Chapter   2

Hardware Installation

This chapter gives you a step-by-step procedure on how to install your system. Follow each section accordingly.

!

Caution: Electrostatic discharge (ESD) can damage your processor, disk drives, expansion boards, and other components. Always observe the following precautions before you install a system component.

1.   Do not remove a component from its protective packaging until you are ready to install it.

2.   Wear a wrist ground strap and attach it to a metal part of the system unit before handling a component. If a wrist strap is not available, maintain contact with the system unit throughout any procedure requiring ESD protection.

Hardware Installation

2.1 Jumper and Connector Locations

The following figure shows the locations of the jumpers and connectors on the system board:
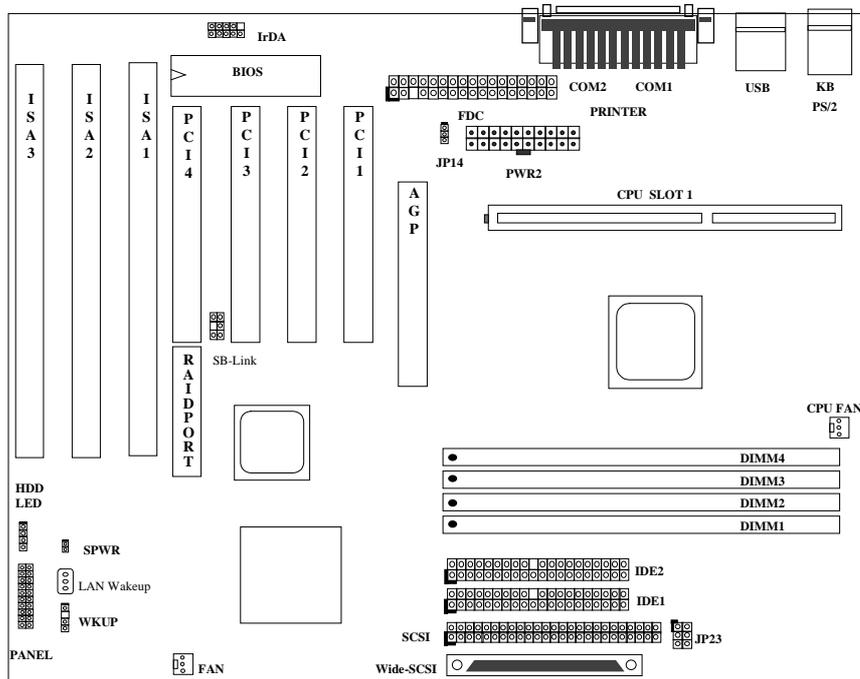
Jumpers:

JP14:	Clear CMOS
JP23:	AGP Ratio

Connectors:

PS2:	PS/2 mouse connector
KB:	PS/2 keyboard connector
COM1:	COM1 connector
COM2:	COM2 connector
PRINTER:	Printer connector
PWR2:	ATX power connector
USB:	USB connector
FDC:	Floppy drive connector
IDE1:	IDE1 primary channel
IDE2:	IDE2 secondary channel
CPUFAN:	CPU Fan connector
FAN:	Housing Fan Connector
IrDA:	IrDA (Infrared) connector
HDD LED:	HDD LED connector
PANEL:	Front panel (Multifunction) connector
SPWR:	ATX Soft-Power Switch Connector
MODEM-WKUP:	Modem Wake Up Connector
LAN-WKUP:	LAN Wake Up Connector
SB-LINK:	Creative PCI sound card connector

2.2 Jumpers

With the help of Pentium II VID signal and SMbus, this motherboard is jumper-less design.

2.2.1 Selecting the CPU Frequency

Pentium II VID signal and SMbus clock generator provide CPU voltage auto-detection and allow user to set CPU frequency through CMOS setup, no jumper or switch is needed. The correct CPU information is saved into EEPROM, with these technologies, the disadvantages of Pentium base jumper-less design are eliminated. There will be no worry of wrong CPU voltage detection and no need to re-open the housing if CMOS battery loss.

