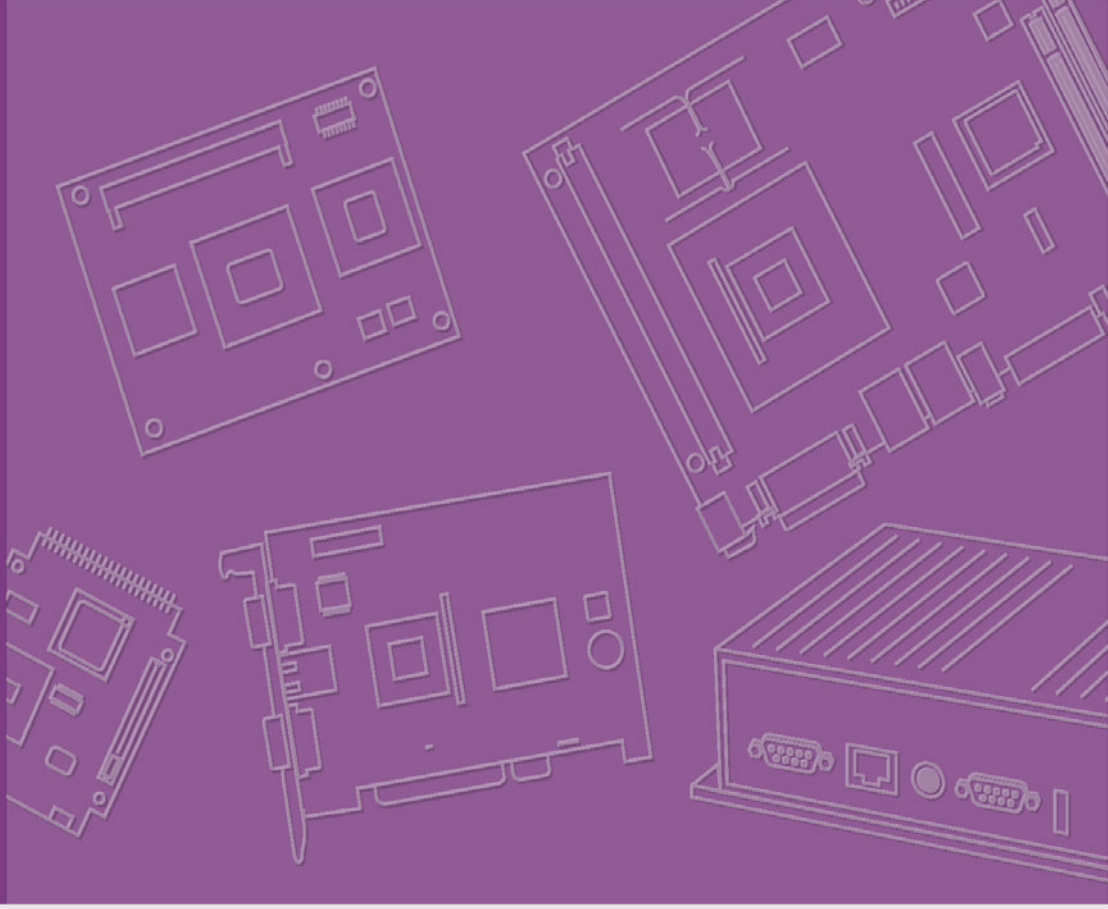

User Manual

AIMB-280

Intel® Core™ i7/i5/i3/Pentium® Socket LGA1156 Mini-ITX with DVI/VGA, DDR3, 2 COM, Dual LAN, PCIe x16

Trusted ePlatform Services

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A Message to the Customer

Advantech Customer Services

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.

Technical Support

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 Class B

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 B 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.*

CPU Compatibility

CPU Family	SPEED	Core Stepping	sSpec.	Power	Vcore	FSB
Lynfield i7 860 MP CPU (NO Integrated Graphic Controller)	2.8G	B0 (MP)	SLBLC	94W	1.2V	1333
Lynfield i5 750 MP CPU (NO Integrated Graphic Controller)	2.66G	B1 (MP)	SLBJJ	95W	1.2V	1333
Clarkdale i3 540 ES sample (Integrated Graphic Controller)	3.066G	C2 (ES)	Q3GQ	79W/ 65W		1333
Clarkdale i5 660 ES sample (Integrated Graphic Controller)	3.330G	C2 (ES)	Q3GP	79W/ 65W	1.24V	1333

Memory Compatibility

Brand	Size	Speed	Type	ECC	Vendor PN	Advantech PN	Memory
Transcend	1GB	DDR3 1066	DDR3	N	TS128MLK64V1U/ TS2KNU28100-1S	96D3-1G1066NN-TR	SEC K4B1G0846D-HCF8(128x8)
	2GB	DDR3 1066	DDR3	N	TS256MLK64V1U/ TS5KNU28300-1S	96D3-2G1066NN-TR	SEC K4B1G0846D-HCF9(128x8)
Apacer	1GB	DDR3 1066	DDR3	N	78.01GC3.420	96D3-1G1066NN-AP	ELPIDA J1108BABG-AE-E
	2GB	DDR3 1066	DDR3	N	78.A1GC3.421	96D3-2G1066NN-AP	ELPIDA J1108BABG-AE-E
Transcend	1GB	DDR3 1333	DDR3	N	TS128MLK64V3U		SEC 907 HCH9 K4B1G08460(128x8)
	2GB	DDR3 1333	DDR3	N	TS256MLK64V3U		SEC 907 HCH9 K4B1G08460(128x8)
Apacer	1GB	DDR3 1333	DDR3	N	78.A 1GC6.421		ELPIDA J1108BABG-DJ-E(128x8)
	2GB	DDR3 1333	DDR3	N	78.01GC6.420		ELPIDA J1108BABG-DJ-E (128x8)
DSL	1GB	DDR3 1333	DDR3	N			ELPIDA J1108BABG-DJ-E (128x8)
	2GB	DDR3 1333	DDR3	N			ELPIDA J1108BABG-DJ-E (128x8)

Ordering Information

Part Number	Chipset	VGA	DVI	SW RAID	USB	COM	GbE LAN
AIMB-280QG2-00A1E	Q57	Yes	Yes	Yes	8	2	2

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:

- 1 x AIMB-280 Intel® Core™ i7/i5/i3/Pentium® socket LGA1156 Mini-ITX motherboard
- 2 x SATA HDD cable
- 2 x SATA Power cable
- 1 x I/O port bracket
- 1 x Startup manual
- 1 x Driver CD
- 1 x Warranty card
-

If any of these items are missing or damaged, contact your distributor or sales representative immediately. We have carefully inspected the AIMB-280 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-280, 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.

Contents

Chapter 1

General Information

1.1 Introduction

The AIMB-280 is designed with the Intel® Q57 for industrial applications that require both performance computing and enhanced power management capabilities. The motherboard supports Intel® Core™ i7 up to 2.93 GHz / Core™ i5 700 up to 2.66GHz / Core™ i5 600 up to 3.3GHz/Core™ i3 up to 3.06 GHz/Pentium® up to 2.8 GHz processor up to 8 MB L2 cache and DDR3 800/1066/1333 up to 4 GB. A rich I/O connectivity of 2 serial ports, 8 USB 2.0, dual GbE LAN and 4 SATA ports.

1.2 Features

- **Performance Q57/3450 Chipset:** Two-chip solution supports data transfer through DMI (Direct Media Interface) and FDI (Flexible Design Interface).
- **Rich I/O connectivity:** 2 serial ports, 8 USB 2.0, Dual GbE LAN.
- **Standard Mini-ITX form factor with industrial feature:** The AIMB-280 is a full-featured Mini-ITX motherboard with balanced expandability and performance.
- **Wide selection of storage devices:** SATA HDD, customers benefit from the flexibility of using the most suitable storage device for larger capacity
- **Optimized integrated graphic solution:** With Intel® Graphics Flexible, it supports versatile display options and a 32-bit 3D graphics engine.

1.3 Specifications

1.3.1 System

- **CPU:** LGA1156 Intel® Core™ i7 up to 2.93 Ghz / Core™ i5 700 up to 2.66GHz/ Core™ i5 600 up to 3.3GHz / Core™ i3 up to 3.06 Ghz/Pentium® up to 2.8 Ghz
- **BIOS:** AMI 64 Mbit SPI BIOS
- **System chipset:** Intel® Q57
- **SATA hard disk drive interface:** Four on-board SATA connectors with data transmission rate up to 300 MB

1.3.2 Memory

- **RAM:** Up to 4 GB in 1 slot 240-pin DIMM socket. Supports single channel DDRIII 800/1066/1333 SDRAM

Note! *Intel® desktop 5 Series Chipset platforms only support non-ECC unbuffered DIMMs.*

1.3.3 Input/Output

- **PCI bus:** 1 PCIe x16 slot
- **Serial ports:** Two serial ports, both COM1 and COM2 only support RS-232
- **Keyboard and PS/2 mouse connector:** Supports one standard PS/2 keyboard, one standard PS/2 mouse (On board 6pin wafer box)
- **USB port:** Supports up to eight USB 2.0 ports with transmission rate up to 480 Mbps, 4 on board pin headers and 4 external ports)

1.3.4 Graphics

- **Controller:** Intel® HD Graphics, only Core™ i5-600, Core™ i3-500 and Pentium® CPUs with Clarkdale core are embedded with integrated graphics; Core™ i7, Core™ i5-700 with Lynnfield core are not embedded with integrated graphics
- **Display memory:** 1 GB maximum shared memory when 2GB and above system memory installed
- **DVI:** Supports DVI up to resolution 1920 x 1200 @ 60Hz refresh rate
- **VGA:** Supports VGA up to resolution 2048 x 1536 @ 75Hz refresh rate

1.3.5 Ethernet LAN

- Supports dual 10/100/1000 Mbps Ethernet ports via PCI Express x1 bus which provides 500 MB/s data transmission rate
- **Controller:** LAN1: Intel 82578DM(PHY); LAN2: Intel 82583v

1.3.6 Industrial features

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

1.3.7 Mechanical and environmental specifications

- **Operating temperature:** 0 ~ 60° C (32 ~ 140° F, Depending on CPU)
- **Storage temperature:** -40 ~ 85° C (-40 ~ 185° F)
- **Humidity:** 5 ~ 95% non-condensing
- **Power supply voltage:** +3.3 V, +5 V, +12 V, -12 V, 5 Vsb
- **Power consumption:**

  Intel® LGA1156 Core™ i5 3.33 GHz, 4 MB L2 cache, 2 GB DDR3 1333 MHz

  +5 V @ 1.85 A, +3.3 V @ 0.73 A, +12 V @ 3.14 A, 5 VSB @ 0.31 A, -12 V@ 0.11 A

  Measured at the maximum current value with system under maximum load (CPU: Top speed, RAM & Graphic: Full loading)
- **Board size:** 170 mm x 170 mm (6.69" x 6.69")
- **Board weight:** 0.365 kg

1.4 Jumpers and Connectors

Connectors on the AIMB-280 motherboard link it to external devices such as hard disk drives and a keyboard. In addition, the board has a number of jumpers used to configure your system for your application.

The tables below list the function of each of the board 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: Jumpers

Label	Function
JFP1+JFP2	Power switch/HDD LED/SMBus/Speaker
JFP3	Power LED and Keyboard lock
JCMOS1	CMOS clear (Default 1-2)
JMECLR1	ME clear (Default 1-2)
PSON1	AT(1-2) / ATX(2-3), (Default 2-3)
JWDT1+JOBS1	Watchdog Reset/ OBS Alarm
JCASE1	Case open

Table 1.2: Connectors

Label	Function
USB56	USB port 5, 6 (on board)
USB78	USB port 7, 8 (on board)
VGA1+DVI1	VGA and DVI connector
COM12	Serial port connector(RS232)
KBMS1	PS/2 Keyboard and Mouse connector
CPUFAN1	CPU FAN connector(4-pin)
SYSFAN1	System FAN1 connector(4-pin)
SYSFAN2	System FAN2 connector(4-pin)
LAN1_USB12	LAN1 / USB port 1, 2
LAN2_USB34	LAN2 / USB port 3, 4
AUDIO1	Audio connector
SPDIF_OUT1	SPDIF Audio out pin header
LPC1	Low pin count pin header
PCIEX16_1	PCIe x16 Slot
SATA1	Serial ATA data connector 1
SATA2	Serial ATA data connector 2
SATA3	Serial ATA data connector 3
SATA4	Serial ATA data connector 4
DIMMA1	Memory connector channel
SPI_CN1	SPI flash update connector
ATX12V_1	ATX 12V Auxiliary power connector (for CPU)
ATX1	ATX 20 Pin Main power connector (for System)
LANLED1	LAN1/2 LED extension connector

1.5 Board layout: Jumper and Connector Locations

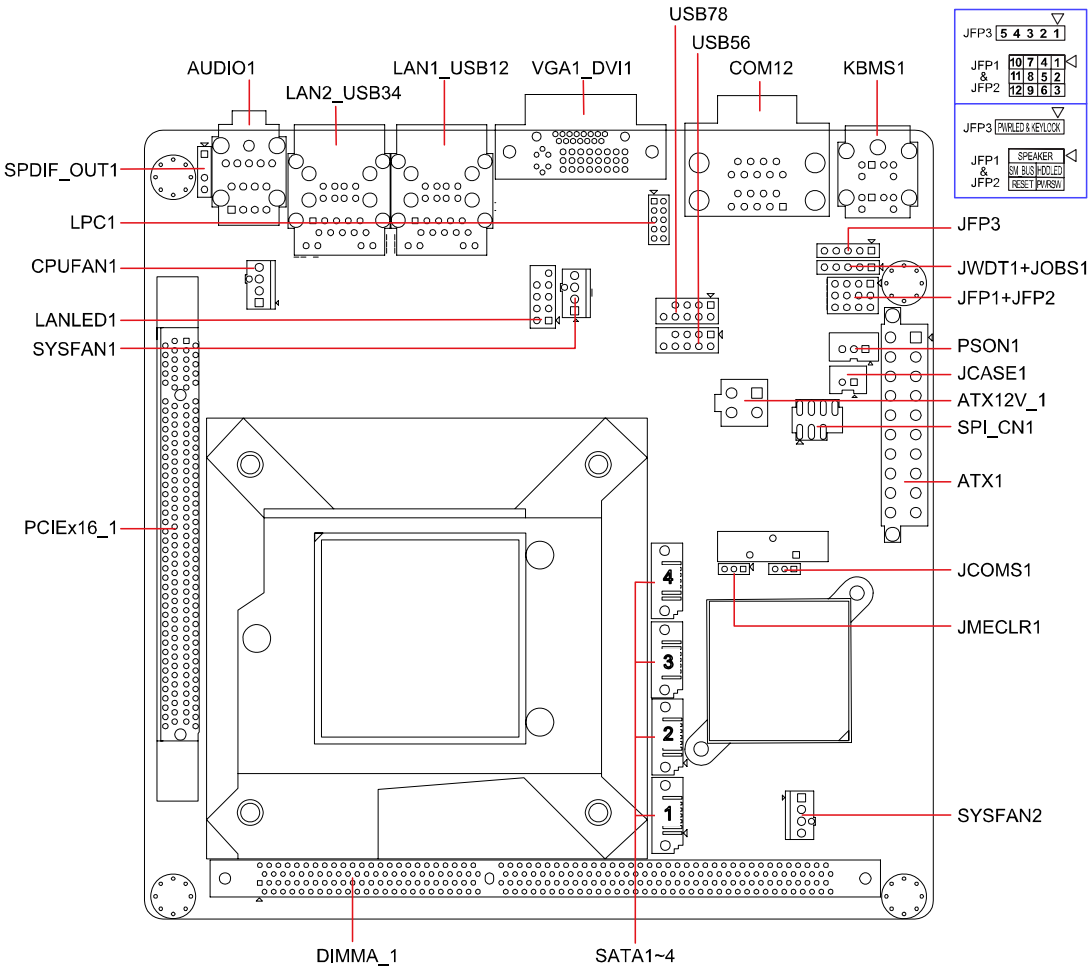


Figure 1.1 Jumper and Connector Locations

Figure 1.2 I/O Connectors

1.6 AIMB-280 Board Diagram

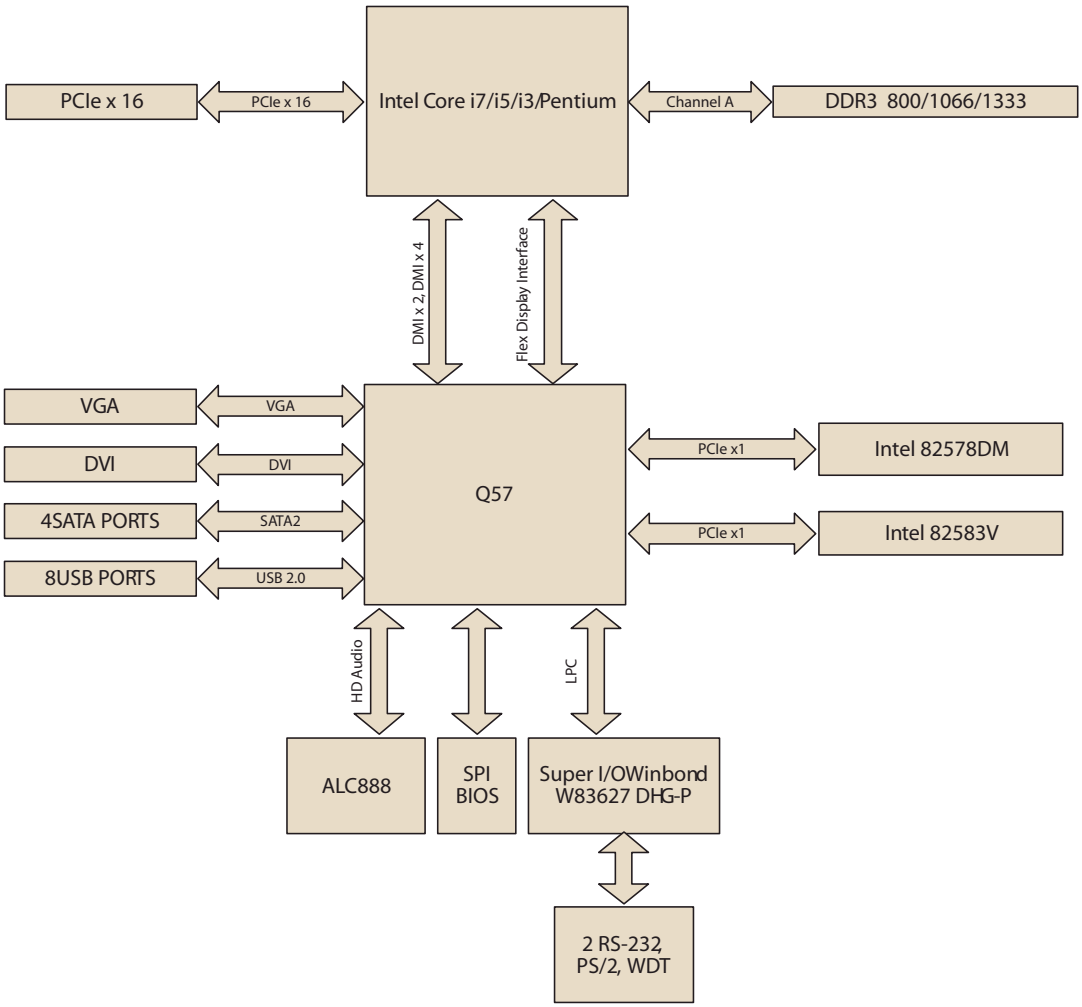


Figure 1.3 AIMB-280 Board Diagram

1.7 Safety Precautions

Warning! *Always completely disconnect the power cord from 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 electrostatic discharges. 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 motherboards's default settings and your options for each jumper.

