

Chapter 2

Hardware Installation

2.1 Central Processing Unit: CPU

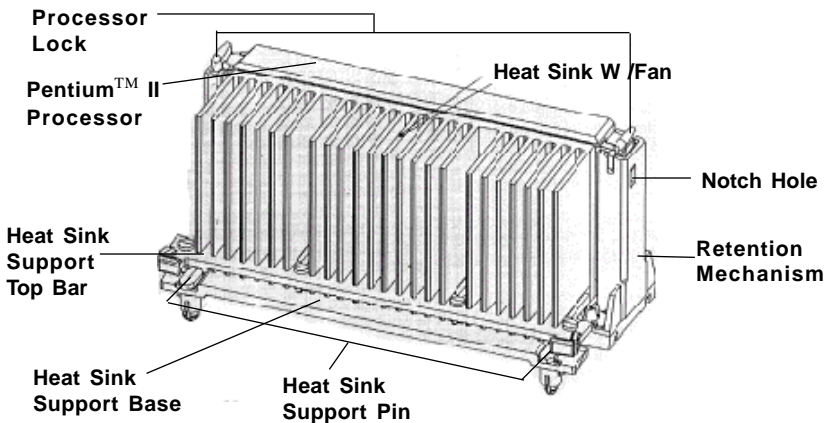
The mainboard operates with **Intel® Pentium™ II Processor** with MMX™ Technology. The mainboard provides a CPU Slot called Slot 1 for easy CPU installation, a DIP switch (SW) to set the proper speed for the CPU. The CPU should always have a Heat Sink and a cooling fan attached to prevent overheating.

CHAPTER 2 **HARDWARE INSTALLATION**

2.1-1 CPU Installation Procedure

There are two kinds of Pentium™ II Processor that is currently used. The OEM Pentium™ II Processor and the Boxed Pentium™ II Processor. OEM Pentium™ II Processor has no Heat Sink, Fan and Heat Sink Support, while the Boxed Pentium™ II Processor is provided with Heat Sink w/ fan and Heat Sink Support.

A. OEM Pentium™ II Processor Installation Procedures



Required Things:

Pentium™ II Processor - Processor.

***Retention Mechanism(RM)** - Plastic Guide that holds the S.E.C. Catridge in the Slot 1 connector.

***Heat Sink Support Base (HSSBASE)** - Plastic support bar mounted to the mainboard under the ATX heatsink.
(One leg is always bigger than the other one)

***Heat Sink Support Pin (HSSPIN)** - Plastic pins inserted through the HSSBASE to secure it to the mainboard (2 required per Assembly).

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***Heat Sink Support Top Bar (HSSTOP)** - Plastic bar that clips onto the HSSBASE through the fins on the ATX heatsink.

****Heat Sink w/ fan** - Heat Sink that can be attach to the **Pentium™ II Processor** with metal clip.

Note: * Provided by MSI mainboard.

 ** Provided by Special request.

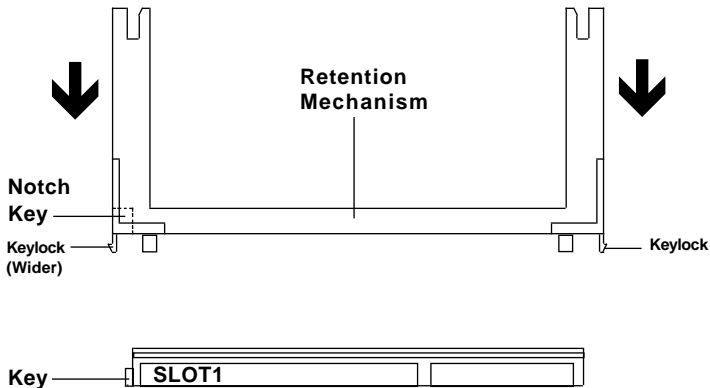


CHAPTER 2 **HARDWARE INSTALLATION**

Step 1: Place the bubble bag that came with your mainboard or use any soft material like Styrofoam underneath the mainboard. Find a flat surface to do the installation.

Step 2: Install the Retention Mechanism.

Look for the key on Slot 1, and match it with the Notch Key on the Retention Mechanism for the proper direction. Then, insert the Two Keylock of the Retention Mechanism into the two holes on the sides of Slot 1. Take note that one hole is wider than the other. The Retention Mechanism will only fit in one direction.

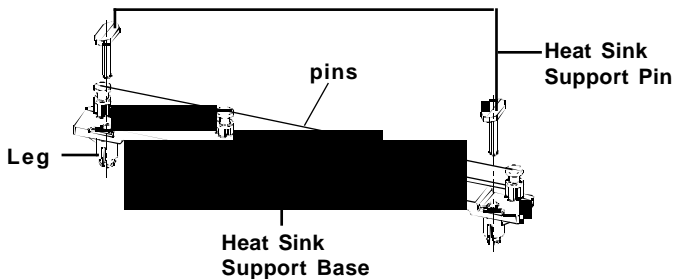


Push the Retention Mechanism onto the mainboard, until you hear a “click” sound. Check for a perfect fit.

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Step 3: Install the Heat Sink Support Base.

Look for the Two holes across Slot 1, and match it with the Two legs of the Heat Sink Support Base for the proper direction. Take note that one hole/leg is bigger than the other. The Four top pins of the Heat Sink Support Base should also be oriented towards Slot 1.



Push the Heat Sink Support Base onto the mainboard, until you hear a click sound. Check for a perfect fit.

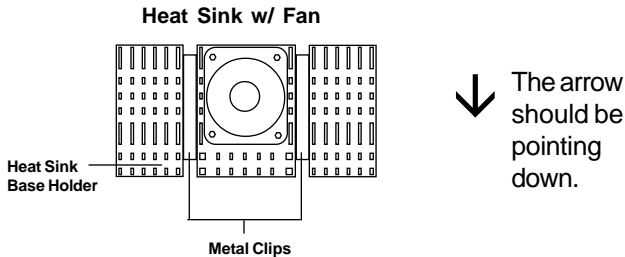
Step 4: Install the Heat Sink Support Pin.