The CPU frequency selection is set by going into:

BOIS Setup à **Chipset Features Setup** à **CPU Clock Frequency**
(The possible setting is 66, 68.5, 75, 83.3, 100, 103, 112 and 133.3 MHz)

BOIS Setup à **Chipset Features Setup** à **CPU Clock Ratio**
(The possible setting is 1.5x, 2x, 2.5x, 3x, 3.5x, 4x, 4.5x, 5x, 5.5x, 6x, 6.5x, 7x, 7.5x, and 8x)

*Core frequency = Ratio * External bus clock*

INTEL Pentium II	CPU Core Frequency	Ratio	External Bus Clock
Pentium II - 233	233MHz =	3.5x	66MHz
Pentium II - 266	266MHz =	4x	66MHz
Pentium II - 300	300MHz =	4.5x	66MHz
Pentium II - 333	333MHz =	5x	66MHz
Pentium II - 350	350MHz=	3.5x	100MHz
Pentium II - 400	400MHz=	4x	100MHz
Pentium II - 450	450MHz=	4.5x	100MHz
Celeron 266	266MHz=	4x	66MHz
Celeron 300	300MHz	4.5x	66MHz
Celeron 300A	300MHz	4.5x	66MHz
Celeron 333	333MHz	5x	66MHz

Warning: *INTEL 440BX chipset supports maximum 100MHz external CPU bus clock, the 103, 112 and 133.3MHz are for internal test only.* **These settings exceed the specification of BX chipset, which may cause serious system damage***.*

2.2.2 Setting the CPU Voltage

This motherboard supports Pentium II VID function, the CPU core voltage is automatically detected, the range is from 1.3V to 3.5V.

2.2.3 Clearing the CMOS

JP14	Clear CMOS
1-2	Normal operation (default)
2-3	Clear CMOS

You need to clear the CMOS if you forget your system password. To clear the CMOS, follow the procedures listed below:
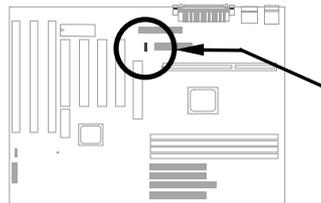
JP14

Normal Operation
(default)

JP14

Clear CMOS

The procedure to clear CMOS:

1. Turn off the system and unplug the AC power.
2. Remove ATX power cable from connector PWR2.
3. Locate **JP14** and short pins 2-3 for a few seconds.
4. Return **JP14** to its normal setting by shorting pins 1-2.
5. Connect ATX power cable back to connector PWR2.
6. Turn on the system power.
7. Press DEL during bootup to enter the BIOS Setup Utility and specify a new password, if needed.

Tip: *If your system hangs or fails to boot because of over-clocking, please clear CMOS and the system will go back to default setting (233MHz).*

Hardware Installation

> **Tip:** *Except using JP14, you may also press <Home> key. By this smart design, it would be more convenient to clear CMOS. For using this function, you just need to press <Home> key first and then press Power button at the same time. After doing this, the system will return to the default setting (233MHz).*

2.2.4 AGP Ratio

JP23	AGP Ratio
1-2	Auto (default)
3-4	2/3
5-6	1/1

To improve system performance, AX6B has implemented this jumper for AGP to synchronize the CPU 100Mhz (or above) external frequency. We recommend you choose a better AGP card for overclocking. Some AGP cards can not take 100MHz bus frequency and may cause overclocking failure.
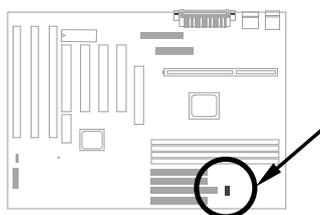
JP23	JP23	JP23
Auto (Default)	2/3	1/1

There is a "66/100" signal pin from CPU for BX chipset to automatically identify AGP clock, this is important for jumperless design. When a 66MHz Pentium II CPU is used, the north bridge will synchronize the CPU external frequency and the AGP bus frequency. Therefore, when you set the CPU external frequency to 100MHz, the AGP bus will also runs at 100MHz.

With 100MHz Pentium II CPU, the north bridge automatically set AGP frequency to 2/3 AGP frequency. In other words, the AGP card will still runs at 66MHz while the CPU is running at 100MHz external frequency.

