

## Chapter 2

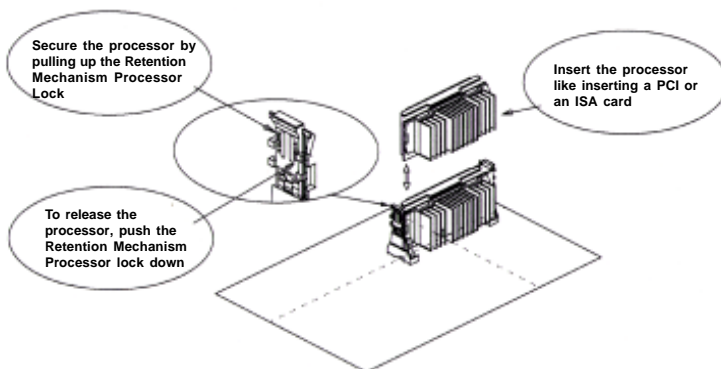
## HARDWARE INSTALLATION

### 2.1 Central Processing Unit: CPU

#### 2.1-1 Processor Installation Procedure

**Step 1:** Install the Retention Mechanism.

Attach the Retention Mechanism to the Mainboard. Push the Plastic lock to secure the Retention Mechanism into the mainboard.



**Step 2:** Install the Processor.

Insert the Processor like inserting a PCI or an ISA card.

**Step 3:** Lock the Processor.

Lock the processor by pulling up the Retention Mechanism processor lock shown above.

**Note:** The Retention Mechanism processor lock can only lock S.E.C.C. 2 and S.E.P.P. processor.

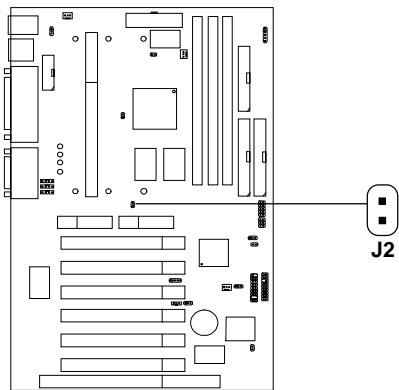
**2.1-2 CPU Core Speed Derivation Procedure**



The mainboard CPU Bus Frequency can be set through BIOS setup

**If**      CPU Clock                      =        66MHz  
          Core/Bus ratio                =        3.5  
**then**   CPU core speed            =        Host Clock x Core/Bus ratio  
    =        66MHz x 3.5  
    =        233MHz

**2.1-3 Overclocking Jumper: J2**

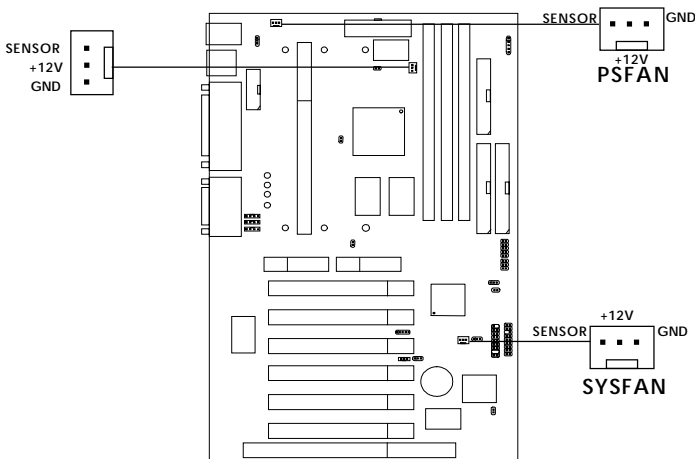
Overclocking is operating a CPU/Processor beyond its specified frequency. J2 jumper is used for overclocking.



J2	Function
 <b>Short</b>	<b>Automatically detect CPU Bus Frequency</b>
 <b>Open</b>	<b>Allows CPU overclocking. Set 66MHz to 100Mhz</b>

### 2.1-4 Fan Power Connector: CPUFAN/PSFAN/SYSFAN

These connectors 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.



**PSFAN:** Power Supply Fan

**CPUFAN:** Processor Fan

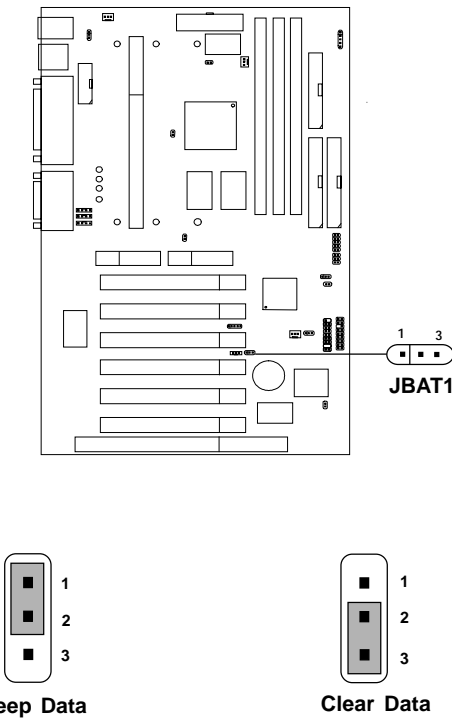
**SYSFAN:** System(Chassis) Fan

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.

