



User Manual

AIMB-701

**LGA1155 Intel® Core™ i7/i5/i3/
Pentium ATX with DVI/VGA,
Dual GbE LAN**

ADVANTECH

Enabling an Intelligent Planet

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

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- 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.

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Memory Compatibility

Brand	Size	Speed	Vendor PN	Memory	Advantech PN
Transcend	1GB	DDR3 1066	TS128MLK64V1U	SEC K4B1G0846G-BCH9	NA
	2GB	DDR3 1066	TS256MLK64V1U	SEC K4B1G0846G-BCH9	NA
Apacer	1GB	DDR3 1066	78.01GC3.420	ELPIDA J1108BDBG-DJ-F (128x8)	96D3-1G1066NN-AP
	2GB	DDR3 1066	78.A1GC3.421	ELPIDA J1108BDSE-DJ-F (128x8)	96D3-2G1066NN-AP
	4GB	DDR3 1066	78.B1GDJ.AF1	HYNIX H5TQ2G83BFR-H9C	NA
Transcend	1GB	DDR3 1333	TS128MLK64V3U	ELPIDA J1108BDBG-DJ-F(128x8)	NA
	2GB	DDR3 1333	TS256MLK64V3U	SEC K4B1G0846G-BCH9	NA
	8GB	DDR3 1333	TS1GLK64V3H	MICRON IWD27 D9PBC	NA
Apacer	1GB	DDR3 1333	78.01GC6.AF0	H5TQ1G83DFR-H9C	96D3-1G1333NN-AP1
	2GB	DDR3 1333	78.A1GDE.4200C	ELPIDA J2108BCSE-DJ-F	NA
	2GB	DDR3 1333	78.A1GDE.AF00C	Hynix H5TQ2G838FR(256x8)	96D3-2G1333NN-AP1
	4GB	DDR3 1333	78.B1GDE.AF1	Hynix H5TQ2G83AFR H9C(256x8)	NA
Kingston	2GB	DDR3 1333	KVR1333D3S8N9/2G	ELPIDA J2108BCSE-DJ-F(128x8)	NA
	4GB	DDR3 1333	KVR1333D3N9/4G	KINGSTON D2568JENC PGD9U(512x64)	NA
DSL	2GB	DDR3 1600	D3US56081XH12AA	SEC 113 HCK0 K4B2G0846C 256x8	NA
	4GB	DDR3 1600	D3US56082XH12AA	SEC 113 HCK0 K4B2G0846C 256x8	NA
Transcend	4GB	DDR3 1600	TS512MLK64V6N	MICRON IUM22 D9PFJ	NA
	2GB	DDR3 1600	TS256MLK64V6N	MICRON IUM22 D9PFJ	NA
ATP	8GB	DDR3-1600	XQ16B8NG-9-AV	NA	NA

AIMB-701 Feature Comparison

	AIMB-701G2-00A1E	AIMB-701VG-00A1E
Chipset	H61	H61
Memory	Non-ECCDDR31066/1333/1600	Non-ECC DDR3 1066/1333/1600
USB	10	10
GbE	2	1
COM	6	2
SW RAID	None	None
DVI-D	Yes	None
PCIe x1	Yes	None
PCIe x4	None	Yes

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.

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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 AIMB-701 Startup Manual
- 1 Driver CD (user's manual is included)
- 2 Serial ATA HDD data cables
- 2 Serial ATA HDD power cables
- 1 I/O port bracket
- 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-701 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-701, 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

AIMB-701 motherboard is the most advanced Intel® H61 board for industrial applications that require high-performance computing. The motherboard supports 2nd/3rd generation Intel® Core™i7/i5/i3/Pentium and DDR3 1066/1333/1600 MHz memory up to 16 GB. AIMB-701 provides cost-effective graphics integrated in processor which is Intel HD 2000/3000/4000 graphics, and the graphics VRAM is 1 GB maximum shared memory with 2 GB and above system memory installed.

AIMB-701 provides a mainstream PCIe x16 gen III/II expansion slot for add-on graphic cards to meet higher graphics performance demand. In addition, the AIMB-701 has dual Gigabit Ethernet LAN (G2 version) via dedicated PCIe x1 bus, which offers bandwidth of up to 500 MB/s, eliminating network bottlenecks. High reliability and outstanding performance make the AIMB-701 the ideal platform for industrial networking applications.

By using the Intel® H61 chipset, the AIMB-701 offers one PCIe x8 slot with x1 or x4 link, one PCIe x16 slot and a variety of features such as 4 onboard SATA II with AHCI support; 10 USB 2.0 connectors and HD Audio. Besides, AIMB-701 also offers five 32-bit 33 MHz PCI slots via PCIe to PCI bridge IC and arbiter. These powerful I/O capabilities ensure even more reliable data storage capabilities and high-speed I/O peripheral connectivity.

The AIMB-701 also adopts Advantech's unique patented Sleep Mode Control Circuit for AT Power Mode. With all the excellent features and outstanding performance, the AIMB-701 is the ideal platform for today's industrial applications.

1.2 Features

- **PCIe architecture:** The Intel® H61 PCH chipset supports 1 PCIe x16 slot, 1 PCIe x8 slot with x1 or x4 link
- **High Performance I/O capability:** Dual Gigabit LAN via PCIe x1 bus, 5 PCI 32-bit/33MHz PCI slots, 4 SATAII connectors and 10 USB 2.0 ports.
- **Standard ATX form factor with industrial features:** AIMB-701 provides industrial features like long product life, reliable operation under wide temperature range, watchdog timer functions, etc.
- **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. Please refer detail "AT" mode setting in table 1.5 of section 1.8.3.

1.3 Specifications

1.3.1 System

- **SATA hard disk drive interface:** Four on-board SATA II connectors support Advanced Host controller interface (AHCI) technology and have data transmission rates up to 300 MB/s.
- **System Chipset:** Intel® H61 PCH

1.3.2 Memory

- **RAM:** Up to 16 GB in two 240-pin DIMM sockets. Supports dual-channel DDR3 1066/1333/1600 SDRAM.
 - AIMB-701: supports non-ECC unbuffered DIMMs and do not support any memory configuration that mixes non-ECC with ECC unbuffered DIMMs
 - DDR3 1600 RAM is supported when using Intel 3rd Gen Core i processor.

Note! A 32-bit OS may not fully detect 4 GB of RAM when 4 GB is installed.



1.3.3 Input/Output

- **PCIe slot:** 1 PCIe x16 expansion slot, 1 PCIe x8 expansion slot with x1 or x4 link.
- **PCI Bus:** 5 PCI slots, 32-bit, 33 MHz PCI 2.2 compliant from PCIe to PCI bridge and PCI arbiter.
- **Enhanced parallel port:** Configured to LPT1 or disabled. Standard DB-25 female connector cable is a optional accessory. LPT1 supports EPP/SPP/ECP.
- **Serial port:** Up to six serial ports, one is RS-232/422/485 with hardware auto-flow control and three are RS-232. Two DB-9 connectors located in rear panel are RS-232
- **Keyboard and PS/2 mouse connector:** Two 6-pin mini-DIN connectors are located on the mounting bracket for easy connection to PS/2 keyboard and mouse.
- **USB port:** Supports up to 10 USB 2.0 ports with transmission rates up to 480 Mbps
- **GPIO:** AIMB-701 supports 8-bit GPIO from super I/O for general purpose control application.

1.3.4 Graphics

- *Both dual and quad core processors are integrated Intel HD Graphics.*
- **Display memory:** 1 GB maximum shared memory with 2 GB and above system memory installed
- **DVI-D:** Up to resolution 1920 x 1200 @ 60 Hz refresh rate (Only for G2 version)
- **CRT:** Up to 2048 x 1536 resolution @ 75 Hz refresh rate

1.3.5 Ethernet LAN

- Supports single/dual 10/100/1000 Base-T Ethernet port (s) via PCIe x1 bus which provides a 500 MB/s data transmission rate.
- **Interface:** 10/100/1000 Base-T
- **Controller:** Intel 82579V(PHY) for LAN1, Intel 82583V for LAN2 (G2 version only)

1.3.6 Industrial Features

- **Watchdog timer:** Can generate system reset or NC. 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)
- **Storage temperature:** -20 ~ 70° C (-4 ~ 158° F)
- **Humidity:** 5 ~ 95% non-condensing
- **Power supply voltage:** +3.3 V, +5 V, ±12 V, 5 VSB
- **Power consumption:**
Maximum: +5 V at 1.80A, +3.3 V at 1.01 A, +12 V at 5.48 A, +5 VSB at 1.76 A
(Intel® i7 2600 3.4 GHz processor, 4 GB UNB DDR3 Memory x2pcs)
- **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-701 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
JCMOS1	CMOS Clear
JWDT1	Watchdog reset
PSON1	AT(1-2) / ATX(2-3)
JSETCOM3	COM3 RS-232/422/485 Jumper Setting

Table 1.2: Connectors

Label	Function
LPT1	Parallel port, supports SPP/EPP/ECP mode
LAN1_USB12	LAN1 / USB port 1, 2
LAN2_USB34	LAN2 / USB port 3, 4
VGA1	VGA connector
DVI1	DVI-D connector
COM 1~2 and 4~6	Serial port: RS-232
COM3	Serial port: RS-232/422/485 (9-pin connector)

Table 1.2: Connectors	
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)
JFP2	External speaker / HDD LED connector / SM Bus connector
JFP1	Power switch / reset connector
JCASE1	Case open
VOLT1	Voltage display
	HW monitor
JOBS1	Close: enable OBS alarm
	Open: disable OBS alarm
CPUFAN1	CPU fan connector (4-pin)
SYSFAN1	System fan connector (3-pin)
SYSFAN2	System fan connector (3-pin)
LANLED1	LAN1/2 LED extension connector
AUDIO1	Audio connector
FPAUO1	HD audio front panel pin header
USB56	USB port 5, 6
Label	Function
USB78	USB port 7, 8
USB910	USB port 9, 10 USB Type A
SATA1	Serial ATA1
SATA2	Serial ATA2
SATA3	Serial ATA3
SATA4	Serial ATA4
ATX12V1	ATX 12 V auxiliary power connector (for CPU)
EATXPWR1	ATX 24-pin main power connector (for system)
PCIEX16_1	PCIe x16 slot 1
PCIEX8_1	PCIe x8 slot with x4 or x1 link
PCI1	PCI slot 1
PCI2	PCI slot 2
PCI3	PCI slot 3
PCI4	PCI slot 4
PCI5	PCI slot 5
DIMMA1	Channel A DIMM1
DIMMB1	Channel B DIMM1
SPI_CN1	Update BIOS pin header
SPDIF_OUT1	SPDIF Audio out pin header
JUSBPWR1	USB port 1~4 and KBMS1/KBMS2 power source switch between +5 VSB and +5 V
JUSBPWR2	USB port 5/6/7/8/9/10 power source switch between +5 VSB and +5 V
GPIO1	8 bit GPIO from super I/O
SMBUS1	SM Bus from PCH

1.5 Board Layout: Jumper and Connector Locations

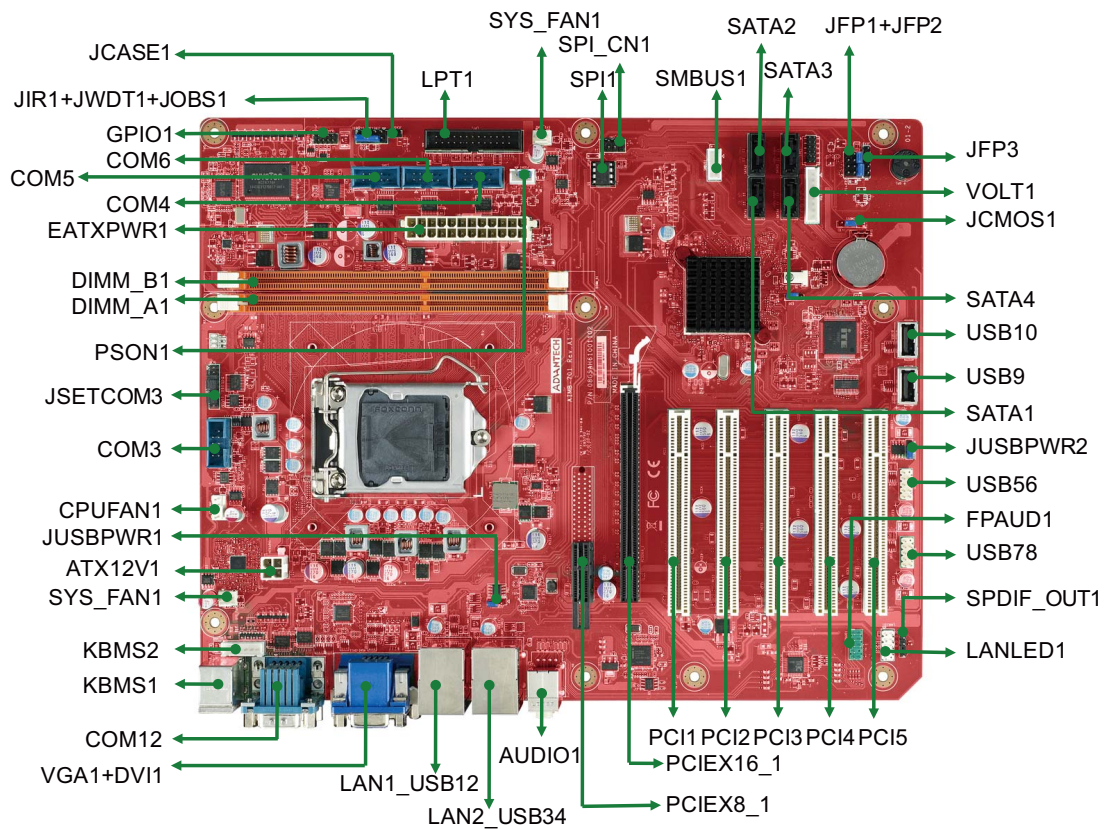


Figure 1.1 Jumper and Connector Locations



AIMB-701G2-00A1E



AIMB-701VG-00A1E

Figure 1.2 I/O connectors

1.6 AIMB-701 Block Diagram

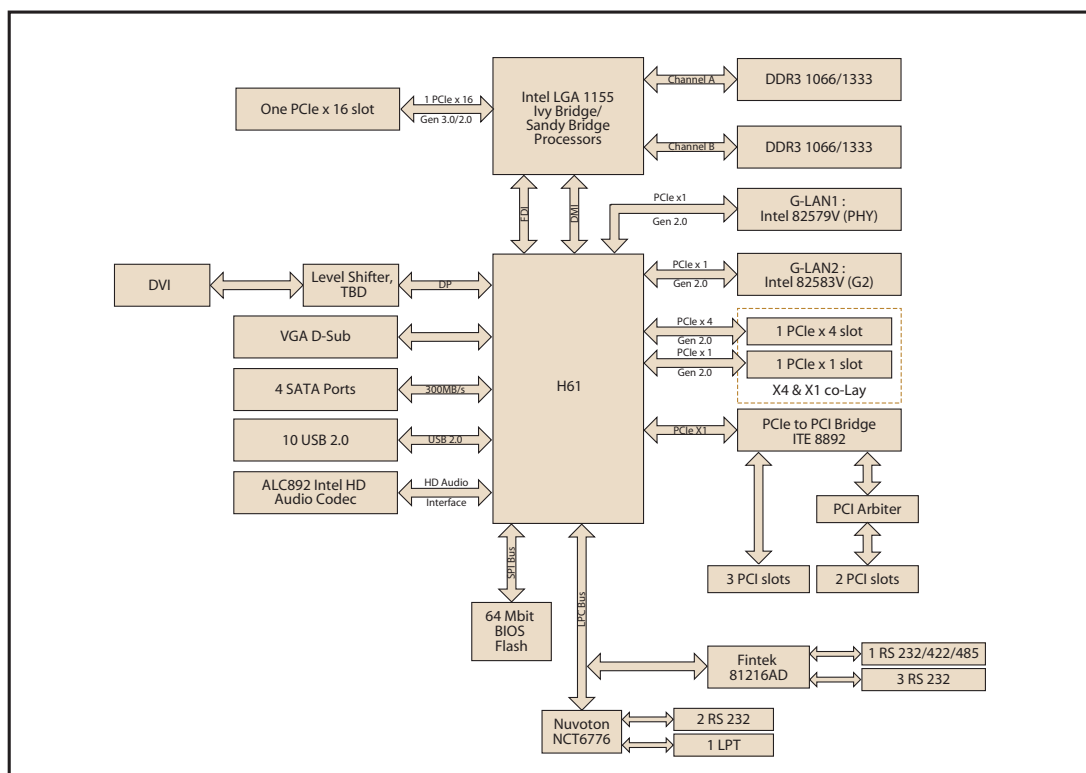


Figure 1.3 AIMB-701 Block Diagram

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 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 motherboard default settings and your options for each jumper.

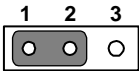
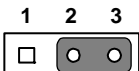
1.8.1 How to set jumpers

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 (JCMOS1)

The AIMB-701 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.

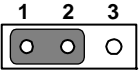
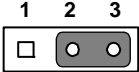
Table 1.3: JCMOS1

Function	Jumper Setting
* Keep CMOS and ME data	 1-2 closed
Clear CMOS and ME data	 2-3 closed
* default setting	

1.8.3 Watchdog timer output (JWDT1)

The AIMB-701 contains a watchdog timer that will reset the CPU. This feature means the AIMB-701 will recover from a software failure or an EMI problem. The JWDT1 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)

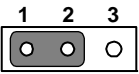
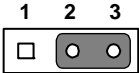
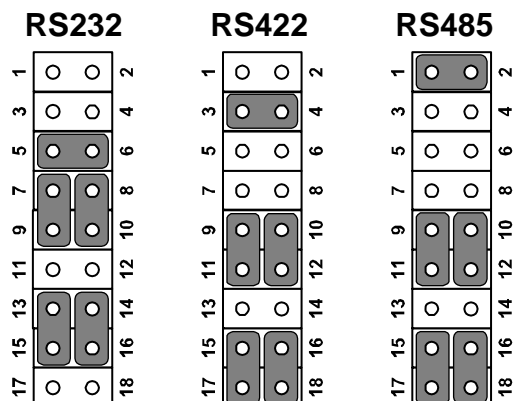
Function	Jumper Setting
AT Mode	 1-2 closed
* ATX Mode	 2-3 closed
* default setting	

Table 1.6: COM3 RS-232/422/485 mode selector (JSETCOM3)

Use JSETCOM3 to select the RS-232/422/485 mode for COM3. The default setting is RS-232.



1.9 System Memory

AIMB-701 has two 240-pin memory sockets for DDR3 1066/1333/1600 MHz memory modules with maximum capacity of 16GB (Maximum 8GB for each DIMM). AIMB-701 only supports non-ECC DDR3 memory modules. Please note that both versions AIMB-701 do NOT support registered DIMMs (RDIMMs).

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-701 supports a CPU with one of the following built-in full speed L3 caches: The built-in third-level cache in the processor yields much higher performance than conventional external cache memories.

- 8 MB for 2nd Generation Intel Core i7-3xxx/2xxx CPU
- 6 MB for 2nd Generation Intel Core i5-3xxx/2xxx CPU
- 3 MB for 2nd Generation Intel Core i3-3xxx/2xxx CPU
- 3 MB for Intel Pentium G8xx CPU

1.12 Processor Installation

The AIMB-701 is designed for LGA1155, Intel Core i7/i5/i3/Pentium processor.