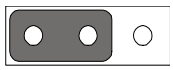
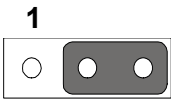
1.8.1 How to Set Jumpers

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/ME Clear (JCMOS1/JMECLR1)

The AIMB-280 motherboard contains a jumper that can erase CMOS/ME 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/ME 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/ME to its default setting.

Table 1.3: CMOS1

Function	Jumper Setting	
*Keep CMOS/ME data		1-2 closed
Clear CMOS/ME data		2-3 closed

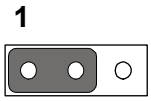
* Default

1.8.3 PSON1: ATX, AT Mode Selector

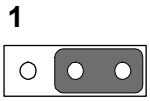
Table 1.4: PSON1: ATX, AT Mode Selector

Closed Pins	Result
1-2	AT Mode
2-3*	ATX Mode

*Default



AT Mode
1-2 closed



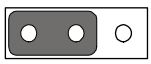
ATX Mode
2-3 closed

1.8.4 JWDT1+JOBS1: Watchdog Timer Output and OBS Alarm Option

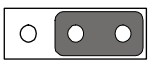
Table 1.5: JWDT1+JOBS1: Watchdog Timer Output and OBS Alarm Option

Closed Pins	Result
1-2	NC
2-3	System Reset
4-5*	Error beep*

*Default



NC
1-2 closed



System Reset
2-3 closed

1.8.5 JCASE1: Case Open Sensor

The AIMB-280 motherboard contains a jumper, JCASE1, that offers a chassis open sensor. When a jumper is installed on JCASE1, the buzzer on the motherboard beeps when the case is opened.

1.9 System Memory

The AIMB-280 has one socket for a 240-pin DDR3 DIMM.

This socket uses a 1.5 V unbuffered double data rate synchronous DRAM (DDR SDRAM). DRAM is available in capacities of 1 GB and 2 GB. AIMB-280 does NOT support ECC (error checking and correction).

1.10 Memory Installation Procedures

To install DIMM, 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. Then press the DIMM module well down into the socket, until you hear a click 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.

1.11 Cache Memory

The AIMB-280 supports a CPU with one of the following built-in full speed L2 caches:

- 8 MB for Intel® Core™ i7 CPU
- 8 MB for Intel® Core™ i5-700 CPU
- 4 MB for Intel® Core™ i5-600 CPU
- 4 MB for Intel® Core™ i3 CPU
- 3 MB for Intel® Pentium® CPU

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

1.12 Processor Installation

The AIMB-280 is designed for LGA1156, Intel™ Core™ i7/Core™ i5/Core™ i3/Pentium™ processor.

Chapter 2

Connecting Peripherals

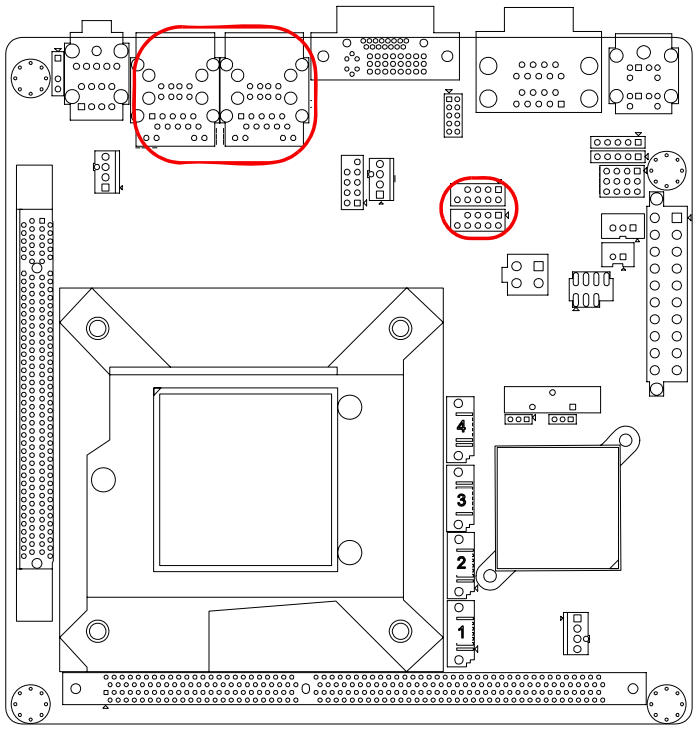
2.1 Introduction

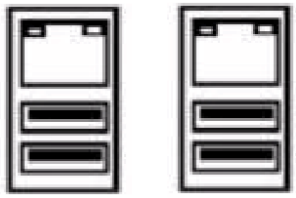
You can access most of the connectors from the top of the board as it is being installed in the chassis. If you have a number of cards installed or have a packed chassis, you may need to partially remove the card to make all the connections.

2.2 USB Ports (LAN1_USB12/LAN2_USB34/USB56/USB78)

The AIMB-280 provides up to eight USB ports. The USB interface complies with USB Specification Rev. 2.0 supporting transmission rate up to 480 Mbps and is fuse protected. The USB interface can be disabled in the system BIOS setup.

The AIMB-280 is equipped with one high-performance 1000 Mbps Ethernet LAN adapter, and one 100 Mbps LAN adapter, both of which are supported by all major network operating systems. The RJ-45 jacks on the rear panel provide for convenient LAN connection.





LAN1_USB12 LAN2_USB34

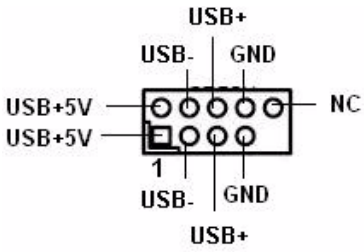
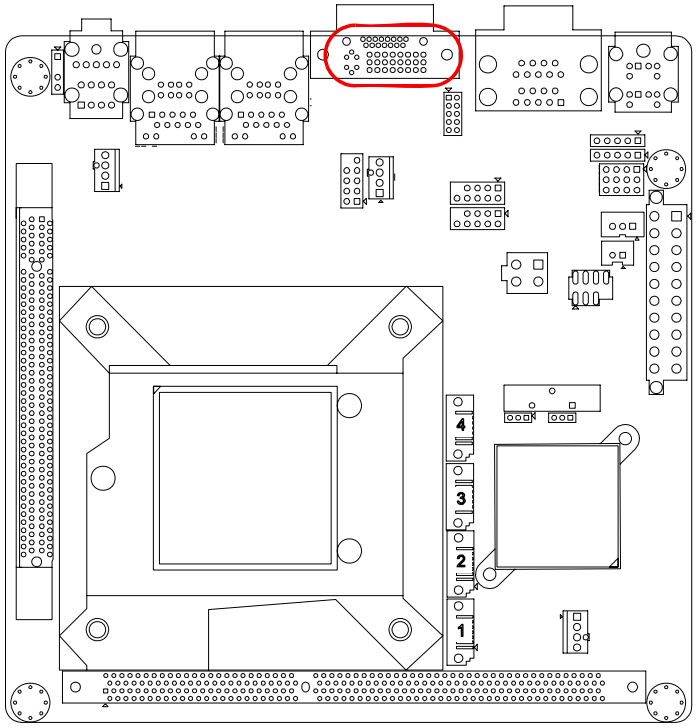
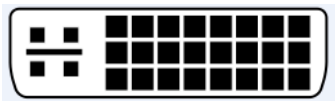


Table 2.1: LAN LED Indicator

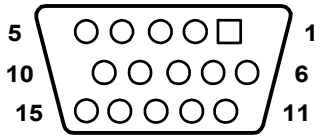
LAN Mode	LAN Indicator	
LAN1 indicator	LED1 (Right)	off for mal-link; Link (On) / Active (Flash)
	LED2 (Left)	100 Mbps (On) / 10 Mbps (Off)
	LED2 (Left)	1000 Mbps (On)
LAN2 indicator	LED1 (Right)	off for mal-link; Link (On) / Active (Flash)
	LED2 (Left)	100 Mbps (On) / 10 Mbps (Off)
	LED2 (Left)	1000 Mbps (On)

2.3 VGA/DVI Connector (VGA1+DVI1)





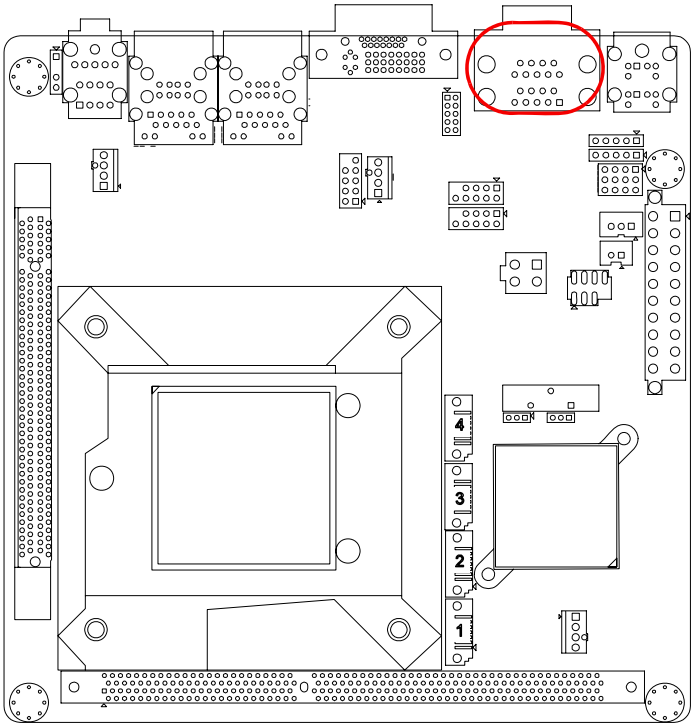
DVI1

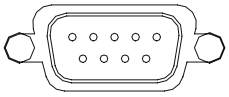


VGA1

The AIMB-280 includes VGA and DVI interface that can drive conventional VGA and DVI displays. VGA1 is a standard 15-pin D-SUB connector commonly used for VGA. DVI1 is DVI-I connector but only for DVI-D single link signals output. Pin assignments for VGA and DVI connector are detailed in Appendix B.

2.4 Serial Ports (COM12)



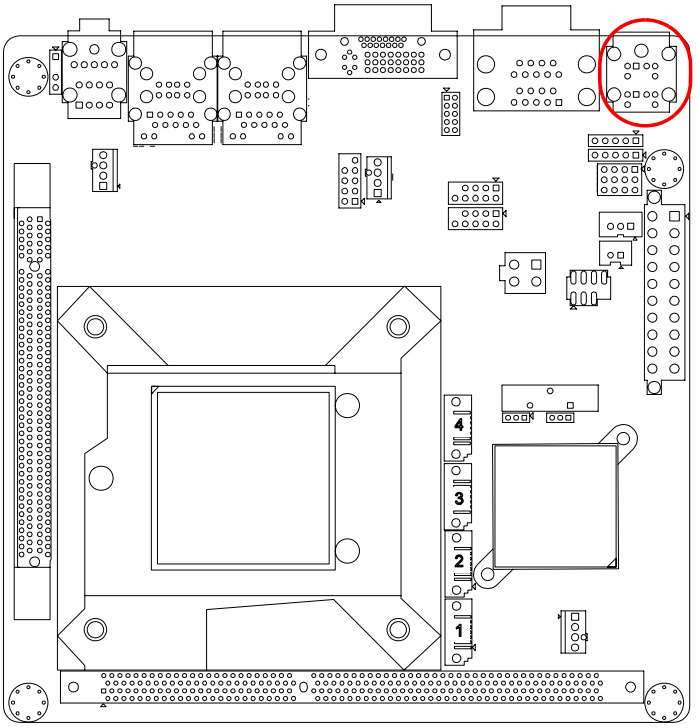


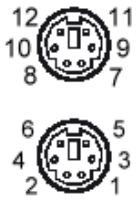
AIMB-280 support two serial ports. both COM1 and COM2 only support RS-232. These ports can connect to serial devices, such as a mouse or a printer, or to a communications network.

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 standards in different ways. If you have problems with a serial device, be sure to check the pin assignments for the connector.

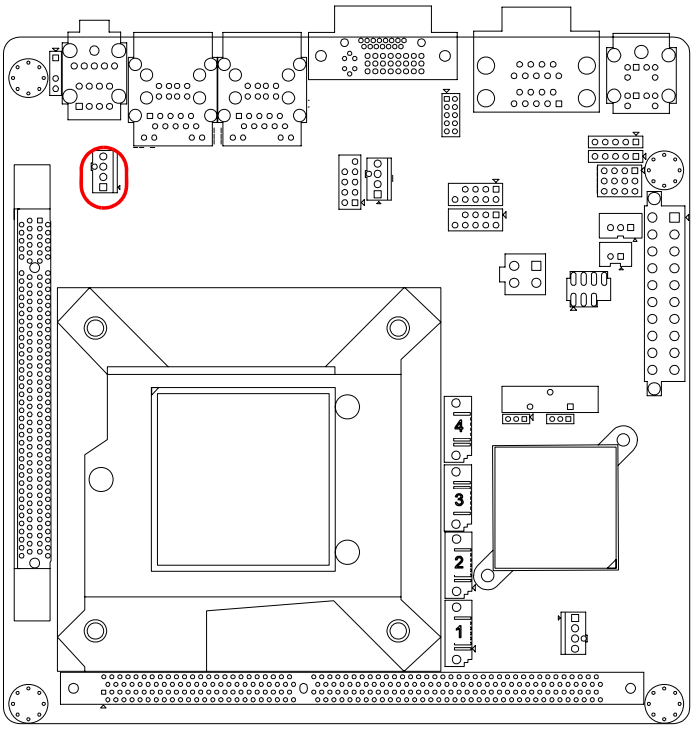
2.5 PS/2 Keyboard and Mouse Connector (KBMS1)

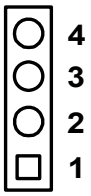




Two 6-pin mini-DIN connectors (KBMS1) on the motherboard provide connection to a PS/2 keyboard and a PS/2 mouse, respectively.

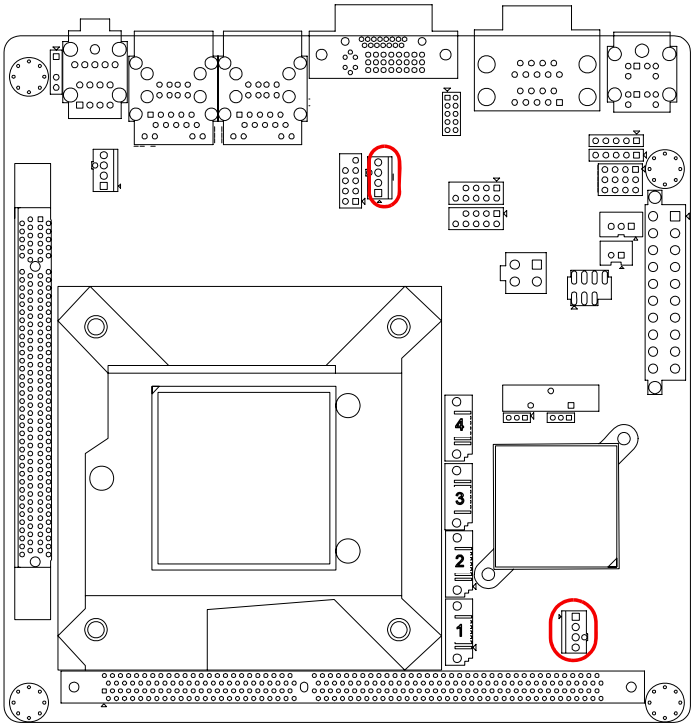
2.6 CPU Fan Connector (CPU_FAN1)

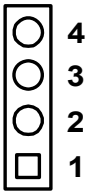




If a fan is used, this connector supports cooling fans of 500 mA (6 W) or less.