**2.2 Clear CMOS Jumper: JBAT1**

A battery must be used to retain the mainboard configuration in CMOS RAM. Short 1-2 pins of JBAT1 to store the CMOS data.

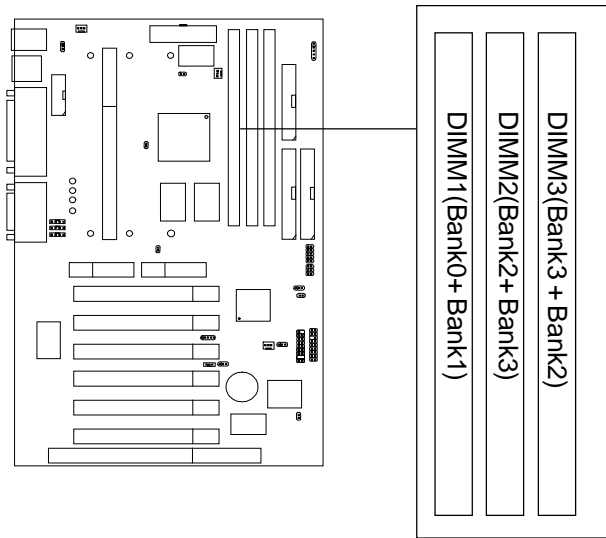


**Note:** You can clear CMOS by shorting 2-3 pin, while the system is off. Then, return to 1-2 pin position. Avoid clearing the CMOS while the system is on, it will damage the motherboard. Always unplug the power cord from the wall socket.

2.3 Memory Installation

2.3-1 Memory Bank Configuration

The mainboard supports a maximum memory size of 256MB(64-bit technology) or 512MB(128-bit technology for SDRAM: It provides three 168-pin **unbuffered** DIMMs (Double In-Line Memory Module) sockets. It supports 8 MB to 128 Mbytes DIMM memory module.

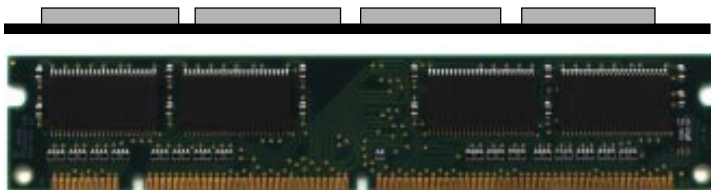


**NOTE:** When you install Double Bank DIMM or DIMM 2, DIMM 3 will not be functional and vice versa. To make use of DIMM 2 and DIMM 3, insert a Single Bank DIMM to each of them. It is recommended that you use the same type or model of SDRAM.

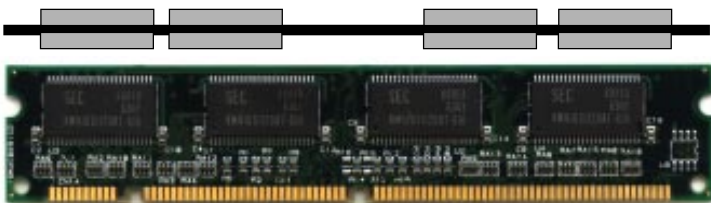
DIMM 2	DIMM 3	
D	X	S: Single Bank DIMM
S	S	D: Double Bank DIMM
X	D	X: Cannot be installed

## 2.3-2 Memory Installation Procedures

### A. How to install a DIMM Module

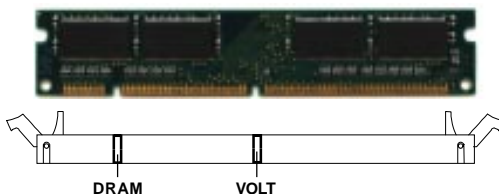


**Single Sided DIMM**



**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.

### 2.3-3 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, DIMM 2 or DIMM 3 in any order.
4. Supports 3.3 volt DIMM.
5. The DRAM addressing and the size supported by the mainboard is shown below:

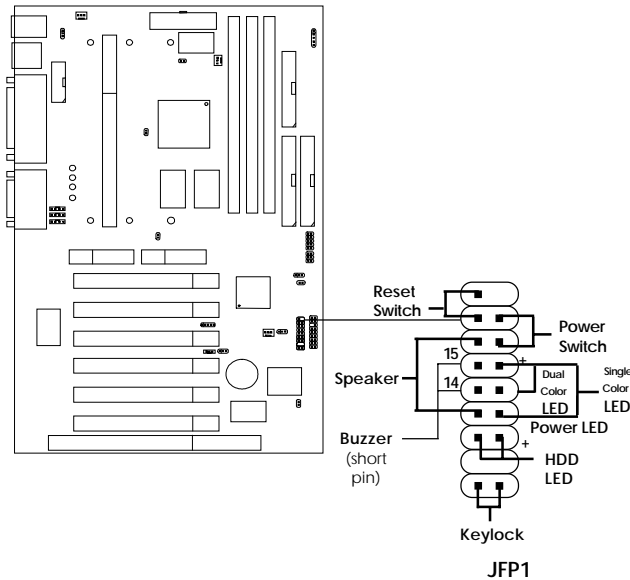
**Table 2.3-1 SDRAM Memory Addressing**

DRAM Tech.	DRAM Density & Width	DRAM Addressing	Address Size		MB/DIMM	
			Row	Column	Single no. Side(S) pcs.	Double no. Side(D) pcs.
16M	1Mx16	ASYM	11	8	8MBx4	16MBx8
	2Mx8	ASYM	11	9	16MBx8	32MBx16
64M	2Mx32	ASYM	11	9	32MBx2	64MBx4
	2Mx32	ASYM	12	8	16MBx2	32MBx4
	4Mx16	ASYM	11	10	32MB	64MB
	4Mx16	ASYM	13	8	32MB	64MB
	8Mx8	ASYM	13	9	64MB	128MB
	2Mx32	ASYM	11	8	16MB	32MB
64M	4Mx16	ASYM	12	8	---	---
	8Mx8	ASYM	12	9	---	---

**NOTE:** Please see page 2-5 for reference.

**2.4 Case Connector: JFP1**

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





### **2.4-1 Power Switch**

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

### **2.4-2 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.

### **2.4-3 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.

### **2.4-4 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.

### **2.4-5 HDD LED**

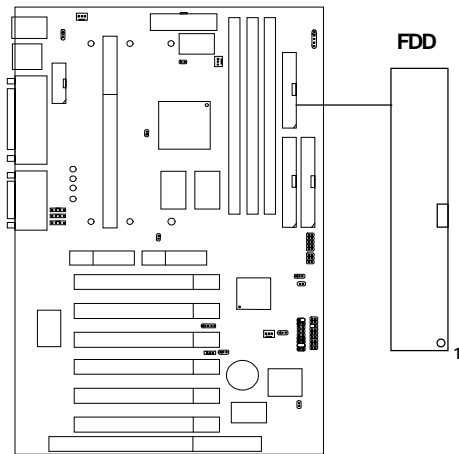
HDD LED shows the activity of a hard disk drive. Avoid turning the power off while the HDD led is lit. You can connect the HDD LED from the system case to this pin.

### **2.4-6 Keylock**

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

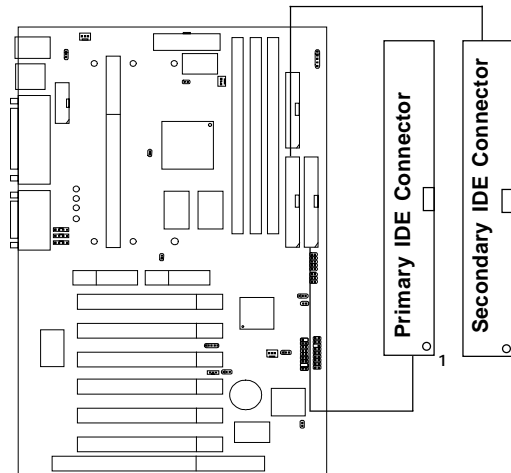
**2.5 Floppy Disk Connector: FDD**

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.



## **2.6 Hard Disk Connectors: IDE1 & IDE2**

The mainboard has a 32-bit Enhanced PCI IDE and Ultra DMA/66 (ICH)/ Ultra DMA/33(ICH0) Controller that provides PIO mode 0~4, Bus Master, and Ultra DMA/33 function. It has two HDD connectors IDE1 (primary) and IDE2 (secondary). You can connect up to four hard disk drives, CD-ROM, 120MB Floppy (reserved for future BIOS) and other devices to IDE1 and IDE2. These connectors support the provided IDE hard disk cable.



### **IDE1(Primary IDE Connector)**

The first hard drive should always be connected to IDE1. IDE1 can connect a Master and a Slave drive. You must configure second hard drive to Slave mode by setting the jumper accordingly.

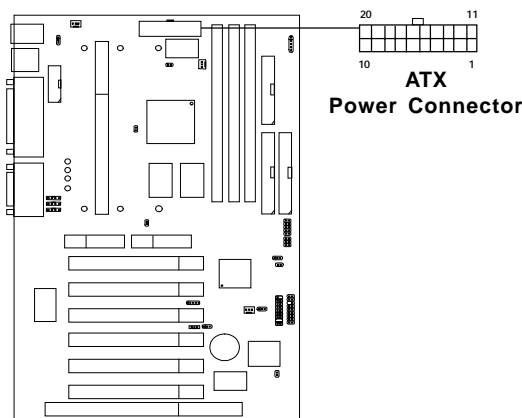
### **IDE2(Secondary IDE Connector)**

IDE2 can also connect a Master and a Slave drive.

2.7 Power Supply

2.7-1 ATX 20-pin Power Connector: JPWR1

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.