1.13 PCI Bus Routing Table

AD PCI slot INT	PCI1	PCI2	PCI3	PCI4	PCI5
	AD31	AD30	AD29	AD28	AD27
A	B	C	D	A	B
B	C	D	A	B	C
C	D	A	B	C	D
D	A	B	C	D	A

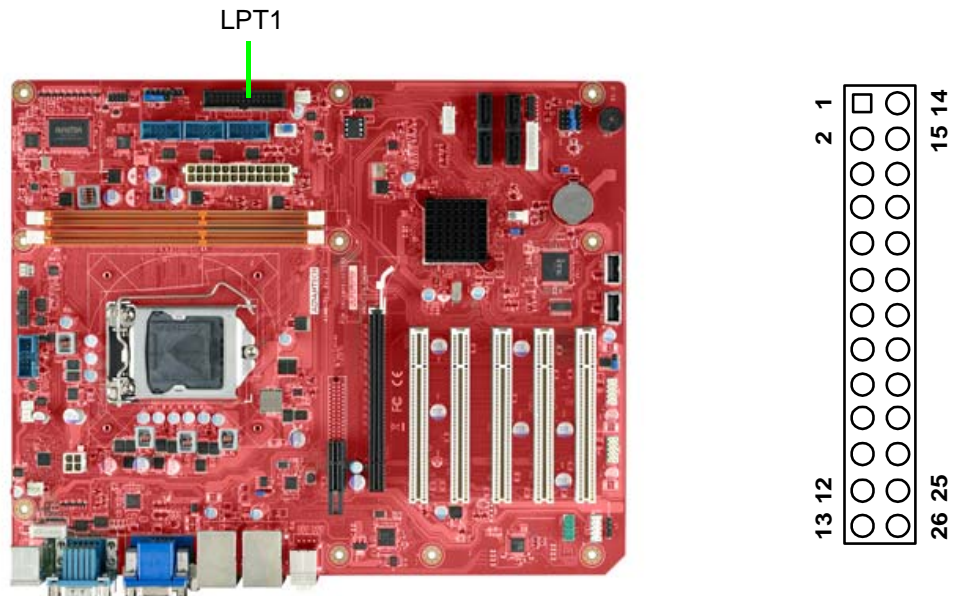
Chapter 2

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 Parallel Port (LPT1)



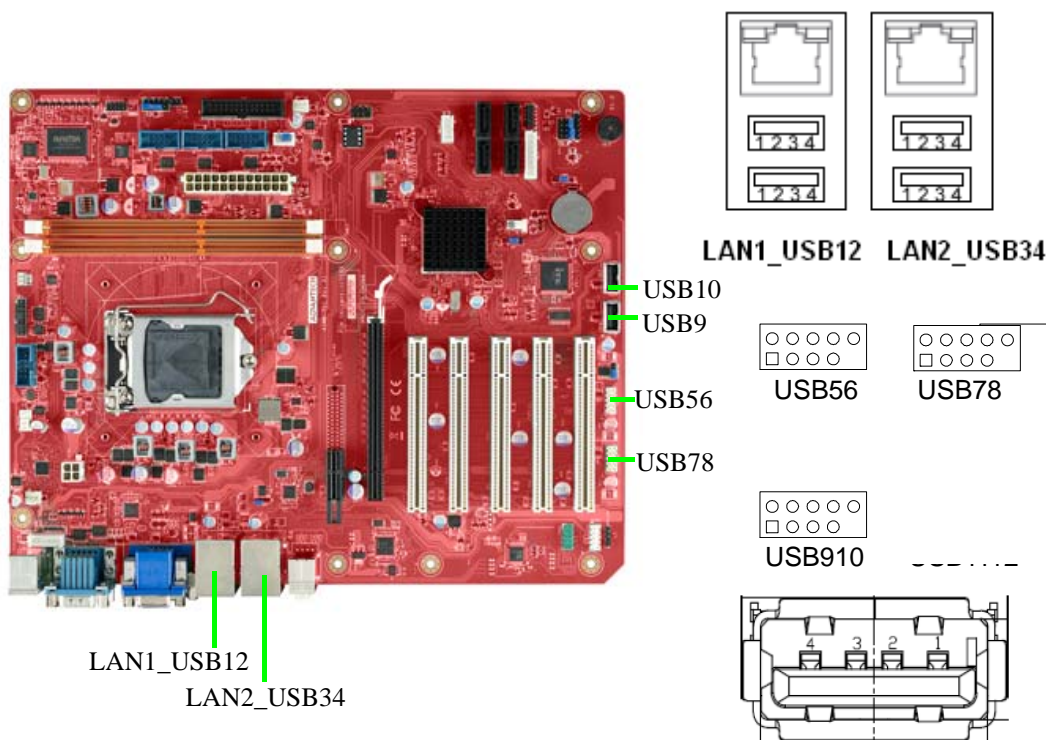
The parallel port is normally used to connect the motherboard to a printer. The AIMB-701 includes an onboard parallel port, accessed through a 25-pin flat-cable connector, LPT1.

2.3 USB Ports (LAN1_USB12, LAN2_USB3/4, USB5/6, USB7/8, USB9/10)

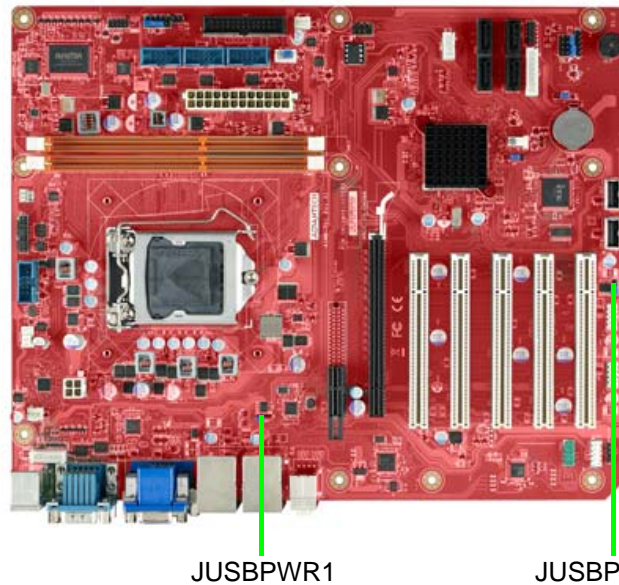
These ports support Plug & Play and hot swapping for up to 127 external devices. The USB ports comply with USB specification rev. 2.0. Transmission rates of up to 480 Mbps and fuse protection are supported. The USB interface can be disabled in the system BIOS setup.

The AIMB-701 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 1000Base-T operation.

If all USB ports will be used, USB power is recommended to switch to +5V instead of +5VSB.



2.4 USB and PS2 Power Switch



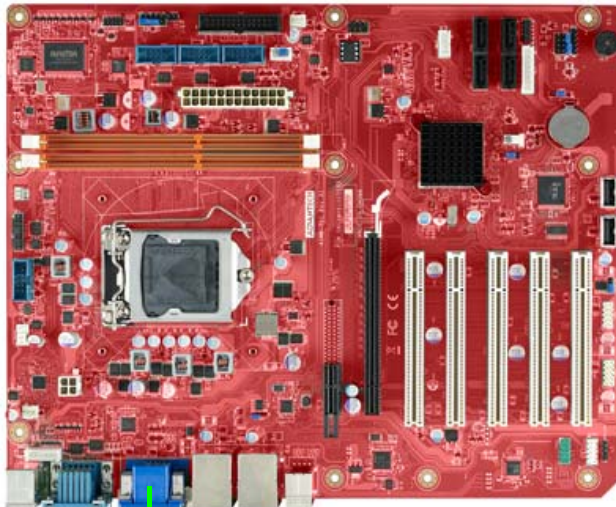
Jumper	USB and PS2 Ports
JUSBPWR1	USB port 1,2,3,4 and KBMS1/KBMS2
JUSBPWR2	USB port 5, 6, 7, 8,9,10

AIMB-701 allows user to set USB and PS/2 power between +5VSB and +5V. When the jumper is set as +5V, the board doesn't support ACPI S3/S4 mode.

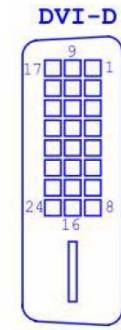
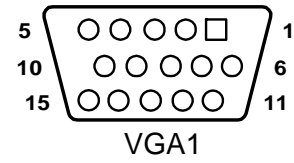
Note! When USB and PS/2 power is switched to +5V, it can't be connected with powered KVM.



2.5 VGA Connector and DVI-D Connector (VGA1+DVI1)

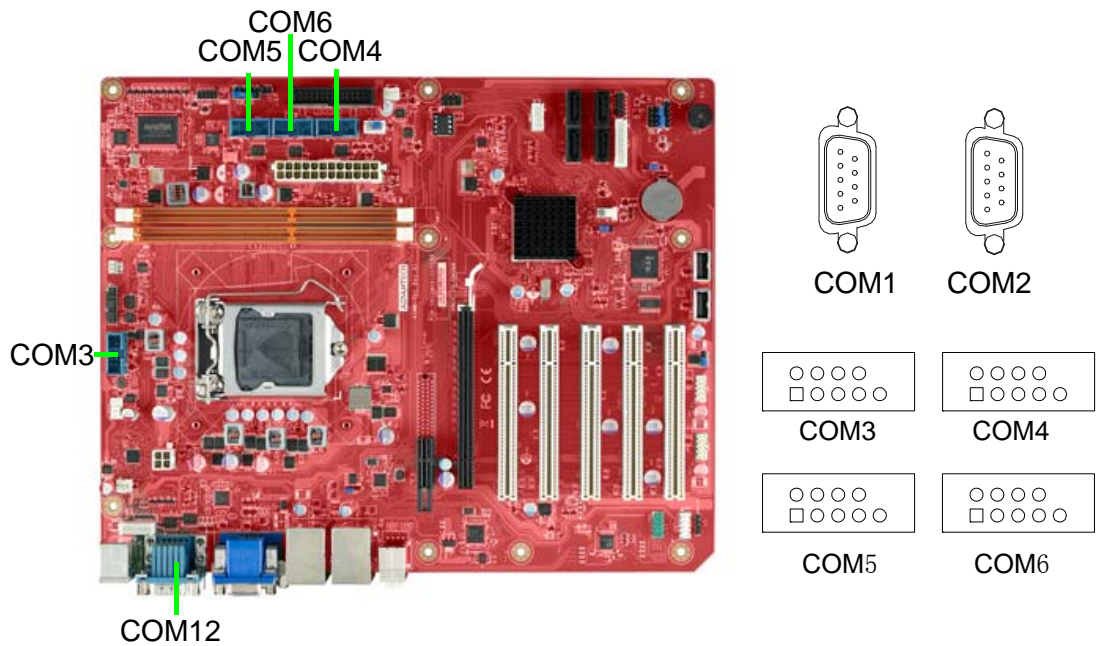


VGA+DVI1



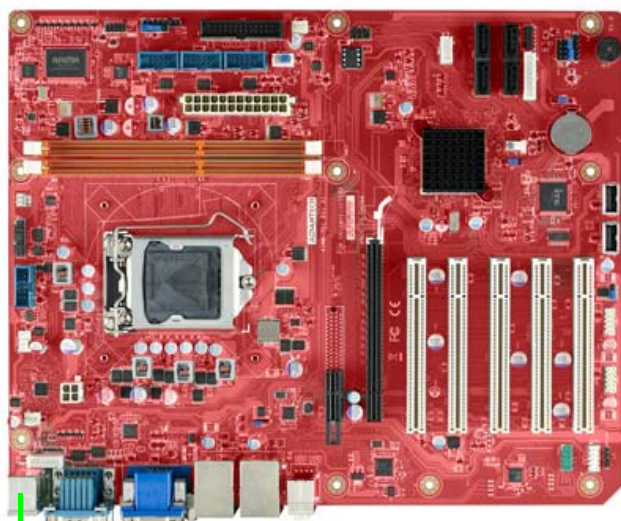
The AIMB-701 includes both VGA and DVI-D interface that can drive conventional CRT and LCD displays. Pin assignments of VGA1 and DVI1 are detailed in Appendix B.

2.6 Serial Ports (COM1, COM2, COM3, COM4, COM5 & COM6)

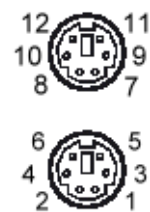


The AIMB-701 offers Six serial ports (two on the rear panel and four onboard) for G2 version and two serial port for VG version. JSETCOM3 is used to select the RS232/422/485 mode for COM3 on G2 version. These ports can connect to a serial mouse, printer or communications network. The IRQ and address ranges for those 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, please be sure to check the pin assignments for the connector.

2.7 PS/2 Keyboard and Mouse Connector (KBMS1)

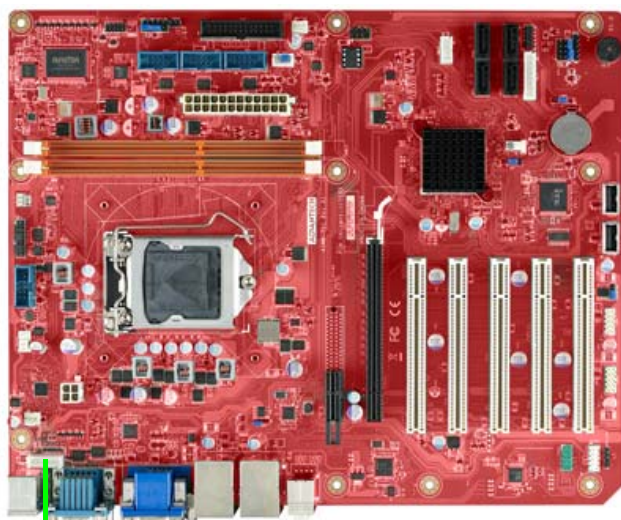


KBMS1

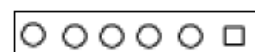


Two 6-pin mini-DIN connectors (KBMS1) on the rear panel of the motherboard provide PS/2 keyboard and mouse connections.

2.8 External Keyboard & Mouse (KBMS2)



KBMS2



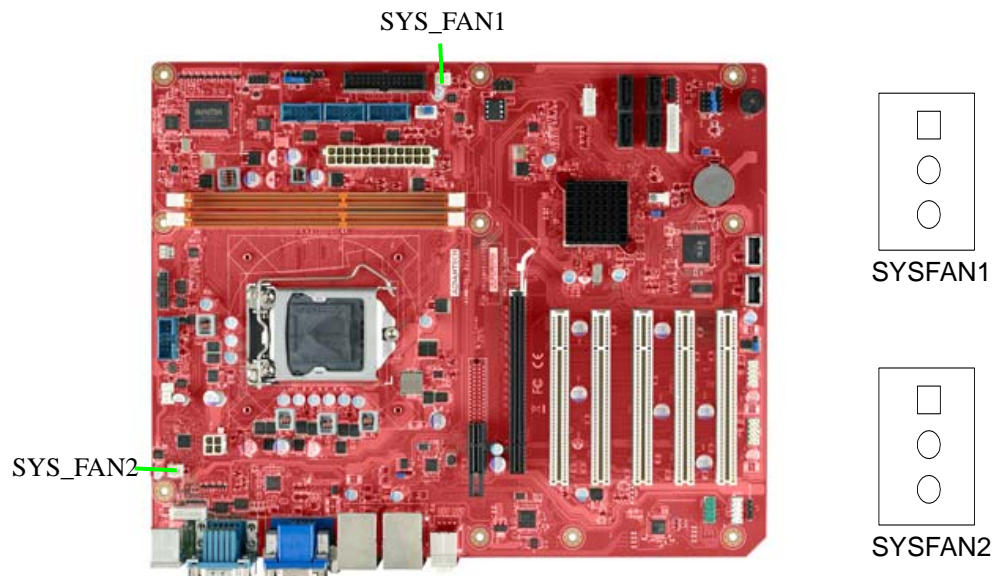
There is also an extra onboard external keyboard and mouse connector on the motherboard. This gives system integrators greater flexibility in designing their systems.

2.9 CPU Fan Connector (CPUFAN1)



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

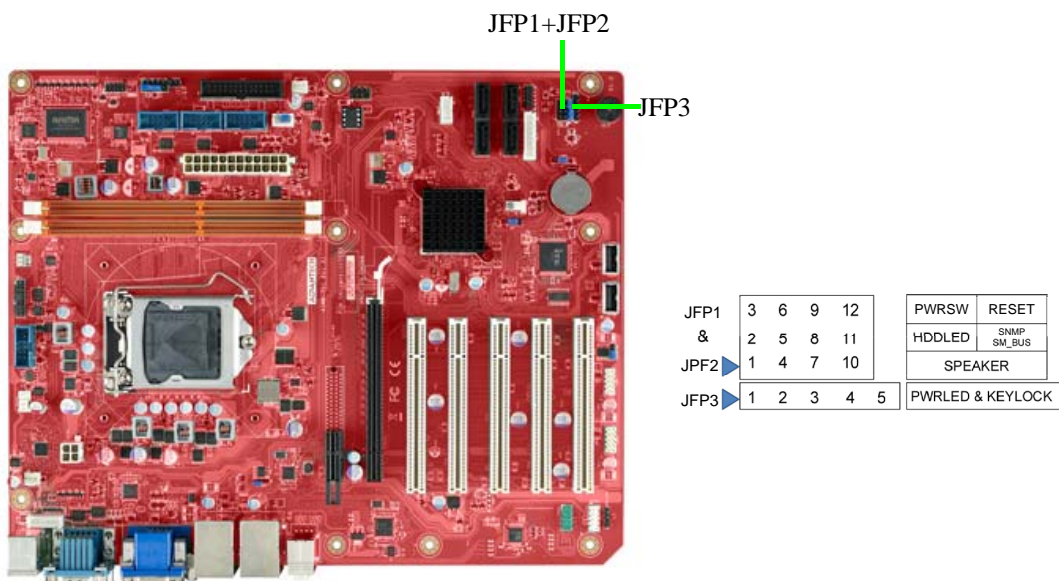
2.10 System FAN Connector (SYSFAN1 and SYSFAN2)



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

2.11 Front Panel Connectors (JFP1, JFP2 & JFP3)

There are several external switches and LEDs to monitor and control the AIMB-701.



2.11.1 Power LED and Keyboard Lock (JFP3)

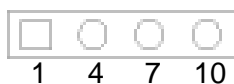
JFP3 is a 5-pin connector for the power LED. Refer to Appendix B for detailed information on the pin assignments. If a PS/2 or ATX power supply is used, the system's power LED status will be as indicated as follows.

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	Off
System Off in deep sleep	Off	Off

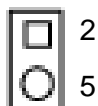
2.11.2 External Speaker (JFP2 pins 1, 4, 7 & 10)

JFP2 is a 8-pin connector for an external speaker. The AIMB-701 provides an onboard buzzer as an alternative. To enable the buzzer, set pins 7-10 as closed.



2.11.3 HDD LED Connector (JFP2 pins 2 & 5)

You can connect an LED to connector JFP2 to indicate when the HDD is active.



2.11.4 SNMP SM_Bus connector (JFP2 pins 8 & 11)

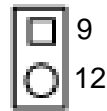
AIMB-701 supports Advantech SNMP-1000 module for providing a platform independent system management. When you're installing SNMP-1000 module on AIMB-701, please connect it to pins 8 and 11 of JFP2.

