MX3S
MX3SP
Online Manual

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What's in this manual

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Before You Start

This Online Manual will introduce to the user how this product is installed. All useful information will be described in later chapters. Please keep this manual carefully for future upgrades or system configuration changes. This Online Manual is saved in PDF format, we recommend using Adobe Acrobat Reader 4.0 for online viewing, it is included in Bonus CD disc or you can get free download from Adobe web site.

Although this Online Manual is optimized for screen viewing, it is still capable for hardcopy printing, you can print it by A4 paper size and set 2 pages per A4 sheet on your printer. To do so, choose **File > Page Setup** and follow the instruction of your printer driver.

Thanks for the help of saving our earth.

Quick Installation Procedure

This page gives you a quick procedure on how to install your system. Follow each step accordingly.

1 Installing CPU and Fan

2 Installing System Memory (DIMM)

3 Connecting Front Panel Cable

4 Connecting IDE and Floppy Cable

5 Connecting ATX Power Cable

6 Connecting Back Panel Cable

7 Power-on and Load BIOS Setup Default

8 Setting CPU Frequency

9 Reboot

10 Installing Operating System (such as Windows 98)

11 Installing Driver and Utility

Motherboard Map

AUX_In

Modem Audio

CD Audio

Front Audio

WOL
Wakeup on LAN

WOM
Wakeup on Modem

4Mb Flash BIOS
Virus Protection
Wake on Timer
Multi-Language BIOS

Housing Fan

Panel Connector

Support 2nd USB X 2

Blinking LED

GPO-Connector

4X AGP

IrDA

FDC

ATA/100 IDE
Suspend to HDD

PC99 Back Panel

Resettable Fuse

JP28 KB/MS Wakeup

CPU Fan Connector
System Voltage & Fan
Monitoring

CPU Jumper-less Design
Over-current Protection
Thermal Protection

Low ESR capacitor

Intel i815E/i815EP Chipset
133MHz FSB Clock

PC133 DIMM x 2
Suspend to RAM

ATX Power Connector
AC Power Auto Recovery

RAM Power LED

Battery-less & Long-life Design

JP14 Clear CMOS

JP23/29 FSB/PCI Clock Ratio

Block Diagram

Hardware

This chapter describes jumpers, connectors and hardware devices of this motherboard.

Note: 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.

JP14 Clear CMOS

You can clear CMOS to restore system default setting. To clear the CMOS, follow the procedure below.

1. Turn off the system and unplug the AC power.

2. Remove ATX power cable from ATX power connector.

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 ATX power connector.

Normal Operation (default)

Clear CMOS
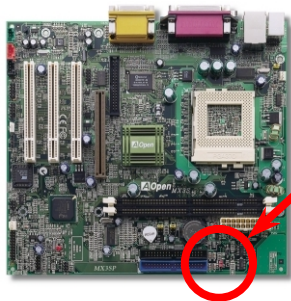
Tip: When should I Clear CMOS?

  1. Boot fail because of overclocking…

  2. Forget password…

  3. Troubleshooting…

JP28 Keyboard/Mouse Wakeup

This jumper is used to enable or disable Keyboard/Mouse Wake Up function. If you select Enable, you can decide the wake up mode from BIOS Setup > Integrated Peripherals > Power On Function. To implement this function, the power supply 5V standby current must be greater than 800mA. Note that only PS/2 mouse supports Wake on Mouse function.

1 2 3
Disable

1 2 3
Enable
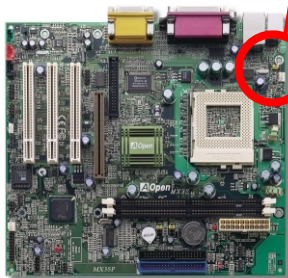
> *Tip: You have to wait for system to successfully boot from operation system (such as Windows or DOS) before the Wake-On-Keyboard/Mouse can take effect. This is because the information of how to support this function must be stored into Super I/O Controller and then you can use it for next power on.*

ATX standby power

Super I/O Controller

BIOS

Keyboard

PS2 Mouse

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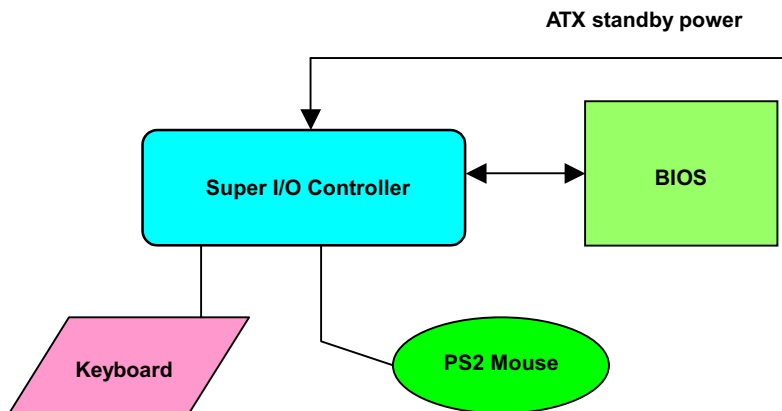
CPU Socket and Fan Connector

Plug CPU to Socket370 connector. Be careful of CPU orientation. Plug in the fan cable to the 3-pin **CPUFAN** or **FAN 1** connector.
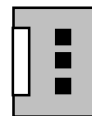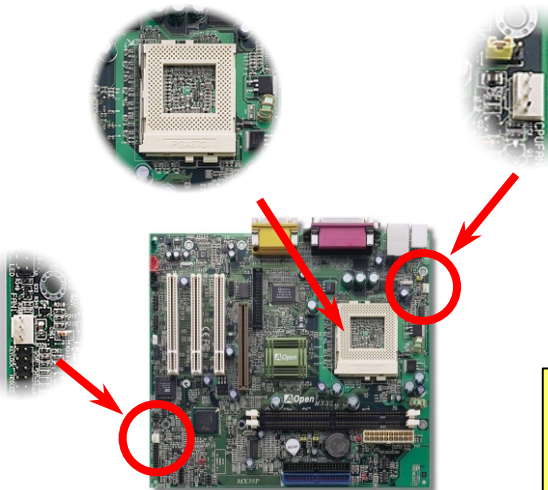
GND
+12V
SENSOR

Note: Some CPU fans do not have sensor pin, so that cannot support fan monitoring.

CPU Jumper-less Design

CPU VID signal and SMbus clock generator provide CPU voltage auto-detection and allows the user to set the CPU frequency through the BIOS setup, therefore no jumpers or switches are used. The correct CPU information is saved into the EEPROM. With these technologies, the disadvantages of the Pentium based jumper-less designs are eliminated. There will be no worry of wrong CPU voltage detection and no need to re-open the housing in case of CMOS battery loss.

Pentium II/III & Celeron CPU

Clock Generator

BIOS Controlled Circuit

CPU Freq. Ratio

CPU VID Signal   CPU voltage

Power Regulator

(Automatically generates CPU voltage)
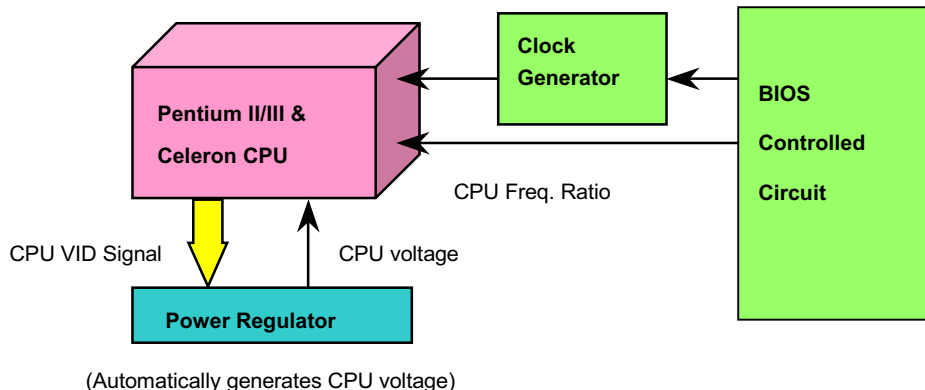
Setting CPU Frequency

This motherboard is CPU jumper-less design, you can set CPU frequency through the BIOS setup, no jumpers or switches are needed.

BIOS Setup > Frequency / Voltage Control > CPU Speed Setup

CPU Ratio	x2, x2.5, x 3, x 3.5, x 4, x 4.5, x 5, x 5.5, x 6, x 6.5, x 7, x 7.5, and x8
CPU FSB	66.6, 66.8, 68.3, 75.3,78, 80, 95, 100, 100.2,105, 110, 114, 117, 122, 127, 129, 133.3, 133.6, 138, 140, 144, 146.6, 150, 157.3, 160 and 166 MHz

Warning: INTEL i815E / i815EP chipset supports maximum 133MHz FSB and 66MHz AGP clock, higher clock setting may cause serious system damage.

Tip: If your system hangs or fails to boot because of overclocking, simply use JP14 to clear CMOS and restore to the default setting.

Supported CPU Frequency

Core Frequency = CPU **Bus** Clock * CPU Ratio

PCI Clock = CPU Bus Clock / Clock Ratio

AGP Clock = PCI Clock x 2

Note: *This motherboard support CPU auto-detection function. Hence, you don't need to setup the CPU frequency by manual.*

CPU	CPU Core Frequency	FSB Clock	Ratio
Celeron 300A	300MHz	66MHz	4.5x
Celeron 366	366MHz	66MHz	5.5x
Celeron 366	366MHz	66MHz	5.5x
Celeron 400	400MHz	66MHz	6x
Celeron 433	433MHz	66MHz	6.5
Celeron 466	466MHz	66MHz	7x
Celeron 500	500MHz	66MHz	7.5x
Celeron 533	533MHz	66MHz	8x
Celeron 566	566MHz	66MHz	8.5x
Celeron 600	600MHz	66MHz	9x
Celeron 667	667MHz	66MHz	10x
Celeron 700	700MHz	66MHz	10.5
Pentium III 500E	500MHz	100MHz	5x
Pentium III 600E	600MHz	100MHz	6x
Pentium III 650E	650MHz	100MHz	6.5x
Pentium III 700E	700MHz	100MHz	7x

Pentium III 750E	750MHz	100MHz	7.5
Pentium III 800E	800MHz	100MHz	8x
Pentium III 850E	850MHz	100MHz	8.5x
Pentium III 533EB	533MHz	133MHz	4x
Pentium III 600EB	600MHz	133MHz	4.5x
Pentium III 667EB	667MHz	133MHz	5x
Pentium III 733EB	733MHz	133MHz	5.5
Pentium III 800EB	800MHz	133MHz	6x
Pentium III 866EB	866MHz	133MHz	6.5
Pentium III 933EB	933MHz	133MHz	7x
Pentium III 1000EB	1GHz	133MHz	7.5x

> **Warning:** Intel® i815E / i815EP chipset supports maximum 133MHz Bus and 66MHz AGP clock, higher clock setting may cause serious system damage.

