i945GTm-VHL
i945GMm-HL

MODT

Cool Stuff is Hot Stuff, MoDT is the Right Stuff

PS/2 Mouse Connector

Analog SPDIF

VGA Port

1394 Port

RJ45 LAN Jack

Rear SUR

Line-In

Speaker Out

Center/ Subwoofer

MIC-In

PS/2 Keyboard Connector

S-Video

DVI Ports

USB 2.0 ports

Side SUR

Onboard HD Audio CODEC

S/PDIF Connector

CD_IN Connector

IRDA Connector

FDD Connector

Printer Connector

32-bit PCI Expansion Slot x2

PCI Express x1 Slot x1

PCI Express VGA Card Enable Jumpers

COM1+COM2 Connector

IEEE 1394 Connector

BIOS

PCI Express x 16 Graphics Slot (8.0GB/s)

ICH7M for i945GMm-HL
ICH7MDH for i945GTm-VHL

USB 2.0 Connector x2

JP14 CMOS Data Clear Jumper

Front Panel Connector

Serial ATA Port x2
Supports 150 MB/s Transfer Rate

Case Open Connector

Power Temperature Connector

SYSFAN1 Connector

Power FAN Connector

Marvell PCIe Gigabit LAN Chip for i945GMm-HL only

Intel PCIe Gigabyte LAN chip for i945GTm-VHL only

200-pins SODIMMsx2 support DDR II 667, Max. To 2GB

Intel® 945GT/945GM support DDR II 533/667 and PCI Express x16

479-pin CPU Socket supports Intel® Yonah Core Duo processors

CPU FAN Connector

4-pin PWR Connector

ATX Power Connector
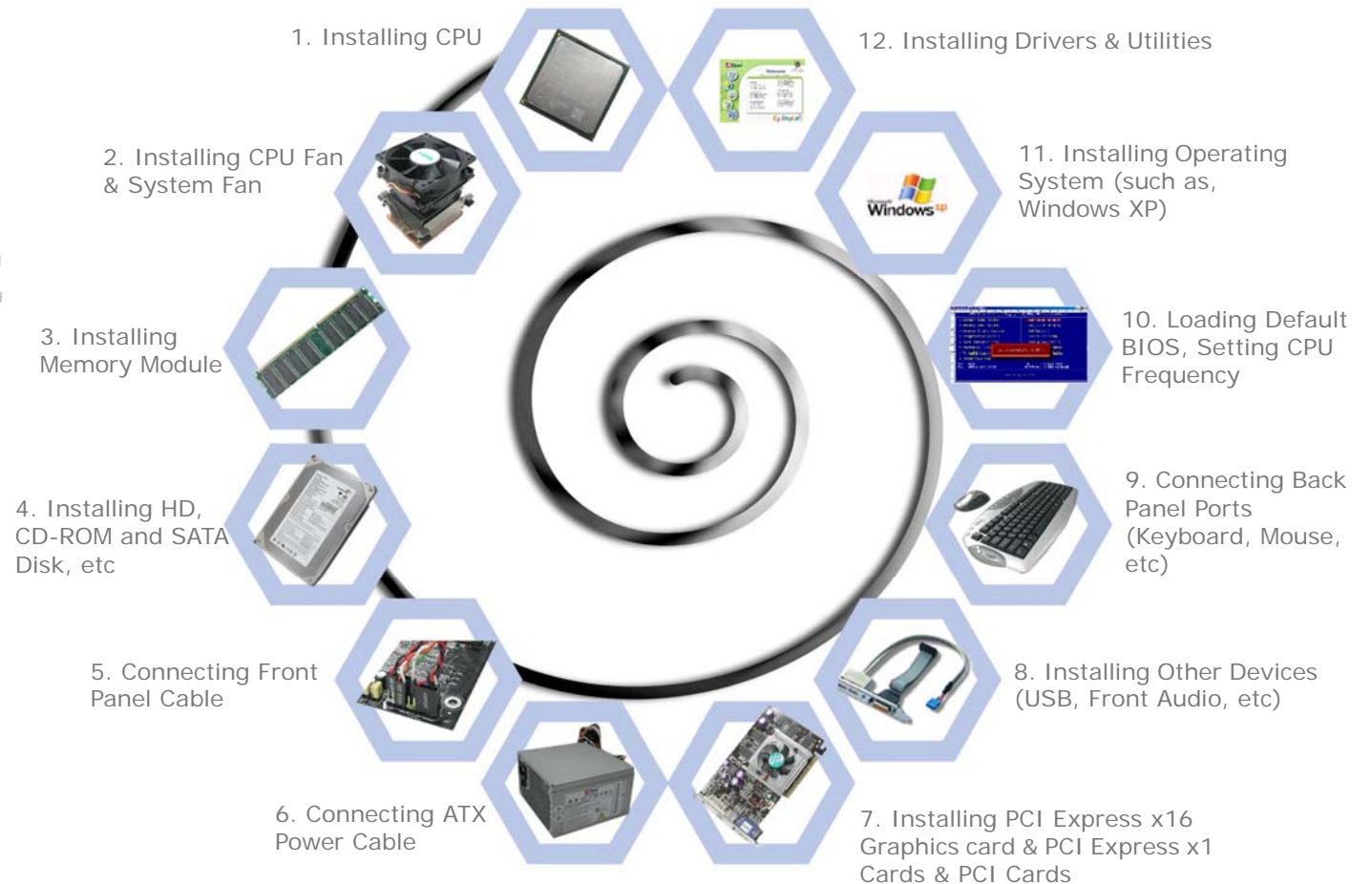
IDE Connector (ATA 33/66/100 supported)

Before You Start

Everything you need to boot this motherboard is included in this Easy Installation Guide. For more information, a complete **Online User's Manual** can be found in the **Bonus Pack CD**. Thanks for the help of saving our earth.

