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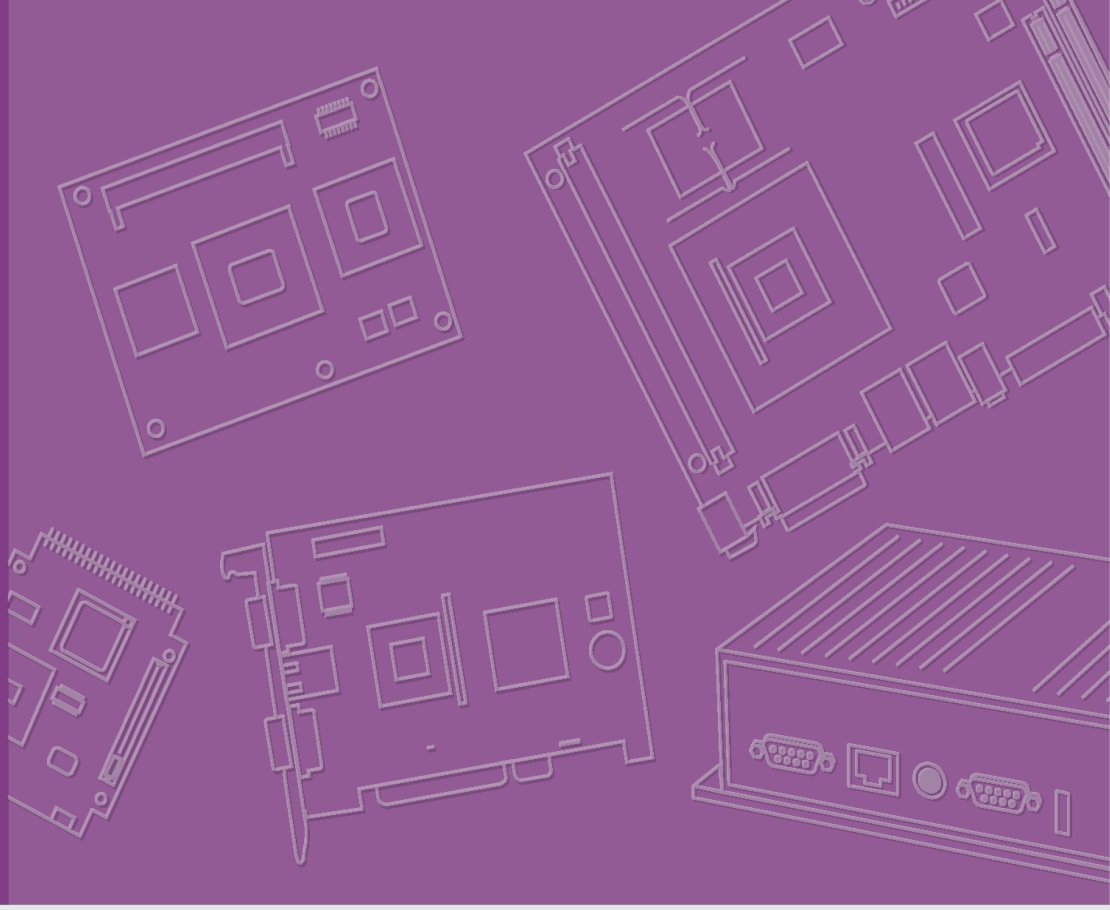
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User Manual

PCA-6011

PICMG 1.0 Full-sized Intel® LGA775 Core™2 Quad CPU Card with VGA/Dual GbE LAN

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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 A

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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



Memory Compatibility

Brand	Size	Speed	Type	Memory	Advantech PN
Transcend	1GB	1066	DDR3	SEC K4B1G0846D-HCF8 (128x8)	96D3-1G1066NN-TR
	1GB	1066	DDR3	SEC K4B1G0846D HCH9 ENJ038A3 (128x8)	96D3-1G1066NN-TR
	2GB	1066	DDR3	SEC K4B1G0846D-HCF9(128x8)	96D3-2G1066NN-TR
Apacer	1GB	1066	DDR3	ELPIDA J1108BABG-AE-E (128x8)	96D3-1G1066NN-AP
	1GB	1066	DDR3	ELPIDA J1108BABG-DJ-E (128x8)	96D3-1G1066NN-AP
	2GB	1066	DDR3	ELPIDA J1108BABG-AE-E (128x8)	96D3-2G1066NN-AP
	2GB	1066	DDR3	ELPIDA J1108BABG-DJ-E 092109D1P (128x8)	96D3-2G1066NN-AP
	4GB	1066	DDR3	Hynix H5TQ2G83AFR H9C (256x8)	NA
ATP	4GB	1066	DDR3	SAMSUNG 940 K4B2G0846B-HCF8 (256x8)	96D3-4G1066NN-AP

Specification Comparison

Part Number	LAN	VGA	COM	SATA	USB	DVI	CF
PCA-6011VG-00A1E	Single GbE	Yes	2	4	8	No (Optional)	No (Optional)
PCA-6011G2-00A1E	Dual GbE	Yes	2	4	7	No (Optional)	No (Optional)

Processor Support

Processors	Long-life supported
Intel® Core™ 2 Quad processor	Q9400
Intel® Core™ 2 Duo processor	E8400/E7400/ E6400/ E4300
Intel® Pentium® processor	E5300
Intel Celeron processor 440	Celeron 440

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 single board computer, please make sure that the following materials have been shipped:

- PCA-6011 Intel® LGA775 processor-based single board computer
- 1 PCA-6011 startup manual
- 1 CD with driver utility and manual (in PDF format)
- 1 Ultra ATA 66/100 IDE cable P/N: 1701400452
- 2 Serial ATA HDD data cable P/N: 1700003194
- 2 Serial ATA HDD power cable P/N: 1703150102
- 1 Printer (parallel) port & COM port cable kit P/N: 1701260305
- 1 Y cable for PS/2 keyboard and PS/2 mouse P/N: 1700060202
- 1 USB cable with 4 ports P/N: 1700008461
- 1 Jumper pack P/N: 9689000068
- 1 User Note for Full-Size CPU card P/N: 2002721020
- 1 User Note for LGA775 CPU
- 1 warranty card

If any of these items are missing or damaged, contact your distributor or sales representative immediately. We have carefully inspected the PCA-6011 mechanically and electrically before shipment. It should be free of marks and scratches and in perfect working order upon receipt. As you unpack the PCA-6011, 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.

Note! *PCA-6011 must use a proprietary CPU cooler; we strongly recommend purchasing it from Advantech (p/n: 1750000332).*

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Chapter 1

Hardware Configuration

1.1 Introduction

The PCA-6011 is designed with the Intel® G41 + ICH7/ICH7R (only for G2 SKU) to support Core™ 2 Quad / Core™ 2 Duo /channel 440 processors (refer to “Processor Support” on page v) with a 800/1066/1333 MHz front side bus and dual channel DDR3 800/1066 MHz memory up to 4 GB. It follows the PICMG 1.0 specification and is the best solution for high-performance computing and applications that demand a wide I/O bandwidth.

The PCA-6011 offers a high-performance cost-saving integrated graphics unit, built into the Intel® G41 chipset, and features the unique Intel® GMA X4500 technology, including built-in support for smooth high-definition video playback without the need for add-on video cards or decoders. It has 2 DIMM sockets in two separate memory channels. It accepts up to 4 GB DDR3 SDRAM memory--plenty for most applications. The PCA-6011 supports 1 to 2 Gigabit Ethernet LAN via dedicated PCI Express x 1 bus, which offers bandwidths up to 500 MB/sec., eliminating network data flow bottlenecks, and incorporating Gigabit Ethernet to operate at 1000 Mbps. High reliability and outstanding performance make the PCA-6011 the ideal platform for industrial networking applications.

Four Serial ATA ports (up to 300 MB/s) allow the use of long, thin SATA cables for storage devices, eliminating cabling issues inside the industrial-grade chassis. In addition, the PCA-6011 also provides most of the popular I/O interfaces including up to eight USB 2.0 ports, 2 RS-232 ports, one enhanced parallel port and a floppy disk interface.

The PCA-6011 is designed for extended reliability, and is built especially to suit demanding industrial environments. The CMOS data backup and restore function protects the BIOS setup data from loss due to battery failure.

The PCA-6011 also adopts Advantech's unique patented “AT Mode Control Circuit” for AT Power Mode. With all these excellent features and outstanding performance, the PCA-6011 is definitely an ideal platform for today's industrial applications.

1.2 Features

- Compliance with PICMG 1.0
- Supports LGA 775 Intel® Core™ 2 Quad / Core™ 2 Duo/Celeron® 440 FSB 800/1066/1333 MHz processors (refer to “Processor Support” on page iv)
- Supports Dual Channel DDR3 800/1066 MHz up to 4 GB
- Single Gigabit Ethernet for PCA-6011VG and Dual Gigabit Ethernet for PCA-6011G2 via dedicated PCI Express x1 Bus
- 4 SATA2 connector
- 8 USB 2.0 ports for PCA-6011VG and 7 ports for PCA-6011G2
- 2 COM ports support RS-232
- CMOS automatic backup and restore to prevent accidental data loss of BIOS setup
- Supports 4 x RS-422/485 with auto-flow by PCA-COM485-00A1E module
- Smart fan control

1.3 Specifications

1.3.1 System

- **CPU:** Intel® LGA 775 Core™ 2 Quad, Core™ 2 Duo, Celeron® 440 up to 2.66/3.33/2.2 GHz, (refer to “Processor Support” on page iv), FSB 800/1066/1333 MHz. PCA-6011 also has an optional CPU cooler (1750000332) for customers who use high-speed CPUs in 2U chassis or in a high-temperature environment.
- **L2 cache:** CPU has built-in 6 MB (for Core™ 2 Quad), 6 MB (for Core™ 2 Duo), 512 KB (for Celeron 440 CPU) full-speed L2 cache
- **BIOS:** AMI 16 MB SPI Flash
- **System chipset:** Intel G41 + ICH7/ICH7R(Only for G2 SKU)
- **SATA/EIDE hard disk drive interface:** Four on-board SATA2 connectors with data transmission rate up to 300 MB/s. One on-board IDE connector supporting up to two enhanced IDE devices. Supports PIO mode 4 (16.67MB/s data transfer rate) and ATA 33/66/100 (33/66/100MB/s data transfer rate.) BIOS enabled/disabled.
- **Floppy disk drive interface:** Supports one floppy disk drive, 5¼" (360 KB and 1.2 MB) or 3½" (720 KB, 1.44 MB). BIOS enable/disable.

1.3.2 Memory

- **RAM:** Up to 4 GB in two 240-pin DIMM sockets. Supports dual-channel DDR3 800/1066 SDRAM.

1.3.3 Input/Output

- **PCI bus:** 32 bit / 33MHz to the backplane
- **Enhanced parallel port:** Configured to LPT1, or disabled. Standard DB-25 female connector provided. Supports EPP/SPP/ECP
- **Serial ports:** Two serial ports on-board. One pin header and one 9-pin D Sub connector located on the mounting bracket for easy connection
- **Keyboard and PS/2 mouse connector:** One 6-pin mini-DIN connector is located on the mounting bracket for easy connection to a keyboard or PS/2 mouse. An on board keyboard pin header connector is also available
- **USB port:** Supports up to eight USB 2.0 ports with transmission rate up to 480 Mbps

1.3.4 Ethernet LAN

- Supporting dual 10/100/1000 Mbps Ethernet port(s) via PCI Express x1 bus which provides 500 MB/s data transmission rate
- **Controller:**
  - LAN 1: Intel® 82583V
  - LAN 2: Intel® 82583V

1.3.5 Industrial features

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

1.3.6 Mechanical and environmental specifications

- **Operating temperature:** 0 ~ 60° C (32 ~ 140° F, depending on CPU) (operating humidity: 40° C @ 85% RH Non-Condensing)
- **Storage temperature:** -40 ~ 85° C (-40 ~ 185° F) non-condensing and 60° C @ 95% RH non-condensing
- **Power supply voltage:** +5 V, +12 V, +5 VSBY
- **Power consumption:**
  - Configuration1: +5 V at 4.04 A, +12 V at 5.14 A, +5 VSBY at 0.17 A (Intel Core 2 Quad processor Q9400 2.66 GHz, 95 W, 1333 MHz FSB + 2 x 2 GB DDR3 1066)
  - Configuration2: +5 V at 3.4 A, +12 V at 3.63 A, +5 VSBY at 0.15 A (Intel Core 2 Duo processor E8400 3.0 GHz, 65 W, 1333 MHz FSB + 2 x 2 GB DDR3 1066)
- **Board size:** 338 x 122 mm (13.3” x 4.8”)
- **Board weight:** 1.0 kg (2.2 lb)

1.4 Jumpers and Connectors

Connectors on the PCA-6011 single board computer 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 the system for any desired 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 the motherboard.

Table 1.1: Jumpers

Label	Function
CMOS1	CMOS Clear
JWDT1	Watchdog timer output selection

Table 1.2: Connectors

Label	Function
IDE1	IDE connector
FDD1	Floppy Drive connector
LPT1	Parallel port
VGA1	VGA connector
COM1/COM2	RS232 serial ports connector, or COM1: RS232 9-pin Box Header (on G2 sku)
KBMS1	PS/2 keyboard and mouse connector
KBMS2	External keyboard/mouse connector
JIR1	Infrared connector
CPUFAN1	CPU fan power connector
JFP1	Power and Reset button connector
JFP2	HDD LED/Speaker connector
JFP3	Reset connector/ATX soft power switch
JOBS1	HW Monitor Alarm Close: Enable OBS Alarm Open: Disable OBS Alarm
LAN1	LAN RJ45 connector
LAN2 (PCA-6011G2)	LAN RJ45 connector
HDAUD1	HD link connector
SATA1	Serial ATA1
SATA2	Serial ATA2
SATA3	Serial ATA3
SATA4	Serial ATA4
LANLED1	LAN LED connector
USB12	Two USB port pin headers
USB34	Two USB port pin headers
USB56	Two USB port pin headers
USB78	Two USB port pin headers
DIMMA1	Memory connector channel A
DIMMB1	Memory connector channel B
LPC1	Low pin count connector
SPI1	BIOS SPI Socket
JCASE1	Case open
ATX12V1	12 V connector
ATXF1	ATX feature connector
SMBUS1	SMBUS
GPIO1	GPIO pin header