Push the Heat Sink Support Pins onto the two holes of the Heat Sink Support Base. Check for a perfect fit. These pins are used to secure the Heat Sink Support Base.

CHAPTER 2 **HARDWARE INSTALLATION**

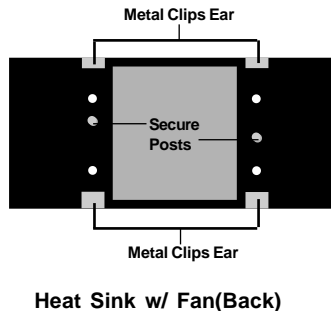
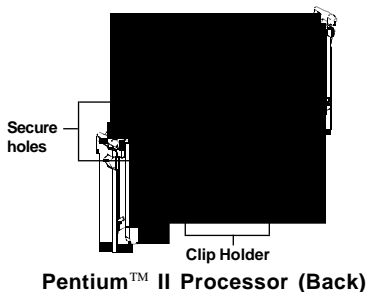
Step 5: Install the Heat Sink with Fan to the Processor.

Push down the metal clips, so that they are in line with the back of the Heat Sink. Be careful, so as not to detach the metal clips from the Heat Sink.



In case the metal clips are detached from the Heat Sink, re-attach them. Look for the arrow on the metal clip. This arrow should be pointing down and aligned with the Heat Sink Support Base Holder.

Attach the Heat Sink to the processor.



- Look at the back of the Heat Sink and take note of the 2 secure posts. Insert these 2 Secure posts to the 2 secure holes on the back of the processor.
- Align the ears of the metal clips with the clip holders on the back of the processor. Use a screw driver to push the metal clips onto the clip holders. Check for a perfect fit.

CHAPTER 2 HARDWARE INSTALLATION

Step 6: Install the Processor.

Unlock the Processor by pushing in the Processor locks.



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

Step 7: Lock the Processor Locks.

Secure the CPU by pushing out the Processor Locks.



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Step 8: Install the Heat Sink Support Top Bar.

Push the Heat Sink Support Top Bar to the Heat Sink Support Base, Until you hear a “click” sound. Check for a perfect fit.



Heatsink
Support Top
Bar

The installation is now complete.

CHAPTER 2 **HARDWARE INSTALLATION**

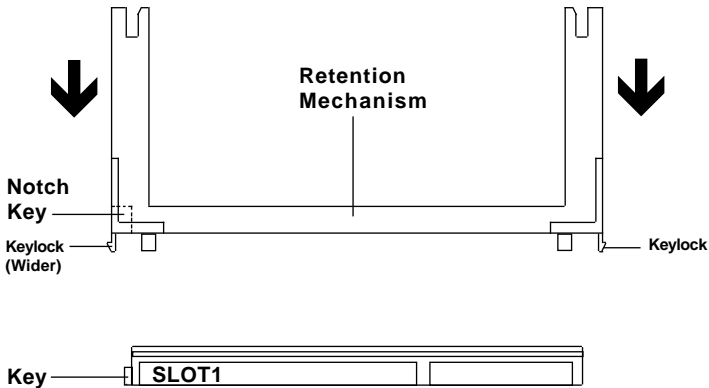
B. Boxed Pentium™ II Processor Installation Procedures

The Boxed Pentium™ II Processor has a built- in Fan and Heat Sink. It also has a Heat Sink Support. So if you're going to use a Boxed Pentium™ II Processor, all you need is the Retention Mechanism.

Step 1: Place the bubble bag that came with your mainboard or use any soft material like Styrofoam underneath the mainboard. Find a flat surface to do the installation.

Step 2: Install the Retention Mechanism.

Look for the key on Slot 1, and match it with the Notch Key on the Retention Mechanism for the proper direction. Then, insert the Two Keylock of the Retention Mechanism into the two holes on the sides of Slot 1. Take note that one hole is wider than the other. The Retention Mechanism will only fit in one direction.

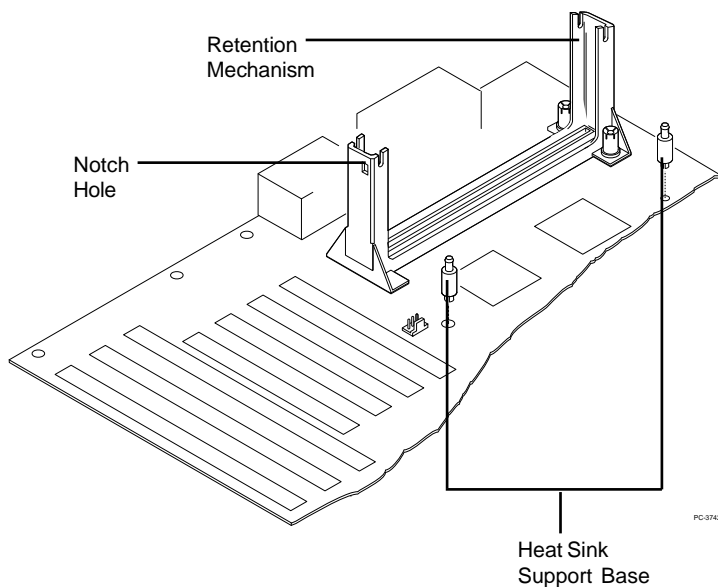


Push the Retention Mechanism onto the mainboard, until you hear a "click" sound. Check for a perfect fit.

CHAPTER 2 **HARDWARE INSTALLATION**

Step 3: Install the Heat Sink Support Base.

Look for the 2 holes across Slot 1, and match it with the 2 Heat Sink Support Base. Take note that one hole/base is bigger than the other.