2.11.5 ATX Soft Power Switch (JFP1 pins 3 & 6)

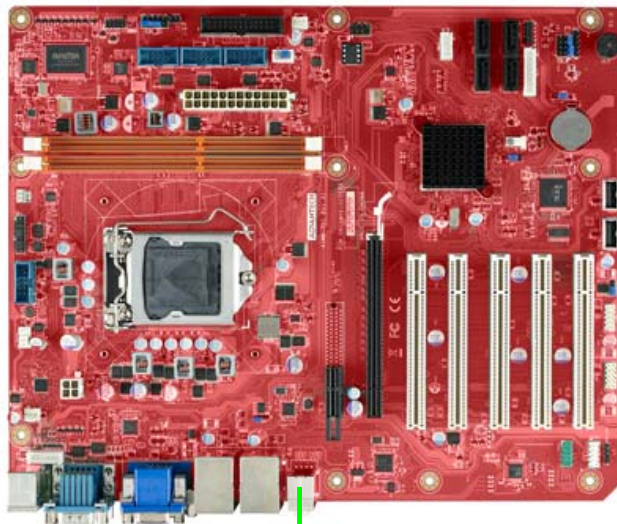
If your computer case is equipped with an ATX power supply, you should connect the power on/off button on your computer case to pins 3 and 6 of JFP1. This connection enables you to turn your computer on and off.

2.11.6 Reset Connector (JFP1 pins 9 & 12)

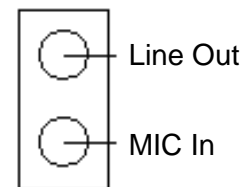
Many computer cases offer the convenience of a reset button.



2.12 Line Out, Mic In Connector (AUDIO1)



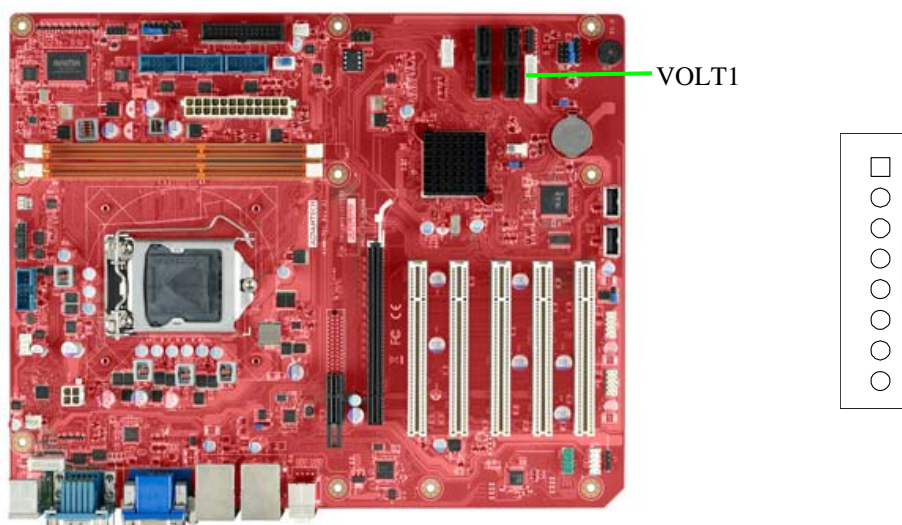
AUDIO1



AUDIO1

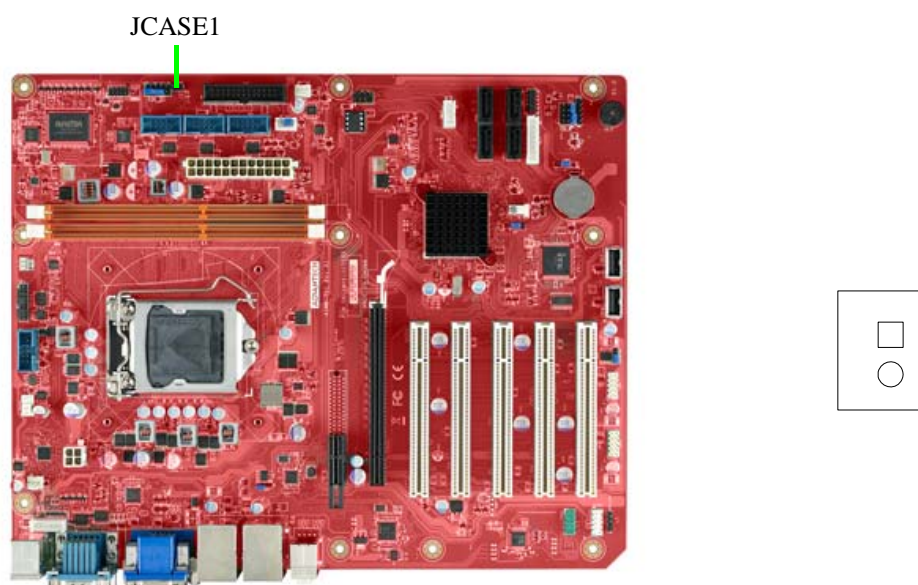
Line Out can be connected to external audio devices like speakers or headphones. Mic In can be connected to a microphone.

2.13 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.

2.14 Case Open Connector (JCASE1)

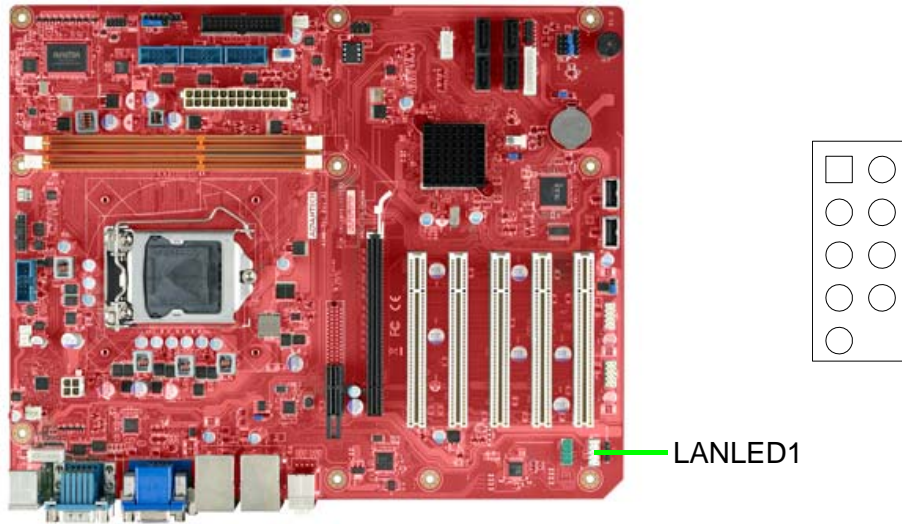


JCASE1 is for chassis with a case open sensor. The buzzer on the motherboard sounds if the case is opened.

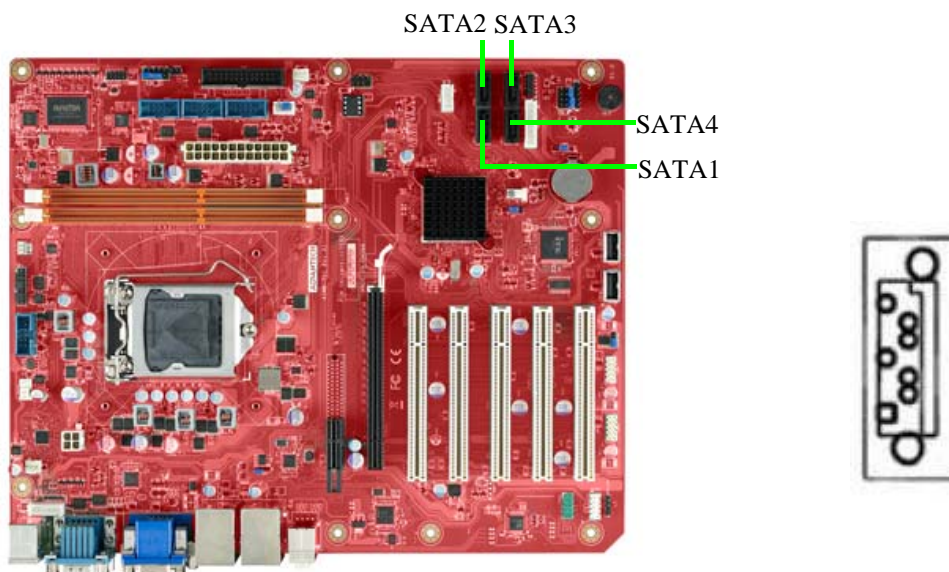
2.15 Front Panel LAN Indicator Connector (LAN_LED1)

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



2.16 Serial ATA Interface (SATA1, SATA2, SATA3, SATA4)

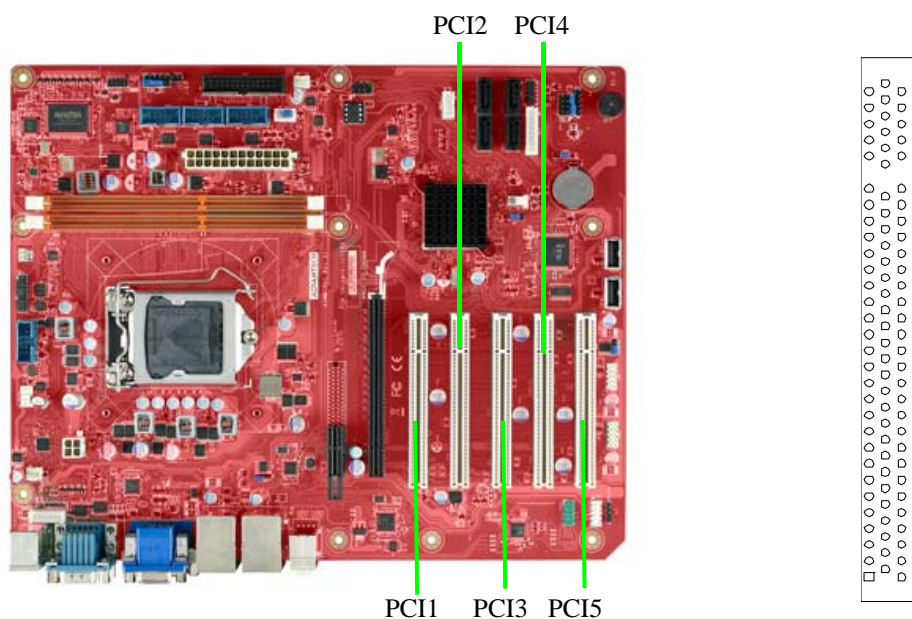


AIMB-701 four high performance serial ATA II interfaces port (up to 300 MB/s, black connector) for both G2 and VG version with long, thin, easy-to-run SATA cables.

Note! AIMB-701 on board SATA only supports Fedora 14 and 15 and SATA mode in BIOS should be set as AHCI mode.

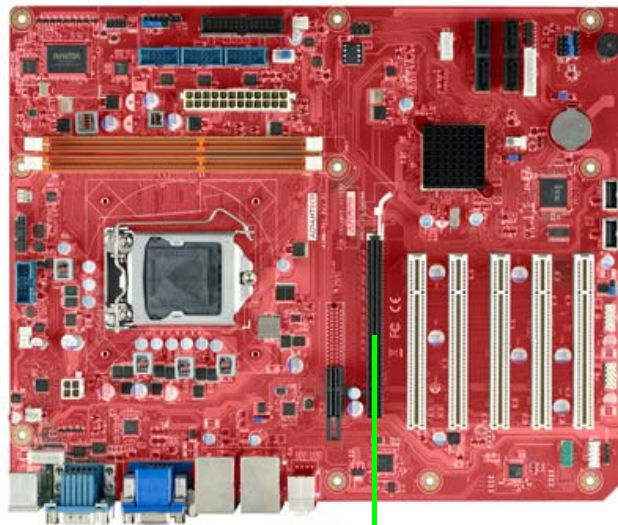


2.17 PCI Slots (PCI1 ~ PCI5)

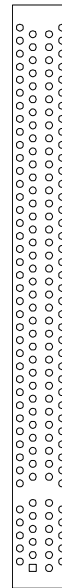


The AIMB-701 provides five 32-bit / 33 MHz PCI slots.

2.18 PCIe x16 Expansion Slot (PCIEX16_1)

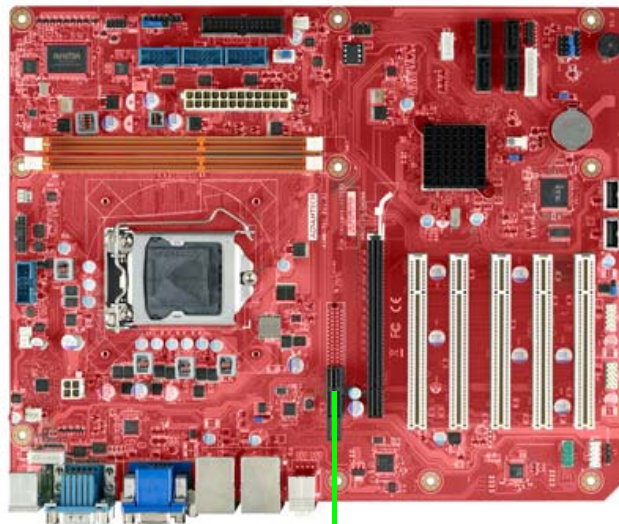


PCIEX16_1



The AIMB-701 provides a PCIe x16 slot for users to install add-on VGA cards when their applications require higher graphics performance than the CPU embedded graphics controller can provide.

2.19 PCIEX8_1

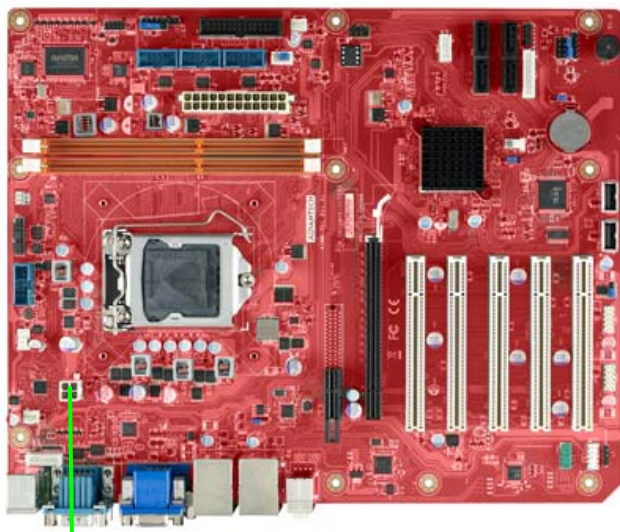


PCIEX8_1

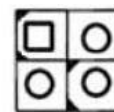
The AIMB-701 provides a PCIe x8 slot with x4(VG version) or x1(G2 version) link for users to install add-on I/O cards.

2.20 Auxiliary 4-pin power connector (ATX12V1)

To ensure the enough power is supplied to the motherboard, one auxiliary 4-pin power connector is available on the AIMB-701. ATX1 must be used to provide sufficient 12 V power to ensure the stable operation of the system.

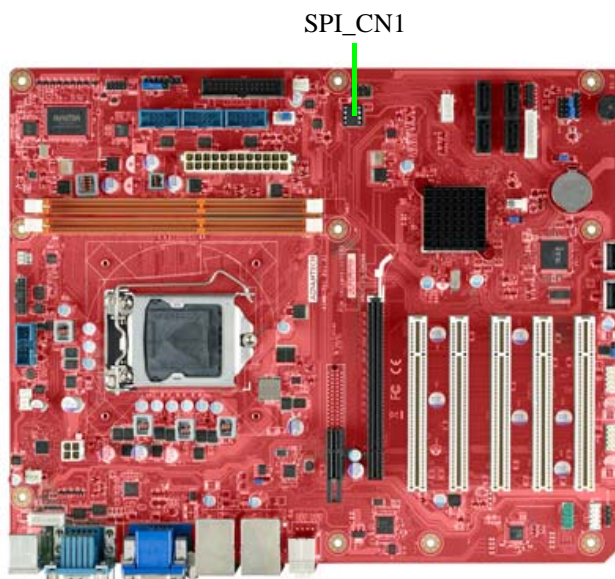


ATX12V1



2.21 SPI Flash connector(SPI_CN1)

SPI flash card pin header which can flash BIOS while AIMB-701 can not be power on and ensures platform integrity.



SPI_CN1

Chapter 3

BIOS Operation

3.1 Introduction

AMIBIOS has been integrated into myriad motherboards for decades. 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-701 setup screens.



Figure 3.1 Main setup screen

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

3.2 Entering BIOS Setup

Press or <F2> at bootup to enter AMI BIOS 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.

When users first enter the BIOS Setup Utility, they enter the Main setup screen. Users can always return to the Main setup screen by navigating to the Main tab. There are two Main Setup options. They are described in this section. The Main BIOS Setup screen is shown below.

3.2.1 Main Menu

Press at bootup 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.



Figure 3.2 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.

3.2.2 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-701 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.