1.5 Board Layout: Jumper and Connector Locations

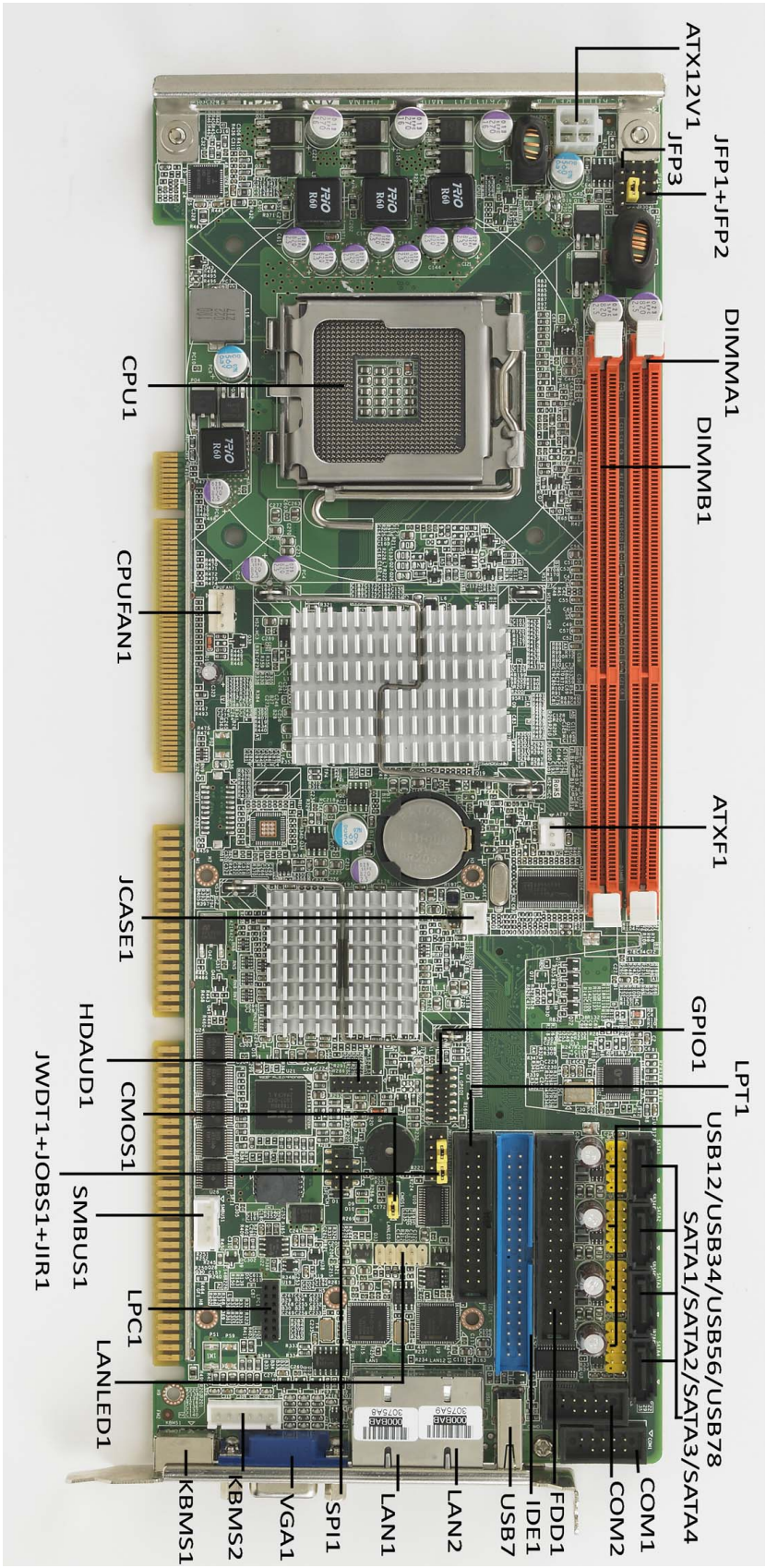


Figure 1.1 Jumper and Connector locations

1.6 PCA-6011 Block Diagram

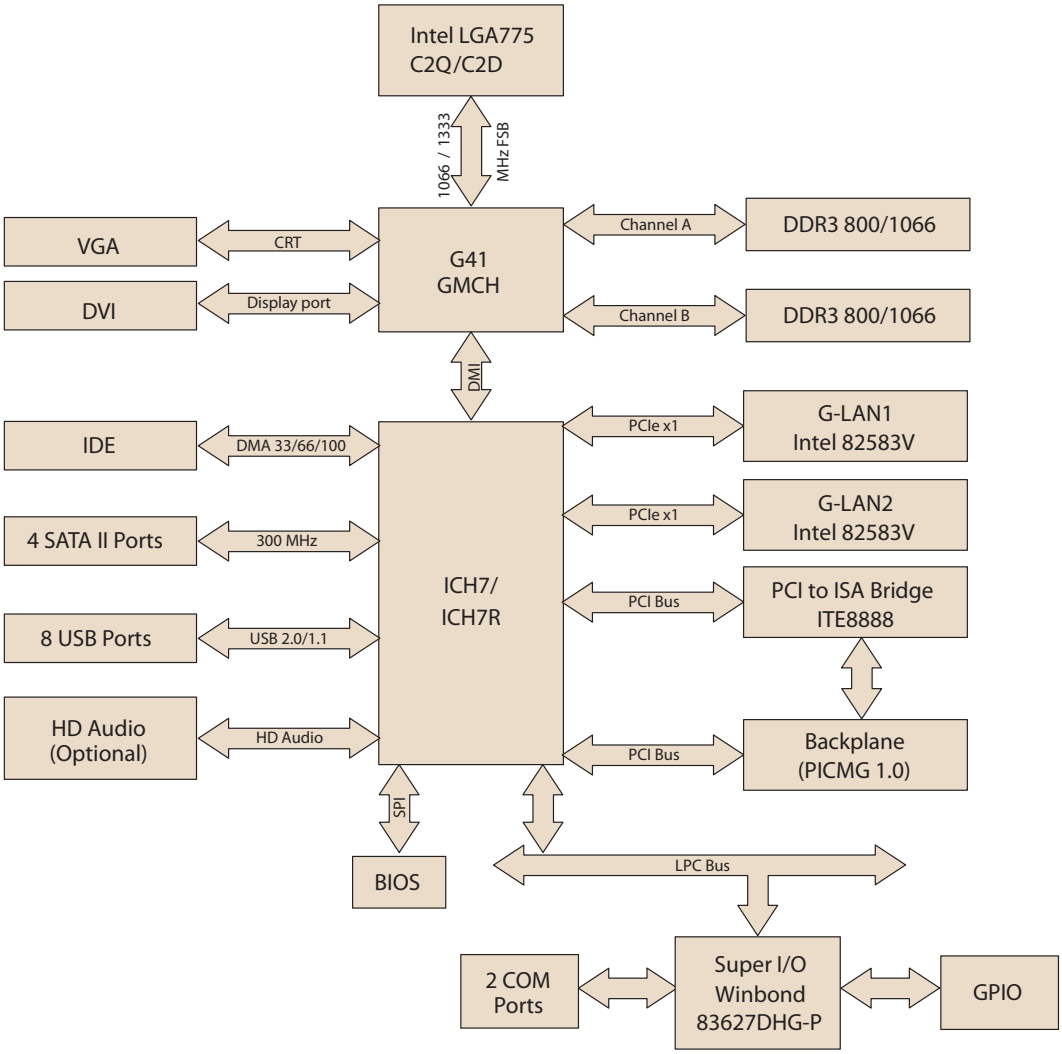


Figure 1.2 PCA-6011 Block Diagram

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 boards. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis.

Caution!



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

Caution!



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

1.8 Jumper Settings

This section provides instructions on how to configure your PCA-6011 by setting the jumpers. It also includes the PCA-6011's default settings and your options for each jumper.

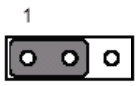
1.8.1 How to set jumpers

You can configure your PCA-6011 to match the needs of your application by setting the jumpers. A jumper is a metal bridge that closes an electrical circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” (or turn ON) a jumper, you connect the pins with the clip. To “open” (or turn OFF) a jumper, you remove the clip. Sometimes a jumper consists of a set of three pins, labeled 1, 2, and 3. In this case you connect either pins 1 and 2, or 2 and 3. A pair of needle-nose pliers may be useful when setting jumpers.

1.8.2 CMOS clear (CMOS1)

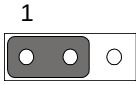
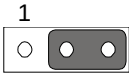
The PCA-6011 single board computer contains a jumper that can erase CMOS data and reset the system BIOS information. Normally this jumper should be set with pins 1-2 closed. If you want to reset the CMOS data, set CMOS1 to 2-3 closed for just a few seconds, and then move the jumper back to 1-2 closed. This procedure will reset the CMOS to its default setting.

.

Table 1.3: CMOS (CMOS1)	
Function	**Jumper Setting**
* Keep CMOS data	 1-2 closed
Clear CMOS data	 2-3 closed
* default setting	

1.8.3 Watchdog timer output (JWDT1)

The PCA-6011 contains a watchdog timer that will reset the CPU in the event the CPU stops processing. This feature means the PCA-6011 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**
IRQ11	 1-2 closed
* Reset	 2-3 closed
*default setting	

1.9 System Memory

The PCA-6011 has two sockets for 240-pin dual inline memory modules (DIMMs) in two memory channels.

All these sockets use 1.5 V unbuffered double data rate synchronous DRAMs (DDR3 SDRAM). They are available in capacities of 512 MB, 1 GB, and 2 GB. The sockets can be filled in any combination with DIMMs of any size, giving a total memory size up to 4 GB.

1.9.1 CPU FSB and memory speed

The PCA-6011 can accept DDR3 SDRAM memory chips without parity. Also note: The PCA-6011 accepts DDR3 800/1066 MHz SDRAM. The PCA-6011 does NOT support ECC (error checking and correction).

1.10 Memory Installation Procedures

To install DIMMs, first make sure the two handles of the DIMM socket are in the “open” position. i.e. The handles lean outward. Slowly slide the DIMM module along the plastic guides on both ends of the socket. 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.

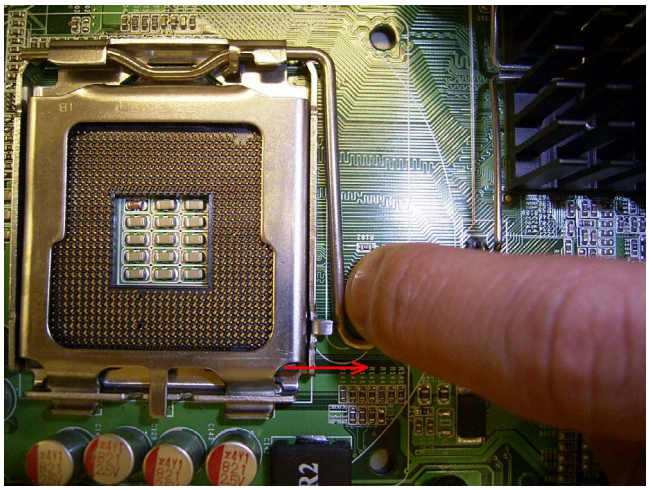
1.11 Cache Memory

The CPU that PCA-6011 supports built-in 6 MB (for Core 2 Quad), 6 MB (for Core 2 Duo), 512 KB (for Celeron 440) full-speed L2 cache. The built-in second-level cache in the processor yields much higher performance than conventional external cache memories.

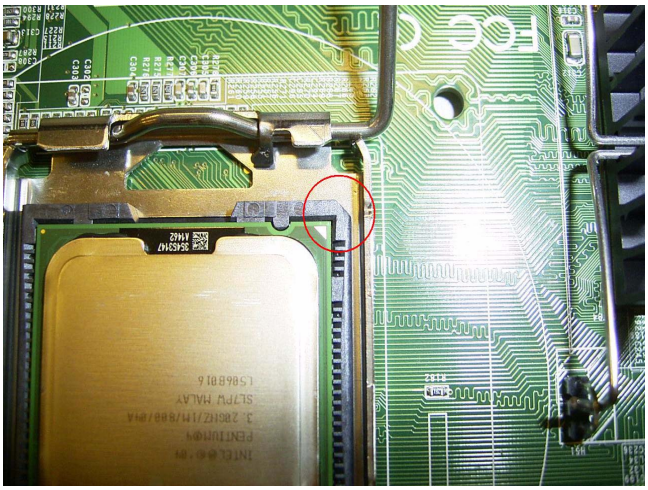
1.12 Processor Installation

The PCA-6011 is designed for Intel® LGA 775 socket CPUs.

1. Pull the bar beside the CPU socket outward and lift it.



2. Align the triangular marking on the processor with the cut edge of the socket.



3. Put back the socket cap and press down the bar to fix it.

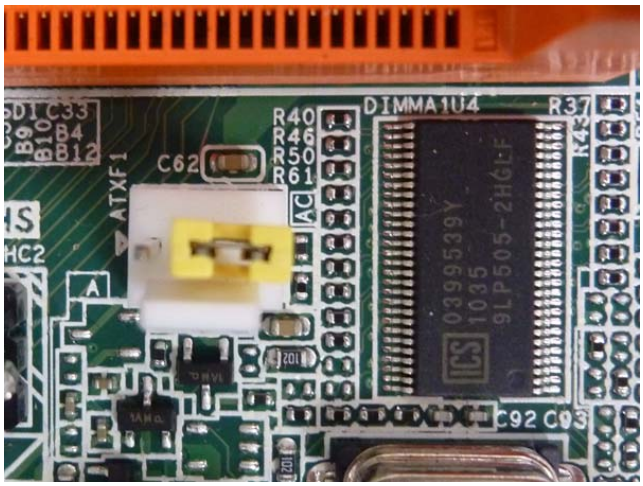


1.13 Power Model Setting and Installation

PCA-6011 can support AT or ATX power model settings.

1.13.1 AT Mode

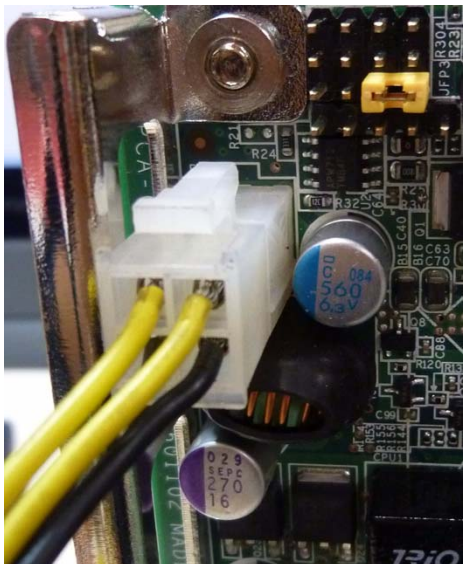
1. Short ATXF1 2-3 pins on CPU board.



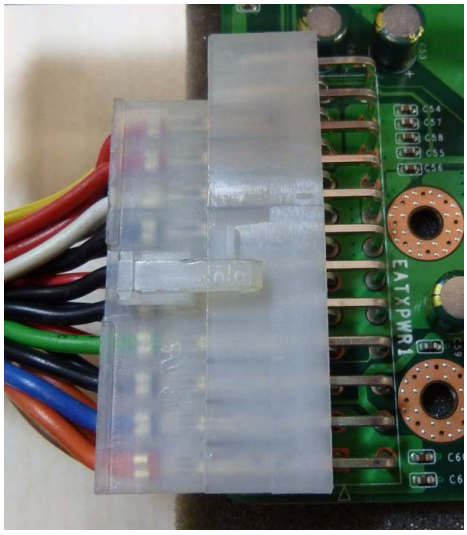
2. Short PSON1(CN1) 1-2 pins on Backplane.



3. Connect the power supply and the ATX12V1 connector on the CPU board.

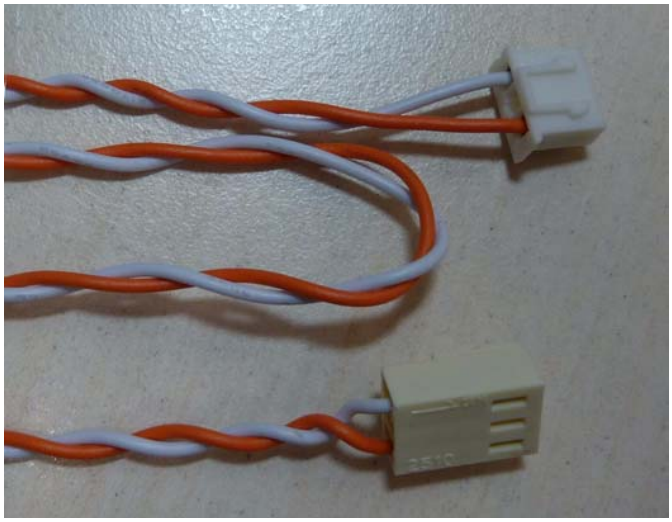


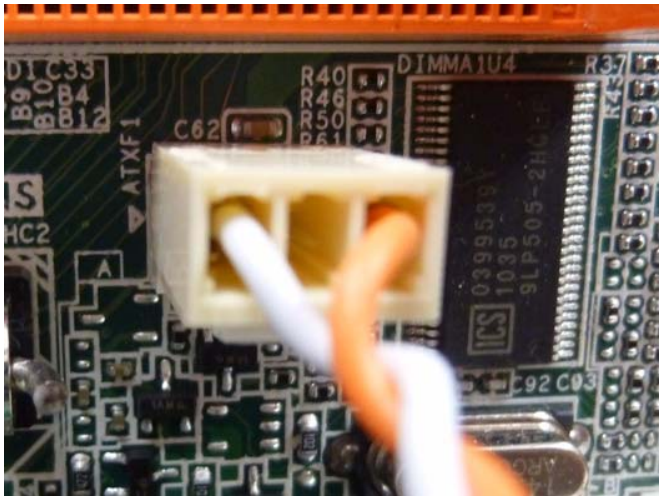
4. Connect the power supply and the EATXPWR1 (VATX1) connector on the CPU board.

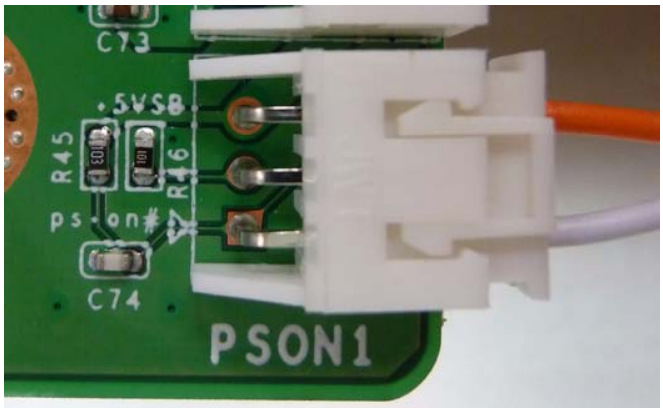


1.14 ATX Mode

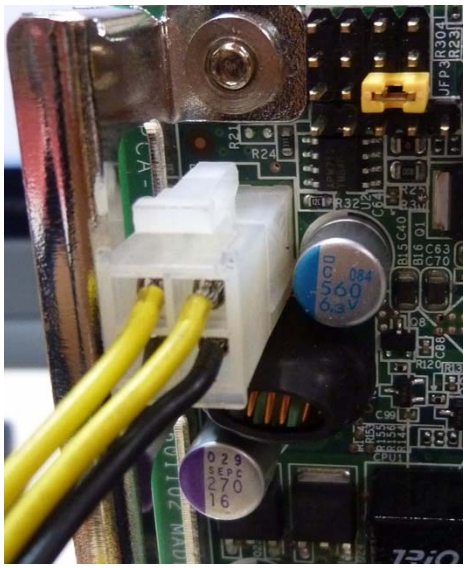
1. Use 3 pin ATX signal cable (P/N:1700030500) connect the ATXF1 on the CPU board with PSON (CN1) on the backplane.



