User Manual

AIMB-766

Socket LGA 775

Intel® Core™ 2 Quad /

Intel® Core™ 2 Duo /

Intel® Pentium® Dual Core /

Celeron® Processor
1333 MHz FSB
Industrial ATX Motherboard
with PCIe/DDR2/Dual GbE

Trusted ePlatform Services

ADVANTECH

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Each and every Advantech product is built to the most exacting specifications to ensure reliable performance in the harsh and demanding conditions typical of industrial environments. Whether your new Advantech equipment is destined for the laboratory or the factory floor, you can be assured that your product will provide the reliability and ease of operation for which the name Advantech has come to be known.

Your satisfaction is our primary concern. Here is a guide to Advantech's customer services. To ensure you get the full benefit of our services, please follow the instructions below carefully.

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We want you to get the maximum performance from your products. So if you run into technical difficulties, we are here to help. For the most frequently asked questions, you can easily find answers in your product documentation. These answers are normally a lot more detailed than the ones we can give over the phone.

So please consult this manual first. If you still cannot find the answer, gather all the information or questions that apply to your problem, and with the product close at hand, call your dealer. Our dealers are well trained and ready to give you the support you need to get the most from your Advantech products. In fact, most problems reported are minor and are able to be easily solved over the phone.

In addition, free technical support is available from Advantech engineers every business day. We are always ready to give advice on application requirements or specific information on the installation and operation of any of our products.

Declaration of Conformity

FCC

This device complies with the requirements in part 15 of the FCC rules:

Operation is subject to the following two conditions:

- This device may not cause harmful interference
- This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this device in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense. The user is advised that any equipment changes or modifications not expressly approved by the party responsible for compliance would void the compliance to FCC regulations and therefore, the user's authority to operate the equipment.

Caution! *There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.*

Memory Compatibility

Brand	Size	Speed	Type	ECC	Vendor PN	Advantech PN	Memory
Apacer (RoHS)	1 GB	DDR2 800	DDR2	N	78.01G91.404	NA	SEC 746 ZCE7 K4T51083QE
	1 GB	DDR2 667	DDR2	N	78.01G92.420	NA	ELPIDA E5108AGBG-6E-E (64x8)
Transcend (RoHS)	512 MB	DDR2 667	DDR2	N	TS64MLQ64V6J	96D2-512M667NN-TR	SEC K4T51083QC ZCE6 (64x8)
	512 MB	DDR2 667	DDR2	N	TS64MLQ64V6J	96D2-512M667NN-TR	Micron 5XB32D9DCL (64x8)
	1 GB	DDR2 667	DDR2	N	TS2QNJ23450-6S	96D2-1G667NN-TR	SEC K4T51083QE ZCE6 (64x8)
	2 GB	DDR2 667	DDR2	N	TS256MLQ64V6U	NA	Micron 7HE12 D9HNL (128x8)
Transcend (RoHS)	1 GB	DDR2 800	DDR2	N	TS128MLQ64V8J	NA	ProMOS V59C1512804QBF25 (64x8)
	2 GB	DDR2 667	DDR2	N	TS256MLQ64V6U	NA	SAMSUNG K4T1G084QA-ZCE6 (128x8)
DSL	1 GB	DDR2 667	DDR2	N	NA	NA	ELPIDA E5108AGBG-6E-E (64x8)
	2 GB	DDR2 667	DDR2	N	NA	NA	ELPIDA E5108AGBG-6E-E (128x8)
	1 GB	DDR2 800	DDR2	N	NA	NA	ELPIDA E5108AHSE-8E-E (64x8)
	2 GB	DDR2 800	DDR2	N	NA	NA	ELPIDA E1108ACBG-8E-E (128x8)
Kingston (RoHS)	2 GB	DDR2 667	DDR2	N	KVR667D2N5/2G	NA	Micron 7KE12 D9HNL (128x8)
	1 GB	DDR2 800	DDR2	N	KVR800D2N5/1G	NA	ELPIDA E5108AHSE-8E-E (64x8)
Samsung	1 GB	DDR2 800	DDR2	N			

AIMB-766 Feature Comparison

LAN/Model	AIMB-766G2-00A1E	AIMB-766VG-00A1E
Chipset	Q35+ICH9DO	Q35+ICH9
SATA	6	4
SW RAID	0, 1, 5, 10	None
LAN1	Intel 82556DM	Intel 82556DM
LAN2	Intel 82573L	None
AMT 3.0	Yes	No

Product Warranty (2 years)

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages you get when the problem occurs.

2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.

3. If your product is diagnosed as defective, obtain an RMA (return merchandise authorization) number from your dealer. This allows us to process your return more quickly.

4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.

5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Initial Inspection

Before you begin installing your motherboard, please make sure that the following materials have been shipped:

- AIMB-766 Intel Core 2 Quad/ Core 2 Duo/ Pentium Dual Core/ Celeron processor based industrial motherboard
- 1 AIMB-766 startup manual
- 1 Driver CD (user's manual is included)
- 1 FDD cable
- 1 Ultra ATA 66/100 HDD cable
- 2 Serial ATA HDD data cable
- 2 Serial ATA HDD power cable
- 2 COM port cable kit (2 to 2, 1 to 1)
- 1 I/O port bracket
- 1 jumper package
- 1 warranty card

If any of these items are missing or damaged, contact your distributor or sales representative immediately. We have carefully inspected the AIMB-766 mechanically and electrically before shipment. It should be free of marks and scratches and in perfect working order upon receipt. As you unpack the AIMB-766, check it for signs of shipping damage. (For example, damaged box, scratches, dents, etc.) If it is damaged or it fails to meet the specifications, notify our service department or your local sales representative immediately. Also notify the carrier. Retain the shipping carton and packing material for inspection by the carrier. After inspection, we will make arrangements to repair or replace the unit.

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Chapter 1

Hardware
Configuration

1.1 Introduction

The AIMB-766 is the most advanced Intel Q35 product for industrial applications that require high-performance computing. The motherboard supports Intel Core 2 Duo / Core 2 Quad / Pentium Dual Core / Celeron processors with 800/1066/1333 MHz front side bus and DDR2 667/ 800 MHz memory up to 8 GB.

The AIMB-766 incorporates the Intel Q35 chipset to offer cost-effective integrated graphics. The Q35 chipset uses the Intel Extreme Graphics architecture (GMA 3100) to maximize VGA performance and share up to 256 MB of system memory. When higher graphics performance is needed, the AIMB-766 provides a mainstream PCIe x16 expansion slot for add-on graphic cards. In addition, the AIMB-766 has a single/ dual Gigabit Ethernet LAN via a dedicated PCIe x1 bus, which offers bandwidth of up to 500 MB/s, eliminating network bottlenecks. High reliability and outstanding performance make the AIMB-766 the idea platform for industrial networking applications.

By using the Intel ICH9 DO chipset, the AIMB-766 offers four 32-bit, 33 MHz PCI slots; two PCIe x1 slot, one PCIe x16 slot and a variety of features such as 6 on-board SATA II interfaces (bandwidth = 300 MB/s) with software for RAID 0, 1, 10 and 5; 12 USB 2.0 connections; 1 ATA 100/66/33 port; and HD Audio. These powerful I/O capabilities ensure even more reliable data storage capabilities and high-speed I/O peripheral connectivity.

The AIMB-766 also adopts Advantech's unique patented "Sleep Mode Control Circuit" for AT Power Mode.

With all the excellent features and outstanding performance, the AIMB-766 is definitely the ideal platform for today's industrial applications.

1.2 Features

■ **PCIe architecture:** The Intel Q35 and ICH9 DO (or ICH9) PCIe chipset supports 1 PCIe x16 slot, 2 PCIe x1 slot and a PCIe x1 link for the Gigabit LAN.

■ **High Performance I/O Capability:** Dual/single Gigabit LAN via PCIe x1 bus, 4 PCI 32-bit/33MHz PCI slots, 6 SATA2 connectors and 12 USB 2.0 ports.

■ **Standard ATX form factor with industrial features:** AIMB-766 provides industrial features like long product life, reliable operation under wide temperature range, watchdog timer, CMOS backup functions, etc.

■ **BIOS CMOS backup and restore:** When BIOS CMOS setup has been completed, data in the CMOS RAM is automatically backed up to the Flash ROM. This is particularly useful in harsh environments which may cause setup data loss such as battery failure. Upon such an error occurring, the BIOS will check the data, and automatically restore the original data for booting.

■ **Automatically power on after power failure:** It is often necessary to have an unattended system come back to operation when power resumes after a power failure. Advantech's industrial motherboard allows users to set the system to power on automatically without pushing the power on button.

■ **Active Management Technology 3.0:** The hardware and firmware base solution (ICH9 DO only, for AIMB-766G2-00A1E sku only) is powered by the system auxiliary power plane to remotely monitor networked systems. Intel AMT stores hardware and software information in non-volatile memory. Built-in management provides out-of-band management capabilities, allowing remote discovery and repair of systems after OS failures or when a system is powered down. Alert and event logging features detect problems and quickly reduce downtime, proactively blocking incoming threats, containing infected clients before they impact the network, and proactively notifying the user when critical software agents are removed.

1.3 Specifications

1.3.1 System

- **CPU:** Intel LGA 775 Core 2 Quad, Core 2 Duo, Pentium Dual Core, Celeron up to 2.83/3.16/2.2/2.0 GHz, FSB 800/1066/1333 MHz. Advantech also certifies several optional high-performance CPU coolers for high-speed CPUs in 2U chassis or in high-temperature environments

> *Note!* *Advantech certifies two LGA775 CPU cooler solutions. Both coolers are capable of keeping the temperature of 95W-thermal-spec CPUs within specification under environmental temperatures of 55°C without a chassis or 40°C with a chassis.*
>
> *1750000334: LGA 775 CPU Cooler for 4U, 5U, and 7U chassis.*
>
> *1750001661: LGA 775 CPU Cooler for 2U chassis and wall-mount chassis.*

- **L2 Cache:** CPU has one of the following built-in full-speed L2 caches
    12/6 MB for Core 2 Quad
    4/2 MB for Core 2 Duo
    1 MB for Pentium® Dual Core
    512 KB for Celeron®
- **BIOS:** AMI 32 Mbit SPI
- **System Chipset:** Intel Q35 with ICH9DO
- **SATA hard disk drive interface:** Six on-board SATA2 connectors support Advanced Host controller interface (AHCI) technology and have data transmission rates up to 300 MB/s
- **One on-board IDE connector:** Supports PIO mode 4 (16.67 MB/s) and ATA 33/66/100 (33/66/100 MB/s) BIOS enabled/disabled.
- **Floppy disk drive interface:** Supports one floppy disk drive, 5 1/4" (360 KB and 1.2 MB) or 3 1/2" (720 KB, 1.44 MB). BIOS enable/disable

1.3.2 Memory

- **RAM:** Up to 8 GB in four 240-pin DIMM sockets. Supports dual-channel DDR2 667/800 SDRAM

> *Note!* 1. *A 64-bit OS may not fully detect 8 GB of RAM when 8 GB is installed.*
>
> 2. *A 32-bit OS may not fully detect 4 GB of RAM when 4 GB is installed.*

1.3.3 Input/Output

- **PCIe slots:** 1 PCIe x16 expansion slot and 2 PCIe x1 expansion slot
- **PCI Bus:** 4 PCI slots, 32-bit, 33 MHz PCI 2.2 compliant
- **Enhanced parallel port:** Configured to LPT1, LPT2, LPT3, or disabled. Standard DB-25 female connector provided. Supports EPP/SPP/ECP
- **Serial ports:** Four serial ports, one of RS-232/422/485 and three of RS-232. DB-9 connector located in rear panel is RS-232
- **Keyboard and PS/2 mouse connector:** Two 6-pin mini-DIN connectors are located on the mounting bracket for easy connection to a PS/2 keyboard and mouse
- **USB port:** Supports up to 12 USB 2.0 ports with transmission rates up to 480 Mbps

1.3.4 Ethernet LAN

- Supports single/dual 10/100/1000Base-T Ethernet port(s) via PCIe x1 bus which provides a 500 MB/s data transmission rate.
- **Interface:** 10/100/1000Base-T
- **Controller:** LAN1: Intel 82766DM, LAN2: Intel 82573L

1.3.5 Industrial Features

- **Watchdog timer:** Can generate a system reset or NC. The watchdog timer is programmable, with each unit equal to one second or one minute (255 levels)

1.3.6 Mechanical and Environmental Specifications

- **Operating temperature:** 0 ~ 55°C (32 ~ 131° F, Depending on CPU)
- **Storage temperature:** -20 ~ 70° C (-4 ~ 158° F)
- **Humidity:** 5 ~ 95% non-condensing
- **Power supply voltage:** +3.3 V, +5 V, ±12 V, 5 V_{sb}
- **Power consumption:**
  Maximum: +5 V at 3.58 A, +3.3 V at 2.86 A, +12 V at 3.52 A, +5 Vsb at 0.74 A, -12 V at 0.02 A (Intel Core 2 Quad9300 2.5 GHz (1333 MHz FSB), 4 x 1 GB DDR2 800 SDRAM)
- **Board size:** 304.8 x 228.6 mm (12" x 9.6")
- **Board weight:** 0.5 kg (1.68 lb)

1.4 Jumpers and Connectors

Connectors on the AIMB-766 motherboard link it to external devices such as hard disk drives and a keyboard. In addition, the board has a number of jumpers that are used to configure your system for your application.

The tables below list the function of each of the jumpers and connectors. Later sections in this chapter give instructions on setting jumpers. Chapter 2 gives instructions for connecting external devices to your motherboard.

Table 1.1: Jumper list	
Label	**Function**
CMOS1	CMOS
JWDT1	Watchdog reset
PSON1	AT(1-2) / ATX(2-3)
JSETCOM2	COM2 RS-232/422/485 jumper setting

Table 1.2: Connectors	
Label	**Function**
IDE1	Primary IDE connector (one channel)
FDD1	FDD connector
LPT1	Parallel port, parallel port x 1, supports SPP/EPP/ECP mode
LAN1_USB12	LAN1 / USB port 1, 2
LAN2_USB34	LAN2 / USB port 3, 4
VGA1	VGA connector
COM1	Serial port: COM1; RS-232 (DB-9 connector)
COM2~4	COM2;RS-232/422/485, COM3~COM4;RS-232
KBMS1	PS/2 keyboard and mouse connector
KBMS2	External keyboard connector (6-pin)
JIR1	Infrared connector
JFP3	Keyboard lock and power LED
	Suspend: fast flash (ATX/AT)
	System On: on (ATX/AT)
	System Off: off (AT)
	System Off: slow flash (ATX)
JFP2	External speaker / SATA HDD LED connector / SM Bus connector
JFP1	Power switch / reset connector
JCASE1	Case open
VOLT1	Voltage display
JOBS1	HW monitor
	Close: enable OBS alarm
	Open: disable OBS alarm
CPUFAN1	CPU fan connector (4-pin)
SYSFAN1	System fan connector (4-pin)
SYSFAN2	System fan connector (4-pin)
LANLED1	LAN1/2 LED extension connector
AUDIO1	Audio connector
FPAUO1	HD audio front panel pin header
USB56	USB port 5, 6

Table 1.2: Connectors	
Label	**Function**
USB78	USB port 7, 8
USB910	USB port 9, 10
USB1112	USB port 11,12
SATA1	Serial ATA1
SATA2	Serial ATA2
SATA3	Serial ATA3
SATA4	Serial ATA4
SATA5	Serial ATA5
SATA6	Serial ATA6
ATX1	ATX 12 V auxiliary power connector (for CPU)
ATX2	ATX 24-pin main power connector (for system)
PCIEX16_1	PCIe x16 slot 1
PCIEx1_1/PCIEx1_2	PCIe x 1 slot1, PCIe x 1 slot2
PCI1	PCI slot 1
PCI2	PCI slot 2
PCI3	PCI slot 3
PCI4	PCI slot 4
DIMMA1	Channel A DIMM1
DIMMA2	Channel A DIMM2
DIMMB1	Channel B DIMM1
DIMMB2	Channel B DIMM2
SPI_CN1	Update BIOS pin header
TPM_SLOT1	TPM2.0 Module connector

1.5 Board Layout: Jumper and Connector Locations
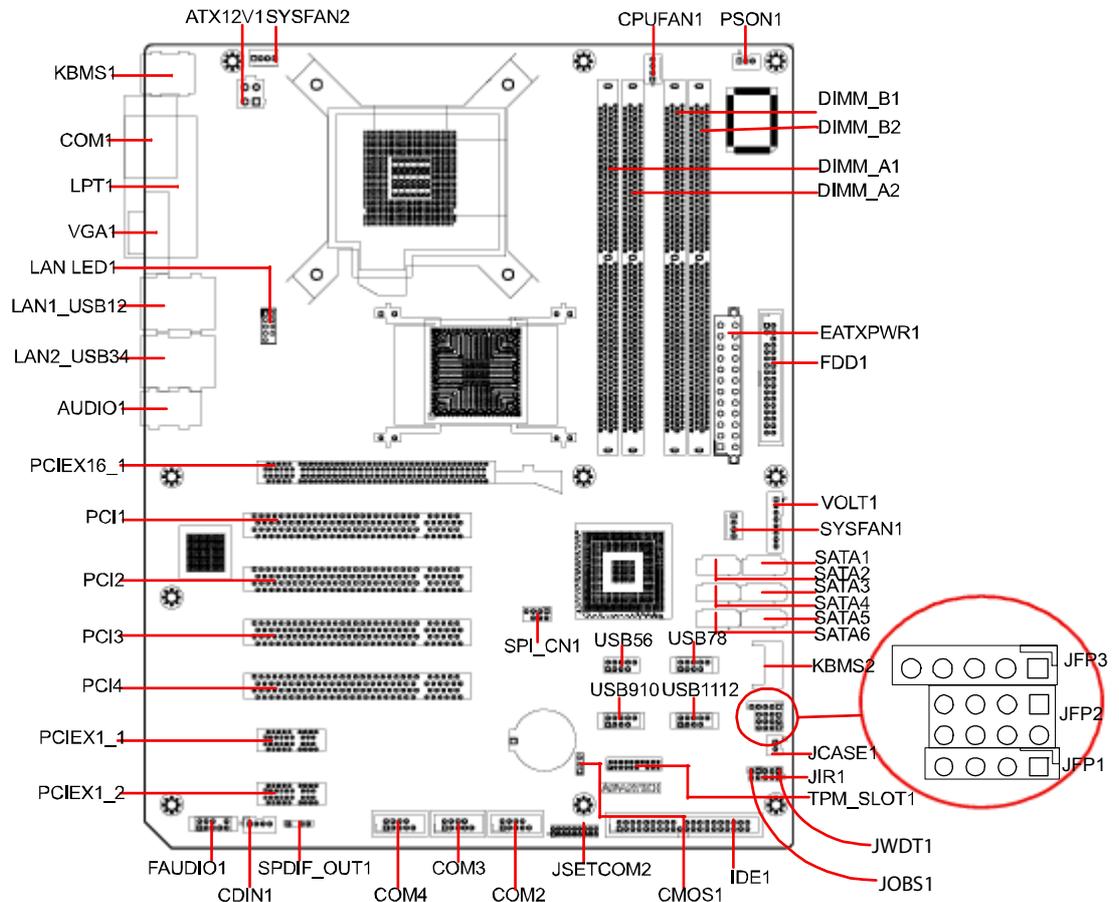
Figure 1.1 Jumper and Connector Locations

Figure 1.2 I/O connectors

1.6 AIMB-766 Block Diagram
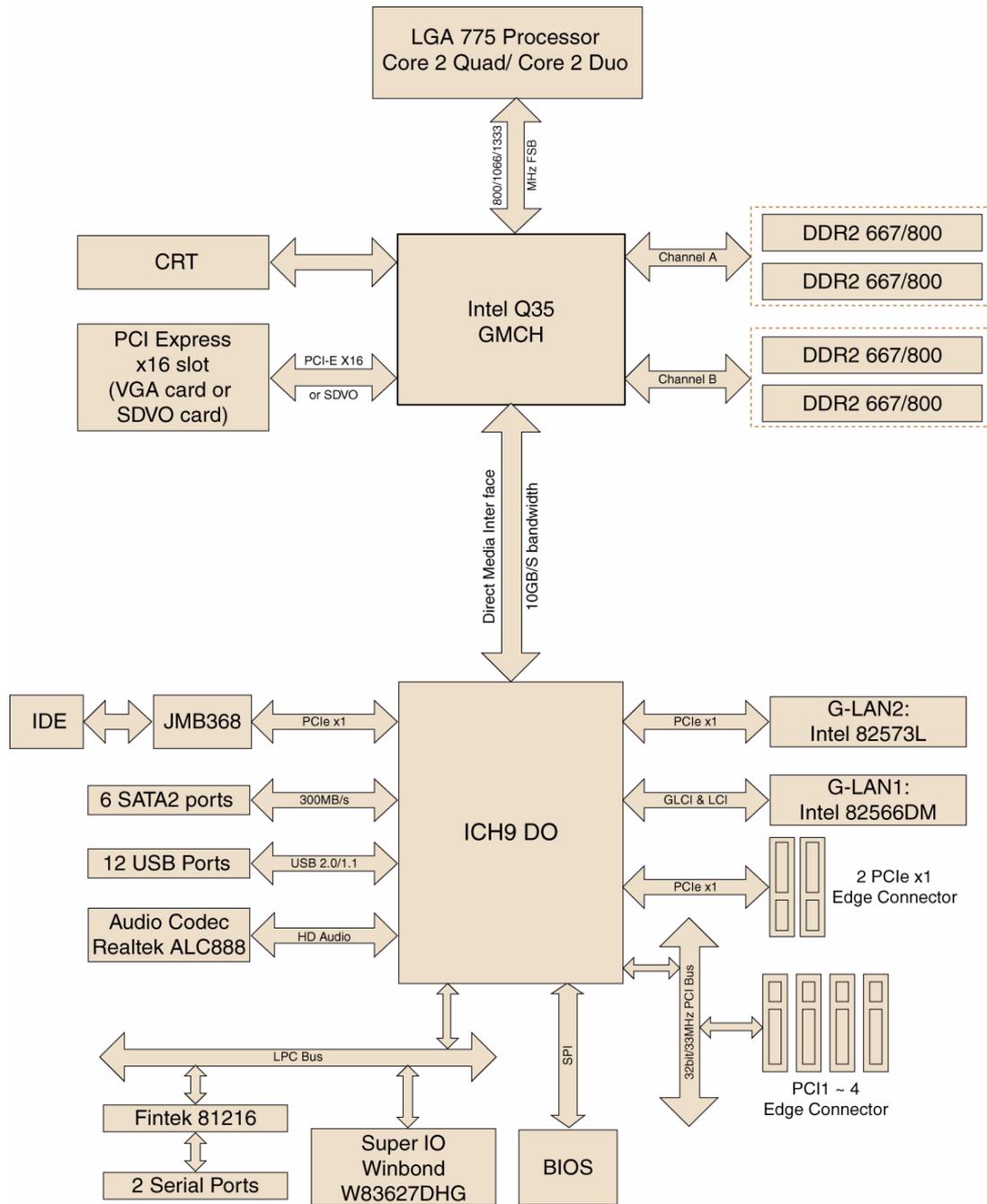
Figure 1.3 AIMB-766 Block Diagram

1.7 Safety Precautions

Warning! *Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.*

Caution! *Always ground yourself to remove any static charge before touching the motherboard. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis.*

Caution! *The computer is provided with a battery-powered Real-time Clock circuit. There is a danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent type recommended by the manufacturer. Discard used batteries according to manufacturer's instructions.*

Caution! *There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.*

1.8 Jumper Settings

This section provides instructions on how to configure your motherboard by setting the jumpers. It also includes the motherboard default settings and your options for each jumper.

1.8.1 How to set jumpers

You can configure your motherboard to match the needs of your application by setting the jumpers. A jumper is a metal bridge that closes an electrical circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To "close" (or turn on) a jumper, you connect the pins with the clip. To "open" (or turn off) a jumper, you remove the clip. Sometimes a jumper consists of a set of three pins, labeled 1, 2, and 3. In this case you connect either pins 1 and 2, or 2 and 3. A pair of needle-nose pliers may be useful when setting jumpers.

1.8.2 CMOS clear (CMOS1)

The AIMB-766 motherboard contains a jumper that can erase CMOS data and reset the system BIOS information. Normally this jumper should be set with pins 1-2 closed. If you want to reset the CMOS data, set J1 to 2-3 closed for just a few seconds, and then move the jumper back to 1-2 closed. This procedure will reset the CMOS to its default setting.

Table 1.3: CMOS1		
Function	Jumper Setting	
* Keep CMOS data	1 2 3 [o o] o	1-2 closed
Clear CMOS data	1 2 3 □ [o o]	2-3 closed
* default setting		
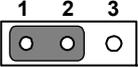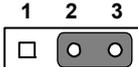
1.8.3 Watchdog timer output (JWDT1)

The AIMB-766 contains a watchdog timer that will reset the CPU. This feature means the AIMB-766 will recover from a software failure or an EMI problem. The JSETCOM2 jumper settings control the outcome of what the computer will do in the event the watchdog timer is tripped.

Table 1.4: Watchdog timer output (JWDT1)	
Function	Jumper Setting
NC	1-2 closed
* Reset	2-3 closed
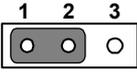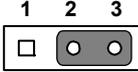
* default setting

Note! *The interrupt output of the watchdog timer is a low level signal. It will be held low until the watchdog timer is reset.*

Table 1.5: ATX/AT mode selector (PSON1)	
Function	Jumper Setting
AT Mode	1-2 closed
* ATX Mode	2-3 closed
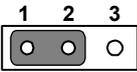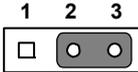
* default setting

Table 1.6: COM2 RS-232/422/485 mode selector (JSETCOM2)
Use JSETCOM2 to select the RS-232/422/485 mode for COM2. The default setting is RS-232.
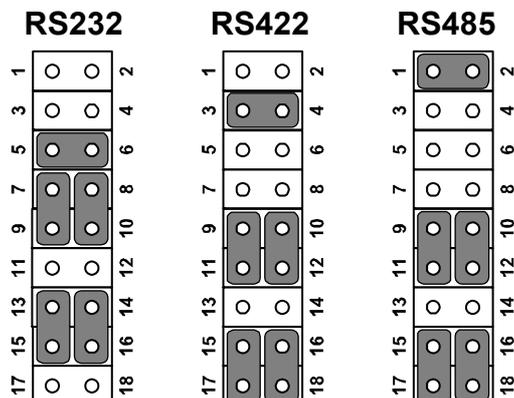
1.9 System Memory

The AIMB-766 has four sockets for 240-pin dual inline memory modules (DIMMs) in two memory channels.