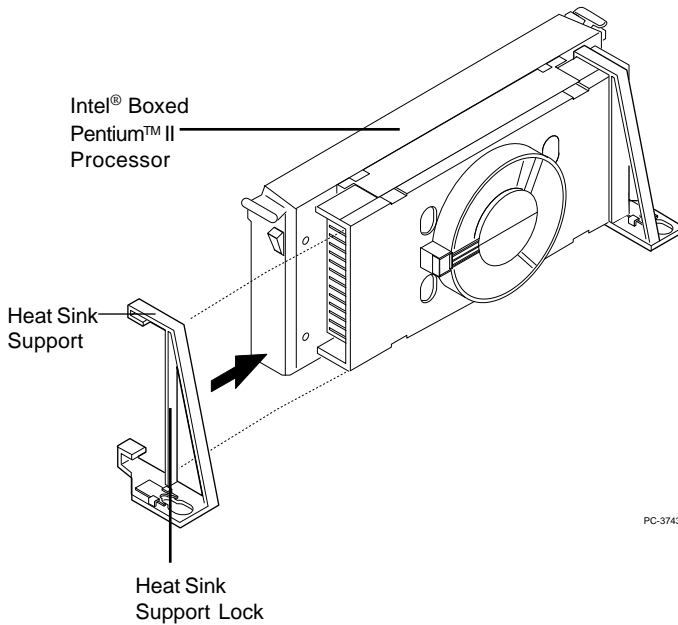


Push the Heat Sink Support Base onto the mainboard, until you hear a click sound. Check for a perfect fit.

CHAPTER 2 **HARDWARE INSTALLATION**

Step 4: Install the Heat Sink Support.

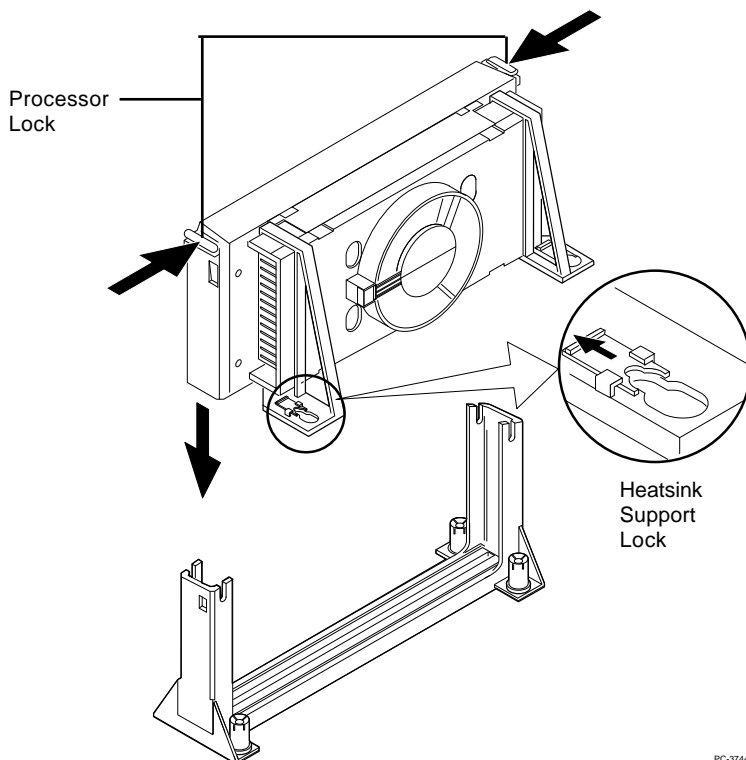
Attach the 2 Heat Sink Supports to the sides of the Processor. These Heat Sink Supports will fit in any direction, so be sure that the Heat Sink Support Locks are oriented outwards for the proper direction.



CHAPTER 2 **HARDWARE INSTALLATION**

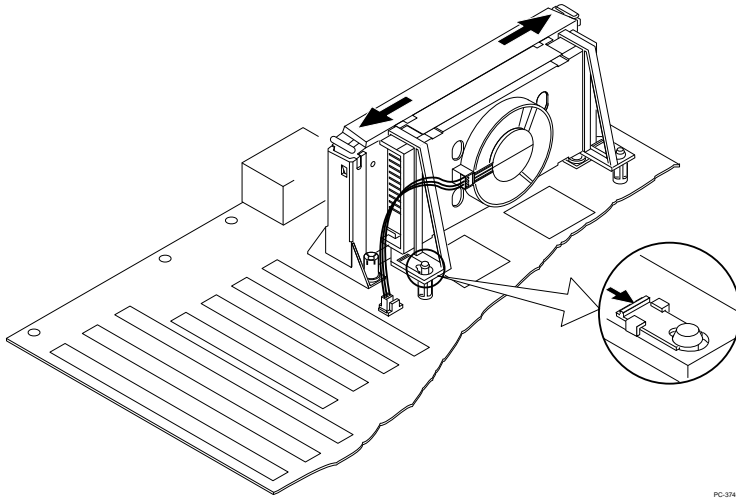
Step 5: Unlock the Processor Locks and Heat Sink Support Locks.

Push in the Processor Locks. Open the Heat Sink Support Locks.



Step 6: Insert the Processor like inserting a PCI or an ISA card.

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Step 7: Lock the Processor Locks and Heat Sink Support Locks

Secure the CPU by pushing out the Processor Locks. Close the Heat Sink Support Locks.

The installation is now complete.

CHAPTER 2 **HARDWARE INSTALLATION**

2.1-2 CPU Core Speed Derivation Procedure

1. The 2 CPU clock frequencies that the system supports are 60 MHz, 66MHz (To adjust SW1 pin 1, 2, 3 and 4). See the following chart to set the different Host Clock Frequencies.

SW1				CPU
1	2	3	4	CLOCK
OFF	OFF	ON	ON	60MHz
ON	ON	OFF	OFF	66MHz

2. The DIP Switch SW1 (5, 6, 7 and 8) is used to set the Core/Bus (Fraction) ratio of the CPU. The actual core speed of the CPU is the Host Clock Frequency multiplied by the Core/Bus ratio. For example:

$$\begin{array}{llll}
 \text{If} & \text{CPU Clock} & = & 66\text{MHz} \\
 & \text{Core/Bus ratio} & = & 7/2 \\
 \text{then} & \text{CPU core speed} & = & \text{Host Clock} \times \text{Core/Bus ratio} \\
 & & = & 66.6\text{MHz} \times 7/2 \\
 & & = & 233\text{MHz}
 \end{array}$$