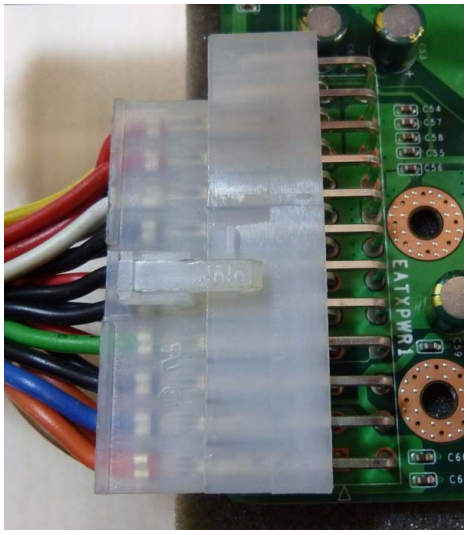




2. Connect the power supply and the ATX12V1 connector on the CPU board.



3. Connect the power supply and the EATXPWR1 (VATX1) connector on the CPU board.



Chapter 2

Connecting Peripherals

2.1 Introduction

You can access most of the connectors from the top of the board while it is 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 IDE Connectors (IDE1)



You can attach up to two IDE (Integrated Drive Electronics) drives to the PCA-6011's built-in controller.

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

Unlike floppy drives, IDE hard drives can connect in either position on the cable. If you install two drives to a single connector, you will need to set one as the master and the other as the slave. You do this by setting the jumpers on the drives. If you use just one drive per connector, you should set each drive as the master. See the documentation that came with your drive for more information.

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

2.3 Floppy Drive Connector (FDD1)



You can attach up to two floppy disk drives to the PCA-6011's on board controller. You can use 3.5" (720 KB, 1.44 MB) drives.

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

2.4 Parallel Port (LPT1)



The parallel port is normally used to connect the single board computer to a printer. The PCA-6011 includes an onboard parallel port, accessed through a 26-pin flat-cable connector, LPT1. The card comes with an adapter cable which lets you use a traditional DB-25 connector. The cable has a 26-pin connector on one end and a DB-25 connector on the other, mounted on a retaining bracket. The bracket installs at the end of an empty slot in your chassis, giving you access to the connector.

To install the bracket, find an empty slot in your chassis. Unscrew the plate that covers the end of the slot. Screw in the bracket in place of the plate. Next, attach the flat-cable connector to LPT1 on the CPU card. Wire 1 of the cable is red or blue, and the other wires are gray. Make sure that wire 1 corresponds to pin 1 of LPT1. Pin 1 is on the upper right side of LPT1.

2.5 VGA Connector (VGA1)



The PCA-6011 includes a VGA interface that can drive conventional CRT displays. VGA1 is a standard 15-pin D-SUB connector commonly used for VGA. Pin assignments for CRT connector VGA1 are detailed in Appendix B.

2.6 Serial Ports (COM1, COM2)



The PCA-6011 offers two serial ports COM1, COM2. These ports can connect to serial devices, such as a mouse or to a communications network.

The IRQ and address ranges for all 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 standard in different ways. If you are having problems with a serial device, be sure to check the pin assignments for the connector.

2.7 PS/2 Keyboard and Mouse Connector (KBMS1)



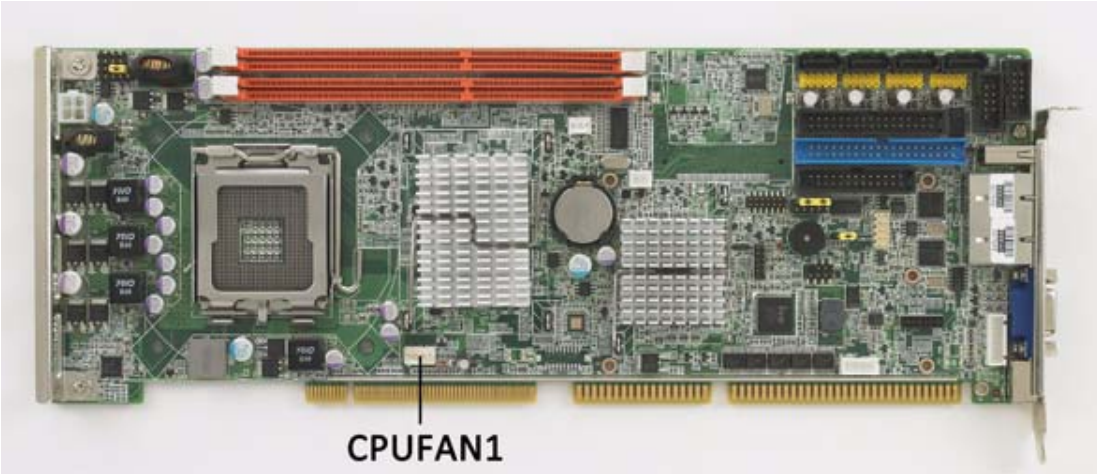
One 6-pin mini-DIN connectors (KBMS1) on the card mounting bracket provide connection to a PS/2 keyboard or a PS/2 mouse, respectively. KBMS1 can also be connected to an adapter cable (P/N: 1700060202) for connecting to both a PS/2 keyboard and a PS/2 mouse.

2.8 External Keyboard & Mouse (KBMS2)



In addition to the PS/2 mouse/keyboard connector on the PCA-6011's rear plate, there is also an extra onboard external keyboard and mouse connector. This gives system integrators greater flexibility in designing their systems.

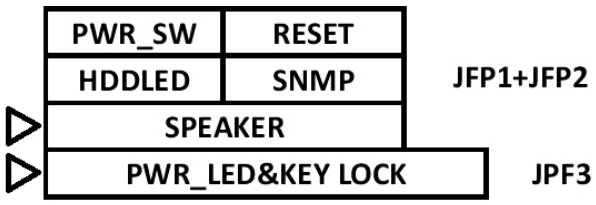
2.9 CPU Fan Connector (CPUFAN1)



If a fan is used, this connector supports cooling fans of 12 V/1 A (12 W) or less.

2.10 Front Panel Connectors (JFP1, JFP2, JFP3)





There are several external switches to monitor and control the PCA-6011.

2.10.1 ATX soft power switch (JFP1 / 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 / PWR_SW). This connection enables you to turn your computer on and off.

2.10.2 Reset (JFP1 / RESET)

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

2.10.3 HDD LED (JFP2 / HDDLED)

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

2.10.4 SMBus Connector (JFP2 / SNMP)

This connector is reserved for Advantech's SNMP-1000 HTTP/SNMP Remote System Manager. The SNMP-1000 allows users to monitor the internal voltages, temperature and fans from a remote computer through an Ethernet network.

(JFP2 / SNMP) can be connected to CN19 of SNMP-1000. Please be careful about the pin assignments, pin 1 must be connected to pin 1 and pin 2 to pin 2 on both ends of cable.

2.10.5 External speaker (JFP2 / SPEAKER)

(JFP2 / SPEAKER) is a 4-pin connector for an external speaker. If there is no external speaker, the PCA-6011 provides an onboard buzzer as an alternative. To enable the buzzer, set pins 3-4 as closed.

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

(JFP3 / 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", where the system is turned on/off by a power button. The second is "AT Power Mode", where the system is turned on/off by the switch on the power supply. The third is another "AT Power Mode" which uses the front panel power switch. The power LED status is indicated as per the following table:

Table 2.1: ATX Power Supply LED Status (No support for AT Power)

Power Mode	**LED (ATX Power Mode)** (On/off by tentative button)	**LED (AT power Mode)** (On/off by switching power supply)	**LED (AT power Mode)** (On/off by front panel switch)
System On	On	On	On
System Suspend	Fast flashes	-	-
System Off	Slow flashes	Off	Off

2.11 H/W Monitor Alarm (JOBS1)

(JOBS1) is a 2-pin jumper to enable/disable the alarm for on board security events.





Table 2.2: Hardware Monitor Alarm setting

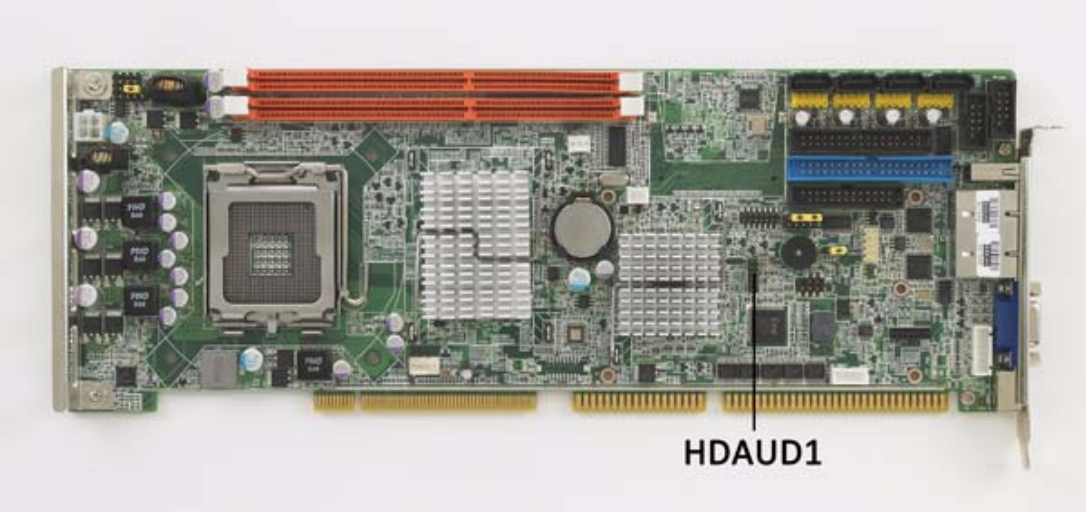
Pin setting	Function
closed	Enable OBS alarm
open	Disable OBS alarm

2.12 LAN RJ45 connector (LAN1/LAN2)



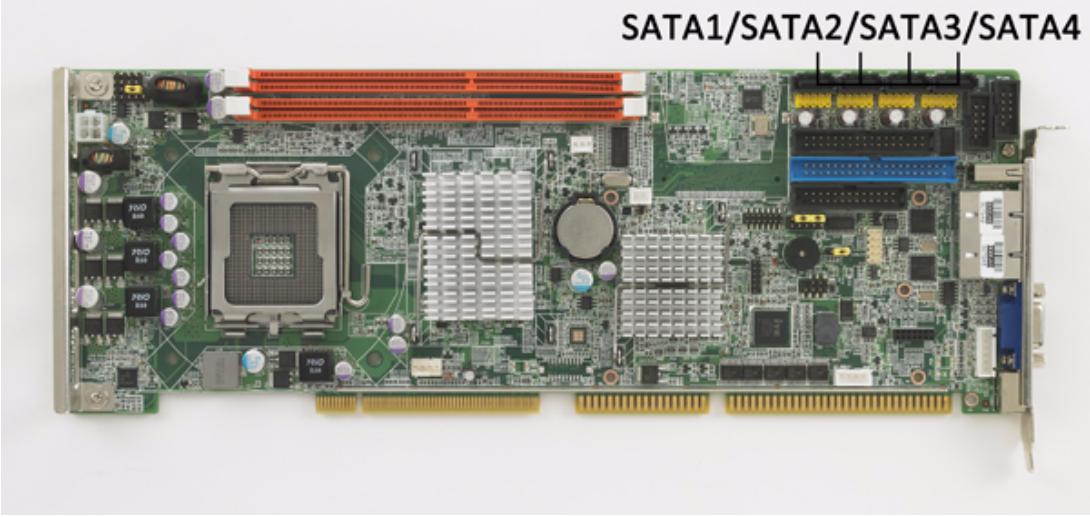
PCA-6011 uses the Intel 82583V Gigabit LAN chip which is linked to PCIe x1 link (LAN2 only exists on PCA-6011G2). With this chip, PCA-6011 may provide high throughputs for a heavy load networking environment. It provides one or two RJ-45 connectors in the rear side and is convenient for most industrial applications.

2.13 HD Link connector (HDAUD1)



The PCA-6011 provides HD audio through PCA-AUDIO-HDA1E module from Advantech.

2.14 Serial ATA2 Interface (SATA1 ~ SATA4)



In addition to the EIDE interfaces (up to two devices), the PCA-6011 features a high performance serial ATA2 interface (up to 300MB/s) which eases cabling to hard drives with thin and long cables.

2.15 LAN LED connector (LAN LED1)



PCA-6011 provides an external LAN LED Pin header for connecting to the front side of the chassis. With this convenient design users can easily see whether the LAN port is active or not. Refer to Appendix B for detailed information on the pin assignments.

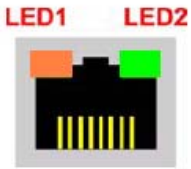
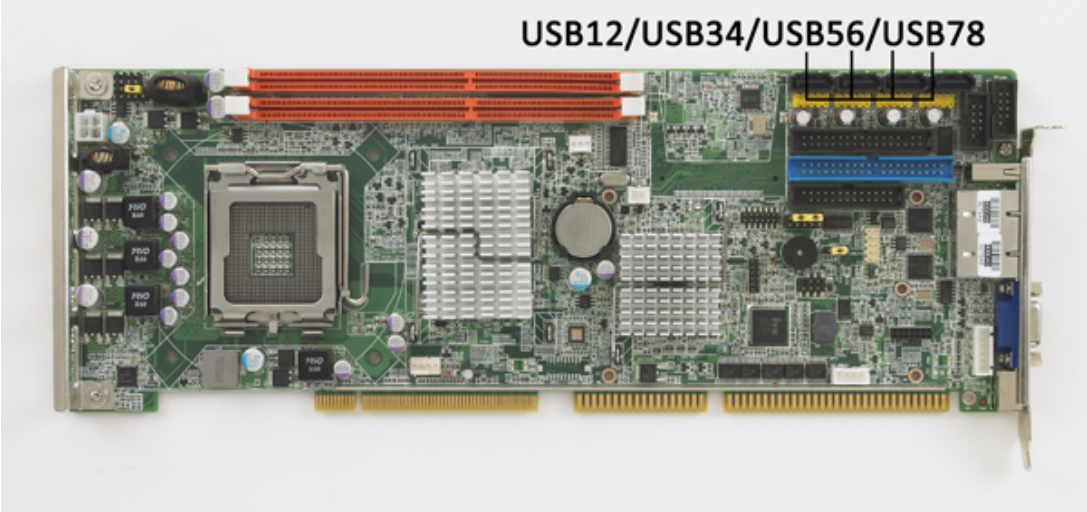


Table 2.3: Front Panel LAN indicator connector

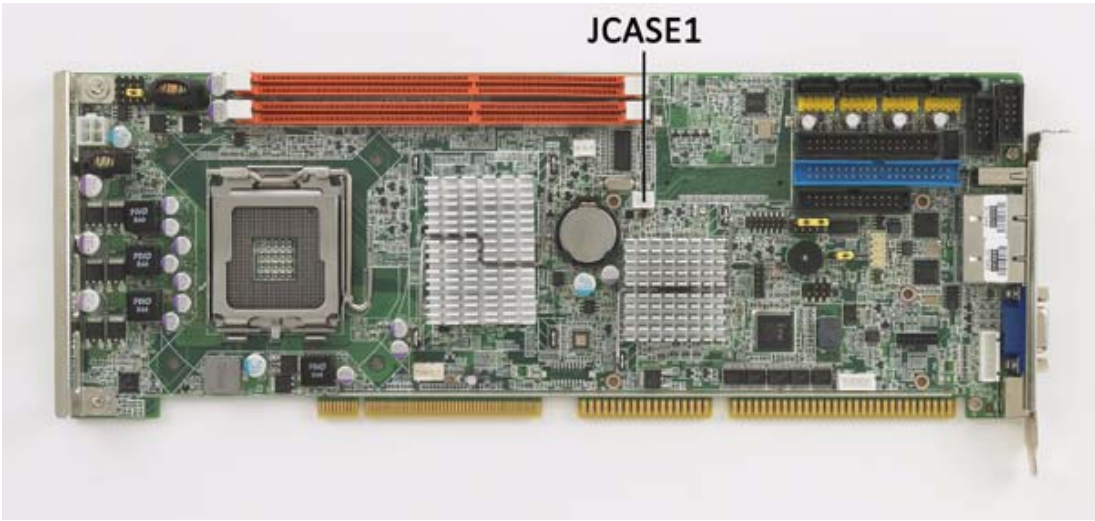
LAN Mode	LED1	LED2
1000Mbps Link On	Green On	On
1000Mbps Active	Green on	Green Flashes
1000Mbps Link Off	Off	Off
100Mbps Link On	Orange On	Green On
100Mbps Active	Orange On	Green Flashes
100Mbps Link Off	Off	Off
10Mbps Link On	Off	Green On
10Mbps Active	Off	Green Flashes
10Mbps Link Off	Off	Off

2.16 USB (USB12, USB34, USB56, USB78)



The PCA-6011 provides eight on board USB 2.0 ports which support transmission rates up to 480 Mbps and which are fuse-protected. To install the USB cable (p/n: 1700008461) bracket, find an empty slot in your chassis and unscrew the plate that covers the end of the slot. Screw in the bracket in place of the plate.

2.17 Case open (JCASE1)



PCA-6011 provides 2-Pins pin header for case open detection. This function could be enabled or disabled in the BIOS setting. When the PIN is shorted, it will cause the on board buzzer to sound.

Chapter 3

AMI BIOS Setup

3.1 Introduction

With the AMI BIOS Setup program, you can modify BIOS settings and control the features of your computer. The Setup program uses a number of menus for reflecting the current system status and controlling the system. This chapter describes the basic navigation of the PCA-6011 setup screens.