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JP23/JP29 FSB/PCI Clock Ratio
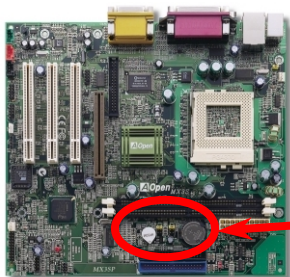
This jumper is used to specify the relationship of PCI and FSB clock. Generally speaking, if you are not overclockers, we recommend to set at the default setting.
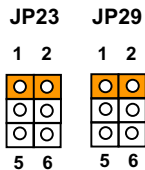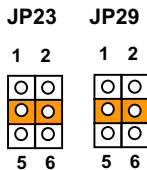
JP23	JP29	JP23	JP29	JP23	JP29	JP23	JP29
1 2	**1 2**	**1 2**	**1 2**	**1 2**	**1 2**	**1 2**	**1 2**
5 6	**5 6**	**5 6**	**5 6**	**5 6**	**5 6**	**5 6**	**5 6**
Auto (default)		**4X** (122~166 MHz)		**3X** (95~133.6 MHz)		**2X** (66.8~80MHz)	
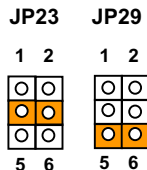
23
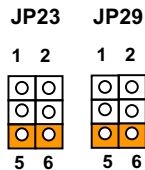
DIMM Socket

This motherboard has two 168-pin DIMM sockets that allow you to install PC133 memory up to 512 MB. Only SDRAM is supported.
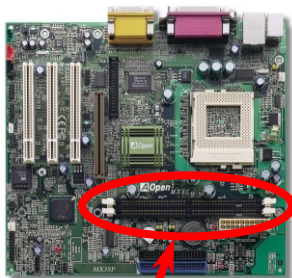
Tip: The driving capability of new generation chipset is limited due to the lack of a memory buffer (to improve performance). This makes DRAM chip count an important factor to take into consideration when you install DIMMs. Unfortunately, there is no way that the BIOS can identify the correct chip count, you need to calculate the chip count by yourself. The simple rule is: By visual inspection, use only DIMMs which are less than 18 chips.

Pin 1

DIMM1
DIMM2

RAM Power LED & Blinking LED

The **RAM Power LED** indicates there is power applies to memory. It is useful to check RAM power during Suspend to RAM. Do not unplug DIMM when this LED is On.

The **Blinking LED** shows you whether system is boot OK. It will continue blinking while system is at POST procedure, and keep ON while system boot successfully.

RAM Power LED

Blinking LED

Front Panel Connector

Keylock →	**1**	**+** ← SPWR
HDD LED →		← ACPI & Power LED
Speaker →		← Reset

1

GND	5VSB
KEYLOCK	SPWR
+5V	ACPI & PWR LED
HDD LED	GND
HDD LED	+5V
+5V	NC
+5V	NC
GND	GND
NC	RESET
SPEAKER	GND

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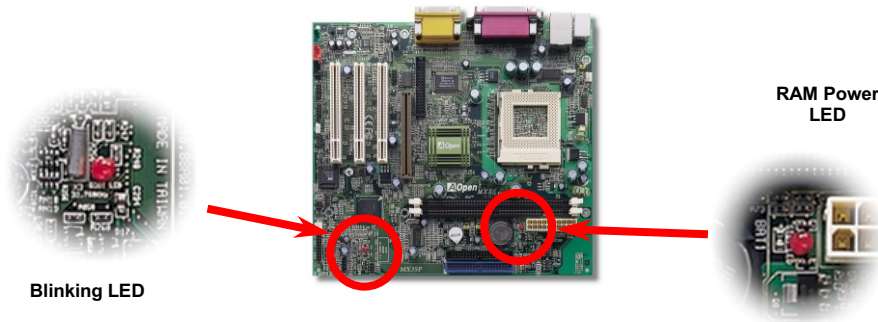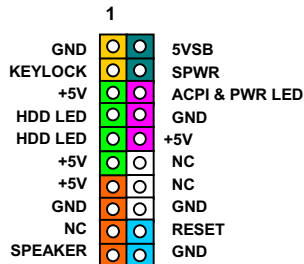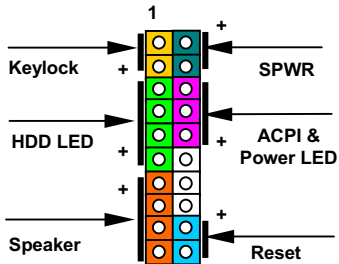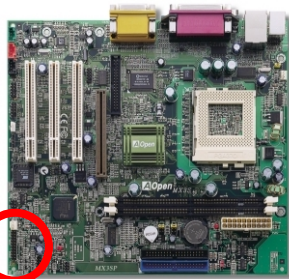
Attach the power LED, keylock, speaker, and reset switch connectors to the corresponding pins. If you enable Power Management Setup > ACPI Function in BIOS Setup, the ACPI & Power LED will keep flashing while the system is in suspend mode.

Suspend Type	ACPI LED
Power on Suspend (S1)	Flashing for every 0.5 second
Suspend to RAM (S3)	Flashing for every 1 seconds

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**.

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ATX Power Connector

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

COM	+5V
+5V	COM
COM	PW-OK
+3.3V	5VSB
+3.3V	+12V
+3.3V	+5V
-12V	+5V
COM	-5V
PS-ON	COM
COM	COM
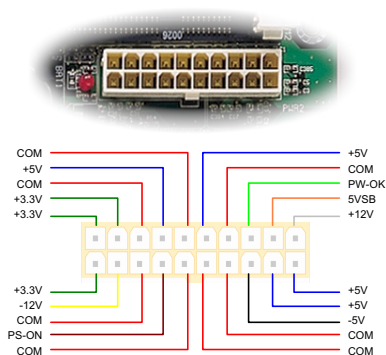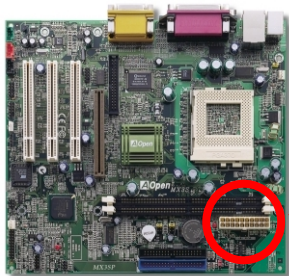
Warning: For ATX system, there is always a standby current on the motherboard. Please make sure that you have unplugged the ATX power cable from the connector before you insert or pull out any CPU, DIMM, PCI and AGP cards. Otherwise, a serious component damage may occur.

AC Power Auto Recovery

A traditional ATX system should remain at power off stage when AC power resumes from power failure. This design is inconvenient for a network server or workstation, without an UPS, that needs to keep power-on. This motherboard implements an AC Power Auto Recovery function to solve this problem. If BIOS Setup > Integrated Peripherals > AC PWR Auto Recovery is set to "Enabled" the system will automatically power-on after AC power resumes.

IDE and Floppy Connector

Connect 34-pin floppy cable and 40-pin IDE cable to floppy connector FDC and IDE connector
IDE1, **IDE2**. Pin1 of cable is normally marked with red color. Be careful of the pin1 orientation.
Wrong orientation may cause system damage.

Pin 1

FDC

Slave (4th)	Master (3rd)

IDE 2

IDE 1

Pin 1

Slave (2nd)	Master (1st)

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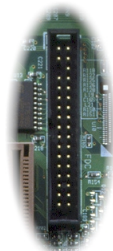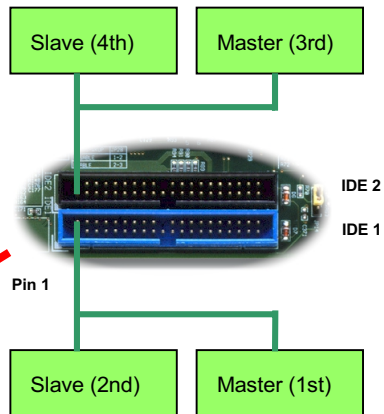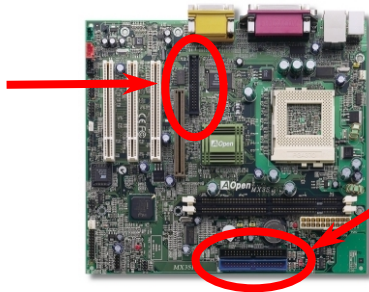
IDE1 is also known as the primary channel and IDE2 as the secondary channel. Each channel supports two IDE devices that make a total of four devices. In order to work together, the two devices on each channel must be set differently to **master** and **slave** mode. Either one can be the hard disk or the CDROM. The setting as master or slave mode depends on the jumper on your IDE device, so please refer to your hard disk and CDROM manual accordingly.

> *Warning: The specification of the IDE cable is a maximum of 46cm (18 inches), make sure your cable does not exceed this length.*

> *Tip: For better signal quality, it is recommended to set the far end side device to master mode and follow the suggested sequence to install your new device. Please refer to above diagram.*

This motherboard supports ATA/100 IDE. Following table lists the transfer rate of IDE PIO and DMA modes. The IDE bus is 16bit, which means every transfer is two bytes.

Mode	Clock Period	Clock Count	Cycle Time	Data Transfer Rate
PIO mode 0	30ns	20	600ns	(1/600ns) x 2byte = 3.3MB/s
PIO mode 1	30ns	13	383ns	(1/383ns) x 2byte = 5.2MB/s
PIO mode 2	30ns	8	240ns	(1/240ns) x 2byte = 8.3MB/s
PIO mode 3	30ns	6	180ns	(1/180ns) x 2byte = 11.1MB/s
PIO mode 4	30ns	4	120ns	(1/120ns) x 2byte = 16.6MB/s
DMA mode 0	30ns	16	480ns	(1/480ns) x 2byte = 4.16MB/s
DMA mode 1	30ns	5	150ns	(1/150ns) x 2byte = 13.3MB/s
DMA mode 2	30ns	4	120ns	(1/120ns) x 2byte = 16.6MB/s
UDMA/33	30ns	4	120ns	(1/120ns) x 2byte x2 = 33MB/s
UDMA/66	30ns	2	60ns	(1/60ns) x 2byte x2 = 66MB/s
UDMA/100	20ns	2	40ns	(1/40ns) x 2byte x2 = 100MB/s

Tip: To achieve the best performance of Ultra DMA/100 hard disks, a special **80-wires IDE cable** is required.

IrDA Connector

The IrDA connector can be configured to support wireless infrared module, with this module and application software such as Laplink or Windows 95 Direct Cable Connection, the user can transfer files to or from laptops, notebooks, PDA devices and printers. This connector supports SIR (115.2Kbps, 2 meters) and ASK-IR (57.6Kbps).

Install the infrared module onto the **IrDA** connector and enable the infrared function from BIOS Setup > Integrated Peripherals > UART Mode Select, make sure to have the correct orientation when you plug in the IrDA connector.

Pin 1

```
        1   2
+5V    O   O   NC
NC     O   O   CIRRX
IRRX   O   O   5VSB
GND    O   O   NC
IRTX   O       NC
        9   10
```
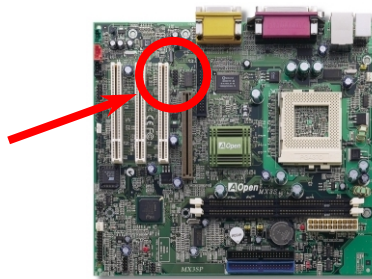
GPO-Connector (General Purpose Output) (Optional)

GPO (General Purpose Output) is an advanced specification developed by AOpen for power users to define the further function by oneself. For example, you can design a daughter board to provide additional capabilities, such as an alarm, a buzzer, a timekeeper, etc.

	1	2	
3.3 V	O		NC
GP019	O	O	NC
GP020	O	O	GND
	5	6	

Pin 1

WOM (Zero Voltage Wake on Modem)

This motherboard implements special circuit to support Wake On Modem, both internal modem card and external box modem are supported. Since Internal modem card consumes no power when system power is off, it is recommended to use an internal modem. To use internal modem, connect 4-pin cable from **RING** connector of modem card to the **WOM** connector on the motherboard.

Pin 1

1
+5V Standby
NC
RING
GND

35
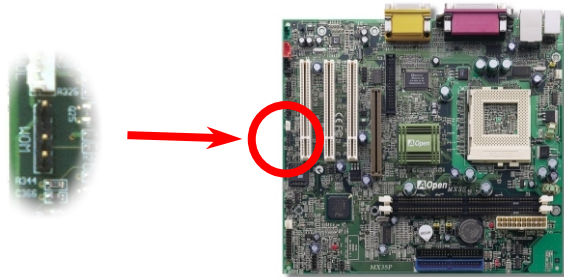
WOM by External BOX Modem

Traditional Green PC suspend mode does not really turn off the system power supply, it uses external box modem to trigger MB COM port and resume back to active.