All these sockets use 1.8 V unbuffered double data rate synchronous DRAMs (DDR SDRAM). They are available in capacities of 256, 512 1024 and 2048 MB. The sockets can be filled in any combination with DIMMs of any size, giving a total memory size between 256 MB and 8 GB.

1.9.1 CPU FSB and memory speed

The AIMB-766 can accept DDR2 SDRAM memory chips without parity. Also note that the AIMB-766 accepts DDR2 667/800 MHz SDRAM, and DDR2 SDRAM. The AIMB-766 does not support ECC (error checking and correction).

1.10 Memory Installation Procedures

To install DIMMs, first make sure the two handles of the DIMM socket are in the "open" position. i.e. The handles lean outward. Slowly slide the DIMM module along the plastic guides on both ends of the socket, and then press the DIMM module right down into the socket, until you hear a click. This is when the two handles have automatically locked the memory module into the correct position of the DIMM socket. To remove the memory module, just push both handles outward, and the memory module will be ejected by the mechanism in the socket.

1.11 Cache Memory

The AIMB-766 supports a CPU with one of the following built-in full speed L2 caches:

6 MB for Core 2 Quad

4 MB for Core 2 Duo

1 MB for Pentium® Dual Core

512 KB for Celeron® D

The built-in second-level cache in the processor yields much higher performance than conventional external cache memories.

1.12 Processor Installation

The AIMB-766 is designed for Intel Core 2 Quad, Core 2 Duo, Pentium dual-core, Celeron D processors.

1. Pull the bar besides the CPU socket outward and lift it.
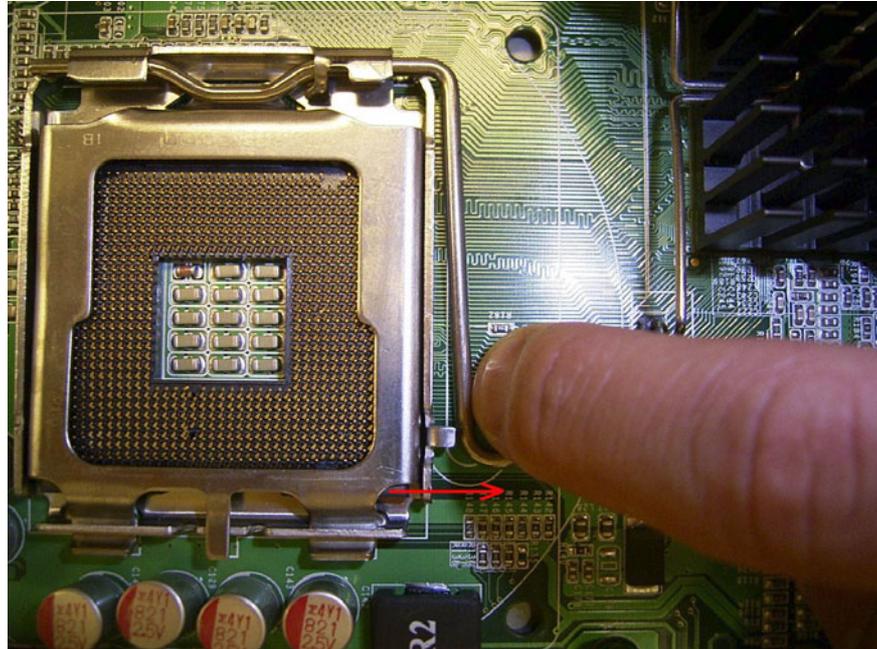
2. Align the triangular marking on the processor with the cut edge of the socket.
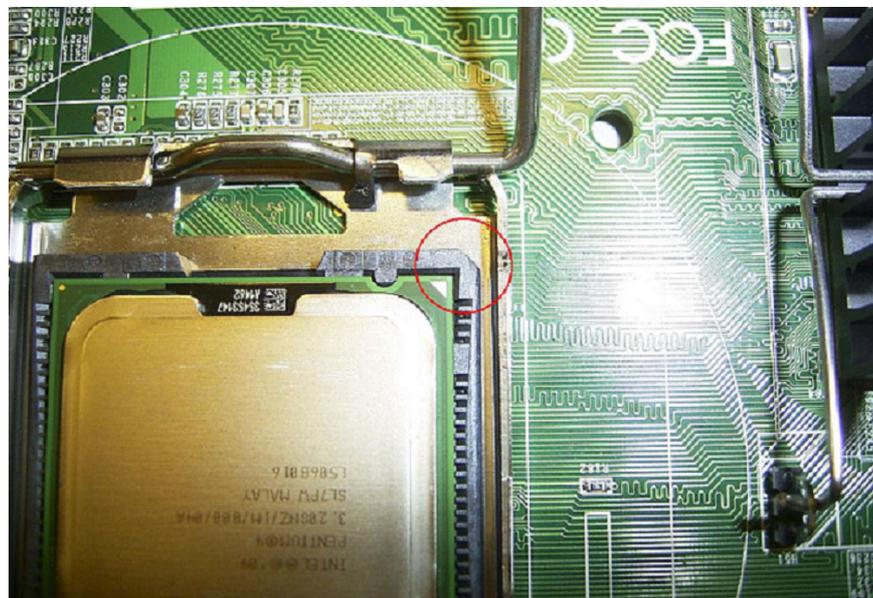
3. Put back the socket cap and press down the bar to fix it.

1.13 PCI Bus Routing Table

AD PCI slot INT	PCI1	PCI2	PCI3	PCI4
	31	25	29	28
A	B	D	D	A
B	C	A	A	B
C	D	B	B	C
D	A	C	C	D

Chapter 2

Connecting
Peripherals

2.1 Introduction

You can access most of the connectors from the top of the board as it is being installed in the chassis. If you have a number of cards installed, you may need to partially remove a card to make all the connections.

2.2 Primary (IDE1) IDE Connector
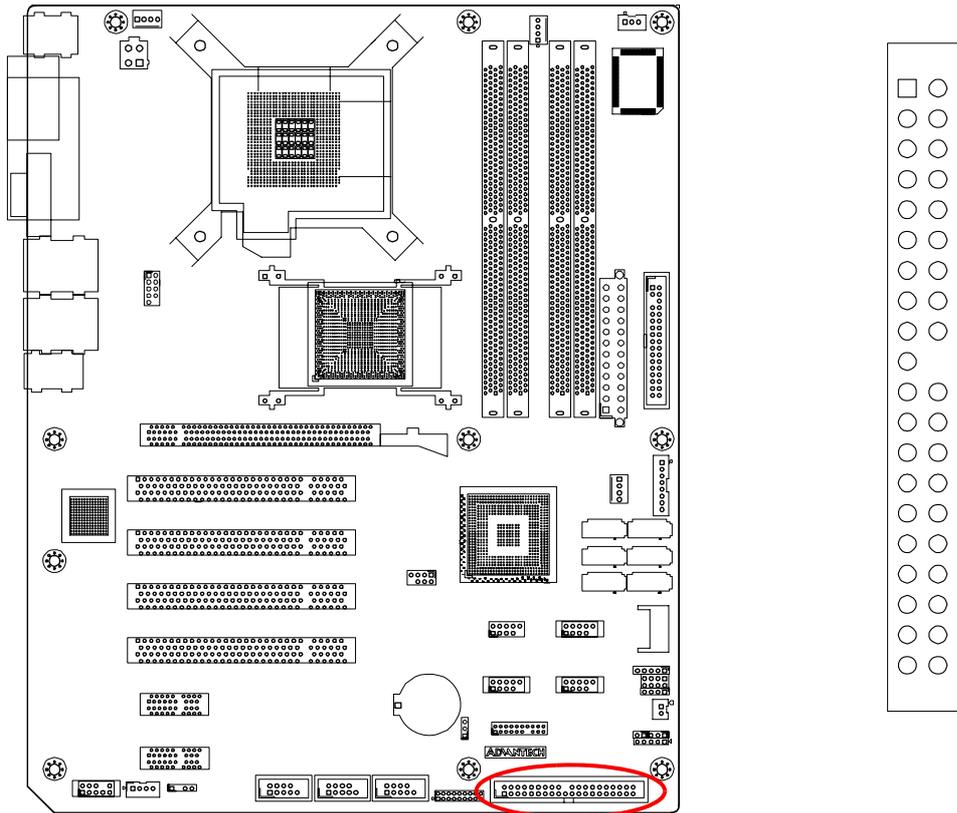
You can attach up to one IDE (Integrated Drive Electronics) drive to the AIMB-766's built-in controller.

Wire number 1 on the cable is red or blue and the other wires are gray. Connect one end to connector IDE1 on the motherboard. Make sure that the red/blue wire corresponds to pin 1 on the connector (in the upper right hand corner).

Connect the hard drive to the other end of the cable. Wire 1 on the cable should also connect to pin 1 on the hard drive connector, which is labeled on the drive circuit board. Check the documentation that came with the drive for more information.

2.3 Floppy Drive Connector (FDD1)
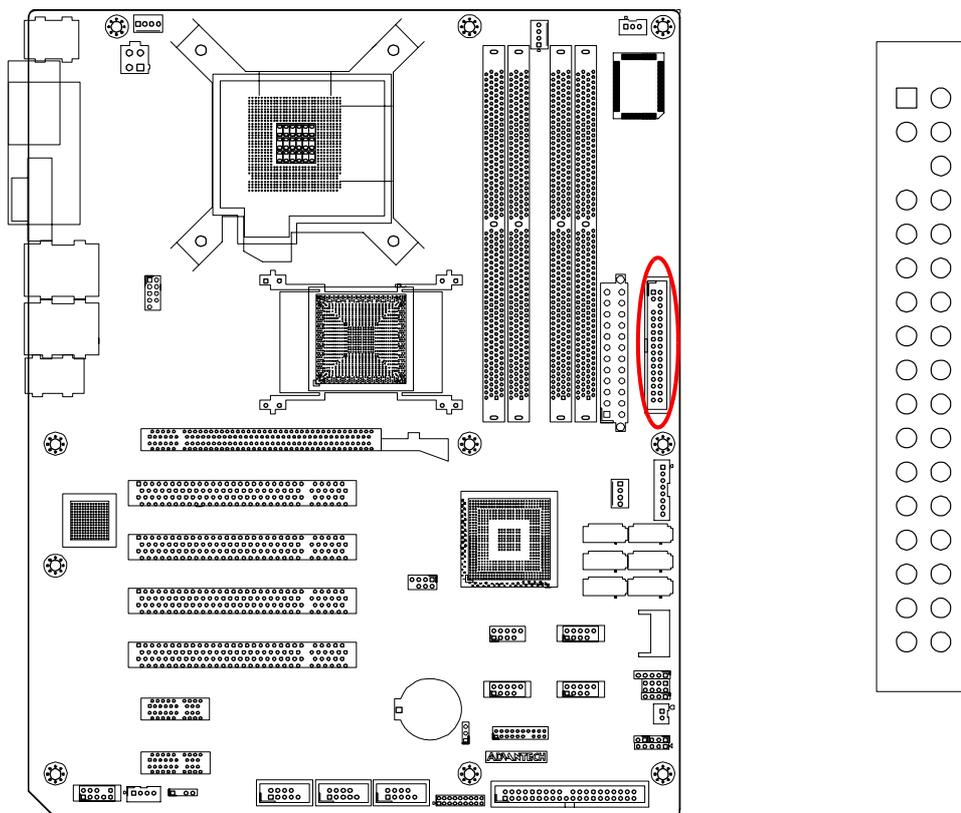
You can attach up to two floppy disk drives to the AIMB-766's onboard controller. You can use 3.5" (720 KB, 1.44 MB) drives.

The motherboard comes with a 34-pin daisy-chain drive connector cable. On one end of the cable is a 34-pin flat-cable connector. On the other end are two 34-pin flat-cable connectors (usually used for 3.5" drives). The connector on the end (after the twist in the cable) connects to the A: floppy drive. The connector in the middle connects to the B: floppy drive.

2.4 Parallel Port (LPT1)
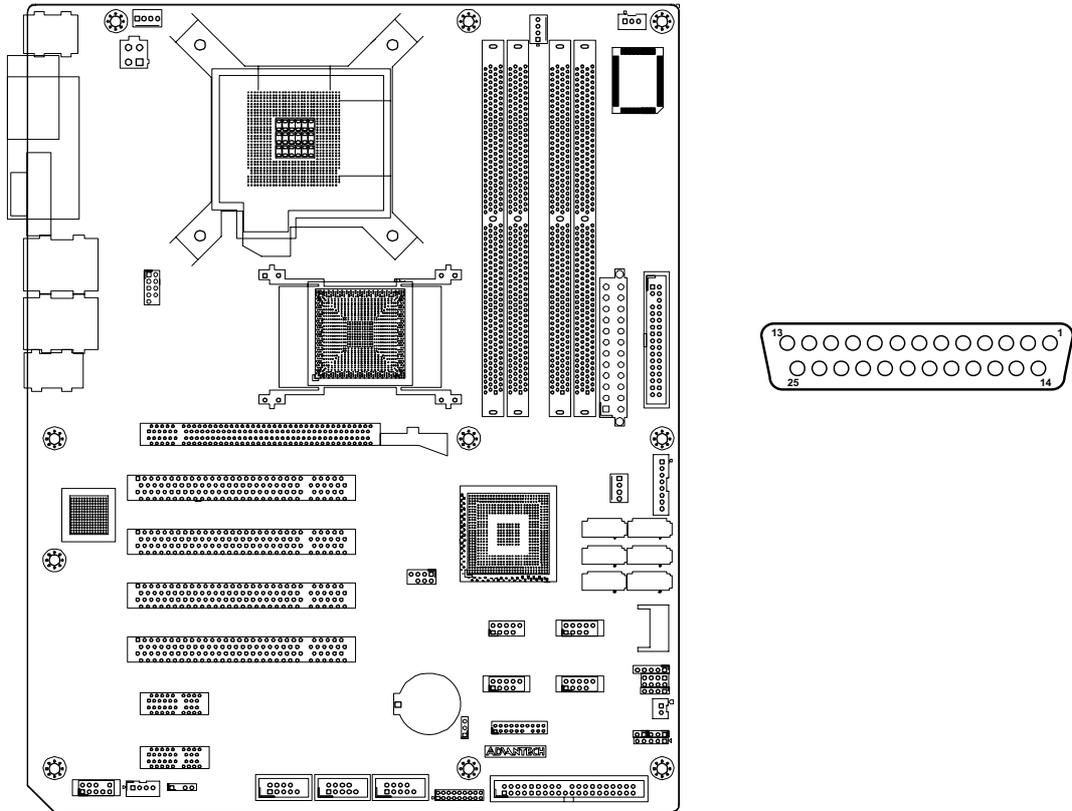
The parallel port is normally used to connect the motherboard to a printer.

The AIMB-766 includes an onboard parallel port, accessed through a 26-pin flat-cable connector, LPT1.

2.5 USB Ports (LAN1_USB12, LAN2_USB34, USB56, USB78, USB910 & USB1112)

These ports support Plug & Play and hot swapping for up to 127 external devices. The USB ports comply with USB Specification Rev. 2.0. Transmission rates of up to 480 Mbps and fuse protection are supported. The USB interface can be disabled in the system BIOS setup.

The AIMB-766 is equipped with one or two high-performance 1000 Mbps Ethernet LANs. They are supported by all major network operating systems. The RJ-45 jacks on the rear plate provide convenient or 1000Base-T operation.

LAN1_USB12 LAN2_USB34

USB56   USB78

USB910   USB1112
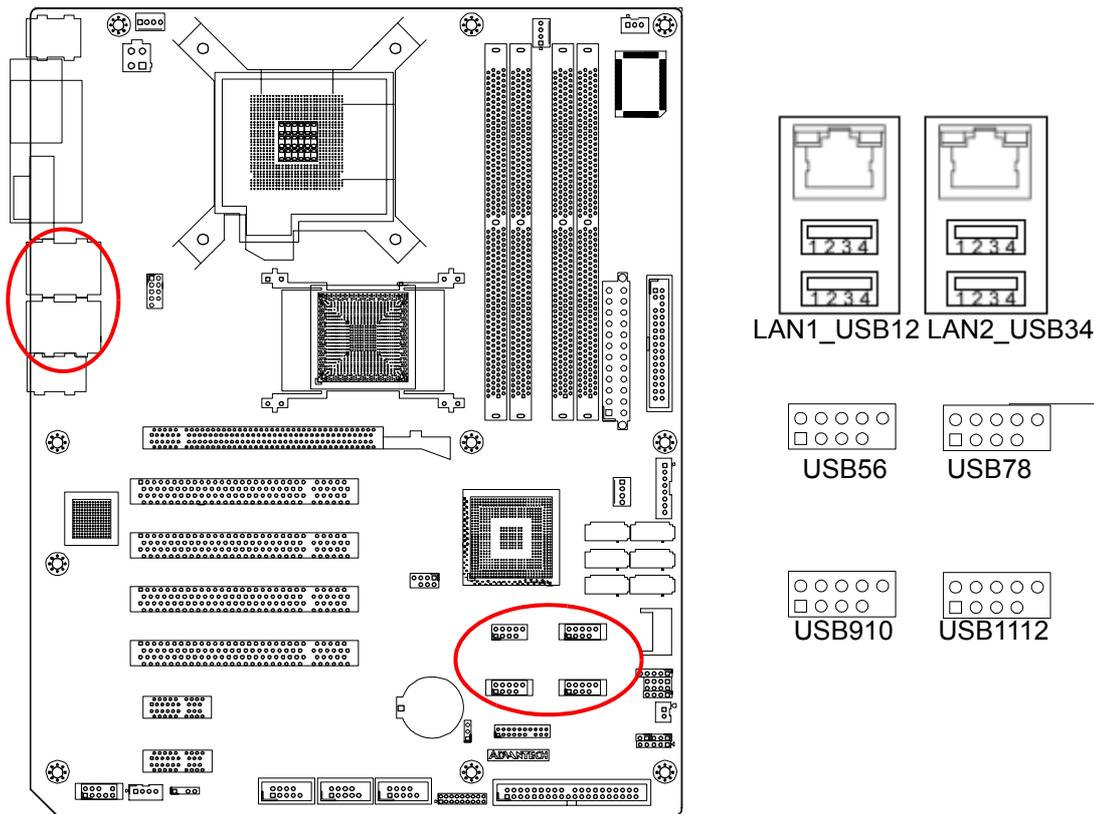
2.6 VGA Connector (VGA1)
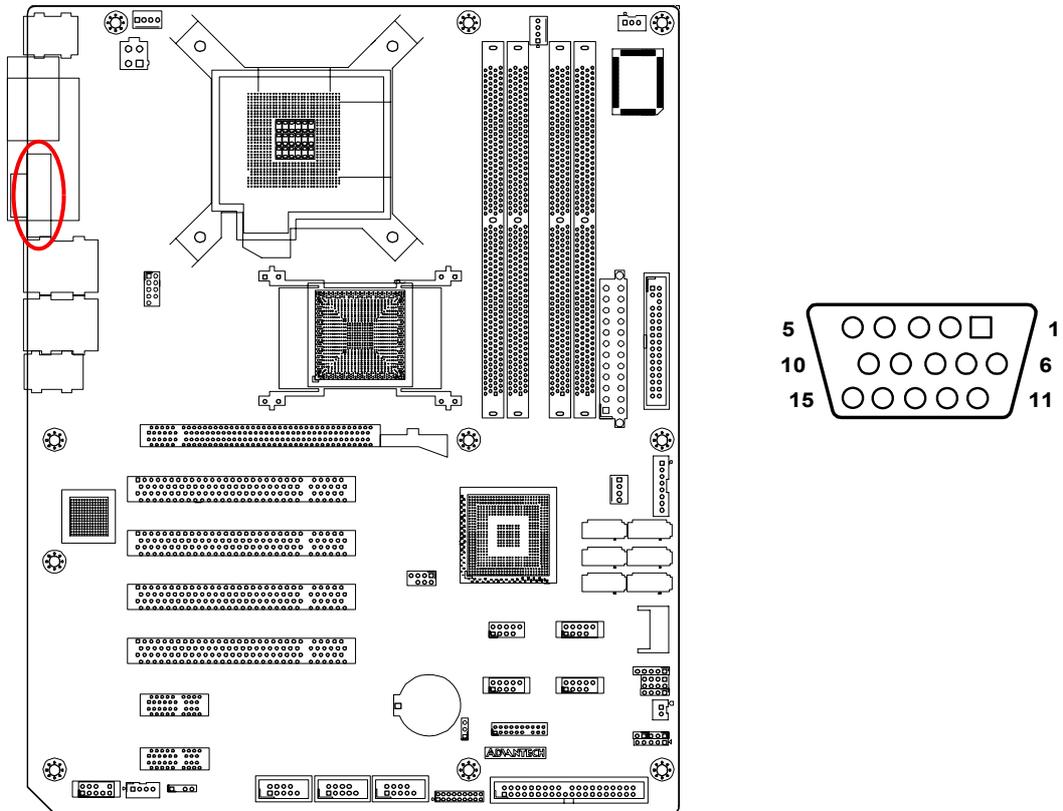
The AIMB-766 includes a VGA interface that can drive conventional CRT displays. VGA1 is a standard 15-pin D-SUB connector commonly used for VGA. Pin assignments for CRT connector VGA1 are detailed in Appendix B.

2.7 Serial Ports (COM1, COM2, COM3 & COM4)

COM1

COM2

COM3   COM4
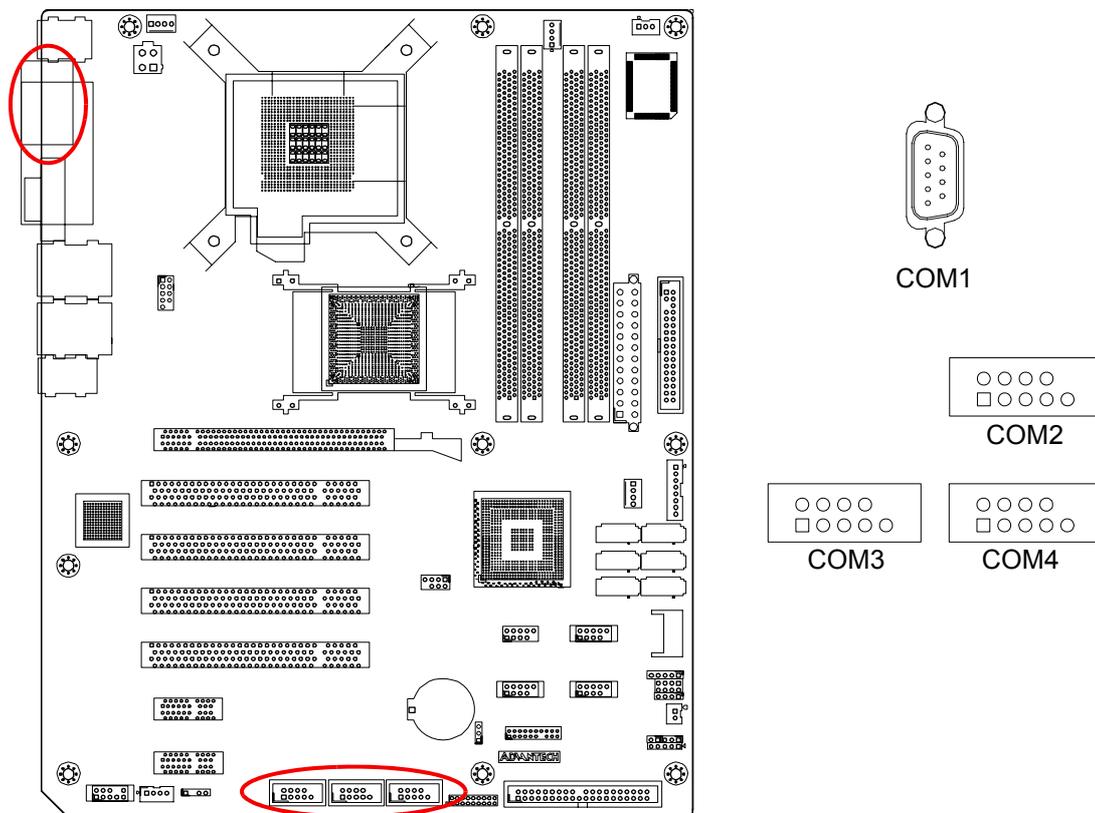
The AIMB-766 offers two serial ports (one on the rear panel and one onboard). JP1 is used to select the RS 232/422/485 mode for COM2. These ports can connect to a serial mouse, printer or communications network.

The IRQ and address ranges for both ports are fixed. However, if you want to disable the port or change these parameters later, you can do this in the system BIOS setup.

Different devices implement the RS-232/422/485 standards in different ways. If you are having problems with a serial device, be sure to check the pin assignments for the connector.