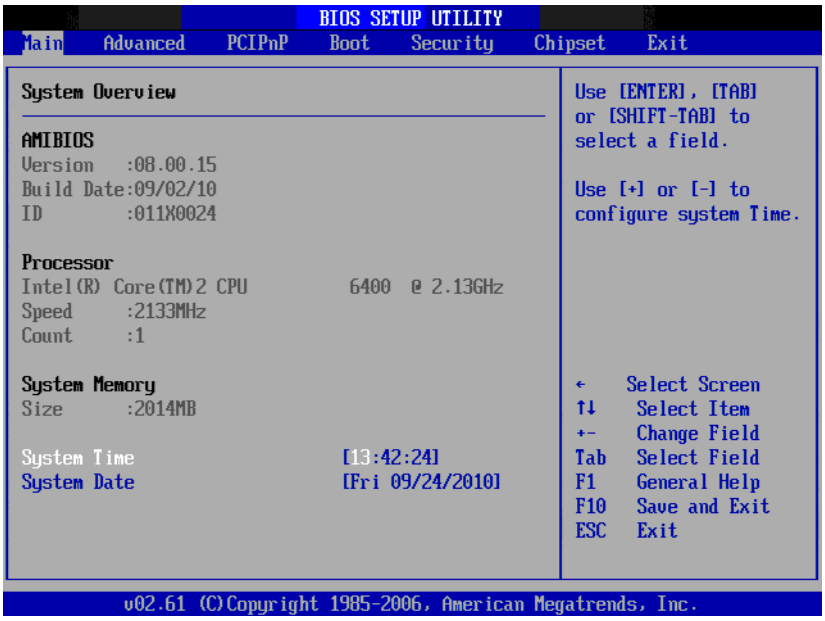


Figure 3.1 Setup Program Initial Screen

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

3.2 Entering Setup

Press the "Del" key during the Power On Self Test (POST) process to enter the BIOS setup screen, otherwise the system will continue the POST process.

3.2.1 Main Setup

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

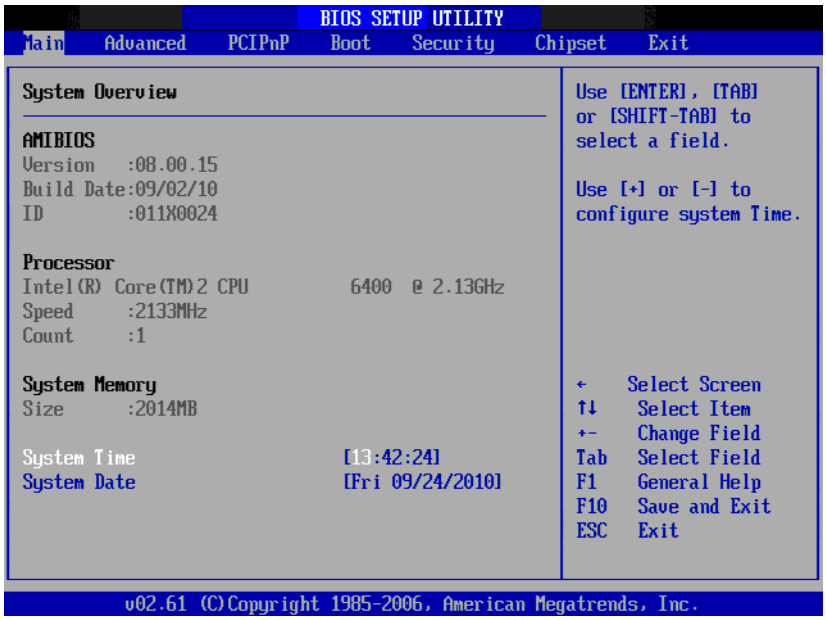


Figure 3.2 Main Setup Screen

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. The right frame displays the key legend.

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

3.2.1.1 System time / System date

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

3.2.2 Advanced BIOS Features Setup

Select the Advanced tab from the PCA-6011 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.

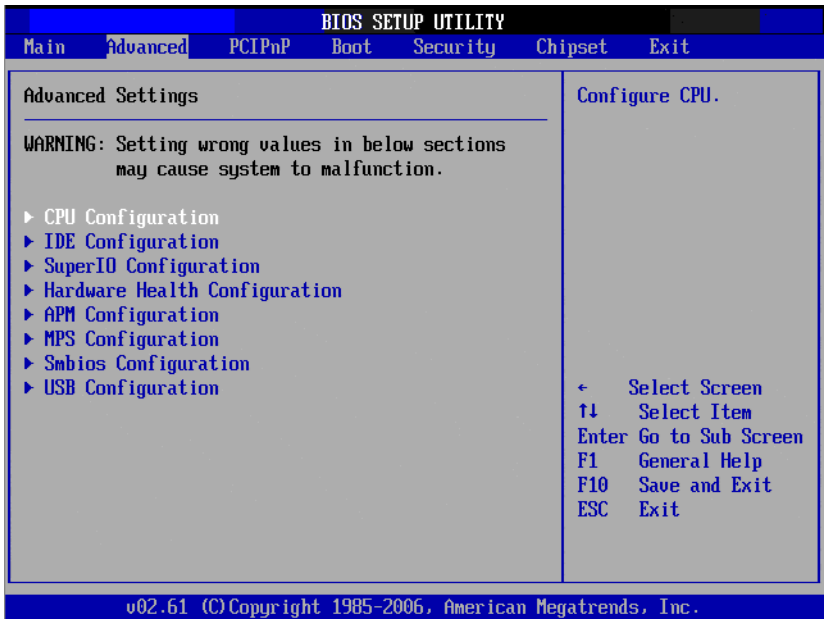


Figure 3.3 Advanced BIOS Features Setup Screen

3.2.2.1 CPU Configuration

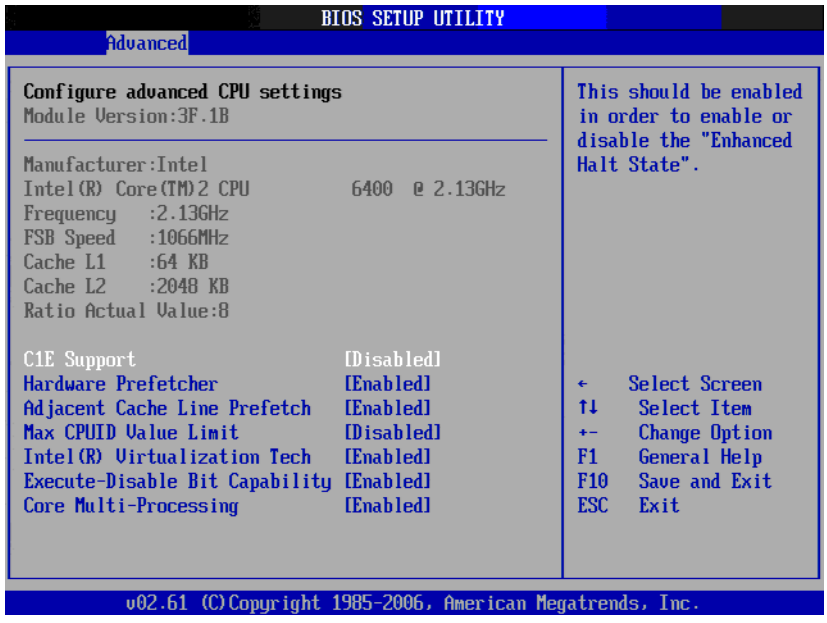


Figure 3.4 CPU Configuration Settings

- **C1E Support**

  Intel® CPU Enhanced Halt (C1E) function, a function to save CPU power consumption in system halt state. When enabled, the CPU speed and voltage will be reduced during system halt state to save power consumption.

You may choose to enable or disable it.

- **Hardware Prefetcher**

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

- **Adjacent Cache Line Prefetch**

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

- **Max CPUID Value Limit**

  This is disabled for Windows XP.

- **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.

- **Execute Disable Bit capability**

  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.

- **Core Multi-Processing**

  You may choose to enable or disable it. When this option disabled, BIOS disables one execution core.

3.2.2.2 IDE Configuration

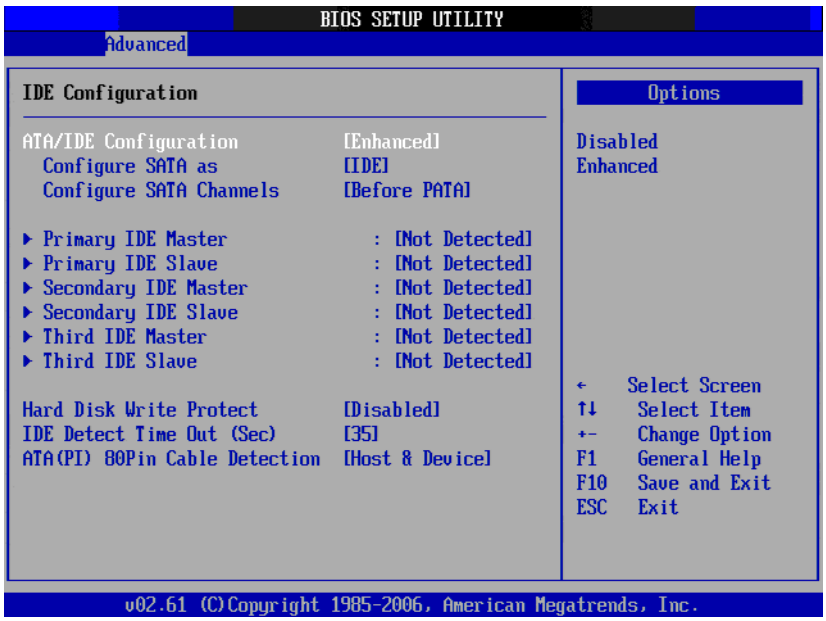


Figure 3.5 IDE Configuration

- **ATA/IDE Configuration**

  This can be configured as Disabled, or Enhanced. If enhanced mode is turned on, primary, secondary and third IDE can be configured.

- **Hard Disk Write Protect**

This will be effective only if device is accessed through BIOS. You may choose to enable or disable it

- **IDE Detect Time Out (sec)**
  Select the time out value for detecting IDE devices.
- **ATA (PI) 80Pin Cable Detection**
  This item is for ATA 80 pin cable detection.

3.2.2.3 Super I/O Configuration

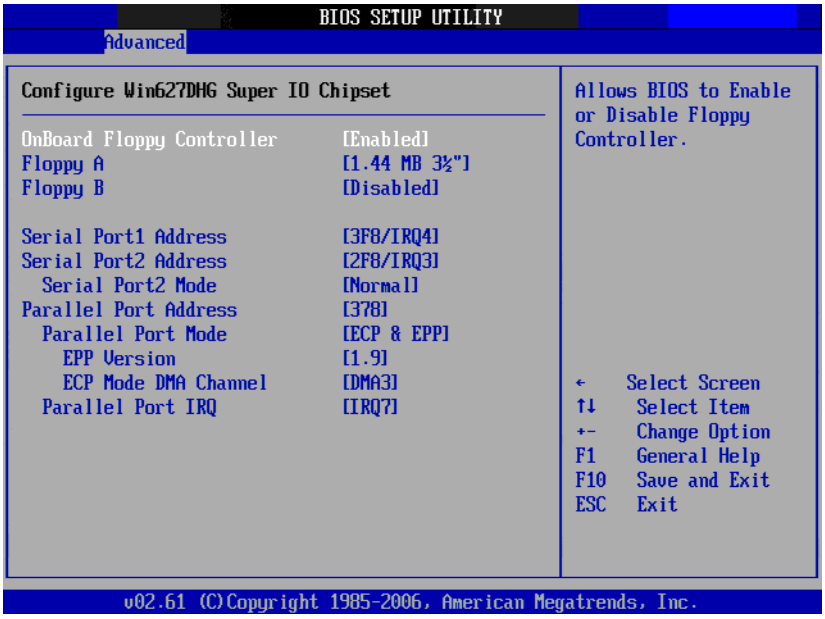


Figure 3.6 Super I/O Configuration

- **OnBoard Floppy Controller**
  Enable or disable the floppy function.
- **Floppy A**
  Select the type of floppy drive connected to the system. We suggest you disable the floppy if installing Windows Vista without a floppy drive.
- **Floppy B**
  Select the type of floppy drive connected to the system.
- **Serial Port1 Address**
  This option configures serial port 1 base addresses.
- **Serial Port2 Address**
  This option configures serial port 2 base addresses. The following options are also available:
  - **Serial port2 Mode**
    This option configures serial port 2 mode. Available options include Normal, IrDA, ASK IR.
- **Parallel Port Address**
  This configures parallel port base addresses. The following options are also available:
  - **Parallel Port Mode**
    This option configures Parallel Port mode. Available options include ECP & EPP/EPP/ECP/Bi-directional/Normal.
  - **Parallel Port IRQ**

This option configures s Parallel Port base IRQ.

3.2.2.4 Hardware Health Function

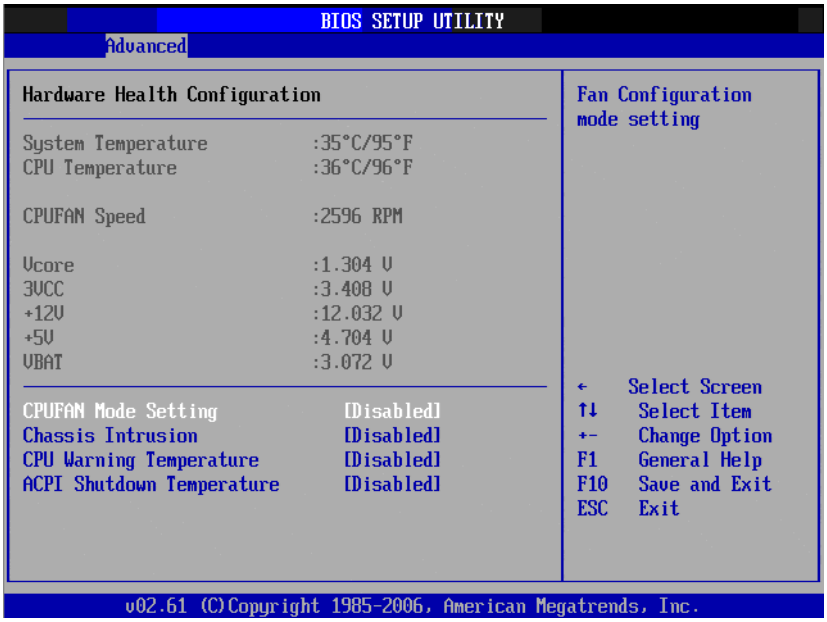


Figure 3.7 Hardware Health Configuration

- **CPUFAN Mode Setting**

  Use this to set the SmartFan control function or disabled SmartFan.

- **Chassis Intrusion**

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

- **CPU Warning Temperature**

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

- **ACPI Shut Down Temperature**

  This potion allows user to set the CPU temperature at that the system will automatically shut down for preventing CPU from over heat damage.

3.2.2.5 APM Configuration

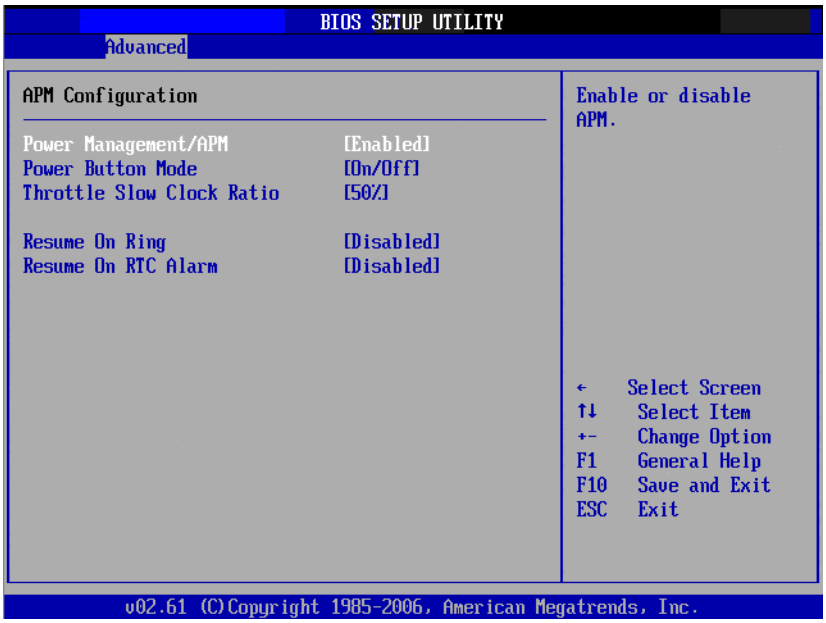


Figure 3.8 APM Configuration

- **Power Management/APM**
  Enable or disable APM power management function.
- **Power Button Mode**
  Power on, off or enter suspend mode when the power button is pressed.
  The following options are also available.
  Resume On Ring: Disable/Enable RI wake event.
  Resume On LAN: Disable/Enable LAN PME wake event.
  Resume On RTC Alarm: Disable/Enable RTC wake event
- **Throttle Slow Clock Ratio**
  Select the duty cycle in throttle mode.
- **Resume On Ring**
  Disable/Enable RI wake event.
- **Resume On RTC Alarm**
  Disable/Enable RTC wake event.