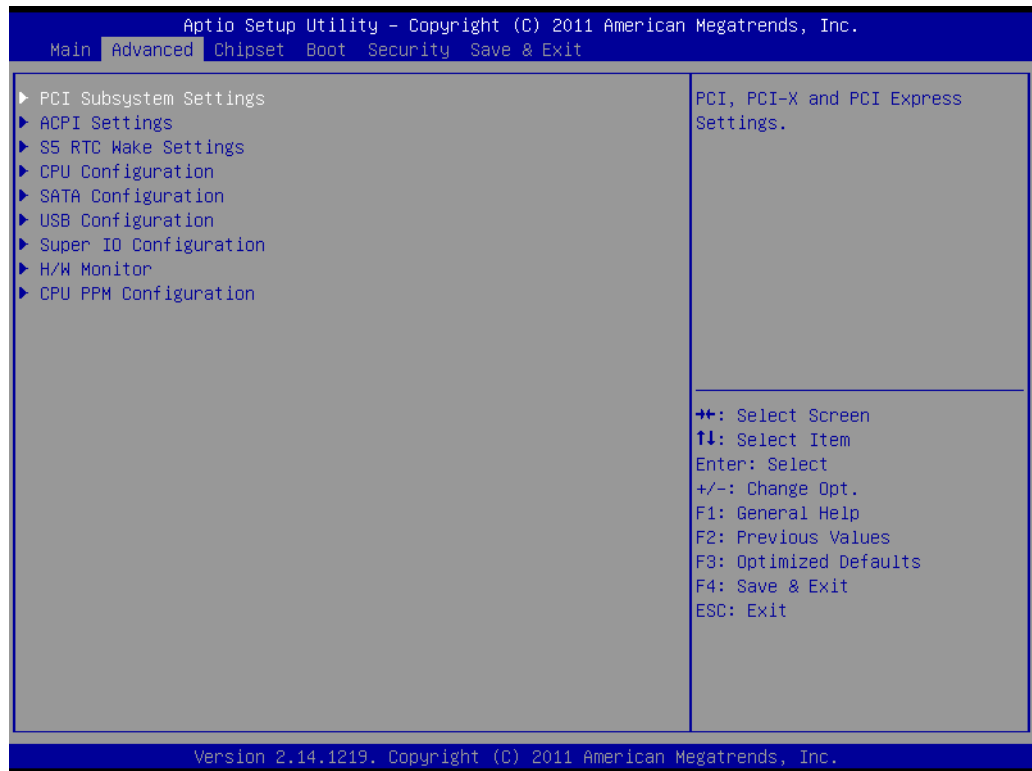


Figure 3.3 Advanced BIOS features setup screen

3.4 PCI Subsystem Settings

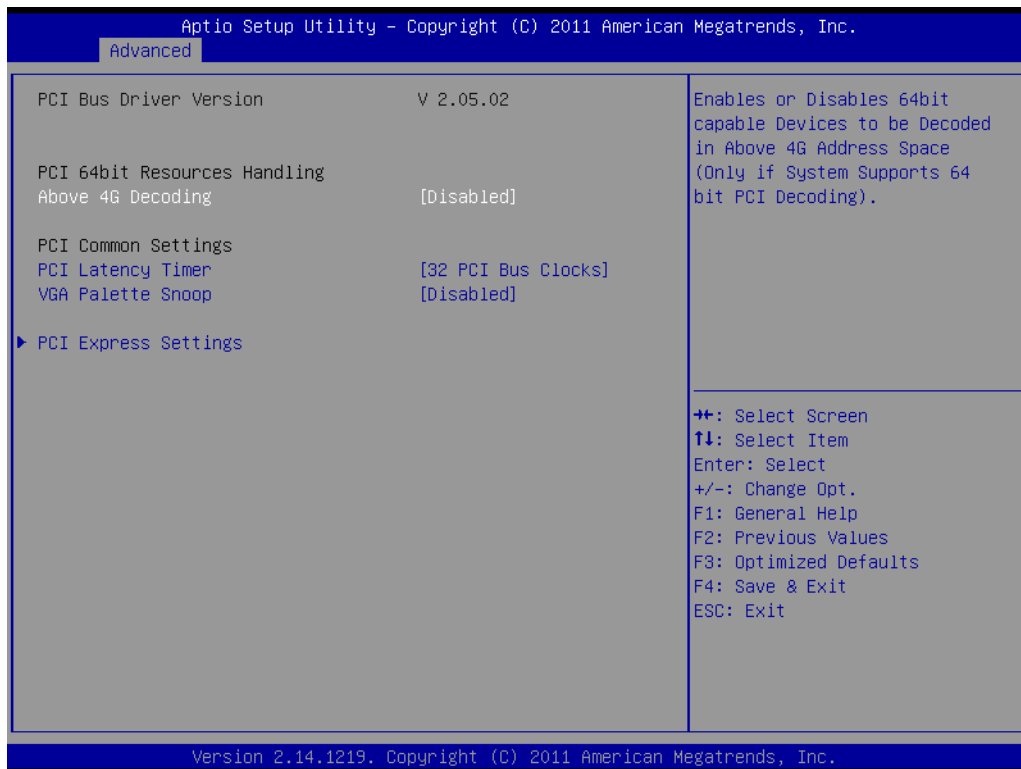


Figure 3.4 PCI subsystem settings screen

Above 4G Decoding

Enable or disable 64bit capable devices to be decoded in above 4G address space when system supports 64 bit PCI decoding.

PCI Latency Timer

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

VGA Palette Snoop

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

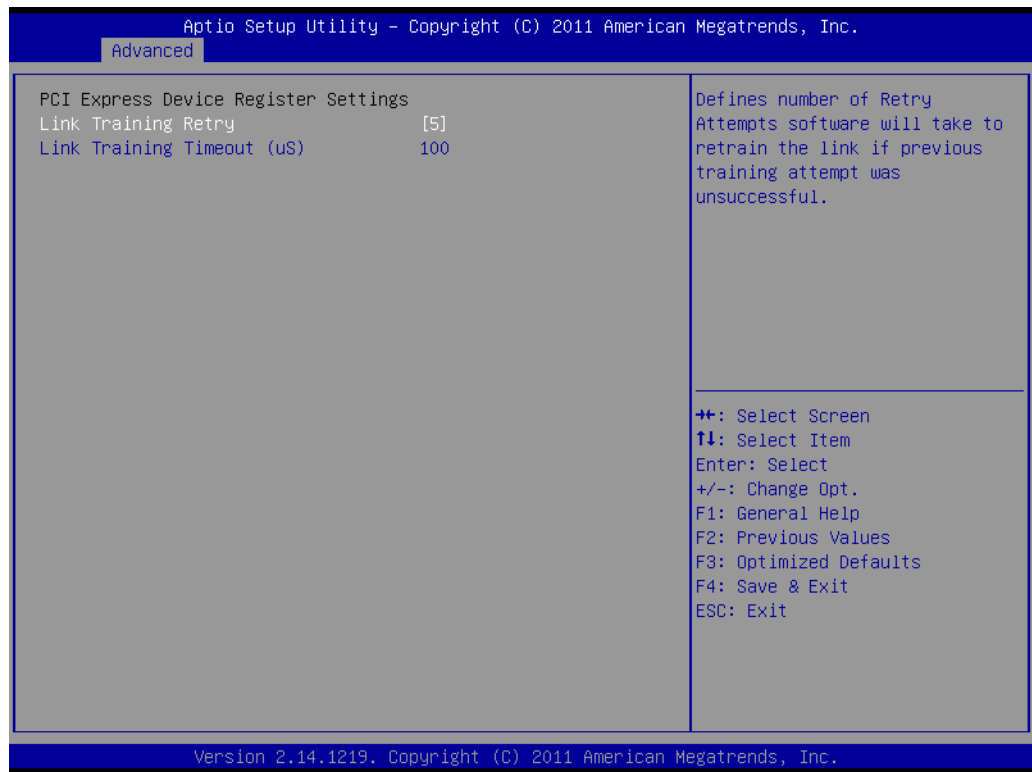


Figure 3.5 PCI Express Setting

Link Training Retry

This item is to allow user to define numbers of retry attempts software will take to retrain the link if previous training attempt was unsuccessful.

Link Training Time out

To define number of microseconds waiting for "Link Training", and the value range is from 10 to 1000 uS.

3.4.1 ACPI Settings

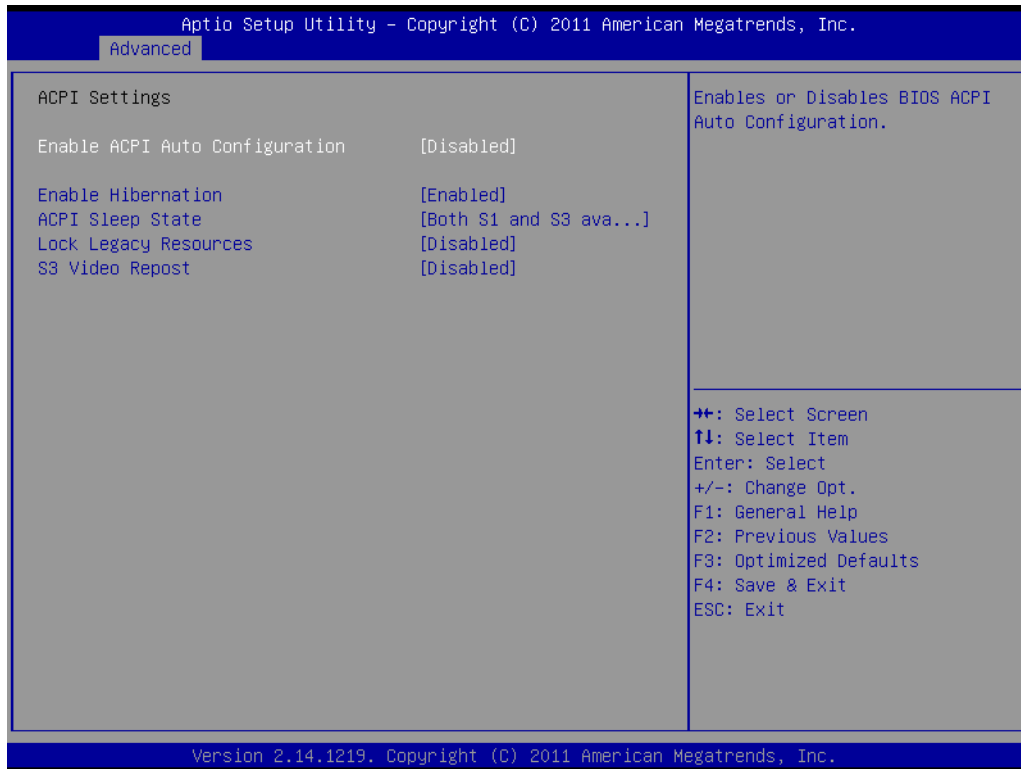


Figure 3.6 ACPI Settings

Enable ACPI Auto Configuration

"Enable" or "disable" ACPI Auto Configuration.

Enable Hibernation

"Enable" or "disable" Hibernation.

ACPI Sleep State

Specifies the ACPI sleep state when the system enters suspend.

Lock Legacy Resources

"Enable" or "Disable" Lock Legacy Resources.

S3 Video Report

"Enable" or "Disable" S3 Video report

3.4.2 S5 RTC Wake Settings



Figure 3.7 S5 RTC Wake Settings

Wake system with Fixed Time

Enable or disable system wake on alarm event. When this item is enabled, system will wake on the Day:Hr:Min:Sec specified.

3.4.3 CPU Configuration

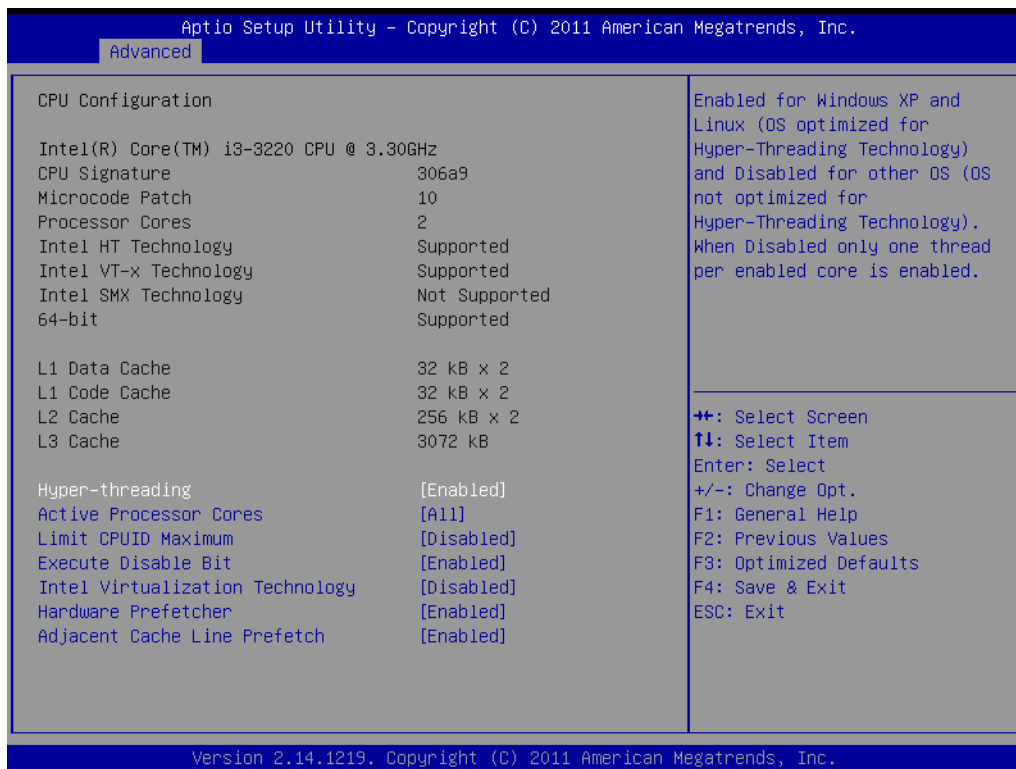


Figure 3.8 CPU Configuration

Hyper-threading

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

Active Processor Core

Use this to select how many processor cores you want to activate when you are using a dual or quad core processor.

Limit CPUID Maximum

Setting this item to [Enable] allows legacy operating systems to boot even without support for CPUs with extended CPUID functions.

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.

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.

Intel Virtualization Technology

This feature is used to enable or disable the Intel Virtualization Technology (IVT) extension. It allows multiple operating systems to run simultaneously on the same system. It does this by creating virtual machines, each running its own x86 operating system.

3.4.4 SATA Configuration

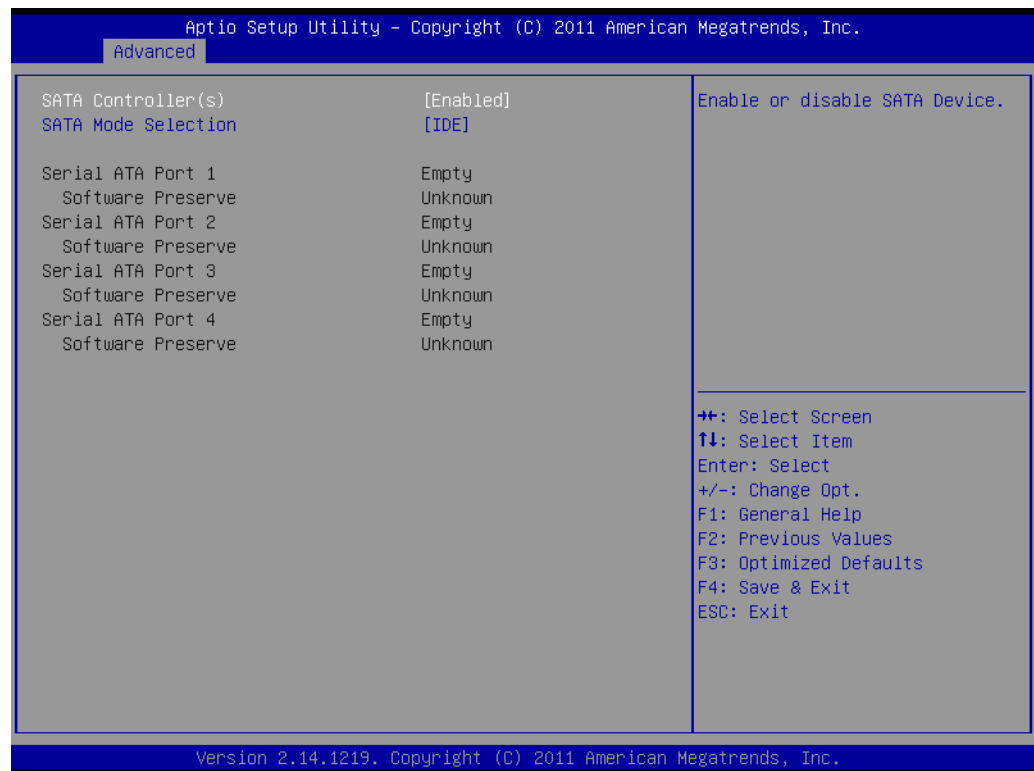


Figure 3.9 SATA Configuration

SATA Controller(s)

This item is to enable or disable SATA devices.

SATA Mode Selection

It may be set as IDE or AHCI when SATA Controllers are enabled.

3.4.5 USB Configuration

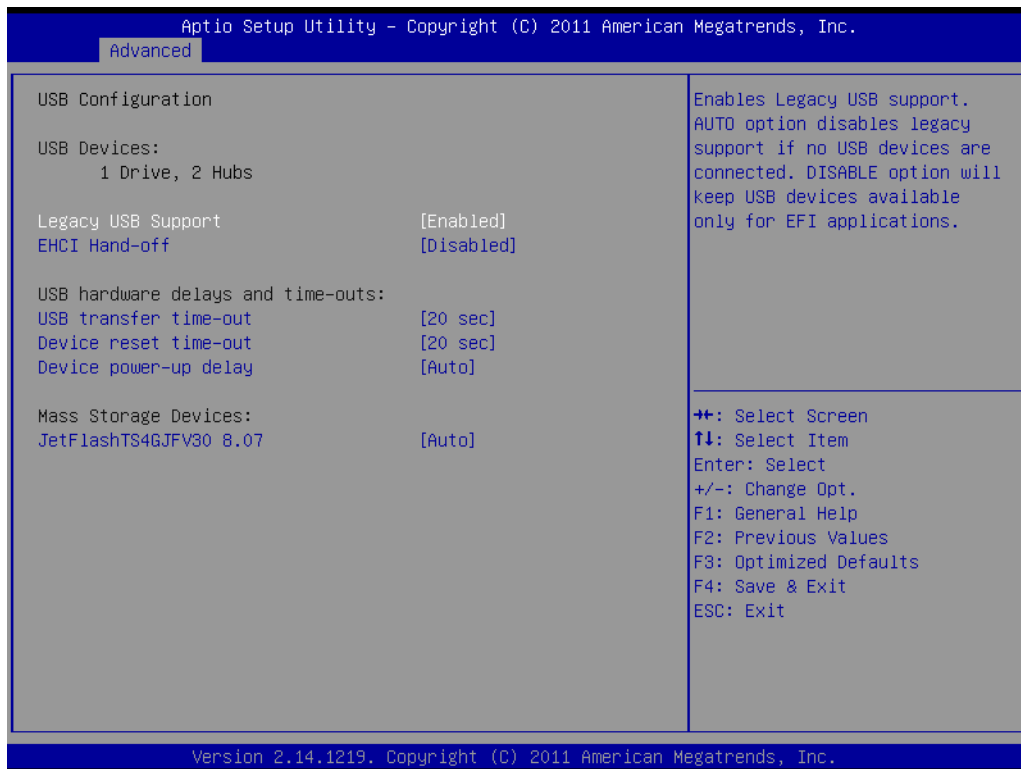


Figure 3.10 USB Configuration

Legacy USB Support

This is for supporting USB device under a legacy OS such as DOS. When choosing "AUTO", the system will automatically detect if any USB device is plugged into the computer and enable USB legacy mode when a USB device is plugged in, and disable USB legacy mode when no USB device is plugged in.

EHCI Hand-off

This enables or disables supporting an OS without EHCI hand-off feature.

USB transfer time-out

Allows you to select the USB transfer time-out value. [1,5,10,20sec]

Device reset time-out

Allows you to select the USB device reset time-out value. [10,20,30,40 sec]

Device power-up delay

This item appears only when you set the Device power-up delay item to [manual].

Mass Storage Devices

Mass storage device emulation type. "Auto" will enumerate devices according to their media formats. Optical drive is emulated as "CDROM", and drives with no media will be emulated according to a drive type.