Except Auto setting, you may also set this jumper to 2/3 or 1/1. Below is a table for better understanding:

CPU Type	66/100 signal	Bus clock	AGP clock	JP23
66MHz	Low	66MHz	66MHz	1-2
66MHz	Low	100MHz	100MHz	1-2
66MHz	Low	100MHz	66MHz	3-4
100MHz	High	100MHz	66MHz	1-2
100MHz	High	100MHz	66MHz	3-4
100MHz	High	100MHz	100MHz	5-6
100MHz	High	133MHz	88.6MHz	1-2
100MHz	High	133MHz	88.6MHz	3-4
100MHz	High	133MHz	133MHz	5-6

Warning: *The specification of AGP is maximum 66Mhz clock. If the bus clock is larger than 66MHz, setting this item to Enabled may cause serious system damage.*

2.3 Connectors

2.3.1 Power Cable

The ATX power supply uses 20-pin connector shown below. Make sure you plug in the right direction.

> **Caution:** *Make sure that the power supply is off before connecting or disconnecting the power cable.*
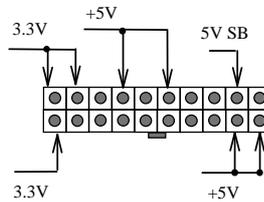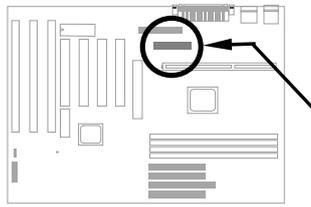
PWR2

2.3.2 ATX Soft-Power Switch Connector

The ATX soft-power switch connector is a 2-pin header on the system board. Locate the power switch cable from your ATX housing. It is 2-pin female connector from the housing front panel. Plug this connector to the soft-power switch connector marked **SPWR**.
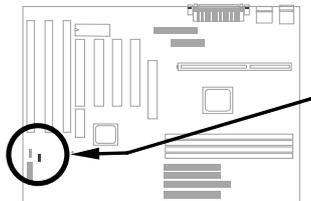
SPWR

2.3.3 Fan

Plug in the fan cable to the 3-pin fan connector onboard. The fan connector is marked **CPU FAN** and **FAN** on the system board.

SENSE
+12V
GND
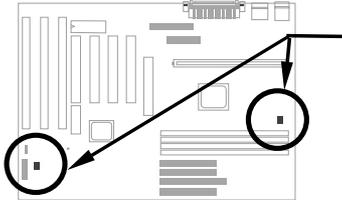
CPUFAN and FAN

> **Note:** *Attach fan cable to either CPU FAN connector or FAN connector. Both of these two fans connectors can support hardware monitoring function, however, you can only use the CPU FAN connector to control the fan power ON/OFF.*

2.3.4 PS/2 Mouse

The onboard PS/2 mouse connector is a 6-pin Mini-Din connector marked **PS2**. The view angle of drawing shown here is from back panel of the housing.


PCB

PS/2 Mouse
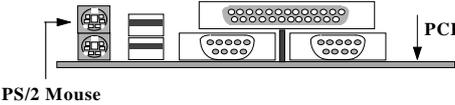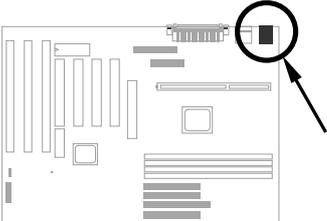
2.3.5 Keyboard

The onboard PS/2 keyboard connector is a 6-pin Mini-Din connector marked **KB2**. The view angle of drawing shown here is from back panel of the housing.
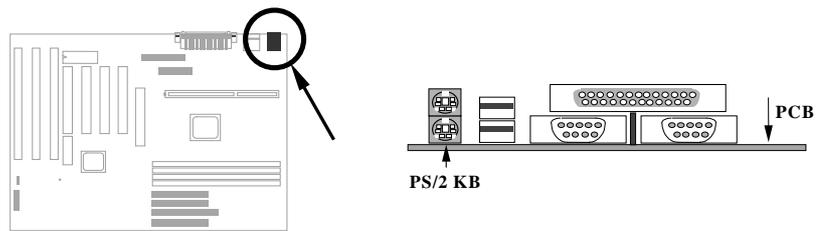