3.2.2.6 MPS Configuration

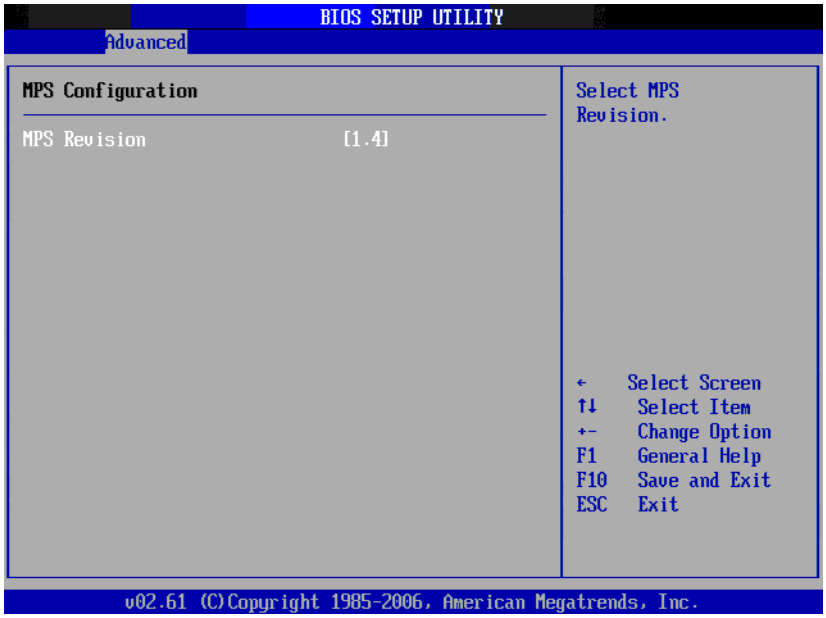


Figure 3.9 MPS Configuration

- **MPS revision**
  This item will allow you choose the version of MPS table to fit your OS system.

3.2.2.7 Smbios Configuration

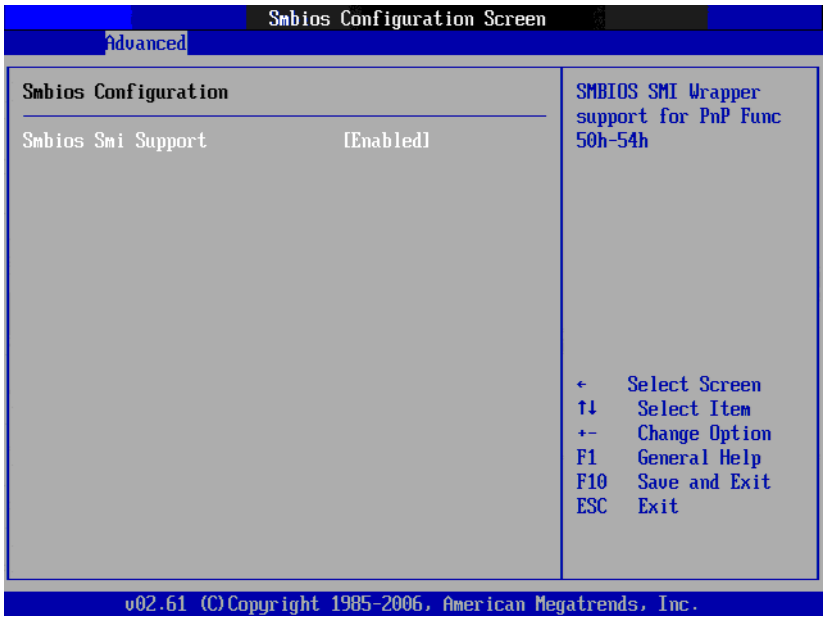
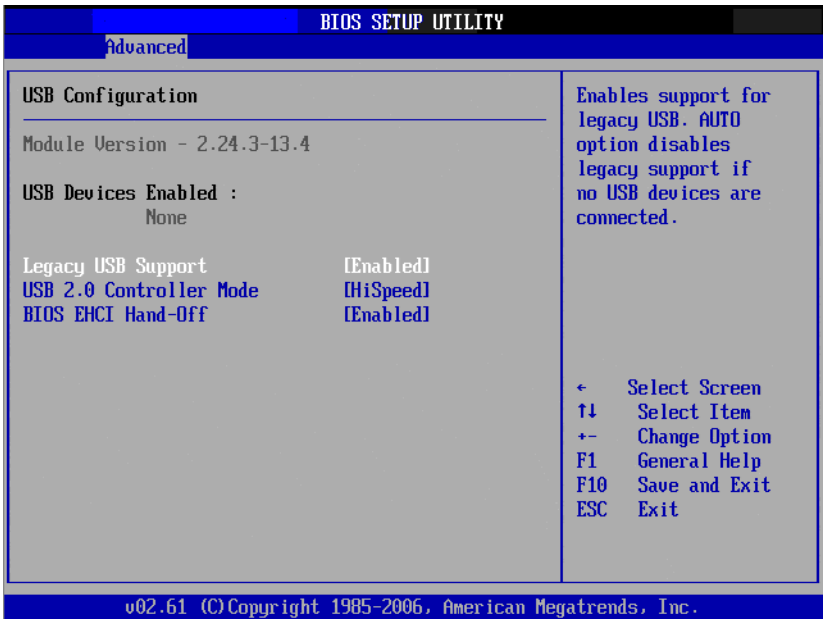


Figure 3.10 Smbios Configuration

- **Smbios SMI support**
  Enable or disable the SMI wrapper support.

3.2.2.8 USB configuration



- **Legacy USB Support**
  This is for supporting USB device under 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 and disable USB legacy mode when no USB device is plugged.
- **USB 2.0 Controller Mode**
  This is to set speed of the USB 2.0 Controller.
- **BIOS EHCI Hand-off**
  This enables or disables supporting OS without EHCI hand-off feature.

3.2.3 PCI/PNP Setup

Select the PCI/PnP tab from the PCA-6011 setup screen to enter the Plug and Play BIOS Setup screen. Highlighting a Plug and Play BIOS Setup option by using the <Arrow> keys displays a description in the right hand panel. All Plug and Play BIOS Setup options are described in this section. The Plug and Play BIOS Setup screen is shown below.

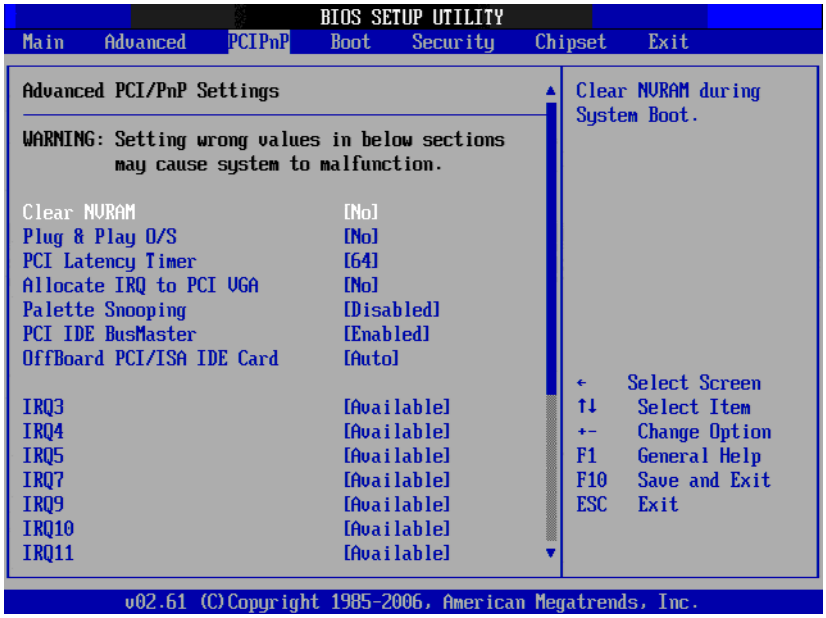


Figure 3.11 PCI/PNP Setup_1

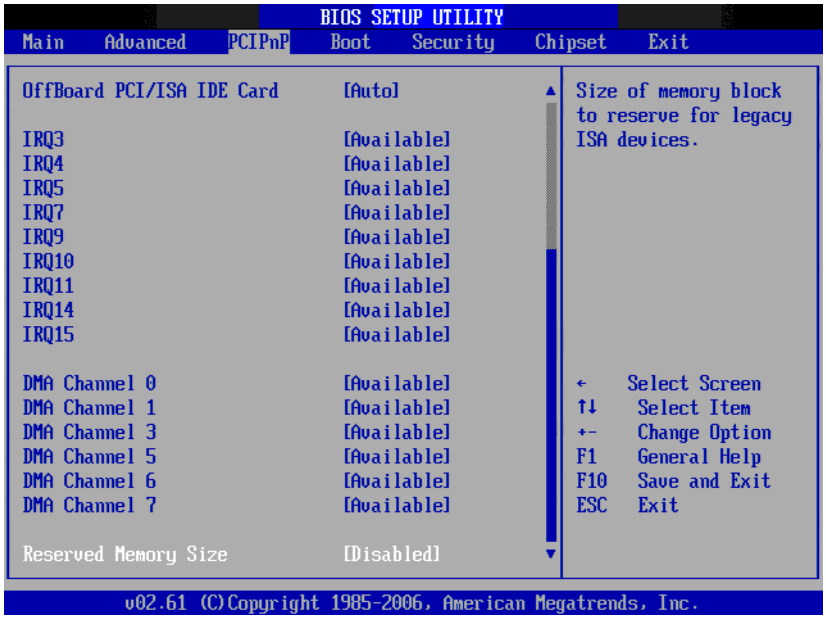


Figure 3.12 PCI/PNP Setup_2

3.2.3.1 Clear NVRAM

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

3.2.3.2 Plug and Play O/S

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

3.2.3.3 PCI Latency Timer

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

3.2.3.4 Allocate IRQ to PCI VGA

Set this value to allow or stop the system from giving the VGA adapter card an interrupt address. The Optimal and Fail-Safe default setting is Yes.

3.2.3.5 Palette Snooping

Set this value to allow the system to modify the Palette Snooping settings. The Optimal and Fail-Safe default setting is “Disabled”.

3.2.3.6 PCI IDE BusMaster

Set this value to allow or prevent the use of PCI IDE Busmastering. The Optimal and Fail-Safe default setting is enabled.

3.2.3.7 Off Board PCI/ISA IDE card

Set this value to allow an add-on PCI/ISA IDE card to be selected. The Optimal and Fail-Safe default setting is Auto.

3.2.3.8 IRQ

You may choose available or reserve. If you choose available, the IRQ will be assigned to PCI.

3.2.3.9 DMA channel

You may choose available or reserve. If you choose available, the DMA channel will be assigned to PCI.

3.2.3.10 Reserved memory size

Size of memory block to reserve for legacy ISA devices.

3.2.4 Boot Settings

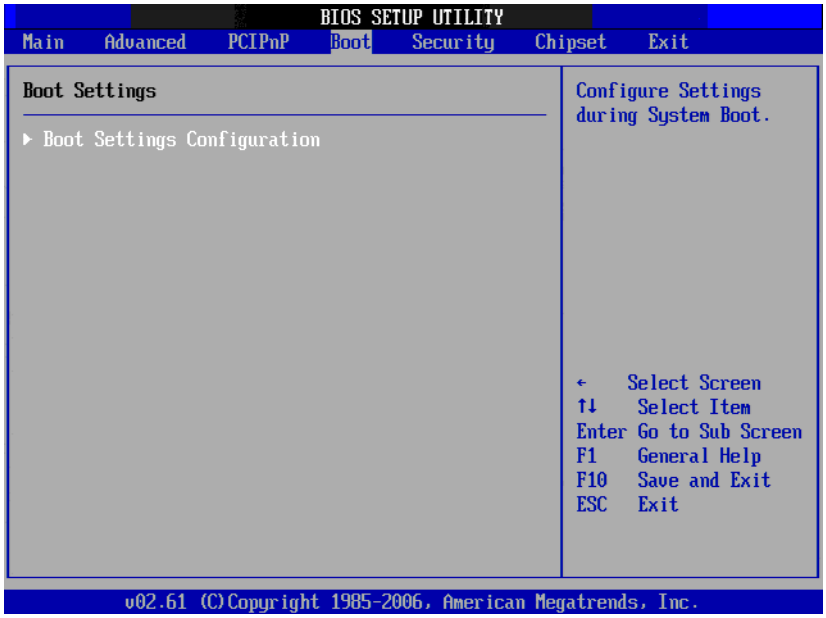


Figure 3.13 Boot Settings

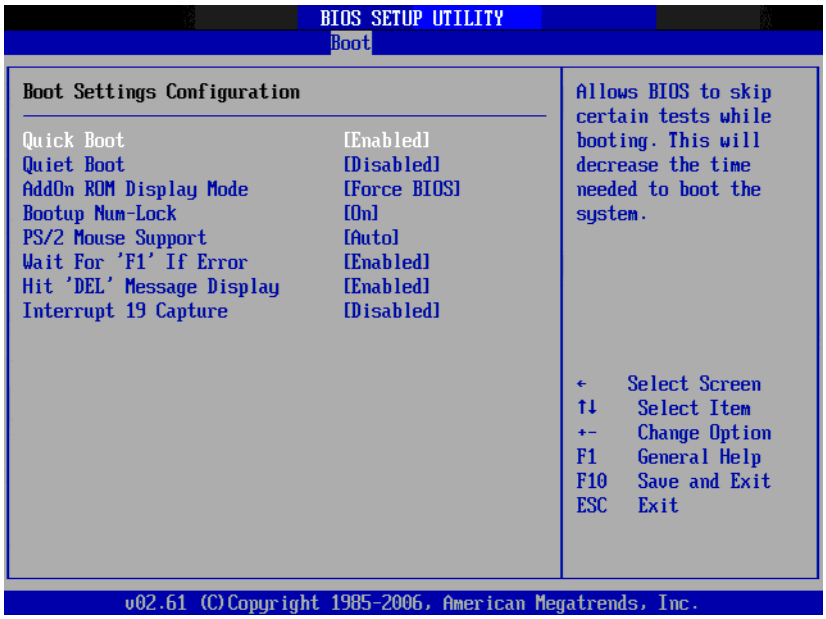


Figure 3.14 Boot Settings Configuration

The following options are available:

- **Quick Boot**

  Allows the BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.

- **Quiet Boot**

  If this option is set to Disabled, the BIOS displays normal POST messages. If Enabled, an OEM Logo is shown instead of POST messages.

- **AddOn ROM Display Mode**

  This is for choosing display mode of option ROM information under DOS environment during booting up process. Available options include Force BIOS, Keep Current.

- **Bootup Num-Lock**
  Select the Power-on state for Numlock.
- **PS/2 Mouse Support**
  Enable or disable PS/2 interface mouse support. Available options include Auto, Enable, Disable.
- **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**
  Enable or disable option ROM to trap interrupt 19.

3.2.5 Security Settings

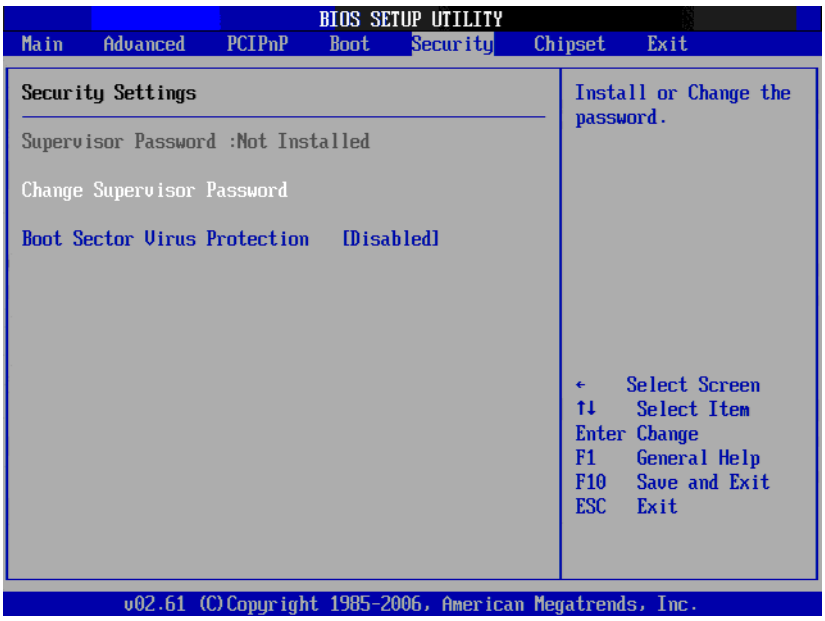


Figure 3.15 Security Settings

Select Security Setup from the PCA-6011 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>:

3.2.5.1 Change Supervisor Password

Provides for either installing or changing the password.

3.2.5.2 Boot sector Virus protection

The boot sector virus protection will warn if any program tries to write to the boot sector.

3.2.6 Advanced Chipset Settings



Figure 3.16 Advanced Chipset Settings

3.2.6.1 North Bridge Configuration

Allows user to set graphic and memory controller configurations.