2.7 System FAN Connector (SYS_FAN1/2)

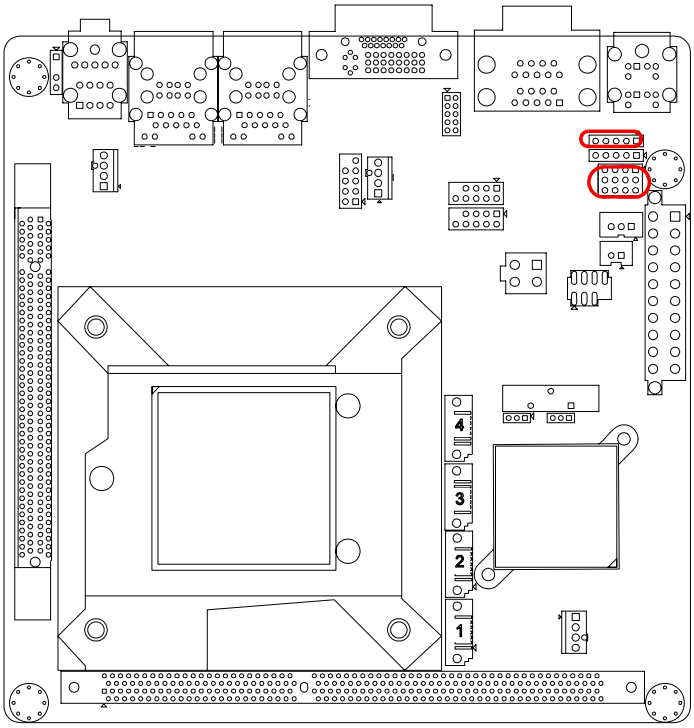


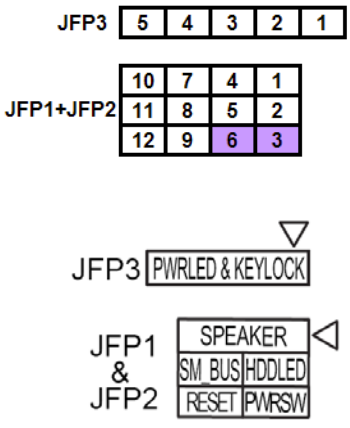


If a fan is used, this connector supports cooling fans of 500 mA (6 W) or less.

2.8 Front Panel Connectors (JFP1+JFP2/JFP3)

There are several external switches to monitor and control the AIMB-280.





2.8.1 ATX soft power switch (JFP1+JFP2/ PWR_SW)

If your computer case is equipped with an ATX power supply, you should connect the power on/off button on your computer case to (JFP1+JFP2/ PWR_SW), for convenient power on and off.

2.8.2 Reset (JFP1+JFP2/ RESET)

Many computer cases offer the convenience of a reset button. Connect the wire for the reset button.

2.8.3 HDD LED (JFP1+JFP2/ HDDLED)

You can connect an LED to connector (JFP2/HDDLED) to indicate when the HDD is active.

2.8.4 External speaker (JFP1+JFP2/ SPEAKER)

(JFP1+JFP2/ SPEAKER) is a 4-pin connector for an external speaker. If there is no external speaker, the AIMB-280 provides an onboard buzzer as an alternative. To enable the buzzer, set pins 3-4 as closed.

2.8.5 Power LED and keyboard lock connector (JFP3 / PWR_LED & KEY LOCK)

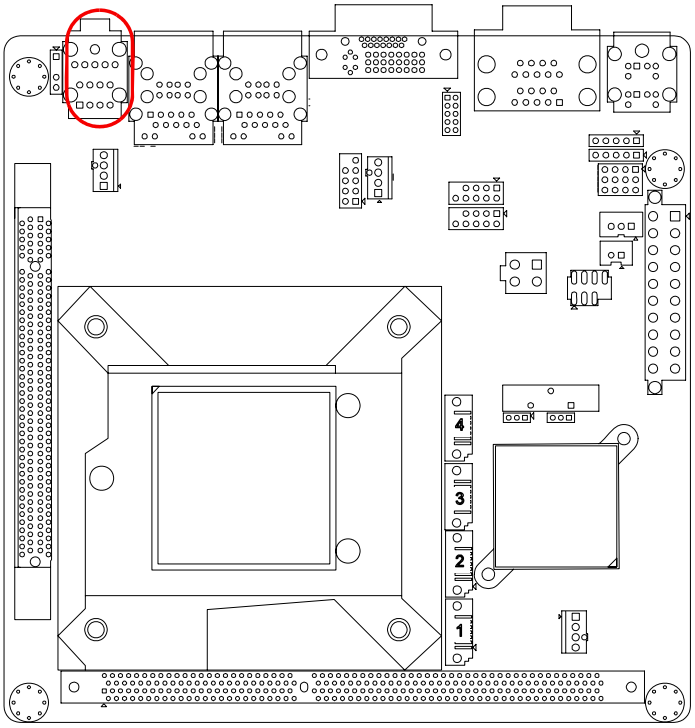
(JFP1 / PWR_LED & KEY LOCK) is a 5-pin connector for the power on LED and Key Lock function. Refer to Appendix B for detailed information on the pin assignments. The Power LED cable should be connected to pin 1-3. The key lock button cable should be connected to pin 4-5.

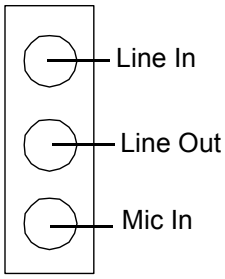
There are 3 modes for the power supply connection. The first is “ATX power mode”; the system turns on/off by a momentary power button. The second is “AT Power Mode”; the system turns on/off via the power supply switch. The third is another “AT Power Mode” which makes use of the front panel power switch. The power LED status is indicated in the following table:

Table 2.2: ATX power supply LED status (No support for AT power)

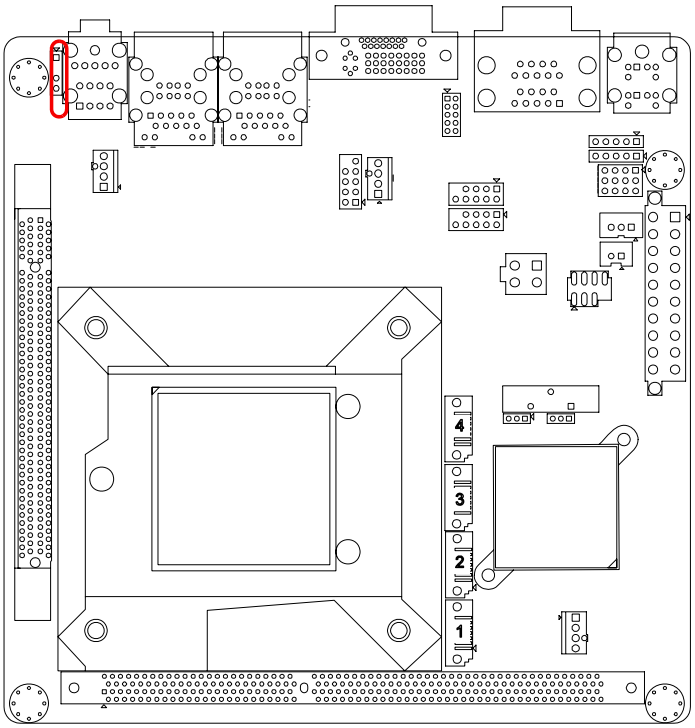
Power mode	LED (ATX Power Mode) (On/off by momentary button)	LED (AT power Mode) (On/off by switching power supply)	LED (AT power Mode) (On/off by front panel switch)
PSON1 (on back plane) jumper setting	pins 2-3 closed	pins 1-2 closed	Connect pins 1 & 2 to panel switch via cable
System On	On	On	On
System Suspend	Fast flashes	Fast flashes	Fast flashes
System Off	Slow flashes	Off	Off

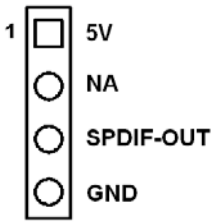
2.9 Line In, Line Out, Mic In Connector (AUDIO1)



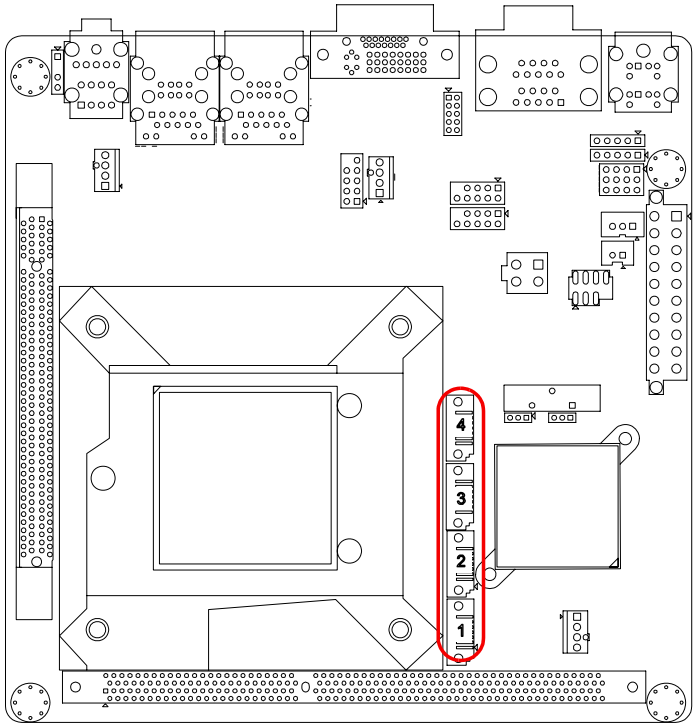


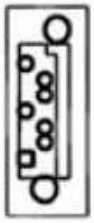
2.10 Digital Audio Connector(SPDIF_OUT1)





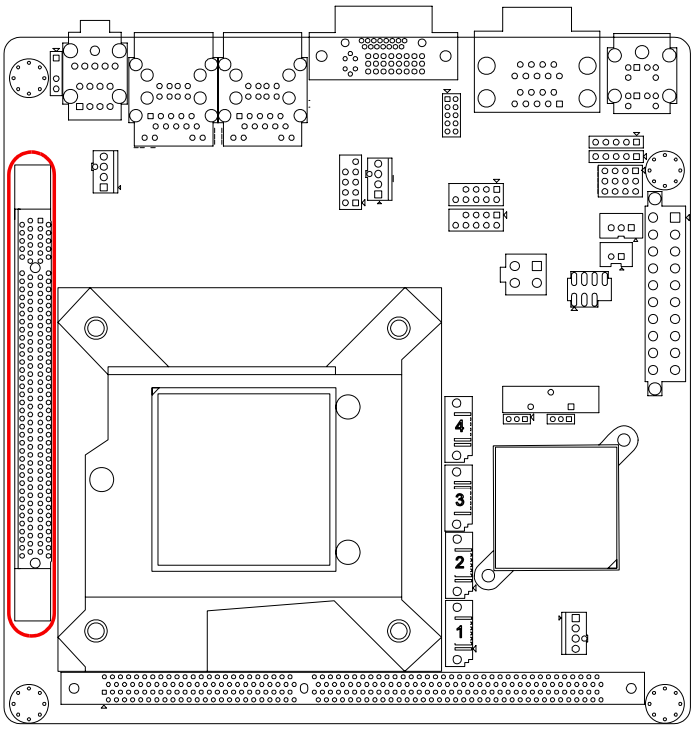
2.11 Serial ATA Interface (SATA1~SATA4)





AIMB-280 features a high performance Serial ATA interface (up to 300 MB/s) which eases cabling to hard drives with long and thin cables.

2.12 PCI express x16 slot



The AIMB-280 provides 1 x PCI express x16 slot.

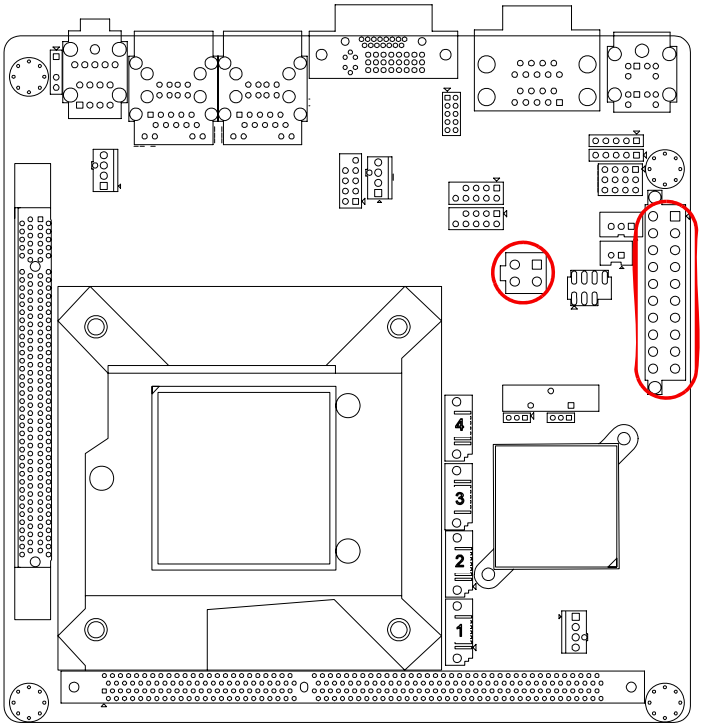
Note! *Intel Q57 chipset support PCIe x16 slot (Gen 2.0), but it still has some compatibility issue with interface card, below is the compatibility list table.*

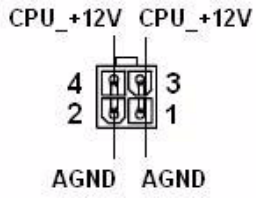
Table 2.3: PCI-E Card

Type	Brand Name	Model	Bus	Advantech PN	Result
VGA card * With SPDIF interface	ASUS	EN9400GT/512M (nVIDIA 9400GT)	PCI-E X16	NA	PASS
	GIGABYTE	GV-NX88T512H-B (nVIDIA GeForce 8800GT)	"PCI-E X16 (Gen2)"	NA	Fail
	Leadtek	PX9600GT DDR3 HDCP 256BIT (NVIDIA GeForce 9600GT)	"PCI-E X16 (Gen2)"	NA	PASS
	PowerColor	HD 4670 PCS (AX4670 512MD3-P) (ATI HD 4670)	"PCI-E X16 (Gen2)"	NA	Fail
	MSI	RX3870-T2D512E/D4 (Radeon HD 3870)	"PCI-E X16 (Gen2)"	NA	PASS
	Leadtek	PX9500GT (NVIDIA GeForce 9500 GT)	"PCI-E X16 (Gen2)"	NA	PASS
	ASUS	EN9600GSO ULTIMATE / 384M/ A (NVIDIA GeForce 9600GSO)	PCI-E X16	NA	PASS
	ASUS*	EN9800GT HybirdPower (NVIDIA GeForce 9800GT)	"PCI-E X16 (Gen2)"	NA	PASS
	ASUS	EAH4850 1GB (ATI Radeon HD 4850)	"PCI-E X16 (Gen2)"	NA	PASS
	Leadtek	PX8500GT TDH (NVIDIA GeForce 8500 GT)	PCI-E X16	NA	PASS
	MSI*	NX8600GTS Diamond Plus (NVIDIA GeForce 8600 GTS)	PCI-E X16	NA	PASS
LAN	SUNIX	LAN1400 MARVELL8053	PCI-E X1	NA	Fail
	Intel	Intel 9400PT Server adapter	PCI-E X1	NA	PASS
	Intel	Intel E1G42ETG1P20	PCI-E x 4	NA	PASS
SATA RAID	SUNIX	SATA2400P	PCI-E X1	NA	PASS
SATAII RAID	Adaptec	AAR-1220SA (2 ports)	PCI-E X1	NA	Fail
	Adaptec	AAR-1430SA (4 ports)	PCI-E X4	NA	PASS
	HighPoint	RocketRAID 3510			
Intel IOP 81341	PCI-E X8	NA	Fail		
	Areca	ARC-1210-X8 (4 ports)	PCI-E X8	NA	Fail
TV- Card	UPMOST	UTV-G PLUS global TV card	PCI-E X1	NA	Fail
	COMPRO	Compro VideoMate Vista E500F TV card	PCI-E X1	NA	PASS
USB	SUNIX	USB4414N	PCI-E X1	NA	PASS
Combo (1394B+ USB2.0)	SUNIX	UFC2412	PCI-E X1	NA	PASS
Sound	Creative	SB X-Fi Titanium Fatality Pro	PCI-E X1	NA	PASS

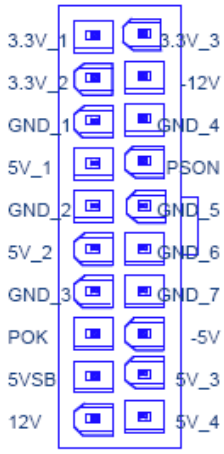
2.13 ATX Power Connector (ATX1, ATX12V_1)

These connectors are for ATX power supply plugs. The power supply plugs are designed to fit these connectors in only one orientation. Find the proper orientation and push down firmly until the connectors completely fit.