2.3.6 Serial Devices (COM1/COM2)

The onboard serial connectors are 9-pin D-type connector on the back panel of mainboard. The serial port 1 connector is marked as **COM1** and the serial port 2 connector is marked as **COM2.**
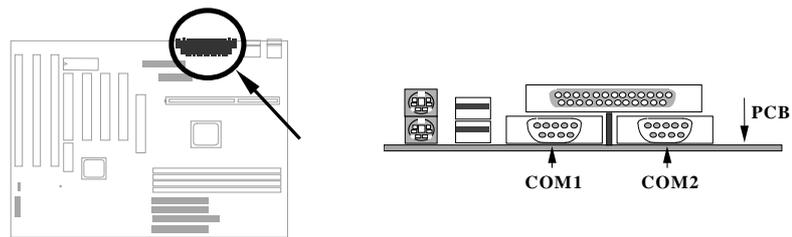
2.3.7 Printer

The onboard printer connector is a 25-pin D-type connector marked **PRINTER**. The view angle of drawing shown here is from back panel of the housing.
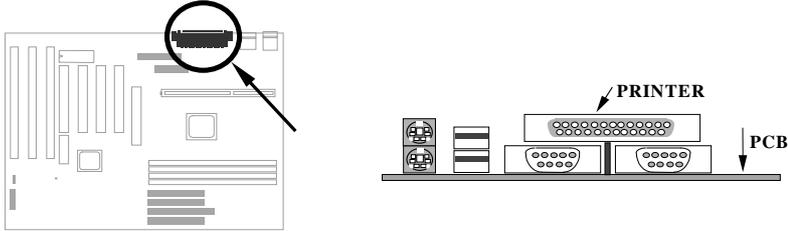

2.3.8 USB Device

You   can attach USB devices to the USB connector. The motherboard contains two USB connectors, which are marked as **USB.**
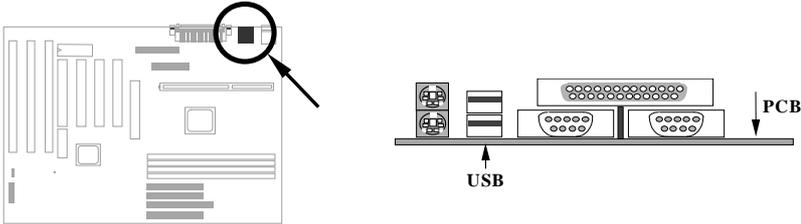
Hardware Installation

2.3.9 Floppy Drive

Connect the 34-pin floppy drive cable to the floppy drive connector marked as **FDC** on the system board.


FDC
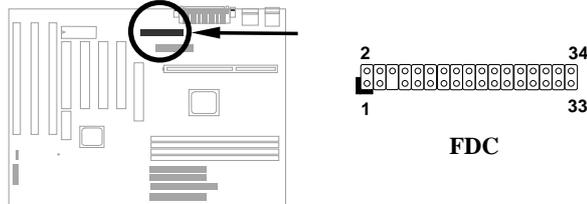
2.3.10 IDE Hard Disk and CD ROM

This mainboard supports two 40 pin IDE connectors marked as **IDE1** and **IDE2.** IDE1 is also known as primary channel and IDE2 as secondary channel, each channel supports two IDE devices that makes total of four devices.

In order to work together, the two devices on each channel must be set differently to master and slave mode, either one can be hard disk or CDROM. The setting as master or slave mode depends on the jumper on your IDE device, please refer to your hard disk and CDROM manual accordingly.

Connect your first IDE hard disk to master mode of the primary channel. If you have second IDE device to install in your system, connect it as slave mode on the same channel, and the third and fourth device can be connected on secondary channel as master and slave mode respectively.