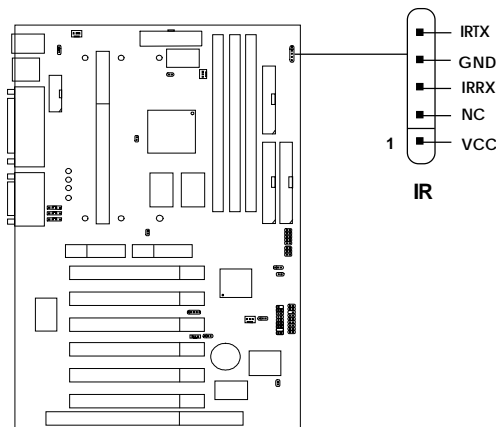
PIN DEFINITION

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.

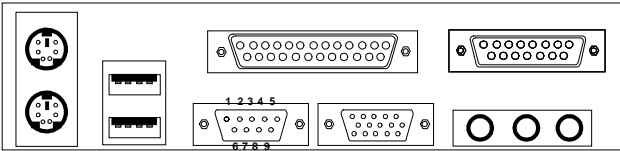
**2.8 IrDA Infrared Module Connector: IR**

The mainboard provides one 5-pin infrared (IR) connector for IR modules. This connector is for optional wireless transmitting and receiving infrared module. You must configure the setting through the BIOS setup to use the IR function. FIR and Consumer IR are reserved functions.



2.9 Serial Port Connectors: COM A and COM B

The mainboard has a 9-pin male DIN connector for serial port COM A. This port is a 16550A high speed communication port that send/receive 16 bytes FIFOs. You can attach a mouse or a modem cable directly into this connector.



COM 1

Serial Port (9-pin Male)

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)

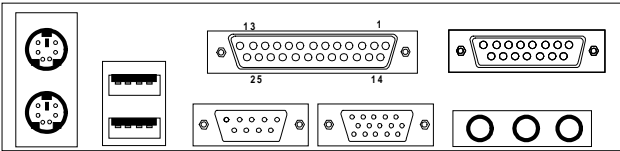
**Note:** There’s another serial port connector (COM B), which is located on the mainboard. Connect a serial port 9-pin male port into this connector.

**2.10 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**

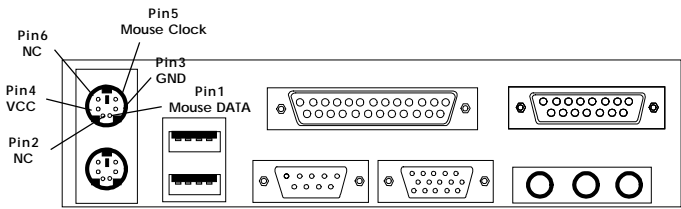


**PIN DEFINITION**

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		

2.11 Mouse Connector: JKBMS1

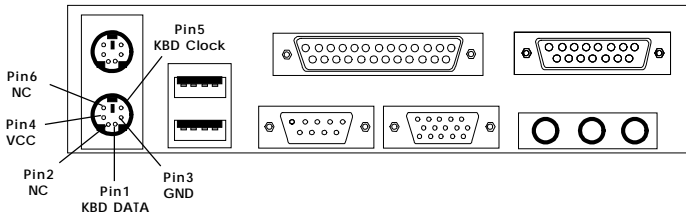
The mainboard provides a standard PS/2® mouse mini DIN connector for attaching a PS/2® mouse. You can plug a PS/2® mouse directly into this connector. The connector location and pin definition are shown below:



PS/2 Mouse (6-pin Female)

2.12 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.

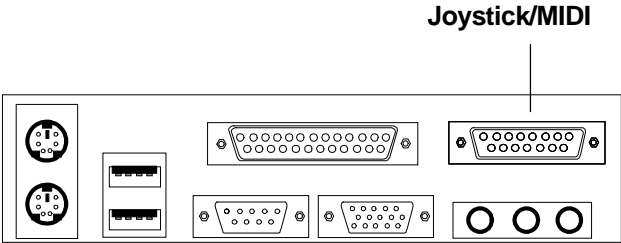


PS/2 Keyboard (6-pin Female)



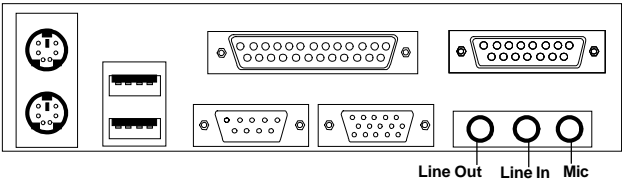
**2.13 Joystick/Midi Connectors**

You can connect joystick or game pad to this connector.



**2.14 Audio Port Connectors**

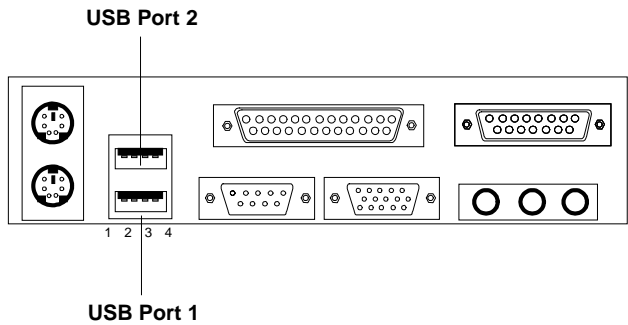
**Line Out** is a connector for Speakers or Headphones. **Line In** is used for external CD player, Tape layer, or other audio devices. **Mic** is a connector for the microphones.