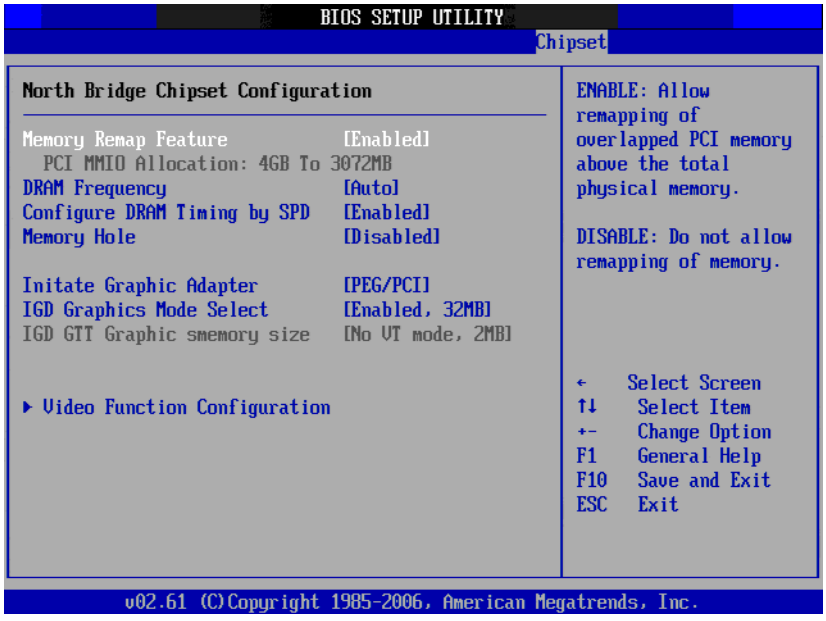


Figure 3.17 North Bridge Configuration

- **Memory remap feature**

  The feature allows you to enable or disable the remapping of the overlapped PCI memory above the total physical memory.

- **DRAM Frequency**

  Allows user to set DDR2 memory operating frequency.

- **Configure DRAM Timing by SPD**

  Allows user to set DRAM operating timing coefficients by SPD or Manual.

- **Memory hole**

15-16 MB of memory block reserved for legacy ISA devices. You may choose disable and 15-16 MB.

- **Initiate Graphic Adapter**

  Allows user to set initial video output device. Available options include IGD, PCI/IGD.

- **Internal Graphics Mode Select**

  Allows user to set graphic mode for DOS environment. Available options include Disable, Enable 32 MB, Enable 64 MB, Enable 128 MB.

- **Video Function Configuration**

  This allows user to set IGD (Integrated Graphics Device) configuration.

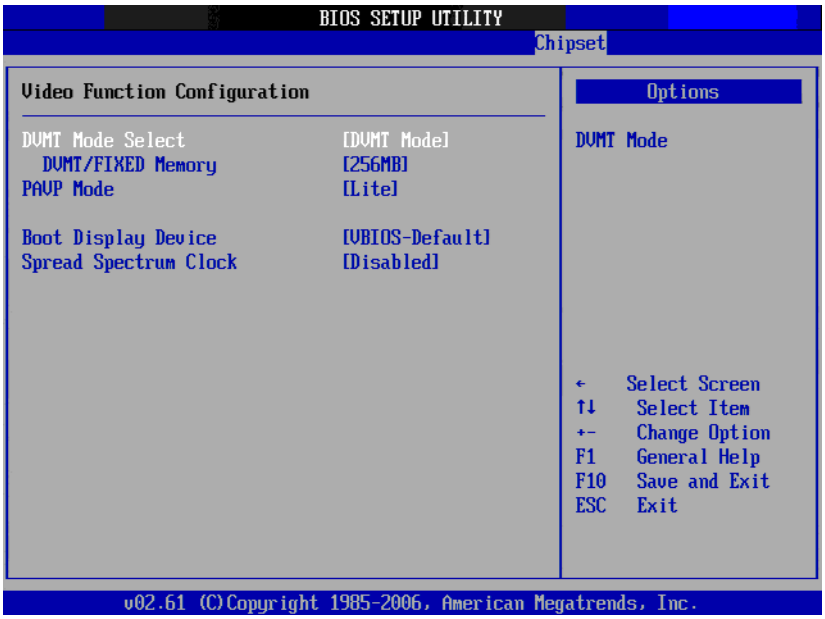


Figure 3.18 Video Function Configuration

- **DVMT model select**

  Displays the active system memory mode.
  DVMT / FIXED Memory: Specify the amount of DVMT / FIXED system memory to allocate for video memory.

- **PAVP Mode**

  GMCH protected Audio Video Path (PAVP) BIOS support.

- **Boot Display Device**

  Choose the boot display device. The available options are VBIOS-default, CRT and DVI.

- **Spread Spectrum Clock**

  Enable/Disable spread spectrum. Enable spread spectrum function can have better EMI compatibility but may cause some unexpected peripheral device incompatibility issue.

3.2.6.2 South Bridge Chipset Configuration

Allows user to set I/O port configurations.

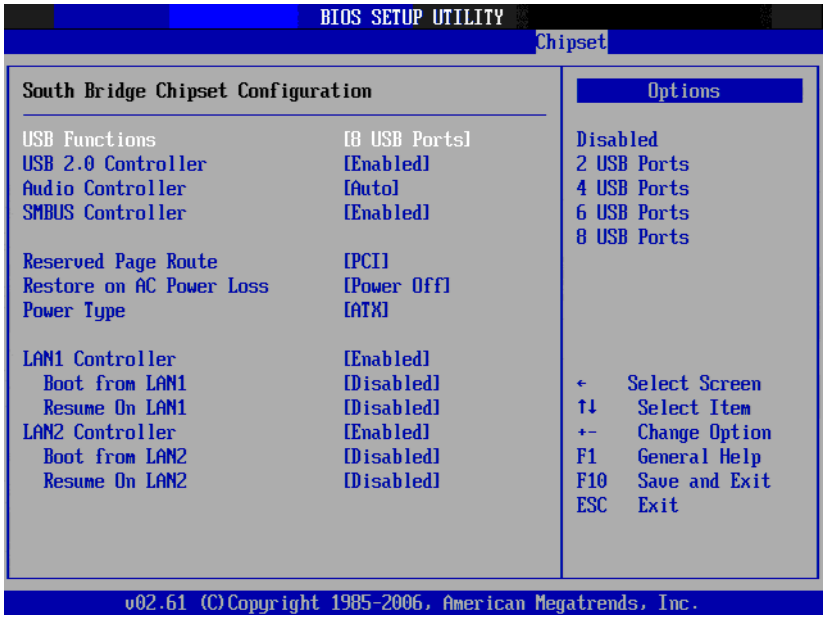


Figure 3.19 South Bridge Chipset Configuration

- **USB Functions**

  Select: Disabled, 2 USB Ports, 4 USB Ports, 6 USB Ports or 8 USB Ports.

- **USB 2.0 Controller**

  Enables or disables the USB 2.0 controller.

- **Audio controller**

  Allows user to choose Auto or Azalia to manage the audio controller.

- **SMBUS Controller**

  Enables or disables the SMBUS controller.

- **Reserved Page Route**

  Allows user to set Port 80 information output port. Available options include PCI, LPC.

- **Restore on AC Power Loss**

  This option allows user to set system action when AC power restores after AC power loss. Available options include Power Off, Power On, Last Status.

- **Power Type**

  ATX or AT.

- **LAN 1/2 Controller**

  Enables or disables the LAN 1/2 GbE controller(s). The options below are also available.

  – **Boot from LAN1/2**

  Allows user to enable or disable the function of LAN booting from a PXE server.

  – **Resume on LAN 1/2**

  Allows user to enable or disable the function of system resuming from LAN 1/2.

3.2.7 Exit Options

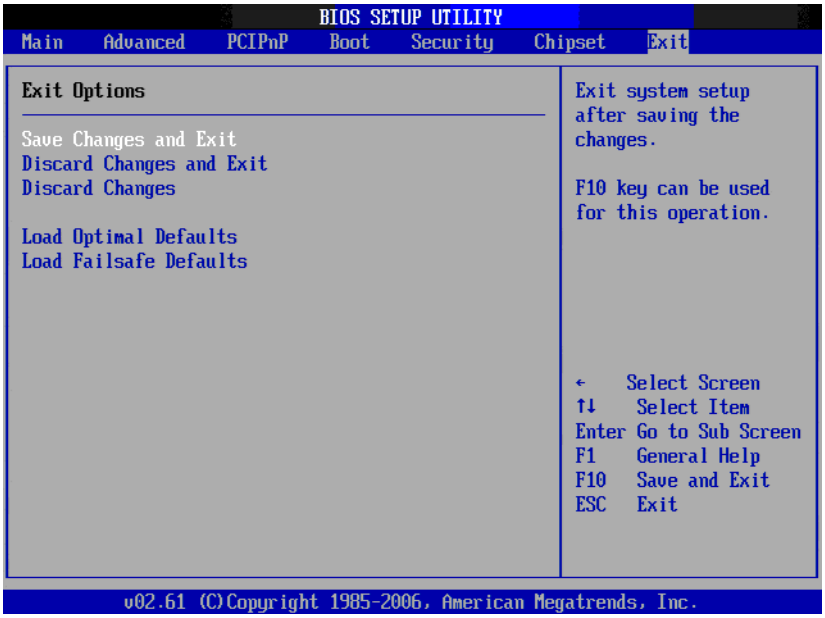


Figure 3.20 Exit Options

3.2.7.1 Save Changes and Exit

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

1. Select 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”.

3.2.7.2 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.

3.2.7.3 Discard Changes

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

3.2.7.4 Load Optimal Defaults

The PCA-6011 automatically configures all setup items to optimal settings when you select this option. Optimal Defaults are designed for maximum system performance, but may not work best for all computer applications. In particular, do not use the Optimal Defaults if your computer is experiencing system configuration problems. Select Load Optimal Defaults from the Exit menu and press <Enter>.

3.2.7.5 Load Failsafe Defaults

The PCA-6011 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

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 PCA-6011 are located on the software installation CD. 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.

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:

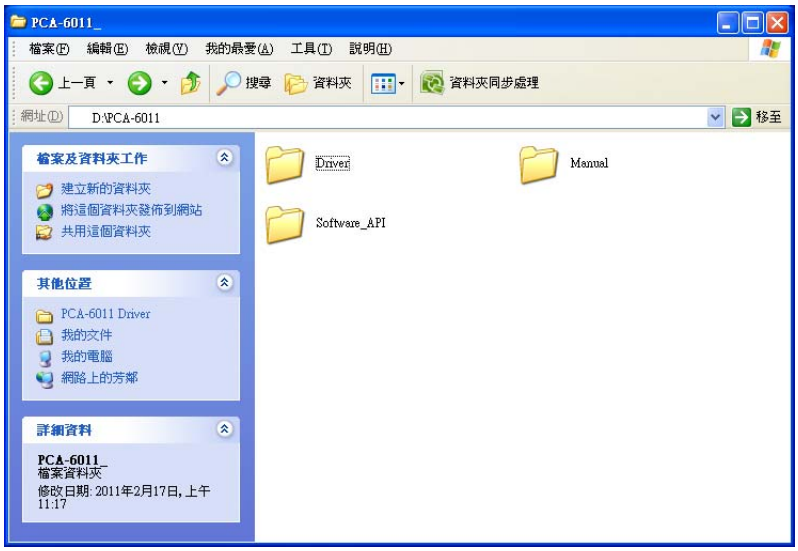
- Core PCI and ISAPNP Services
- PCIe Support
- IDE/ATA33/ATA66/ATA100 Storage Support
- SATA Storage Support
- USB Support
- Identification of Intel (R) Chipset Components in the Device Manager

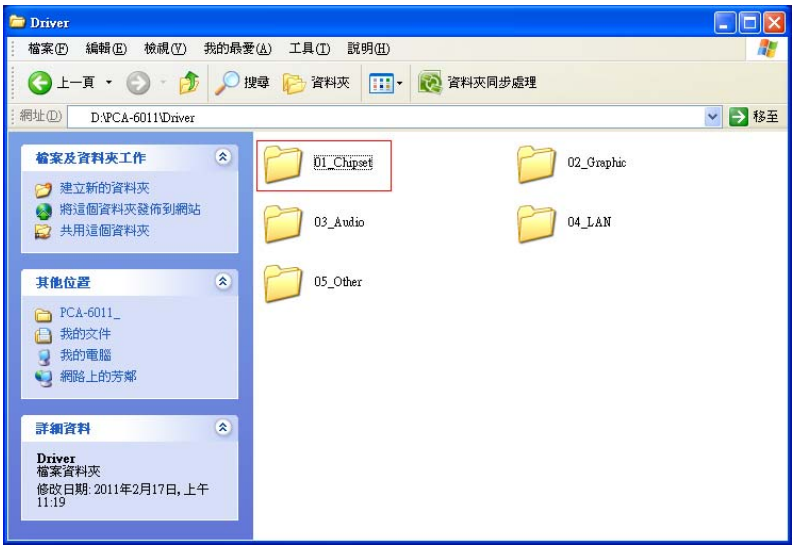
Note! *This utility is used for the following versions of Windows system, and it has to be installed before installing all the other drivers:*

- *Microsoft Windows 7*
- *Microsoft Windows 7 x64 Edition*
- *Microsoft Windows XP Professional x64 Edition*
- *Microsoft Windows XP with Service Pack 2*

4.3 Windows XP Driver Setup

1. Insert the driver CD into your system's CD-ROM drive. Select the folder "Driver" then select folder "01_Chipset" and click "infinst_autol.exe". A message pops up telling you to install the CSI utility before other device drivers. Windows XP is used as an example in the following steps.





2. Click “Next” when you see the following message.



3. Click “Yes” when you see the following message.



4. Click “Next” when you see the following message.



5. Click "Next" when you see the following message.



6. When the following message appears, click “Finish” to complete the installation and restart Windows.



Chapter 5

VGA Setup

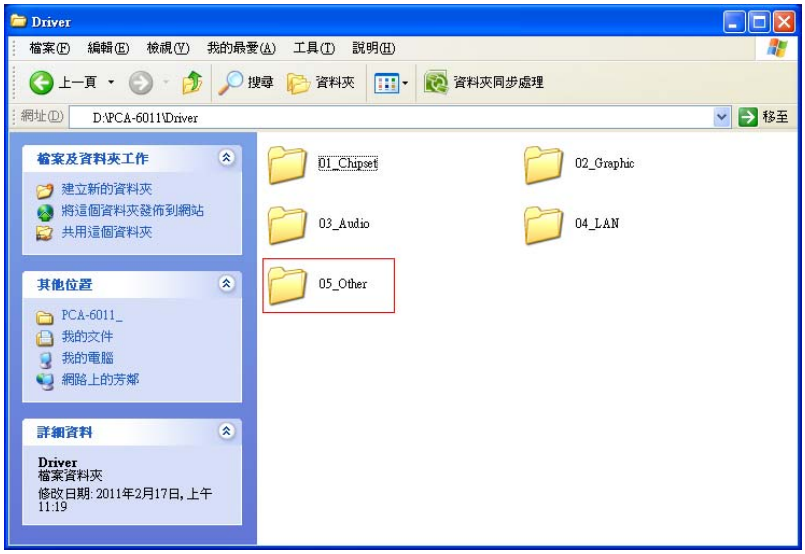
5.1 Introduction

The Intel G41 integrated graphics controller provides an analog display port. You need to install the VGA driver to enable the function. The Intel G41 integrated graphics controller incorporates the latest Microsoft* DirectX*9 support capabilities. It allows software developers to create life like environments and characters. Enhanced display modes for widescreen flat panels, and optimized 3D support deliver an intense and realistic visual experience without requiring a separate graphics card.

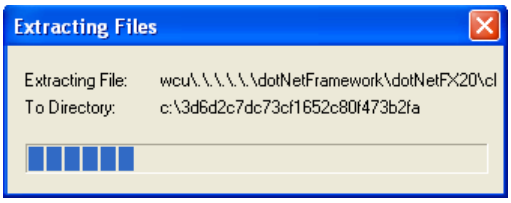
5.2 Preparation for VGA Driver Setup

Please install the .NET Framework to run the application correctly.

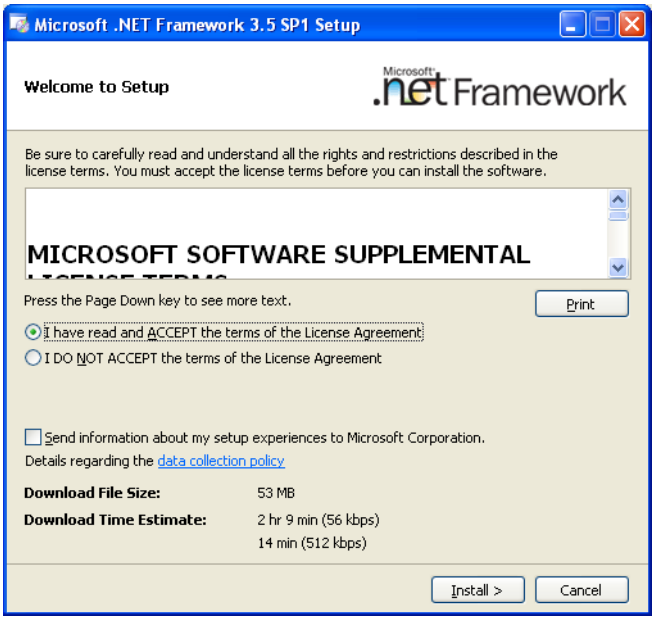
1. Insert the driver CD into your system's CD-ROM drive. Select the folder "Driver", select folder "05_Other", select folder "NET Framework 3.5" then click the "dotnetfx35.exe" for the .NET Framework install.