IDE2

IDE1
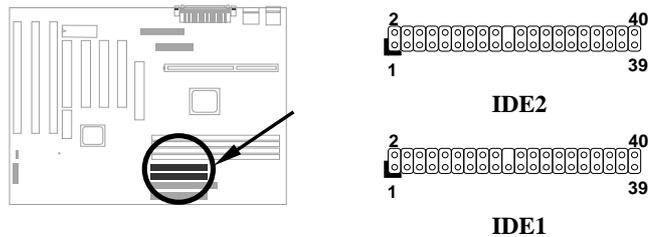
> **Caution**: *The specification of IDE cable is maximum 46cm (18 inches), make sure your cable does not excess this length.*
>
> **Caution:** *For better signal quality, it is recommended to set far end side device to master mode and follow the suggested sequence to install your new device. Please refer to following figure.*
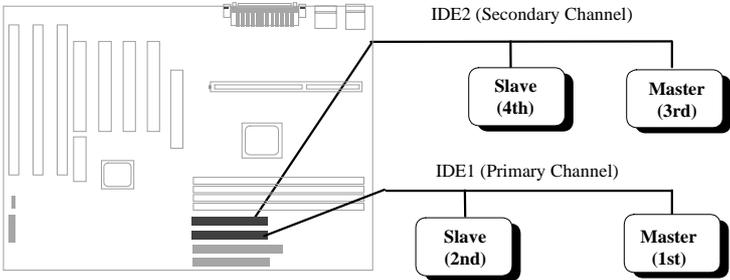
2.3.11 SCSI Devices

Connect your SCSI devices to the on board 68-pin **WIDE-SCSI** or 50-pin **SCSI** connector.
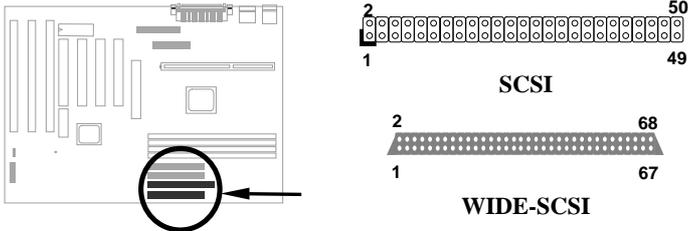
2.3.12 Hard Disk LED

The HDD LED connector is marked as **HDD LED** on the board. This connector is designed for different type of housing, actually only two pins are necessary for the LED. If your housing has four pin connector, simply plug it in. If you have only two pin connector, please connect to pin 1-2 or pin 3-4 according to the polarity.

Pin	Description
1	HDD LED
2	GND
3	GND
4	HDD LED

HDD LED	HDD LED	HDD LED
4-pin connector	2-pin connector at pin 1-2	2-pin connector at pin 3-4
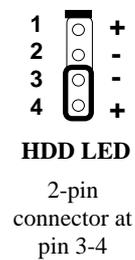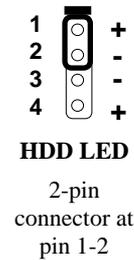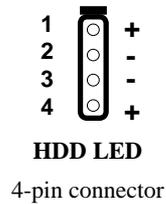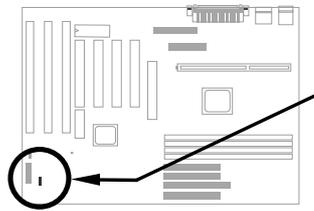
2.3.13 SB-LINK

SB-LINK is used to connect Creative PCI sound card. If you have a Creative PCI sound card installed, it is necessary to link the card to this connector for compatibility issue under DOS environment.

Pin	Description
1	GNT#
2	GND
3	NC
4	REQ#
5	GND
6	SIRQ#

SB-LINK
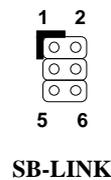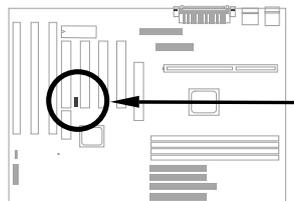
### 2.3.14 Panel Connector

The Panel (multifunction) connector is a 20-pin connector marked as **PANEL** on the board. Attach the power LED, keylock, speaker, and reset switch to the corresponding pins as shown in the figure.