**1/8" Stereo Audio Connectors**

**2.15 USB Connectors**

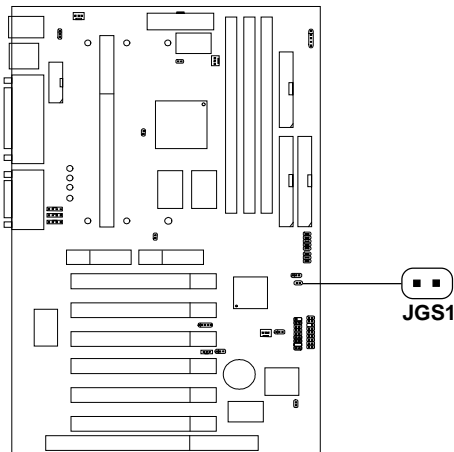
The mainboard provides a **UHCI(Universal Host Controller Interface)** **Universal Serial Bus root** for attaching USB devices like: keyboard, mouse and other USB devices. You can plug the USB device directly to this connector.



PIN	SIGNAL
1	VCC
2	-Data0
3	GND
4	+Data0

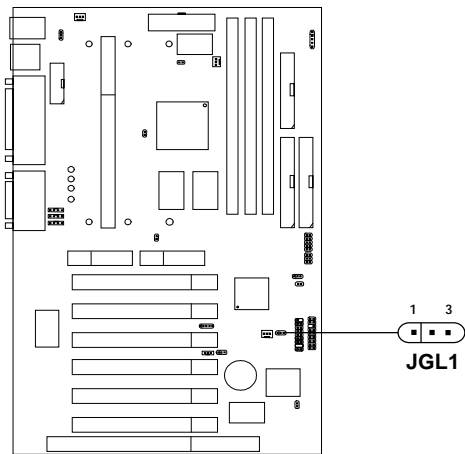
## **2.16 Power Saving Switch Connector: JGS1**

Attach a power saving switch to **JGS1**. When the switch is pressed, the system immediately goes into suspend mode. Press any key and the system wakes up.



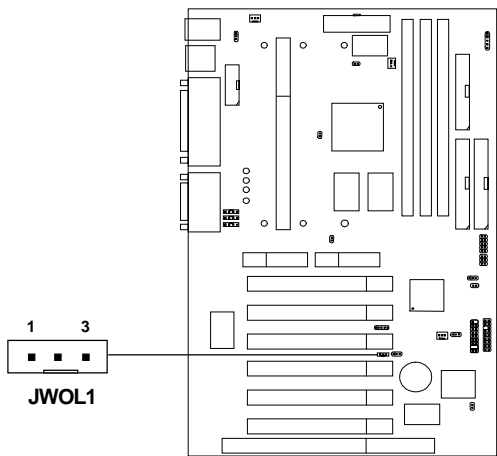
**2.17 Power Saving LED Connector: JGL1**

JGL1 can be connected with a LED. When the 2-pin LED is connected to JGL1, the light will turn green, when system is On. During sleep mode, the 2-pin LED will change color from Green to Orange.



2.18 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.



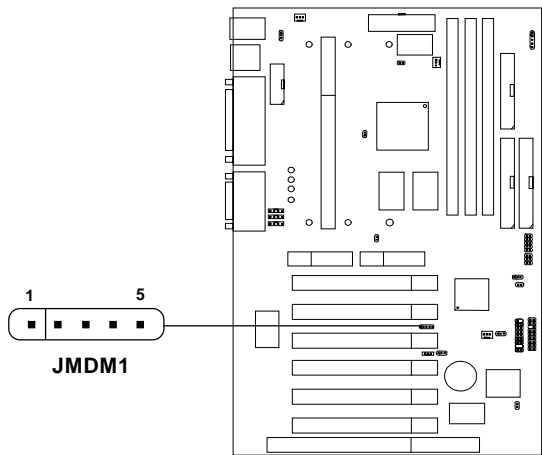
PIN	SIGNAL
1	5VSB
2	GND
3	MP_WAKEUP

**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)

**2.19 Modem Wake Up Connector: JMDM1**

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



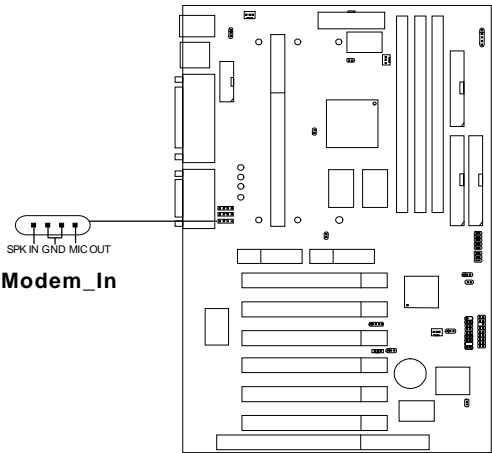
PIN	SIGNAL
1	NC
2	GND
3	MDM_WAKEUP
4	NC
5	5VSB