TEL Line

Box Modem

COM port

Motherboard
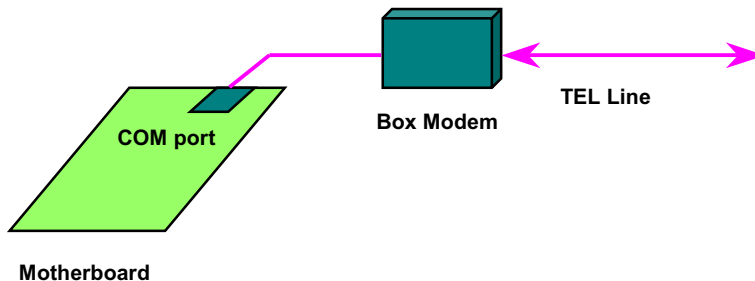
WOM by Internal Modem Card

With the help of the ATX soft power On/Off, it is possible to have a system totally power off, and wakeup to automatically answer a phone call as an answering machine or to send/receive a fax. You may identify whether or not your system is in true power off mode by checking to see if the fan of your power supply is off. Both an external box modem and an internal modem card can be used to support Modem Wake Up, but if you use an external modem, you have to leave your box modem on.

Modem Card

TEL Line
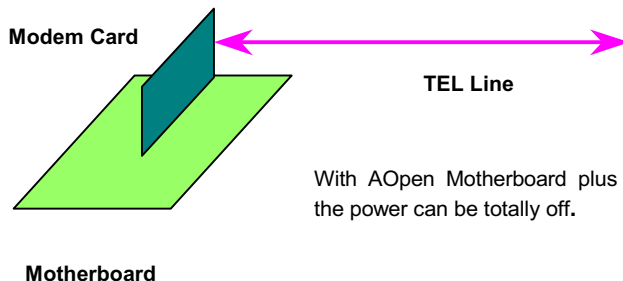
With AOpen Motherboard plus AOpen Modem Card, the power can be totally off.

Motherboard

WOL (Wake on LAN)

This feature is very similar as Wake On Modem, but it goes through local area network. To use Wake On LAN function, you must have a network card with chipset that supports this feature, and connect a cable from LAN card to motherboard WOL connector. The system identification information (probably IP address) is stored on network card and because there is a lot of traffic on the Ethernet, you need to install a network management software, such as ADM, for the checking of how to wake up the system. Note that, at least 600mA ATX standby current is required to support the LAN card for this function.

Pin 1

+5V Standby
GND
LID

LAN Card

Ethernet

Motherboard

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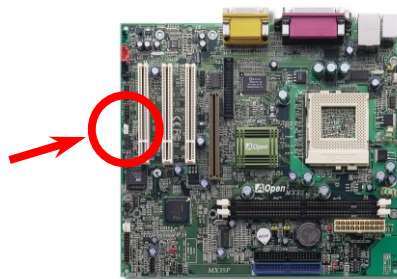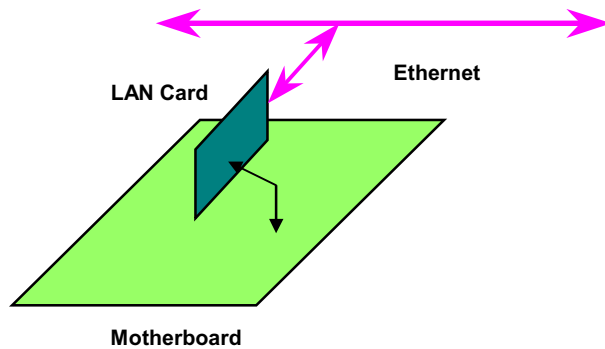
4X AGP (Accelerated Graphic Port)

This motherboard supports 4X AGP. AGP is a bus interface designed for high-performance 3D graphic and supports only memory read/write operation. One motherboard can only have one AGP slot. **2X AGP** uses both rising and falling edge of the 66MHz clock, the data transfer rate is 66MHz x 4 bytes x 2 = 528MB/s. **4X AGP** is still using 66MHz AGP clock but the it has 4 data transfers within one 66MHz clock cycle, so that the data transfer rate is 66MHz x 4 bytes x 4 = 1056MB/s.
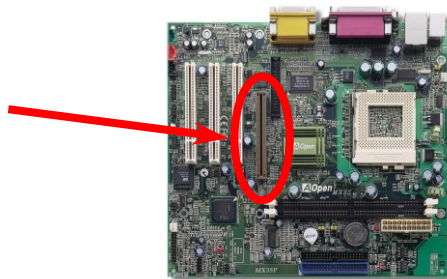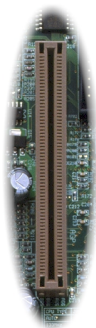
PC99 Color Coded Back Panel

The onboard I/O devices are PS/2 Keyboard, PS/2 Mouse, RJ-45 LAN connector, serial ports COM1, Parallel port, USB, VGA Connector (MX3S) / COM2 port (MX3SP), AC97 sound and Game port. The view angle of drawing shown here is from the back panel of the housing.

PS/2 Keyboard
Connector

RJ-45 LAN
Connector

SPP/EPP/ECP
Parallel Port

MIDI/Game Port

PS/2 Mouse
Connector

USB Port   COM 1 Port

(MX3S)
VGA Connector

(MX3SP)
Com2 Port

MIC-In
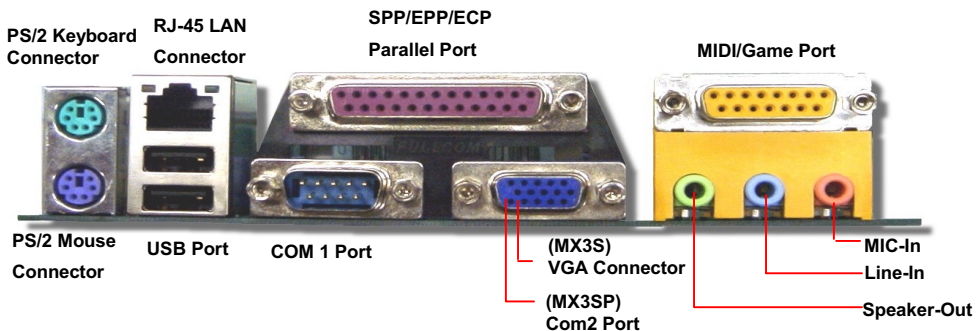
Line-In

Speaker-Out

Speaker Out: To External Speaker, Earphone or Amplifier.
Line-In: From the signal source, such as CD/Tape player.
MIC-In: From Microphone.
Game Prot: To 15-pin PC joystick or game pad.

Support 10/100 Mbps LAN onboard

Intel i815E / i815EP (Solano Series) includes a fast Ethernet controller on chip. On the strength of Intel 82562EM, which is a highly-integrated Platform LAN Connect device, it provides 10/100M bps Ethernet for office and home use, the Ethernet RJ45 connector is located on top of USB connectors. The green LED indicates the link mode, it lights when linking to network and blinking when transferring data. The orange LED indicates the transfer mode, it will light when transferring data in 100Mbps mode.

Green/ACT

Yellow/Speed

Note: This motherboard implements special technology to support Wake On LAN. To take advantage of this function, you will need to insert an add-on PCI LAN card.
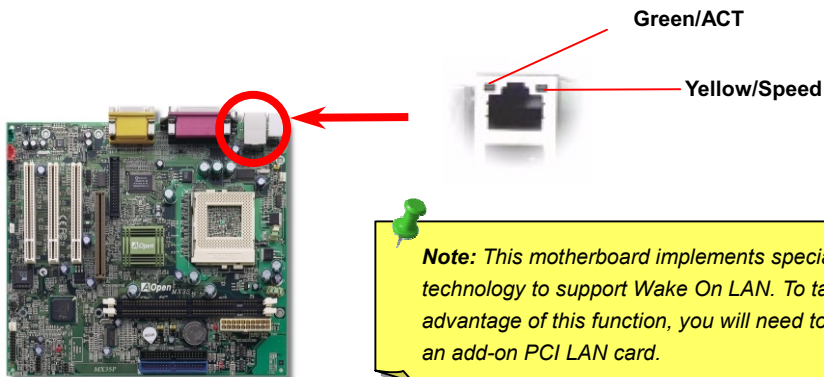
Support 4 USB Ports

This motherboard supports four USB ports. Two of them are on back panel connector, the other two are on the left-bottom area of this motherboard. With proper cable, you can connect them to front panel.

Pin 1

```
        1   2
+5V    O O   +5V
D2-    O O   D3-
D2+    O O   D3+
GND    O O   GND
NC     O     NC
        9  10
```
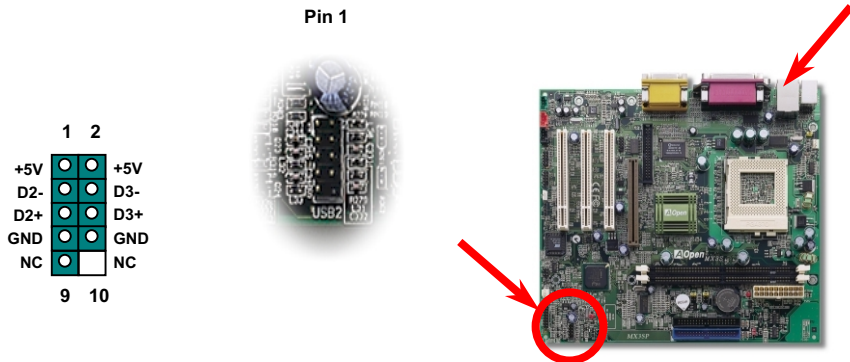
AUX_IN Connector

This **green** connector is used to connect MPEG Audio cable from MPEG card to onboard sound.

Pin 1

```
L
GND
GND
R
```
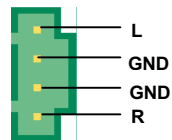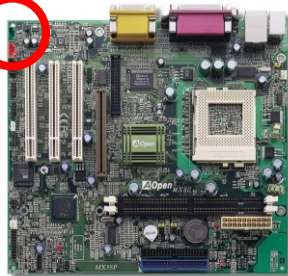
AUX_IN

Modem Audio Connector

This connector is used to connect Mono In/Mic Out cable from internal modem card to onboard sound circuit. The pin 1-2 is **Mono In**, and the pin 3-4 is **Mic Out**. Please note that there is no standard for this kind of connector yet, only some internal modem cards implement this connector.

Pin 1

Mono-In (To Modem)
GND
GND
MIC-Out (From Modem)
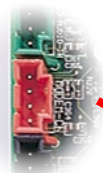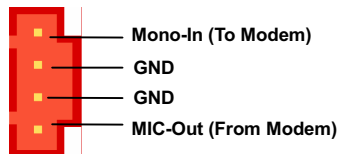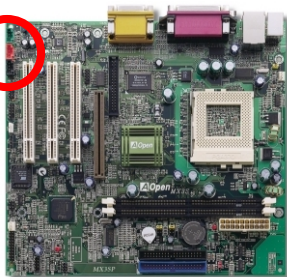
MODEM-CN

CD Audio Connector

This **black** connector is used to connect CD Audio cable from CDROM or DVD drive to onboard sound.