Some housings have a five-pin connector for the keylock and power LED Since power LED and keylock are aligned together, you can still use this kind of connector.

```
        1  11
 GND   ○ ○   +5V
 KEYLOCK  ○ ○   GND
 ACPI & POWER LED  ○ ○   Reserved
 GND   ○ ○   GND
 +5V   ○ ○   NC
 SPEAKER  ○ ○   NC
 +5V   ○ ○   GND
 GND   ○ ○   NC
 NC   ○ ○   RESET
 SPEAKER  ○ ○   GND
       10  20
```

PANEL


```
        1  11
Keylock  +
ACPI &
Power LED  +
        +
Speaker       +
              Reset
       10  20
```
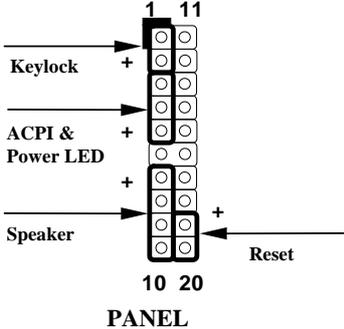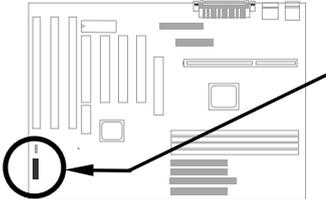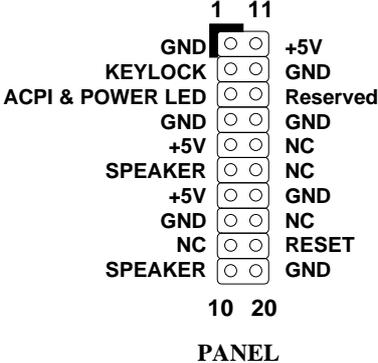
PANEL

Other housings may have a 12-pin connector. If your housing has this type of connector, connect it to PANEL as shown in the figure. Make sure that the red wire of the connector is connected to +5V.

```
        1  11
 ○ ○   +5V
 ○ ○
 ○ ○
 ○ ○
 ○ ○
 ○ ○
 ○ ○
 ○ ○
 ○ ○
 ○ ○
       10  20
```

PANEl
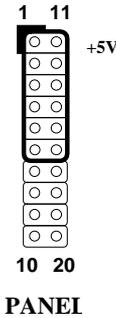
Hardware Installation

2.3.15 IrDA Connector

The IrDA connector can be configured to support wireless infrared module, with this module and application software such as Laplink or Win95 Direct Cable Connection, user can transfer files to or from laptops, notebooks, PDA and printers. This connector supports HPSIR (115.2Kbps, 2 meters), ASK-IR (56Kbps) and Fast IR (4Mbps, 2 meters).

Install infrared module onto **IrDA** connector and enable infrared function from BIOS setup, make sure to have correct orientation when you plug onto IrDA connector.

Pin	Description
1	+5V
3	FIRRX (FAST IR)
4	CIRRX
5	IRRX (STANDARD IR)
6	5VSB
7	GND
9	IRTX (STANDARD IR)


```
2  4  6  8  10
 O  O  O  O  O
 O  O  O  O  O
1  3  5  7  9
```

IrDA
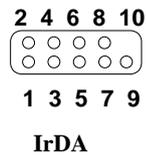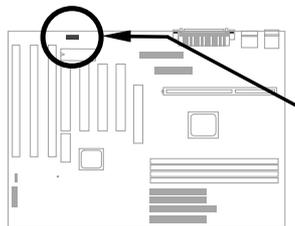
2.3.16 Modem Wake-up Connector

This mainboard implements special circuit to support Modem Ring-On, both Internal Modem Card (AOpen MP56) and external box Modem are supported. Since Internal Modem card consumes no power when system power is off, it is recommended to use Internal Modem. To use AOpen MP56, connect 4-pin cable from **RING** connector of MP56 to **MODEM-WKUP** connector on the mainboard.

Pin	Description
1	+5V SB
2	NC
3	RING
4	GND

MODEM-WKUP
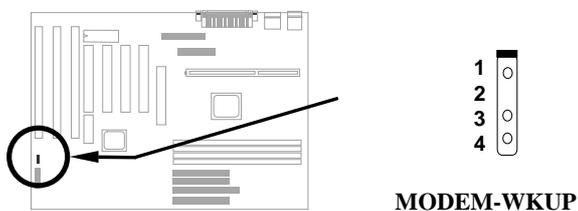
2.3.17 LAN Wake-up Connector

This mainboard implements a **LAN-WKUP** connector. To use LAN Wake-up function, you need a network card that supports this feature. In addition, you also need to install a network management software, such as ADM.

