### Diagnostic LED Function

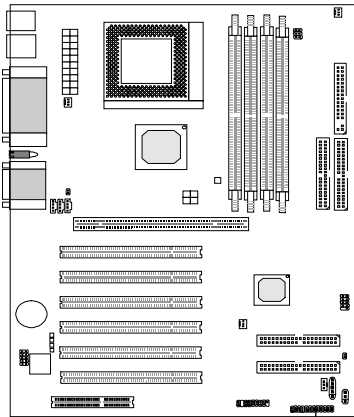
<b>Diagnostic LED</b> <b>6 5 4 3</b>	<b>Description</b>	<b>Possible Problem/ Solution</b>
0 0 0 0	System Power ON. This will start BIOS Initialization	System D-LED will hang here The Processor might be damage or not installed properly Damage/Discharge Lithium Battery
0 0 0 1	Early Chipset Initialization	***
0 0 1 0	Memory Detection Test Testing Onboard memory size	System D-LED will hang here The Memory module might be damage or not installed properly.
0 0 1 1	Decompressing BIOS image to RAM for fast booting.	***
0 1 0 0	Initializing Keyboard Controller	***
0 1 0 1	Testing VGA BIOS This will start writing VGA sign-on messages to the screen.	System D-LED will produce Beep sound The VGA card might be damage or not inserted properly.
0 1 1 0	Processor Initialization This will show information regarding the processor (like brand name, system bus, etc...)	***
0 1 1 1	Testing RTC (Real Time Clock)	Low Lithium Battery
1 0 0 0	Initializing Video Interface This will start detecting CPU clock, checking type of video onboard. Then, detect and initialize the video adapter	***
1 0 0 1	BIOS Sign On This will start showing information about Logo, processor brand name, etc.....	***
1 0 1 0	Testing Base and Extended Memory Testing base memory from 240K to 640K and extended memory above 1MB using various patterns.	***
1 0 1 1	Assign Resource to all ISA	***
1 1 0 0	Initializing Hard Drive Controller This will initialize IDE drive and controller	Check IDE cable for proper installation
1 1 0 1	Initializing Floppy Drive Controller This will initialize Floppy Drive and controller	System D-LED will hang here The Floppy Drive Cable might not be installed properly
1 1 1 0	Boot Attempt This will set low stack and boot via INT19h.	***
1 1 1 1	Operating System Booting.	***

**1 = GREEN 0 = RED**

**\*\*\* Check local Vendor for possible internal mainboard problem.**

**Front Panel Connector: J7**

The mainboard provides a **Front Panel** connector.



**Pin Definition:**

**11-13 pin (optional)**  
Short 11-13 pin to disable Onboard Codec.

**13-15 pin (optional)**  
Short 13-15 pin to enable Onboard Codec.

**Speaker Output**  
Short 6-8 pin to activate AC97\_SPKR  
Short 8-10 pin to activate onboard Buzzer.