2.8 PS/2 Keyboard and Mouse Connector (KBMS1)
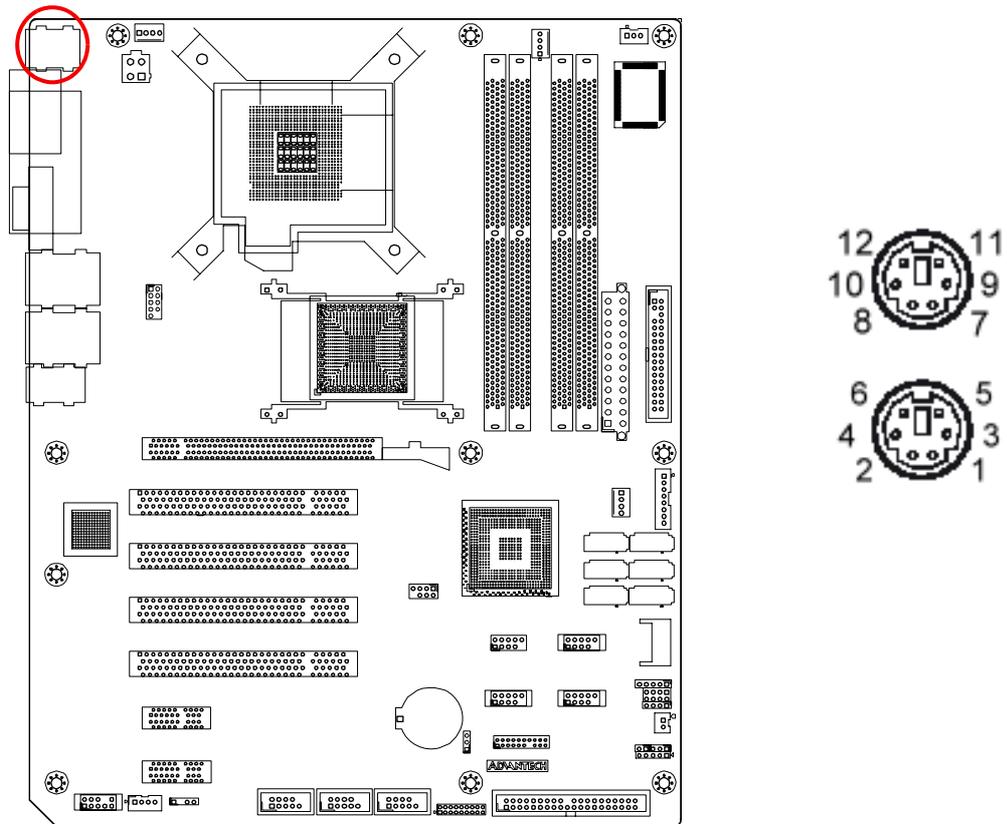
Two 6-pin mini-DIN connectors (KBMS1) on the rear panel of the motherboard provide PS/2 keyboard and mouse connections.

2.9   External Keyboard & Mouse (KBMS2)
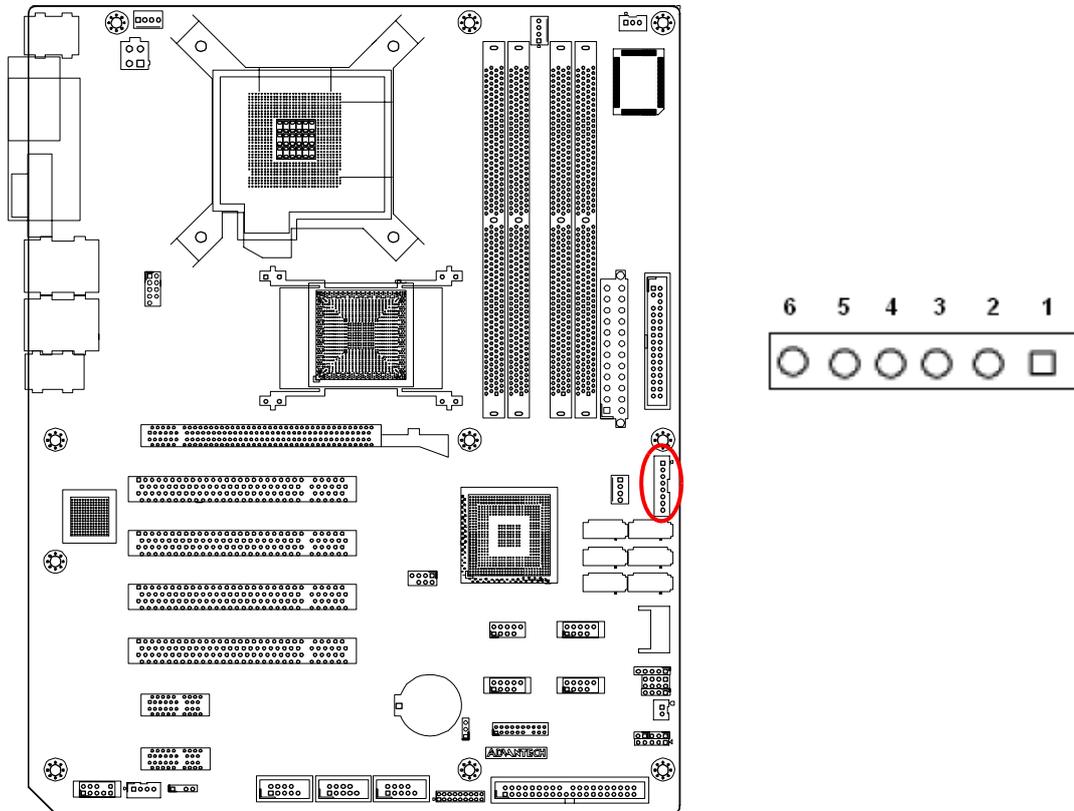
There is also an extra onboard external keyboard and mouse connector on the motherboard. This gives system integrators greater flexibility in designing their systems.

2.10 CPU Fan Connector (CPUFAN1)
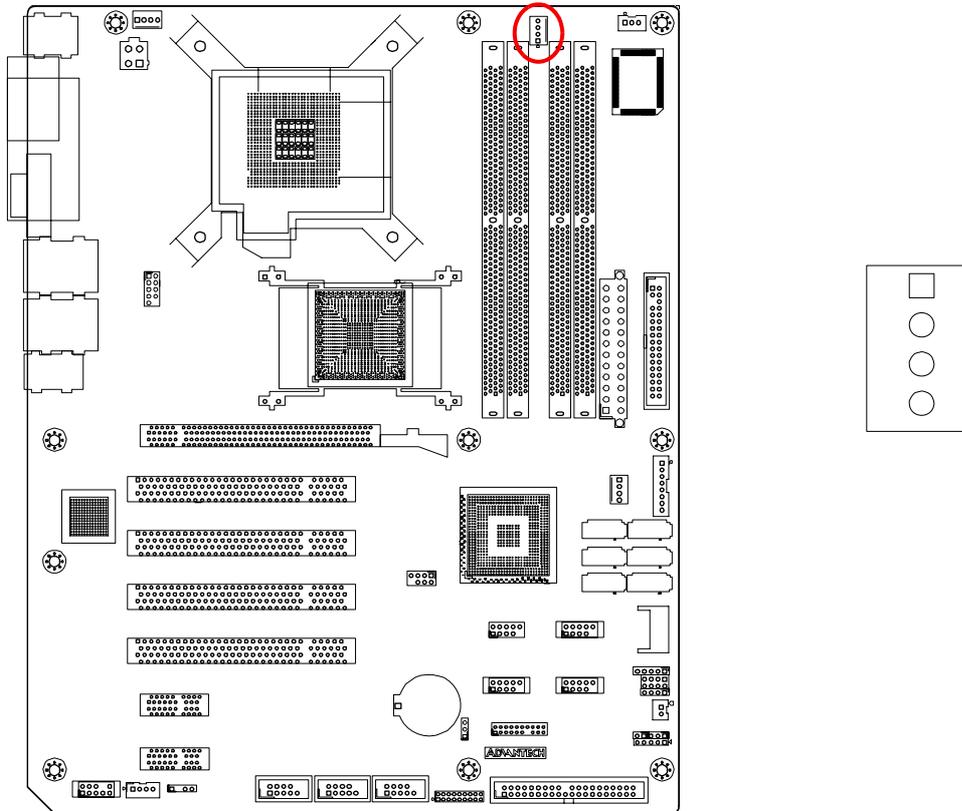
If a fan is used, this connector supports cooling fans that draw up to 500 mA (6 W).

2.11 System FAN Connector (SYSFAN1 and SYSFAN2)

SYSFAN1

SYSFAN2
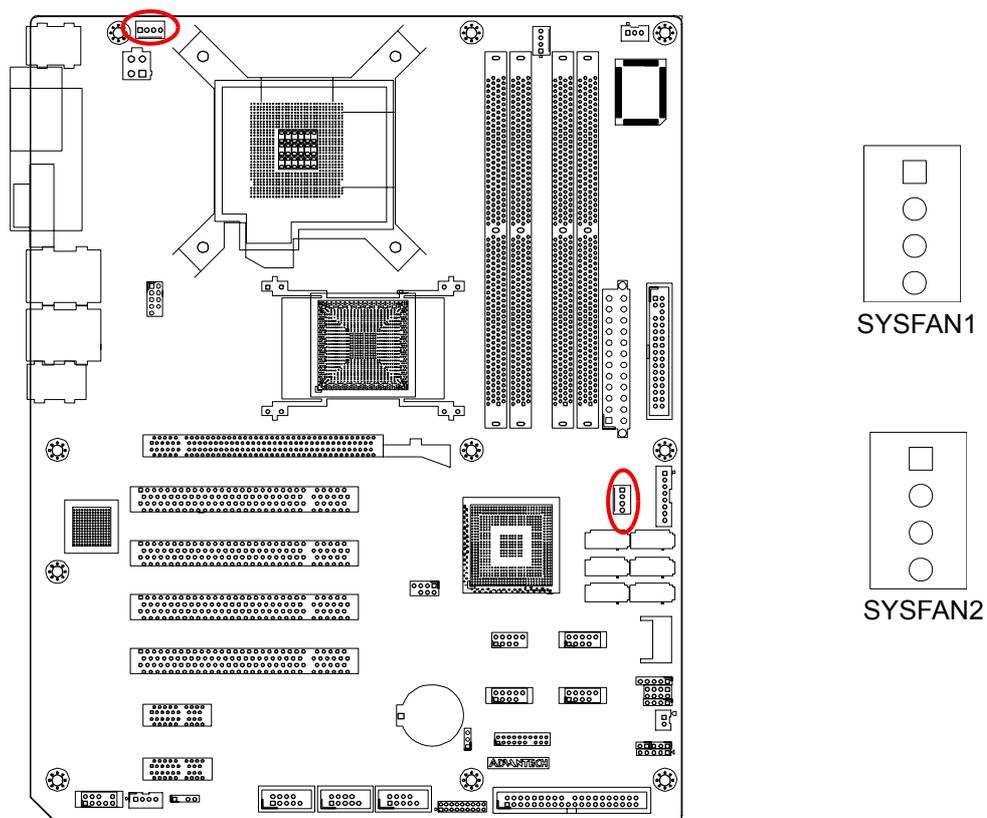
If a fan is used, this connector supports cooling fans that draw up to 500 mA (6 W).

2.12 Front Panel Connectors (JFP1, JFP2 & JFP3)

There are several external switches and LEDs to monitor and control the AIMB-766.
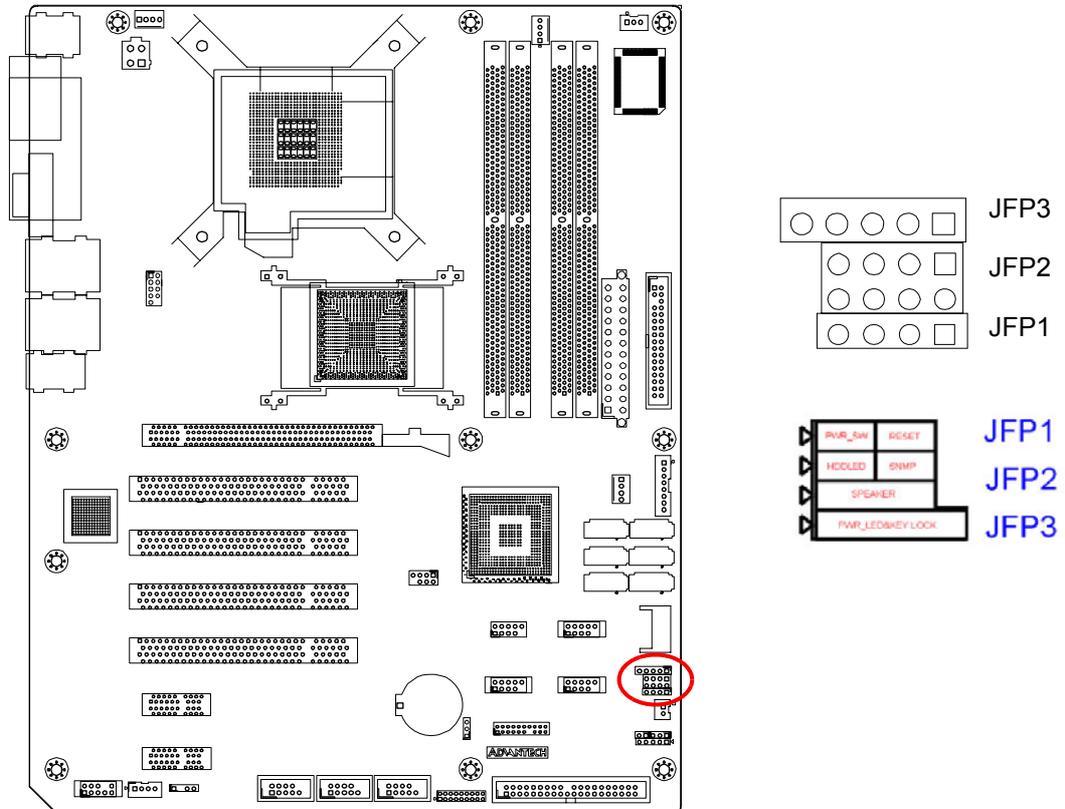
2.12.1 Power LED and Keyboard Lock (JFP3)

JFP3 is a 5-pin connector for the power LED. Refer to Appendix B for detailed information on the pin assignments. If a PS/2 or ATX power supply is used, the system's power LED status will be as indicated as follows.

Table 2.1: PS/2 or ATX power supply LED status		
Power mode	**LED (PS/2 power)**	**LED (ATX power)**
System On	On	On
System Suspend	Fast flashes	Fast flashes
System Off	Off	Slow flashes

2.12.2 External Speaker (JFP2 pins 1, 3, 5 & 7)

JFP2 is a 8-pin connector for an external speaker. The AIMB-766 provides an onboard buzzer as an alternative. To enable the buzzer, set pins 5-7 as closed.

2.12.3 HDD LED Connector (JFP2 pins 2 & 4)

You can connect an LED to connector JFP2 to indicate when the HDD is active.
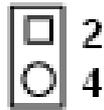
2.12.4 ATX Soft Power Switch (JFP1 pins 1 & 2)

If your computer case is equipped with an ATX power supply, you should connect the power on/off button on your computer case to pins 1 and 2 of JFP1. This connection enables you to turn your computer on and off.

2.12.5 Reset Connector (JFP1 pins 3 & 4)

Many computer cases offer the convenience of a reset button.
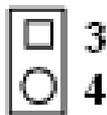
2.13 Line Out, Mic In Connector (AUDIO1)
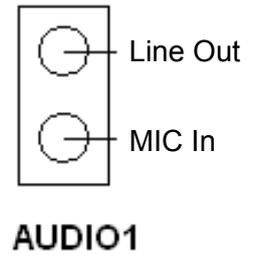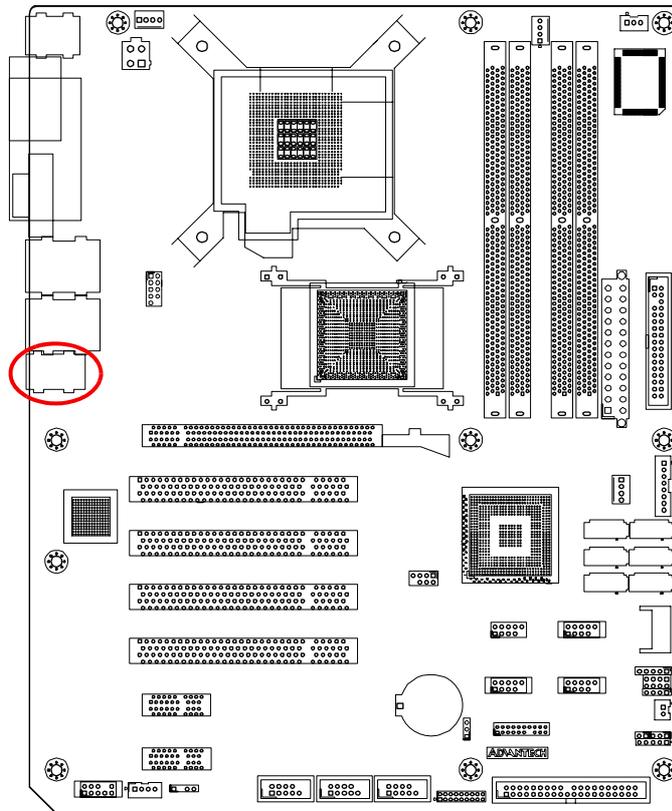
Line Out can be connected to external audio devices like speakers or headphones. Mic In can be connected to a microphone.

2.14 8-pin Alarm Board Connector (VOLT1)
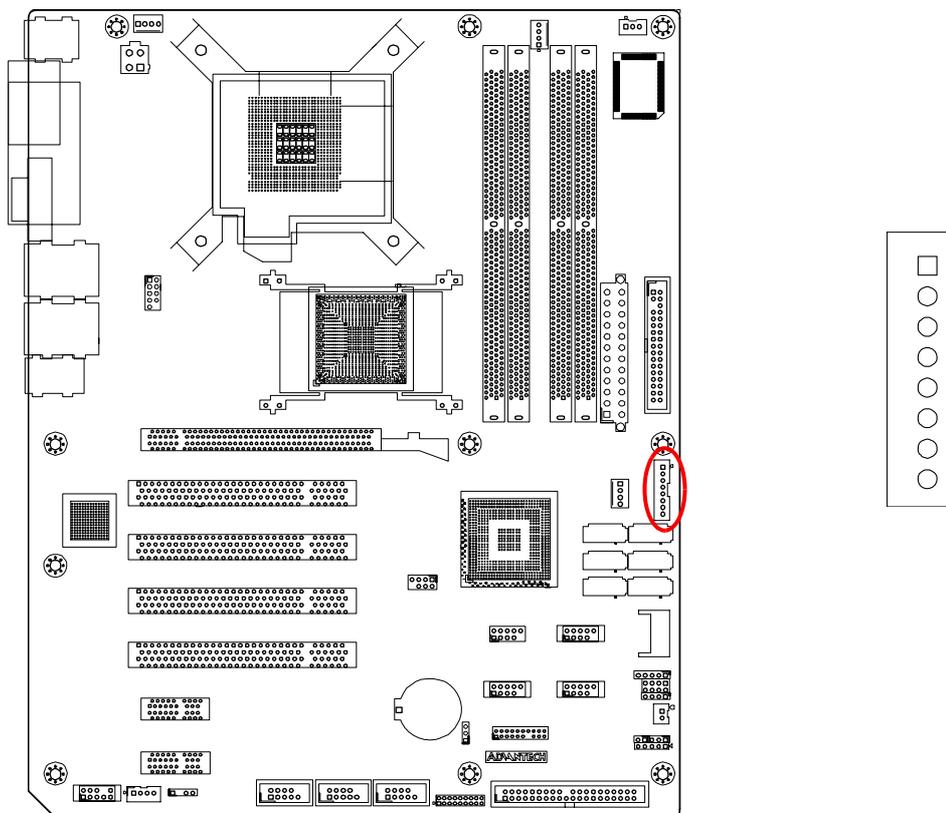
VOLT1 connects to the alarm board of Advantech chassis. These alarm boards give warnings if a power supply or fan fails; if the chassis overheats; or if the backplane malfunctions.

2.15 Case Open Connector (JCASE1)
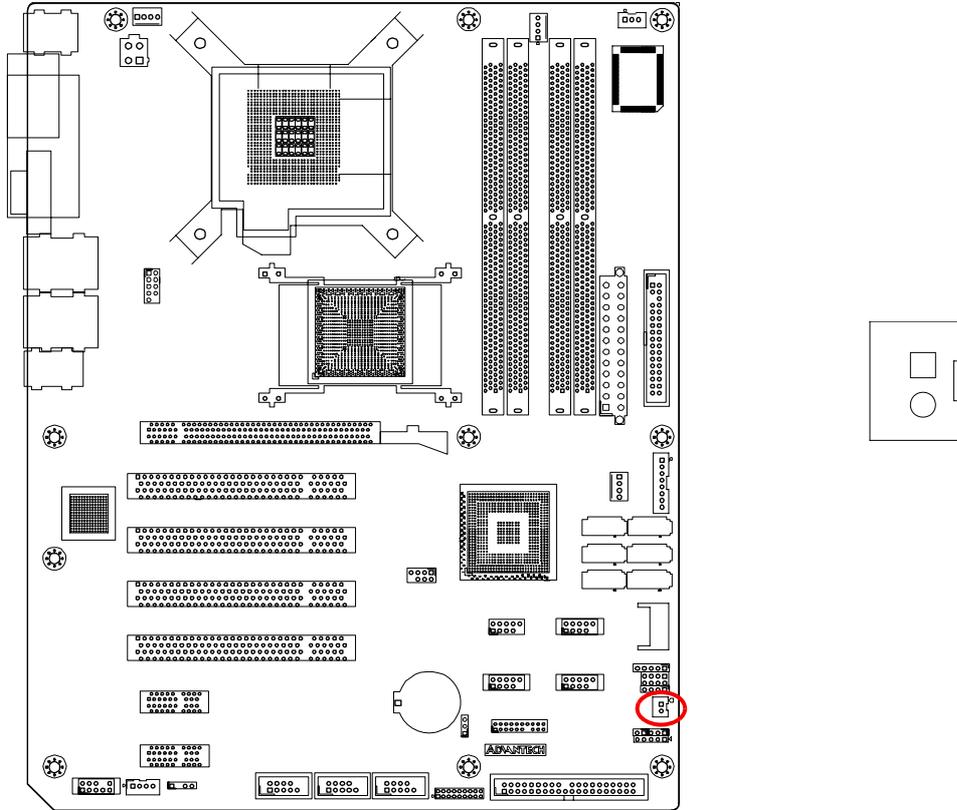
JCASE1 is for chassis with a case open sensor. The buzzer on the motherboard sounds if the case is opened.

2.16 Front Panel LAN Indicator Connector (LAN_LED1)

Table 2.2: Front Panel LAN Indicator Connector	
LAN Mode	**Indicator**
G-LAN Link ON	Green ON
G-LAN Active	Green Flash
G-LAN Link Off	Green OFF
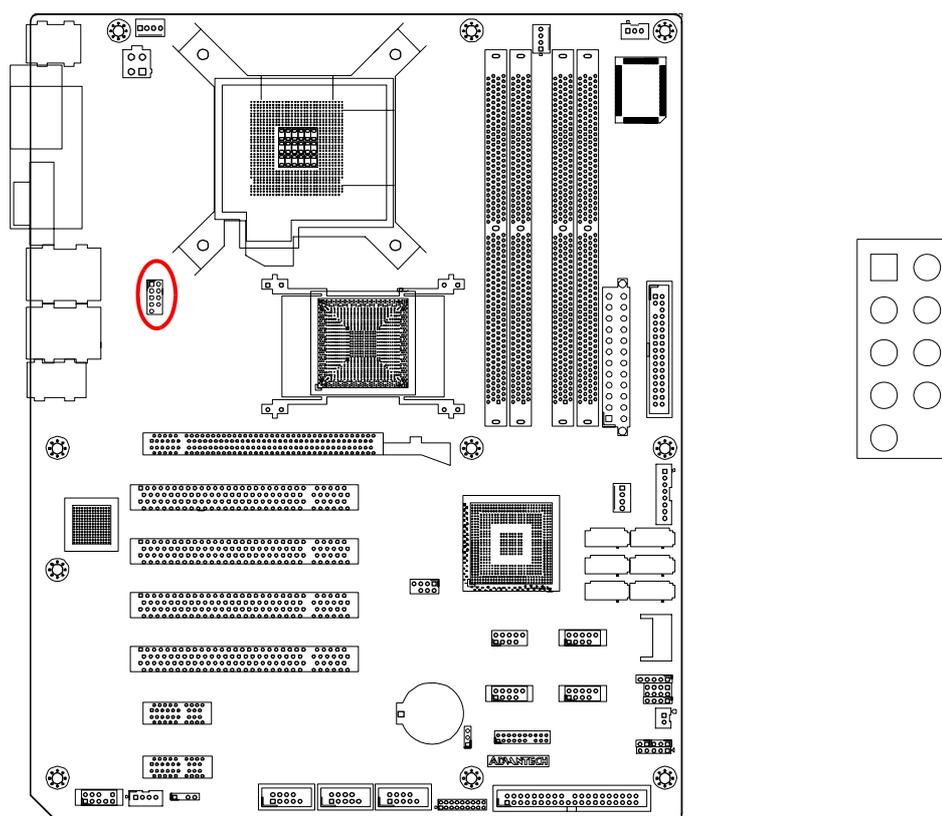
2.17 Serial ATA Interface (SATA1, SATA2, SATA3, SATA4, SATA5 & SATA6)
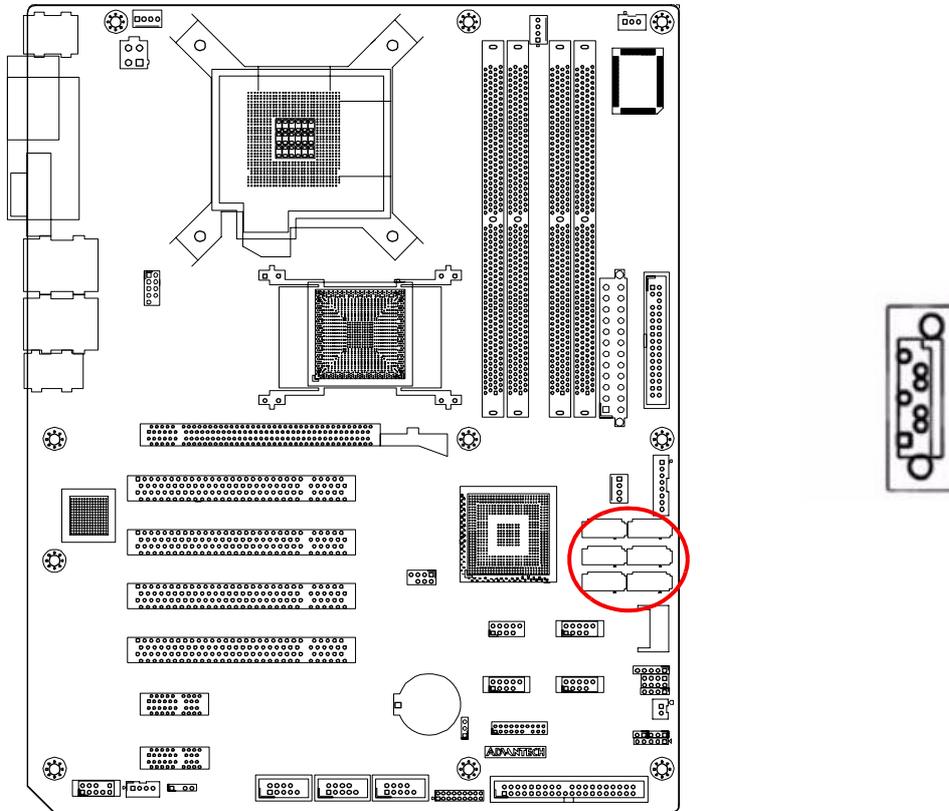
In addition to the IDE interface, the AIMB-766 features a high performance serial ATA interface (up to 300 MB/s) which eases cabling to hard drives with thin and long cables. AIMB-766VG-00A1E sku only support 4 SATA connectors.