3.4.6 Super IO Configuration

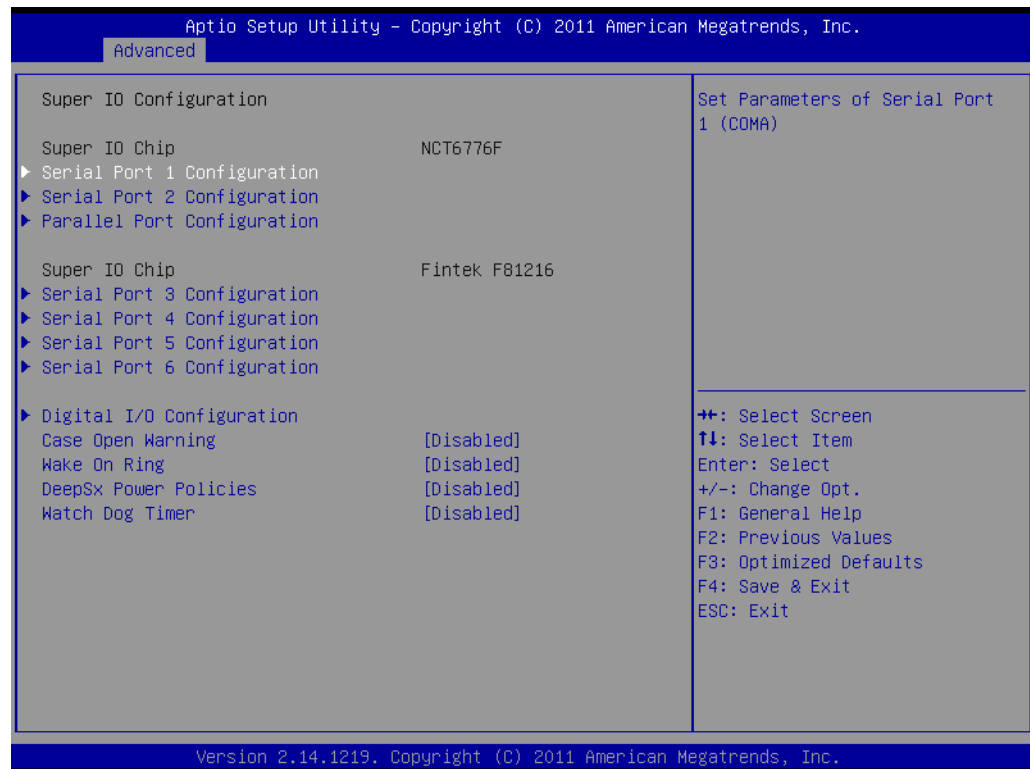


Figure 3.11 Super IO Configuration

Case Open Warning

Enable/Disable the chassis Intrusion monitoring function. When enabled and the case is opened, a warning message will show in post screen.

Wake On Ring

Enable or disable the wake on ring function

Deep Sx Power Policies

Enable or disable Deep Sx feature. When Deep Sx is enabled, most power including 5VSB will be off during deep Sx for energy saving.

Watchdog Timer

Enable and disable the watchdog timer function

Note!



When a system enters G3 status with deep S5 enabled, some power supply's 5VSB won't drop until after more than 30 seconds. If "Restore AC Power Loss" is set to "power on", the system won't boot up in 30 seconds after power failure. We recommend the user waits for more than 30 seconds to power on after a power failure. On the other hand, the system will auto power on if power is restored within 30 seconds, before 5VSB actually drops, even if "Restore AC Power Loss" is set to "power off".

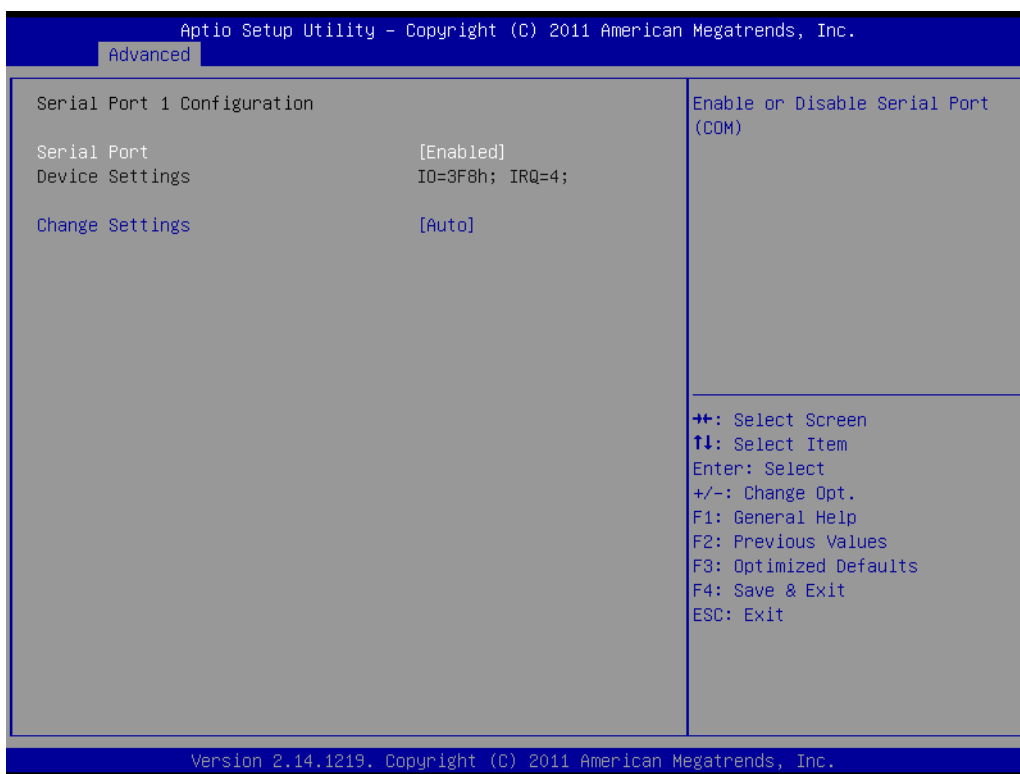


Figure 3.12 Serial Port 1 Configuration

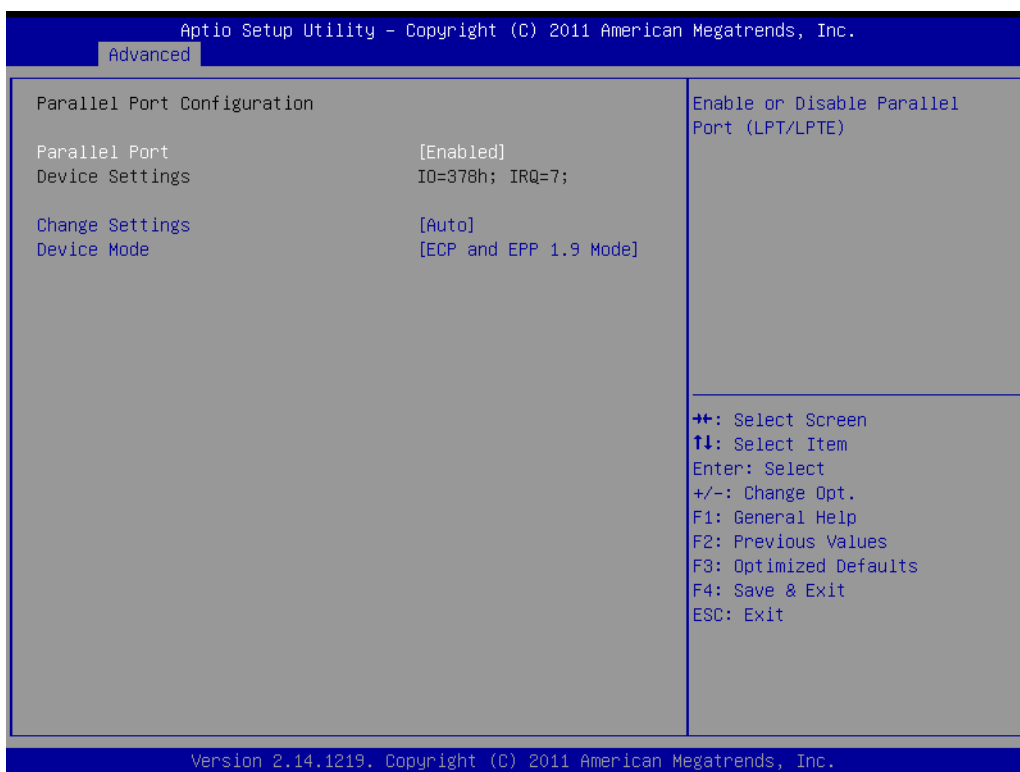


Figure 3.13 Parallel Configuration

Serial Port 1 Configuration

Serial Port

“Enable” or “disable” Serial Port 1.

Change Settings

Select optimal settings for serial port 1.

Serial Port 2 Configuration

Serial Port

“Enable” or “disable” Serial Port 2.

Change Settings

Select optimal settings for serial port 2.

Device Mode

Serial port 2 could be selected as "Standard serial port mode" or "IrDA 1.0 (HP SIR).

Parallel Port

“Enable” or “disable” Parallel Port.

Change Settings

Select optimal settings for parallel port.

Device Mode

To change the printer port mode.

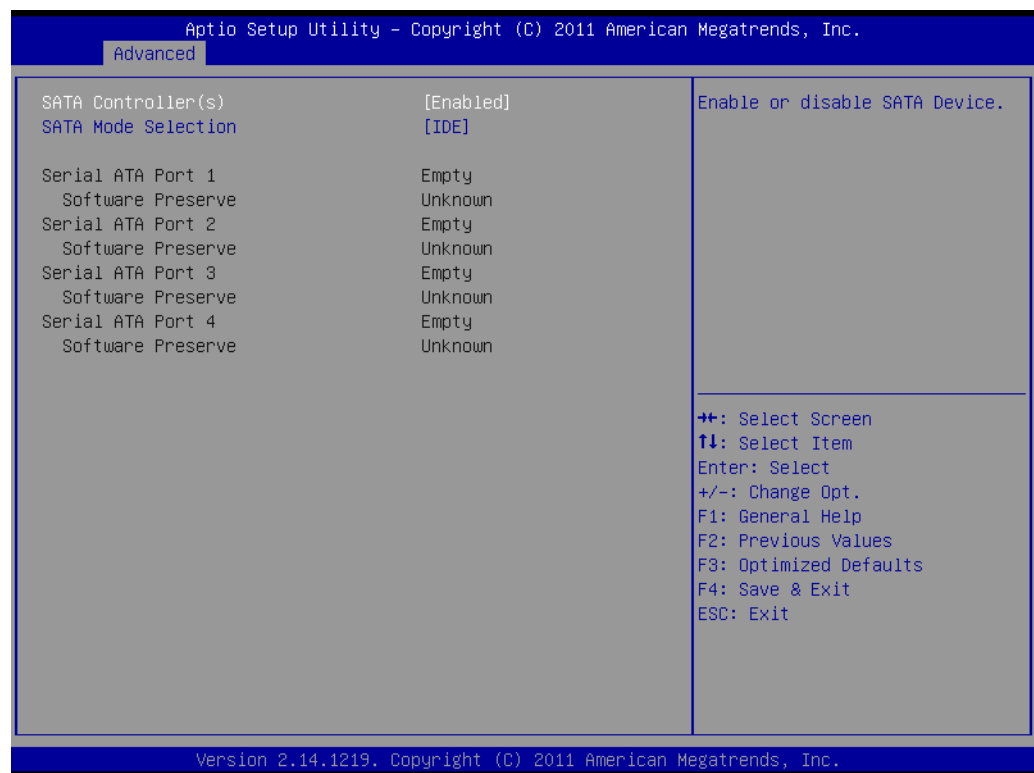


Figure 3.14 Serial Port 3 Configuration

Serial Port

“Enable” or “disable” Serial Port 3.

Change Settings

Select optimal settings for serial port 3.

RS485 AUTO FLOW

Select RS485 auto flow control function for serial port 3.

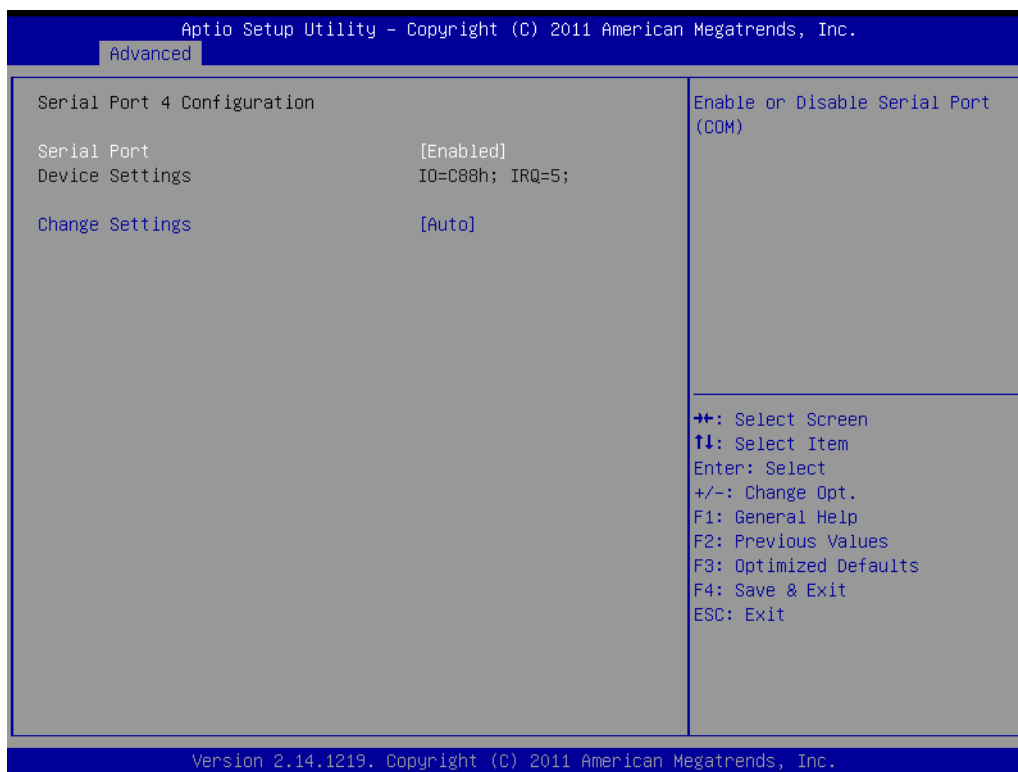


Figure 3.15 Serial Port 4~6 Configuration

Serial Port

“Enable” or “disable” Serial Port 4~6.

Change Settings

Select optimal settings for serial port 4~6.

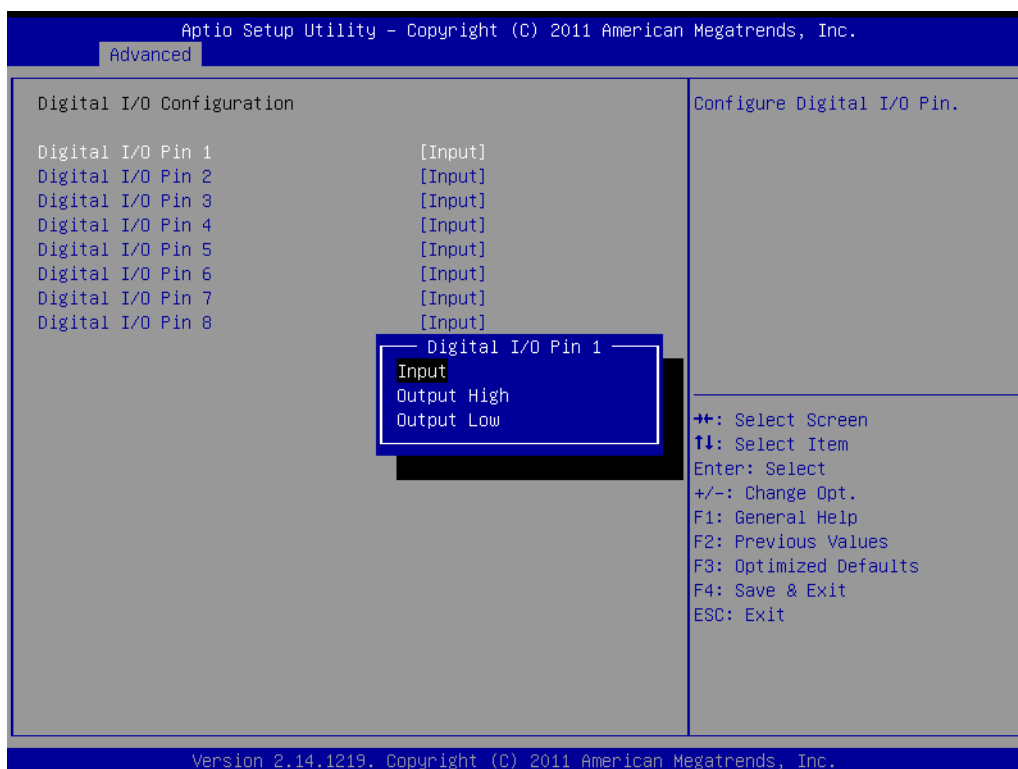


Figure 3.16 Digital I/O Configuration

Digital I/O Pin 1~8

This item is to set digital I/O pin 1~8 as "Input", "Output High", or "Output Low"

3.4.7 H/W Monitor

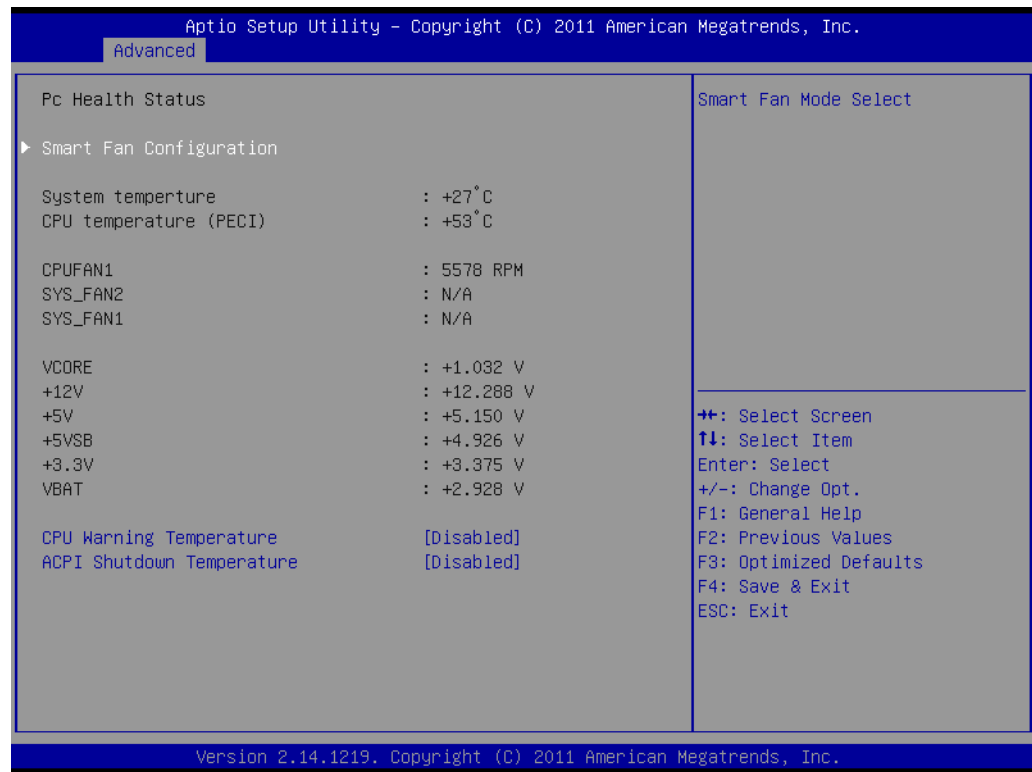


Figure 3.17 PC Health Status

CPU temperature (PECI)

CPU Temperature showed here is CPU T-junction temperature via PEFI.

CPU Warning Temperature

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

ACPI Shutdown Temperature

Use this to set the ACPI shutdown temperature threshold. When the system reaches the shutdown temperature, it will be automatically shut down by ACPI OS to protect the system from overheat damage.

Smart Fan Mode Configuration

“Enable” or “Disable” CPU FAN and System FAN Mode to SMART FAN setting.



Figure 3.18 Smart Fan Mode Configuration

CPU Smart Fan

To enable or disable CPU smart fan.

System Smart Fan

To enable or disable system smart fan1.

Chassis Smart Fan

To enable or disable system smart fan2.