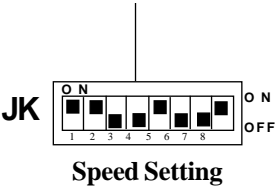
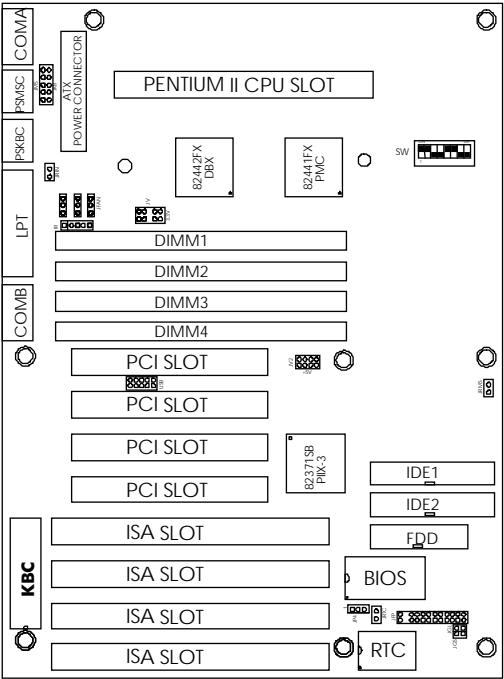
SW1				CPU
5	6	7	8	CORE/BUS RATIO
ON	ON	ON	OFF	4/1
ON	ON	OFF	OFF	5/1
ON	OFF	OFF	ON	7/2
ON	OFF	ON	OFF	9/2
ON	OFF	OFF	OFF	11/2
OFF	ON	ON	ON	6/1
OFF	ON	OFF	ON	7/1
OFF	ON	ON	OFF	8/1
OFF	OFF	ON	ON	13/2
OFF	OFF	OFF	ON	15/2

3. The PCI Bus Clock is the CPU Clock Frequency divided by 2.

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2.1-3 CPU Speed Setting: JK

To adjust the speed of the CPU, you must know the specification of your CPU (*always ask the vendor for CPU specification*) then look at **Table 2.1 (Intel® 233 ~ 266MHz Pentium™ II Processor Card)** for proper setting.



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Table 2.1 Intel® 233 ~ 266MHz Pentium™ II Processor Card

Intel® Pentium™ II Processor is currently available in two speed setting: 233MHz and 266MHz . For future reference, refer to the CPU core speed derivation procedure on **Section 2.1-2**.

SPEED SETTING



Intel® 233MHz Pentium™ II Processor Card

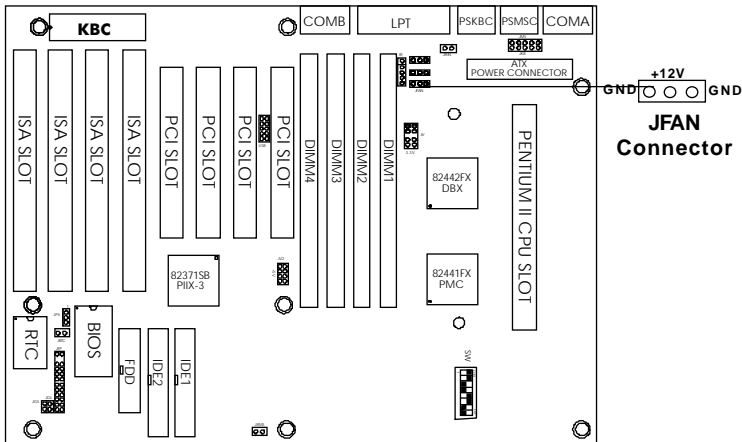


Intel® 266MHz Pentium™ II Processor Card

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2.1-5 CPU Fan Power Connector: JFAN

This connector supports CPU cooling fan with +12V. It supports both two and three pin head connector. When connecting the wire to the connector, always take note that the red wire is positive and should be connected to the +12V.

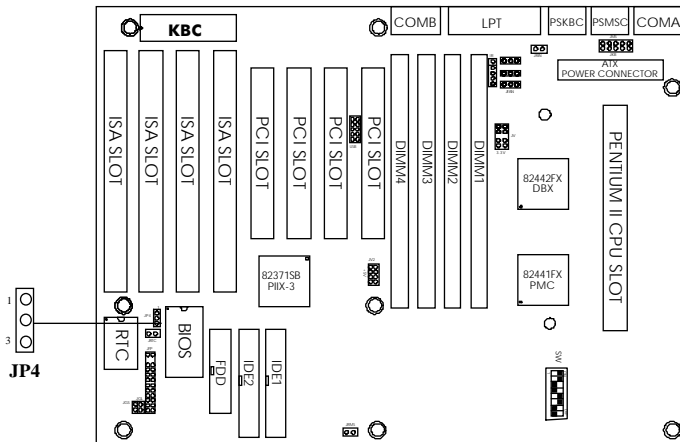


Note: Always consult vendor for proper CPU cooling fan.

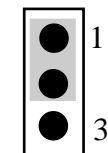
CHAPTER 2 **HARDWARE INSTALLATION**

2.2 Flash ROM Programming Voltage: JP4

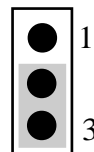
This jumper is for setting the Voltage of the Flash ROM BIOS.



Voltage Setting



+12V



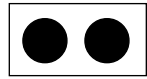
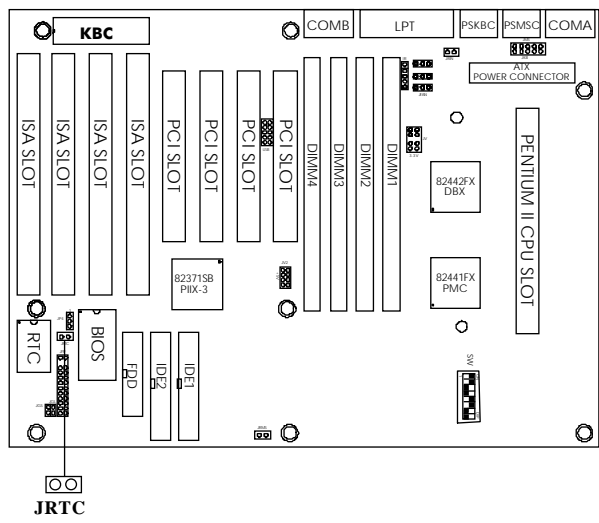
**+5V
(default)**

Note: SST & Winbond Flash ROM are set in +5V
MXIC & Intel Flash ROM are set in +12V.