ATX12V_1



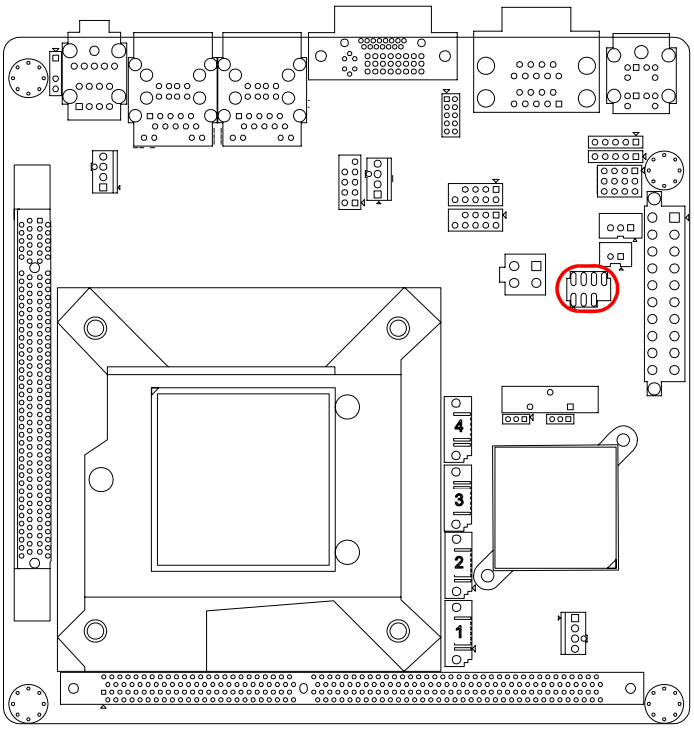
ATX1

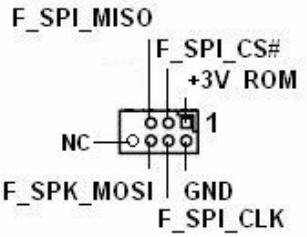
Note!

1. *For a fully configured system, we recommend that you use a power supply unit (PSU) that complies with ATX 12 V Specification 2.0 (or later version) and provides a minimum power of 350 W.*
2. *You must install a PSU with a higher power rating if you intend to install additional devices.*

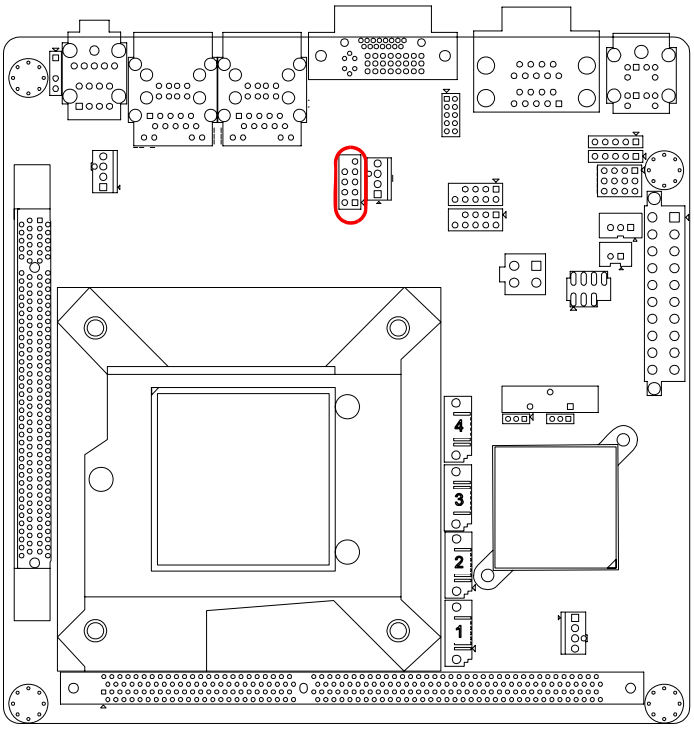
2.14 SPI Flash connector(SPI_CN1)

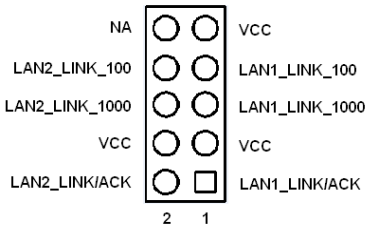
The SPI flash card pin header may be used to flash BIOS if the AIMB-280 cannot power on.





2.15 Front Panel LAN LED connector(LANLED1)





Chapter 3

BIOS Operation

3.1 Introduction

AMI BIOS has been integrated into many motherboards, and has been very popular for over a decade. People sometimes refer to the AMI BIOS setup menu as BIOS, BIOS setup or CMOS setup.

With the AMI BIOS 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 special features on or off. This chapter describes the basic navigation of the AIMB-280 setup screens.

3.2 BIOS Setup

The AIMB-280 Series system has AMI BIOS built in, with a CMOS SETUP utility that allows users to configure required settings or to activate certain system features.

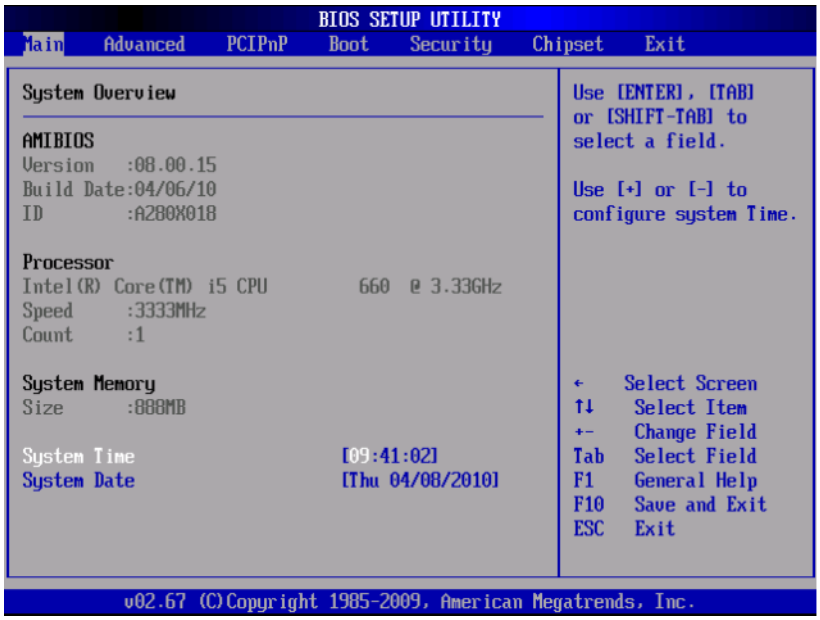
The CMOS SETUP saves the configuration in the CMOS RAM of the motherboard. When the power is turned off, the battery on the board supplies the necessary power to preserve the CMOS RAM.

When the power is turned on, press the <Del> button during the BIOS POST (Power-On Self Test) to access the CMOS SETUP screen.

Control Keys	
< ↑ >< ↓ >< ← >< → >	Move to select item
<Enter>	Select Item
<Esc>	Main Menu - Quit and not save changes into CMOS Sub Menu - Exit current page and return to Main Menu
<Page Up/+>	Increase the numeric value or make changes
<Page Down/->	Decrease the numeric value or make changes
<F1>	General help, for Setup Sub Menu
<F2>	Item Help
<F5>	Load Previous Values
<F7>	Load Setup Defaults
<F10>	Save all CMOS changes

3.3 Main Menu

Press <Del> to enter AMI BIOS CMOS Setup Utility, the Main Menu will appear on the screen. Use arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.



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. 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.

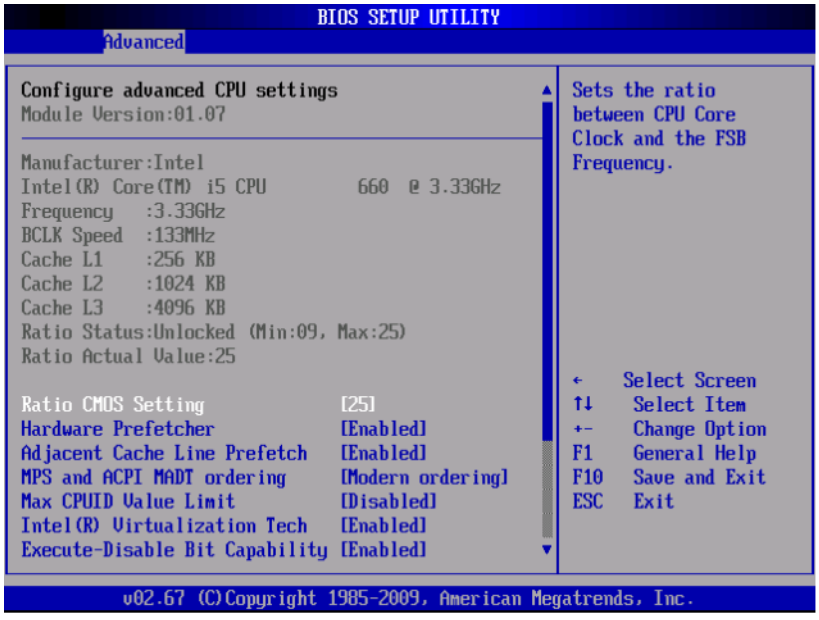
- **System time / System date**

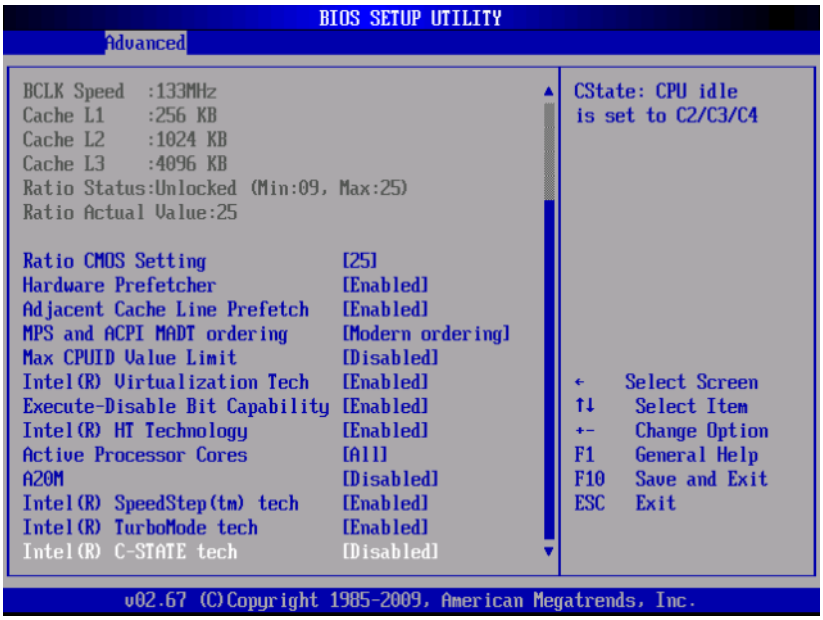
  Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time must be entered in HH:MM:SS format.

3.4 Advanced BIOS Features

Select the Advanced tab from the AIMB-280 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 screen is shown below. The sub menus are described on the following pages.

3.4.1 CPU Configuration





- **Ratio CMOS Setting**

  Allows you to set the ratio between the CPU Core Clock and the BCLK Frequency. The valid value ranges vary according to your CPU model.

- **Hardware Prefectcher**

  The processor fetches data and instructions from the memory into the cache that are likely to be required in the near future. This reduces the latency associated with memory reads.

- **Adjacent Cache Line Prefetch**

  The processor fetches the currently requested cache line, as well as the subsequent cache line. This reduces the cache latency by making the next cache line immediately available if the processor requires it as well.

- **MPS and ACPI MADT ordering**

  MADT refers to the Multiple APIC Description Table.

- **Max CPUID Value Limit**

  This item allows you to limit CPUID maximum value.

- **Intel® Virtualization Tech**

  Intel Virtualization Technology (Intel VT) is a set of hardware enhancements to Intel server and client platforms that provide software-based virtualization solutions. Intel VT allows a platform to run multiple operating systems and applications in independent partitions, allowing one computer system to function as multiple virtual systems.

- **Execute-Disable Bit Capability**

  This item allows you to enable or disable the No-Execution page protection technology.

- **Intel® Hyper Threading Technology**

  This item allows you to enable or disable Intel Hyper Threading technology.

- **Active Processor Cores**

  Allows you to choose the number of CPU cores to activate in each processor package.

- **A20M**

  Allows Legacy OSes to be compatible with APs.

- **Intel® SpeedStep™ tech**

  When set to disabled, the CPU runs at its default speed, when set to enabled, the CPU speed is controlled by the operating system.
- **Intel® TurboMode tech**

  Allows processor cores to run faster than marked frequency under certain conditions.
- **Intel® C-STATE tech**

  This item allows the CPU to save more power when in idle mode.

3.4.2 IDE/SATA Configuration

- **Configure SATA as**

  This can be configured as IDE or AHCI or RAID.
- **SATA1/SATA2/SATA3/SATA4**

  While entering setup, the BIOS automatically detects the presence of SATA devices. This displays the status of SATA device auto-detection.
- **Hard Disk Write Protect**

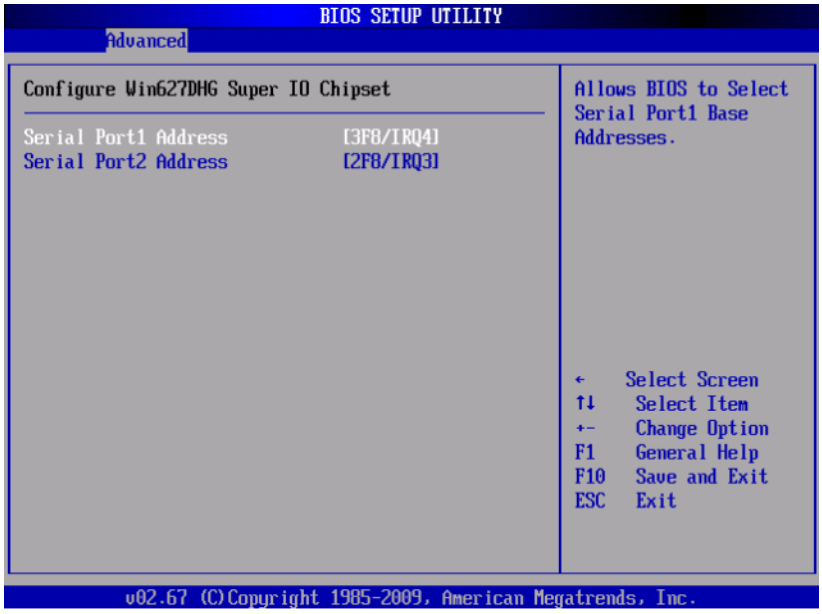
  Disable/Enable device write protection. This will be effective only if device is accessed through BIOS.
- **IDE Detect Time Out (Sec)**

  This item allows you to select the time out value for detecting ATA/ATAPI device(s).
- **AHCI Configuration**

  AHCI is a new interface specification that allows the SATA controller driver to support advanced features. While entering setup, BIOS auto detects the presence of AHCI devices. This displays the status of auto detection of AHCI devices.

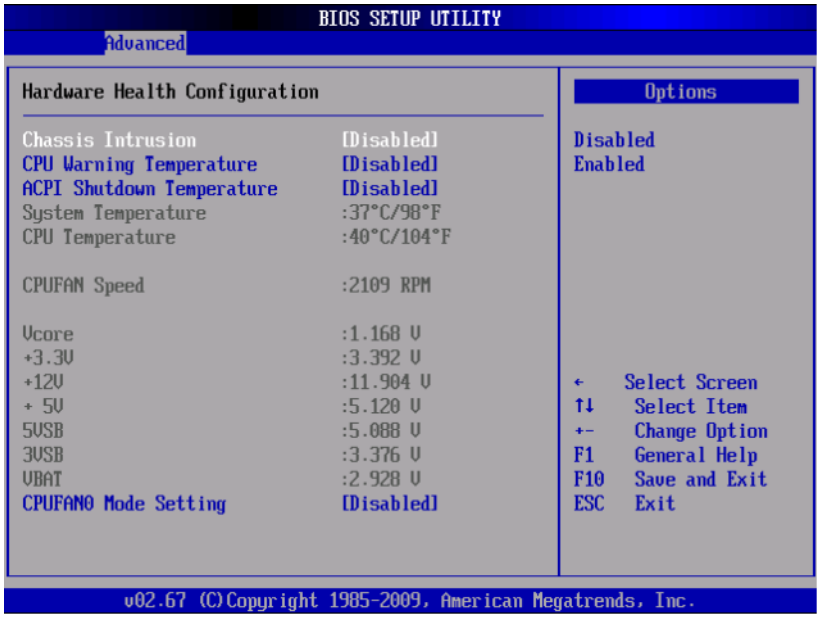
3.4.3 Super I/O Configuration

This item enables users to set the Super IO device status, including enabling of COMs.