Accessory Checklist

- **Easy Installation Guide x 1**
- **Enhanced Full Pictured Manual x 1**
- **80-Wire IDE Cable x 1**
- **Floppy Drive Cable x 1**
- **Serial ATA Cable x 1**
- **Serial ATA Power Cable x 1**
- **Back Panel I/O Shield x 1**
- **Bonus Pack CD x 1**
- **Yonah Core Duo/Solo CPU cooler x 1**

Installing By Yourself

1. Installing CPU

2. Installing CPU Fan & System Fan

3. Installing Memory Module

4. Installing HD, CD-ROM and SATA Disk, etc

5. Connecting Front Panel Cable

6. Connecting ATX Power Cable

7. Installing PCI Express x16 Graphics card & PCI Express x1 Cards & PCI Cards

8. Installing Other Devices (USB, Front Audio, etc)

9. Connecting Back Panel Ports (Keyboard, Mouse, etc)

10. Loading Default BIOS, Setting CPU Frequency

11. Installing Operating System (such as, Windows XP)

12. Installing Drivers & Utilities

Dual Core | 667 MHz FSB | 667 SODIMM DDRII | IEEE 1394 | USB 2.0 | LAN Gigabit | Express PCI

TV | DVI | CRT | Analog Audio | SPDIF OUT Digital Audio | Serial ATA | 100 PATA
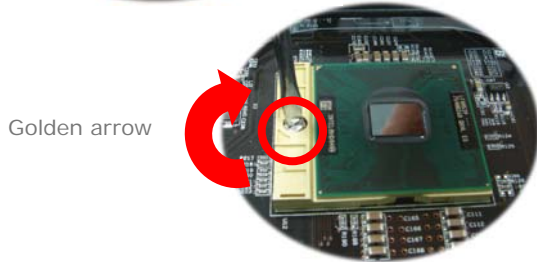
1. Installing CPU

This socket supports Yonah Core Duo/Solo CPU, which is the latest CPU package developed by Intel. Please do not plug other CPU to avoid any damage. Other forms of CPU package are impossible to be fitted in.
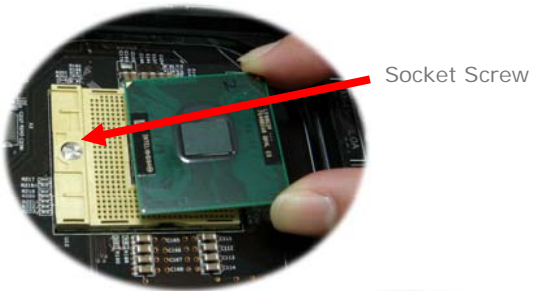
Socket Screw

1. Unscrew socket screw counter-clockwise.
2. Locate Pin 1 in the socket and look for a golden arrow on the CPU upper interface. Match Pin 1 and golden arrow. Then insert the CPU into the socket.
3. Lock the socket screw clockwise to fasten CPU.

Golden arrow

Note: If you do not match the CPU socket Pin 1 and CPU golden arrow well, you may damage the CPU.

2. Installing CPU & System Fans

Plug in the CPU fan cable to the 4-pin CPUFAN connector. If you have chassis fan, you can also plug it in SYSFAN1 or PWRFAN connector.

GND
+12V
Sensor

SYSFAN1 Connector

GND
+12V
Sensor

CPUFAN Connector
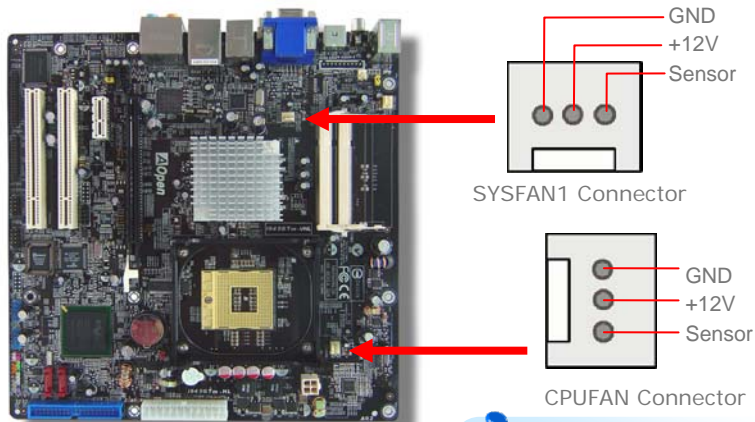
Note: Some CPU fans do not have sensor pin so they cannot support fan monitoring.