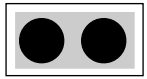
CHAPTER 2 **HARDWARE INSTALLATION**

2.3 CMOS RAM Clear: JRTC

This jumper is for clearing the RTC data.



**Keep Data
(default)**



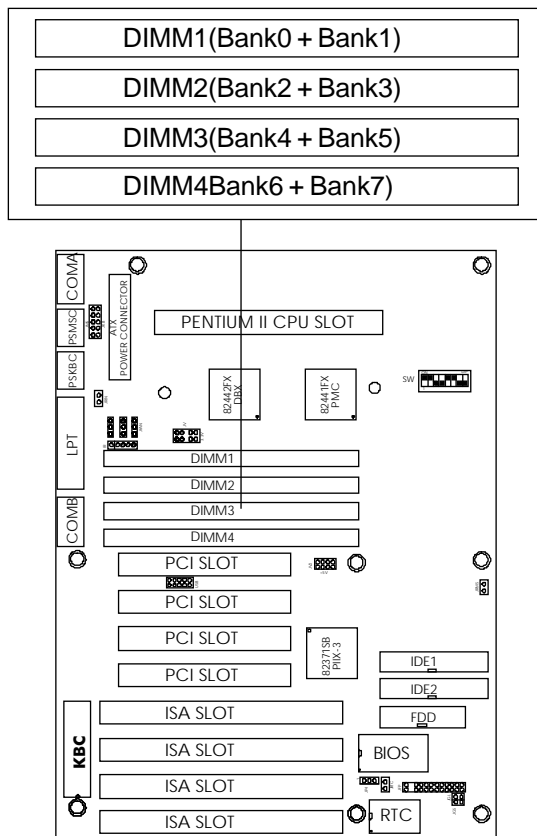
Clear

CHAPTER 2 **HARDWARE INSTALLATION**

2.4 Memory Installation

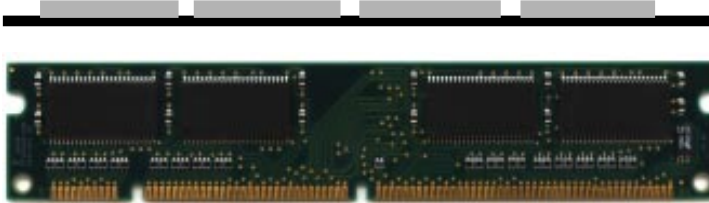
2.4-1 Memory Bank Configuration

The system board supports a maximum of 1 GB of memory: It provides Four 168-pin unbuffered DIMMs (Double In-Line Memory Module) sockets. It supports 8 MB up to 256 MB of memory. The memory module can be either FP (Fast Page), EDO (Extended Data Output) or BEDO (Burst Extended Data Output) Mode DRAM. A DIMM consist of two Banks and may have a maximum of 256 MB of memory.

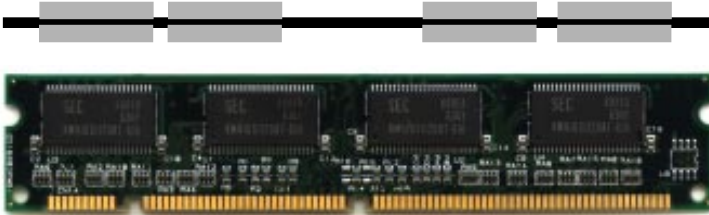


CHAPTER 2 **HARDWARE INSTALLATION**

A. How to install a DIMM Module

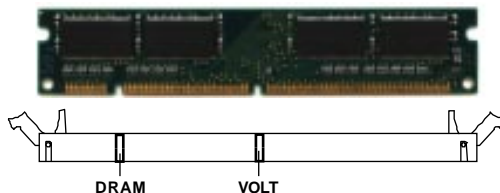


Single Sided DIMM



Double Sided DIMM

1. The DIMM slot has a two Notch Key “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.

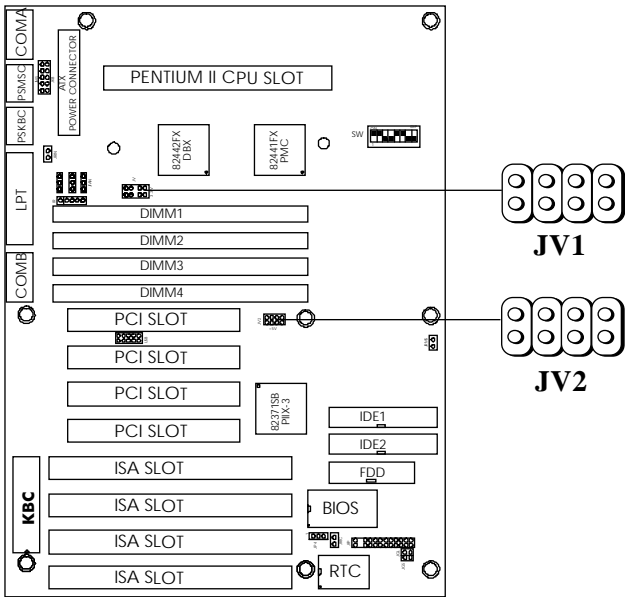




3. Close the plastic clip at the side of the DIMM slot.

Note: You can use a 5 volt or a 3.3 volt DIMM module (EDO, FP or BEDO), but cannot mixed 5 volt with 3 volt of DIMM module.

CHAPTER 2 **HARDWARE INSTALLATION**

A.1 DIMM Power Voltage Selector : JP1



DIMM Voltage	
5V	 JV2
3.3V	 JV1

DIMM Power Level : 3.3V or 5V

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2.2-1 Memory Population Rule

1. You can use any kind of DIMM **except for BEDO**.
2. To operate properly at least one 168-pin DIMM module must be installed.
3. This mainboard supports Table Free so memory can be installed on DIMM1, DIMM2, or DIMM 3.
4. The DRAM addressing and the size supported by the system board is shown below.