**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)

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

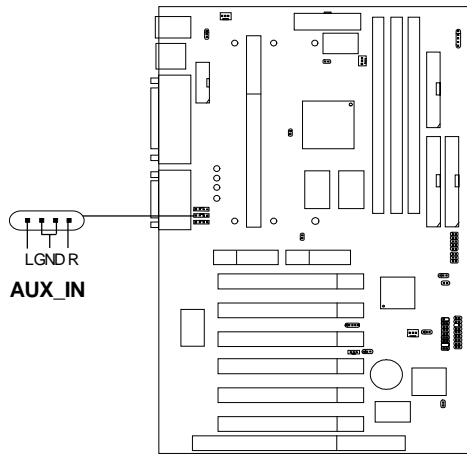
The connector is for Modem with internal voice connector.



SPK\_IN is connected to the Modem Speaker Out connector.  
MIC\_OUT is connected to the Modem Microphone In connector.

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

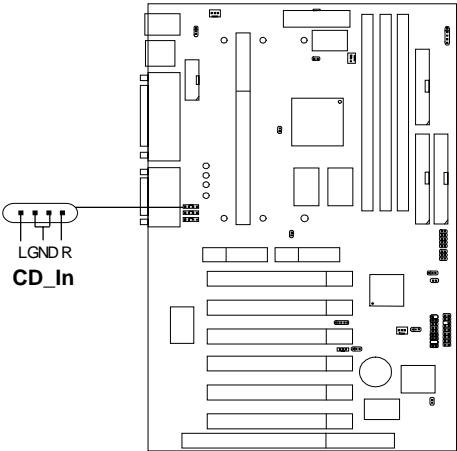
This connector is used for DVD Add on Card with Line In connector.





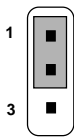
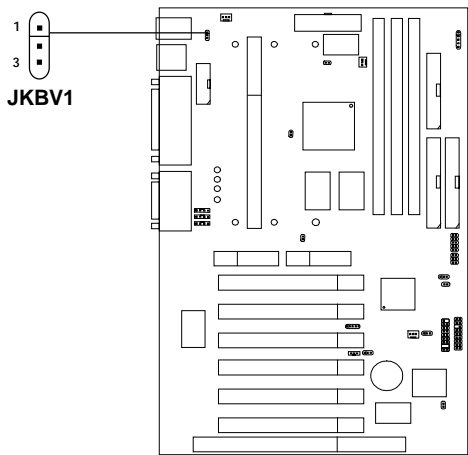
**2.22 CD-In Connector: CD\_In**

This connector is for CD-ROM audio connector.

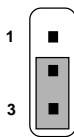


2.23 Keyboard Power: JKBV1

The JKBV1 jumper is for setting keyboard power. This function should be set in the BIOS for the keyboard Wake-up function.



5V Standby  
Enable keyboard  
power on function

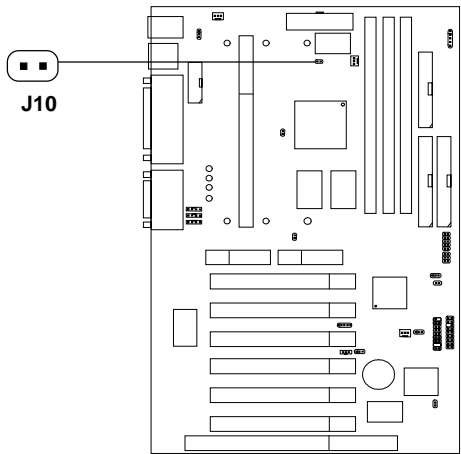


5V (default)  
Disable keyboard  
power on function

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

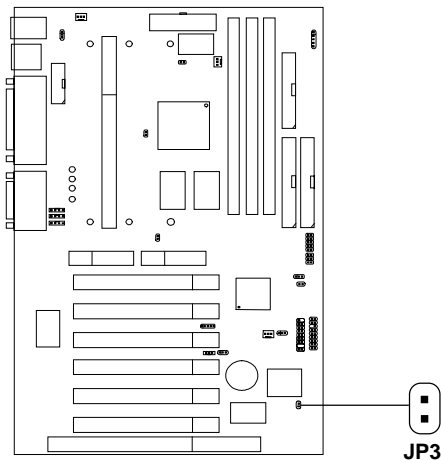
**2.24 Chassis Intrusion Switch Case: J10**

This connector is connected to a 2-pin connector chassis switch. If the Chassis is open, the switch will be open. The system will record this status. To clear the warning, you must enter the BIOS setting and clear the status.



**2.25 BIOS Flash Jumper: JP3**

This jumper is used to lock/unlock BIOS Flash. This Jumper should be unlock when flashing/programming the BIOS.