Pin 1

R
GND
L
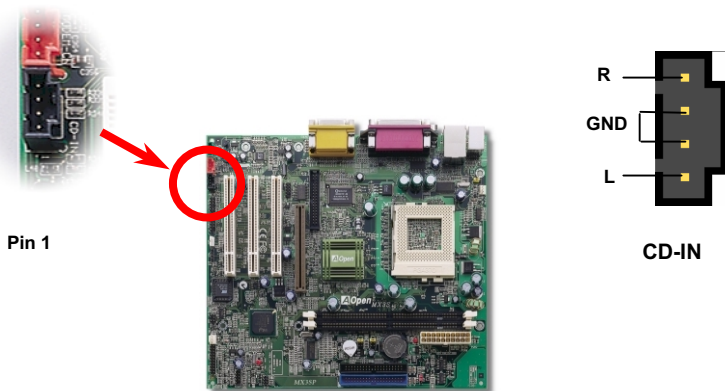
CD-IN

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Front Audio

If the housing has been design with an audio port on the front panel, you'll be able to connect onboard audio to front panel through this connector. By the way, please remove the jumper cap from the Front Audio Connector before you connect the cable. Do not remove this yellow jumper cap if housing without an audio port on the front panel.
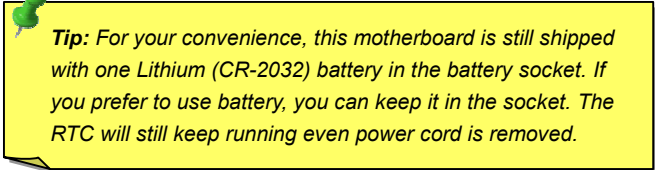
Pin 1
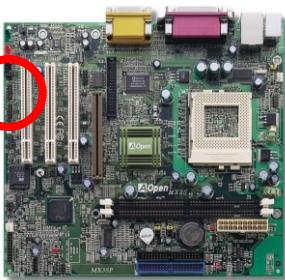
```
            1   2
MIC_IN2   [O  O]
VREFOUT   [O  O]
PHONE_R   [O  O]
     NC   [O   ]
PHONE_L   [O  O]
            9  10
```

Battery-less and Long Life Design

This Motherboard implements EEPROM and a special circuit that allows you to save your current CPU and CMOS Setup configurations without the need of a battery. The RTC (real time clock) can also keep running as long as the power cord is plugged. If you lose your CMOS data by accident, you can just reload the CMOS configurations from EEPROM and the system will recover as usual.

> *Tip: For your convenience, this motherboard is still shipped with one Lithium (CR-2032) battery in the battery socket. If you prefer to use battery, you can keep it in the socket. The RTC will still keep running even power cord is removed.*

ATX standby power

Battery

Auto Switch

Auto switch to ATX standby power as long as AC power line is plugged. This smart design increases battery life if you still plug battery on motherboard.

RTC real time clock

00:00:00

EEPROM ⟷ **CMOS**

Backup by EEPROM
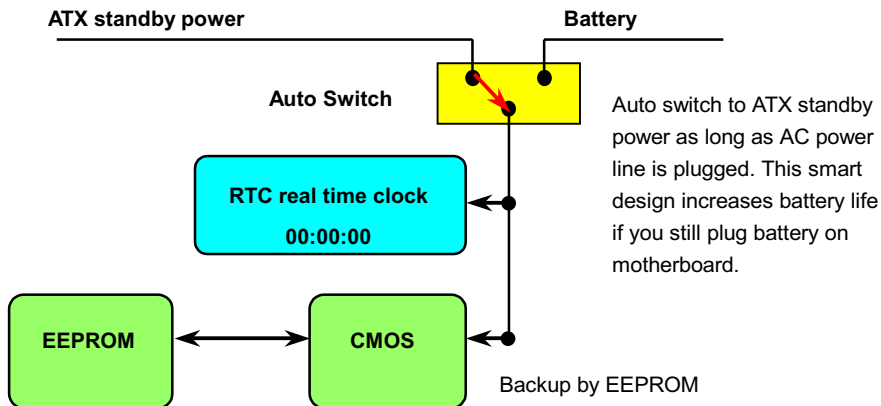
Over-current Protection

The Over Current Protection was very popular implemented on ATX 3.3V/5V/12V switching power supply. However, the new generation CPU uses different voltage that has regulator to transfer 5V to CPU voltage (for example, 2.0V), and makes 5V over current protection useless. This motherboard with switching regulator onboard support CPU over-current protection, in conjunction with 3.3V/5V/12V power supply provide the full line over-current protection.
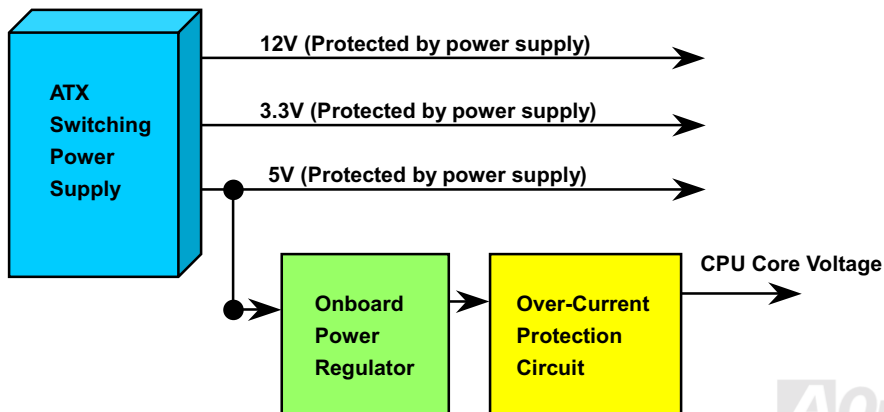
> *Note: Although we have implemented protection circuit try to prevent any human operating mistake, there is still certain risk that CPU, memory, HDD, add-on cards that install on this motherboard may be damaged because of component failure, human operating error or unknown nature reason. **AOpen cannot guaranty the protection circuit will always work perfectly.***

Hardware Monitoring

This motherboard implements a hardware monitoring system. As you turn on your system, this smart design will continue to monitor your system's working voltage, fan status and CPU temperature. If any of these system's status go wrong, there will be an alarm through the AOpen Hardware Monitoring Utility to warn the user.
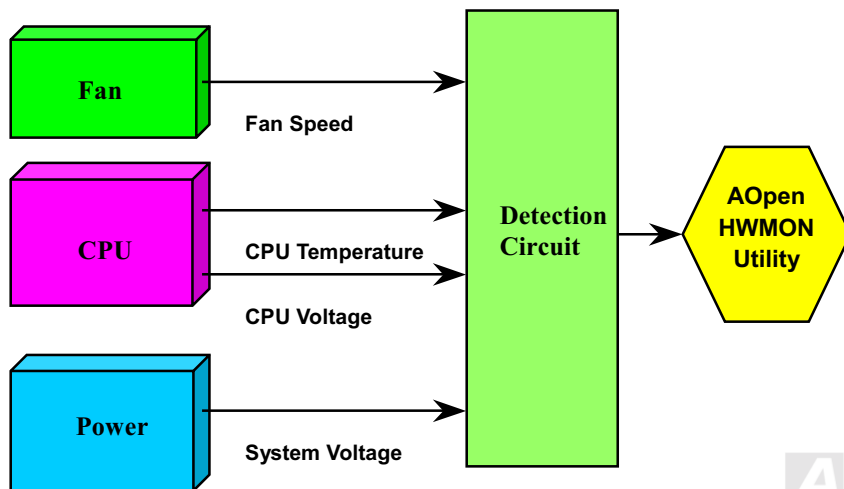
Resettable Fuse

Traditional motherboard has fuse for Keyboard and USB port to prevent over-current or shortage. These fuses are soldered onboard that when it is broken (did the job to protect motherboard), user still cannot replace it and the motherboard is still malfunction.

With expensive Resettable Fuse, the motherboard can back to normal function after fuse did the protection job.
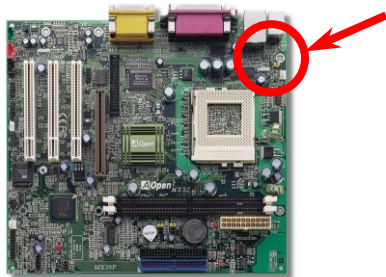
The green part at the left side of JP28.

Year 2000 (Y2K)

Y2K is basically a problem of the identification of year code. To save storage space, traditional software uses only two digits for year identification. For example, 98 for 1998 and 99 for 1999, but 00 will be confused with 1900 and 2000.

There is an RTC circuit (Real Time Clock) in conjunction with 128 bytes of CMOS RAM data in the chipset of the motherboard. The RTC has only two digits and the CMOS has another 2 digits. Unfortunately, this circuit's behavior is like this 1997→ 1998 → 1999 → 1900, that means it may have the Y2K problem. Below is a diagram of how applications work with the OS, BIOS and RTC. In order to keep the best compatibility in the PC industry there is a rule that applications must call the OS to get services and OS must call the BIOS, and then only BIOS is allowed to access the hardware (RTC) directly.

Applications

⇕

Operating System (such as Windows 98)

⇕

BIOS (Tick Routine)

⇕

RTC and CMOS data
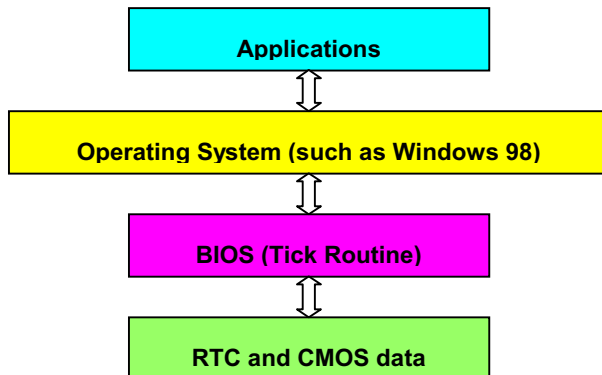
There is a Tick Routine (that goes live around every 50m sec) in the BIOS to keep record of date/time information. In general the BIOS, this Tick Routine does not update the CMOS every time because the CMOS is a very slow device which degrades system performance. The Tick Routine of the AOpen BIOS has 4 digits for year coding, as long as applications and the operating system follow the rule to get date/time information. There will be no Y2K problem (such as NSTL's test program). But unfortunately again, we found some test programs (such as Checkit 98) accesses RTC/CMOS directly.

Low ESR Capacitor

The quality of low ESR capacitor (Low Equivalent Series Resistance) during high frequency operation is very important for stability of CPU power. The location of where to put these capacitors is another know-how that requires experience and detail calculation.
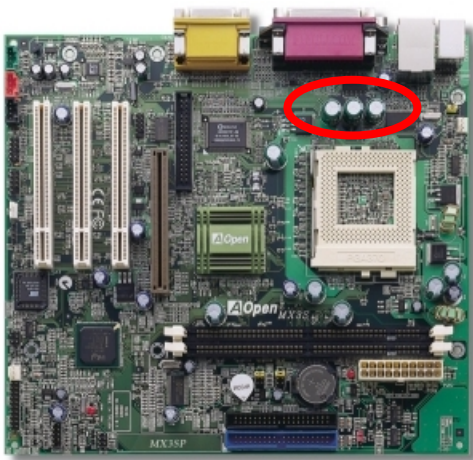
The power circuit of the CPU core voltage must be checked to ensure system stability for high speed CPUs (such as the new Pentium III, or when overclocking). A typical CPU core voltage is 2.0V, so a good design should control voltage between 1.860V and 2.140V. That is, the transient must be below 280mV. Below is a timing diagram captured by a Digital Storage Scope, it shows the voltage transient is only 143mv even when maximum 18A current is applied.
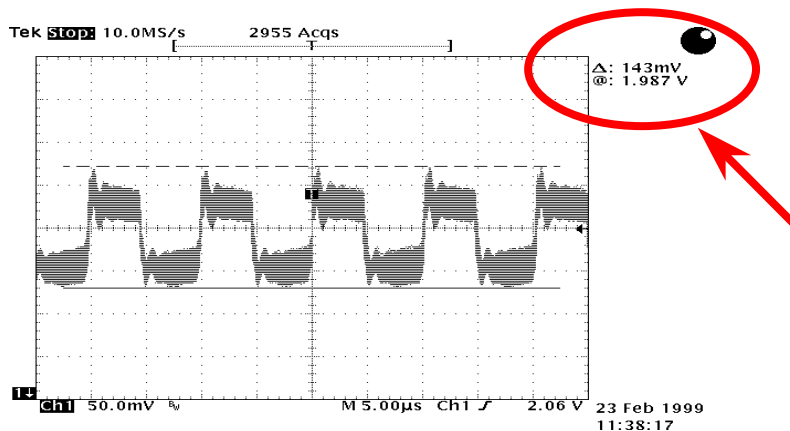
Note: This diagram is for example only, it may not be

exactly the same as this motherboard.