3.4.8 CPU PPM Configuration

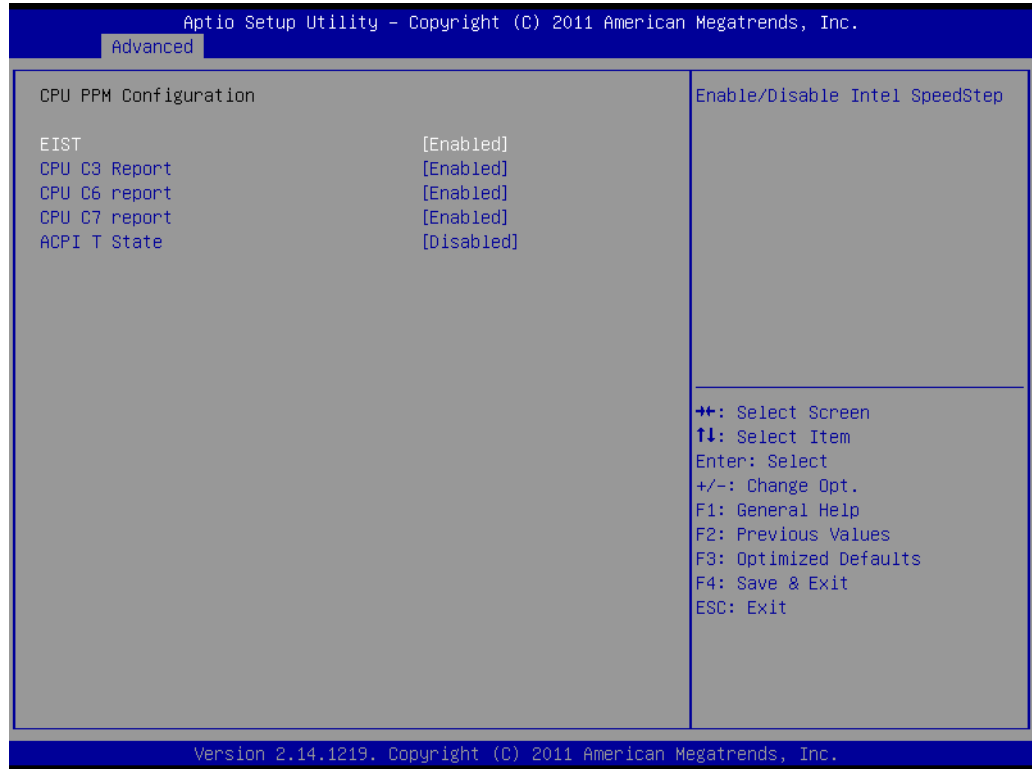


Figure 3.19 CPU PPM Configuration

EIST

Enable or disable Intel Speedstep function.

CPU C3 Report

Enable/disable CPU C3(ACPI C2) report to OS CPU

CPU C6 Report

Enable/disable CPU C6(ACPI C3) report to OS CPU

CPU C7 Report

Enable/disable CPU C7(ACPI C3) report to OS CPU

ACPI T State

Enable/disable ACPI T state

3.5 Chipset



Figure 3.20 Chipset

3.5.1 PCH-IO Configuration



Figure 3.21 PCH-IO Configuration

Onboard LAN1/LAN2 Controller

Enable or disable onboard LAN1/LAN2.

LAN1/LAN2 Option-ROM

Enable or disable boot options for legacy network devices.

Wake on LAN1 from S5

Enable or disable LAN1 wake up from S5.

PCIE Wake

To enable or disable PCIE to wake the system from S5.

High Precision Timer

To enable or disable the high precision event timer.

SLP_S4 Assertion Width

To select a minimum assertion width of the SLP_S4 signal.

Restore AC Power Loss

To select AC power state when power is re-applied after a power failure.

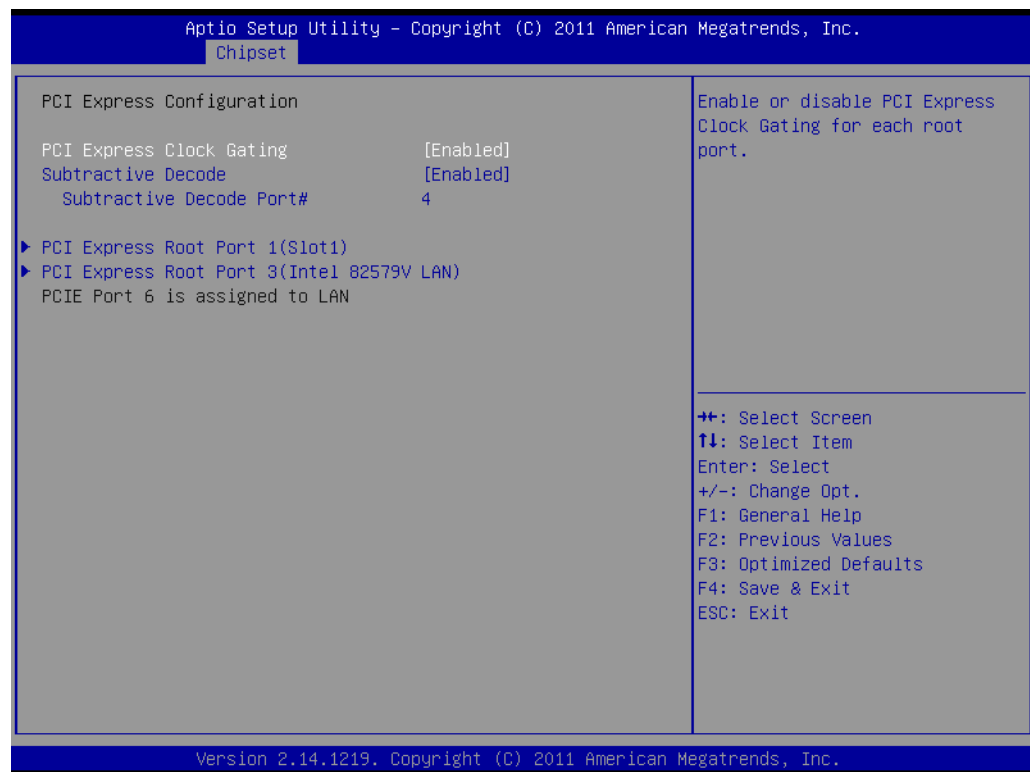


Figure 3.22 PCI Express Configuration

PCI Express Clock Gating

Enable or disable PCI Express Clock Gating for each port

Subtractive Decode

Enable or disable PCI Express Subtractive Decode.

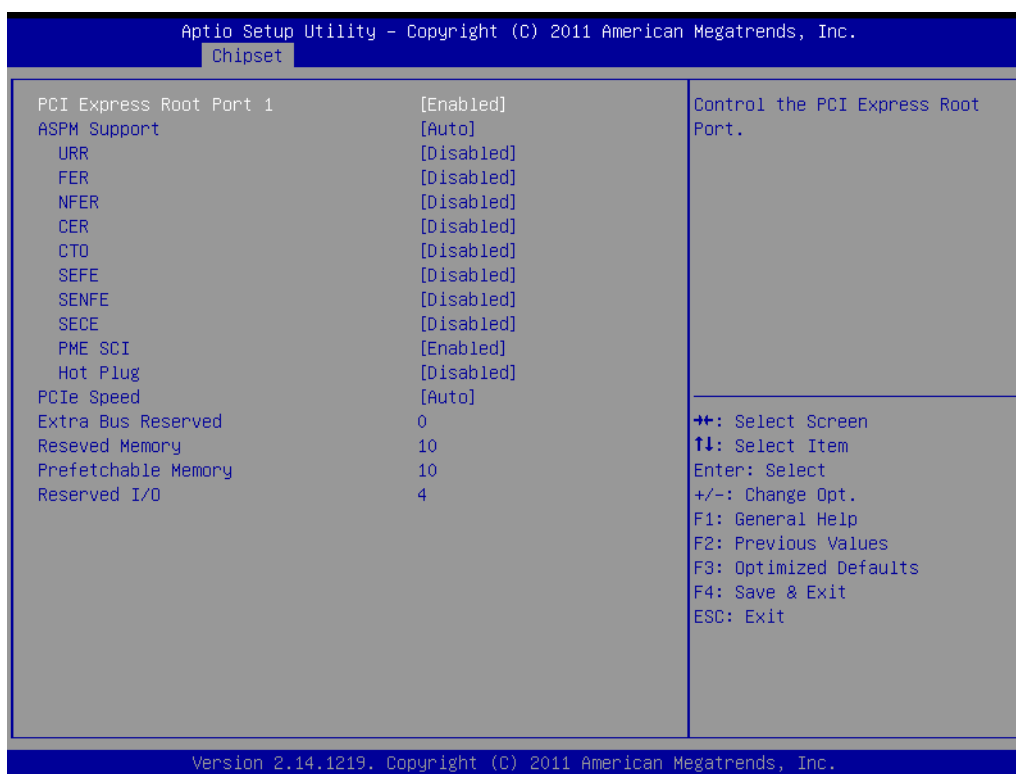


Figure 3.23 PCI Express Configuration

PCI Express Root Port 1

To enable or disable PCI Express Root Port 1

ASPM Support

To set ASPM level for PCI Express Root Port 1 : Force L0s - Force all links to L0s State : AUTO - BIOS auto configure : DISABLE - Disables ASPM

URR

Enable or disable PCI Express Unsupported Request Reporting.

FER

Enable or disable PCI Express Device Fatal Error Reporting.

NFER

Enable or disable PCI Express Device Non-Fatal Error Reporting.

CER

Enable or disable PCI Express Device Correctable Error Reporting.

CTO

Enable or disable PCI Express Completion Timer TO.

SEFE

Enable or disable Root PCI Express System Error on Fatal Error.

SENFE

Enable or disable Root PCI Express System Error on Non-Fatal Error.

SECE

Enable or disable Root PCI Express System Error on Correctable Error.

PME SCI

Enable or disable PCI Express PME SCI.

Hot Plug

Enable or disable PCI Express Hot Plug.

PCIe Speed

Select PCI Express port speed.

Extra Bus Reserved

Extra Bus Reserved for bridges behind this Root Bridge.

Reseved Memory

Reserved Memory Range for this Root Bridge.

Prefetchable Memory

Prefetchable Memory Range for this Root Bridge.

Reserved I/O

Reserved I/O (4K/8K/12K/16K/20K) Range for

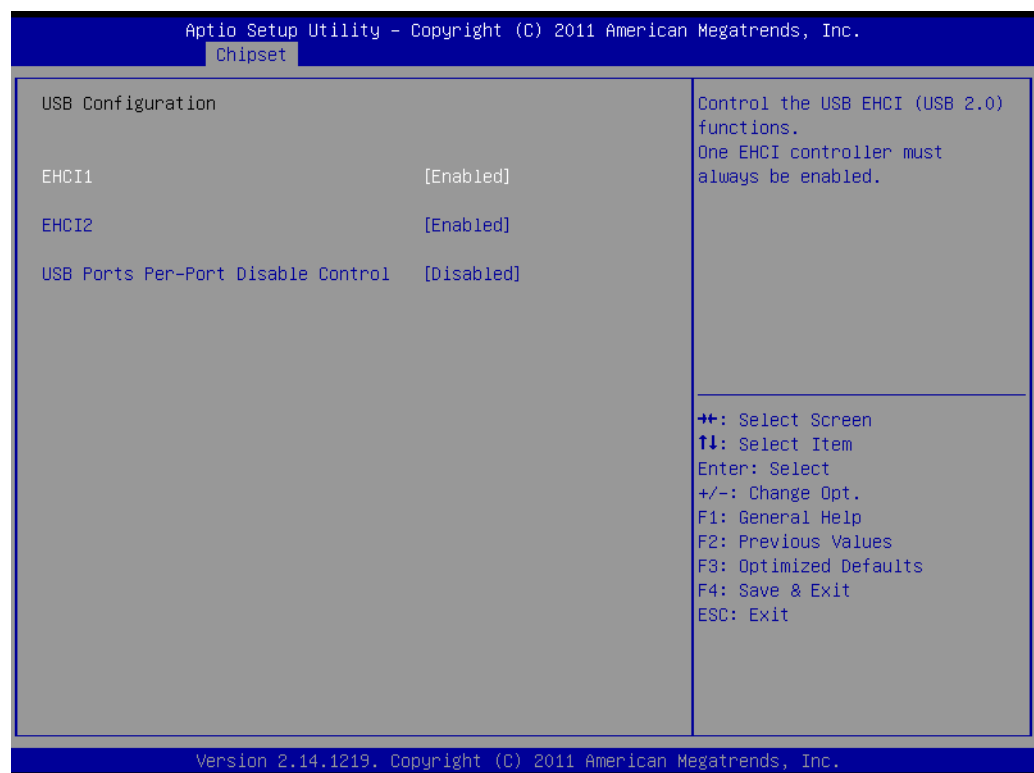


Figure 3.24 USB Configuration

EHCI1 and EHCI2

“Enable” or “Disable” EHCI Controller 1 or 2.

USB Ports Pre-Port Disable Control

To enable or disable USB port#1~10.



Figure 3.25 PCH Azalia

Azalia

Control detection of Azalia device.

3.5.2 System Agent (SA) Configuration

Figure 3.26 System Agent (SA) Configuration

3.5.2.1 Graphics Configuration

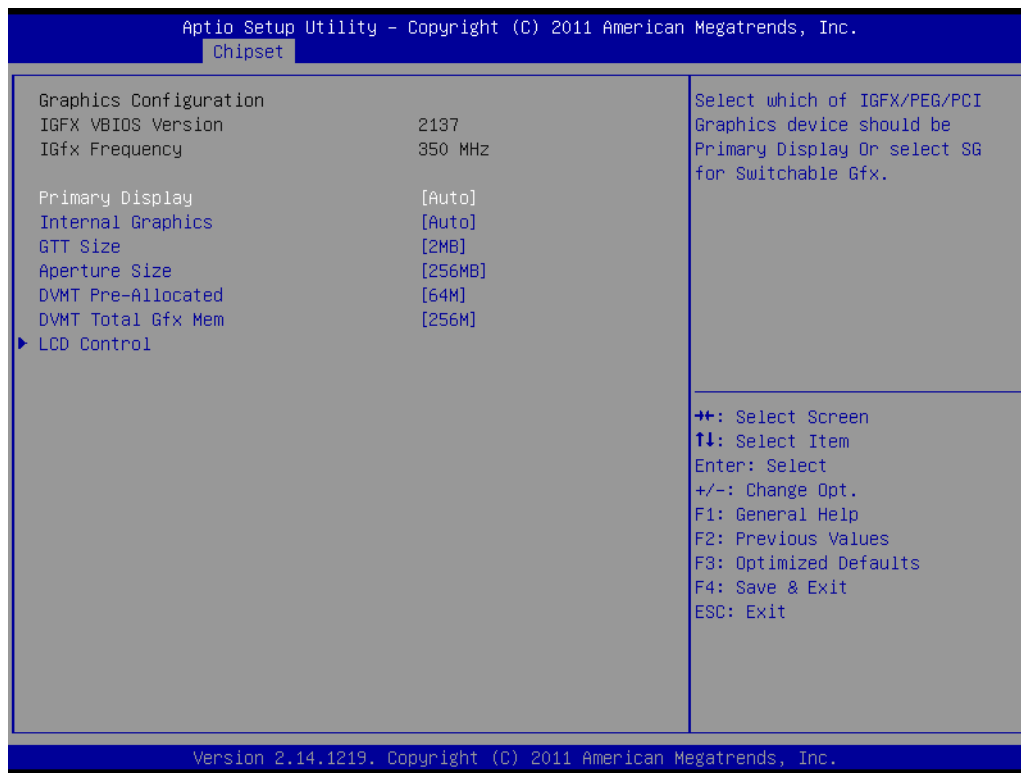


Figure 3.27 Graphics Configuration

Primary Display

To select which graphics device,IGFX/PEG/PCI should be primary display or select SG for switchable Gfx.

Internal Graphics

To enable/disable/Auto the internal graphics.

GTT Size

This item it so set the amount of main memory that is pre-allocated to support the Internal Graphics Translation Table.

Aperture Size

This item is to determine the size of the graphics memory aperture in function 0 and in the trusted space.

DVMT Pre-Allocated

This item is to select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.

DVMT Total Gfx Mem

This item is to select DVMT5.0 Total Graphic Memory size used by the Internal Graphics Device.



Figure 3.28 LCD Control

Primary IGFX Boot Display

To select the video device which will be activated during post. There are three options, [VBIOS Default], [CRT], or [DVI] for G2 sku.

3.5.2.2 NB PCIe Configuration

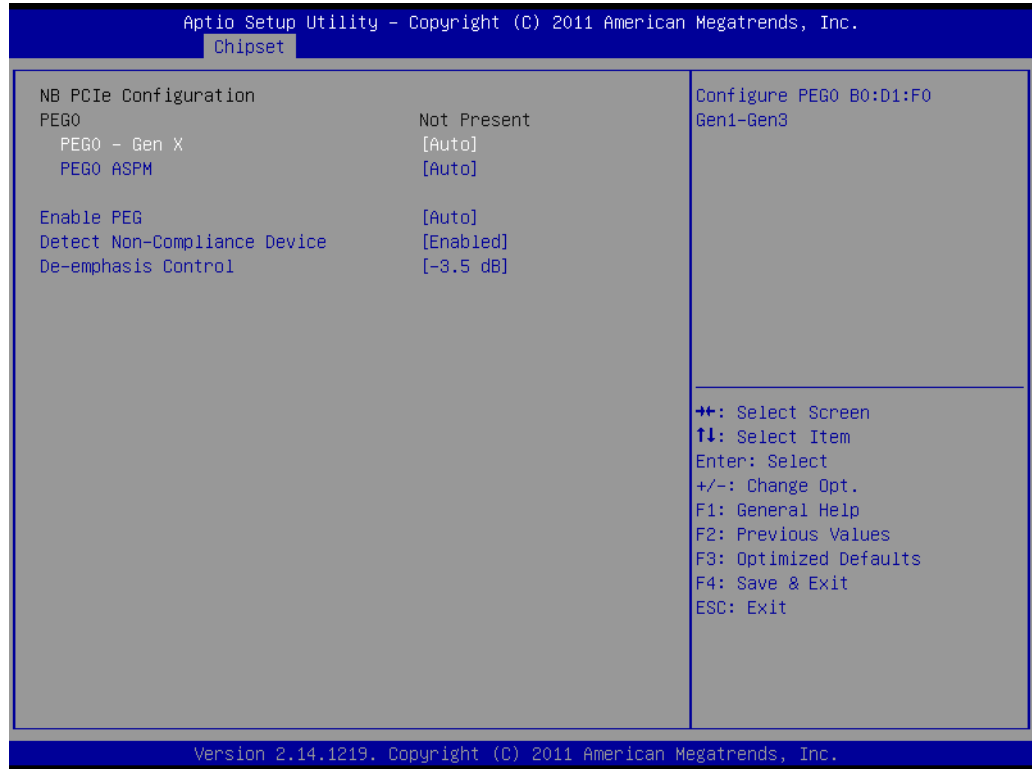


Figure 3.29 NB PCIe Configuration

PEG0 - Genx

To configure PEG from Gen1 to Gen3.

PEG0 ASPM

To control ASPM support for the PEG Device , and this item has no effect if PEG is not the currently active device.

Detect Non-Compliance Device

Detect Non-Compliance PCI Express Device in PEG.

De-emphasis control

To configure the De-emphasis control on PEG.