2.18 PCI Slots (PCI 1 ~ PCI 4)
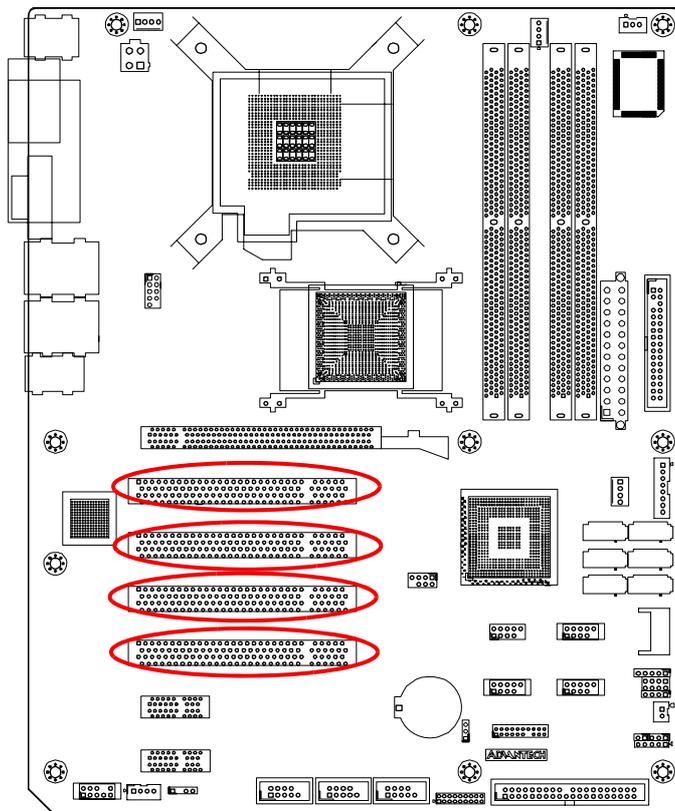
The AIMB-766 provides four 32-bit / 33 MHz PCI slots.

Note! *64-bit PCI or PCI-X expansion cards installed in the PCI 2 slots will not fit because of the south bridge heat sink. If you want to use 64-bit PCI or PCI-X expansion cards, please install them in the PCI 1, PCI 3 or PCI 4.*

2.19 PCIe x16 Expansion Slot (PCIEX16_1)
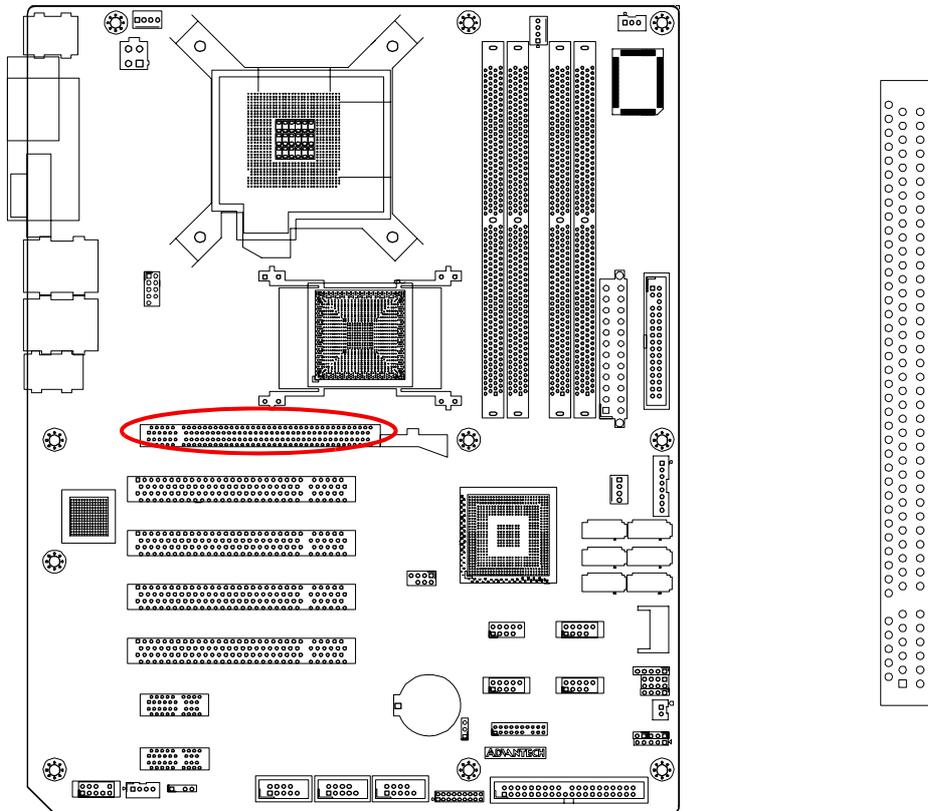
The AIMB-766 provides a PCIe x16 slot for users to install add-on VGA cards when their applications require higher graphics performance than the onboard graphics controller can provide.

2.20 PCIEX1_1
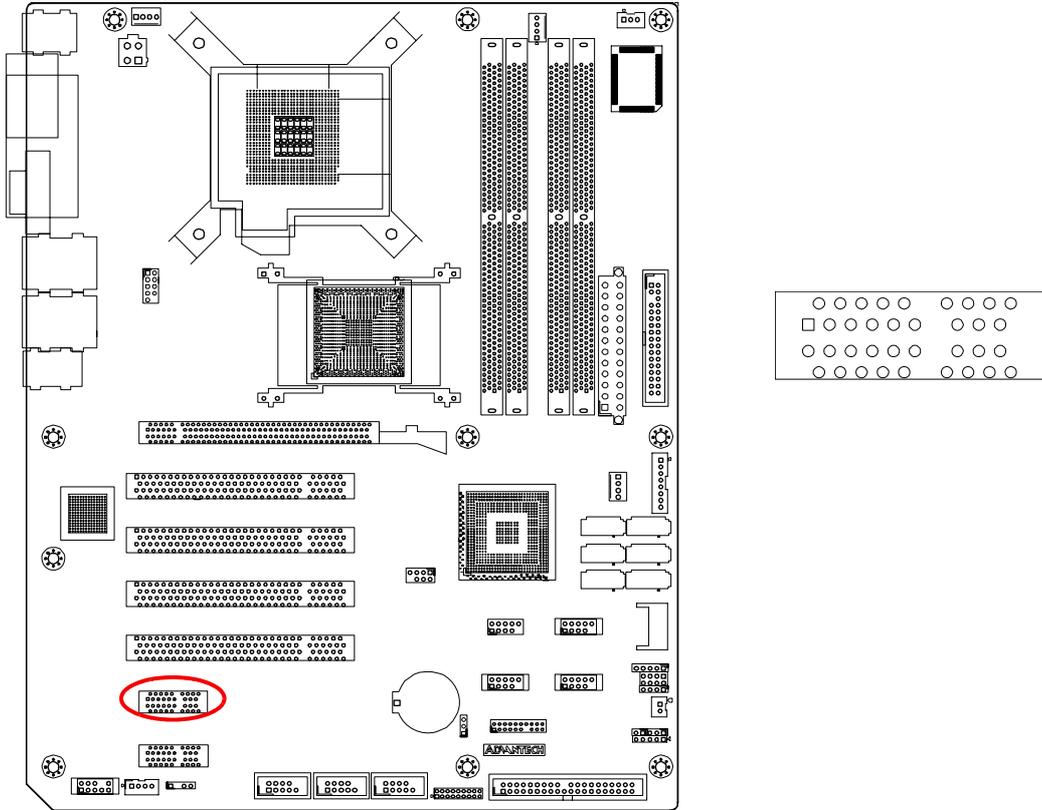
2.21 PCIEX1_2
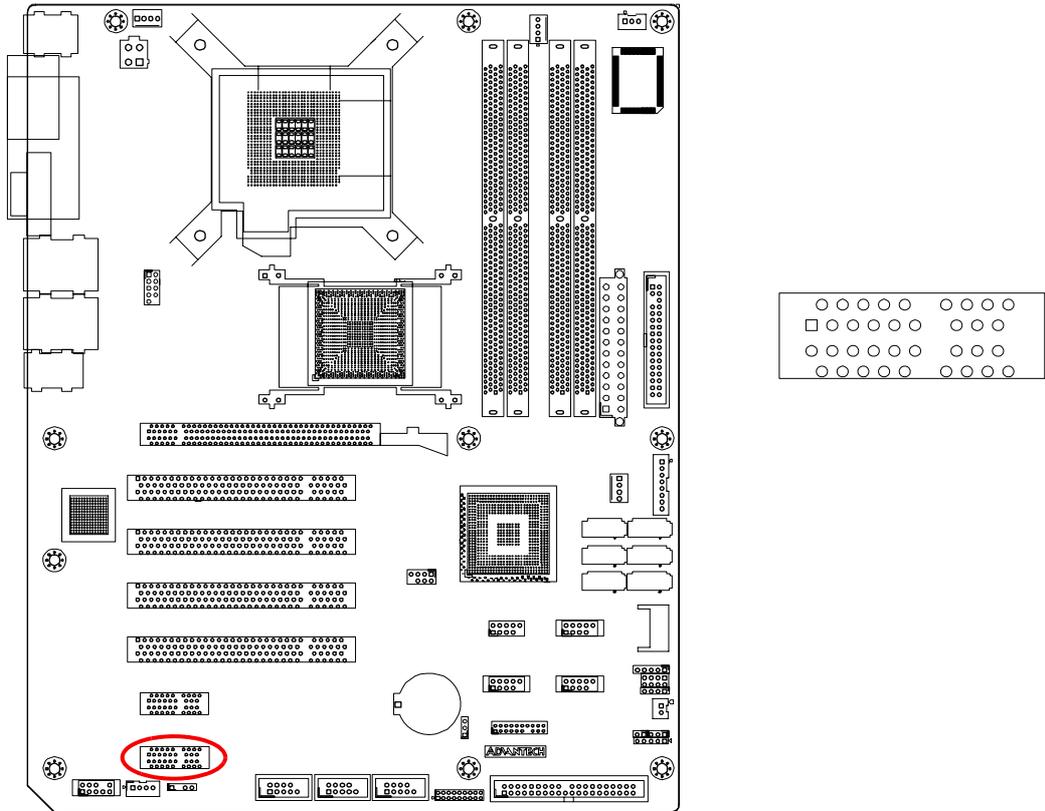
2.22 Auxiliary 4-pin power connector (ATX1)

To ensure the enough power is supplied to the motherboard, one auxiliary 4-pin power connector is available on the AIMB-766. ATX1 must be used to provide sufficient 12 V power to ensure the stable operation of the system.
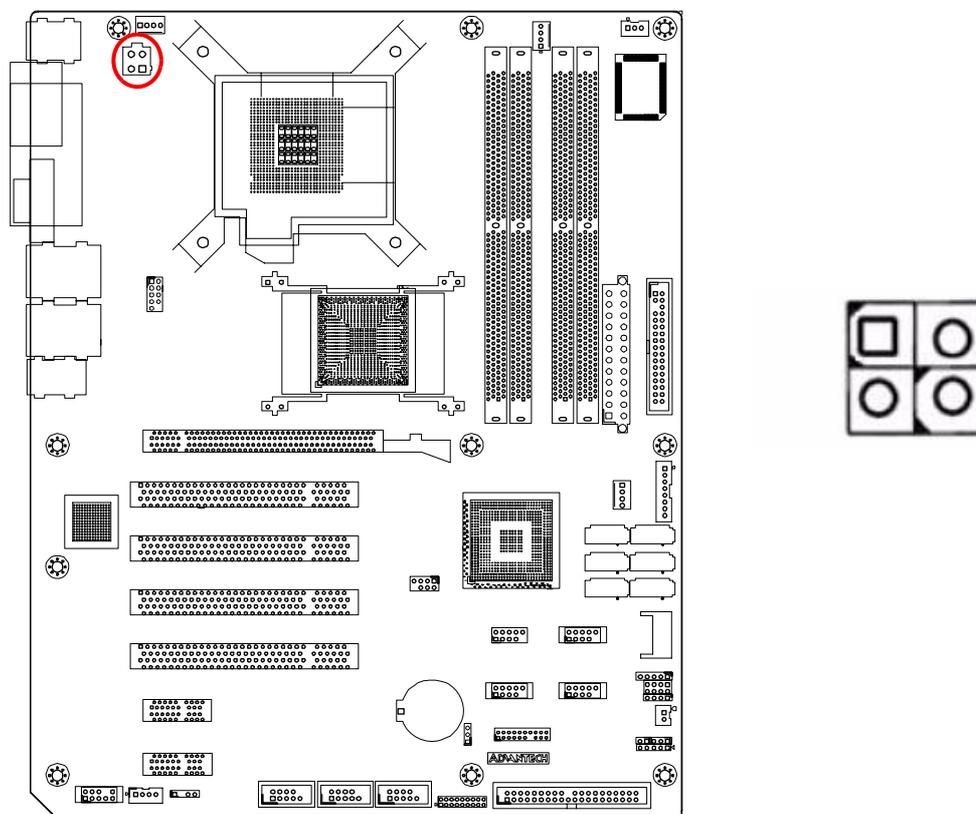
2.23 TPM connector (20-1 pin TPM_SLOT)

This connector supports a Trusted Platform Module (TPM) system, which can securely store keys, digital certificates, passwords, and data. TPM system also helps enhance network security, protects digital identities, and ensures platform integrity. The order part number of TPM module is 9680004525.

2.24 SPI Flash connector(SPI_CN1)

SPI flash card pin header which can flash BIOS while AIMB-766 can not be power on and ensures platform integrity.

Chapter 3

BIOS Operation

AMIBIOS has been integrated into many motherboards for over a decade. In the past, people often referred to the AMIBIOS setup menu as BIOS, BIOS setup or CMOS setup.

With the AMIBIOS Setup program, you can modify BIOS settings and control the special features of your computer. The Setup program uses a number of menus for making changes and turning the special features on or off. This chapter describes the basic navigation of the AIMB-766 setup screens.
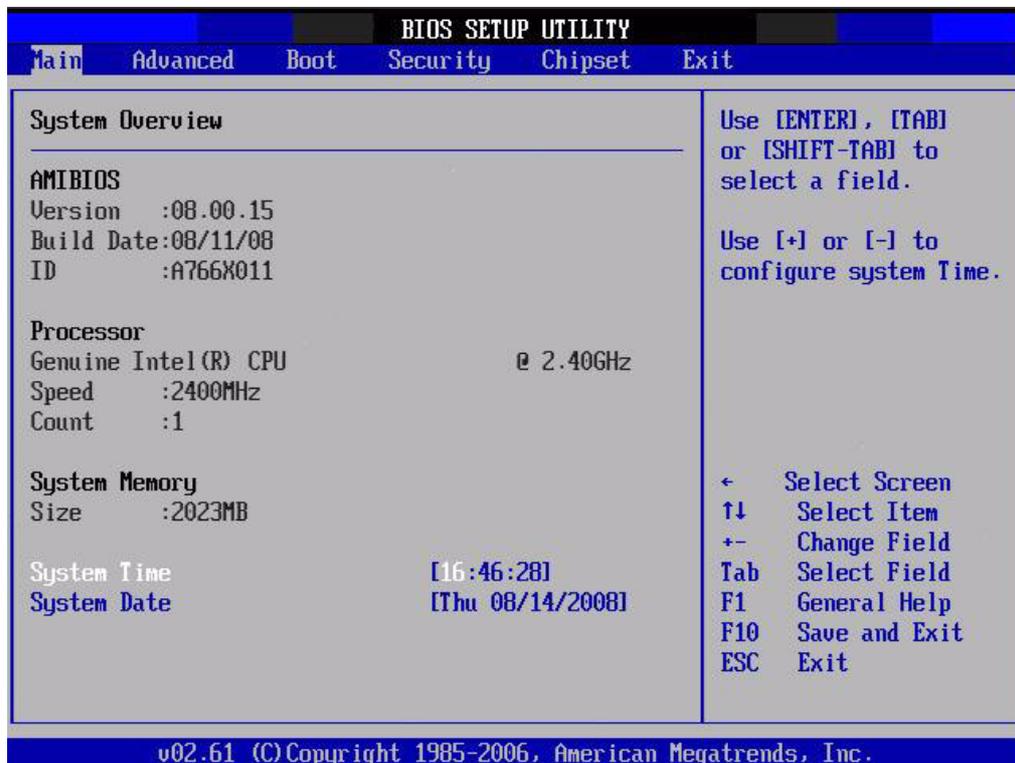
Figure 3.1 Setup program initial screen

AMI's BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed up CMOS so it retains the Setup information when the power is turned off.

3.1 Entering Setup

Turn on the computer and check for the "patch" code. If there is a BIOS date and version number showing in the patch code, it means that the BIOS supports your CPU. If there is no number assigned to the patch code, please contact an Advantech application engineer to obtain an up-to-date patch code file. This will ensure that your CPU's system status is valid. After ensuring that you have a number assigned to the patch code, press <DEL> and you will immediately be allowed to enter Setup.

Figure 3.2 Patch Code example

3.2 Main Setup

When you first enter the BIOS Setup Utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab. There are two Main Setup options. They are described in this section. The Main BIOS Setup screen is shown below.

```
                         BIOS SETUP UTILITY
  Main     Advanced    Boot     Security    Chipset    Exit

  System Overview                                    Use [ENTER], [TAB]
                                                     or [SHIFT-TAB] to
  AMIBIOS                                            select a field.
  Version   :08.00.15
  Build Date:08/11/08                                Use [+] or [-] to
  ID        :A766X011                                configure system Time.

  Processor
  Genuine Intel(R) CPU              @ 2.40GHz
  Speed     :2400MHz
  Count     :1

  System Memory                                      ←     Select Screen
  Size      :2023MB                                  ↑↓    Select Item
                                                     +-    Change Field
  System Time                 [16:46:28]             Tab   Select Field
  System Date                 [Thu 08/14/2008]       F1    General Help
                                                     F10   Save and Exit
                                                     ESC   Exit

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```

Figure 3.3 Main setup screen

The Main BIOS setup screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured; options in blue can be. The right frame displays the key legend.

Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

3.2.1 System time / System date

Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time must be entered in HH:MM:SS format.

3.3   Advanced BIOS Features Setup

Select the Advanced tab from the AIMB-766 setup screen to enter the Advanced BIOS Setup screen. You can select any of the items in the left frame of the screen, such as CPU Configuration, to go to the sub menu for that item. You can display an Advanced BIOS Setup option by highlighting it using the <Arrow> keys. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup screens are shown below. The sub menus are described on the following pages.

```
                         BIOS SETUP UTILITY
   Main    Advanced    Boot    Security    Chipset    Exit

   Advanced Settings                              Configure CPU.

   WARNING: Setting wrong values in below sections
            may cause system to malfunction.

   ▶ CPU Configuration
   ▶ SATA Configuration
   ▶ SuperIO Configuration
   ▶ Hardware Health Configuration
   ▶ ACPI Configuration
   ▶ APM Configuration
   ▶ Remote Access Configuration                 ←    Select Screen
   ▶ Trusted Computing                            ↑↓   Select Item
   ▶ PCI/PnP Configuration                        Enter Go to Sub Screen
                                                  F1    General Help
                                                  F10   Save and Exit
                                                  ESC   Exit

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```

Figure 3.4 Advanced BIOS features setup screen

3.3.1 CPU Configuration
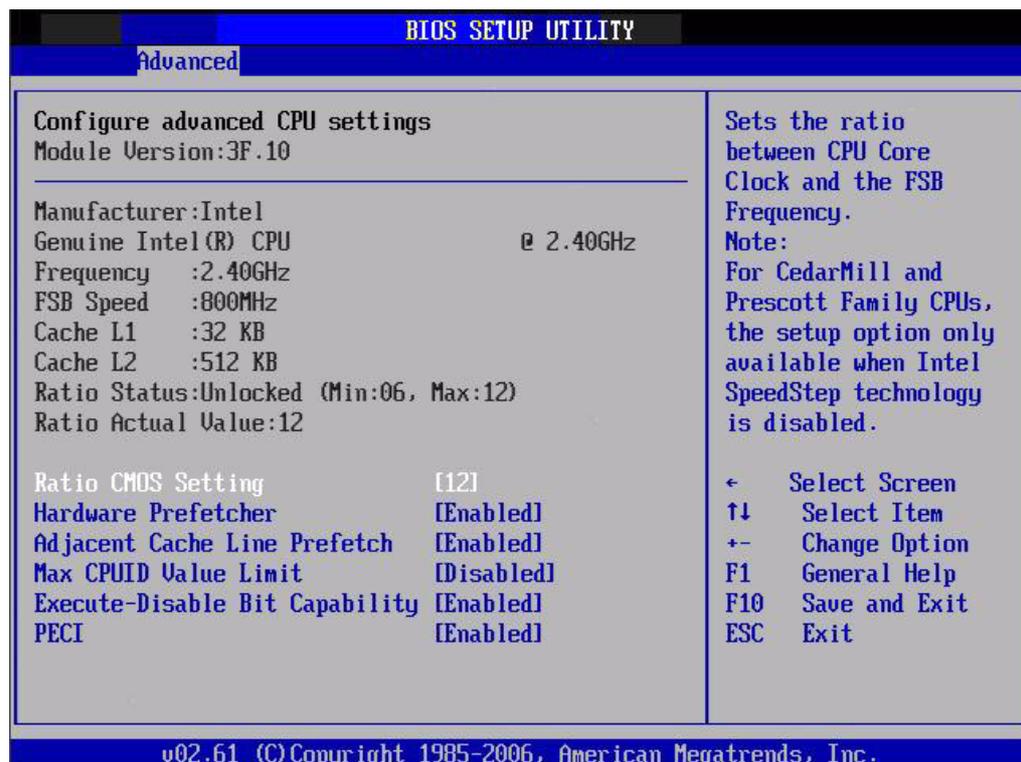
Figure 3.5 CPU Configuration Setting

Ration CMOS Setting

Sets the ratio between CPU core clock and the FSB Frequency.

Hardware Prefetcher

Hardware Prefetcher is a technique that fetches instructions and/or data from memory into the CPU cache memory well before the CPU needs it, so that it can improve the load-to-use latency. You may choose to enable or disable it.

Adjacent Cache Line Prefetch

The Adjacent Cache-Line Prefetch mechanism, like automatic hardware prefetch, operates without programmer intervention. When enabled through the BIOS, two 64-byte cache lines are fetched into a 128-byte sector, regardless of whether the additional cache line has been requested or not. You may choose to enable or disable it.

Max CPUID Value Limit

This is disabled for Windows XP.

Execute Disable Bit

This item specifies the Execute Disable Bit Feature. The settings are Enabled and Disabled. The Optimal and Fail-Safe default setting is Enabled. If Disabled is selected, the BIOS forces the XD feature flag to always return to 0.

PECI

You may choose to disable or enable the Platform Environment Control Interface function.

3.3.2 IDE Configuration
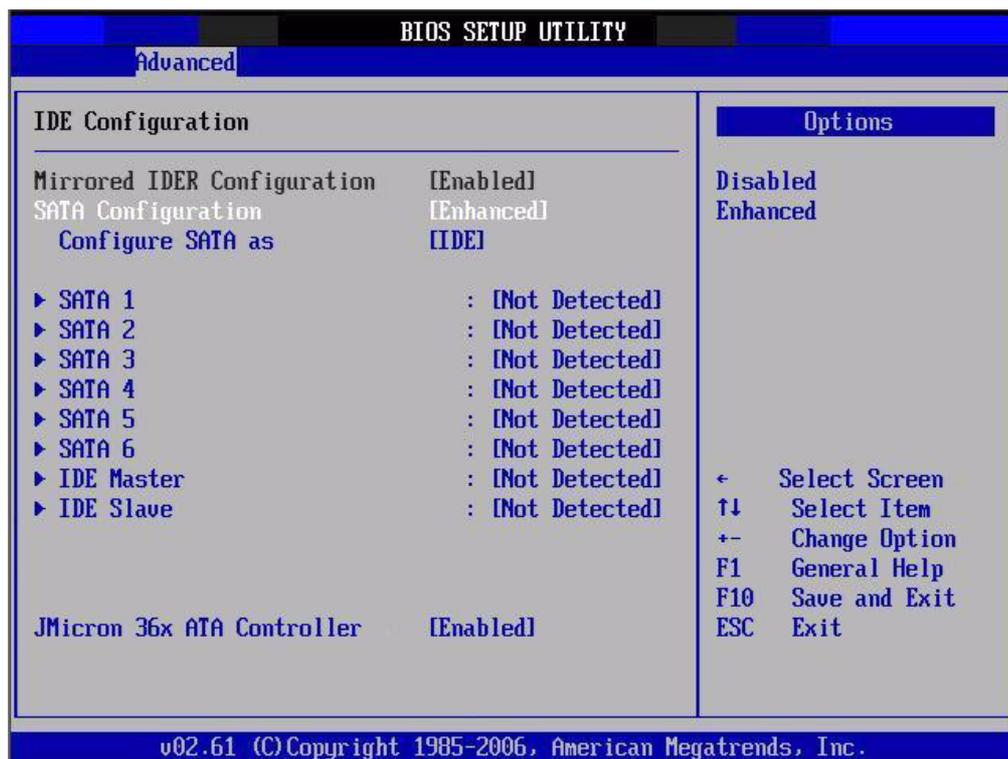
Figure 3.6 IDE Configuration

SATA Configuration

This can be configured as Disabled or Enhanced.

Configure SATA as

This can be configured as IDE, RAID or AHCI. RAID will be activated by the ICH9DO only.