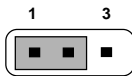
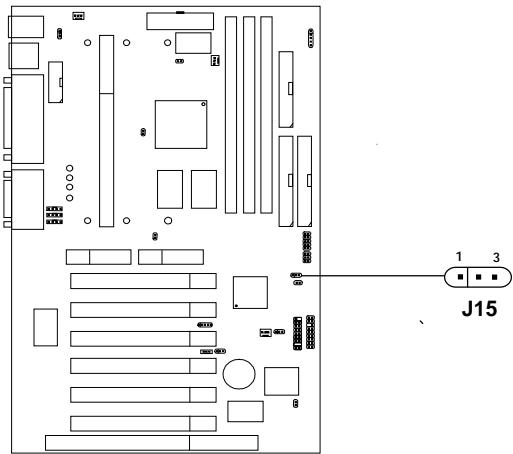
**BIOS Flash  
Unlocked**



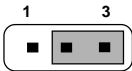
**BIOS Flash  
Locked**

**2.26 Case Speaker to Audio Speaker  
Jumper: J15**

This jumper will enable the case speaker/buzzer to be transferred to the Audio speaker.



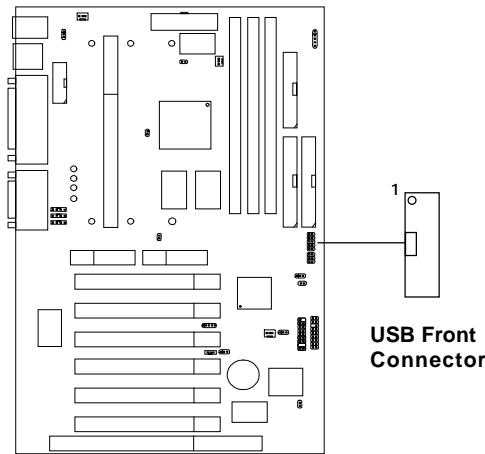
**Enabled**



**Disabled**

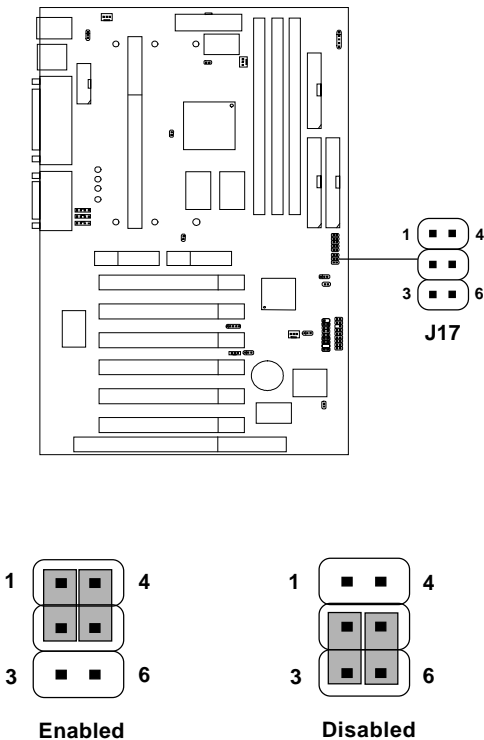
**2.27 USB Front Connector**

The mainboard provides a **front Universal Serial Bus connector**. This is an optional USB connector for Front Panel.



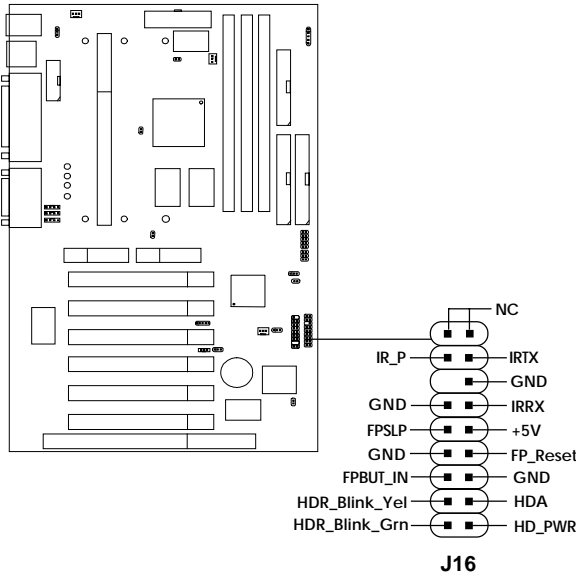
**2.28 USB Front Connector Enabled/Disabled  
Jumper: J17**

This jumper is used to Enabled or Disabled the USB Front Connector. If the USB Front connector is set to enabled, the top USB port at the rear I/O panel will be disabled. If the USB Front connector is set to disabled, the USB port at rear I/O panel will both be operational.



2.29 Front Panel Header: J16 (optional)

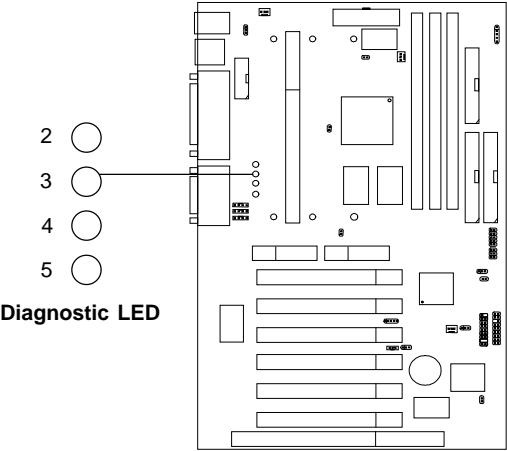
J16 is an optional Front Panel Connector.