Pin	Description
1	+5V SB
2	GND
3	LID

LAN-WKUP
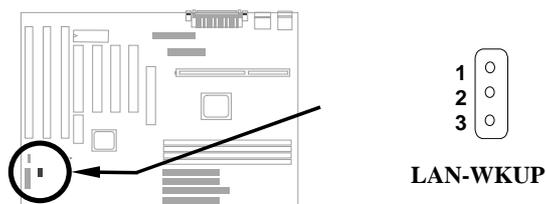
2.4 Configuring the System Memory

PIN 1
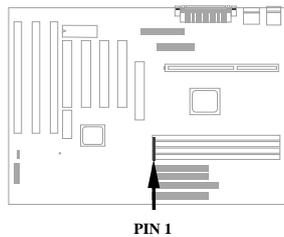
The DIMM types supported are SDRAM (Synchronous DRAM) and Registered SDRAM. This mainboard has four 168 pin DIMM sockets (Dual-in-line Memory Module) that allow you to install system memory up to **1GB**. But note that mixing SDRAM and Registered SDRAM is not allowed, you can install one of the DRAM types only.

Warning: This motherboard does not support EDO DRAM.

DIMM modules can be identified by the following factors:

I.   Size: single side, 1Mx64 (8MB), 2Mx64 (16MB), 4Mx64 (32MB), 8Mx64 (64MB), 16Mx64 (128MB), and double side, 1Mx64x2 (16MB), 2Mx64x2 (32MB), 4Mx64x2 (64MB), 8Mx64x2 (128MB).

Tip: Here is a trick to check if your DIMM is single-side or double-side -- if there are traces connected to golden finger pin 114 and pin 129 of the DIMM, the DIMM is probably double-side; otherwise, it is single-side. Following figure is for your reference.

168   **85**

Pin 129   **Pin 114**
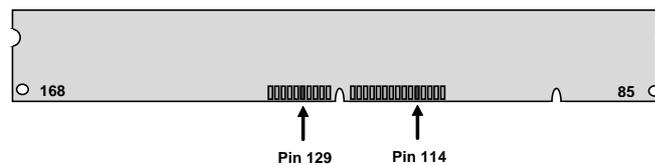
Note: 1GB memory is achieved by using 64M bit Registered SDRAMs.

II. Speed: Normally marked as -12, which means the clock cycle time is 12ns and maximum clock of this SDRAM is 83MHz. Sometimes you can also find the SDRAM marked as -67, which means maximum clock is 67MHz.

> ⚠️ *Caution: Some SDRAMs marked as -10 may work fine with 100 MHz CPU clock, but not all this kind of modules can work properly under 100MHz external clock. We suggest you choose and install SDRAMs that match **PC 100** specification if 100MHz or above CPU clock is selected.*

III. Buffered and non-buffered: This motherboard supports non-buffered DIMMs. You can identify non-buffered DIMMs and buffered DIMMs according to the position of the notch, following figure is for your reference:

Reserved | **non-buffered**
buffered
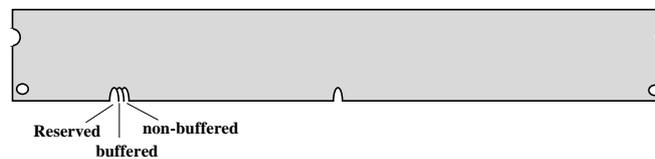
Because the positions are different, only non-buffered DIMMs can be inserted into the DIMM sockets on this motherboard. Although most of DIMMs on current market are non-buffered, we still recommend you to ask your dealer for the correct type.

IV. 2-clock and 4-clock signals: Although both of 2-clock and 4-clock signals are supported by AX6B, we strongly recommend you to choose 4-clock SDRAM in consideration of reliability.