3. Installing Memory Modules

SODIMM slots are designed in high and low positions which are very easy to recognize. Insert the module straight down to the SODIMM slot with finger and press down firmly until the SODIMM module is securely in place.

Key

Tab
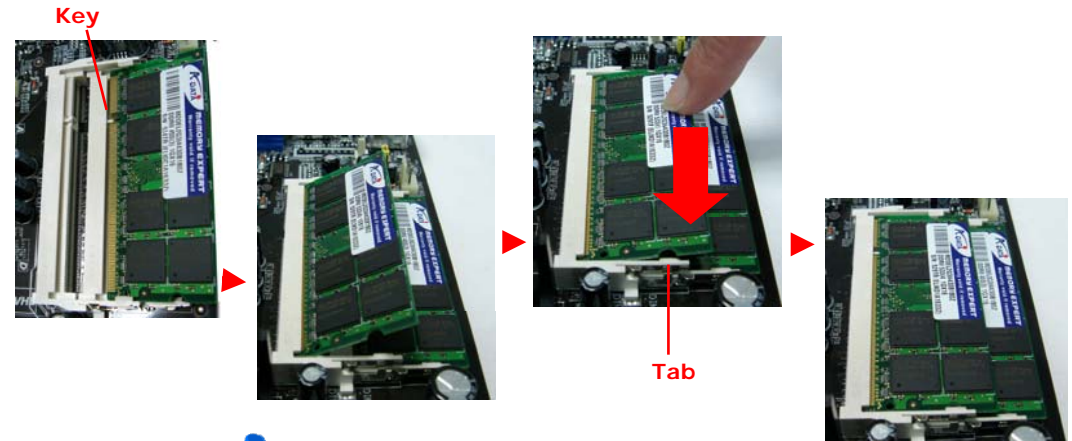
Note: The tabs of the SODIMM slot will close-up to hold the DIMM in place when the SODIMM touches the slot's bottom.
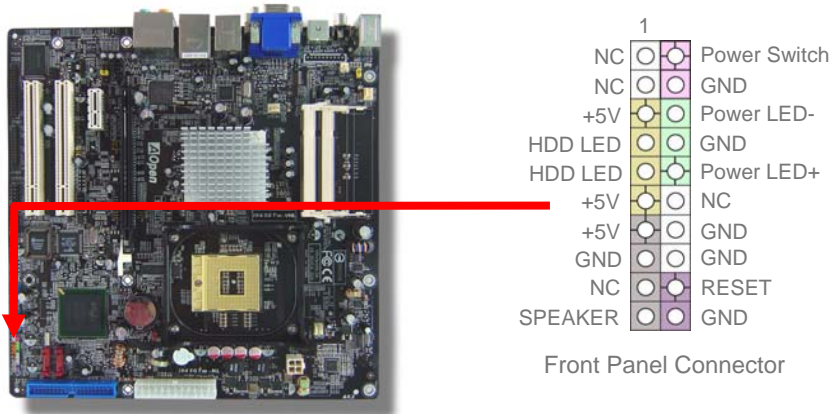
4. Connecting IDE and Floppy Cables

Connect 34-pin floppy cable and 40-pin, 80-wire IDE cable to floppy connector FDD and IDE connector. Be careful of the pin1 orientation. Wrong orientation may cause system damage.

Pin 1

FDD Connector

Pin 1

ATA 66/100 IDE Connector

Primary Master (1st)