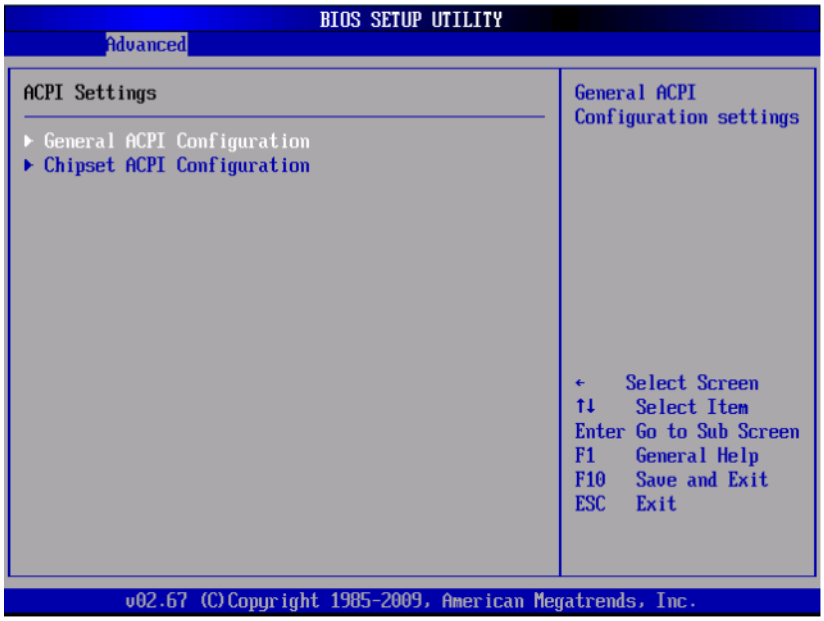
- **Onboard Serial port 1 [3F8 / IRQ4]**
  This item allows user to adjust serial port 1 address and IRQ.
- **Onboard Serial port 2 [2F8/ IRQ3]**
  This item allows user to adjust serial port 2 address and IRQ.

3.4.4 Hardware Health Configuration

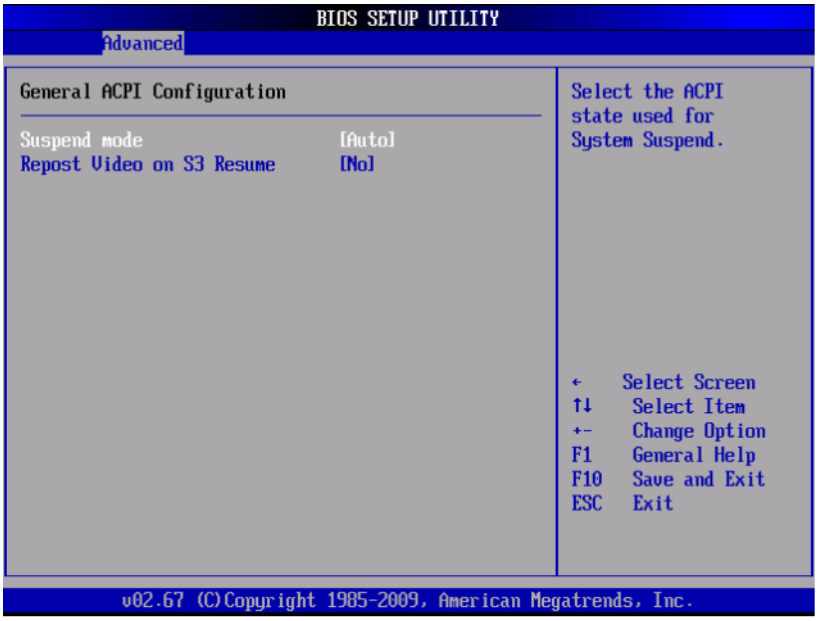


- **Chassis Intrusion**
  When enabled, shows warning message and beeps when case been opened.
- **CPU warning temperature**
  Use this to set the CPU warning temperature threshold. When the system CPU reaches the warning temperature, the buzzer will beep.
- **ACPI Shut Down Temperature**
  This portion allows user to set the CPU temperature at which the system will automatically shut down to prevent CPU overheat damage.
- **System Temperature**
  The onboard hardware monitor automatically detects and displays the system temperatures.
- **CPU Temperature**
  The onboard hardware monitor automatically detects and displays the CPU temperatures.
- **CPUFAN Speed**
  Shows CPU FAN speed [xxxxRPM].
- **CPUFAN0 Mode Setting**
  Enables or disables the Smart Fan control feature.

3.4.5 ACPI Setting



3.4.6 General ACPI Configuration



- **Suspend mode**

  Allows you to select the Advanced Configuration and Power Interface (ACPI) state to be used for system suspend.

  [Auto] The system automatically configures the ACPI suspend mode.

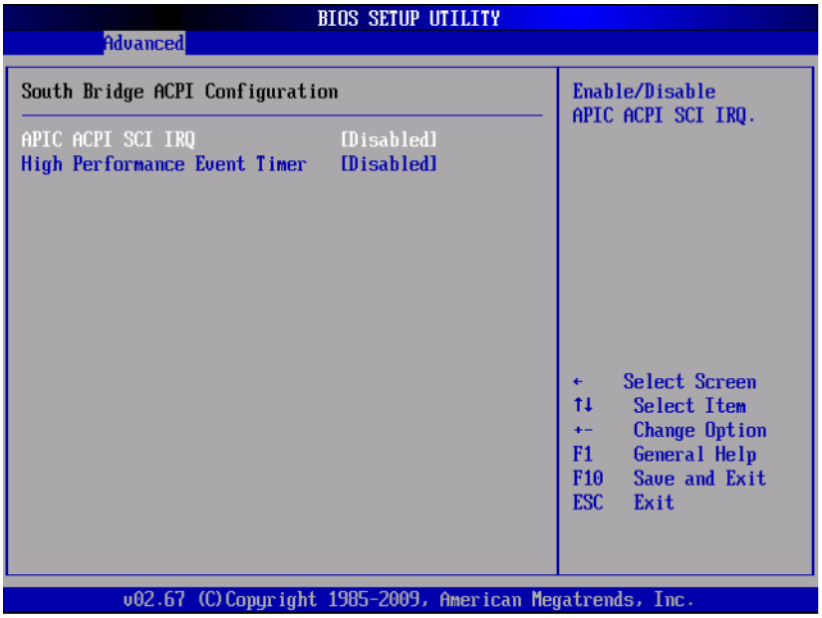
  [S1(POS) only] Sets the ACPI suspend mode to S1/POS (Power On Suspend).

  [S3 only] Sets the ACPI suspend mode to S3/STR (Suspend to RAM)

- **Report Video on S3 Resume**

  This item allows you to invoke VA BIOS POST on S3/STR resume.

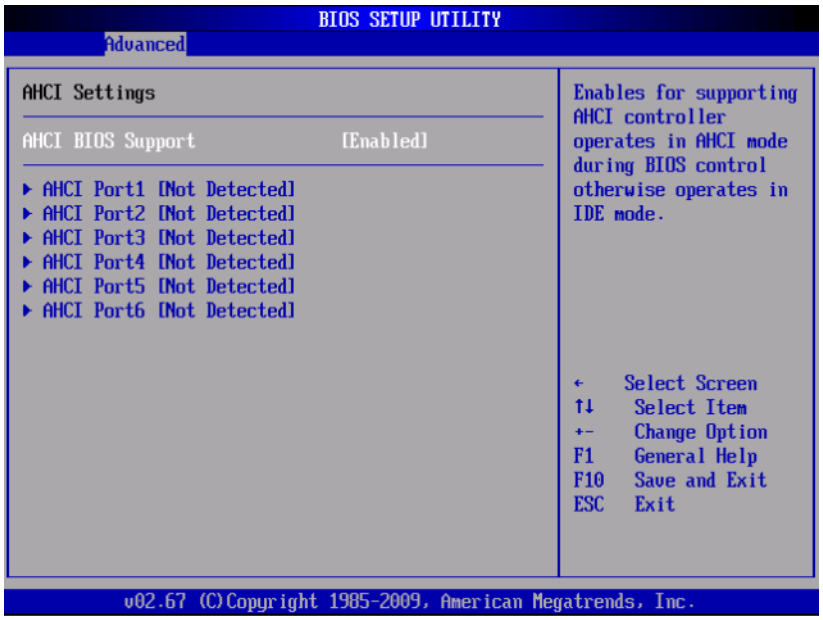
3.4.7 Chipset ACPI Configuration



- **APIC ACPI SCI IRQ**
  Enable/Disable APIC ACPI SCI IRQ.
- **High Performance Event Timer**
  Enable/Disable High performance Event timer.

3.4.8 AHCI Configuration

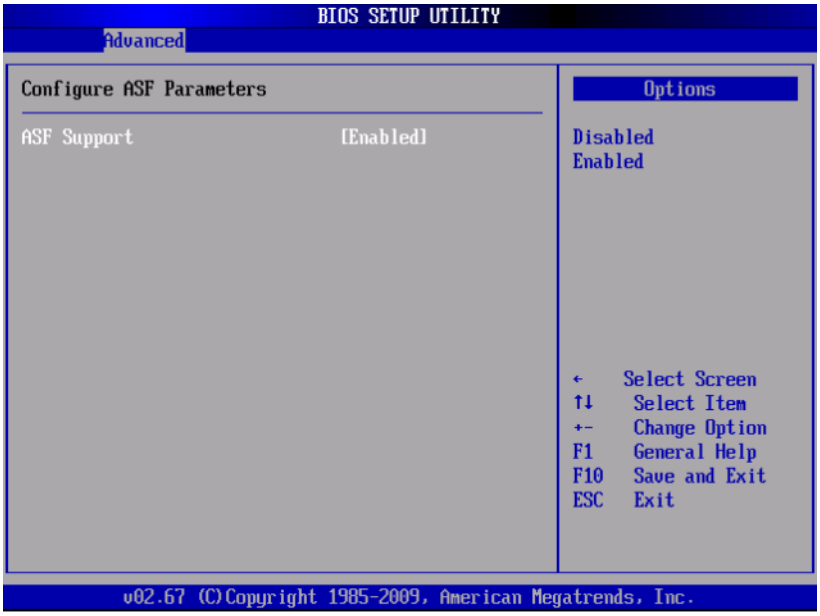
AHCI Settings appears only when SATA Configuration submenu is set to [AHCI].



- **SATA Port 1-4**
  Displays the status of auto-detection of SATA devices.
  [Auto] Allows automatic selection of the device type connected to the system.
  [Not installed] Select this option if no SATA devices are installed.

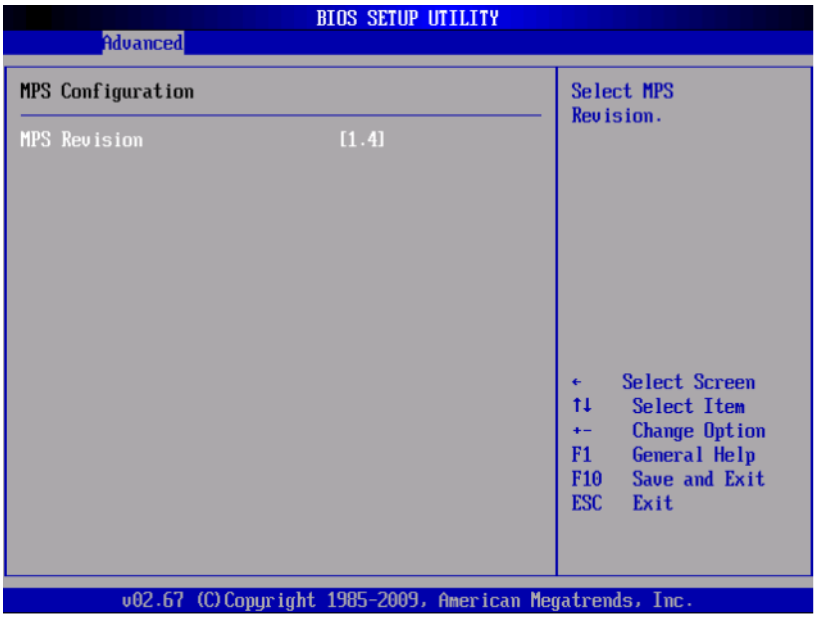
3.4.9 ASF Configuration

ASF (Alert Standard Format) provides standards-based alerting and remote control. Both the alerting and remote control capabilities of ASF are hardware-based and local to the networking solution on managed systems. This allows for CPU and OS independence, providing a persistent connection with the management console.



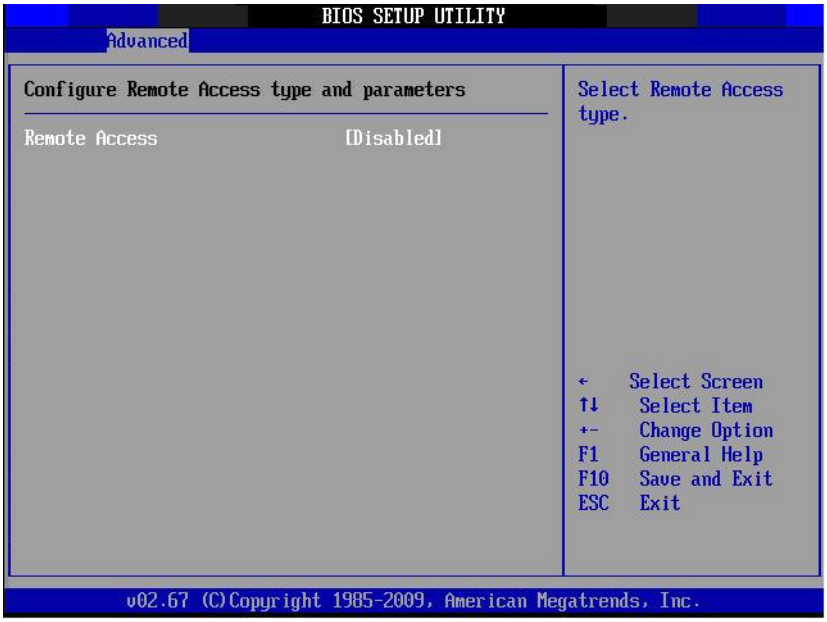
3.4.10 MPS Configuration

This feature is only applicable to multiprocessor motherboards as it specifies the version of the Multi-Processor Specification (MPS) that the motherboard will use. The MPS is a specification by which PC manufacturers design and build Intel architecture systems with two or more processors.



3.4.11 Remote Access Configuration

The remote access control configurations while using Intel AMT (Activate Management Technology), include remote boot, reboot with boot options, Serial over LAN, and IDE redirection.



3.4.12 USB Configuration

- **Legacy USB Support**
  Enables support for legacy USB. Auto option disables legacy support if no USB devices are connected.
- **USB 2.0 Controller Mode**
  This item allows selection of HiSpeed (480 Mbps) or FullSpeed (12 Mbps).

- **Legacy USB1.1 HC Support**

  Allows the system to detect the presence of USB devices at startup. If detected. The USB controller legacy mode is enabled. If no USB device is detected, the legacy USB support is disabled.

3.5 Advanced PCI/PnP Settings

Select the PCI/PnP tab from the AIMB-280 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.

- **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.

- **Plug & Play O/S**

  When set to No, BIOS configures all the devices in the system. When set to Yes and if you install a Plug and Play operating system, the operating system configures all Plug and Play devices not required for bootup.

- **PCI Latency Timer**

  Value in units of PCI clocks for PCI device latency timer register.

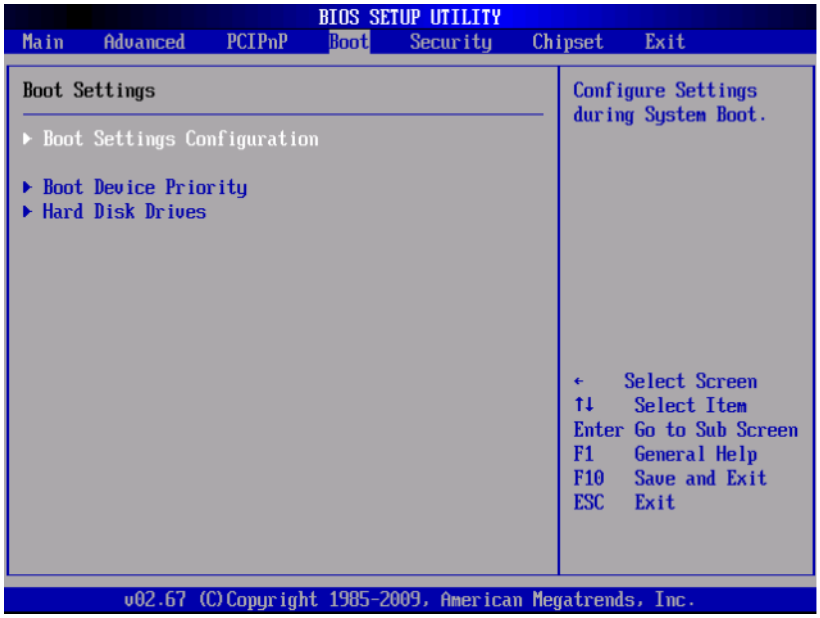
- **Allocate IRQ to PCI VGA**

  When set to Yes, will assign IRQ to PCI VGA card if card requests IRQ. When set to No will not assign IRQ to PCI VGA card even if card requests an IRQ.