**2.30 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.



Below is the Diagnostic LED reference table to help users define their mainboard conditions.

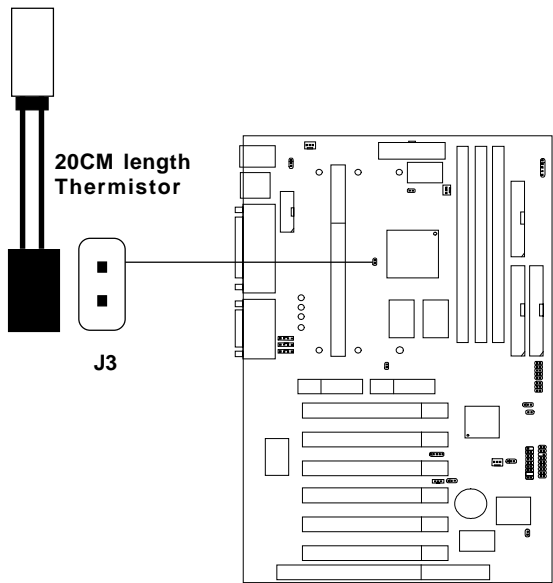
Diagnostic LED				Description
2	3	4	5	
0	0	0	0	Power On. Starting BIOS
1	0	0	0	Early Chipset Initialization
0	1	0	0	Memory & L2 Cache Detecting and Sizing
1	1	0	0	Testing F segment shadow to see whether its re-writable or not
0	0	1	0	Detecting CPU Information
1	0	1	0	Invoke VGA BIOS, Display Enabled
1	1	1	0	Test 8259 PIC Functionality
0	0	0	1	Initialize USB
1	0	0	1	Test all memory(Clear all extended memory to 0)
0	1	0	1	Initialize PS/2 Mouse
1	1	0	1	Program chipset register according to item described in setup & auto-configuration
0	0	1	1	Detect & Install all IDE devices
1	0	1	1	Detect & Install co-processor
0	1	1	1	Assign IRQs to PCI device
1	1	1	1	Booting operating system

**1 = Red**

**0 = Green**

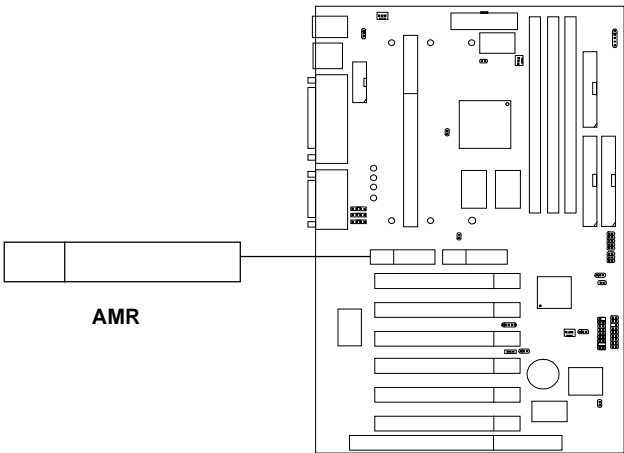
**2.31 TOP TECH. II: J3 (Optional)**

This is used to check the AGP card or BX chipset temperature. The J3 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. II” should be set to enabled.



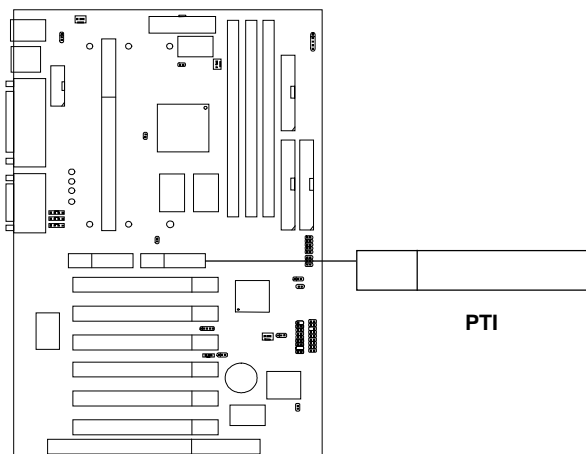
**2.32 AMR**

The Audio/Modem Riser specification is an open industry-standard specification that defines a hardware scalable Original Equipment Manufacturer (OEM) mainboard riser board and interface, which supports both audio and modem.



## 2.33 PTI

The Panel link/TV-Out Interface (PTI) is a MSI in-house designed which supportd either Panel link or TV-out function. To be able utilize both AMR and PTI simultaneously you need to use MSI product like MS-5965 & MS-5966 or MS-5964 & MS-5966.



**Note:** If there is Creative Hardware Audio Onboard and you want to use the MR (Modem Riser) card. Please set the CODAC to primary CODAC which is located on the MR card.