> 💡 *Tip: To identify 2-clock and 4-clock SDRAM, you may check if there are traces connected to golden finger pin 79 and pin 163 of the SDRAM. If there are traces, the SDRAM is probably 4-clock; Otherwise, it is 2-clock.*

V. Parity: This motherboard supports standard 64 bit wide (without parity) and 72-bit wide (with parity) DIMM modules.

VI. SPD support: BIOS will automatically detect DIMM with SPD, and set to appropriate timing. DIMMs without SPD are still able to work fine on this board, but BIOS POST screen will give you a warning message that you use a DIMM without SPD.

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There is no jumper setting required for the memory size or type. It is automatically detected by the system BIOS, and the total memory size is to add them together.

Total Memory Size = Size of DIMM1 + Size of DIMM2 + Size of DIMM3 + Size of DIMM4

Following table list the recommended SDRAM combinations of DIMM:

DIMM Data chip	Bit size per side	Single/ Double side	Chip count	DIMM size	Recommended
1M by 16	1Mx64	x1	4	8MB	Yes
1M by 16	1Mx64	x2	8	16MB	Yes
2M by 8	2Mx64	x1	8	16MB	Yes
2M by 8	2Mx64	x2	16	32MB	Yes
4M by 16	4Mx64	x1	4	32MB	Yes
4M by 16	4Mx64	x2	8	64MB	Yes
8M by 8	8Mx64	x1	8	64MB	Yes
8M by 8	8Mx64	x2	16	128MB	Yes

DIMM Data chip	Bit size per side	Single/ Double side	Chip count	DIMM size	Recommended
2M by 32	2Mx64	x1	2	16MB	Yes, but not tested.
2M by 32	2Mx64	x2	4	32MB	Yes, but not tested.

Following table are possible SDRAM combinations that is **NOT** recommended:

DIMM Data chip	Bit size per side	Single/ Double side	Chip count	DIMM size	Recommended
4M by 4	4Mx64	x1	16	32MB	No
4M by 4	4Mx64	x2	32	64MB	No
16M by 4	16Mx64	x1	16	128MB	No

For getting the best performance and stability under 100MHz or above external clock, we strongly recommend you use PC 100 SDRAM. The PC 100 SDRAM that AOpen had tested are listed below.

Size	Vendor	Model	Single/Double	Chip Count
16M	Micron	MT48LC2M8A1-08	x1	8
16M	TI	TMX626812BDGE-10A	x1	8
16M	Hyundai	HY57V168010CTC-10	x1	8
32M	Fujitsu	81F16822D-A10-7JF	X2	16
32M	Micron	MT48LC2M8A1-08	x2	16
32M	Hyndai	HY57V168010CTC-10	x1	16
32M	NEC	D4516821AG5-A10-7JF	x1	16
32M	SEC	KM48S2020CT-GH	x1	16
32M	LGS	GM72V661641CT7J	x1	4
64M	Fujitsu	81F64842B-103FN	x2	16
64M	Mitsubishi	M5M4V64S30ATP-10	x1	8
64M	NEC	D4564841G5-A10-9JF	x1	8
64M	SEC	KM48S8030BT-GH	x1	8
64M	Toshiba	TC59S6408FTL-80H	x1	8
64M	LGS	GM72V661641CT7J	x2	8
64M	LGS	GM72V66841CT7J	x1	9
128M	LGS	GM72V66841CT7J	x2	18
128M	Simens	HYS72V16220GU	x2	18

Memory error checking is supported by parity check. To use parity check you need 72 bit DIMM (64+8 bit parity), which are automatically detected by BIOS.

Hardware Installation

Warning: *The driving capability of new generation chipset is limited because the lack of memory buffer (to improve performance). This makes DRAM chip count an important factor to be taking into consideration when you install DIMM. Unfortunately, there is no way that BIOS can identified the correct chip count, you need to calculate the chip count by yourself. The simple rule is:* **By visual inspection, use only DIMM which is less than 16 chips***.*

Tip: *The parity mode uses 1 parity bit for each byte, normally it is even parity mode, that is, each time the memory data is updated, parity bit will be adjusted to have even count "1" for each byte. When next time, if memory is read with odd number of "1", the parity error is occurred and this is called single bit error detection.*