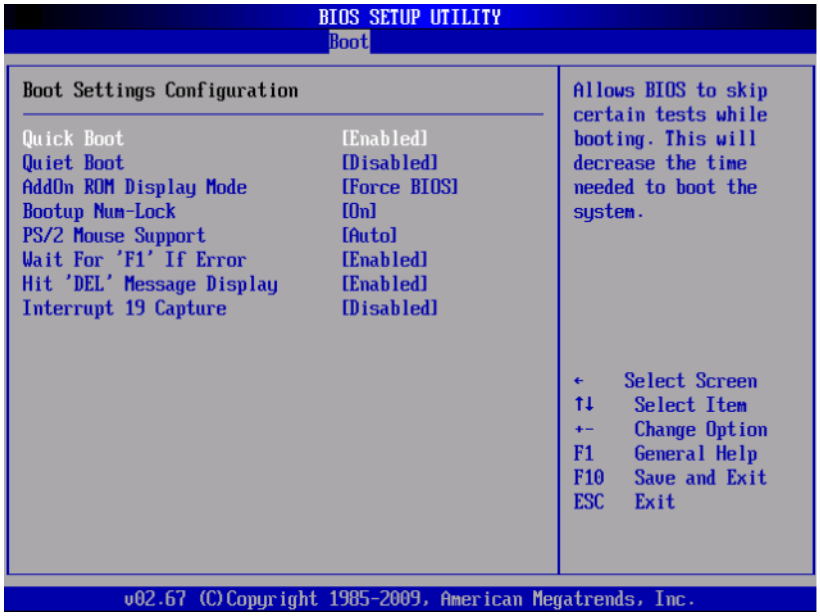
- **Palette Snooping**

  This item is designed to solve problems caused by some non-standard VGA cards.

3.6 Boot Settings



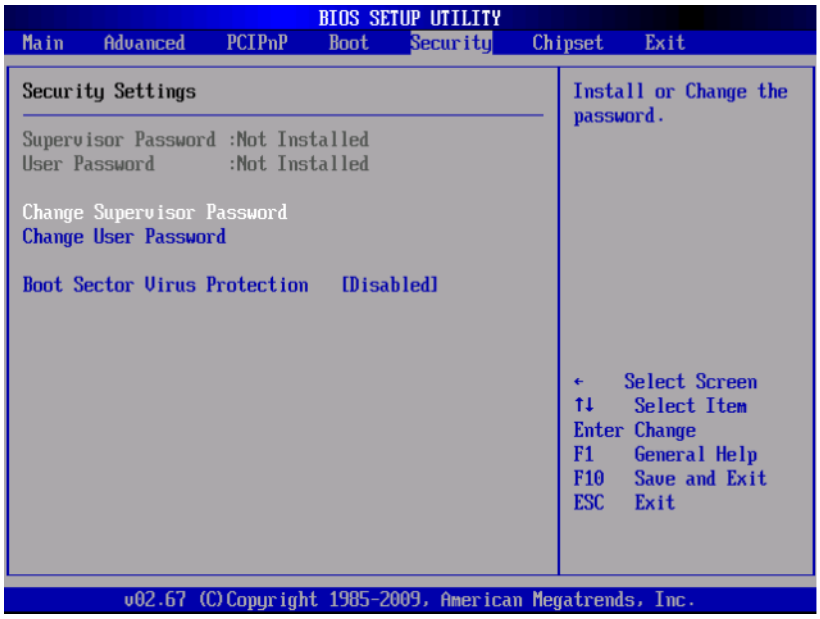
3.6.1 Boot Settings Configuration



- **Quick Boot**
  This item allows 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.
- **AddOn ROM Display Mode**
  Set display mode for option ROM.
- **Bootup Num-Lock**
  Select the Power-on state for Numlock.

- **PS/2 Mouse Support**
  Select 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**
  This item allows option ROMs to trap interrupt 19.

3.7 Security Setup



Select Security Setup from the AIMB-280 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 / User Password**
  Provides for either installing or changing the password.
- **Boot sector Virus protection**
  The boot sector virus protection will warn if any program tries to write to the boot sector.

3.8 Advanced Chipset Settings

3.8.1 North Bridge Chipset Configuration

- **Memory Remap Feature**

  Allows for the segment of system memory that was previously overwritten by PCI devices to be remapped above the total physical memory.

- **DRAM Frequency**

  This item allows you to manually change DRAM frequency.

- **Configure DRAM Timing by SPD**

  This item allows you to enable or disable detect by DRAM SPD.

- **Initiate Graphic Adapter**

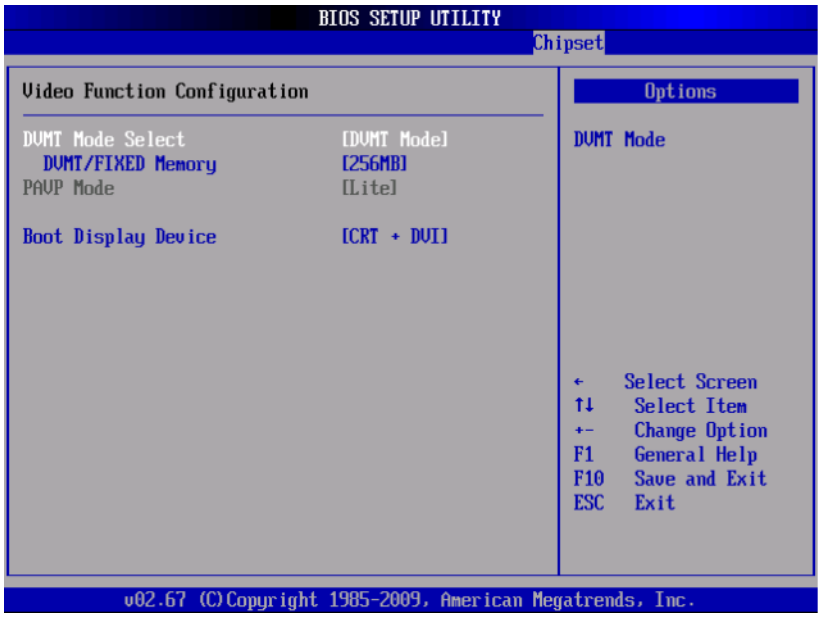
  This item allows you to select which graphics controller to use as the primary boot device.

Note!

When SG mode is selected, it enables Hybrid Multi-monitor, which is one form of Intel's Hybrid Graphics Support where integrated graphics (graphics built into the motherboard chipset) is available to operate simultaneously with add-in or "external" graphics. But Clone and Twin are only possible within a single GPU. It is not possible to Clone or Twin between integrated and discrete graphics.

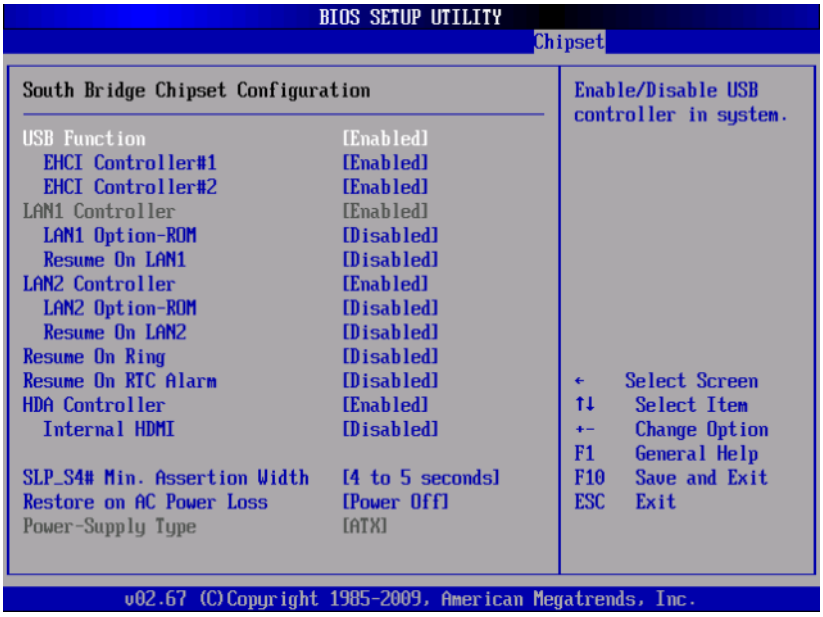
- **IGD Graphics Mode Select**
  Select the amount of system memory used by the internal graphics device.

3.8.2 Video Function Configuration



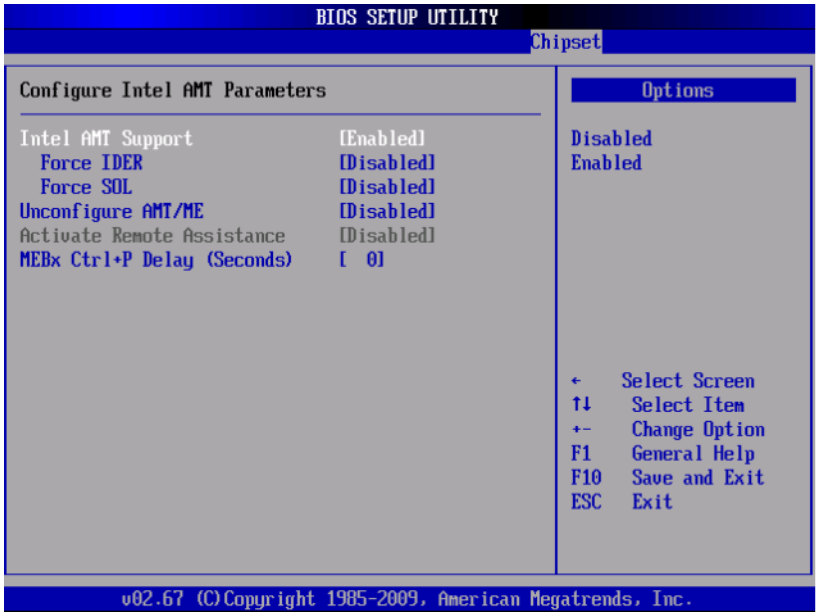
- **DVMT Mode Select**
  Displays the active system memory mode.
- **DVMT/FIXED Memory**
  Specifies the amount of DVMT / FIXED system memory to allocate for video memory.
- **Boot Display Device**
  Select boot display device at the post stage.

3.8.3 South Bridge Chipset Configuration



- **USB Functions**
  Enables or disables the USB Host Controllers.
- **LAN1 controller**
  Enables or disables the GbE controller.
- **LAN1 Option-ROM**
  Enables or disables GbE LAN boot.
- **Resume on LAN1**
  Enables or disables GbE LAN wake up from S5 function.
- **LAN2 controller**
  Enables or disables the GbE controller.
- **LAN2 Option-ROM**
  Enables or disables GbE LAN boot.
- **Resume on LAN2**
  Enables or disables GbE LAN wake up from S5 function.
- **Resume On Ring**
  Allows the system to be awakened from an ACPI sleep state by a wake-up signal from a modem that supports wake-up function.
- **Resume On RTC Alarm**
  The field is used to enable or disable the feature of booting up the system on a scheduled time/date.
- **HDA Controller**
  Enables or disables the HDA controller.
- **Internal HDMI**
  Enables or disables the internal HDMI codec
- **SLP_S4# Min. Assertion Width**
  This item allows you to set a delay of a set number of seconds.
- **Restore on AC Power Loss**
  The system goes into on/off state after an AC power loss.

3.8.4 Intel AMT Configuration



- **Intel AMT support**

  Intel Active Management Technology (AMT) is hardware-based technology for remotely managing and securing PCs out-of-band.

- **Force IDER**

  IDE-R allows an Intel Remote PC Assist Technology for Consumer managed client to be booted by a management console from a remote disk image. If the client system does not support IDE-R, this value cannot enable it.

- **Force SOL**

  SOL allows the console input/output of an Intel® Remote PC Assist Technology for Consumer managed client to be redirected to a management server console (if the client system supports SOL). If the system does not support SOL, this value cannot enable it.

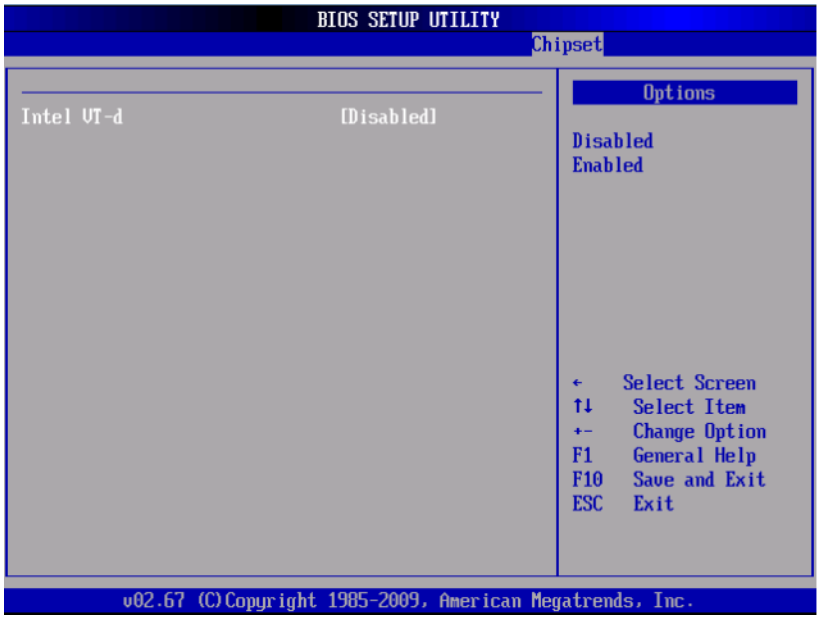
- **Unconfigure AMT/ME**

  Unconfigure AMT/ME setting.

- **Activate Remote Assistance**

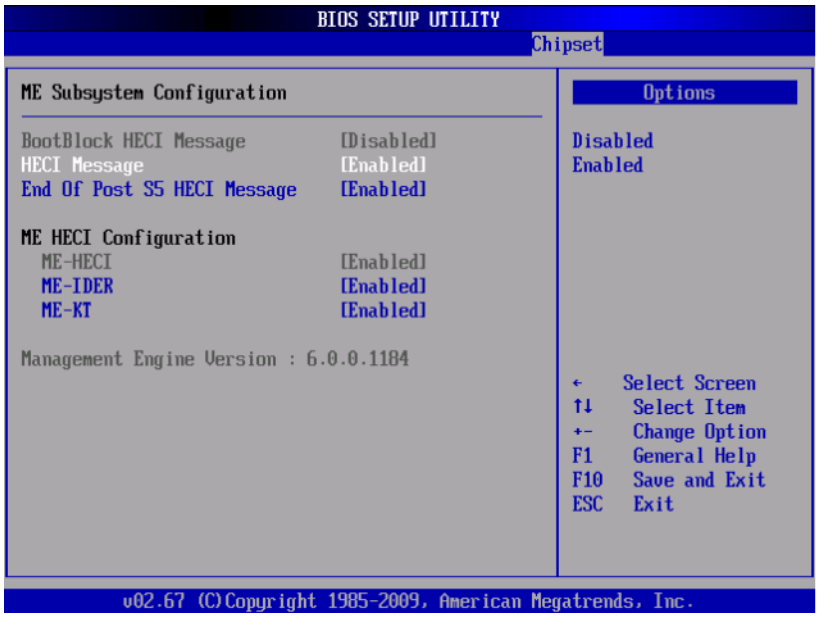
  This item is to activate the remote console when using the iAMT function.

3.8.5 Intel VT-d Configuration



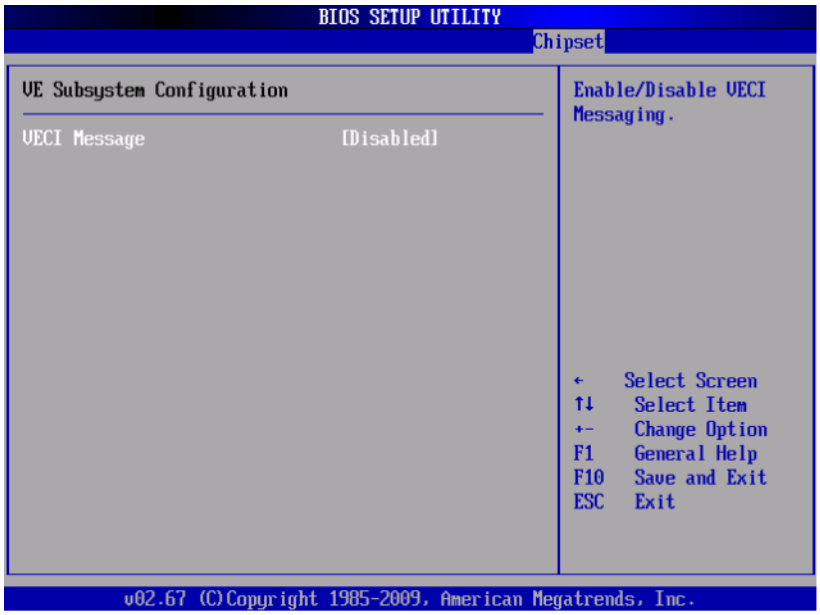
- **Intel VT-d Configuration**
  Supports Intel chipset virtualization technology for directed I/O.

3.8.6 ME Subsystem Configuration



- **Intel ME Subsystem Configuration**
  This item includes ME-IDER (to boot up from server side instead of client side), ME-HECI (remove from BIOS), ME-KT(BIOS check).

3.8.7 VE Subsystem Configuration



- **Intel VE Subsystem Configuration**

  VE refers to Intel Virtualization Engine. Access to the PBA area is permitted via the VE by using the VE Command Interface (VECI), or via the Intel ME by using the Intel AT-d Host Command Interface (DHCI); which uses HECI. The VE can ensure that access requests outside the PBA ranges are prevented given that PBA code executes on the host processor.

3.9 Exit Option

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

- **Discard Changes and Exit**

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

1. Select Discard Changes and Exit 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**

1. Select Discard Changes from the Exit menu and press <Enter>.

- **Load Optimal Defaults**

  The AIMB-280 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>.

- **Load Failsafe Defaults**

  The AIMB-280 automatically configures all setup options to failsafe settings when you select this option. Failsafe Defaults are designed for maximum system stability, but not maximum performance. Select Failsafe Defaults if your computer is experiencing system configuration problems.