Layout (Frequency Isolation Wall)
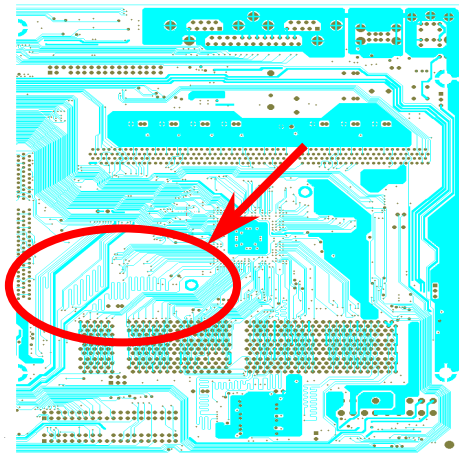
For high frequency operation, especially overclocking, layout is the most important factor to make sure chipset and CPU working in stable condition. The layout of this motherboard implements AOpen's unique design called " Frequency Isolation Wall". Separating each critical portion of motherboard into regions where each region operates in a same or similar frequency range to avoid crosstalk and frequency interference between each region's operations and condition. The trace length and route must be calculated carefully. For example, the clock trace must be equal length (not necessarily as short as possible) so that clock skew will be controlled within few a pico second $(1/10^{12}$ Sec)

Note: This diagram is for example only, it may not be exactly the same as this motherboard.

Driver and Utility

There are motherboard drivers and utilities included in AOpen Bonus CD disc. You don't need to install all of them in order to boot your system. But after you finish the hardware installation, you have to install your operation system first (such as Windows 98) before you can install any drivers or utilities. Please refer to your operation system's installation guide.

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Autorun Menu from Bonus CD Disc

You can use the autorun menu of Bonus CD disc. Choose the utility and driver and select model name
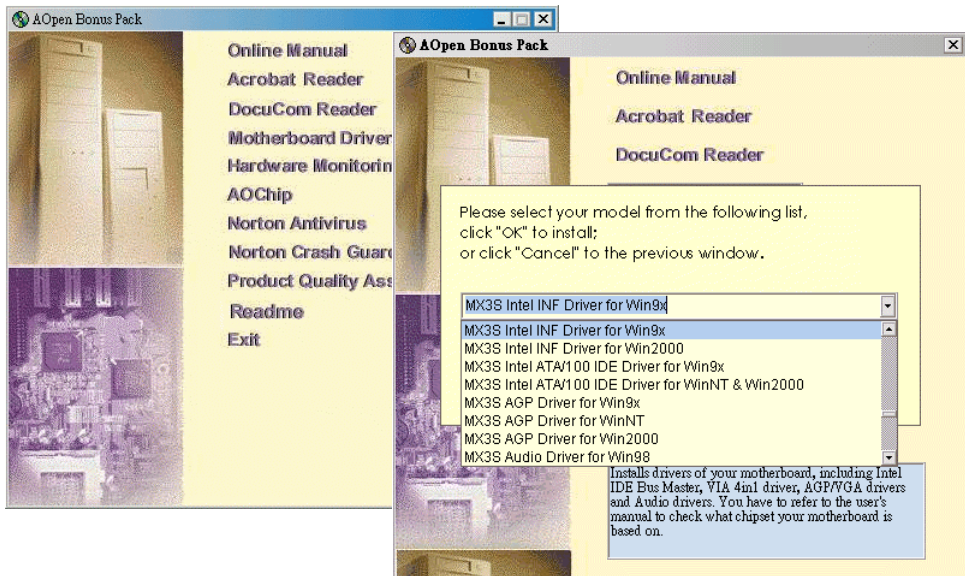
Eliminate "?" mark from Windows 95/98

Windows 95/98 cannot recognize this chipset, because it was released before the Intel 815 chipset.
You can install the Intel INF Update Utility from the Bonus Pack CD disc autorun menu to eliminate
the "?" marks.

Installing Onboard AGP Driver

Intel i815E/i815EP chipset integrates a 2D/3D graphics accelerator and provides AGP 2X/4X incredible performance to access main memory at over 1GB/s. You can find the audio driver from the Bonus Pack CD disc auto-run menu.

Note: If you are using Windows95, you should install DCOM95 patch from the Bonus Pack auto-run menu first, before you install AGP driver.
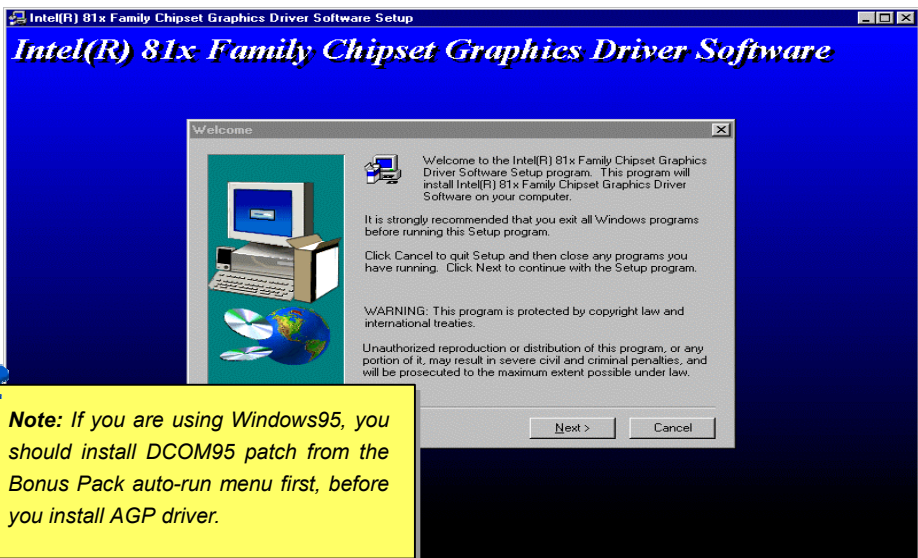
Installing Onboard Sound Driver

This motherboard comes with an AD1885 AC97 CODEC. You can find the audio driver from the Bonus Pack CD disc autorun menu.
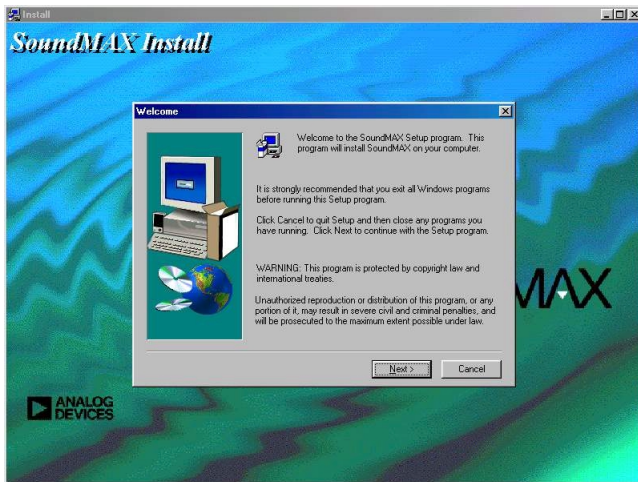
Installing Bus Master IDE Driver

It is necessary to install Bus Master IDE driver to support ATA/100 hard disk. If you need this driver, you can find it in the AOpen Bonus Pack CD disc.

Note: *Installing this Bus Master IDE driver may cause Suspend to Hard Drive failure.*
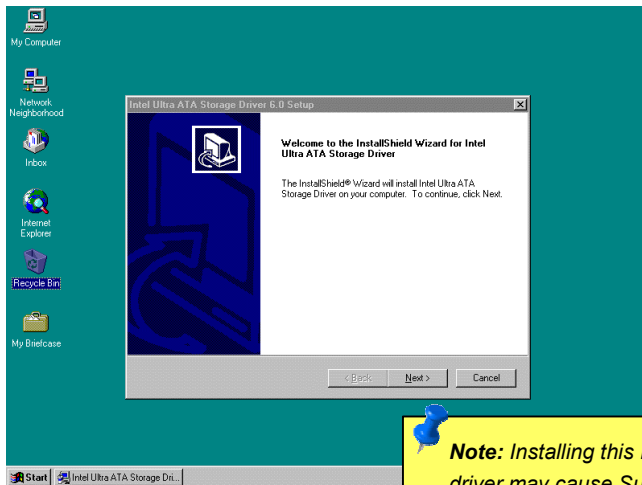
Installing LAN Driver

The South Bridge in Intel i815E/i815EP (Solano Series) integrates a total communication solution including 10/100Mb Fast Ethernet for Office requirement. You can install LAN Driver under Windows95/98, WindowsNT & Windows2000 by following steps.
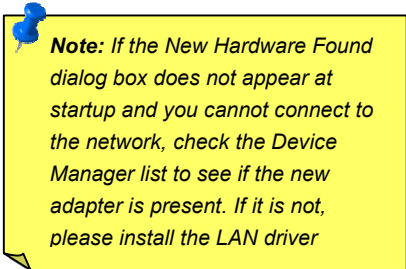
Manually Adding an Adapter in Windows 95 / 98

===

LOCATION OF DRIVER: \Intel\Driver\Lan\E100BNT5.SYS (NDIS 5.0)

LOCATION OF SETUP FILE: \Intel\Driver\Lan\NET82557.INF

> *Note: If the New Hardware Found dialog box does not appear at startup and you cannot connect to the network, check the Device Manager list to see if the new adapter is present. If it is not, please install the LAN driver*

1.   From the Control Panel, double-click the "Add Hardware" icon.
2.   Double-click Other Devices or Network Adapters in the list area.
3.   Double-click a PCI Ethernet Controller.
4.   Click the Driver tab, then click Update Driver.
5.   Click Next at the Update Device Driver Wizard.
6.   Select "Display a list of all the drivers..." and click Next.
7.   Insert the AOpen Bonus CD and click Have Disk.
8.   Enter the appropriate drive for your disk media (for example: D:\), and click OK.
9.   Click OK at the Select Device dialog box.
10. The Update Wizard displays the message that it has found the driver. Click Next.
11. Click Finish and restart your computer when prompted.

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Manually Adding an Adapter in WindowsNT 4.0

==================================

LOCATION OF DRIVER: \Intel\Driver\Lan\E100BNT.SYS (NDIS 4.0)
                        \Intel\Driver\Lan\OEMSETUP.INF

Due to some limitation under WindowsNT, you have to copy the "Lan" driver folder to your harddisk before installing the LAN driver.

1. Double-click the Network icon in the Control Panel.
2. Select the Adapter tab.
3. Click Add. You'll see a list of adapters.
4. Don't select an adapter from this list. Instead, insert the AOpen Bonus CD into the appropriate drive and click Have Disk.
5. Enter the appropriate drive for your disk media (for example: C:\Lan), and click OK.
6. Then follow the prompts to complete installation.
    When the adapter is added you'll see a new adapter listed in the Network adapters list.
7. Click Close to finish and configure any protocols as prompted.
8. Restart Windows NT when prompted.