3.5.2.3 Memory Configuration

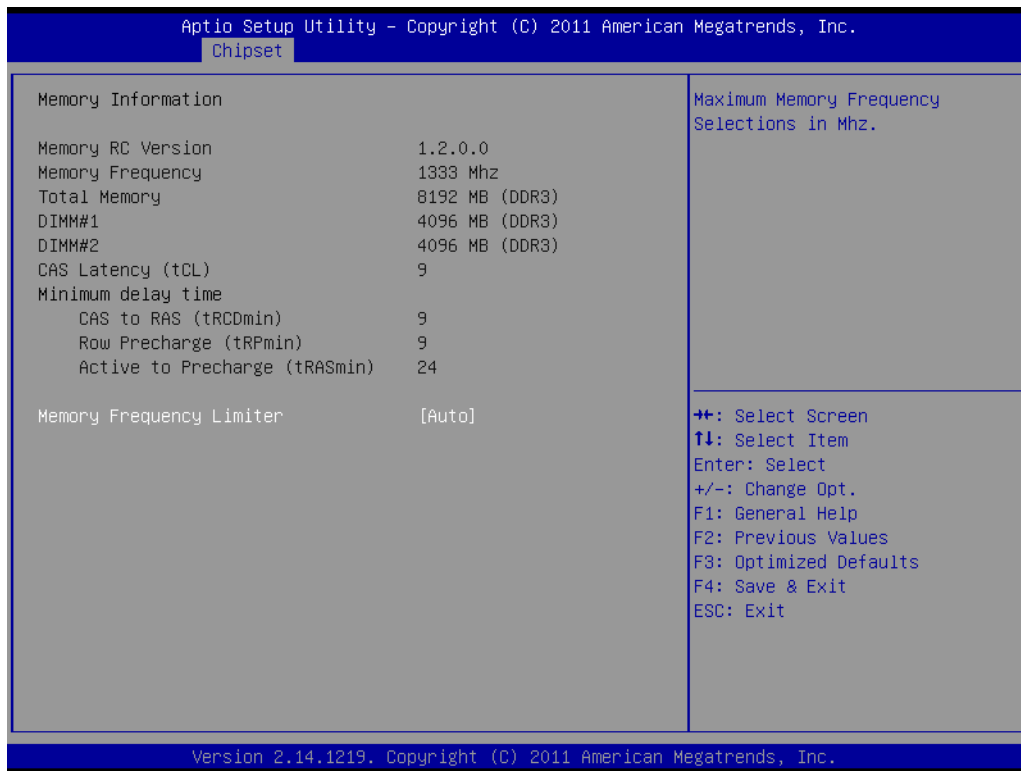


Figure 3.30 Memory Information

Memory Frequency Limiter

Maximum memory frequency. There are four options as [Auto], [1067], [1333], or [1600] when installing with Intel 3rd Core i processor.

3.6 Boot

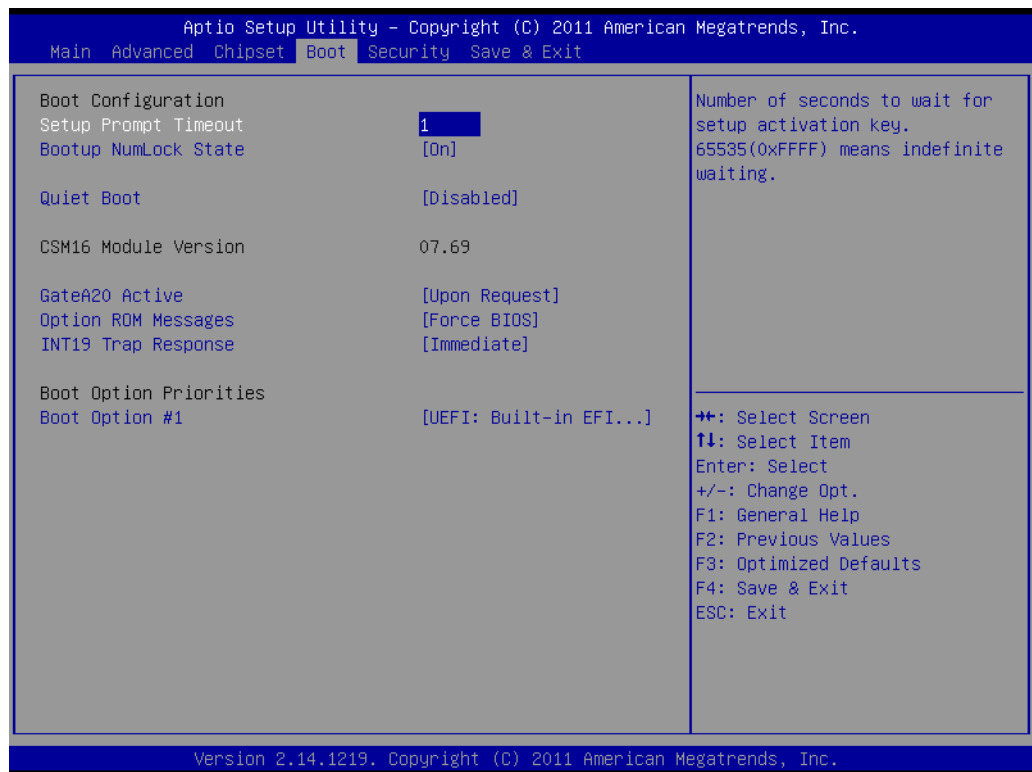


Figure 3.31 Boot

Setup Prompt Timeout

Use the <+> and <-> keys to adjust the number of seconds to wait for setup activation key.

Bootup NumLock State

“On” or “Off” power-on state for the NumLock

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.

GateA20 Active

This item is useful when RT code is executed above 1MB. When this is set as "UPON REQUEST", GA20 can be disabled using BIOS services. When it's set as "Always", it does not allow disabling GA20.

Option ROM Messages

“Force BIOS or Keep Current” to set the display mode for Option ROM

INT19 Trap Response

This item is a BIOS reaction on INT19 trapping by Option ROM. When it's set as "Immediate", the trap will be executed right away. When it's set as "Postponed", the trap will be executed during legacy boot.

Boot Option Priorities

Choose boot priority from boot device.

3.7 Security

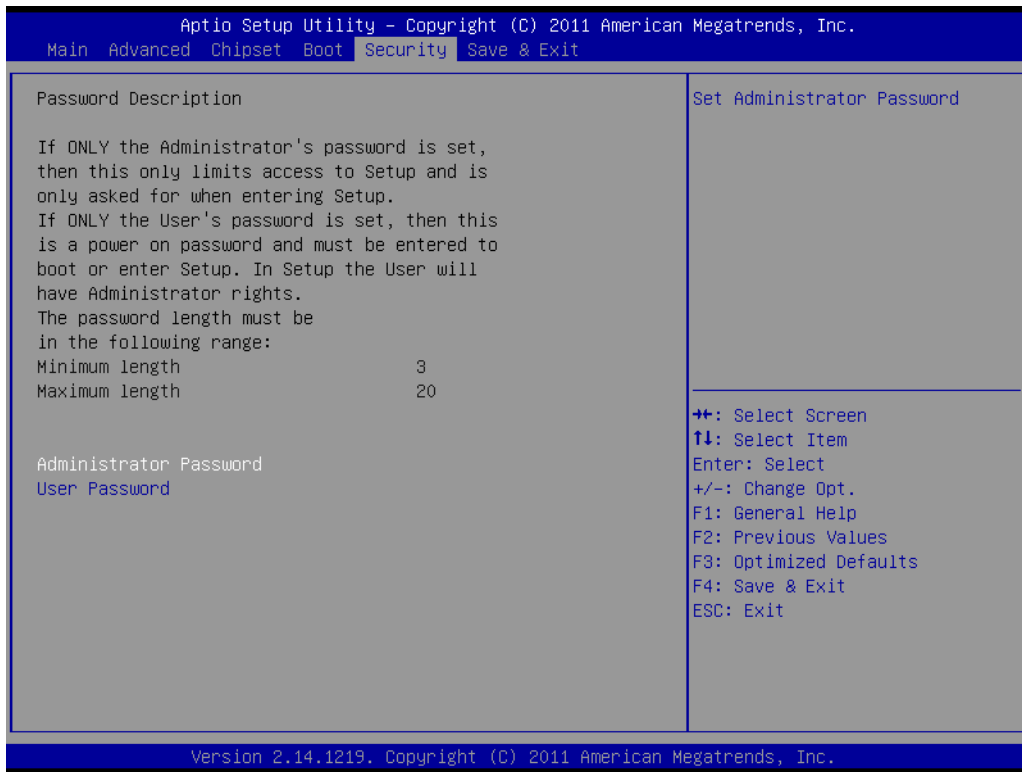


Figure 3.32 Security

Select Security Setup from the AIMB-701 Setup main BIOS setup menu. All Security Setup options, such as password protection, are described in this section. To access the sub menu for the following items, select the item and press <Enter>.

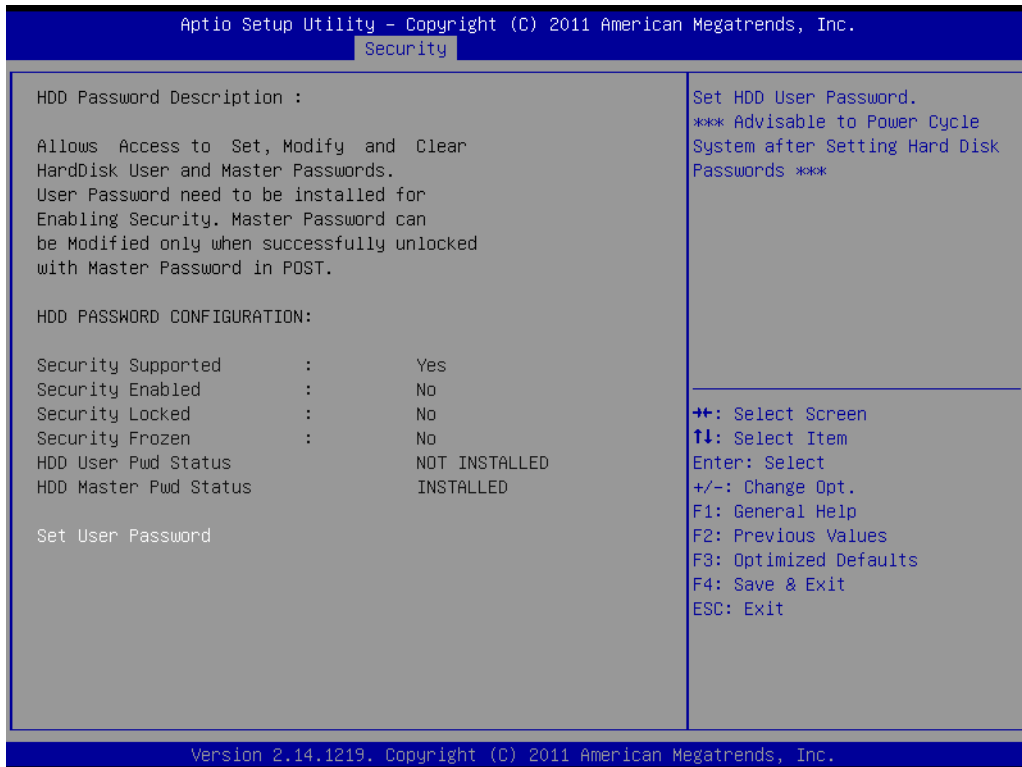


Figure 3.33 HDD Password Configuration

HDD Password Configuration

This item is to allow use to set HDD password.

3.8 Save & Exit

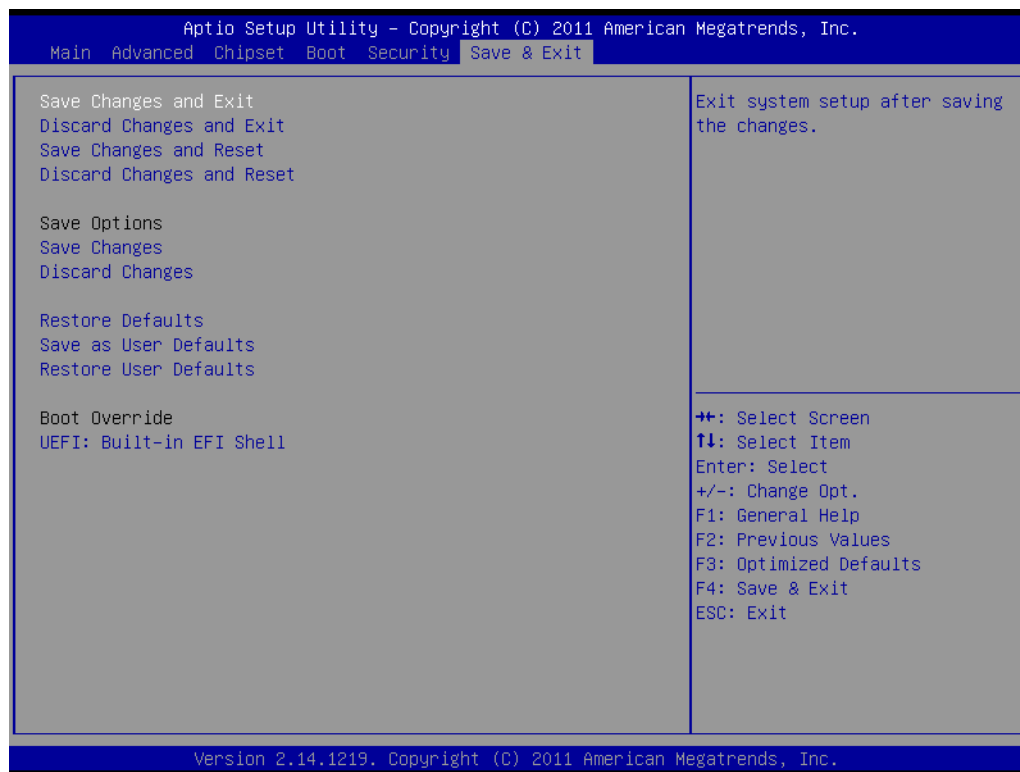


Figure 3.34 Save & Exit

Save changes and exit*

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

Discard changes and exit

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

Save changes and Reset

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

Discard changes and Reset

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

Save Changes

Select this option to save your changes.

Discard Changes

Select this option to discard your changes.

Restore Defaults

Select this option to restore BIOS configuration as origin.

Save as User Defaults

Select this option to save user's configuration.

Restore User Defaults

Select this option to restore BIOS to user's configuration.

Boot Override

This option allows you to attempt to launch the EFI Shell application (shellx64.efi) from one of the available file system device.

*When you do some critical changes, the system will still reboot even you choose "Save changes and exit".

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-701 are located on the software installation CD.

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.

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
- 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

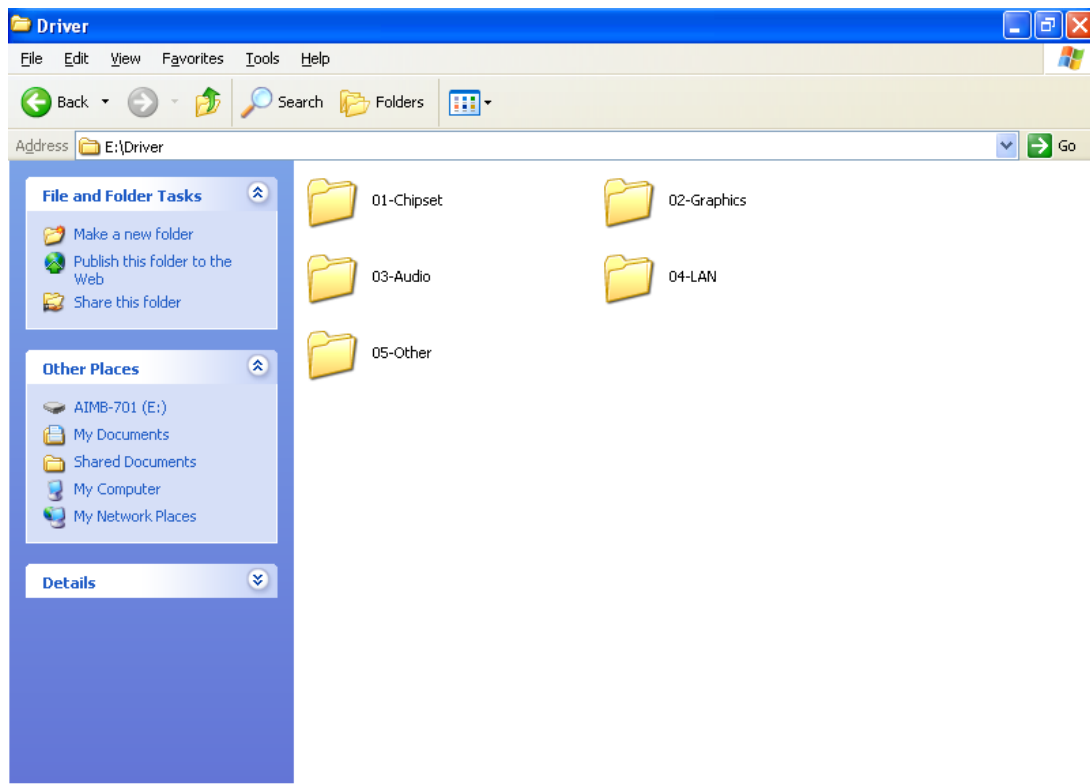
Note! *The chipset driver is used for the following versions of Windows, and it has to be installed before installing all the other drivers:*



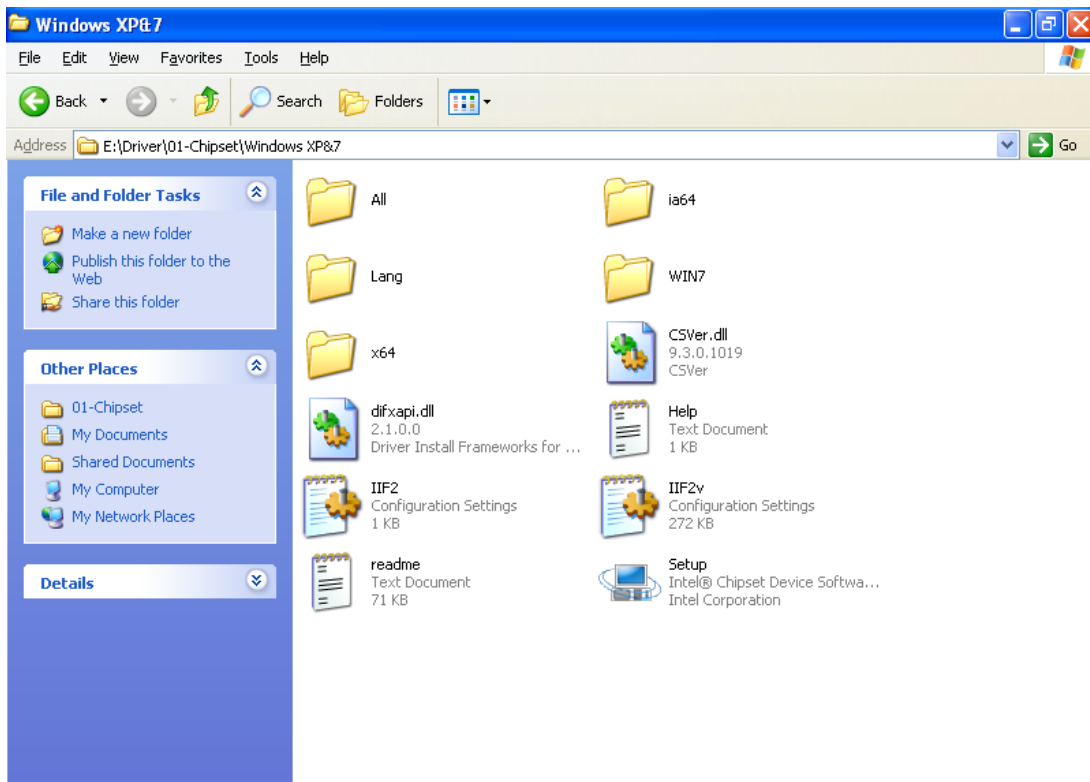
- Windows 7 (32-bit)
- Windows 7 (64-bit)
- Windows XP professional edition (32-bit)
- Windows XP professional edition (64-bit)