3.3.3 Super I/O Configuration

```
                          BIOS SETUP UTILITY
     Advanced

 Configure Win627DHG Super IO Chipset            Allows BIOS to Select
                                                 Parallel Port Base
 Parallel Port Address          [378]           Addresses.
    Parallel Port Mode          [Normal]
    Parallel Port IRQ           [IRQ7]

 Serial Port1 Address           [3F8/IRQ4]
 Serial Port2 Address           [2F8]
    Serial Port2 IRQ            [3]
    IRDA Mode Control           [Disabled]
 Serial Port3 Address           [3E8]
    Serial Port3 IRQ            [5]
 Serial Port4 Address           [2E8]
    Serial Port4 IRQ            [10]                 ←     Select Screen
                                                     ↑↓    Select Item
 Floppy Controller              [Enabled]            +-    Change Option
 Floppy A                       [1.44 MB 3½"]        F1    General Help
 Floppy B                       [Disabled]           F10   Save and Exit
                                                     ESC   Exit


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```

Figure 3.7 Super I/O Configuration

Parallel Port Address

This configures parallel port base addresses. The following options are also available:

- Parallel Port Mode
- Parallel Port IRQ

Serial Port1 Address

This option configures serial port 1 base addresses.

Serial Port2 Address

This option configures serial port 2 base addresses.

Serial port2 Mode

This option configures serial port 2 mode.

Serial Port 3/4 Address

This option configures serial port 3/4 base addresses.

Serial Port 3/4 IRQ

This option configures serial port 3/4 base IRQ.

OnBoard Floppy Controller

This option allows the BIOS to Enable or Disable the floppy controller.

Floppy A

Select the type of floppy drive connected to the system. We suggest you

disable the floppy while installing Windows Vista without a floppy drive.

Floppy B

Select the type of floppy drive connected to the system.

3.3.4 Hardware Health Configuration
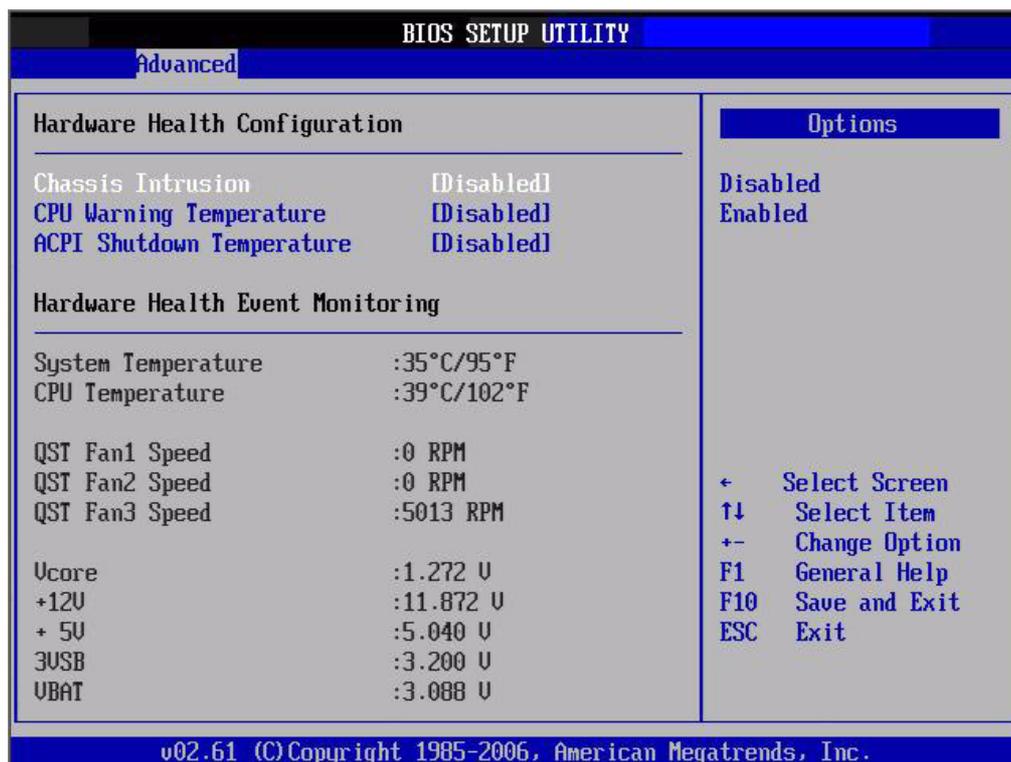
Figure 3.8 Hardware health configuration

Chassis Intrusion

Enable/Disable the Chassis Intrusion monitoring function. When the case is opened, the buzzer beeps.

CPU Warning Temperature

Use this to set the CPU warning temperature threshold. When the system reaches the warning temperature, the buzzer will beep.

ACPI Shutdown Temperature

The system will shut down automatically under OS with ACPI mode, when the CPU temperature is over the selected setting.

Hardware health event monitoring

When the Hardware Health Function is enabled, the BIOS will display hardware health information.

3.4 ACPI Settings
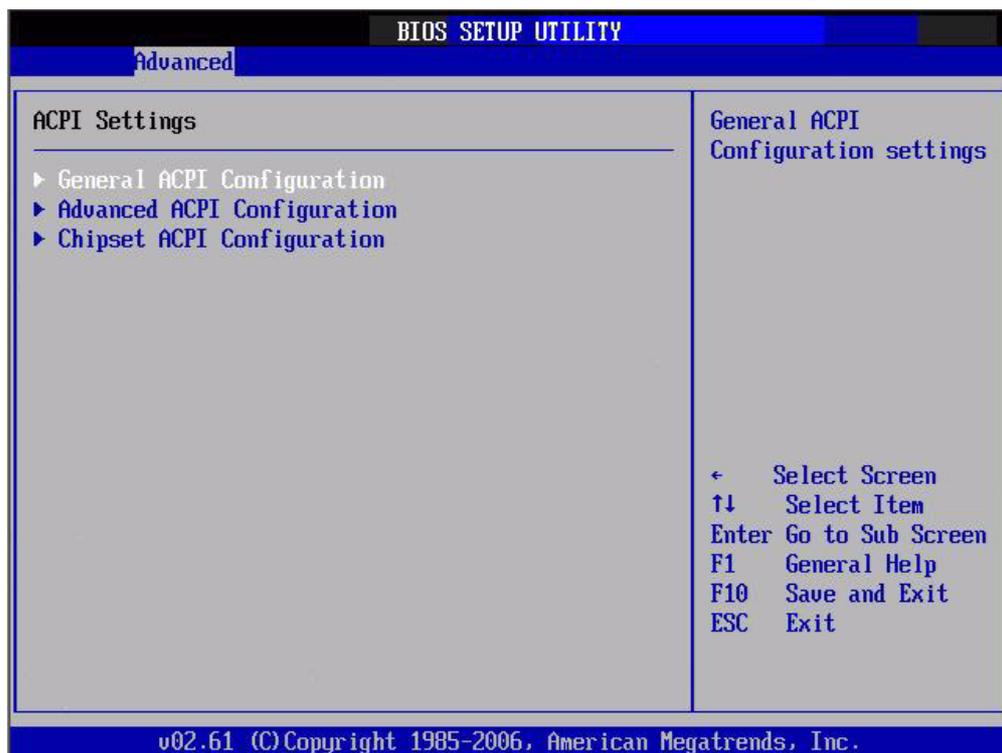
Figure 3.9 ACPI Settings
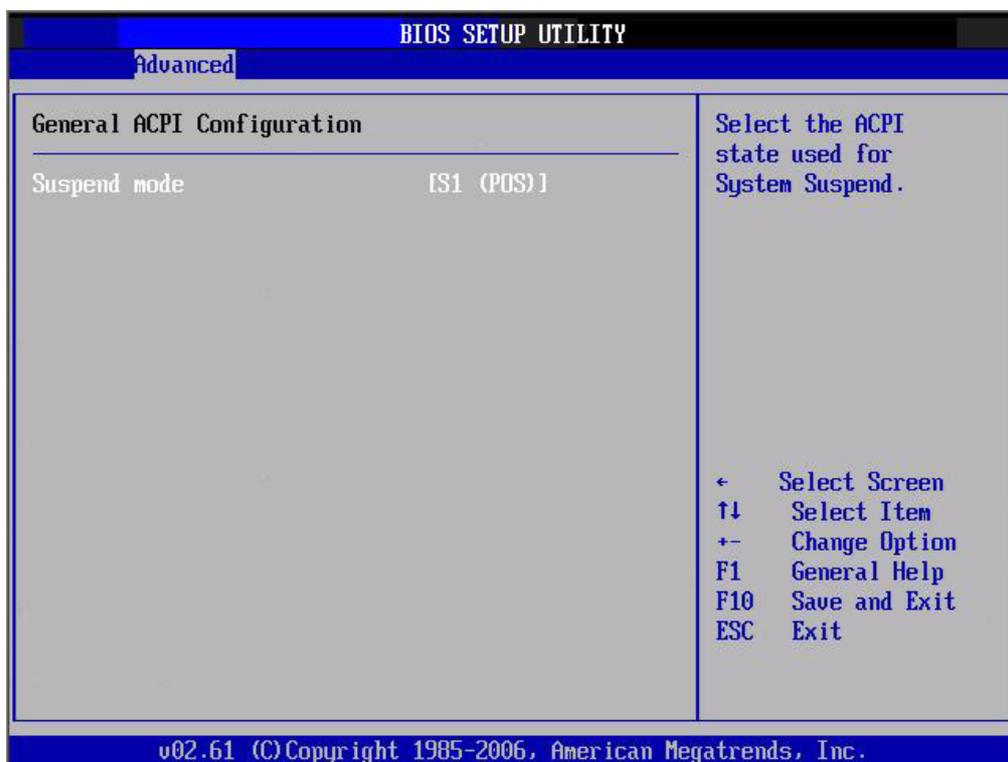
Figure 3.10 General ACPI Configuration

3.4.1 General ACPI Configuration

Suspend mode

Select the ACPI state used for system suspend.

```
                    BIOS SETUP UTILITY
  Advanced

  Advanced ACPI Configuration                    Include ACPI APIC
                                                 table pointer to
  ACPI APIC support              [Enabled]       RSDT pointer list.




                                                 ←     Select Screen
                                                 ↑↓    Select Item
                                                 +-    Change Option
                                                 F1    General Help
                                                 F10   Save and Exit
                                                 ESC   Exit


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```
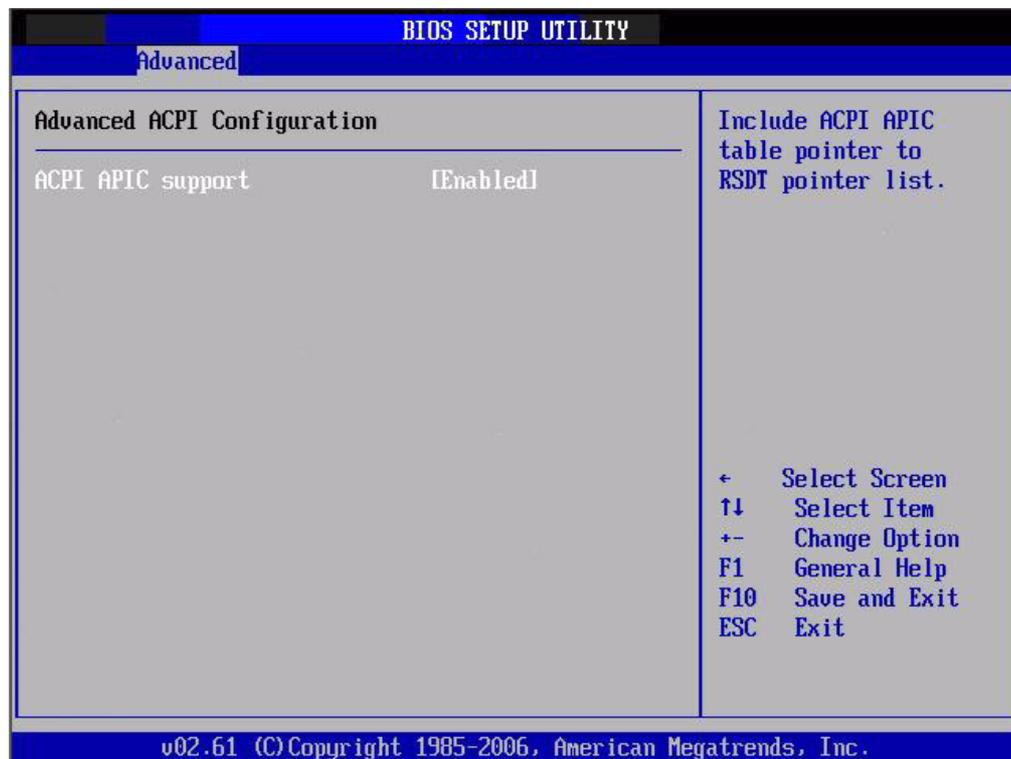
Figure 3.11 Advanced ACPI Configuration

3.4.2 Advanced ACPI Configuration

ACPI APIC support

Include APIC table pointer to RSDT pointer list.

AIMB-766 User Manual
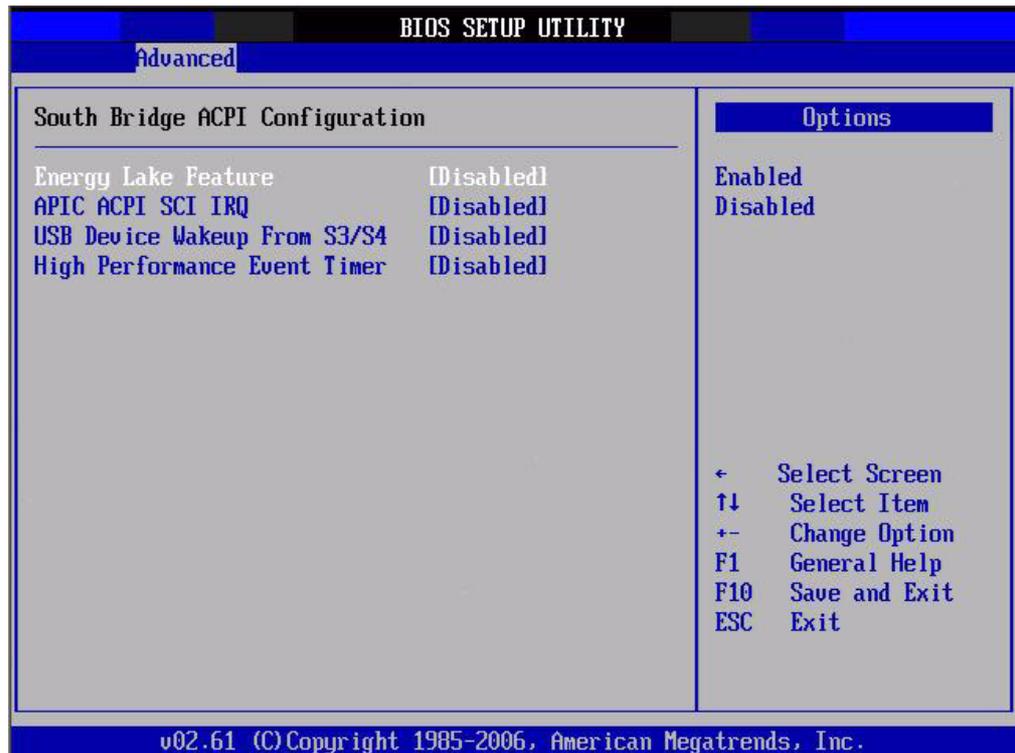
Figure 3.12 South Bridge ACPI Configuration

3.4.3 South Bridge ACPI Configuration

Energy Lake Feature

Allows you to configure Intel's Energy lake power management technology.

APIC ACPI SCI IRQ

Enable/Disable APIC ACPI SCI IRQ.

USB Device Wakeup From S3/S4

Enable/Disable USB Device Wakeup from S3/S4.

High Performance Event Timer

Enable/Disable High performance Event timer.

3.5 APM Configuration

Figure 3.13 APM Configuration

Power Management/APM

Enable or disable APM.

Power Button Mode

Power on, off or enter suspend mode when the power button is pressed. The following options are also available.

Power type

Under ACPI mode, select AT or ATX power type.

Restore on AC power Loss

Use this to set up the system after power failure. The "off" setting keeps the system powered off after power failure, the "On" setting boots up the system after failure, and the "former-STs" returns the system to the status before power failure.

Throttle Slow Clock Ratio

Select the Duty Cycle in Throttle mode.

- Resume On Ring: Disable/Enable RI wake event.
- Resume On LAN: Disable/Enable LAN PME wake event.
- Resume On RTC Alarm: Disable/Enable RTC wake event.
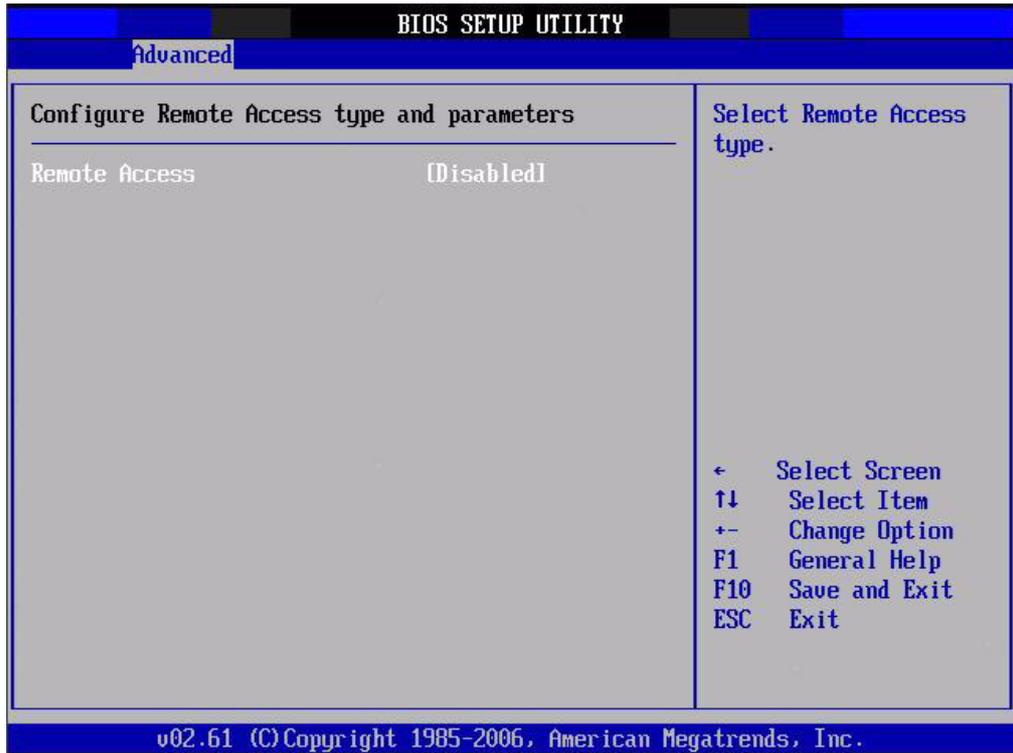
Figure 3.14 Configure Remote Access type and parameters

3.6 Configure Remote Access Type and parameters

Remote Access

You can disable or enable the BIOS remote access feature here. This function is used to redirect the console from the serial port. The Optimal and Fail-Safe default setting is Disabled.

3.7 Trusted Computing

This item allow you to set the TPM (Trusted Platform Module) features
Select Enable/Disable (TPM 1.1/1.2) support in BIOS

```
                          BIOS SETUP UTILITY
   Advanced

 Trusted Computing                                Enable/Disable TPM
 ─────────────────────────────────────────────   TCG (TPM 1.1/1.2) supp
 TCG/TPM SUPPORT              [No]                 in BIOS




                                                  ←     Select Screen
                                                  ↑↓    Select Item
                                                  +-    Change Option
                                                  F1    General Help
                                                  F10   Save and Exit
                                                  ESC   Exit



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```
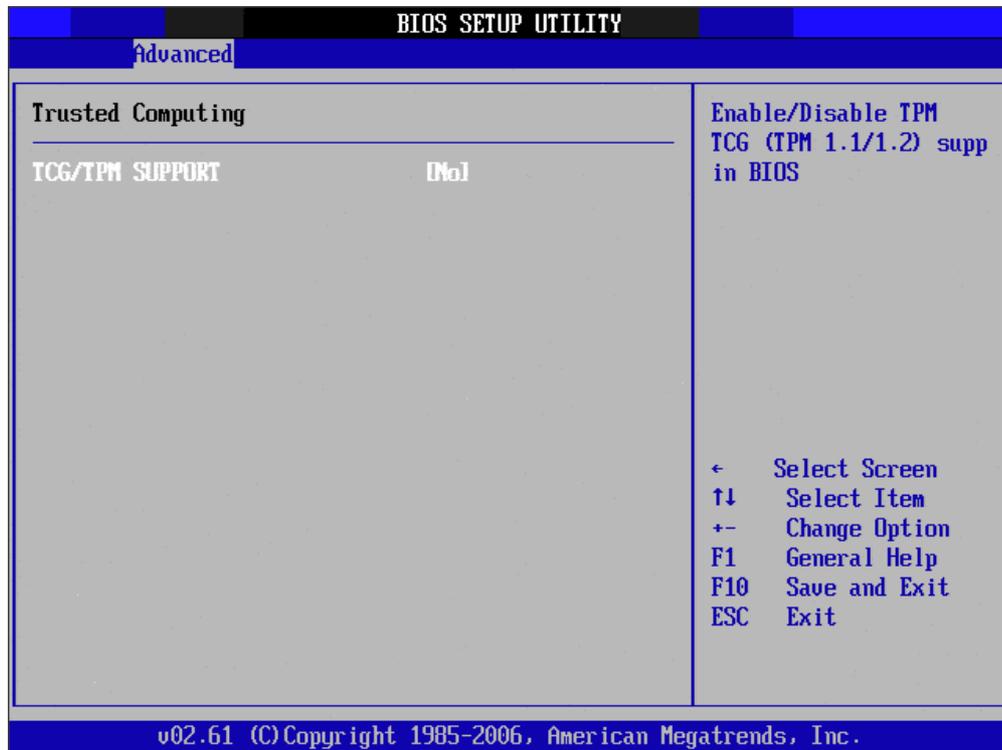
Figure 3.15 Trusted Computing

3.8 Advanced PCI/PnP Settings

Select the PCI/PnP tab from the AIMB-766 setup screen to enter the Plug and Play BIOS Setup screen. You can display a Plug and Play BIOS Setup option by highlighting it using the <Arrow> keys. All Plug and Play BIOS Setup options are described in this section. The Plug and Play BIOS Setup screen is shown below.

```
                      BIOS SETUP UTILITY
      Advanced

  Advanced PCI/PnP Settings                    Clear NVRAM during
                                               System Boot.
  WARNING: Setting wrong values in below sections
           may cause system to malfunction.

  Clear NVRAM                    [No]
  Plug & Play O/S                [No]
  PCI Latency Timer              [64]



                                               ←    Select Screen
                                               ↑↓   Select Item
                                               +-   Change Option
                                               F1   General Help
                                               F10  Save and Exit
                                               ESC  Exit


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```
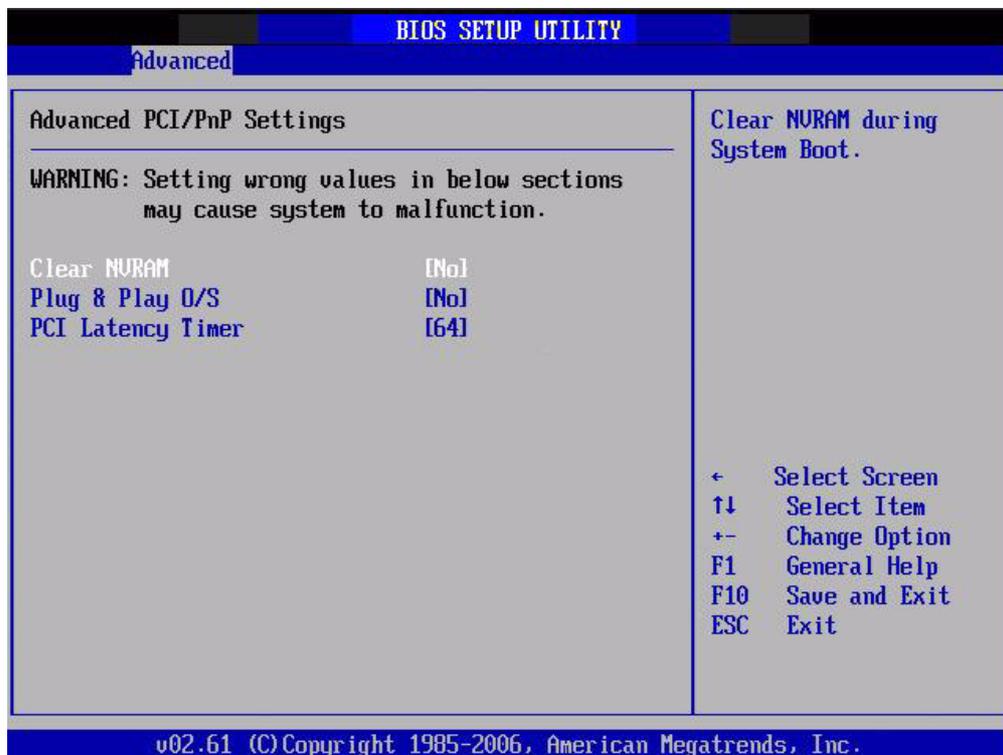
Figure 3.16 PCI/PNP Setup (top)

3.8.1 Clear NVRAM

Set this value to force the BIOS to clear the Non-Volatile Random Access Memory (NVRAM). The Optimal and Fail-Safe default setting is No.

3.8.2 Plug and Play O/S

Set this value to allow the system to modify the settings for Plug and Play operating system support. The Optimal and Fail-Safe default setting is No.

3.8.3 PCI Latency Timer

Use this to adjust the PCI Latency Timer. This option sets the latency of all PCI devices on the PCI bus. The Optimal and Fail-Safe default setting is 64.