> *Note: It is recommended that you install the latest Service Pack for Windows NT 4.0, available through Microsoft.*

Installing Hardware Monitoring Utility

You can install Hardware Monitoring Utility to monitor CPU temperature, fans and system voltage. You can find it in the AOpen Bonus Pack CD disc.
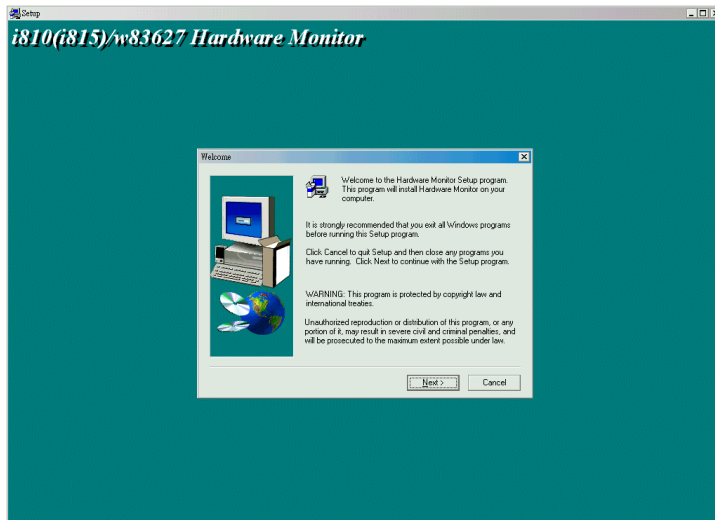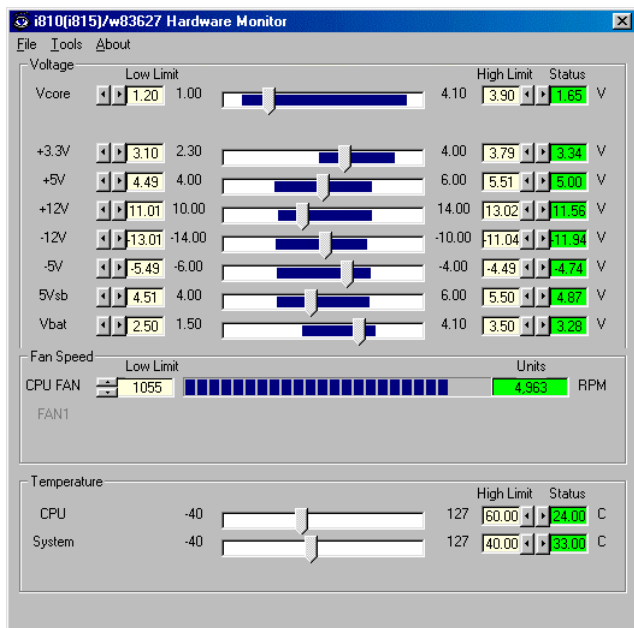
ACPI Suspend to Hard Drive

ACPI Suspend to Hard Drive is basically controlled by Windows operation system. It saves your current work (system status, memory and screen image) into hard disk, and then the system can be totally power off. Next time, when power is on, you can resume your original work directly from hard disk within few seconds without go through the Windows booting process and run your application again. If your memory is 64MB, normally, you need to reserve at least 64MB HDD space to save your memory image.

When go into Suspend:


```
┌─────────────┐                          ╭──────────╮
│  System     │                          │          │
│  Image &    │────── Save into ────────▶│  Hard    │
│  Status     │                          │  Disk    │
└─────────────┘                          ╰──────────╯
```

When power-on next time:

```
┌─────────────┐                          ╭──────────╮
│  System     │                          │          │
│  Image &    │◀─────────────────────────│  Hard    │
│  Status     │                          │  Disk    │
└─────────────┘                          ╰──────────╯
```

Restore within

seconds
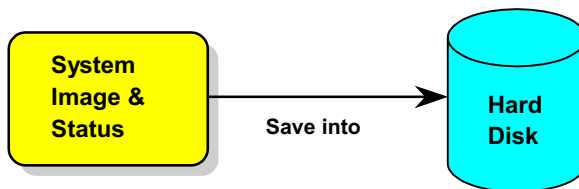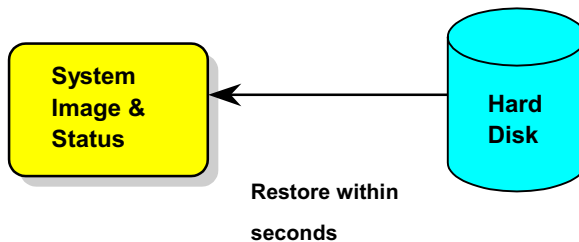
System Requirement

1.   **AOZVHDD.EXE 1.30b** or later.

2.   Delete **config.sys** and **autoexec.bat**.

Fresh installation of Windows 98 on a new system

1. Execute "**Setup.exe /p j**" to install Windows 98

2. After Windows 98's installation is complete, go to the Control Panel > Power Management.

   a. Set Power Schemes > System Standby to "Never".

   b. Click on "Hibernate" and select "Enable Hibernate Support" then "Apply".

   c. Click on the "Advanced" tab, you'll see "Hibernate" on "Power Buttons". Note that this option will only be seen after step b mentioned above has been completed, otherwise only "Standby" and "Shutdown" will be shown. Select "Hibernate" and "Apply".

3.Clean boot into DOS and run AOZVHDD utility.

   a. If you assign the whole disk to your Win 98 system (FAT 16 or FAT 32), please run "**aozvhdd /c /file**". Please remember sufficient free space has to be reserved in the disk, e.g. if you have 64 MB DRAM and 16 MB VGA card installed, the system needs at least 80 MB free space. The utility will locate the space automatically.

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    b.   If you assign an individual partition for Win 98, please run "**aozvhdd /c /partition**". Of course, the system needs to provide unformatted an empty partition.

4. Reboot system.

5. You've already implemented ACPI Suspend to-Hard Drive. Click "Start > Shut Down > Standby" then the screen will go off immediately. And 1 minute or so will be taken for the system to save what's in the memory to the hard drive; the larger the memory size the longer this process will take.

Changing from APM to ACPI (Windows 98 only)

1. Run "**Regedit.exe**"

   a. Go through the following path

     HKEY_LOCAL_MACHINE

       SOFTWARE

         MICROSOFT

           WINDOWS

             CURRENT VERSION

             DETECT

   b. Select "ADD Binary" and name it as "**ACPIOPTION**".

   c. Right click and select Modify, add "01" after "0000" to make it "0000 01".

   d. Save changes.

2. Select "Add New Hardware" under Control Panel. Allow Windows 98 to detect new hardware. (It will find "**ACPI BIOS**" and remove "**Plug and Play BIOS**")

3. Reboot system.

4. Clean boot into DOS and run "AOZVHDD.EXE /C /File"

Changing from ACPI to APM

1. Run "**Regedit.exe**"

    a. Go through the following path

        HKEY_LOCAL_MACHINE

            SOFTWARE

                MICROSOFT

                    WINDOWS

                        CURRENT VERSION

                        DETECT

                          ACPI OPTION
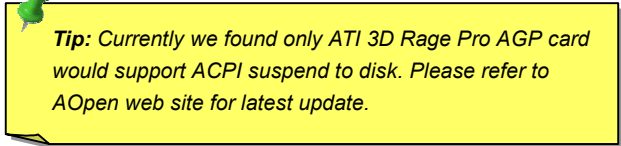
    b. Right click and select "Modify, change "01" to "00" to make it "0000 02".

> *Tip: "02" means Windows 98 is ACPI acknowledged but the ACPI function is disabled.*

    c. Save changes.

2. Select "Add New Hardware" under Control Panel. Allow Windows 98 to detect new hardware. (It will find "**Plug and Play BIOS**" and **remove "ACPI BIOS**")

3. Reboot system.

4. Run "Add New Hardware" again and it will find "Advanced Power Management Resource".

5. Click "OK".

> *Tip: Currently we found only ATI 3D Rage Pro AGP card would support ACPI suspend to disk. Please refer to AOpen web site for latest update.*

ACPI Suspend to RAM (STR)

This motherboard supports ACPI Suspend to RAM function. With this function, you can resume your original work directly from DRAM without going through the Windows 98 booting process and run your application again. Suspend to DRAM saves your current work in the system memory, it is faster than Suspend to Hard Drive but requires power supplied to DRAM, while Suspend to Hard Drive requires no power.

When go into Suspend:

System Image & Status in the DRAM		Other System Devices	
	Backuped by 3.3V Power		Power loss

When power-on next time:

System Image & Status in the DRAM		Other System Devices	
	Power back to work		Power back to work
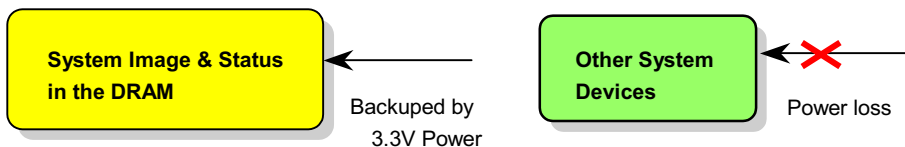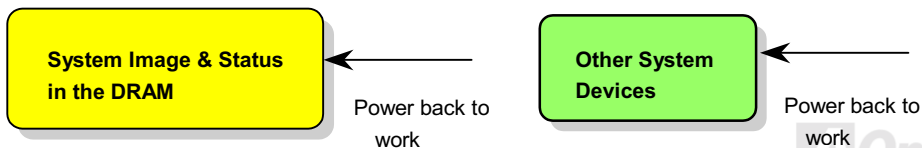
To implement ACPI Suspend to DRAM, please follow the procedures as below:

System Requirement

1.   An ACPI OS is required. Currently, Windows 98 is the only choice. Please refer to ACPI
     Suspend to Hard Drive of how to setup Windows 98 ACPI mode.

2.   The Intel INF Update Utility must be installed properly.

Procedures

1.   Changed the following BIOS settings.

     BIOS Setup > Power Management Setup > ACPI Function : Enabled

     BIOS Setup > Power Management Setup > ACPI Suspend Type :S3.

2.   Go to Control Panel > Power Management. Set "Power Buttons" to "Standby".

3.   Press power button or standby button to wake up the system.

AWARD BIOS

System parameters can be modified by going into BIOS Setup menu, this menu allows you to configure the system parameters and save the configuration into the 128 bytes CMOS area, (normally in the RTC chip or in the main chipset).

The AwardBIOS™ that installed in the Flash ROM of the motherboard is a custom version of an industry standard BIOS. The BIOS provides critical low-level support for standard devices such as hard disk drives, serial and parallel ports.

Most BIOS setting of MX3S / MX3SP had optimized by AOpen's R&D engineering team. But, the default setting of BIOS still can't fine-tune the chipset controlling entire system. Hence, the rest of this chapter is intended to guide you through the process of configuring your system using setup.

To enter to BIOS setup menu, press <Del> when POST (Power-On Self Test) screen is shown on your monitor.