Memory Mapping Options

DRAM Tech.	Memory Org.	Addressing	Address Size	MB/DIMM	
				Single Side	Double Side
4M	1M x 4	Symmetric	10 x 10	8MB	16MB
16M	1M x 16	Symmetric	10 x 10	8MB	16MB
	2M x 8	Asymmetric	11 x 10	16MB	32MB
	4M x 4	Symmetric	11 x 11	32MB	64MB
64M	4M x 16	Symmetric	11 x 11	32MB	64MB
	8M x 8	Asymmetric	12 x 11	64MB	128MB
	16M x 4	Symmetric	12 x 12	128MB	256MB

CHAPTER 2 HARDWARE INSTALLATION

2.5 Case Connector: JFP

The Turbo LED, Hardware Reset, Key Lock, Power LED, Power Saving LED, Power Saving Switch, Speaker and HDD LED are all connected to the JFP connector block.

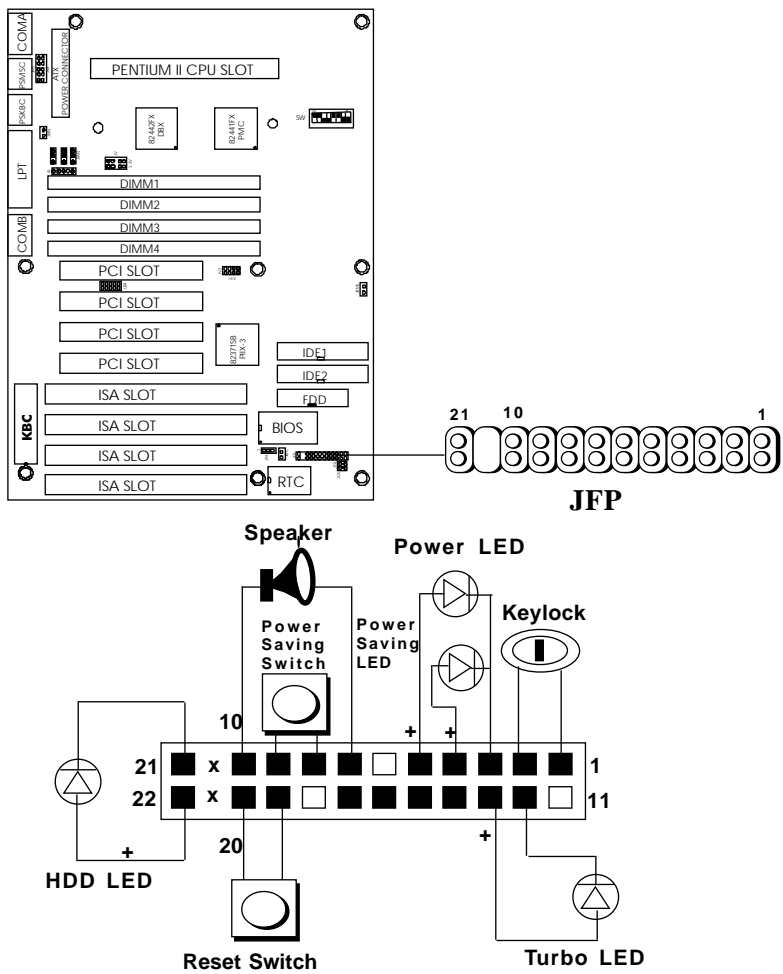


Figure 2.1

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2.5-1 Turbo LED

The Turbo LED is always lit. You can connect the Turbo LED from the system case to this pin. (See Figure 2.1)

2.5-2 Hardware Reset

Reset switch are use to reboot the system rather than turning the power ON/OFF. You can connect the Reset switch from the system case to this pin. Avoid rebooting while the HDD LED is lit. (See Figure 2.1)

2.5-3 Keylock

Keylock allows you to disable the keyboard for security purposes. You can connect the keylock. (See Figure 2.1)

2.5-4 Power LED

The Power LED is always lit while the system power is on. You can connect the Power LED from the system case to this pin. (See Figure 2.1)

2.5-5 Speaker

Speaker from the system case are connected to this pin. (See Figure 2.1)

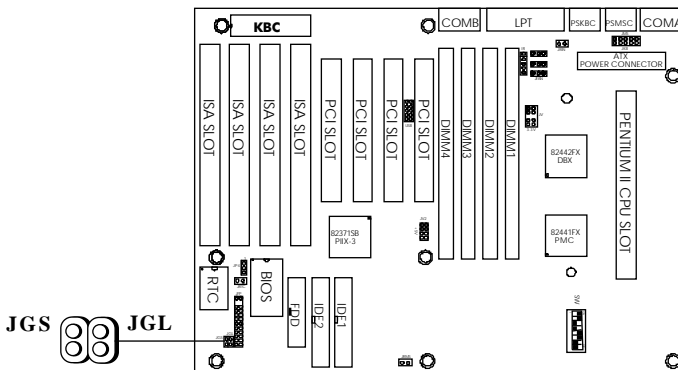
2.5-6 HDD LED

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. (See Figure 2.1).

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2.6 Power Saving Switch Connector: JGS/ Power Saving LED Connector: JGL

Attach a power saving switch to **JGS**. When the switch is pressed, the system immediately goes into suspend mode. Press any key and the system wakes up. **JGL** are used to monitor the **JGS**, you could attach a LED indicator to this connector.

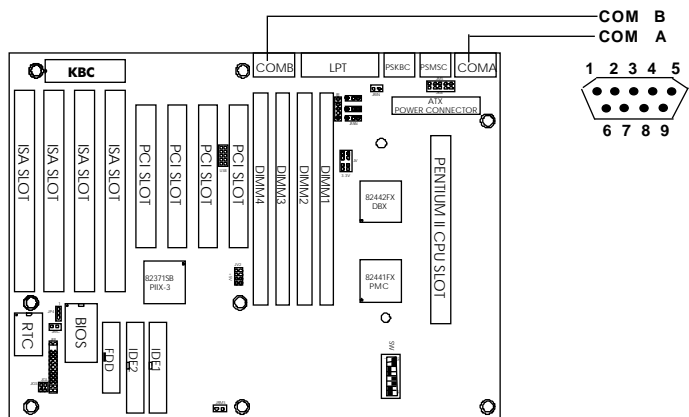


Note: You should enable the Power Management Mode (at BIOS setup) to use this function.