3.9 Boot Settings
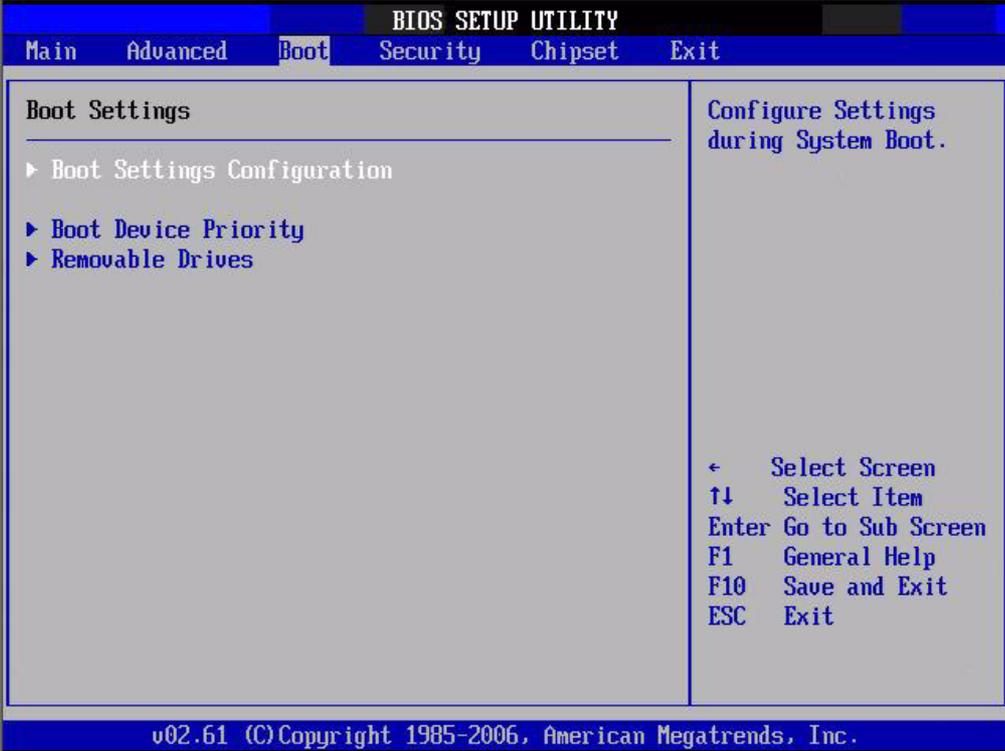
Figure 3.17 Boot Setup Utility
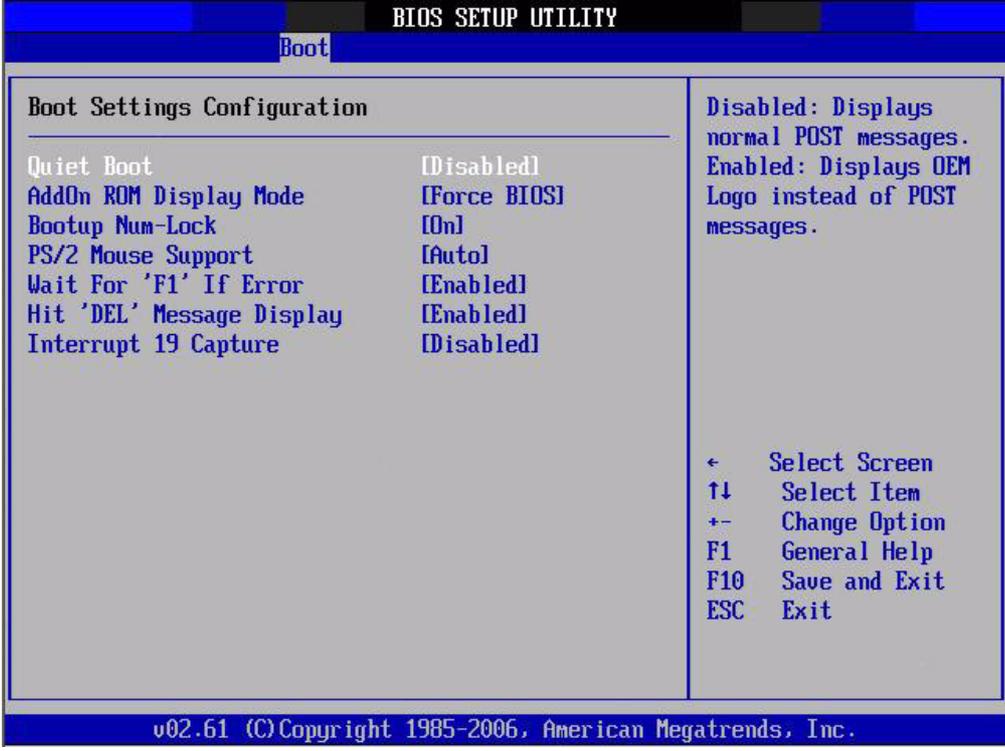
Figure 3.18 Boot Setting Configuration

3.9.1 Boot settings Configuration

The following options are available:

- **Quick Boot:** Allows the BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.
- **Quiet Boot:** If this option is set to Disabled, the BIOS displays normal POST messages. If Enabled, an OEM Logo is shown instead of POST messages.
- **Add On ROM Display Mode:** Set display mode for option ROM.
- **Bootup Num-Lock:** Select the Power-on state for Numlock.
- **PS/2 Mouse Support:** Selects support for PS/2 Mouse.
- **Wait For 'F1' If Error:** Wait for the F1 key to be pressed if an error occurs.
- **Hit 'DEL' Message Display:** Displays "Press DEL to run Setup" in POST.
- **Interrupt 19 Capture**

3.10 Security Setup

```
                    BIOS SETUP UTILITY
  Main     Advanced     Boot    Security    Chipset    Exit

  Security Settings                              Install or Change the
                                                 password.
  Supervisor Password :Not Installed

  Change Supervisor Password

  Boot Sector Virus Protection    [Disabled]



                                                 ←     Select Screen
                                                 ↑↓    Select Item
                                                 Enter Change
                                                 F1    General Help
                                                 F10   Save and Exit
                                                 ESC   Exit


        v02.61 (C)Copyright 1985-2006, American Megatrends, Inc.
```
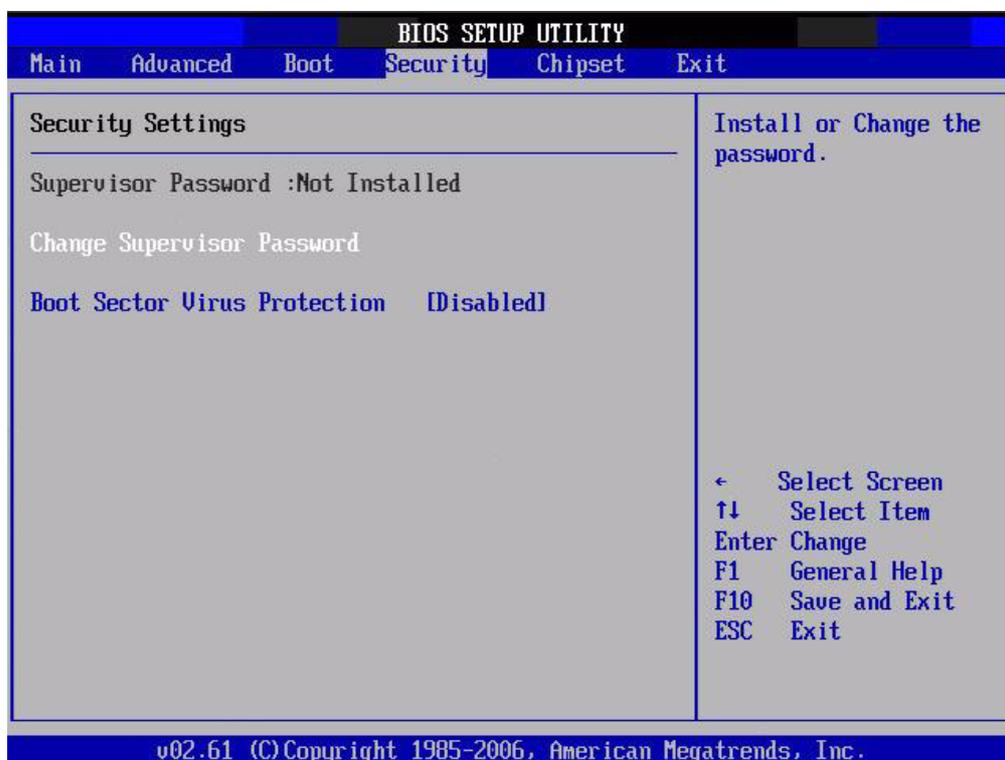
Figure 3.19 Password Configuration

Select Security Setup from the AIMB-766 Setup main BIOS setup menu. All Security Setup options, such as password protection and virus protection are described in this section. To access the sub menu for the following items, select the item and press <Enter>:

- Change Supervisor Password
- Boot sector Virus protection: The boot sector virus protection will warn if any program tries to write to the boot sector.

3.11 Advanced Chipset Settings
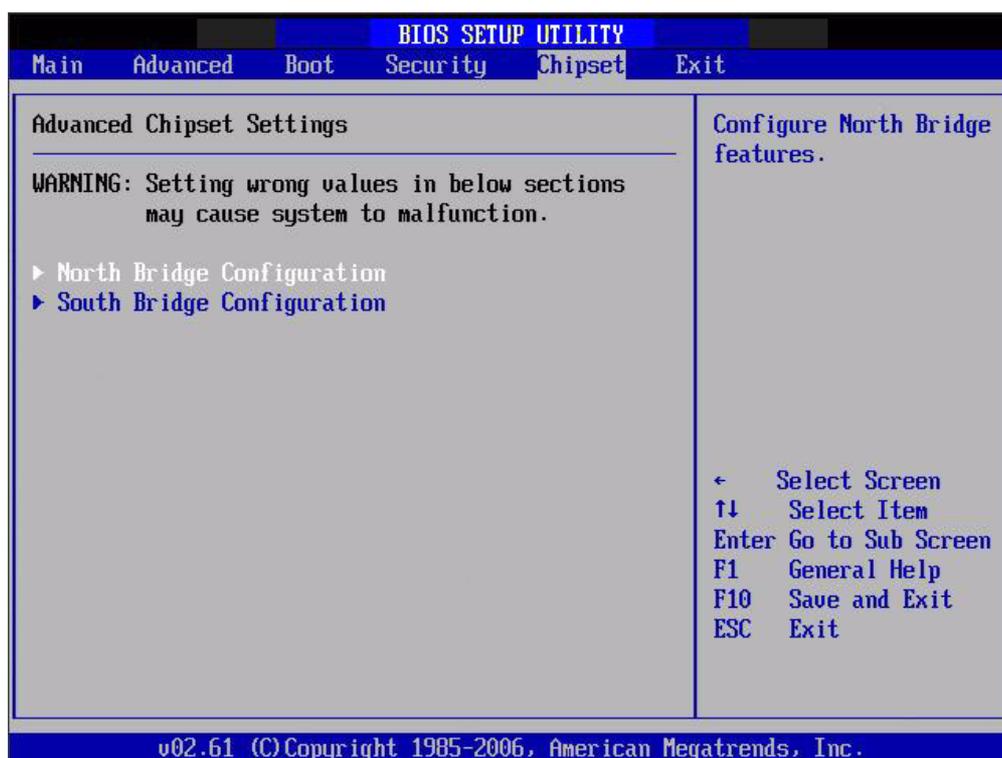
Figure 3.20 Advanced Chipset Settings
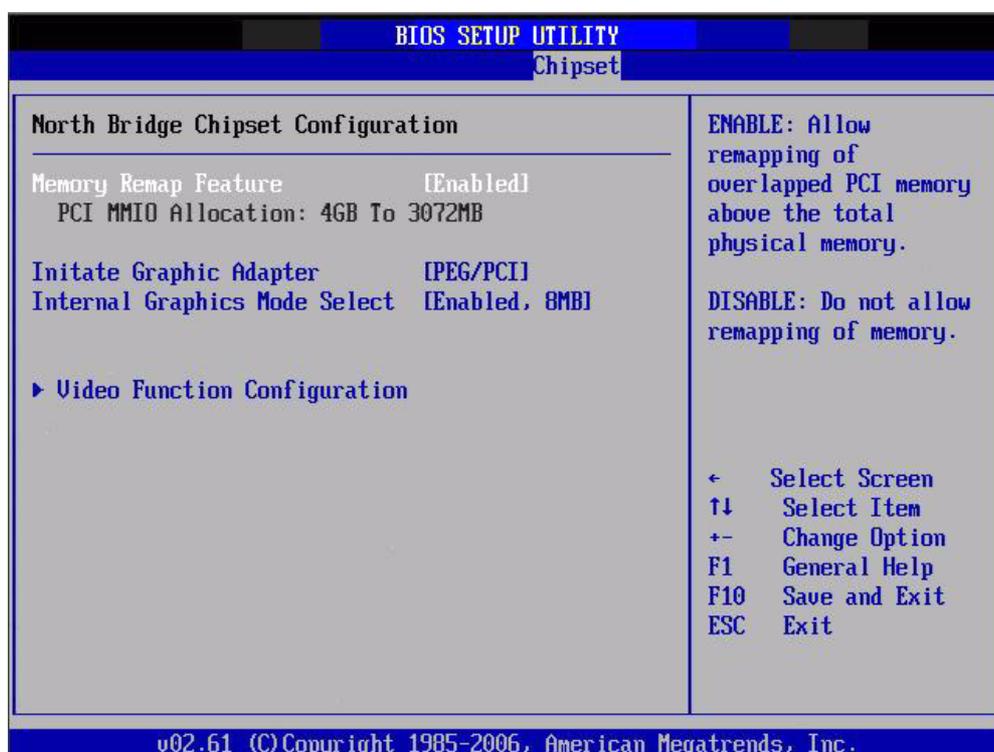
Figure 3.21 North Bridge Configuration

AIMB-766 User Manual

3.11.1 North Bridge Chipset Configuration

The following options are available:

- **Boots Graphic Adapter Priority:** Select which graphics controller to use as the primary boot device.
- **Internal Graphics Mode Select:** Select the amount of system memory used by the Internal graphics device.

```
                   BIOS SETUP UTILITY
                                    Chipset

Video Function Configuration                      Options

DVMT Mode Select          [DVMT Mode]      Fixed Mode
  DVMT/FIXED Memory       [256MB]          DVMT Mode

Boot Display Device       [VBIOS-Default]



                                       ←     Select Screen
                                       ↑↓    Select Item
                                       +-    Change Option
                                       F1    General Help
                                       F10   Save and Exit
                                       ESC   Exit


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```

Figure 3.22 Video function configuration

DVMT model select

Displays the active system memory mode.

DVMT / FIXED Memory

Specify the amount of DVMT / FIXED system memory to allocate for video memory.

Boot display device

Select boot display device at post stage.
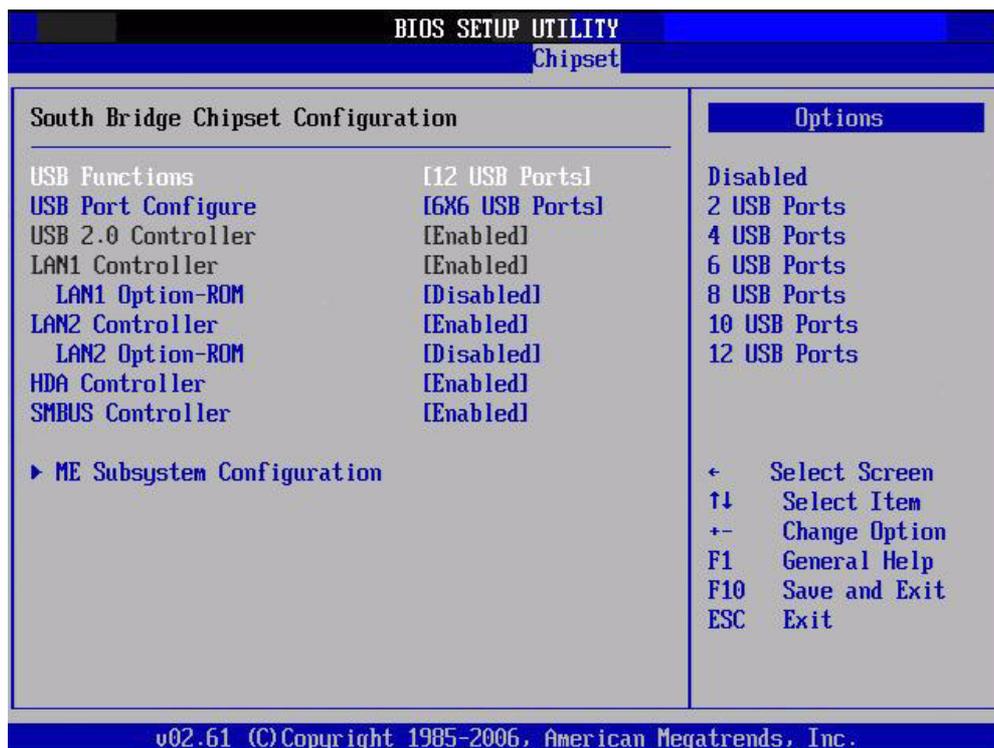
Figure 3.23 South Bridge Configuration

3.11.2 South Bridge Chipset Configuration

The following options are available:

- USB Functions: Disabled, 2 USB Ports, 4 USB Ports, 6 USB Ports or 8 USB Ports.
- USB Port Configure
- USB 2.0 Controller: Enables or disables the USB 2.0 controller.
- LAN1 controller: Enables or disables the GbE controller.
- LAN1 Option-ROM: Enables or disables GbE LAN boot.
- LAN2 Controller: Enables or disables the LAN2 controller.
- LAN2 option ROM:
- HDA Controller: Enables or disables the HDA controller.
- SMBUS Controller: Enables or disables the SMBUS controller.
- ME subsystem configuration.

Figure 3.24 South Bridge Chipset Configuration

3.11.3 ME Subsystem Configuration

ME-HECI: Enable/disable ME-H

ME-IDER: Enable/disable ME-IDER

ME-KT: Enable/Disable ME-KT

3.12 Exit Option
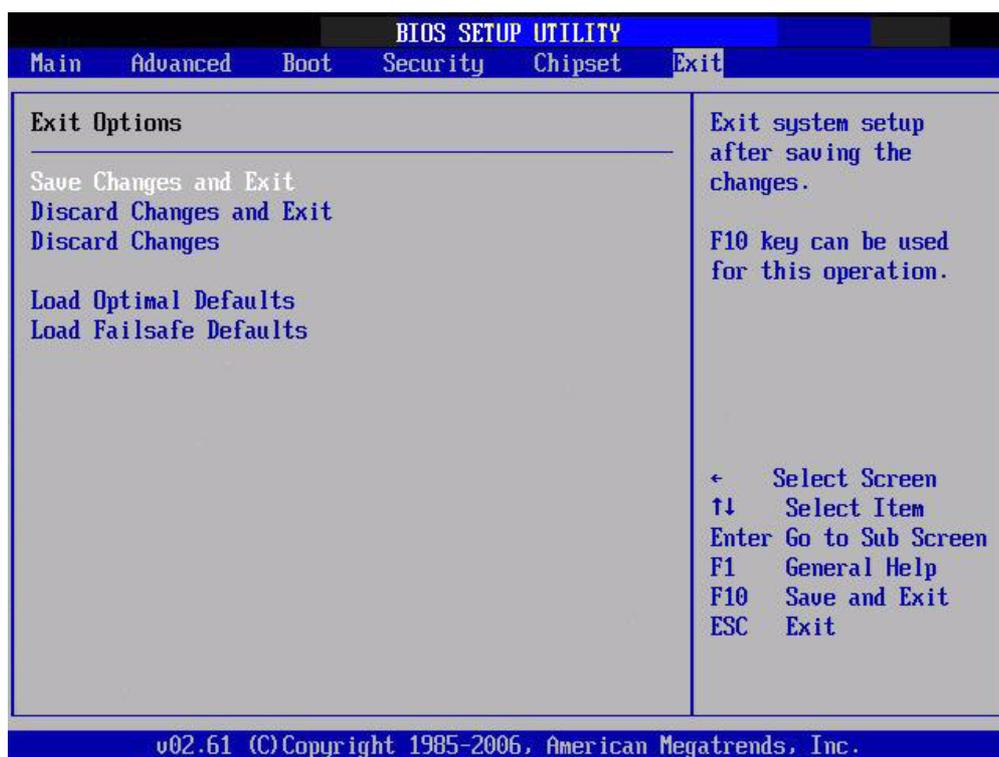
Figure 3.25 Exit Option

3.12.1 Save Changes and Exit

When you have completed system configuration, select this option to save your changes, exit BIOS setup and reboot the computer so the new system configuration parameters can take effect.

1.   Select Exit Saving Changes from the Exit menu and press <Enter>.
The following message appears:
Save Configuration Changes and Exit Now?
[Ok] [Cancel]
2.   Select Ok or cancel.

3.12.2 Discard Changes and Exit

Select this option to quit Setup without making any permanent changes to the system configuration.

1.   Select Exit Discarding Changes from the Exit menu and press <Enter>. The following message appears:
Discard Changes and Exit Setup Now?
[Ok] [Cancel]
2.   Select Ok to discard changes and exit.
Discard Changes
3.   Select Discard Changes from the Exit menu and press <Enter>.

3.12.3 Load Optimal Defaults

The AIMB-766 automatically configures all setup items to optimal settings when you select this option. Optimal Defaults are designed for maximum system performance, but may not work best for all computer applications. In particular, do not use the Optimal Defaults if your computer is experiencing system configuration problems. Select Load Optimal Defaults from the Exit menu and press <Enter>.

3.12.4 Load Fail-Safe Defaults

The AIMB-766 automatically configures all setup options to fail-safe settings when you select this option. Fail-Safe Defaults are designed for maximum system stability, but not maximum performance. Select Fail-Safe Defaults if your computer is experiencing system configuration problems.

1. Select Load Fail-Safe Defaults from the Exit menu and press <Enter>. The following message appears:
Load Fail-Safe Defaults?
[OK] [Cancel]
2. Select OK to load Fail-Safe defaults.

Chapter 4

**Chipset Software
Installation Utility**

4.1 Before you begin

To facilitate the installation of the enhanced display drivers and utility software, read the instructions in this chapter carefully. The drivers for the AIMB-766 are located on the software installation CD.

> **Note!** *Files are compressed. Do not attempt to install the drivers by copying the files manually. You must use the supplied SETUP program to install the drivers.*

Before you begin, it is important to note that most display drivers need to have the relevant software application already installed in the system prior to installing the enhanced display drivers. In addition, many of the installation procedures assume that you are familiar with both the relevant software applications and operating system commands. Review the relevant operating system commands and the pertinent sections of your application software's user manual before performing the installation.

4.2 Introduction

The Intel Chipset Software Installation (CSI) utility installs the Windows INF files that outline to the operating system how the chipset components will be configured. This is needed for the proper functioning of the following features:

- Core PCI PnP services
- IDE Ultra ATA 100/66/33 and Serial ATA interface support
- USB 1.1/2.0 support (USB 2.0 driver needs to be installed separately for Windows 98)
- Identification of Intel chipset components in the Device Manager

> **Note!** *This utility is used for the following versions of Windows, and it has to be installed before installing all the other drivers:*
> - *Windows 2000*
> - *Windows XP*
> - *Windows Vista*

4.3 Windows XP Driver Setup

1. Insert the driver CD into your system's CD-ROM drive. You can see the driver folders items. Move the mouse cursor over the folder "INF". In INF folder, you can click "setup.exe" to complete the implement of the driver
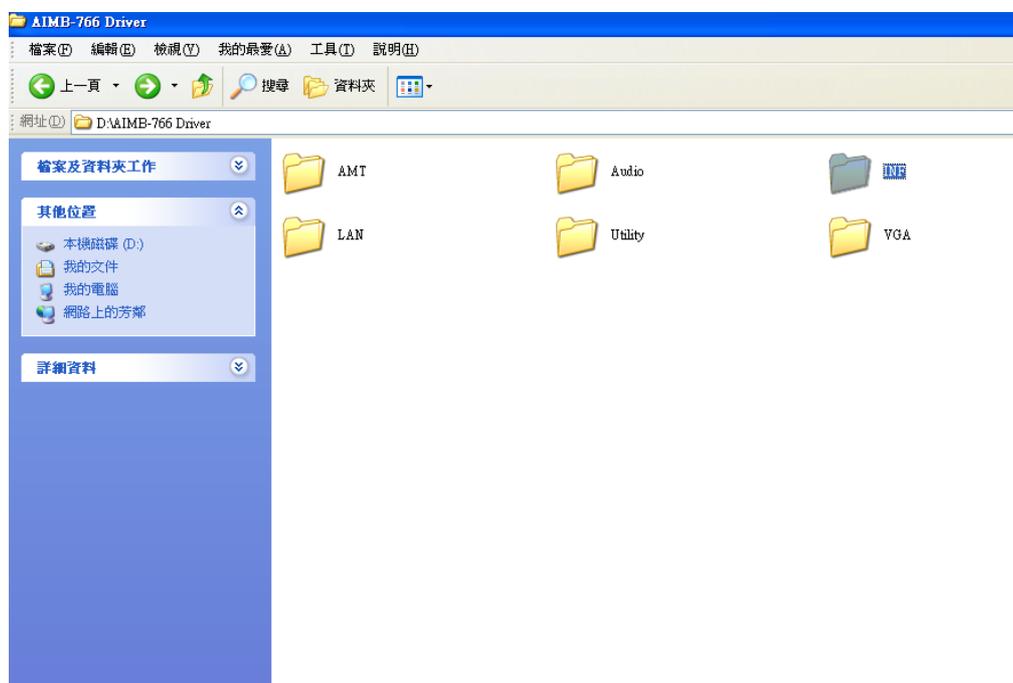
2. Click setup to execute program.
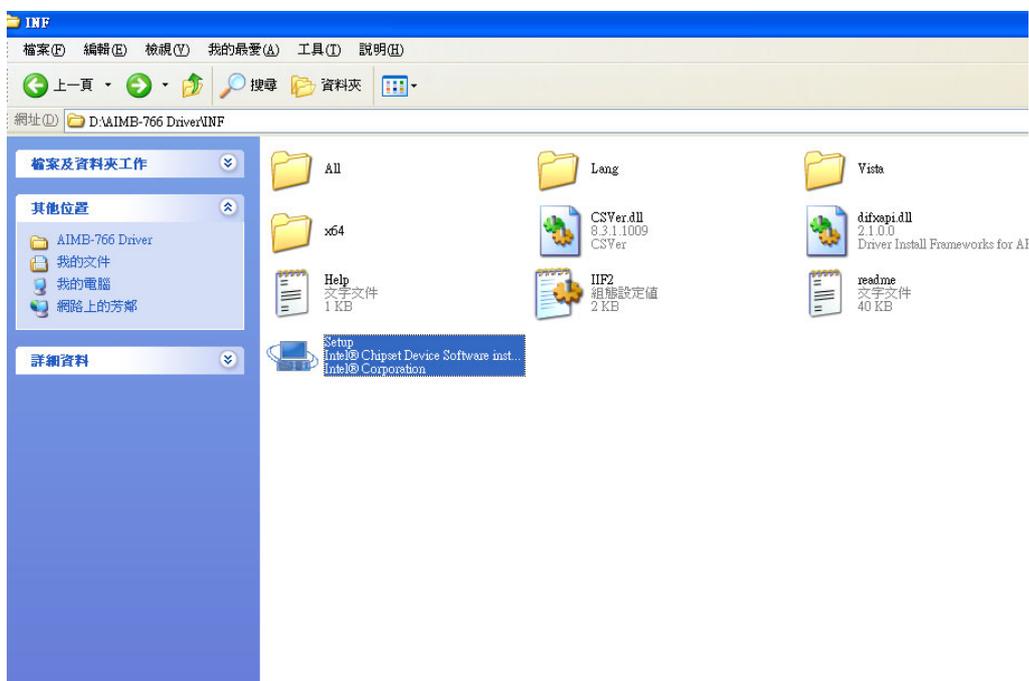
Chapter 5

VGA Setup

5.1 Introduction

The AIMB-766 delivers cost competitive 3D, 2D, and video capabilities. The GMCH uses a UMA configuration with DVMT for graphic memory. The analog display supports up to 2048 x 1536 @ 75 MHz refresh, 350 MHz integrated 24-bit RAMDAC. AIMB-766 supports dual channels SDVO interface. It supports flat panels up to 1920 x 1200 @ 60 MHz or digital CRT/ HDTV at 1400 x 1050 @ 85 MHz.

- **Intel GMA X3100 GPU Integrated:** Intel GMA X3100 controller deliver 3-D enhancements that enable greater flexibility and scalability. Improved realism with support for Microsoft DirectX* 9.0c Shader Model 2.0, OpenGL* 1.4.
- **Intel Serial Digital Video Output (SDVO):** The AIMB-766 supports dual channel SDVO interface, providing a cost-effective solution with a 2nd display via SDVO channel. Advantech provides full range of ADD2 PCI Express based graphic expansion card with options for DVI, VGA/CRT, LVDS, and HDMI. The default BIOS supports ADD2 DVI and ADD2 HDMI cards. It will require custom BIOS if ADD2 LVDS and ADD2 VGA cards are used.

5.2 Windows Vista/XP/2000 Driver Setup

Note! *Before installing this driver, make sure the INF driver has been installed in your system. See Chapter 4 for information on installing the INF driver.*

Insert the driver CD into your system's CD-ROM drive. You can see the driver folders items. Move the mouse cursor over the folder "VGA". In VGA folder, you can click "setup.exe" to complete the implement of the driver based on Vista, Windows XP and Windows 2000.
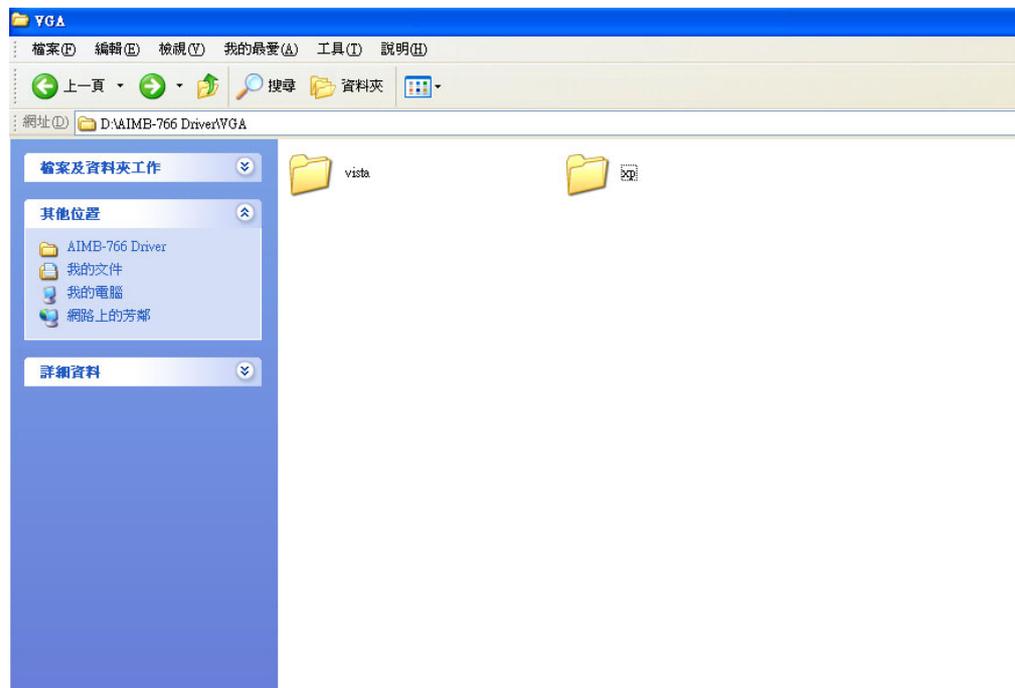
Chapter 6

LAN Configuration

6.1 Introduction

The AIMB-766 is designed with dual gigabit Ethernet controller- Intel 82556DM and Intel 82573L. The Intel® 82566DM Gigabit Ethernet Controller is a compact, single-port integrated physical layer device that connect to appropriate Intel® chipsets with an integrated Media Access Controller (MAC). The 82566DM supports Intel® Active Management Technology. The Intel 82573L Gigabit controller is single, compact component with integrated Gigabit Ethernet Media Access Control (MAC) and Physical Layer (PHY) functions. These devices use PCIe architecture (Rev.1.0a).

6.2 Features

- 10/100/1000Base-T Ethernet controller
- 10/100/1000Base-T triple-speed MAC
- Full duplex at 10, 100, or 1000 Mbps and half duplex at 10 or 100 Mbps
- Power consumption less than 1.16 Watt
- Wake-on-LAN (WOL) support
- PCIe x1 host interface

6.3 Installation

Note! *Before installing the LAN drivers, make sure the INF Drivers have been installed on your system. See Chapter 4 for information on installing the INF Drivers.*

The integrated Intel gigabit Ethernet controller supports all major network operating systems. However, the installation procedure varies with different operating systems. In the following sections, refer to the one that provides the driver setup procedure for the operating system you are using.

6.4 Win XP Driver Setup (LAN)

Insert the driver CD into your system's CD-ROM drive. Select the LAN folder then click the proper Lan driver for the OS.
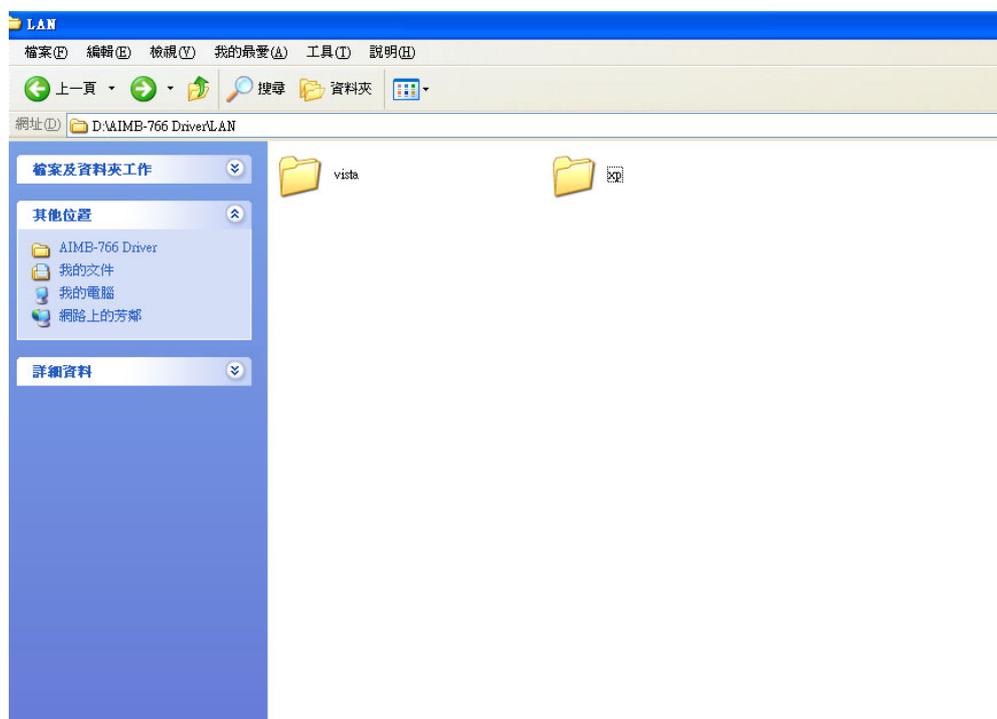
Chapter 7

AMT Setup

7.1 Intel AMT Overview

AIMB-766 supports Intel Active Management Technology 3.0. The hardware and firmware based solution (ICH9 DO only, for AIMB-766G2-00A1E sku only) is powered by the system auxiliary power plane to remotely monitor networked systems. Intel AMT stores hardware and software information in non-volatile memory. Built-in management provides out-of-band management capabilities, allowing remote discovery and repair of systems after OS failures or when a system is powered down. Alert and event logging features detect problems to quickly reduce downtime, proactively blocking incoming threats, containing infected clients before they impact the network, and proactively notifying the user when critical software agents are removed.

Features:

- Out-of-Band system access
- Remote trouble-shooting and recovery
- Proactive alerting
- Remote HW and SW asset tracking
- Third-party nonvolatile storage

Intel AMT is a comprehensive solution that includes software support from top-tier security and management software vendors.

7.2 Windows XP Intel ME (Management Engine) Interface Setup

Note! *Before installing this driver, make sure the INF Drivers have been installed in your system. See Chapter 4 for information on installing the INF Drivers.*

Insert the driver CD into your system's CD-ROM drive. Select the AMT folder then click setup in HECI folder to install ME interface
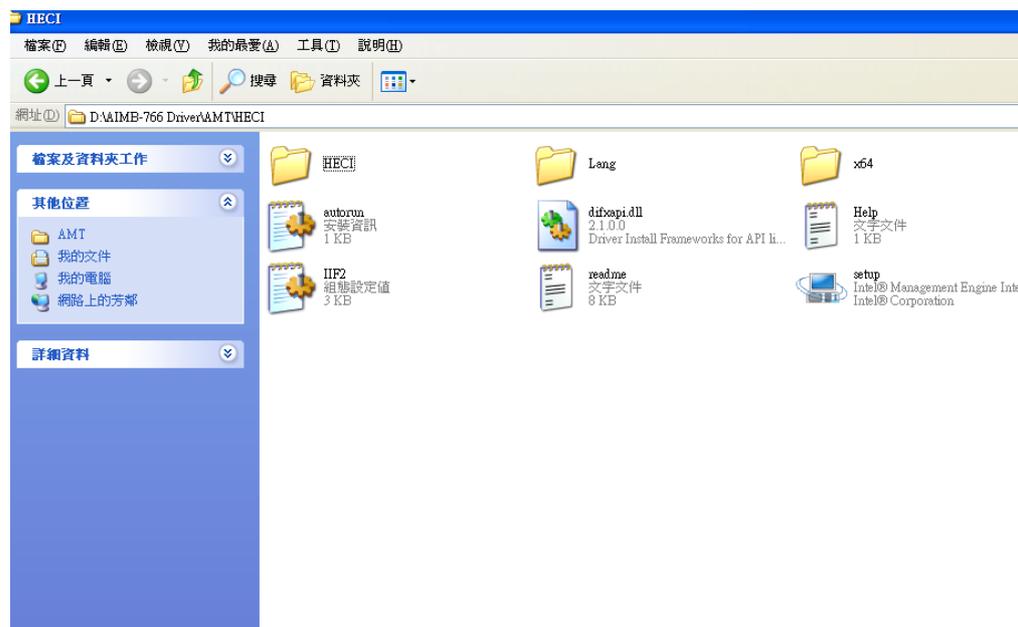
The following installation procedure is for Windows XP. Currently, Vista drivers are not available.

1. You will see a welcome window. Click "Next" to continue the installation.

2. Please click "Yes" to continue the installation.
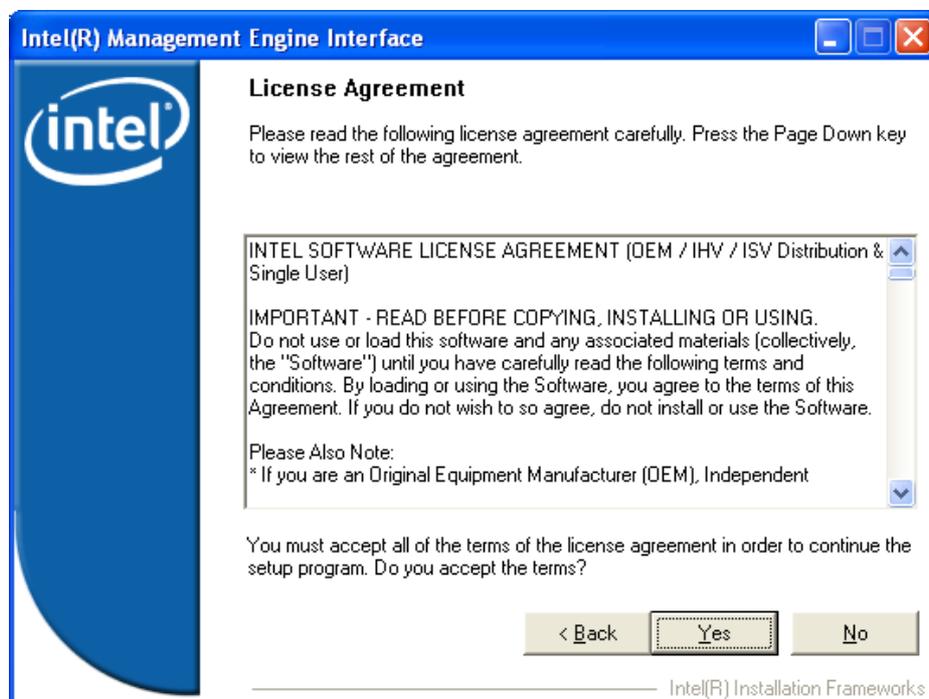
3. Please click "Next" to continue the installation.
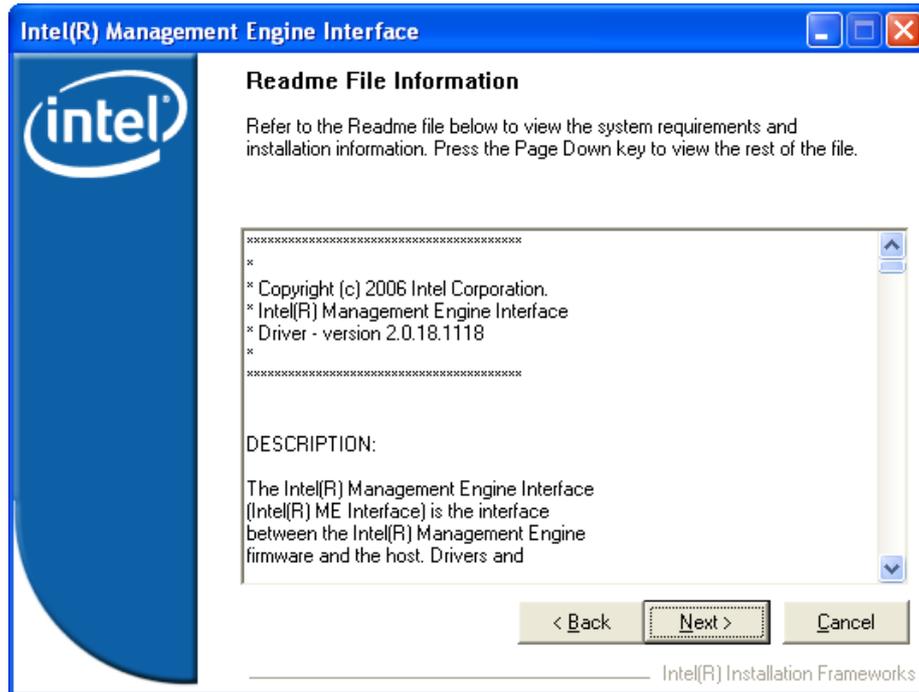
4. Please click "Next" to continue the installation.
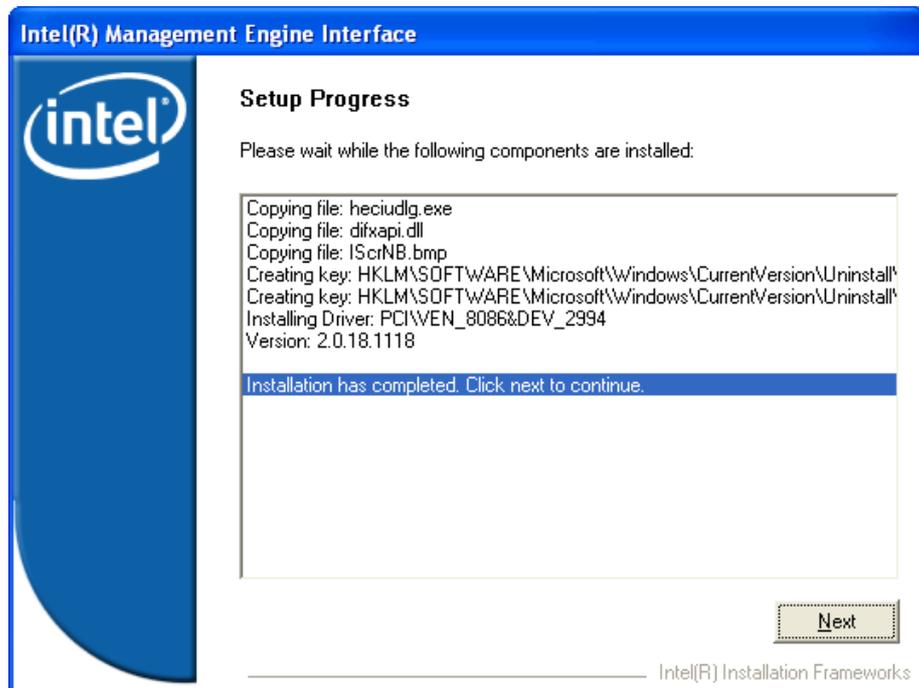
5. Click "Finish" to complete the installation.
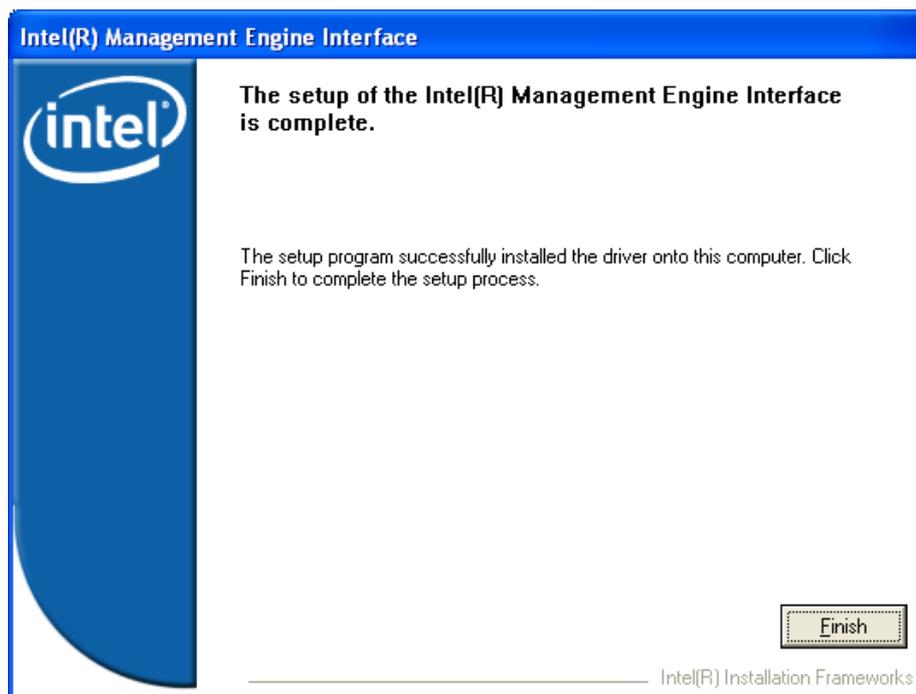
7.3 Windows XP AMT ME Driver Setup

Insert the driver CD into your system's CD-ROM drive. Select the AMT folder then click setup in LMS_SOL folder to install AMT ME driver.
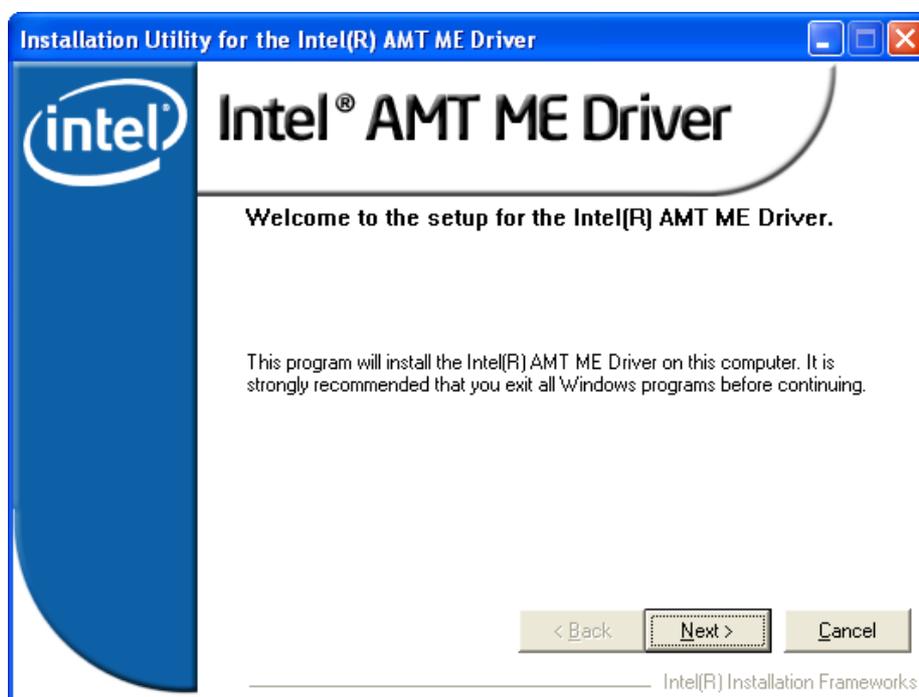
6. Please click "Yes" to continue the installation.
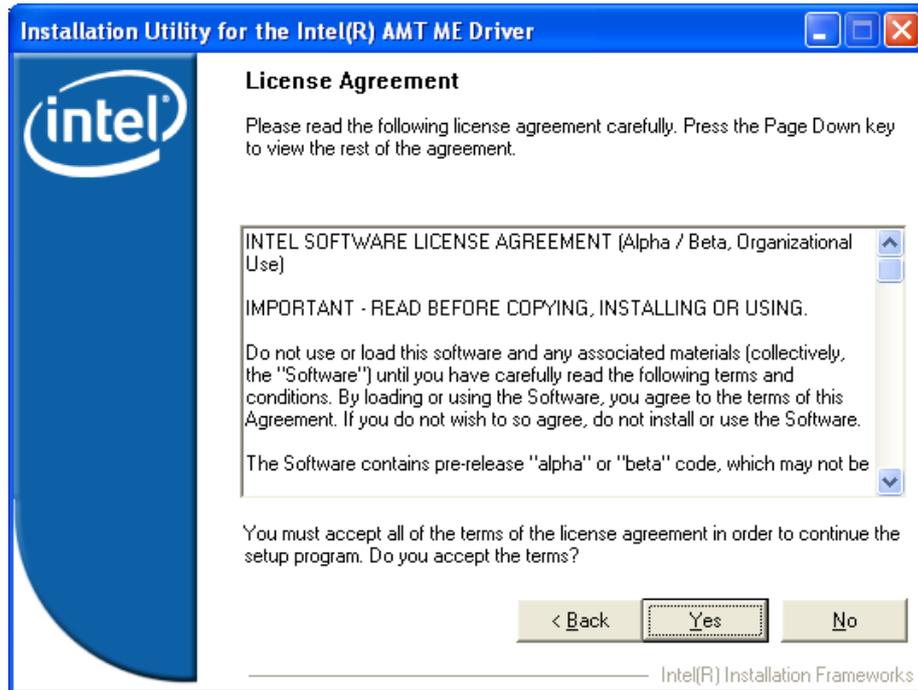
7. Please click "Next" to continue the installation.
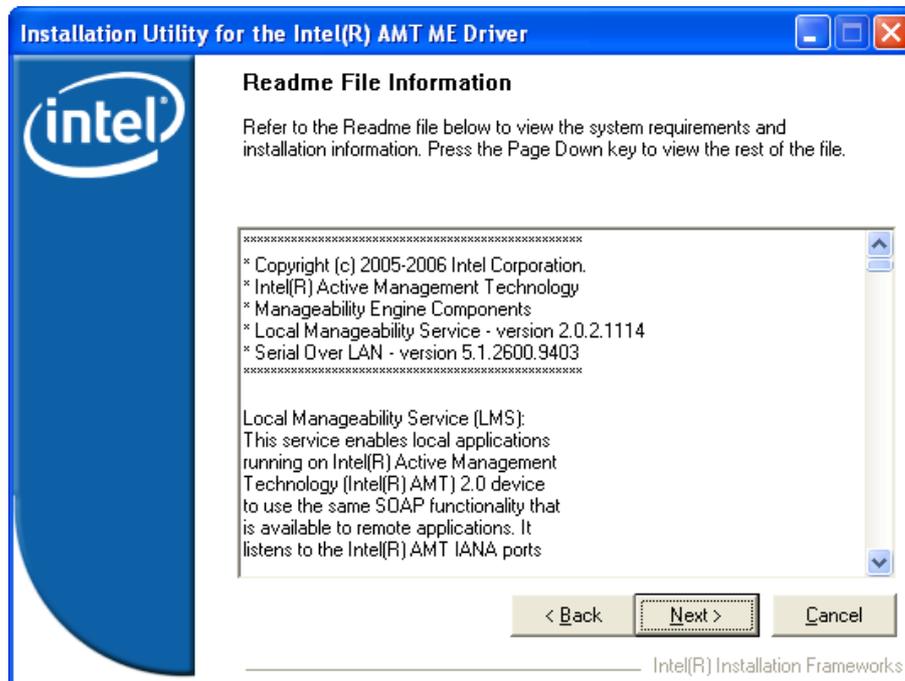
8. Please click "Next" to continue the installation.
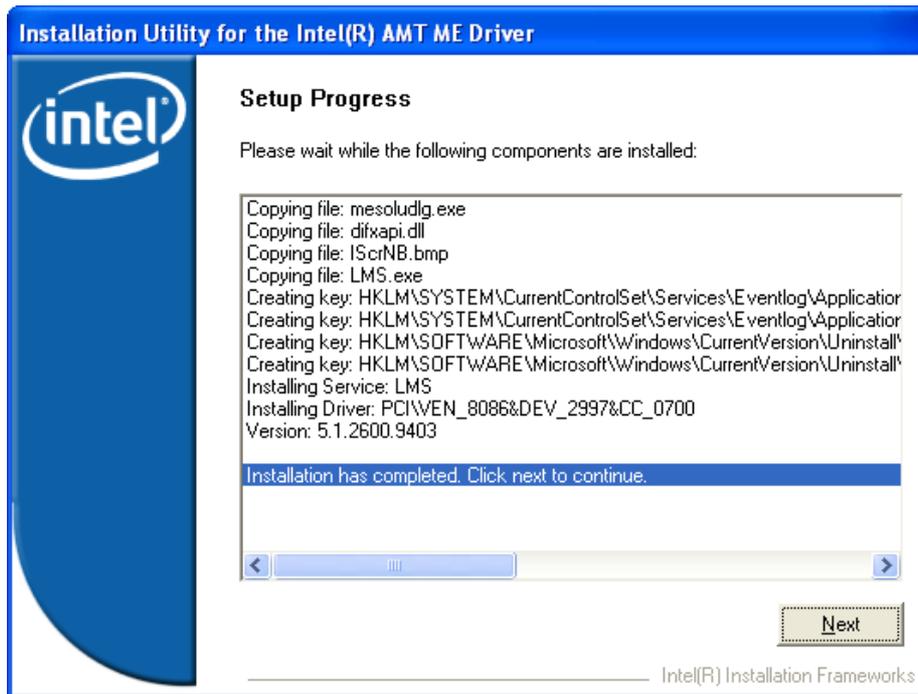
9. Click "Finish" to complete the installation.
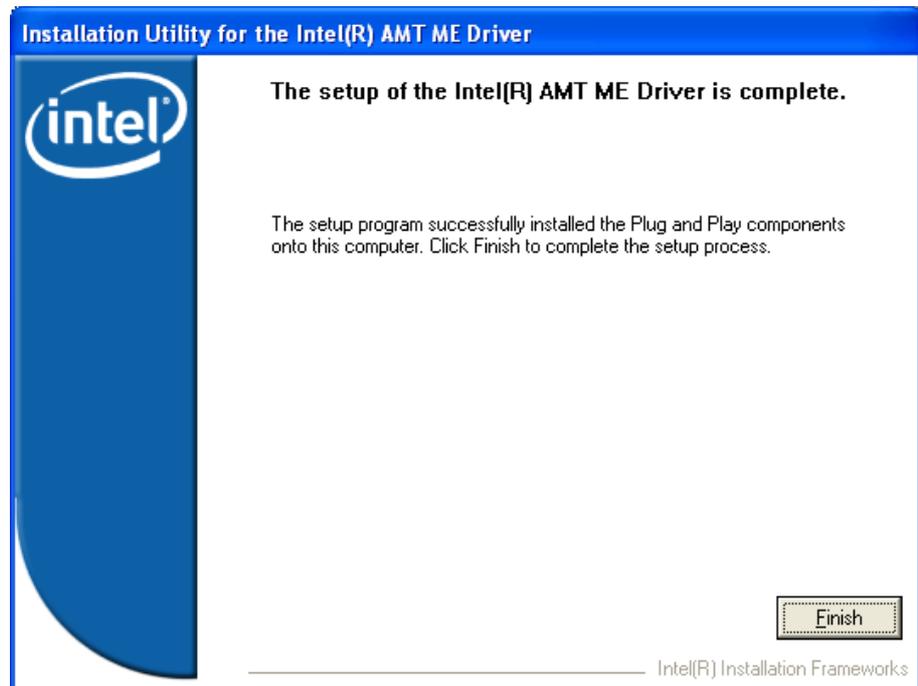
Appendix A

Programming the Watchdog Timer

The AIMB-766's watchdog timer can be used to monitor system software operation and take corrective action if the software fails to function within the programmed period. This section describes the operation of the watchdog timer and how to program it.

A.1 Watchdog timer overview

The watchdog timer is built in to the super I/O controller W83627DHG. It provides the following functions for user programming:

- Can be enabled and disabled by user's program
- Timer can be set from 1 to 255 seconds or 1 to 255 minutes
- Generates an interrupt or resets signal if the software fails to reset the timer before time-out

A.2 Programming the Watchdog Timer

The I/O port address of the watchdog timer is 2E (hex) and 2F (hex). 2E (hex) is the address port. 2F (hex) is the data port. You must first write an address value into address port 2E (hex), and then write/read data to/from the assigned register through data port 2F (hex).