Primary Slave (2nd)
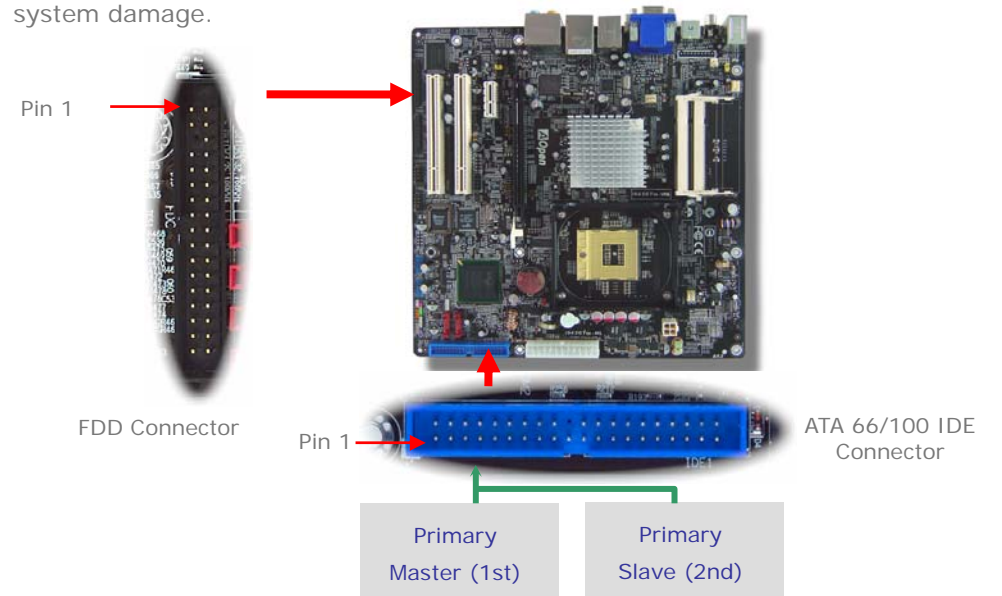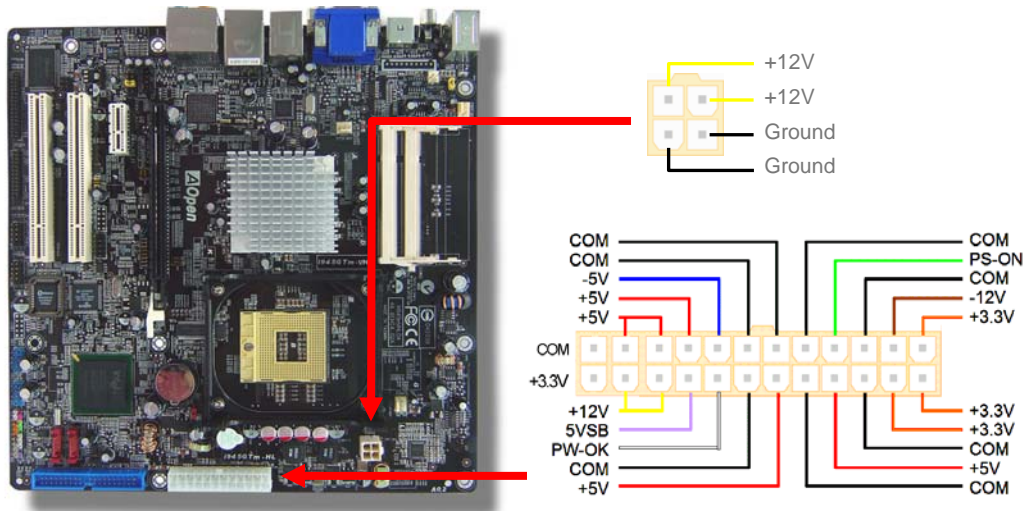
5. Connecting Front Panel cable

Attach the power LED, speaker, and reset switch connectors to the corresponding pins. If you enable "Suspend Mode" item in BIOS Setup, the ACPI & Power LED will keep flashing while the system is in suspend mode.

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*.

	1	
NC	◯◯	Power Switch
NC	◯◯	GND
+5V	◯◯	Power LED-
HDD LED	◯◯	GND
HDD LED	◯◯	Power LED+
+5V	◯◯	NC
+5V	◯◯	GND
GND	◯◯	GND
NC	◯◯	RESET
SPEAKER	◯◯	GND

Front Panel Connector
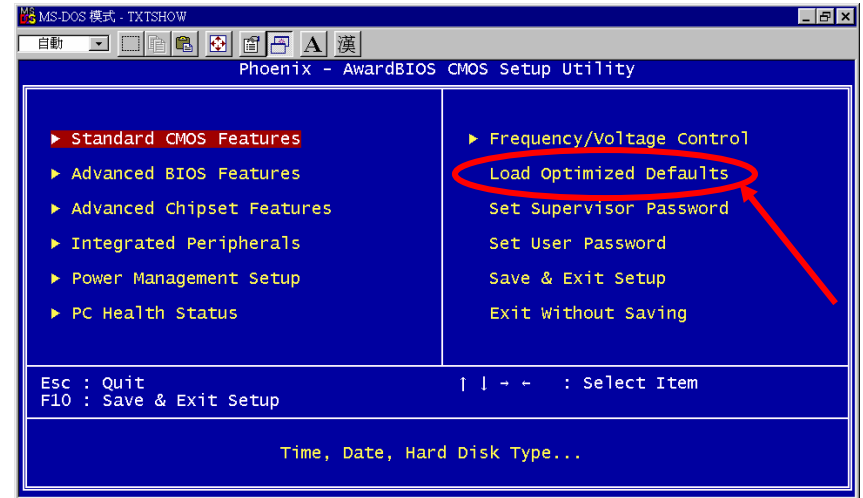
6. Connecting ATX Power Cables

This motherboard comes with a 24-pin and 4-pin ATX power connector as shown below. Make sure you plug in the right direction. We strongly recommend you to insert the 4-pin connector before connecting the 24-pin connector.