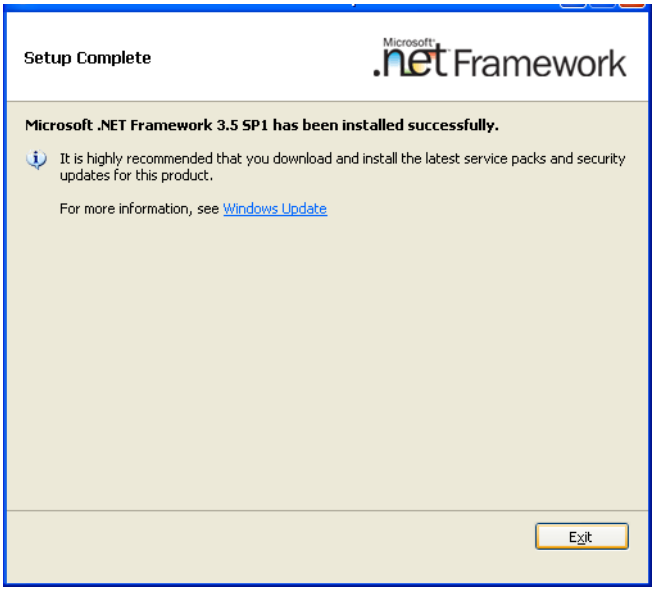
2. Waiting some minutes for extracting files.



3. You will see a welcome window. Please read the license terms and select the item, then click "Install" to start the installation.



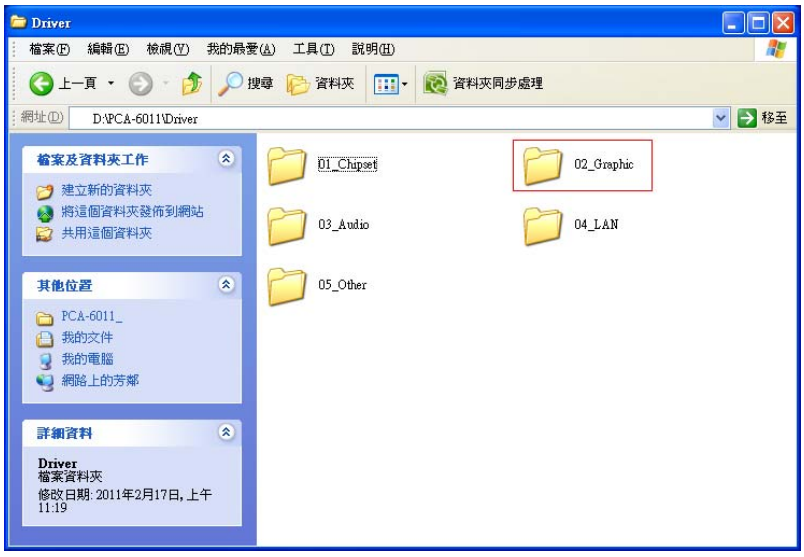
4. Click "Exit" to complete the installation and restart the computer.



5.3 Windows XP Driver Setup

Note! *Before installing this driver, make sure the CSI utility and .NET Framework has been installed in your system. See Chapter 4 and Section 5.2 for information on installing the CSI utility and .NET Framework.*

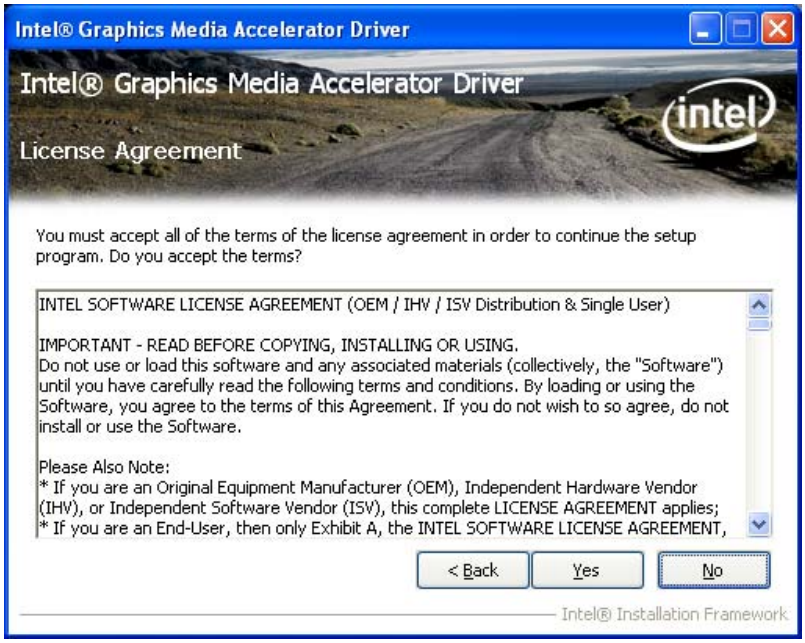
1. Insert the driver CD into your system's CD-ROM drive. Select the folder "02_Graphic" then click the proper VGA driver for the OS. Windows XP is used as an example in the following steps.



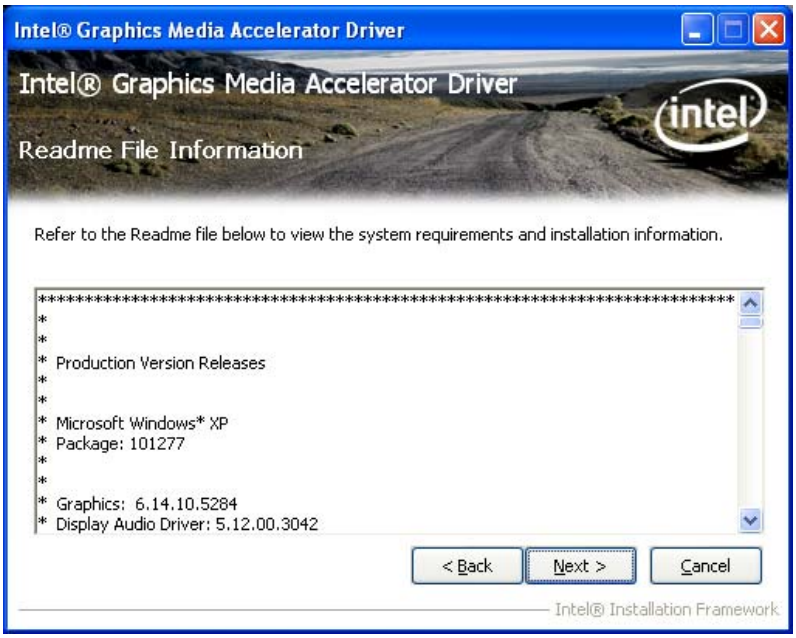
2. You will see a welcome window. Please click "Next" to continue the installation.



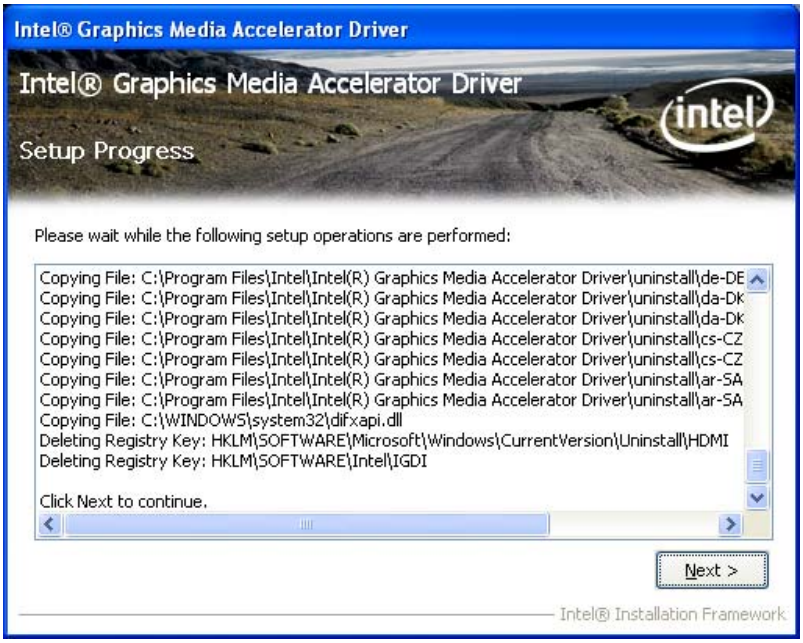
3. Click "Yes" when you see the following message.



4. When you see the following message, please click "Next" to continue the installation.



5. Please click "Next" to continue the installation.



6. Click “Finish” to complete the installation and restart the computer now or later.



Chapter 6

LAN Configuration

6.1 Introduction

The PCA-6011 has a single Gigabit Ethernet LAN via dedicated PCI Express x 1 bus (Intel® 82583V), which offers bandwidth of up to 500 MB/sec, eliminating the bottle-neck of network data flow and incorporating Gigabit Ethernet to operate at 1000 Mbps.

6.2 Features

- Integrated 10/100/1000 Mbps transceiver
- 10/100/1000 Mbps triple-speed MAC
- High-speed RISC core with 24-KB cache
- On-chip voltage regulation
- Wake-on-LAN (WOL) support
- PCI Express X1 host interface

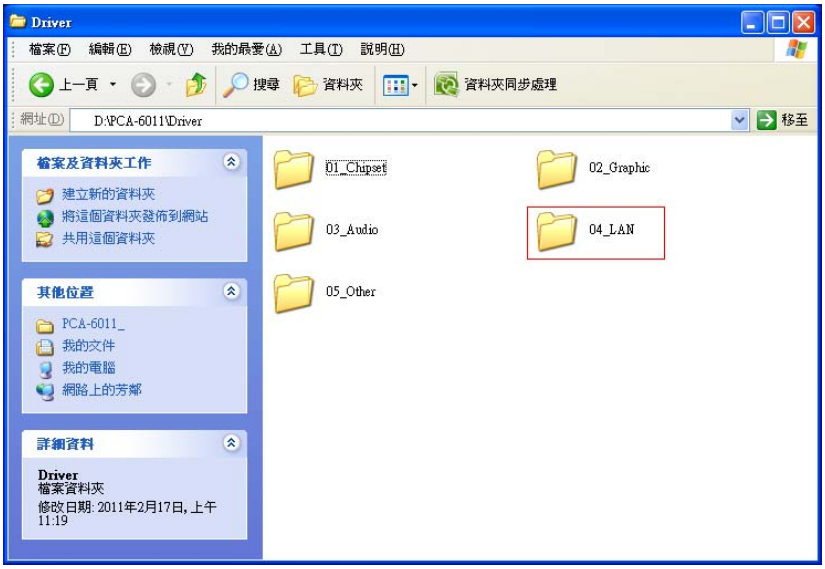
6.3 Installation

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

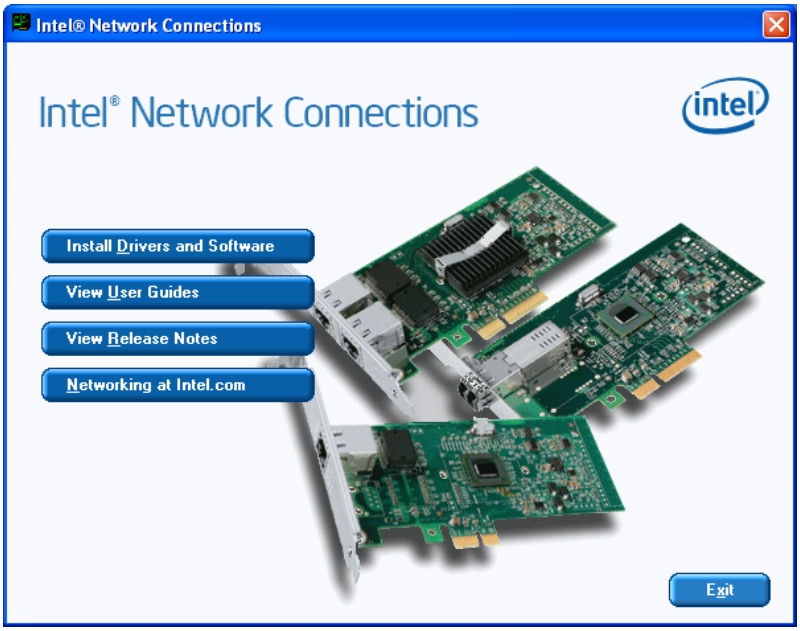
The PCA-6011 Intel 82583V Gigabit integrated controller supports all major network operating systems. However, the installation procedure varies with different operating systems. In the following sections, refer to the one that provides the driver setup procedure for the operating system you are using.

6.4 Win XP Driver Setup

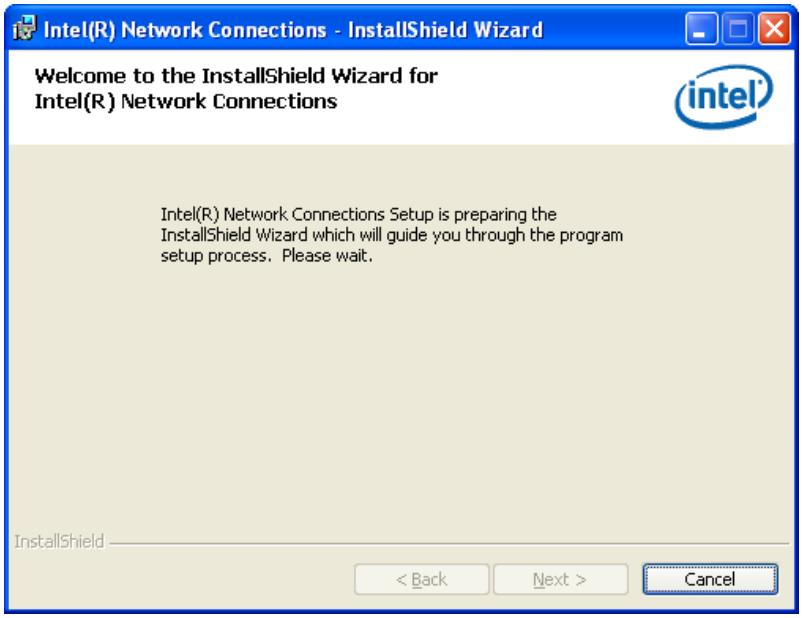
1. Insert the driver CD into your system's CD-ROM drive. Select the folder "04_LAN" then click "Autorun.exe" for the driver install. Windows XP is used as an example in the following steps.



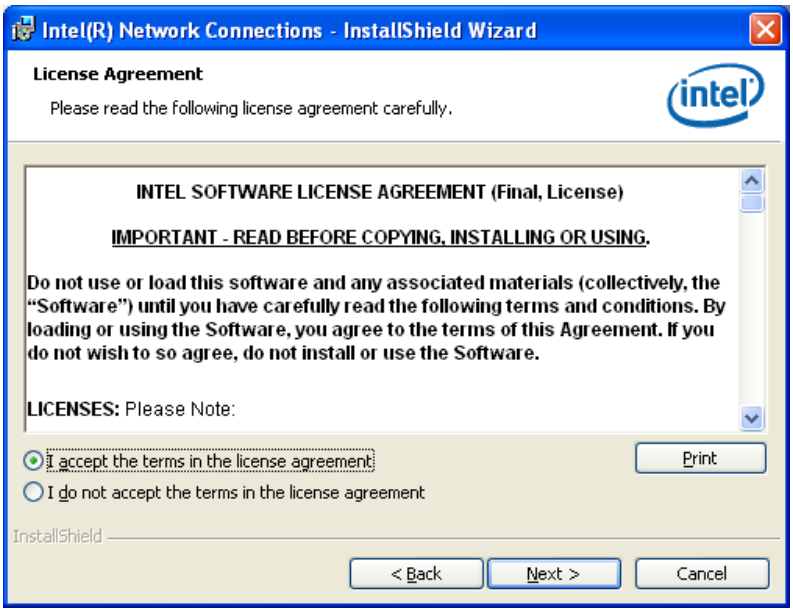
2. Select "Install Drivers and Software" to install driver.



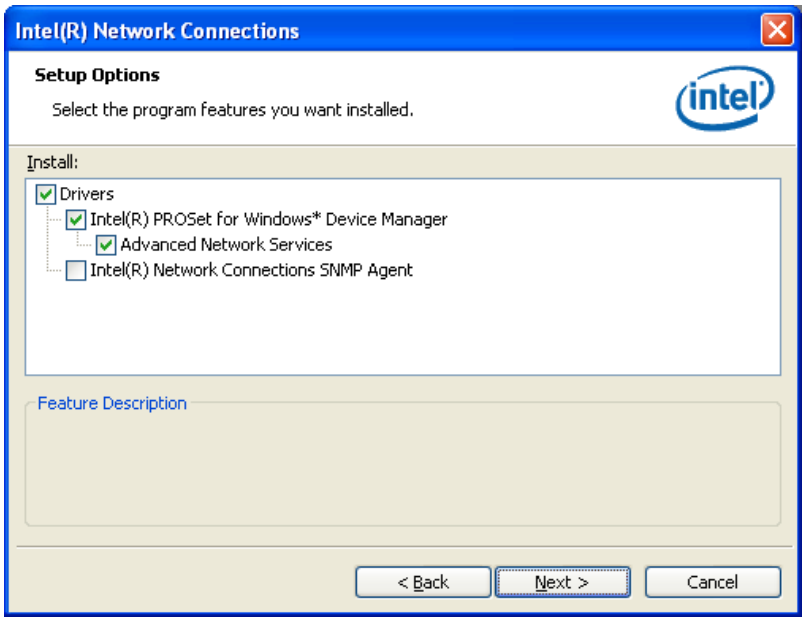
3. You will see a welcome window. Please click "Next" to continue the installation.