CHAPTER 2 **HARDWARE INSTALLATION**

2.7 Serial Port Connectors: COM A & COM B

The system board has two 9-pin male DIN connectors for serial ports COM A and COM B. These two ports are 16550A high speed communication ports that send/receive 16 bytes FIFOs. You can attach a mouse or a modem cable directly into these connectors.



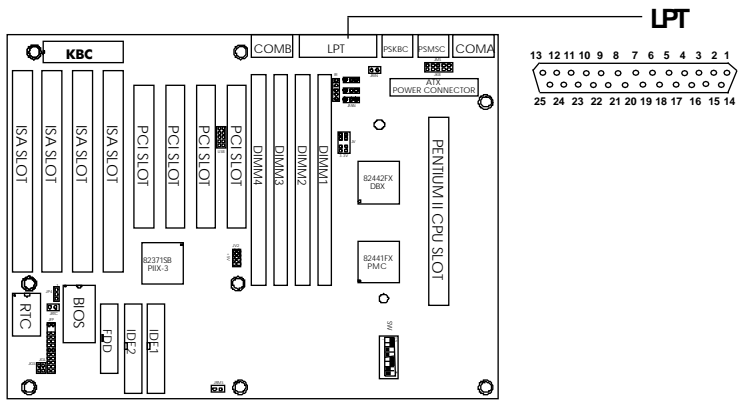
PIN DEFINITION

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

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2.8 Parallel Port Connectors: LPT

The system board 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:



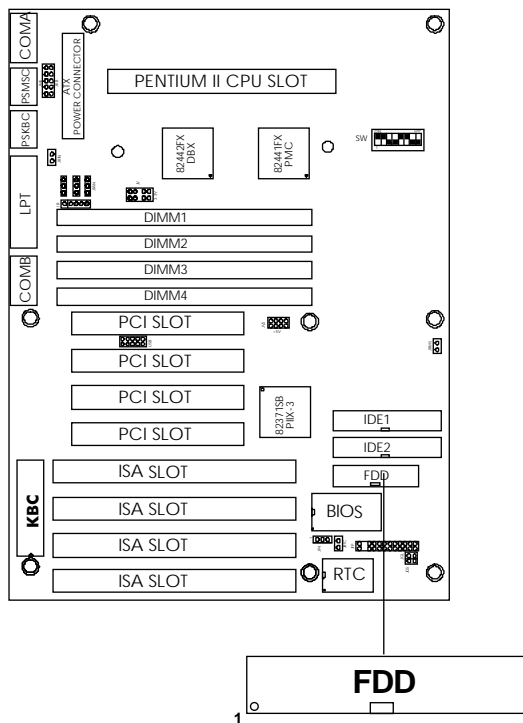
PIN DEFINITION

PIN #	DEFINITION	PIN #	DEFINITION
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		

CHAPTER 2 **HARDWARE INSTALLATION**

2.9 Floppy Disk Connector: FDD

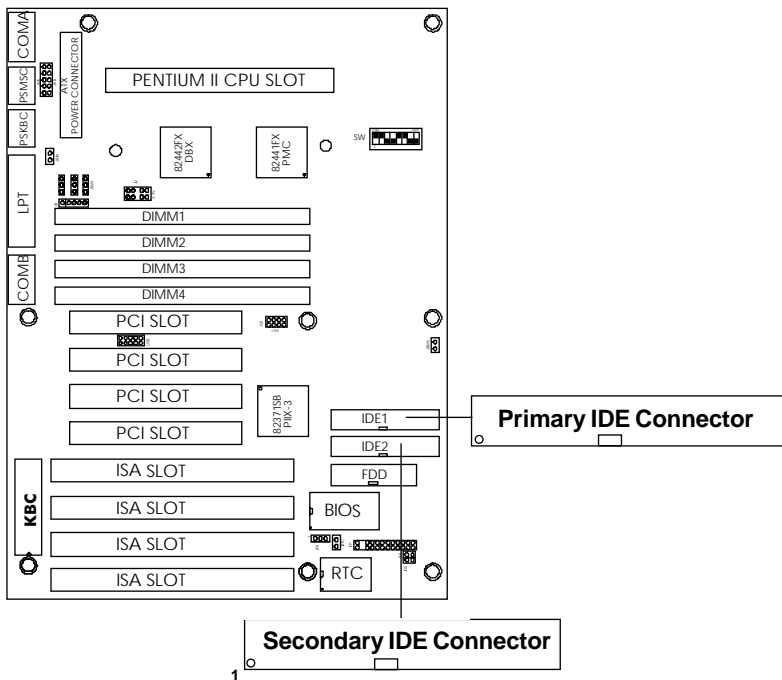
The system board also provides a standard floppy disk connector(FDD) that supports 360K, 720K, 1.2M, 1.44M and 2.88M floppy disk types. You can attach a floppy disk cable directly to this connector.



CHAPTER 2 **HARDWARE INSTALLATION**

2.10 Hard Disk Connector: IDE1 & IDE2

The system board has a 32-bit Enhanced PCI IDE Controller that provides for 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.



IDE1(Primary IDE connector)

The first hard disk should always be connected to IDE1. IDE1 can connect a Master and a Slave drive.

IDE2(Secondary IDE connector)

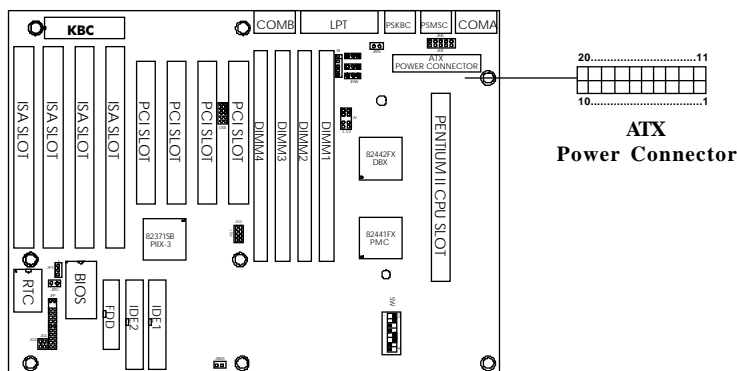
IDE2 can connect a Master and a Slave drive.