+12V	
+12V	
Ground	
Ground	

COM	COM
COM	PS-ON
-5V	COM
+5V	-12V
+5V	+3.3V
COM	
+3.3V	
+12V	+3.3V
5VSB	+3.3V
PW-OK	COM
COM	+5V
+5V	COM

7. Power-on and Loading BIOS Setup

Del

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 Optimized Defaults" for recommended optimal performance.


```
MS-DOS 模式 - TXTSHOW                                          _ ⊡ ✕
自動                  🔲 📋 📋 🔲 🔲 🖨 A 漢

                Phoenix - AwardBIOS CMOS Setup Utility

  ▶ Standard CMOS Features          ▶ Frequency/Voltage Control

  ▶ Advanced BIOS Features           Load Optimized Defaults

  ▶ Advanced Chipset Features        Set Supervisor Password

  ▶ Integrated Peripherals           Set User Password

  ▶ Power Management Setup           Save & Exit Setup

  ▶ PC Health Status                 Exit Without Saving


  Esc : Quit                         ↑ ↓ → ←   : Select Item
  F10 : Save & Exit Setup

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

8. AOpen EzInstall and Bonus Pack CD

You can use the autorun menu of Bonus CD disc. Choose the utility and driver from the icons at left side, and then click on the "**GO**" button to complete installation automatically.

Install driver

Install utility

Browse

Read me

Exit CD

Click to install online manual

Install User manual

Welcome

Install Driver

☑ Intel Pro Network Connections Driver
☑ Intel Chipset Software Installation Utility
☑ Intel Graphics Media Accelerator Driver
☑ Intel Matrix Storage Manager Driver
☑ Realtek High Definition Audio Driver

GO

EzInstall

Setting CPU Core Voltage

This motherboard supports Voltage ID (VID) function to detect CPU voltage automatically during power-on.

Setting CPU Frequency

This motherboard is CPU jumper-less design, you can set CPU frequency through 1MHz stepping CPU Overclocking in the BIOS. CPU Core Frequency = CPU external frequency x CPU Ratio. However, all CPU now selling in the market belong to "Fixed Multiplier". That means users can not adjust the CPU Ratio but only change CPU FSB clock to achieve overclocking.

(Users do the overclocking at their own risk!!)

BIOS Setup > Frequency / Voltage Control > CPU Bus Frequency

CPU Ratio	4x, 5x... 17x, 18x, 20x
CPU FSB (Adjustment manually)	FSB = 533MHz - 667MHz by 1MHz Stepping CPU Overclocking

Processor Number	Architecture	Clock Speed	Front Side Bus	Cache	Ratio
Core Duo T2700	65nm	2.33GHz	667MHz	2MB L2	
Core Duo T2600	65nm	2.16GHz	667MHz	2MB L2	
Core Duo T2500	65nm	2GHz	667MHz	2MB L2	
Core Duo T2400	65nm	1.83GHz	667MHz	2MB L2	
Core Duo T2300	65nm	1.66GHz	667MHz	2MB L2	
Core Solo T1400	65nm	1.83GHz	667MHz	2MB L2	
Core Solo T1300	65nm	1.66GHz	667MHz	2MB L2	

Note: With CPU speed changing rapidly, there might be faster CPU on the market by the time you received this installation guide. This table is kindly for your references only.

Tip: When you fail to over-clock, you could:

1. Clear CMOS (JP14) to restore the default setting.

2. After turning power on, press "Home" immediately until the screen appears.

*Warning: Intel 945GT/945GM chipset supports maximum 667MHz (166MHz*4) system bus; higher clock setting may cause serious system damage.*

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 connector PWR3.
3. Locate JP14 and short pins 2-3 for a few seconds.
4. Return JP14 to its normal setting by shorting pin 1 & pin 2.
5. Connect ATX power cable back to connector PWR3.

Pin 1

1   1

Normal (Default)   Clear CMOS
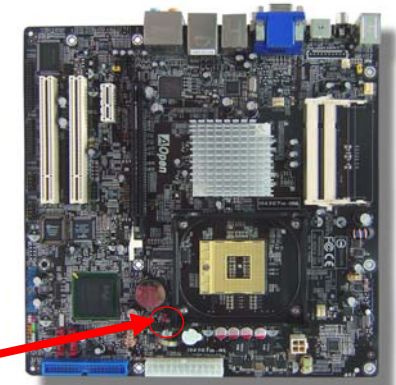
Tip: When should I Clear CMOS?

1. Boot fails because of overclocking...
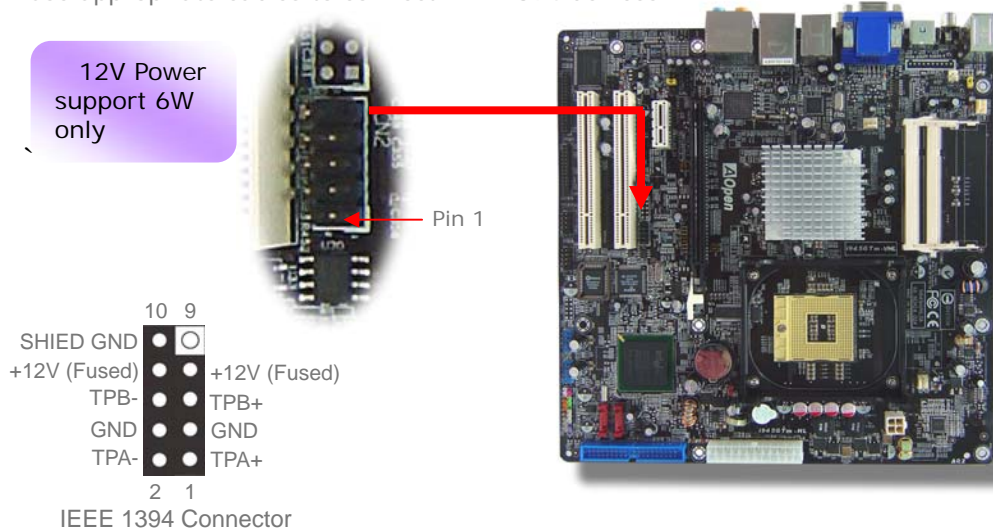
2. Forget password...

3. Troubleshooting...

This motherboard provides keyboard / mouse wake-up function. You can use JP28 to enable or disable this function, which could resume your system from suspend mode with keyboard or mouse. The factory default setting is "Disable" (1-2), and you may enable this function by setting the jumper to 2-3.

Pin 1

1   1

Disable   Enable (Default)
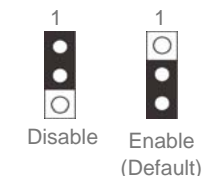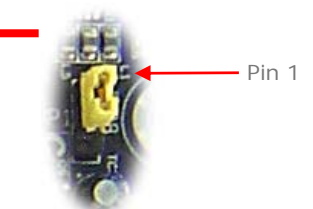
IEEE 1394 Connectors

With IEEE1394 Chip on board (AGERE 1394), having its data transfer rate up to 400Mb/s, this interface can connect to devices that require high data transferring performance such as digital camera, scanner or others IEEE 1394 devices. Please use appropriate cables to connect IEEE1394 devices.

12V Power support 6W only

Pin 1