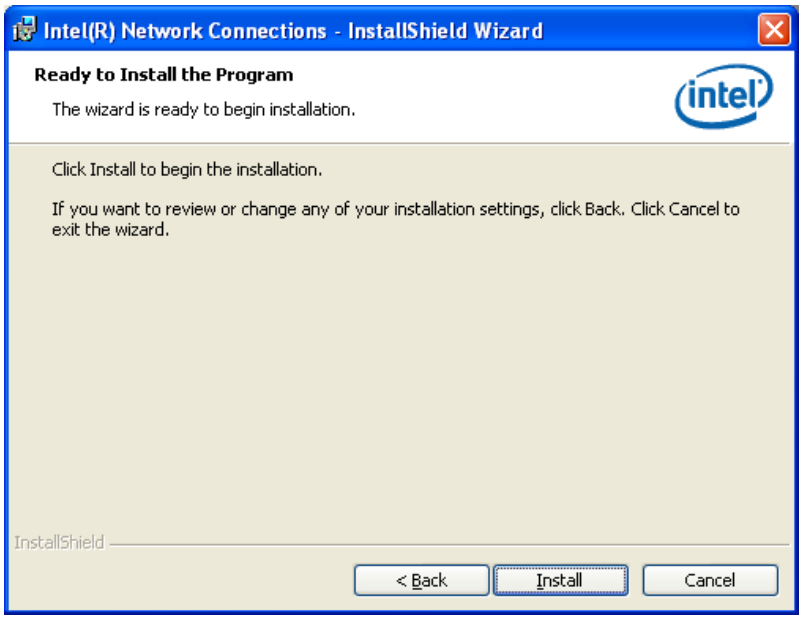
4. Select “I accept the terms in the license agreement” and click “Next” to continue.



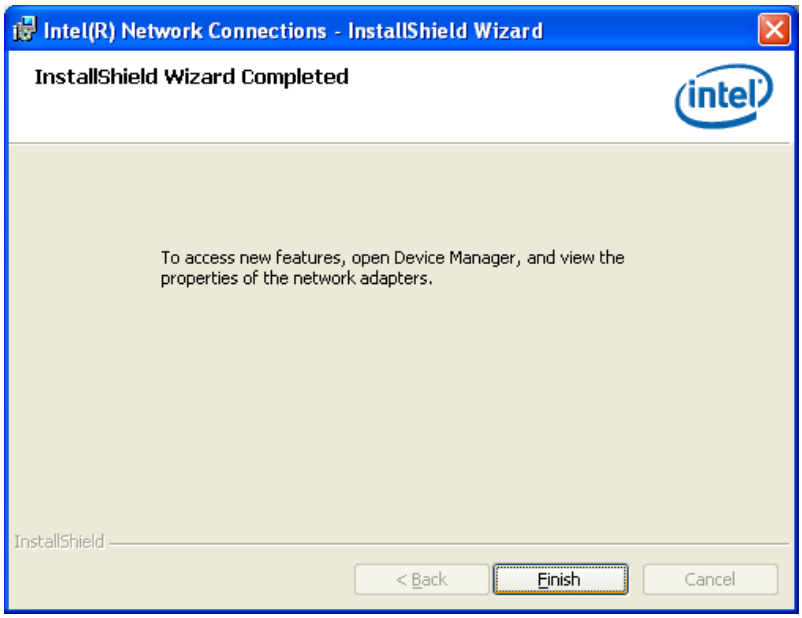
5. Click “Next” to continue.



6. Click “Install” to start the installation procedure.



7. Click "Finish" to complete the installation and the LAN function will be enabled after the installation.



Appendix A

Programming the Watchdog Timer

A.1 Programming the Watchdog Timer

The PCA-6011 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 in to the super I/O controller W83627DHG-P. 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 reset signal if the software fails to reset the timer before time-out.

A.1.2 Jumper selection

The JWDT1 jumper is used to select reset in the event the watchdog timer is tripped. See Chapter 1 for detailed jumper settings.

A.1.3 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 the 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).

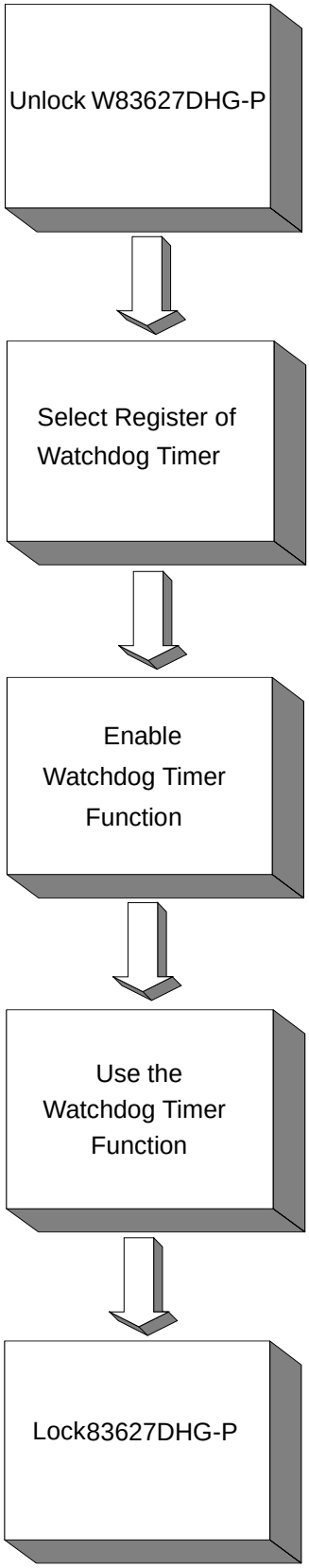

Unlock W83627DHG-P
Select Register of Watchdog Timer
Enable Watchdog Timer Function
Use the Watchdog Timer Function
Lock83627DHG-P

Table A.1: Watchdog Timer Registers		
Address of Register (2E)	**Attribute**	**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.1.4 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 IDE Hard Drive Connector (IDE1)

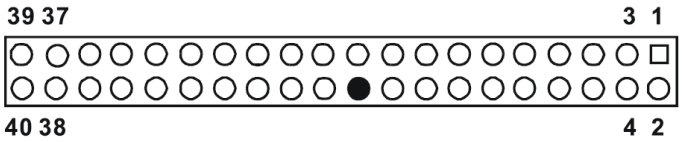


Table B.1: IDE Hard Drive Connector (IDE1)

Pin	Signal	Pin	Signal
1	IDE RESET*	2	GND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	SIGNAL GND	20	N/C
21	DISK DMA REQUEST	22	GND
23	IO WRITE	24	GND
25	IO READ	26	GND
27	IO CHANNEL READY	28	CSEL
29	HDACKO*	30	GND
31	IRQ14	32	IDSC16-
33	ADDR 1	34	PDIAG
35	ADDR 0	36	ADDR 2
37	HARD DISK SELECT 0*	38	HARD DISK SELECT 1*
39	IDE ACTIVE*	40	GND
* low active			

B.2 Floppy Drive Connector (FDD1)

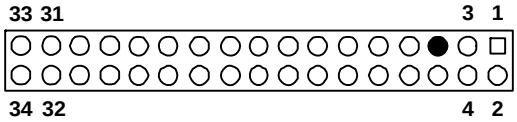


Table B.2: Floppy Drive Connector (FDD1)

Pin	Signal	Pin	Signal
1	GND	2	FDHDIN*
3	GND	4	N/C
5	N/C	6	N/C
7	GND	8	INDEX*
9	GND	10	MOTOR 0*
11	GND	12	N/C
13	GND	14	DRIVE SELECT 0*
15	GND	16	N/C
17	GND	18	DIRECTION*
19	GND	20	STEP*
21	GND	22	WRITE DATA*
23	GND	24	WRITE GATE*
25	GND	26	TRACK 0*
27	GND	28	WRITE PROTECT*
29	GND	30	READ DATA*
31	GND	32	HEAD SELECT*
33	GND	34	DISK CHANGE*

* low active

B.3 Parallel Port Connector (LPT1)

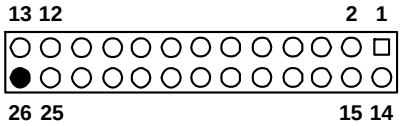


Table B.3: Parallel Port Connector (LPT1)

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

* low active

B.4 VGA Connector (VGA1)

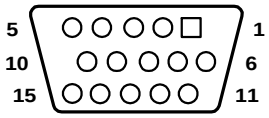


Table B.4: VGA Connector (VGA1)			
Pin	**Signal**	**Pin**	**Signal**
1	RED	2	GREEN
3	BLUE	4	N/C
5	GND	6	VGA_En
7	GND	8	GND
9	VCC	10	GND
11	N/C	12	SDT
13	H-SYNC	14	V-SYNC
15	SCK		

B.5 RS-232 Serial Port (COM1, COM2)

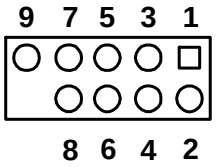


Table B.5: RS-232 Serial Port (COM1, COM2)		
Pin	**Signal (COM1)**	**Signal (COM2)**
1	DCDA	DCDB
2	DSRA	DSRB
3	SINA	SINB
4	RTSA	RTSB
5	SOUTA	SOUTB
6	CTSA	CTSB
7	DTRA	DTRB
8	RIA	RIB
9	GND	GND

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

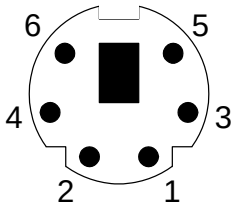


Table B.6: PS/2 Keyboard/Mouse Connector (KBMS1)	
Pin	**Signal**
1	KB DATA
2	MS DATA
3	GND
4	VCC
5	KB CLOCK
6	MS CLOCK

B.7 External Keyboard Connector (KBMS2)

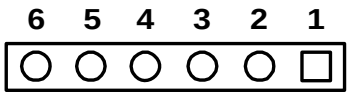


Table B.7: External Keyboard Connector (KBMS2)	
Pin	**Signal**
1	KBCLK
2	KBDAT
3	MSDAT
4	GND
5	MSVCC
6	MSCLK

B.8 CPU Fan Power Connector (CPUFAN1)

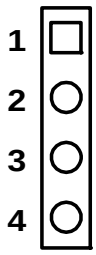


Table B.8: CPU Fan Power Connector (CPUFAN1)	
Pin	**Signal**
1	GND
2	+12 V
3	Detect
4	FANPWM

B.9 Power LED and Keyboard Lock Connector (JFP3 / PWR_LED & KEY LOCK)

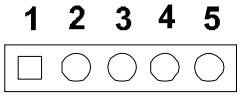


Table B.9: Power LED and Keyboard Lock Connector (JFP3 / PWR_LED & KEY LOCK)	
Pin	**Signal**
1	Power LED(+5 V)
2	NC
3	GND
4	KEYLOCK#
5	GND

B.10 External Speaker Connector (JFP2 / SPEAKER)

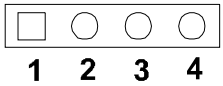


Table B.10: External Speaker Connector (JFP2 / SPEAKER)	
Pin	**Signal**
1	SPK+
2	NC
3	SPK_IN
4	SPK-

B.11 Reset Connector (JFP1 / RESET)

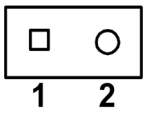


Table B.11: Reset Connector (JFP1 / RESET)	
Pin	**Signal**
1	RESET #
2	GND

B.12 HDD LED (JFP2 / HDDLED)

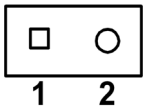


Table B.12: HDD LED (JFP2 / HDDLED)	
Pin	**Signal**
1	VCC
2	#HD_ACT

B.13 ATX Soft Power Switch (JFP1 / PWR_SW)

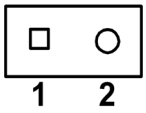


Table B.13: ATX Soft Power Switch (JFP1 / PWR_SW)	
Pin	**Signal**
1	5VSB
2	PWR-BTN

B.14 SM Bus Connector (JFP2/SNMP)

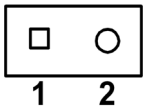


Table B.14: SM BUX Connector (JFP2/SNMP)	
Pin	**Signal**
1	SMB_DATA
2	SMB_CLK

B.15 HD Link connector (HDAUD1)

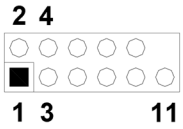


Table B.15: HD Link Connector (HDAUD1)			
Pin	**Signal**	**Pin**	**Signal**
1	VCC	2	GND
3	Sync	4	BITCLK
5	SDOUT	6	SDIN0
7	SDIN1	8	AC-RST
9	+12V	10	GND
11	GND	12	N/C

B.16 LAN LED Connector (LAN LED1)

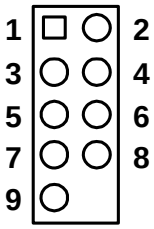


Table B.16: LAN LED Connector (LANLED1)

Pin	Signal
1	#LAN1_ACT
2	#LAN2_ACT
3	VCC3_LANLED1
4	VCC#_LANLED2
5	LAN1_1000#
6	LAN2_1000#
7	LAN1_LED0
8	LAN2_LED0
9	VCC 3SB

B.17 AT Power Connector (ATXF1)

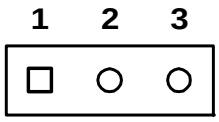


Table B.17: AT Power Connector (ATXF1)

Pin	Signal
1	#PSON
2	VCC
3	5VSB

B.18 H/W Monitor Alarm (JOBS1)

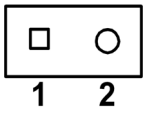


Table B.18: H/W Monitor Alarm (JOBS1)	
Pin	**Signal**
1	OBS_BEEP
2	ERR_BEEP

B.19 USB Connector (USB12, USB34, USB56, USB78)

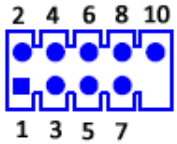


Table B.19: USB Connector (USB12, USB34, USB56, USB78)			
Pin	**Signal**	**Pin**	**Signal**
1	+5V	2	+5V
3	UV-	4	UV-
5	UV+	6	UV+
7	GND	8	GND
9	N/C	10	GND

B.20 Case Open Connector (JCASE1)



Table B.20: Case Open Connector (JCASE1)	
Pin	**Signal**
1	CASEOP#
2	GND

B.21 GPIO Pin Header (GPIO1)

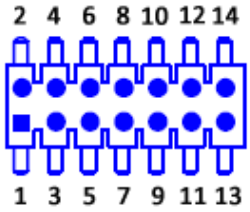


Table B.21: GPIO Pin Header (GPIO1)

Pin	Signal	Pin	Signal
1	GPIO_PORT80_1	2	GPIO_PORT80_5
3	VCC_GPIO	4	GND
5	GPIO_PORT80_2	6	GPIO_PORT80_6
7	GND	8	GND
9	GPIO_PORT80_3	10	GPIO_PORT80_7
11	GND	12	GND
13	GPIO_PORT80_4	14	GPIO_PORT80_8

B.22 System I/O Ports

Table B.22: System I/O Ports

Addr. range (Hex)	Device
000-01F	DMA controller
020-02D	Interrupt controller
02E-02F	LPC SIO
030-03D	Interrupt Controller
040-043 & 050-053	8254 timer
04E-04F	LPC SIO
060-06F	8042 (keyboard controller)
070-07F	Real-time clock, non-maskable interrupt (NMI) mask
080-09F	DMA page register
0A0-0BF	Interrupt controller
0C0-0DF	DMA controller
0F0	Process I/F
1F0-1F7	IDE or SATA controller
290-297	On-board hardware monitor
2F8-2FF	Serial port 2
378-37F	Parallel printer port (LPT1)
3C0-3CF	Reserved
3D0-3DF	Color/graphics monitor adapter
3F0-3F7	Diskette controller
3F8-3FF	Serial port 1
C80-C87	COM3
C88-C8F	COM4

Table B.22: System I/O Ports	
C90-C97	COM5
C98-C9F	COM6
4D0-4D1	Interrupt Controller
CF9	Reset Generator

B.23 DMA Channel Assignments

Table B.23: DMA Channel Assignments	
Channel	**Signal**
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.24 Interrupt Assignments

Table B.24: Interrupt Assignments		
Priority	**Interrupt#**	**Interrupt Source**
1	NMI	Parity error detected
2	IRQ0	Interval timer
3	IRQ1	Keyboard
-	IRQ2	Interrupt from controller 2 (cascade)
4	IRQ8	Real-time clock
5	IRQ9	Cascaded to INT 0A (IRQ 2)
6	IRQ10	Available
7	IRQ11	Available
8	IRQ12	PS/2 mouse
9	IRQ13	INT from co-processor
10	IRQ14	IDE Channel
12	IRQ3	Serial communication port 2
13	IRQ4	Serial communication port 1
14	IRQ5	Parallel port 2
15	IRQ6	Diskette controller (FDC)
16	IRQ7	Parallel port 1 (print port)

B.25 1st MB Memory Map

Table B.25: 1st MB Memory Map	
Addr. range (Hex)	**Device**
E0000h - FFFFFh	BIOS
D0000h - DFFFFh	Unused
C0000h - CFFFFh	VGA BIOS
A0000h - BFFFFh	Video Memory
00000h - 9FFFFh	Base memory

B.26 PCI Bus Map

Table B.26: PCI Bus Map				
Signal	**IDSEL**	**INT# Pin**	**GNT**	**REQ**
PCI slot 1	AD31	INT B, C, D, A	GNT A	REQ A
PCI slot 2	AD30	INT C, D, A, B	GNT B	REQ B
PCI slot 3	AD29	INT D, A, B, C	GNT C	REQ C
PCI slot 4	AD28	INT A, B, C, D	GNT D	REQ D

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