4.3 Windows XP / Windows 7 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 "01-Chipset". In CSI folder, you can click find an executable file to complete the implement of the driver



2. Click setup to execute program.



Chapter 5

VGA Setup

5.1 Introduction

The 2nd Gen Intel Core i processors are embedded with integrated graphics controller. You need to install the VGA driver to enable this function, which includes the following features:

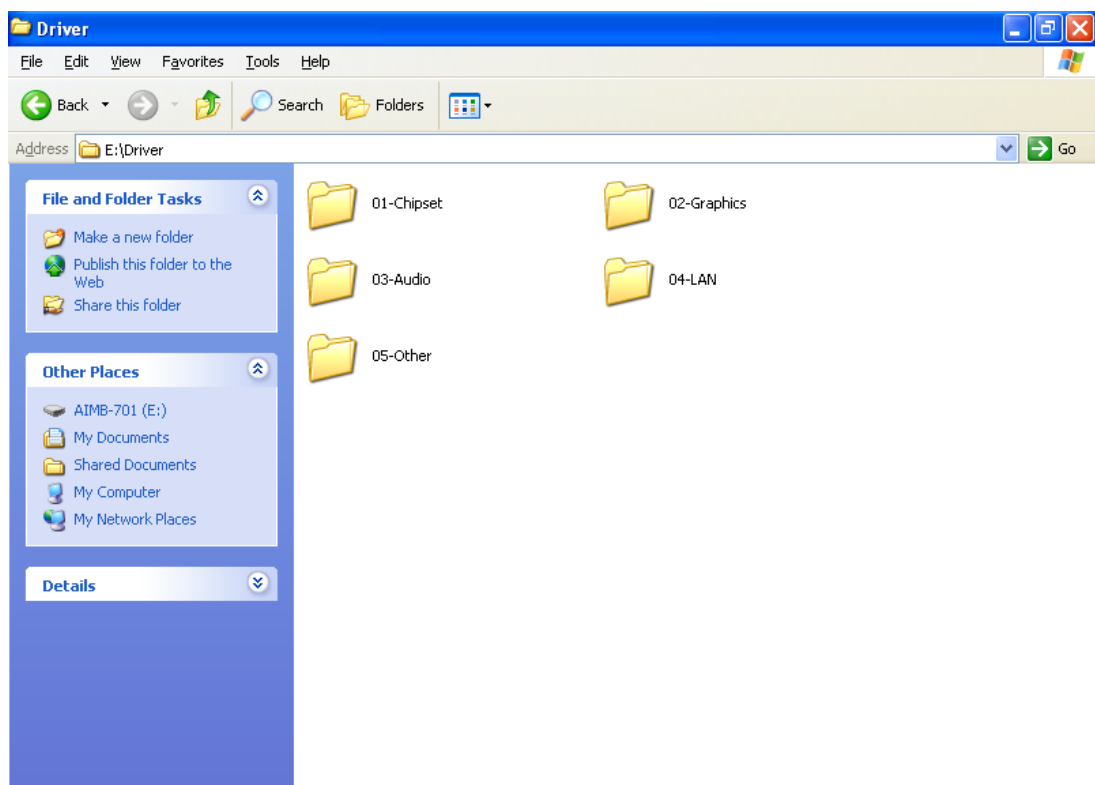
- Optimized integrated graphic solution: With Intel Graphics Flexible Display Interface, it supports versatile display options and 32-bit 3D graphics engine. Dual independent display, enhanced display modes for widescreen flat panels for extend, twin, and clone dual display mode, and optimized 3D support deliver an intensive and realistic visual experience.

5.2 Windows XP/Windows 7 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. Navigate to the "02-Graphic" folder and click the executable file to complete the installation of the drivers for Windows 7, XP.



Chapter 6

LAN Configuration

6.1 Introduction

The AIMB-701 has dual Gigabit Ethernet LANs via dedicated PCI Express x1 lanes (Intel 82579V (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.

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
- Wake-on-LAN (WOL) support
- PCIe x1 host interface

6.3 Installation

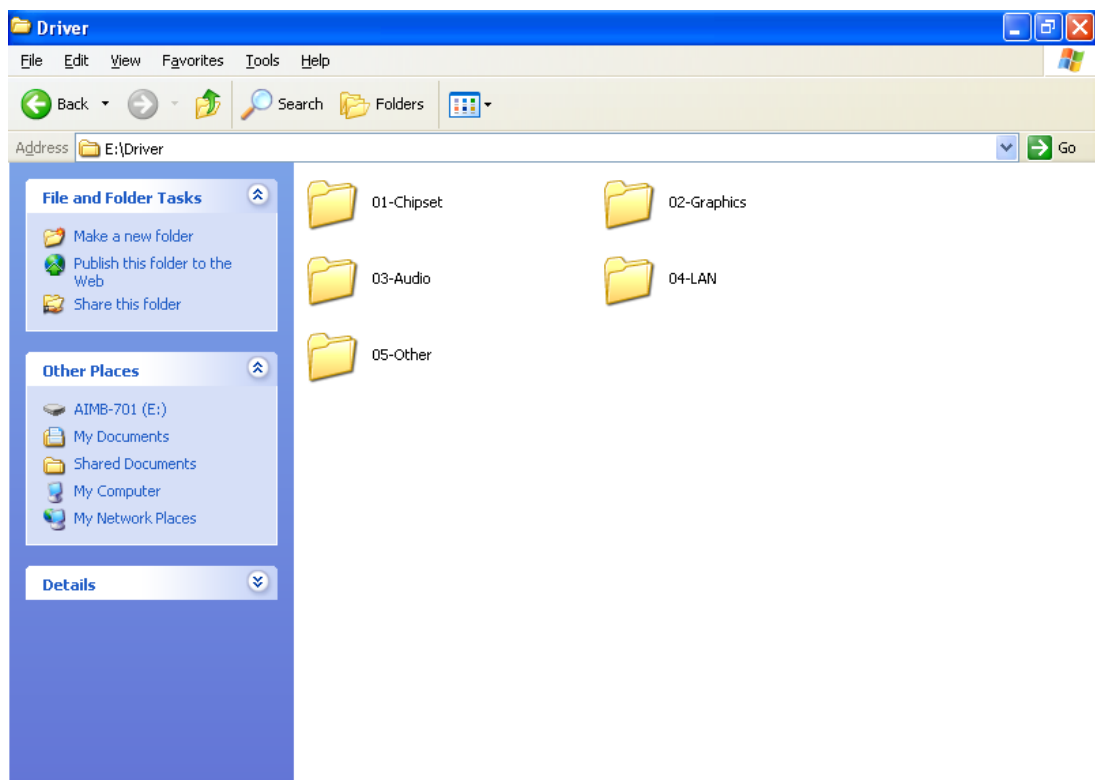
Note! Before installing the LAN drivers, make sure the CSI utility have been installed on your system. See Chapter 4 for information on installing the CSI utility.



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 /Win 7 Driver Setup (LAN)

Insert the driver CD into your system's CD-ROM drive. Select folder "04-LAN" then click the proper Lan driver for the OS.



Appendix **A**

Programming the
Watchdog Timer

The AIMB-701'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 NCT6776F. 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).

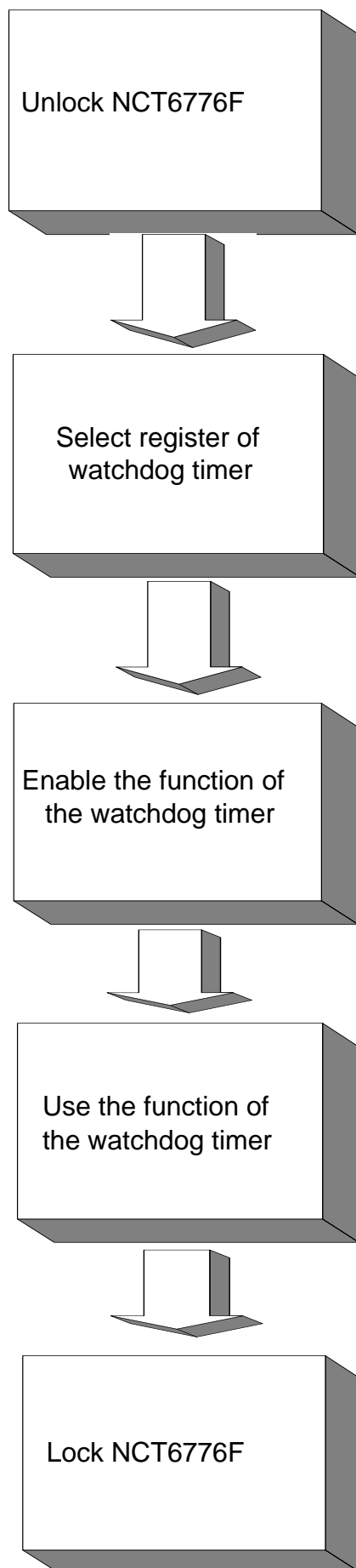


Table A.1: Watchdog timer registers

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 NCT6776F
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. Write 1 to bit 4: Watchdog timer count mode is 1000 times faster. If bit 3 is 0, the count mode is 1/1000 seconds mode. If bit 3 is 1, the count mode is 1/1000 minutes mode.
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 NCT6776F.

A.2.1 Example Programs

Enable watchdog timer and set 10 seconds as the timeout interval

```

;-----
Mov dx,2eh ; Unlock NCT6776F
Mov al,87h
Out dx,al
Out dx,al
;-----
Mov al,07h ; Select registers of watchdog timer
Out dx,al
Inc dx
in al,dx
Or 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; 10 minutes
Out dx,al
;-----
Dec dx ; lock NCT6776F
Mov al,0aah
Out dx,al
Enable watchdog timer and set 5 minutes as the timeout interval
;-----
Mov dx,2eh ; unlock NCT6776F
Mov al,87h
Out dx,al
Out dx,al
;-----
Mov al,07h ; Select registers of watchdog timer
Out dx,al
Inc dx
In al,dx
Or 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; 5 minutes
Out dx,al
;-----
Dec dx ; lock NCT6776F
Mov al,0aah
Out dx,al
Enable watchdog timer to be reset by mouse
;-----
Mov dx,2eh ; unlock NCT6776F
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
In al,dx
Or 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 NCT6776F
Mov al,0aah
Out dx,al
Enable watchdog timer to be reset by keyboard

```

```

;-----
Mov dx,2eh ; unlock NCT6776F
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 NCT6776F
Mov al,0aah
Out dx,al
Generate a time-out signal without timer counting
;-----
Mov dx,2eh ; unlock NCT6776F
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
In al,dx
Or 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 NCT6776F
Mov al,0aah
Out dx,al
```

Appendix **B**

I/O Pin Assignments

B.1 Parallel Port (LPT1)

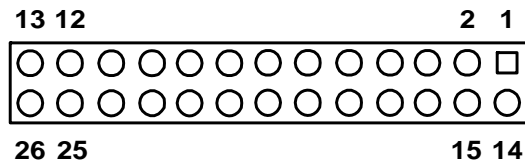


Table B.1: Parallel Port (LPT1)

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

B.2 USB Header (USB56, USB78)

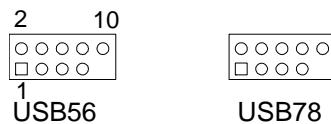


Table B.2: USB Header (USB56,USB78)

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	N/C

B.3 VGA Connector (VGA1)

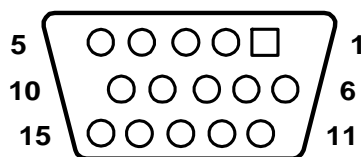


Table B.3: VGA Connector (VGA1)

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.4 RS-232 Interface (COM4~6)

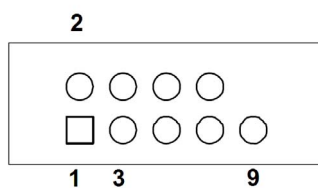


Table B.4: RS-232 Interface (COM4~6)

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

B.5 RS-232 Interface (COM3)

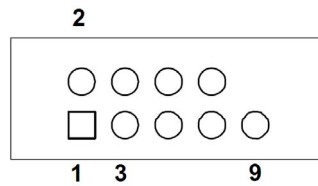


Table B.5: RS232/422/485 Interface (COM3)

	RS232	RS422	RS485
Pin	Signal	Signal	Signal
1	DCD	Tx-	DATA-
2	DSR		
3	Rx	Tx+	DATA+
4	RTS		
5	Tx	Rx+	
6	CTS		
7	DTR	Rx-	
8	RI		
9	GND		

B.6 PS/2 Keyboard and Mouse Connector (KBMS1)



Table B.6: 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.7 External Keyboard Connector (KBMS2)



Table B.7: External Keyboard Connector (KBMS2)

Pin	Signal
1	KB CLK
2	KB DATA
3	MS DATA
4	GND
5	VCC
6	MS CLK

B.8 Infrared (IR) connector (JIR1)

Table B.8: Infrared Connector (JIR1)

Pin	Signal
1	+5 V
2	N/C
3	IRRX
4	GND
5	IRTX

B.9 System Fan Power Connector (SYSFAN1/SYSFAN2)

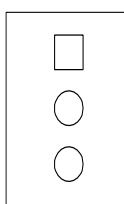


Table B.9: Fan Power Connector (SYSFAN1/SYSFAN2)

Pin	Signal
1	GND
2	+12 V
3	DETECT

B.10 Power LED and Keyboard Lock (JFP3)

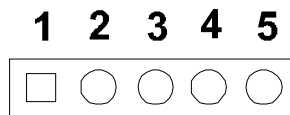


Table B.10: Power LED and Keyboard Lock (JFP3)

Pin	Function
1	LED power (3.3 V)
2	NC
3	Ground
4	#keylock
5	Ground

B.11 External Speaker Connector (JFP2)



Table B.11: External Speaker Connector (JFP2)

Pin	Function
1	SPK_VCC
4	SPK_OBS
7	SPK_BUZ
10	SPK_OUT

B.12 Reset Connector (JFP1)

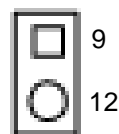


Table B.12: Reset Connector (JFP1)

Pin	Signal
9	RESET
12	GND

B.13 HDD LED Connector (JFP2)

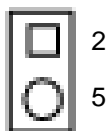


Table B.13: HDD LED Connector (JFP2)

Pin	Signal
2	HDD_LED+
5	HDD_LED-

B.14 ATX Soft Power Switch (JFP1)

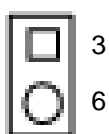


Table B.14: ATX Soft Power Switch (JFP1)

Pin	Signal
3	PWR-BTN
6	GND

B.15 H/W Monitor Alarm (JOBS1)

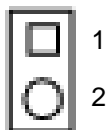


Table B.15: H/W Monitor Alarm (JOBS1)

Pin	Signal
1	Error Beep
2	OBS Beep alarm

B.16 SNMP SM_BUS Bus Connector (JFP2)

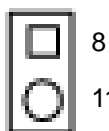
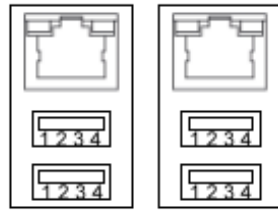


Table B.16: SM Bus Connector (JFP2)

Pin	Signal
8	SMB_DATA
11	SMB_CLK

B.17 USB/LAN ports (LAN1_USB12 and LAN2_USB34)



LAN1_USB12 LAN2_USB34

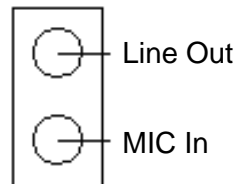
Table B.17: USB Port

Pin	Signal	Pin	Signal
1	VCC_DUAL	3	Data0+
2	Data0-	4	GND

Table B.18: 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.18 Line Out, Mic IN Connector (AUDIO1)



AUDIO1

B.19 Front Panel Audio Connector (FPAUD1)

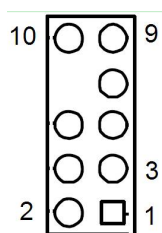


Table B.19: Front Panel Audio Connector (FPAUD1)

Pin	Signal
1	MIC2_L
2	AGND
3	MIC2_R
4	PRESENSE
5	LIN2_R
6	MIC_DEC
7	FIO_JD
8	N/A
9	LIN2_L
10	LINEOUT2_DEC

B.20 8-pin Alarm Board Connector (VOLT1)

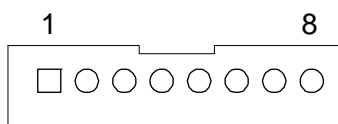


Table B.20: 8-pin Alarm Board Connector (VOLT1)

Pin	Signal	Pin	Signal
1	5VSB	5	VCC
2	GND	6	VCC3
3	GND	7	-12V
4	-5V	8	+12V

B.21 Case Open Connector (JCASE1)

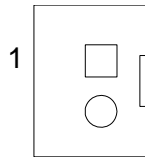


Table B.21: Case Open Connector (JCASE1)

Pin	Signal
1	CASEOP
2	GND

B.22 Front Panel LAN LED Connector (LAN_LED1)

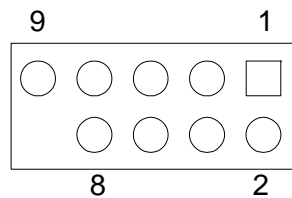


Table B.22: LAN LED Connector (LANLED1)

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.23 SPI_CN1: SPI flash card pin connector

Table B.23: SPI_CN1:SPI fresh card pin connector

Pin	Signal	Pin	Signal
1	+3VSB	2	GND
3	SPI_CS#	4	SPI_CLK
5	SPI_MISO	6	SPI_MOSI
7	N/A	8	NC

B.24 System I/O Ports

Table B.24: 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
0F0-0FF	Numeric data processor
1F0-1F8	Fixed disk
290-297	On-board hardware monitor
2F8-2FF	Serial port2
378-37F	ECP Printer Port (LPT1)
778-77F	ECP Printer Port (LPT1)
3F8-3FF	Serial port 1
C80-C87	Serial port 3
C88-C8F	Serial port 4
C90-C97	Serial port 5
C98-C9F	Serial port 6

B.25 Interrupt Assignments

Table B.25: 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	Serial communication port 5/Serial communication port 6
7	IRQ11	Ethernet Controller
8	IRQ12	PS/2 mouse
9	IRQ13	INT from co-processor
10	IRQ14	Available
11	IRQ15	Available
12	IRQ3	Serial communication port 2
13	IRQ4	Serial communication port 1
14	IRQ5	Serial communication port 3/ Serial communication port 4
15	IRQ6	Available
16	IRQ7	Parallel port 1 (print port)

B.26 1st MB Memory Map

Table B.26: 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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