```
        10  9
SHIED GND  ☐ ○
+12V (Fused) ☐ ☐ +12V (Fused)
      TPB-  ☐ ☐  TPB+
       GND  ☐ ☐  GND
      TPA-  ☐ ☐  TPA+
         2  1
```
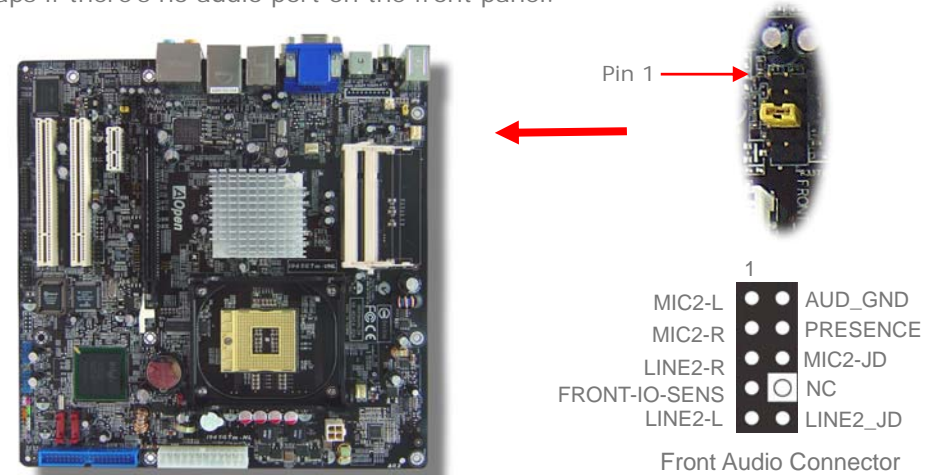
IEEE 1394 Connector

Gigabit LAN onboard

On the strength of Marvell Gigabit LAN chip on board, the motherboard provides 10/100/1000Mbps Ethernet for home and office use. The Ethernet RJ45 connector is located on top of USB connectors. The right hand side LED indicates link mode, it lights in yellow whenever linking to network. The left hand side LED indicates the transfer mode and it lights in green when data is transferring in 100Mbps (never lights while in 10Mbps), but lights in orange when transferring in Gigabit's mode. To enable or disable this function, you may simply adjust it through BIOS.

Transferring (Left)
Green 100Mbps
Orange Gigabit mode

Linking (Right)
Yellow
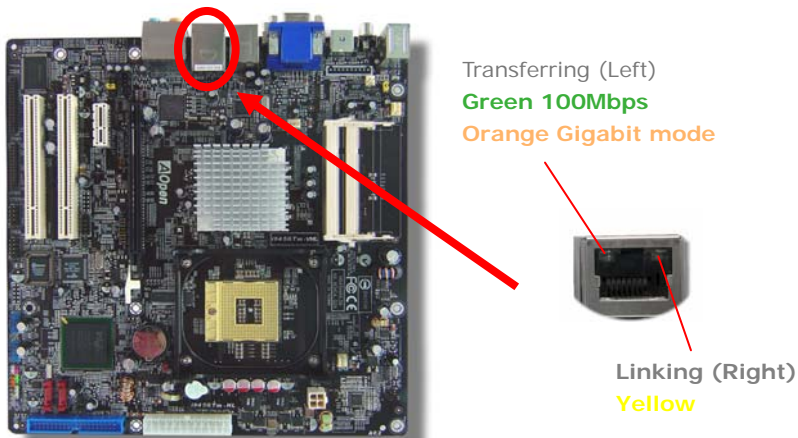
Front Audio Connectors

If the housing has been designed 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 5-6 and 9-10 jumper caps from the Front Audio Connector before connecting the cable. Please do not remove these 5-6 and 9-10 yellow jumper caps if there's no audio port on the front panel.

Pin 1