```
┌─────────────────────────┐
│                         │
│   Unlock W83627DHG      │
│                         │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│                         │
│   Select register of    │
│   watchdog timer        │
│                         │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│                         │
│  Enable the function of │
│   the watchdog timer    │
│                         │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│                         │
│   Use the function of   │
│   the watchdog timer    │
│                         │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│                         │
│    Lock W83627DHG       │
│                         │
└─────────────────────────┘
```
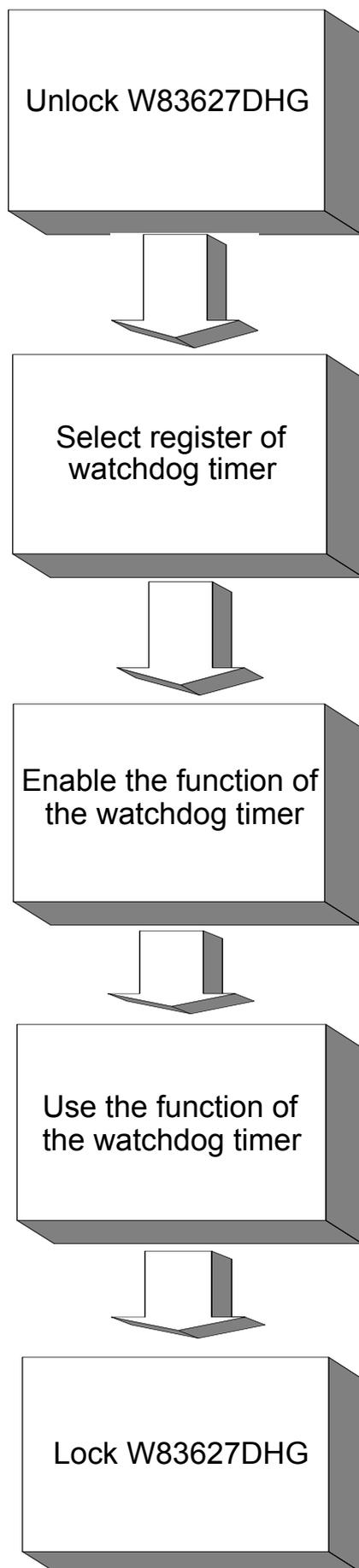
Table A.1: Watchdog timer registers		
Address of register (2E)	Read/ Write	Value (2F) & description
87 (hex)	-	Write this address to I/O address port 2E (hex) twice to unlock the W83627DHG
07 (hex)	write	Write 08 (hex) to select register of watchdog timer.
30 (hex)	write	Write 01 (hex) to enable the function of the watchdog timer. Disabled is set as default.
F5 (hex)	write	Set seconds or minutes as units for the timer. Write 0 to bit 3: set seconds as counting unit. [default]. Write 1 to bit 3: set minutes as counting unit.
F6 (hex)	write	0: stop timer [default] 01 ~ FF (hex): The amount of the count, in seconds or minutes, depends on the value set in register F5 (hex). This number decides how long the watchdog timer waits for strobe before generating an interrupt or reset signal. Writing a new value to this register can reset the timer to count with the new value.
F7 (hex)	read/ write	Bit 6: Write 1 to enable keyboard to reset the timer, 0 to disable.[default] Bit 5: Write 1 to generate a timeout signal immediately and automatically return to 0. [default=0] Bit 4: Read status of watchdog timer, 1 means timer is "timeout".
AA (hex)	-	Write this address to I/O port 2E (hex) to lock the watchdog timer 2.

A.2.1 Example Programs

Enable watchdog timer and set 10 seconds as the timeout interval

```
;----------------------------------------------------------
Mov dx,2eh ; Unlock W83627DHG
Mov al,87h
Out dx,al
Out dx,al
;----------------------------------------------------------
Mov al,07h ; Select registers of watchdog timer
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;----------------------------------------------------------
Dec dx; Enable the function of watchdog timer
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;----------------------------------------------------------
Dec dx ; Set second as counting unit
Mov al,0f5h
Out dx,al
```

```
Inc dx
In al,dx
And al,not 08h
Out dx,al
;--------------------------------------------------------
Dec dx ; Set timeout interval as 10 seconds and start counting
Mov al,0f6h
Out dx,al
Inc dx
Mov al,10
Out dx,al
;--------------------------------------------------------
Dec dx ; lock W83627DHG
Mov al,0aah
Out dx,al
```

Enable watchdog timer and set 5 minutes as the timeout interval

```
;--------------------------------------------------------
Mov dx,2eh ; unlock W83627DHG
Mov al,87h
Out dx,al
Out dx,al
;--------------------------------------------------------
Mov al,07h ; Select registers of watchdog timer
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;--------------------------------------------------------
Dec dx ; Enable the function of watchdog timer
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;--------------------------------------------------------
Dec dx ; Set minute as counting unit
Mov al,0f5h
Out dx, al
Inc dx
In al,dx
Or al, 08h
Out dx,al
;--------------------------------------------------------
Dec dx ; Set timeout interval as 5 minutes and start counting
Mov al,0f6h
```

```
Out dx,al
Inc dx
Mov al,5
Out dx,al
;--------------------------------------------------------
Dec dx ; lock W83627DHG
Mov al,0aah
Out dx,al
```
Enable watchdog timer to be reset by mouse
```
;--------------------------------------------------------
Mov dx,2eh ; unlock W83627DHG
Mov al,87h
Out dx,al
Out dx,al
;--------------------------------------------------------
Mov al,07h ; Select registers of watchdog timer
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;--------------------------------------------------------
Dec dx ; Enable the function of watchdog timer
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;--------------------------------------------------------
Dec dx ; Enable watchdog timer to be reset by mouse
Mov al,0f7h
Out dx,al
Inc dx
In al,dx
Or al,80h
Out dx,al
;--------------------------------------------------------
Dec dx ; lock W8362DHG
Mov al,0aah
Out dx,al
```
Enable watchdog timer to be reset by keyboard
```
;--------------------------------------------------------
Mov dx,2eh ; unlock W83627DHG
Mov al,87h
Out dx,al
Out dx,al
```

```
;---------------------------------------------------------
Mov al,07h ; Select registers of watchdog timer
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;---------------------------------------------------------
Dec dx ; Enable the function of watchdog timer
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;---------------------------------------------------------
Dec dx ; Enable watchdog timer to be strobed reset by keyboard
Mov al,0f7h
Out dx,al
Inc dx
In al,dx
Or al,40h
Out dx,al
;---------------------------------------------------------
Dec dx ; lock W83627DHG
Mov al,0aah
Out dx,al
```

Generate a time-out signal without timer counting

```
;---------------------------------------------------------
Mov dx,2eh ; unlock W83627DHG
Mov al,87h
Out dx,al
Out dx,al
;---------------------------------------------------------
Mov al,07h ; Select registers of watchdog timer
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;---------------------------------------------------------
Dec dx ; Enable the function of watchdog timer
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;---------------------------------------------------------
```

```
Dec dx ; Generate a time-out signal
Mov al,0f7h
Out dx,al ;Write 1 to bit 5 of F7 register
Inc dx
In al,dx
Or al,20h
Out dx,al
;---------------------------------------------------------
Dec dx ; lock W83627DHG
Mov al,0aah
Out dx,al
```

Appendix B

I/O Pin Assignments

B.1 IDE Hard Drive Connector (IDE1)
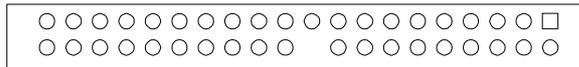
Table B.1: IDE hard drive connector (IDE1)			
Pin	**Signal**	**Pin**	**Signal**
1	IDE RESET*	2	GND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	SIGNAL GND	20	N/C
21	DISK DMA REQUEST	22	GND
23	IO WRITE	24	GND
25	IO READ	26	GND
27	IO CHANNEL READY	28	CSEL
29	HDACKO*	30	GND
31	IRQ14	32	NC
33	ADDR 1	34	PDIAG
35	ADDR 0	36	ADDR 2
37	HARD DISK SELECT 0*	38	HARD DISK SELECT 1*
39	IDE ACTIVE*	40	GND
* low activity			

B.2 Floppy Drive Connector (FDD1)
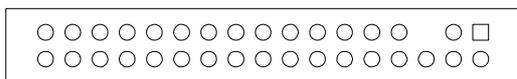
Table B.2: Floppy drive connector (FDD1)			
Pin	**Signal**	**Pin**	**Signal**
1	GND	2	FDHDIN*
3	GND	4	N/C
5	N/C	6	FDEDIN*
7	GND	8	INDEX*
9	GND	10	MOTOR 0*
11	GND	12	DRIVE SELECT 1*
13	GND	14	DRIVE SELECT 0*
15	GND	16	MOTOR 1*
17	GND	18	DIRECTION*
19	GND	20	STEP*
21	GND	22	WRITE DATA*
23	GND	24	WRITE GATE*
25	GND	26	TRACK 0*
27	GND	28	WRITE PROTECT*
29	GND	30	READ DATA*
31	GND	32	HEAD SELECT*
33	GND	34	DISK CHANGE*
* low activity			

B.3 Parallel Port (LPT1)

Table B.3: Parallel Port (LPT1)			
Pin	**Signal**	**Pin**	**Signal**
1	STROBE*	14	AUTOFD*
2	D0	15	ERR
3	D1	16	INIT*
4	D2	17	SLCTINI*
5	D3	18	GND
6	D4	19	GND
7	D5	20	GND
8	D6	21	GND
9	D7	22	GND
10	ACK*	23	GND
11	BUSY	24	GND
12	PE	25	GND
13	SLCT	26	N/C
* low activity			

B.4 USB Header (USB56, USB78, USB910 & USB1112)
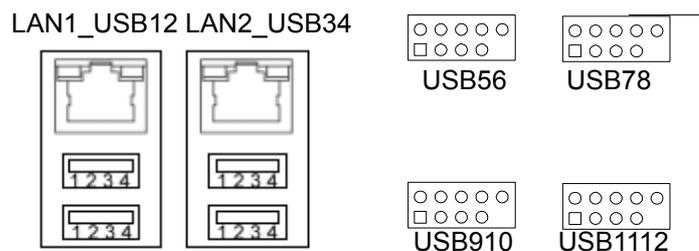
Table B.4: USB Header (USB56,USB78,USB910)			
Pin	**Signal**	**Pin**	**Signal**
1	USB_VCC5	2	USB_VCC5
3	USB_D-	4	USB_D-
5	USB_D+	6	USB_D+
7	GND	8	GND
9	Key	10	GND

B.5 VGA Connector (VGA1)
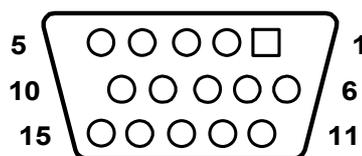
Table B.5: VGA Connector (VGA1)

Pin	Signal	Pin	Signal
1	RED	9	VCC
2	GREEN	10	GND
3	BLUE	11	N/C
4	N/C	12	SDT
5	GND	13	H-SYNC
6	GND	14	V-SYNC
7	GND	15	SCK
8	GND		

B.6 RS-232 Interface (COM1, COM2, COM3 & COM4)
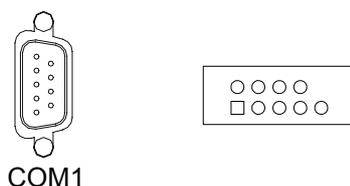
COM1

Table B.6: RS-232 Interface (COM1)

Pin	Signal
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

B.7 PS/2 Keyboard and Mouse Connector (KBMS1)
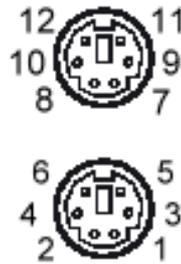
Table B.7: Keyboard and Mouse Connector (KBMS1)	
Pin	**Signal**
1	KB DATA
2	N/C
3	GND
4	KB VCC
5	KB CLK
6	N/C

B.8 External Keyboard Connector (KBMS2)
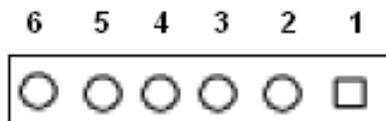
Table B.8: External Keyboard Connector (KBMS2)	
Pin	**Signal**
1	KB CLK
2	KB DATA
3	MS DATA
4	GND
5	VCC
6	MS CLK

B.9 Infrared (IR) connector (JIR1)

Table B.9: Infrared Connector (JIR1)	
Pin	Signal
1	VCC
2	N/C
3	IRRX
4	GND
5	IRTX

B.10 CPU/System Fan Power Connector (SYSFAN1/SYSFAN2)
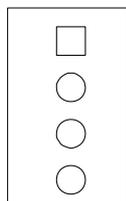
Table B.10: Fan Power Connector (SYSFAN1/CHAFAN1)	
Pin	Signal
1	GND
2	+12 V
3	DETECT
4	PWM

B.11 Power LED and Keyboard Lock (JFP3)
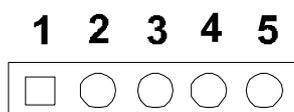
Table B.11: Power LED and Keyboard Lock (JFP3)	
Pin	Function
1	LED power (+)
2	NC
3	LED power (-)
4	#keylock
5	Ground

B.12 External Speaker Connector (JFP2)

Table B.12: External Speaker Connector (JFP2)	
Pin	**Function**
1	Buzzer
3	NC
5	Buzzer
7	Speaker out

B.13 Reset Connector (JFP1)
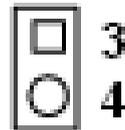
Table B.13: Reset Connector (JFP1)	
Pin	**Signal**
3	RESET
4	GND

B.14 HDD LED Connector (JFP2)
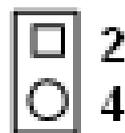
Table B.14: HDD LED Connector (JFP2)	
Pin	**Signal**
2	VCC
4	IDE/SATA

B.15 ATX Soft Power Switch (JFP1)
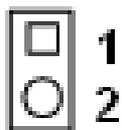
Table B.15: ATX Soft Power Switch (JFP1)	
Pin	**Signal**
1	PWR-BTN
2	GND

B.16 H/W Monitor Alarm (JOBS1)
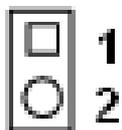
Table B.16: H/W Monitor Alarm (JOBS1)	
Pin	**Signal**
1	Error Beep
2	OBS Beep alarm

B.17 SM Bus Connector (JFP2)
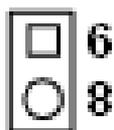
Table B.17: SM Bus Connector (JFP2)	
Pin	**Signal**
6	SMB_DATA
8	SMB_CLK

B.18 USB/LAN ports (LAN1_USB12 and LAN2_USB34)
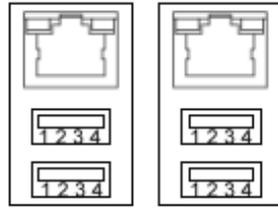
LAN1_USB12   LAN2_USB34

Table B.18: USB Port			
Pin	Signal	Pin	Signal
1	VCC_DUAL	3	Data0+
2	Data0-	4	GND

Table B.19: Giga LAN 10/100/1000 Base-T RJ-45 port			
Pin	Signal	Pin	Signal
1	MID0+	5	MID2+
2	MID0-	6	MID2+
3	MID1+	7	MID3+
4	MID1-	8	MID3+

B.19 Line Out, Mic IN Connector (AUDIO1)
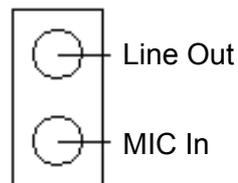
AUDIO1

B.20 Audio Input from CD-ROM (CDIN1)

CDIN1
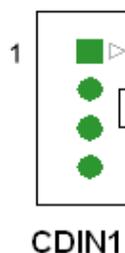
Table B.20: Audio Input from CD-ROM			
Pin	Signal	Pin	Signal
1	CD_L	3	GND
2	GND	4	CD_R

B.21 Front Panel Audio Connector (FP AUDIO; FAUDIO1)

Table B.21: Audio Connector (FP AUDIO; FAUDIO1)			
Pin	Signal	Pin	Signal
1	MIC2_L	2	Ground
3	MIC2_R	4	VCC3
5	LINEOUT2_R	6	Ground
7	FRONT_IO_JD	8	NC
9	LINEOUT2_L	10	Ground

B.22 8-pin Alarm Board Connector (VOLT1)
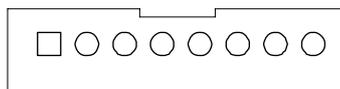
Table B.22: 8-pin Alarm Board Connector (VOLT1)			
Pin	Signal	Pin	Signal
1	5VSB	5	VCC
2	GND	6	VCC3
3	GND	7	-12V
4	-5V	8	+12V

B.23 Case Open Connector (JCASE1)
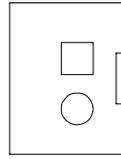
Table B.23: Case Open Connector (JCASE1)	
Pin	**Signal**
1	CASEOP
2	GND

B.24 Front Panel LAN LED Connector (LAN_LED1)
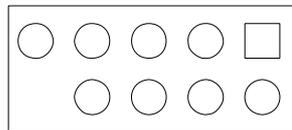
Table B.24: LAN LED Connector (LANLED1)			
Pin	**Signal**	**Pin**	**Signal**
1	LAN1_LINK/ACT	2	LAN2_LINK/ACT
3	3VDUAL	4	3VDUAL
5	LAN1_LINK1000	6	LAN2_LINK1000
7	LAN1_LINK100	8	LAN2_LINK100
9	3VDUAL	10	N/C

B.25 SPI_CN1: SPI fresh card pin connector

Table B.25: SPI_CN1:SPI fresh card pin connector			
Pin	Signal	Pin	Signal
1	+F1_3V	2	GND
3	F1_SPI_CS#_Q	4	F1_SPI_CLK_Q
5	F1_SPI_MISO_Q	6	F1_SPI_MOSI_Q
7	NC	8	NC

B.26 TPM_SLOT1: TPM module connector

Table B.26: TPM_SLOT1:TPM module connector			
Pin	Signal	Pin	Signal
1	GND	2	CLK
3	SMB_ CLK	4	FRAME#
5	SMB_DATA	6	REST
7	LAD2	8	LAD3
9	LAD1	10	VCC3
11	GND	12	LAD0
13	N/C	14	VCC3
15	SERIRQ#	16	VCC3SB
17	CLKRUN#	18	GND
19	N/C	20	SLPS3#

B.27 System I/O Ports

Table B.27: System I/O ports	
Addr. range (Hex)	**Device**
000-01F	DMA controller
020-021	Interrupt controller 1, master
022-023	Chipset address
040-05F	8254 timer
060-06F	8042 (keyboard controller)
070-07F	Real-time clock, non-maskable interrupt (NMI) mask
080-09F	DMA page register
0A0-0BF	Interrupt controller 2
0C0-0DF	DMA controller
0F0	Clear math co-processor
0F1	Reset math co-processor
0F8-0FF	Math co-processor
1F0-1F8	Fixed disk
200-207	Game I/O
278-27F	Parallel printer port 2 (LPT3)
290-297	On-board hardware monitor
2F8-2FF	Serial port 2
300-31F	Prototype card
360-36F	Reserved
378-37F	Parallel printer port 1 (LPT2)
380-38F	SDLC, bisynchronous 2
3A0-3AF	Bisynchronous 1
3B0-3BF	Monochrome display and printer adapter (LPT1)
3C0-3CF	Reserved
3D0-3DF	Color/graphics monitor adapter
3F0-3F7	Diskette controller
3F8-3FF	Serial port 1

B.28 DMA Channel Assignments

Table B.28: DMA channel assignments	
Channel	**Function**
0	Available
1	Available
2	Floppy disk (8-bit transfer)
3	Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

Appendix B   I/O Pin Assignments

B.29 Interrupt Assignments

Table B.29: Interrupt assignments		
Priority	**Interrupt#**	**Interrupt source**
1	NMI	Parity error detected
2	IRQ0	Interval timer
3	IRQ1	Keyboard
-	IRQ2	Interrupt from controller 2 (cascade)
4	IRQ8	Real-time clock
5	IRQ9	Cascaded to INT 0A (IRQ 2)
6	IRQ10	Available/Serial communication port 4
7	IRQ11	Available
8	IRQ12	PS/2 mouse
9	IRQ13	INT from co-processor
10	IRQ14	Primary IDE Channel
11	IRQ15	Secondary IDE Channel
12	IRQ3	Serial communication port 2
13	IRQ4	Serial communication port 1
14	IRQ5	Serial communication port 3
15	IRQ6	Diskette controller (FDC)
16	IRQ7	Parallel port 1 (print port)

B.30 1st MB Memory Map

Table B.30: 1st MB memory map	
Addr. range (Hex)	**Device**
E0000h - FFFFFh	BIOS
CC000h - DFFFFh	Unused
C0000h - CBFFFh	VGA BIOS
A0000h - BFFFFh	Video Memory
00000h - 9FFFFh	Base memory

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