> *Note: Because the BIOS code is the most often changed part of the motherboard design, the BIOS information contained in this manual may be different with actual BIOS that come with your motherboard.*

About BIOS Function Description…

AOpen always dedicates to give users a more friendly computer system. Now, we include all function descriptions of BIOS setup program into the BIOS Flash ROM. When you select one function of BIOS setup program, the function description will appeared at right side of screen. Hence, you don't need read this manual while you changing the BIOS setting.

```
          CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
                           Advanced BIOS Features

       Virus Warning                 Disabled     ▲          Item Help
       CPU Internal Cache            Enabled
       External Cache                Enabled              Menu Level   ▶
       CPU L2 Cache ECC Checking     Enabled
       Quick Power On Self Test      Disabled             Allows you to choose
       First Boot Device             Floppy               the VIRUS warning
       Second Boot Device            HDD-0                 feature for IDE Hard
       Third Boot Device             LS120                 Disk boot sector
       Boot Other Device            Enabled               protection. If this
       Swap Floppy Drive             Disabled             function is enabled
       Boot Up Floppy Seek           Enabled              and someone attempt to
       Boot Up NumLock Status        On                   write data into this
       Gate A20 Option               Fast                 area , BIOS will show
       Typematic Rate Setting        Disabled             a warning message on
     x Typematic Rate (Chars/Sec)    6                    screen and alarm beep
     x Typematic Delay (Msec)        250
       Security Option               Setup
       OS Select For DRAM > 64MB     Non-OS2
       Video BIOS Shadow             Enabled      ▼

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

        Menu Items Select Window   Item Function Description Window

How To Use Award™ BIOS Setup Program

Generally, you can use the arrow keys to highlight items that you want to choose, then press <Enter> key to select, and use the <Page Up> and <Page Down> key to change setting value. You also can press <F1> key for help and press <Esc> key to quit Award™ BIOS setup program. The following table provides details about how to use keyboard in the Award™ BIOS setup program. By the way, all products of AOpen also provides a special function in the BIOS setup, you can press <F3> key selecting preferred menu language to display.

Key	Description
Page Up or +	Changing setting to next value or increase the value.
Page Down or -	Changing setting to previous value or decrease value.
Enter	Select the item.
Esc	1. In main menu: Quit and don't save any change.
	2. In sub menu: Exit current menu to main menu.
Up Arrow	Highlight previous item.
Down Arrow	Highlight next item.
Left Arrow	Move the light bar to left side of menu.
Right Arrow	Move the light bar to right side of menu.
F1	Get menu or item help description.
F3	Changing menu language.
F5	Load previous setting value from CMOS.

Key	Description
F6	Load fail-save setting value from CMOS.
F7	Load turbo setting value from CMOS.
F10	Save changed setting and exit setup program.

Note: AOpen always dedicates to give users a more friendly computer system. Now, we include all function descriptions of BIOS setup program into the BIOS Flash ROM. When you select one function of BIOS setup program, the function description will appeared at right side of screen. Hence, you don't need read this manual while you changing the BIOS setting.

How To Enter BIOS Setup

After you finish the setting of jumpers and connect correct cables. Power on and enter the BIOS Setup, press <Del> during POST (Power-On Self Test). Choose "Load Setup Defaults" for recommended optimal performance.

```
      CMOS Setup Utility - Copyright (C) 1984-2000 Award Software

  ▶ Standard CMOS Features        ▶ Frequency/Voltage Control

  ▶ Advanced BIOS Features          Load Setup Defaults

  ▶ Advanced Chipset Features       Load Turbo Defaults

  ▶ Integrated Peripherals          Set Supervisor Password

  ▶ Power Management Setup          Save & Exit Setup

  ▶ PnP/PCI Configurations          Exit Without Saving

  ▶ PC Health Status


  Esc : Quit          F9 : Menu in BIOS      ↑ ↓ → ←    : Select Item
  F10 : Save & Exit Setup

                  Time, Date, Hard Disk Type...
```

Warning: Please avoid of using "Load Turbo Defaults", unless you are sure your system components (CPU, DRAM, HDD, etc.) are good enough for turbo setting.

BIOS Upgrade

By flashing your motherboard, you agree to accept the possibility of BIOS flash failure. If you motherboard is working and is stable, and there are no major bugs that were fixed by a latter BIOS revision, we recommend that you DO NOT try to upgrade your BIOS.

By doing so, you are taking a risk of BIOS flash failure. If you indeed intent on upgrading, PLEASE BE SURE to use the right BIOS revision for the right motherboard model.

AOpen Easy Flash is a little different than traditional flash method. The BIOS binary file and flash routine are linked together and you simply run a single commend to complete the flash process.

> *Caution: AOpen Easy Flash BIOS programs are designed to be compatible with the Award BIOS. At the date of this note, AOpen Easy Flash BIOS programs are not available for AMI BIOS. AMI BIOS appears mostly only on old 486 boards and some early Pentium boards. Please be sure to view the README compressed inside the BIOS package before upgrading, and follow upgrade instructions carefully. This will minimize the chance of flash failures*.

Below are the steps for easy flashing procedures: (applies for Award BIOS ONLY)

1. Download new BIOS upgrade zip file from AOpen's web site.
   For example, MX3SP102.ZIP.

2. Run shareware PKUNZIP (http://www.pkware.com/) which supports miscellaneous operation
   systems to extract the binary BIOS file and the flash utility.
   Or Winzip (http://www.winzip.com/) in Windows environment.

3. Save the unzipped file into a bootable floppy disk.
   For example, MX3SP102.BIN & MX3SP102.EXE

4. Reboot the system to DOS mode without loading any memory handler (such as EMM386) or
   device driver. It needs around 520K free memory spaces.

5. Execute A:> MX3SP102 and the program will do the rest of it.

   DO NOT turn off the power during FLASH PROCESS until you are asked to!!

6. Reboot system and press <Del> to enter BIOS setup, Choose "Load Setup Defaults", then
   "Save & Exit Setup". Done!

*Warning: The new BIOS upgrade will permanently replace your original
BIOS's settings and PnP information when flashing. You may need to
reconfigure your BIOS setting and re-install Win95/Win98 as well as your
add-on cards, so that your system can go back to work as normal.*

AOpen

Overclocking

As a leading manufacturer in motherboard industry, AOpen always listens to what customers want and develop products to fit different user's requirements. Reliability, compatibility, leading technology and friendly features are our basic goals when designing motherboards. Other than above mentioned design criteria, there are power users who are always seeking to push the limitation of the system performance by overclocking which we call them "Overclocker".

This section is dedicated to Overclockers.

This high performance motherboard is designed for maximum **133MHz** CPU bus clock. But it comes with clock generator of **166MHz** when we design it to accommodate future CPU bus clock. Our lab test results shown that **166MHz** is achievable when proper setting and qualified components were presented.

Warning: The design of this product follows CPU and chipset vendor's design guideline. Any attempts to push beyond product specification are not recommended and you are taking your own risk to damage your system or important data. Before doing overclocking, you must make sure your components are able to tolerate such abnormal setting, especially CPU, memory, hard disks, and AGP VGA cards.

Tip: Note that overclocking may also cause thermal problem. Please make sure that the cooling fan and the heatsink were adequate to dissipate excessive heat that's generated by overclocking the CPU.

VGA and HDD

VGA and HDD are key components for overclocking, following list are what have been tested in our lab. Please note that AOpen can not guaranty they can be successful overclocked again.

VGA: http://www.aopen.com.tw/tech/report/overclk/mb/vga-oc.htm

HDD: http://www.aopen.com.tw/tech/report/overclk/mb/hdd-oc.htm

Glossary

AC97

Basically, AC97 specification separates sound/modem circuit to two parts, digital processor and a CODEC for analog I/O, they are linked by AC97 link bus. Since digital processor can be put into motherboard main chipset, the cost of sound/modem onboard solution can be reduced.

ACPI (Advanced Configuration & Power Interface)

ACPI is the power management specification of PC97 (1997). It intends to save more power by taking full control of power management to operating system and bypass BIOS. The chipset or super I/O chip needs to provide standard register interface to operating system (such as Windows 98). This is a bit similar as the PnP register interface. ACPI defines ATX momentary soft power switch to control the power state transition.

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AGP (Accelerated Graphic Port)

AGP is a bus interface targeted for high-performance 3D graphic. AGP supports only memory read/write operation and single-master single-slave one-to-one only. AGP uses both rising and falling edge of the 66MHz clock, for 2X AGP, the data transfer rate is 66MHz x 4byte x 2 = 528MB/s. AGP is now moving to 4X mode, 66MHz x 4byte x 4 = 1056MB/s. AOpen is the first company to support 4X AGP motherboards by both AX6C (Intel 820) and MX64/AX64 (VIA 694x), started from Oct 1999.

AMR (Audio/Modem Riser)

The CODEC circuit of AC97 sound/modem solution can be put on motherboard or put on a riser card (AMR card) that connects to motherboard through AMR connector.

AOpen Bonus Pack CD

A disc bundled with AOpen motherboard product, there are motherboard drivers, Acrobat Reader for PDF online manual and other useful utilities.

APM

Unlike ACPI, BIOS controls most APM power management functions. AOpen Suspend to Hard Drive is a good example of APM power management.

ATA/66

ATA/66 uses both rising edge and falling edge as UDMA/33, but reduces the cycle time to 2 clocks, that is 60ns. The data transfer rate is (1/60ns) x 2 bytes x 2 = 66MB/s. To use ATA/66, you need special 80-wire ATA/66 IDE cable.

ATA/100

ATA/100 is a new IDE specification under developing. ATA/100 uses both rising edge and falling edge as ATA/66 but clock cycle time is reduced to 40ns. The data transfer rate is (1/40ns) x 2 bytes x 2 = 100MB/s. To use ATA/100, you need special 80-wire IDE cable, the same as ATA/66.

BIOS (Basic Input/Output System)

BIOS is a set of assembly routine/program that reside in EPROM or Flash ROM. BIOS controls Input/output devices and other hardware devices of motherboard. In general, to provide hardware independent portability, operation system and drivers is required to access BIOS without directly access hardware devices.

Bus Master IDE (DMA mode)

The traditional PIO (Programmable I/O) IDE requires the CPU to involve in all the activities of the IDE access including waiting for the mechanical events. To reduce the workload of the CPU, the bus master IDE device transfers data from/to memory without interrupting CPU, and releases CPU to operate concurrently while data is transferring between memory and IDE device. You need the bus master IDE driver and the bus master IDE HDD to support bus master IDE mode.

CODEC (Coding and Decoding)

Normally, CODEC means a circuit that can do digital to analog conversion and also the analog to digital conversion. It is part of AC97 sound/modem solution.

DIMM (Dual In Line Memory Module)

DIMM socket has total 168-pin and supports 64-bit data. It can be single or double side, the golden finger signals on each side of PCB are different, that is why it was called Dual In Line. Almost all DIMMs are made by SDRAM, which operate at 3.3V. Note that some old DIMMs are made by FPM/EDO and only operate at 5V. Do not confuse them with SDRAM DIMM..

ECC (Error Checking and Correction)

The ECC mode needs 8 ECC bits for 64-bit data. Each time memory is accessed, ECC bits are updated and checked by a special algorithm. The ECC algorithm has the ability to detect double-bit error and automatically correct single-bit error while parity mode can only detect single-bit error.

EDO (Extended Data Output) Memory

The EDO DRAM technology is actually very similar to FPM (Fast Page Mode). Unlike traditional FPM that tri-states the memory output data to start the pre-charge activity, EDO DRAM holds the memory data valid until the next memory access cycle, that is similar to pipeline effect and reduces one clock state.

AOpen

EEPROM (Electronic Erasable Programmable ROM)

Also known as E^{2}PROM. Both EEPROM and Flash ROM can be re-programmed by electronic signals, but the interface technology is different. Size of EEPROM is much smaller than flash ROM, AOpen motherboard uses EEPROM for jumper-less and battery-less design.

EPROM (Erasable Programmable ROM)

Traditional motherboard stores BIOS code in EPROM. EPROM can only be erased by ultra-violet (UV) light. If BIOS has to be upgraded, you need to remove EPROM from motherboard, clear by UV light, re-program, and then insert back.

FCC DoC (Declaration of Conformity)

The DoC is component certification standard of FCC EMI regulations. This standard allows DIY component (such as motherboard) to apply DoC label separately without a shielding of housing.

Flash ROM

Flash ROM can be re-programmed by electronic signals. It is easier for BIOS to upgrade by a flash utility, but it is also easier to be infected by virus. Because of increase of new functions, BIOS size is increased from 64KB to 256KB (2M bit). AOpen AX5T is the first board to implement 256KB (2Mbit) Flash ROM. Now flash ROM size is moving to 4M bit on AX6C (Intel 820) and MX3W (Intel 810) motherboard.

FSB (Front Side Bus) Clock

FSB Clock means CPU external bus clock.

CPU internal clock = CPU FSB Clock x CPU Clock Ratio

I2C Bus

See SMBus.

P1394

P1394 (IEEE 1394) is a standard of high-speed serial peripheral bus. Unlike low or medium speed USB, P1394 supports 50 to 1000Mbit/s and can be used for video camera, disk and LAN.

PBSRAM (Pipelined Burst SRAM)

For Socket 7 CPU, one burst data read requires four QWord (Quad-word, 4x16 = 64 bits). PBSRAM only needs one address decoding time and automatically sends the remaining QWords to CPU according to a predefined sequence. Normally, it is 3-1-1-1, total 6 clocks, which is faster than asynchronous SRAM. PBSRAM is often used on L2 (level 2) cache of Socket 7 CPU. Slot 1 and Socket 370 CPU do not need PBSRAM.

PC100 DIMM

SDRAM DIMM that supports 100MHz CPU FSB bus clock.

AOpen

PC133 DIMM

SDRAM DIMM that supports 133MHz CPU FSB bus clock.

PDF Format

A file format for electronic document, PDF format is independent from platform, you can read PDF file under Windows, Unix, Linux, Mac … with different PDF reader. You can also read PDF file by web browser such as IE and Netscape, note that you need to install PDF plug-in first (Included in Acrobat Reader).

PnP (Plug and Play)

The PnP specification suggests a standard register interface for both BIOS and operating system (such as Windows 95). These registers are used by BIOS and operating system to configure system resource and prevent any conflicts. The IRQ/DMA/Memory will be automatically allocated by PnP BIOS or operating system. Currently, almost all the PCI cards and most ISA cards are already PnP compliant.

POST (Power-On Self Test)

The BIOS self test procedure after power-on, sometimes, it is the first or the second screen shown on your monitor during system boot.

RDRAM (Rambus DRAM)

Rambus is a memory technology that uses large burst mode data transfer. Theoretically, the data transfer should be high than SDRAM. RDRAM is cascaded in channel operation. For Intel 820, only one RDRAM channel is supported, 16-bit data per channel, and this channel may have maximum 32 RDRAM devices, no matter how many RIMM sockets.

RIMM

184-pin memory module that supports RDRAM memory technology. A RIMM memory module may contain up to maximum of 16 RDRAM devices.

SDRAM (Synchronous DRAM)

SDRAM is one of the DRAM technologies that allows DRAM to use the same clock as the CPU host bus (EDO and FPM are asynchronous and do not have clock signal). It is similar as PBSRAM to use burst mode transfer. SDRAM comes in 64-bit 168-pin DIMM and operates at 3.3V. AOpen is the first company to support dual-SDRAM DIMMs onboard (AP5V), from Q1 1996

SIMM (Single In Line Memory Module)

SIMM socket is only 72-pin, and is only single side. The golden finger signals on each side of PCB are identical. That is why it was called Single In Line. SIMM is made by FPM or EDO DRAM and supports 32-bit data. SIMM had been phased out on current motherboard design.

SMBus (System Management Bus)

SMBus is also called I2C bus. It is a two-wire bus developed for component communication (especially for semiconductor IC). For example, set clock of clock generator for jumper-less motherboard. The data transfer rate of SMBus is only 100Kbit/s, it allows one host to communicate with CPU and many masters and slaves to send/receive message.

SPD (Serial Presence Detect)

SPD is a small ROM or EEPROM device resided on the DIMM or RIMM. SPD stores memory module information such as DRAM timing and chip parameters. SPD can be used by BIOS to decide best timing for this DIMM or RIMM.

Ultra DMA/33

Unlike traditional PIO/DMA mode, which only uses the rising edge of IDE command signal to transfer data. UDMA/33 uses both rising edge and falling edge, the data transfer rate is double of the PIO mode 4 or DMA mode 2.

16.6MB/s x2 = 33MB/s

USB (Universal Serial Bus)

USB is a 4-pin serial peripheral bus that is capable of cascading low/medium speed peripherals (less than 10Mbit/s) such as keyboard, mouse, joystick, scanner, printer and modem. With USB, the traditional complex cables from back panel of your PC can be eliminated.

AOpen

ZIP file

A compressed file format to reduce file size. To unzip file, run shareware PKUNZIP (http://www.pkware.com/) for DOS and other operating system or WINZIP (http://www.winzip.com/) for windows environment.

Troubleshooting