```
              1
      MIC2-L  ☐ ☐  AUD_GND
      MIC2-R  ☐ ☐  PRESENCE
      LINE2-R ☐ ☐  MIC2-JD
FRONT-IO-SENS ☐ ○  NC
      LINE2-L ☐ ☐  LINE2_JD
```

Front Audio Connector

Serial ATA Connectors

To connect a serial ATA disk, you have to have a 7-pin serial ATA cable. Connect two ends of the serial ATA cable to the serial ATA header on the motherboard and the disk. Like every other traditional disk, you also have to connect a power cable. Please be noted that it is a jumper free implement; you don't need to set jumpers to define a master or slave disk. When serial ATA hard disks are installed on serial ATA ports, the one connected on SATA1 will be set as the first boot device automatically. ***Please note that it supports Hot-Plug in function.***

SATA1

Hot Plug

SATA2
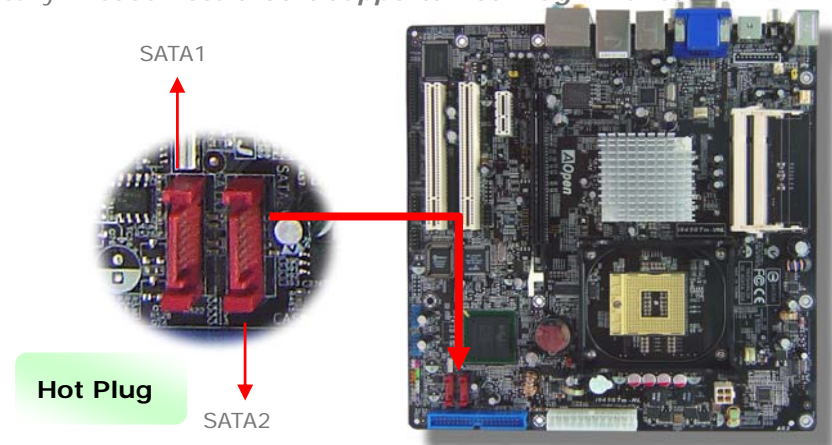
Troubleshooting

If you encounter any trouble to boot you system, follow the procedures accordingly to resolve the problem.
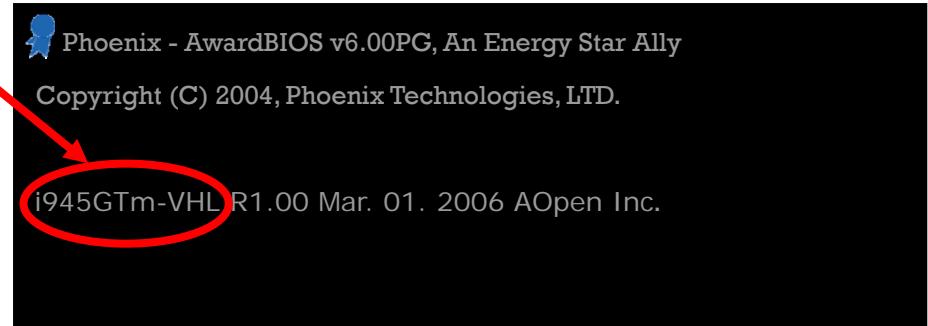

Start

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, printer and other external devices.

Clear CMOS and then plug the ATX Power cord. (For P4 system, please connect the 4-pin (+12V) cord before ATX cord is connected.)

Install VGA card*1, connect monitor and keyboard.

Yes → Turn on the power and check if the power supply, power fan and CPU fan work properly. → **No** → Perhaps your memory is not compatible with the system, or either your VGA card*2 or monitor is out of order.

Yes → Check if there is display → **No** → The problem maybe caused by power supply/motherboard failure. Please contact your reseller or your distributor for repairing.

Yes → Press Del to enter BIOS setup, and choose "Load Setup Default". (For AMD user, please make sure you set the right CPU frequency in BIOS) Save the changes you make in BIOS and reboot the system.

Yes → Turn on the system again and re-connect the IDE cable. Check if the system can reboot successfully. → **No** → The problem maybe caused by the IDE cables or HDD itself.

Reinstall operating system such as Windows 2000 or Windows XP.

End

*1 The VGA card is not necessary to be installed if your monitor is connected to the onboard VGA port.

*2 If you connect to the onboard VGA port and no screen displays, then your onboard VGA device might have problem.

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:

Phoenix - AwardBIOS v6.00PG, An Energy Star Ally

Copyright (C) 2004, Phoenix Technologies, LTD.

i945GTm-VHL R1.00 Mar. 01. 2006 AOpen Inc.

i945GTm-VHL is model name of motherboard; **R1.02** is BIOS version

Register Your Motherboard

Thanks for choosing AOpen product, please register this motherboard at http://club.aopen.com.tw/productreg/ to become a Gold member of Club AOpen, and to ensure high service quality and priority from AOpen. You will also have a chance to play slot machine game to win prize from AOpen. Please prepare the following information before you start: **Model Name, Part Number (P/N), Serial Number (S/N) and Purchase Date**. The Part Number and Serial number are printed on bar code label. You can find this bar code label on the outside packing or on component side of PCB. For example:

918811020191949378KN73

Part No.   Serial No.

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

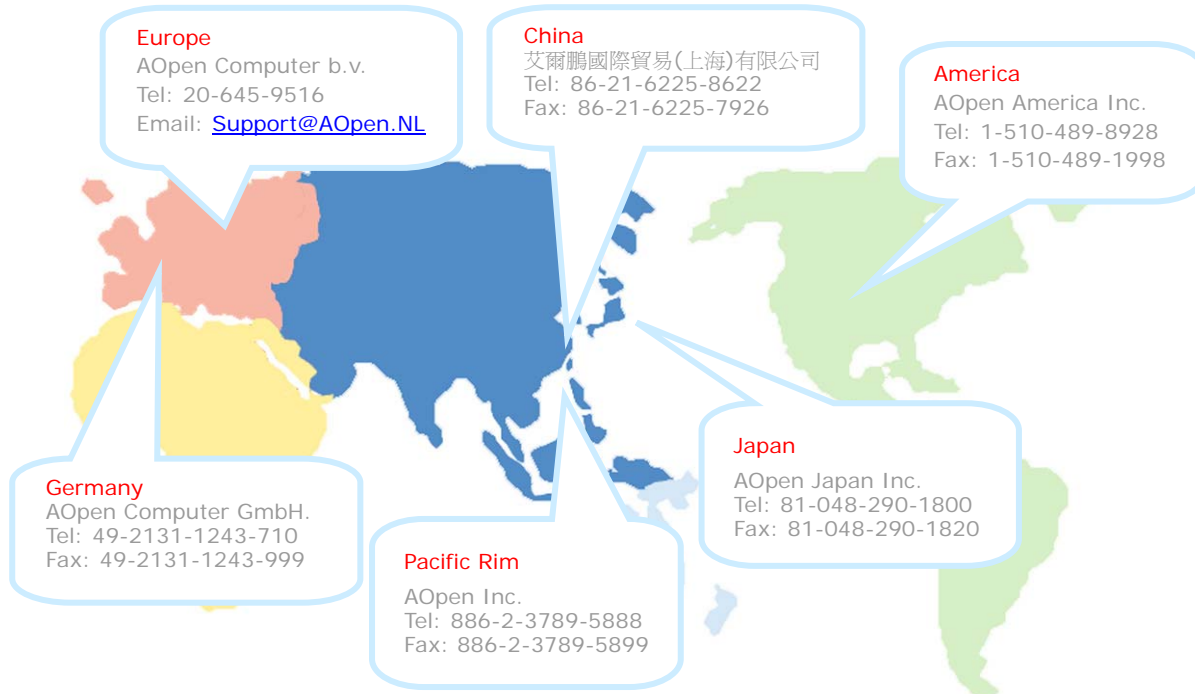| Phoenix-Award BIOS ERROR Message	
Beep Sound	Message
1 short(Beep)	System booting is normally.
1 long - 1 short(Beep)	DRAM ERROR
1 long - 2 short(Beep)	Display card or monitor connected error
1 long - 3 short(Beep)	Keyboard Error
Long(Beep) continuous	DRAM hasn't inset correctly.

Technical Support

Dear Customer,

Thanks for choosing AOpen products. We invite you to register at http://www.aopen.com to become a Gold Member of Club AOpen so as to ensure quality service in the future. In order to maintain the best service to every customer of us, we recommend you to follow the procedures below and seek help from our branches according to the region you buy the product. With your help, we can then continue to provide efficient and the best quality service to every customer.

Thanks very much for your understanding!

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Fax: 81-048-290-1820

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Fax: 49-2131-1243-999

Pacific Rim
AOpen Inc.
Tel: 886-2-3789-5888
Fax: 886-2-3789-5899

Europe	http://www.aopen.nl/tech/default.htm
Pacific Rim	http://www.aopen.com.tw/tech/default.htm
China:	http://www.aopen.com.cn/tech/default.htm
Germany	http://www.aopen.de/tech/default.htm
America	http://usa.aopen.com/tech/default.htm
Japan	http://aopen.jp/tech/index.html

Online Manual: To download manual, please log on and then select your preferred language. Under "Type" directory, choose "Manuals" to go to our manual database. You can also find the manual and EIG in AOpen Bonus Pack.
http://download.aopen.com.tw/

Test Report: We recommend you to choose board/card/device from the compatibility test reports for assembling your PC. It may prevent incompatibility problems.
http://global.aopen.com.tw/tech/report/default.htm

FAQ: Here we list problems that users often encounter and FAQ (Frequently Asked Questions). You may select your preferred language after log on, and may be able to find a solution to your problem.
http://club.aopen.com.tw/faq/

Download Software: After log on and having language selected, you may get the latest updated BIOS/utility and drivers you need under "Type" directory. In most case, newer versions of drivers and BIOS have solved earlier bugs or compatibility problems.
http://download.aopen.com.tw/

eForum: AOpen eForum is provided to discuss our products with other users, in which your problem probably had been discussed before or will be answered. After log on, you may select your preferred language under "Multi-language".
http://club.aopen.com.tw/forum

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.

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 efficiently and provide important reference for you.