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

Chapter 4

Software Introduction & Service

4.1 Introduction

The mission of Advantech Embedded Software Services is to "Enhance quality of life with Advantech platforms and Microsoft® Windows® embedded technology." We enable Windows® Embedded software products on Advantech platforms to more effectively support the embedded computing community. Customers are freed from the hassles of dealing with multiple vendors (hardware suppliers, system integrators, embedded OS distributors) for projects. Our goal is to make Windows® Embedded Software solutions easily and widely available to the embedded computing community.

4.2 Value-Added Software Services

Software API: An interface that defines the ways by which an application program may request services from libraries and/or operating systems. Provides not only the underlying drivers required but also a rich set of user-friendly, intelligent and integrated interfaces, which speeds development, enhances security and offers add-on value for Advantech platforms. It plays the role of catalyst between developer and solution, and makes Advantech embedded platforms easier and simpler to adopt and operate with customer applications.

4.2.1 Software API

4.2.1.1 Control

SMBus

SMBus is the System Management Bus defined by Intel Corporation in 1995. It is used in personal computers and servers for low-speed system management communications. The SMBus API allows a developer to interface a embedded system environment and transfer serial messages using the SMBus protocols, allowing multiple simultaneous device control.

4.2.1.2 Monitor

Watchdog

A watchdog timer (WDT) is a device that performs a specific operation after a certain period of time if something goes wrong and the system does not recover on its own. A watchdog timer can be programmed to perform a warm boot (restarting the system) after a certain number of seconds.

Hardware Monitor

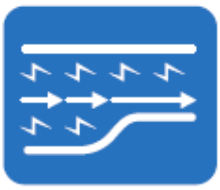
The Hardware Monitor (HWM) API is a system health supervision API that inspects certain condition indexes, such as fan speed, temperature and voltage.

4.2.1.3 Power Saving

CPU Speed

Makes use of Intel SpeedStep technology to save power consumption. The system will automatically adjust the CPU speed depending on the system loading.

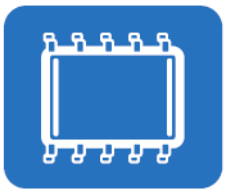
System Throttling



Refers to a series of methods for reducing power consumption in computers by lowering the clock frequency. This API allows the user to adjust the clock from 87.5% to 12.5%.

4.2.2 Software Utility

BIOS Flash



The BIOS Flash utility allows customers to update the flash ROM BIOS version, or use it to back up current BIOS by copying it from the flash chip to a file on customers' disk. The BIOS Flash utility also provides a command line version and an API for fast implementation into customized applications.

Embedded Security ID

The embedded application is the most important property of a system integrator. It contains valuable intellectual property, design knowledge and innovation, but it is easy to be copied! Embedded Security ID utility which provides reliable security functions for customers to secure their application data within embedded BIOS.

Monitoring

The Monitoring is a utility for customer to monitor the system health, like voltage, CPU and system temperature and fan speed. These items are important to a device, if the critical errors occur and are not solved immediately, permanent damage may be caused.

eSOS

The eSOS is a small OS stored in BIOS ROM. It will boot up in case of a main OS crash. It will diagnose the hardware status, and then send an e-mail to the designated administrator. The eSOS also provide for remote connection via Telnet server and FTP server so the administrator can attempt to rescue the system. Note: This function requires BIOS customization.

Chapter 5

Chipset Software Installation Utility

5.1 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-280 are located on the software installation CD. The driver in the folder of the driver CD will guide and link you to the utilities and drivers under a Windows system. Updates are provided via Service Packs from Microsoft*.

Note! *The files on the software installation CD 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.

5.2 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:

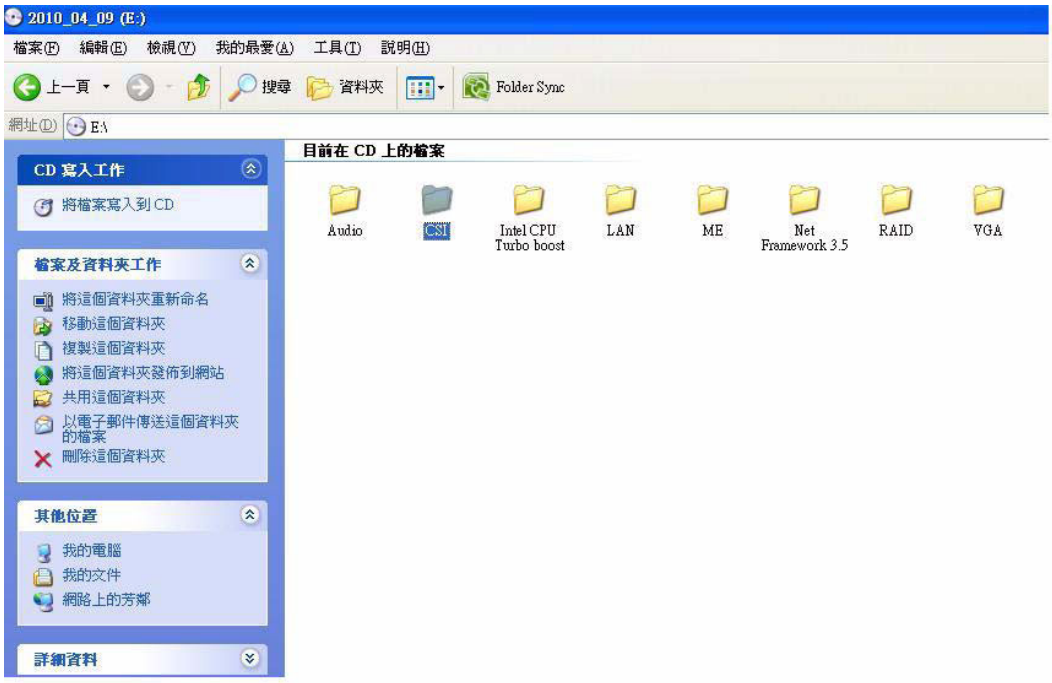
- Core PCI PnP services
- IDE Ultra ATA 100/66/33 and Serial ATA interface support
- USB 1.1/2.0 support (USB 2.0 driver needs to be installed separately for Win98)
- Identification of Intel® chipset components in the Device Manager

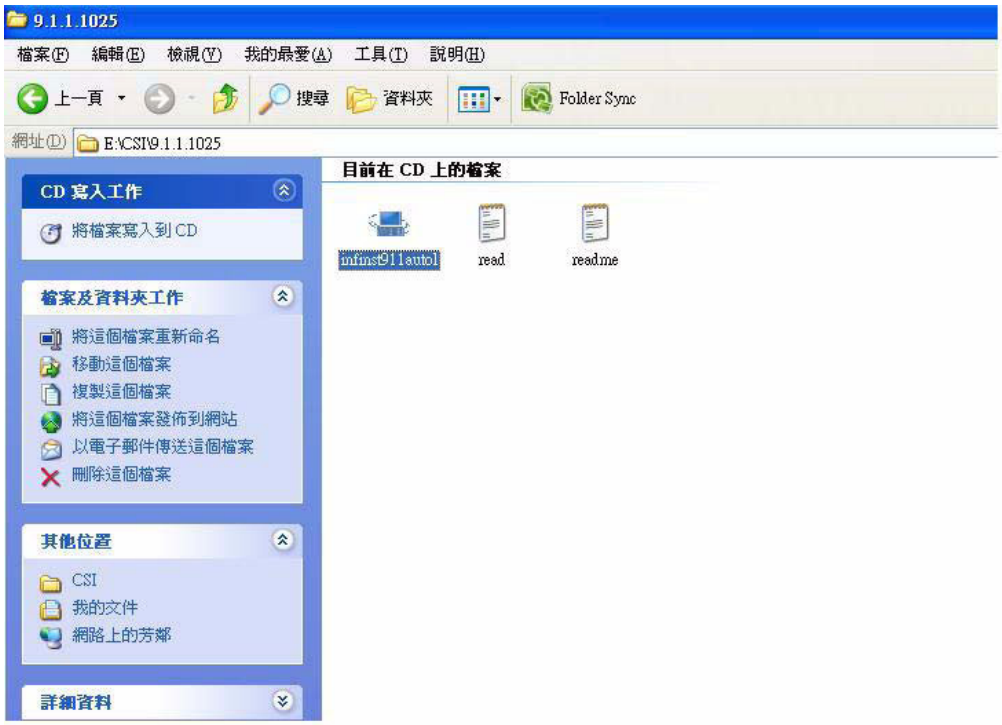
Note! *This utility is used for the following versions of Windows, and it has to be installed **before** installing all the other drivers:*

- *Windows 7 (32-bit)*
- *Windows 7 (64-bit)*
- *Windows XP professional edition (32-bit)*
- *Windows XP professional edition (64-bit)*
- *Windows XPe*

5.3 Windows XP/Windows 7 Driver Setup

1. Insert the driver CD into your system's CD-ROM drive. You can see the driver folder items. Navigate to the "Chipset" folder and click "infinst_autol.exe" to complete the installation of the driver.





Chapter 6

VGA Setup

6.1 Introduction

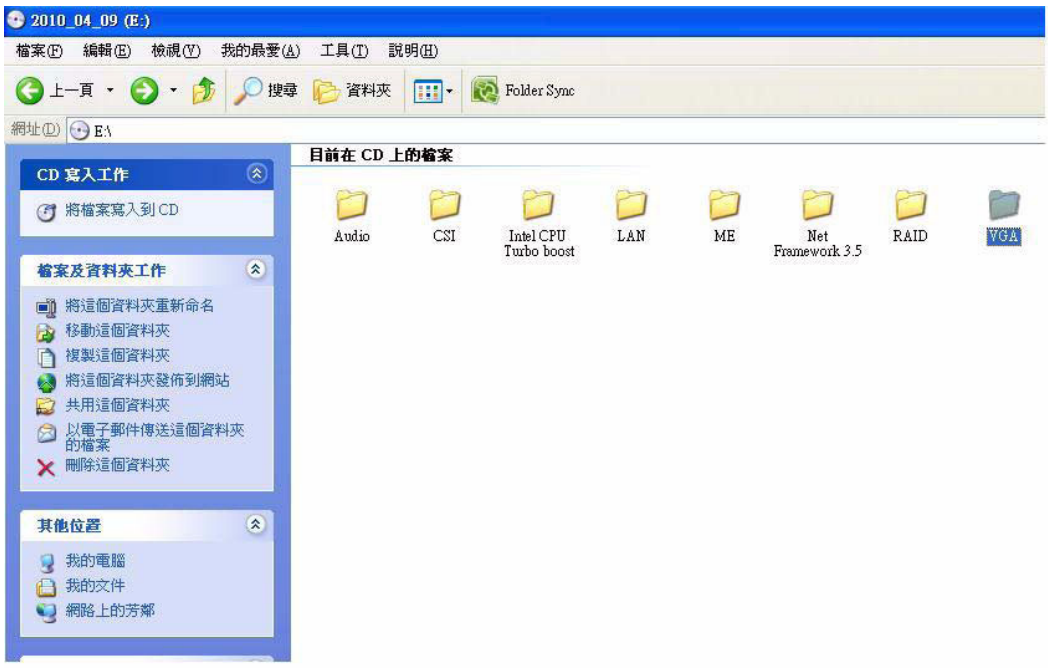
The Intel Core i5-600, Core i3-500 and Pentium CPUs with dual core are embedded with an integrated graphics controller. You need to install the VGA driver to enable the function.

- Optimized integrated graphic solution: With Intel Graphics Flexible, it supports versatile display options and 32-bit 3D graphics engine. Dual independent display, enhanced display modes for widescreen flat panels for extend, twin, and clone dual display mode, and optimized 3D support deliver an intensive and realistic visual experience. Only Core i5-600, Core i3-500 and Pentium CPUs are embedded with integrated graphics, Core i7, Core i5-700 are not embedded with integrated graphics that require a separate graphic card.

6.2 Windows 7/Vista/XP

Note! *Before installing this driver, make sure the CSI utility has been installed in your system. See Chapter 5 for information on installing the CSI utility.*

Insert the driver CD into your system's CD-ROM drive. You can see the driver folder items. Navigate to the "VGA" folder and click the appropriate "setup.exe" to complete the installation of the drivers for Windows 7, Windows Vista, Windows XP.




VGA
檔案(F) 編輯(E) 檢視(V) 我的最愛(A) 工具(T) 說明(H)
上一頁
搜尋
資料夾
Folder Sync
網址(D) E:\VGA
CD 寫入工作
將檔案寫入到 CD
檔案及資料夾工作
將這個資料夾重新命名
移動這個資料夾
複製這個資料夾
將這個資料夾發佈到網站
共用這個資料夾
以電子郵件傳送這個資料夾的檔案
刪除這個資料夾
其他位置
2010_04_09 (E:)
我的文件
網路上的芳鄰
詳細資料
目前在 CD 上的檔案
Vista_Win7
XP VGA

Chapter 7

LAN Configuration

7.1 Introduction

The AIMB-280 has dual Gigabit Ethernet LANs via dedicated PCI Express x1 lanes (Intel 82578DM (LAN1) and 82583V (LAN2)) that offer bandwidth of up to 500 MB/sec, eliminating the bottleneck of network data flow and incorporating Gigabit Ethernet at 1000 Mbps.

7.2 Features

- Integrated 10/100/1000 Mbps transceiver
- 10/100/1000 Mbps triple-speed MAC
- On-chip voltage regulation
- Wake-on-LAN (WOL) support
- PCI Express X1 host interface

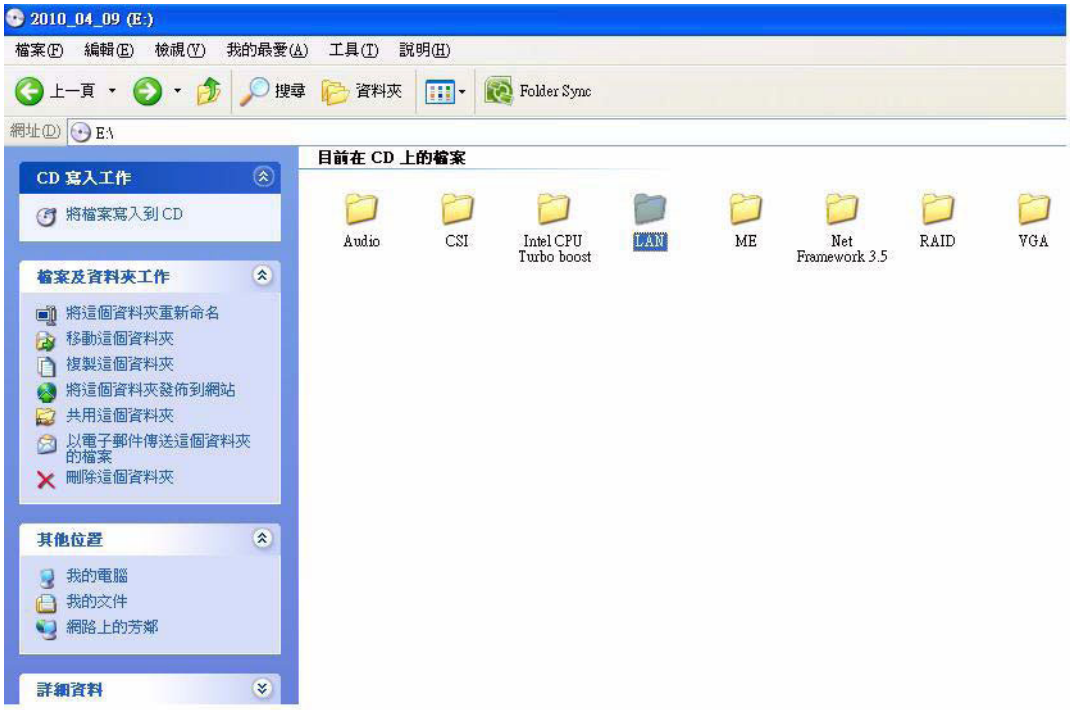
7.3 Installation

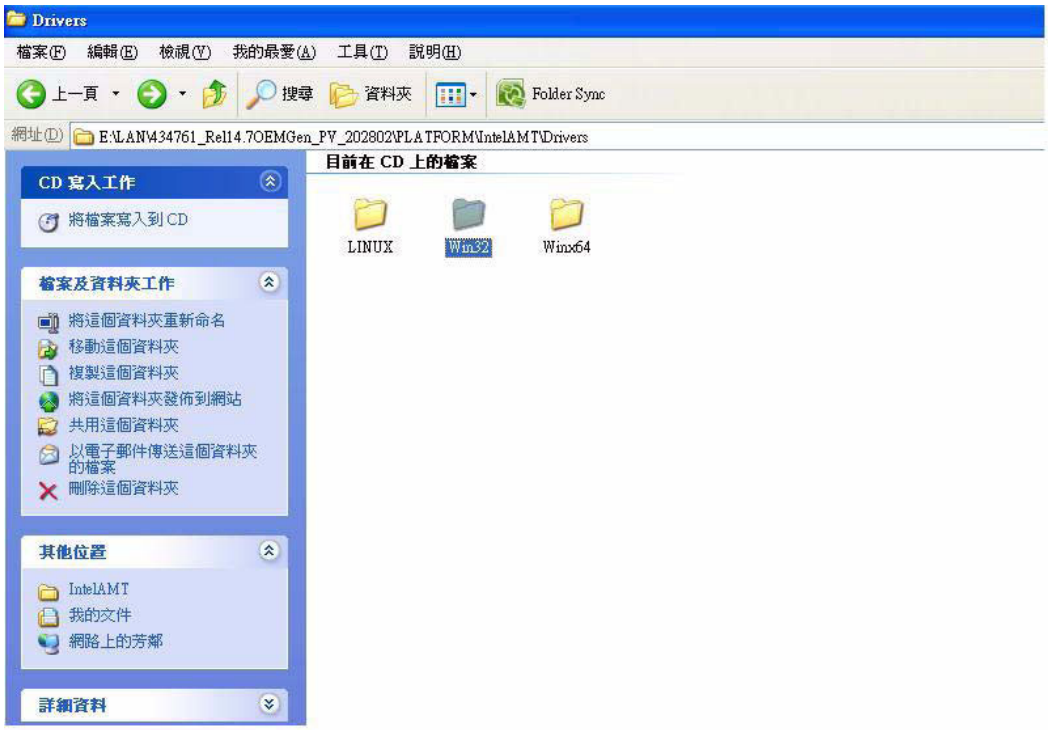
Note! *Before installing the LAN drivers, make sure the CSI utility has been installed on your system. See Chapter 5 for information on installing the CSI utility.*

The AIMB-280 Intel 82578DM and 82583V Gigabit integrated controller supports all major network operating systems. However, the installation procedure varies with different operating systems. Please find and use the section that provides the driver setup procedure for the operating system you are using.