CHAPTER 2 **HARDWARE INSTALLATION**

2.11 **Power Supply**

2.11-1 **ATX 20-pin Power Connector: PWR20**

This type of connector already supports the remote ON/OFF function. If you use an ATX power supply you don't need to connect the JRMC. But need to connect the **Remote Power On/OFF switch JRMS (J10)**.



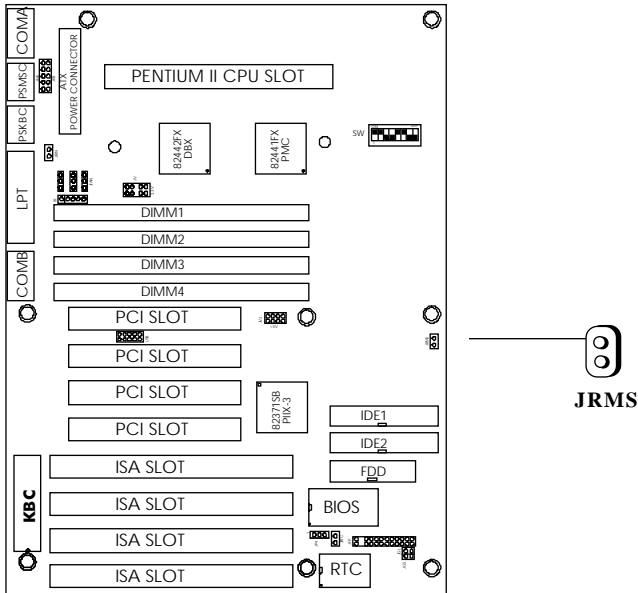
ATX Power Connector Pin Description

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

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2.11-2 Remote Power On/Off Switch: JRMS(J10)

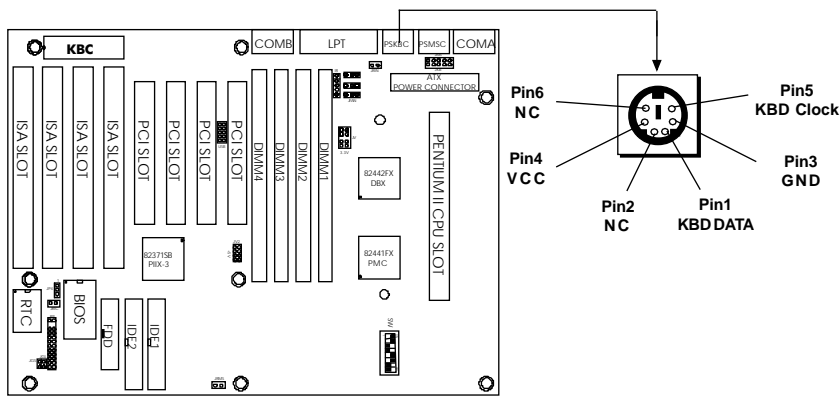
Connect to a 2-pin push button switch. Every time the switch is shorted by pushing it once, the power supply will change its status from OFF to ON and On to OFF. This is use for ATX type power supply.



CHAPTER 2 **HARDWARE INSTALLATION**

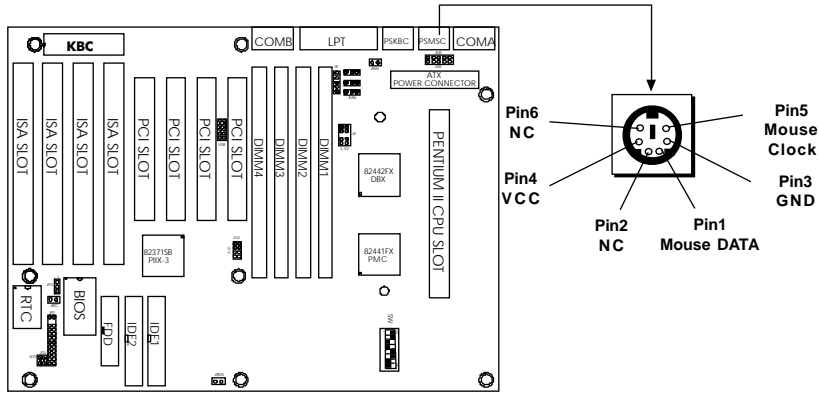
2.12 Keyboard Connector: PSKBC

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



2.13 Mouse Connector: PSMSC

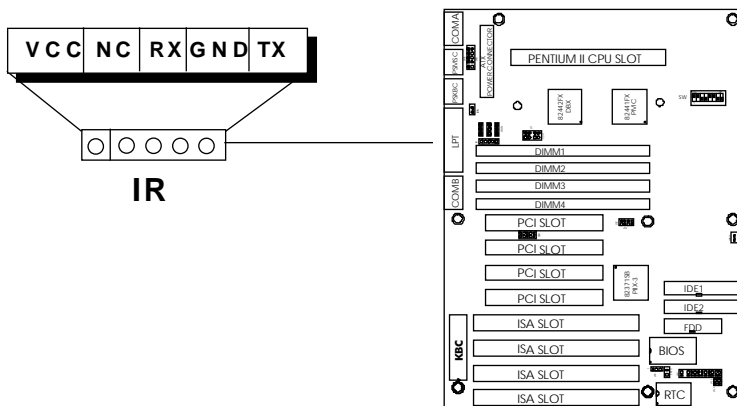
The system board provides a standard PS/2 style mouse mini DIN connector for attaching a PS/2 style mouse. You can plug a PS/2 style mouse directly into this connector. The connector location and pin definition as shown below:



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2.14 IrDA Infrared Module Connector: IR

The system board provides a 5-pin infrared connector(IR) for IR module. This connector is for optional wireless transmitting and receiving infrared module. You must configure the setting through BIOS setup.



2.15 USB Connector: USB (Reserved)

This 10-pin connector supports USB devices. This function is a reserved function.