```
                        ┌─────────────────┐
                        │      Start      │
                        └─────────────────┘
                                 │
                                 ▼
    ┌───────────────────────────────────────────────────────────────┐
    │  Turn off the power and unplug the AC power cable, then remove │
    │  all of the add-on cards and cables, including VGA, IDE, FDD,  │
    │           COM1, COM2 and printer.                             │
    └───────────────────────────────────────────────────────────────┘
                                 │
                                 ▼
        ┌───────────────────────────────────────────────┐
        │    Make sure if all jumper settings are correct.│
        └───────────────────────────────────────────────┘
                                 │
                                 ▼
            ┌───────────────────────────────────┐
            │            Clear CMOS              │
            └───────────────────────────────────┘
                                 │
                                 ▼
                        ┌─────────────────┐
                        │      Next       │
                        └─────────────────┘
```

Continue

Install the VGA card. Then connect your monitor and keyboard.

Turn on the power and check if the power supply and CPU fan work properly.

Yes

No

Next

The problem is probably caused by power supply or motherboard failure. Please contact your reseller or local distributor for repairing.

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Continue

Check if there is display?   No → Perhaps your VGA card or monitor is defective.

Yes

Press <Ctrl> and <Alt> key at the same time, hold them and then press <Del> to reboot the system.

Check if the system reboots?   No → It is very possible that your keyboard is defective.

Yes

Next

Continue

During system rebooting, press <Del> to enter BIOS setup.
Choose "Load Setup Default".

Turn off the system and re-connect IDE cable.

Check if the system can reboot successfully?

No

The problem should be caused by the IDE cable or HDD itself.

Yes

Re-install operatiing system such as Windows 98.

End

Technical Support

Dear Customer,

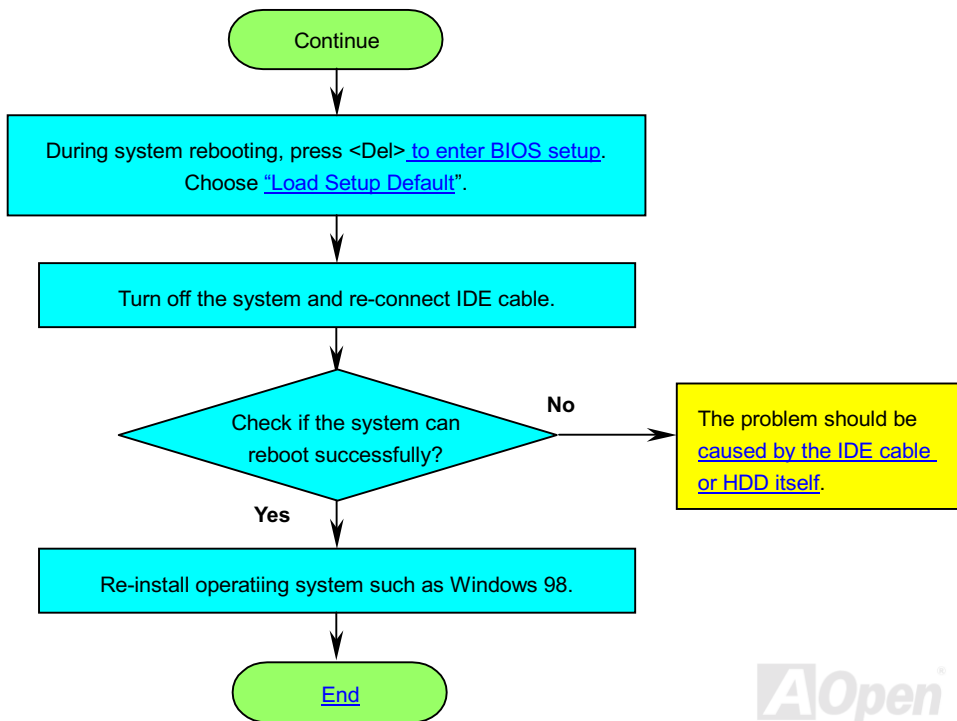Thanks for choosing AOpen products. To provide the best and fastest service to our customer is our first priority. However, we receive numerous emails and phone-calls worldwide everyday, it is very hard for us to serve everyone on time. We recommend you follow the procedures below and seek help before contact us. With your help, we can then continue to provide the best quality service to more customers.

Thanks very much for your understanding!

AOpen Technical Supporting Team

1	**Online Manual:** Please check the manual carefully and make sure the jumper settings and installation procedure are correct. http://www.aopen.com.tw/tech/download/manual/default.htm
2	**Test Report:** We recommend to choose board/card/device from the compatibility test reports for assembling your PC. http://www.aopen.com.tw/tech/report/default.htm

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3

FAQ: The latest FAQ (Frequently Asked Questions) may contain a solution to your problem.
http://www.aopen.com.tw/tech/faq/default.htm

4

Download Software: Check out this table to get the latest updated BIOS/utility and drivers.
http://www.aopen.com.tw/tech/download/default.htm

5

News Group: Your problem probably had been answered by our support engineer or professional users on the news group.
http://www.aopen.com.tw/tech/newsgrp/default.htm

6

Contact Distributors/Resellers: We sell our products through resellers and integrators. They should know your system configuration very well and should be able to solve your problem more efficiently than us. After all, their attitude of service is an important reference for you if next time you want to buy something else from them.

> **7**
> **Contact Us:** Please prepare detail system configuration and error symptom before contacting us. The **part number**, **serial number** and **BIOS version** are also very helpful.

Part Number and Serial Number

The Part Number and Serial number are printed on bar code label. You can find this bar code label on the outside packing, on ISA/CPU slot or on component side of PCB. For example:
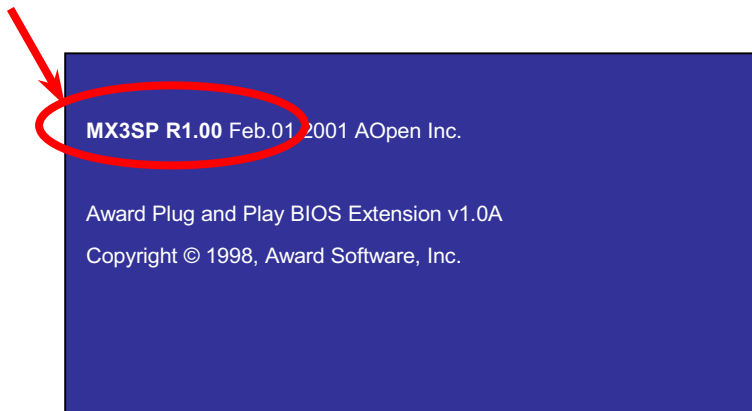

P/N:91.88110.201　　S/N:91949378KN73

P/N: 91.88110.201 is part number, **S/N: 91949378KN73** is serial number

Model name and BIOS version

Model name and BIOS version can be found on upper left corner of first boot screen (POST screen). For example:

MX3SP R1.00 Feb.01 2001 AOpen Inc.

Award Plug and Play BIOS Extension v1.0A

Copyright © 1998, Award Software, Inc.

MX3SP is model name of motherboard, **R1.00** is BIOS version.

Pacific Rim
AOpen Inc.
Tel: 886-2-2696-1333
Fax: 886-2-8691-2233

Europe
AOpen Computer b.v.
Tel: 31-73-645-9516

China
艾尔鹏国际上海(股)有限公司
Tel: 49-2102-157700

Germany
AOpen Computer GmbH.
Tel: 49-2102-157700

America
AOpen America Inc.
Tel: 1-510-498-8928

Web Site: *www.aopen.com*

E-mail: Send us email by going through the contact form below.

English	*http://www.aopen.com.tw/tech/contact/techusa.htm*
Japanese	*http://aojp.aopen.com.tw/tech/contact/techjp.htm*
Chinese	*http://w3.aopen.com.tw/tech/contact/techtw.htm*
German	*http://www.aopencom.de/tech/contact/techde.htm*
French	*http://aofr.aopen.com.tw/tech/contact/techfr.htm*
Simplified Chinese	*http://www.aopen.com.cn/tech/contact/techcn.htm*