7.4 Windows XP/ Windows 7 Setup (Intel 82578DM and 82583V)

Insert the driver CD into your system's CD-ROM drive. Select the LAN folder, navigate to the directory for your OS, and run setup.




Drivers
檔案(F) 編輯(E) 檢視(V) 我的最愛(A) 工具(T) 說明(H)
上一頁
搜尋
資料夾
Folder Sync
網址(D) E:\LAN\434761_Rel14.7OEMGen_PV_202802\PLATFORM\IntelAMT\Drivers
CD 寫入工作
將檔案寫入到 CD
檔案及資料夾工作
將這個資料夾重新命名
移動這個資料夾
複製這個資料夾
將這個資料夾發佈到網站
共用這個資料夾
以電子郵件傳送這個資料夾的檔案
刪除這個資料夾
其他位置
IntelAMT
我的文件
網路上的芳鄰
詳細資料
目前在 CD 上的檔案
LINUX
Win32
Winx64

Chapter 8

Turbo Boost Configuration

8.1 Introduction

The Intel Turbo Boost Monitor application is a Microsoft Windows sidebar gadget which provides a simple display of processor frequency when Intel Turbo Boost technology is active. This further improves performance by allowing processor cores to run at higher frequencies within the available thermal envelope. Supported operating systems are Microsoft Windows Vista 32-bit and 64-bit editions with Service Pack 2, and Microsoft Windows 7, 32-bit and 64-bit editions.

Note! *Only Intel Core™ i7/i5 processors support Intel Turbo Boost Technology*

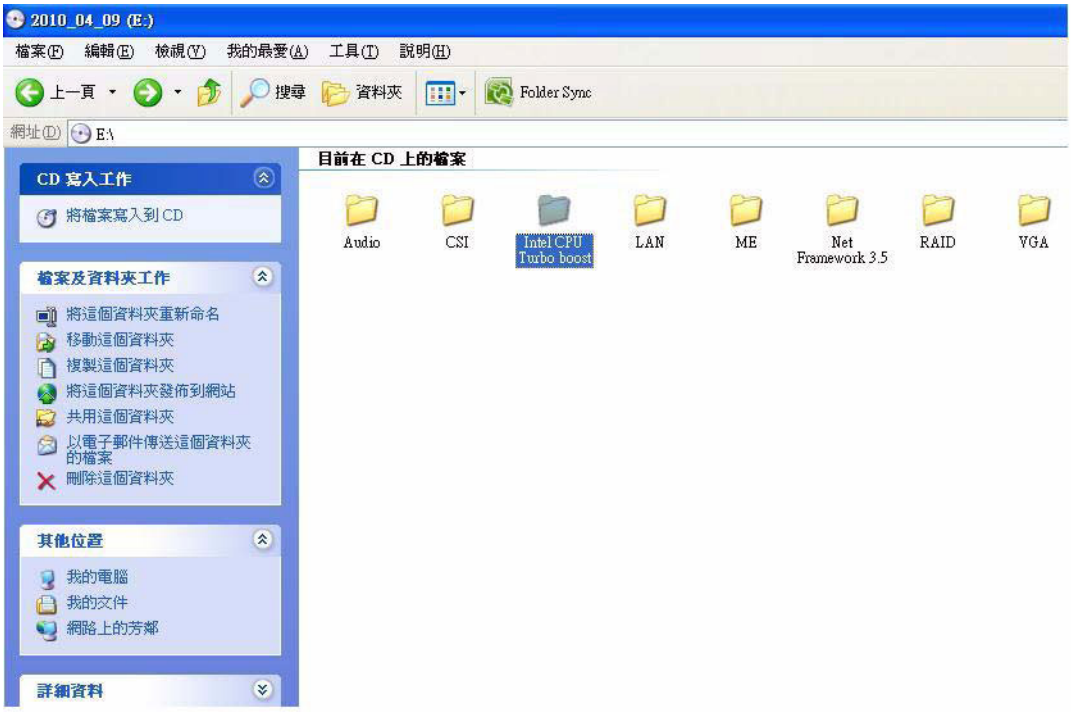
8.2 Installation

Note! *Before installing this driver, make sure the CSI utility has been installed in your system. See Chapter 8 for information on installing the CSI utility.*

Insert the driver CD into your system's CD-ROM drive. You can see the driver folders items. Navigate to the "Turbo Boost" folder and click "setup.exe" to complete the installation of the drivers for Windows XP.

8.3 Windows 7/Vista Driver

The AIMB-280 has dual Gigabit Ethernet LANs via dedicated PCI Express x1 lanes (Intel 82578DM (LAN1) and 82583V (LAN2)) that offer bandwidth of up to 500 MB/sec, eliminating the bottleneck of network data flow and incorporating Gigabit Ethernet at 1000 Mbps.



Appendix A

Programming the Watchdog Timer

A.1 Programming the Watchdog Timer

The AIMB-280'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.1.1 Watchdog Timer Overview

The watchdog timer is built into the super I/O controller W83627DHG-P. It provides the following user-programmable functions:

- Can be enabled and disabled by user 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.1.2 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 assign the address of register by writing an address value into address port 2E (hex), then write/read data to/from the assigned register through data port 2F (hex).

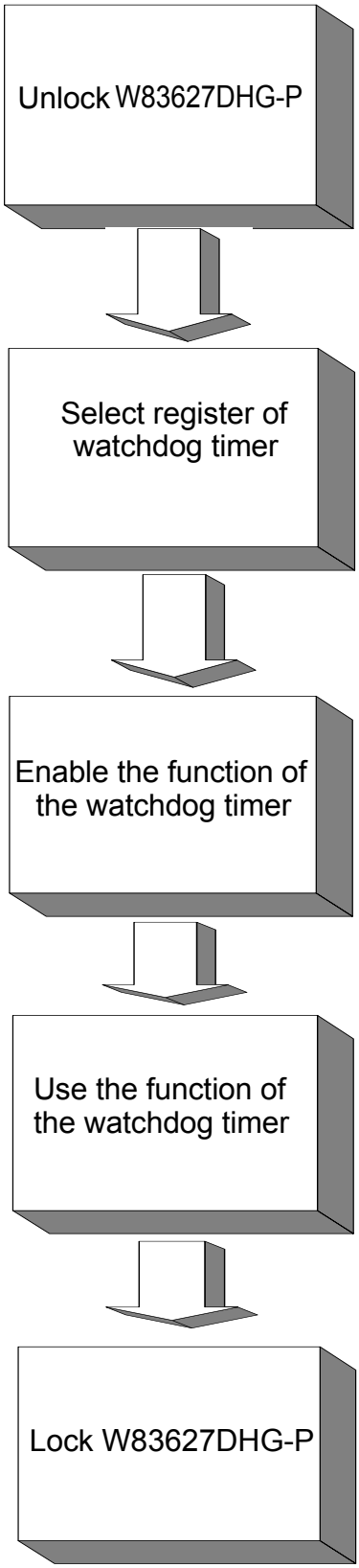

Unlock W83627DHG-P
Select register of watchdog timer
Enable the function of the watchdog timer
Use the function of the watchdog timer
Lock W83627DHG-P

Table A.1: Watchdog Timer Registers

Address of Register (2E)	Attribute	
Read/Write	Value (2F) & description	
87 (hex)	-----	Write this address to I/O address port 2E (hex) twice to unlock the W83627DHG-P.
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 second 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 7:Write 1 to enable mouse to reset the timer, 0 to disable[default]. 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.1.3 Example Program

1. Enable watchdog timer and set 10 sec. as timeout interval

```
;----------------------------------------------------------
Mov dx,2eh ; Unlock W83627DHG-P
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-P
Mov al,0aah
Out dx,al
```

2. Enable watchdog timer and set 5 minutes as timeout interval

```
;----------------------------------------------------------
Mov dx,2eh ; Unlock W83627DHG-P
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-P
Mov al,0aah
Out dx,al
```

3. Enable watchdog timer to be reset by mouse

```
;------------------------------------------------------
Mov dx,2eh ; Unlock W83627DHG-P
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 W83627DHG-P
Mov al,0aah
Out dx,al
```

4. Enable watchdog timer to be reset by keyboard

```
;--------------------------------------------------------
Mov dx,2eh ; Unlock W83627DHG-P
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-P
Mov al,0aah
Out dx,al
```

5. Generate a time-out signal without timer counting

```
;--------------------------------------------------------
Mov dx,2eh ; Unlock W83627DHG-P
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-P
Mov al,0aah
Out dx,al
```

Appendix B

I/O Pin Assignments

B.1 USB Header (USB56, USB78)

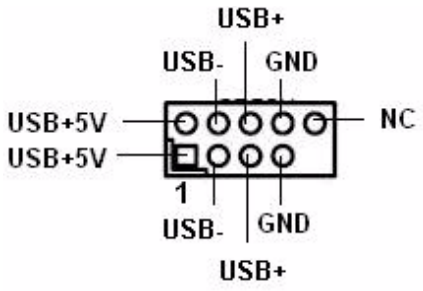


Table B.1: USB Header (USB56)			
Pin	**Signal**	**Pin**	**Signal**
1	USB1_VCC5	2	USB1_VCC5
3	USB0_D-	4	USB1_D-
5	USB0_D+	6	USB1_D+
7	GND	8	GND
9	Key	10	GND

B.2 VGA Connector (VGA1)

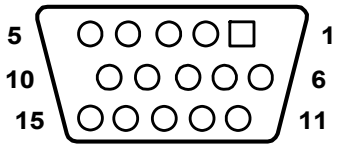


Table B.2: VGA Connector (VGA1)			
Pin	**Signal**	**Pin**	**Signal**
1	RED	9	CRT_VCCIN
2	VGA_G	10	GND
3	VGA_B	11	N/C
4	N/C	12	V_SDAT
5	GND	13	H-SYNC
6	GND	14	V-SYNC
7	GND	15	V_SCLK
8	GND		

B.3 SPI_CN1: SPI Fresh Card Pin Connector

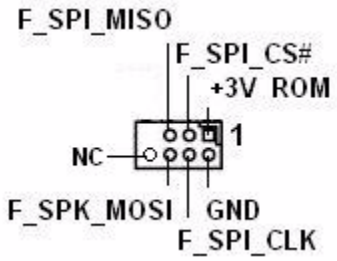


Table B.3: SPI_CN1:SPI Fresh Card Pin Connector

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.4 PS/2 Keyboard and Mouse Connector (KBMS1)

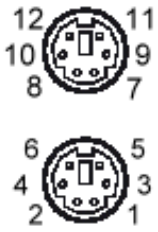


Table B.4: PS/2 Keyboard and Mouse Connector (KBMS1)

Pin	Signal
1	KB DATA
2	N/C
3	GND
4	KB VCC
5	KB CLK
6	N/C
7	M_DATA
8	N/C
9	GND
10	M_VCC
11	M_CLK
12	N/C

B.5 CPU Fan Power Connector (CPU_FAN1)

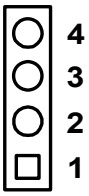


Table B.5: CPU Fan Power Connector (CPU_FAN1)	
Pin	**Signal**
1	GND
2	+12 V
3	DETECT
4	PWM

B.6 System Fan Power Connector (SYS_FAN1/2)

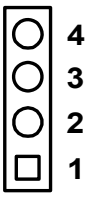


Table B.6: System Fan Power Connector (SYSFAN1/SYSFAN2)	
Pin	**Signal**
1	GND
2	+12 V
3	DETECT
4	PWM

B.7 Power LED & Keyboard Lock Connector (JFP3)

You can use an LED to indicate when the single board computer is on. Pin 1 of JFP3 supplies the LED power, and pin 3 is the ground.

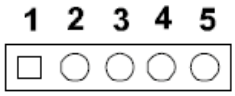


Table B.7: Power LED & Keyboard Lock Connector (JFP3)

Pin	Function
1	LED power
2	NC
3	GND
4	KEYLOCK#
5	GND

B.8 Power switch/HDD LED/SMBus/Speaker (JFP1+JFP2)

The single board computer has its own buzzer. You can also connect it to the external speaker on your computer chassis.

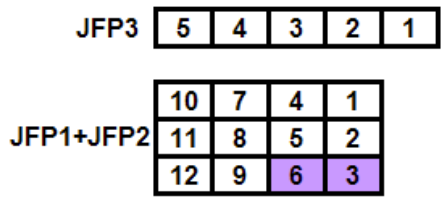


Table B.8: Power Switch/HDD LED/SMBus/Speaker (JFP1+JFP2)

Pin	Signal	Pin	Signal
1	SPK_P1	2	HDDLED+
3	PWR	4	SPK_P2
5	HDDLED-	6	GND
7	SPK_P3	8	SMBDATA
9	SYS_RST	10	SPK_P4
11	SMBCLK	12	GND

B.9 USB/LAN ports (LAN1_USB12/LAN2_USB34)

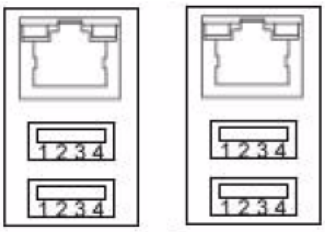
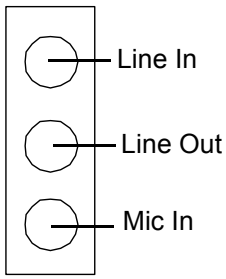


Table B.9: USB Port			
Pin	**Signal**	**Pin**	**Signal**
1	VCC	3	Data0+
2	Data0-	4	GND

Table B.10: Ethernet 10/100 Mbps RJ-45 Port			
Pin	**Signal**	**Pin**	**Signal**
1	XMT+	5	N/C
2	XMT-	6	RCV-
3	RCV+	7	N/C
4	N/C	8	N/C

B.10 Line In, Line Out, Mic In Connector (AUDIO1)



B.11 Serial ATA (SATA1~4)

Table B.11: Serial ATA 0/1 (SATA1/SATA2)			
Pin	**Signal**	**Pin**	**Signal**
1	GND	2	SATA_0TX+
3	SATA_0TX-	4	GND
5	SATA_0RX-	6	SATA_0RX+
7	GND	8	

B.12 AT/ATX Mode (PSON1)

Table B.12: AT/ATX Mode (PSON1)			
Pin	**Signal**	**Pin**	**Signal**
1	#PSON_SIO (to super IO)	2	#PSON (to power supply)
3	GND		

B.13 ATX Power Connector (ATX1)

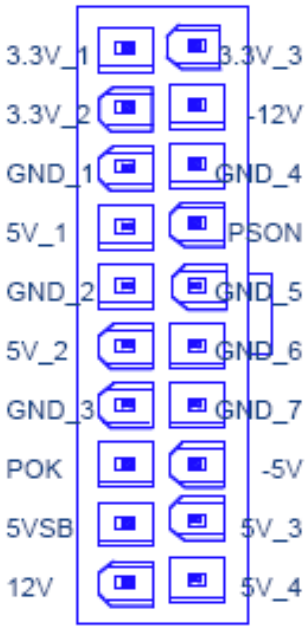


Table B.13: ATX Power Connector (ATX1)			
Pin	**Signal**	**Pin**	**Signal**
1	+3.3 V	11	3.3 V
2	+3.3 V	12	-12 V
3	GND	13	GND
4	+5 V	14	PSON
5	GND	15	GND
6	+5 V	16	GND
7	GND	17	GND
8	POK	18	-5 V
9	5 VSB	19	+5 V
10	12 V	20	+5 V

B.14 ATX 12 V connector (ATX12V_1)

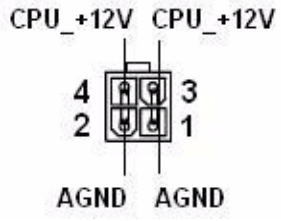


Table B.14: ATX 12 V connector (ATX12V_1)

Pin	Signal	Pin	Signal
1	GND	2	GND
3	+12V	4	+12V

B.15 DMA Channel Assignments

Table B.15: 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

B.16 Interrupt Assignments

Table B.16: 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	IRQ12	PS/2 mouse
7	IRQ13	INT from co-processor
8	IRQ14	Primary IDE Channel
9	IRQ15	Secondary IDE Channel
10	IRQ3	Serial communication port 2
11	IRQ4	Serial communication port 1
12	IRQ5	Available
13	IRQ6	Available
14	IRQ7	Parallel port 1 (print port)

B.17 1st MB Memory Map

Table B.17: 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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