



User Manual

PCA-6781

**ISA Celeron® M Half-sized SBC
with VGA/LCD/LVDS/10/100
Ethernet/USB 2.0 and SSD**

Trusted ePlatform Services

ADVANTECH

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This manual is for the PCA-6781.

Packing List

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

- 1 x PCA-6781 series half-sized single board computer
- 1 x Startup manual
- 1 x CD for utility, drivers, and manual (in PDF format)
- 1 x Y cable for PS/2 Keyboard, PS/2 Mouse p/n: 1700060202
- 1 x E-IDE (HDD) cable p/n: 1701400452
- 1 x FDD cable (600 mm) p/n: 1701340705
- 1 x Printer+COM (RS-232) cable w/ bracket p/n: 1700008891
- 1 x ATX power cable 20P/7P 10 cm p/n: 1703070101
- Jumper pack p/n: 9689000002
- 1 x ATX feature cable (3-pin 2.54 mm to 2.0 mm) p/n: 1700002343
- 1 x USB 4 port cable w/ bracket p/n: 1700008887

If any of these items are missing or damaged, contact your distributor or sales representative immediately.

Additional Information and Assistance

1. Visit the Advantech website at www.advantech.com where you can find the latest information about the product.
2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:
 - Product name and serial number
 - Description of your peripheral attachments
 - Description of your software (operating system, version, application software, etc.)
 - A complete description of the problem
 - The exact wording of any error messages

Declaration of Conformity

FCC

This device complies with the requirements in part 15 of the FCC rules: Operation is subject to the following two conditions:

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

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

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



Table 1.1: PCA-6781 Comparison Table

Model	CPU	LAN
PCA-6781VE-M0A1E	Intel Celeron M 600MHz (512KB L2)	Intel 82551QM
PCA-6781VE-S0A1E	Intel Celeron M 1.0GHz (0 L2)	Intel 82551QM
PCA-6781LV-M0A1E	Intel Celeron M 600MHz (512KB L2)	-

Table 1.2: PCA-6781 Memory Compatibility Table

Model	Size	Speed	Type	ECC	Vendor PN	Advantech PN	Memory
Apacer	128MB	DDR266	DDR SODIMM	N	77.10920.110		AM1 22561615A-7A
	256MB	DDR333	DDR SODIMM	N	77.10634.190		Infineon HYB25D256807BT-5
Kingston	128MB	DDR333	DDR SODIMM	N	KVR333X64SC25/128		ELPIDA SINGAPORE DD2516AKTA-6B-E
	256MB	DDR266	DDR SODIMM	N			hynix 417A HY5DU561622CT-H
	256MB	DDR333	DDR SODIMM	N			hynix 346AA HY5DU561622CT-J
	256MB	DDR400	DDR SODIMM	N	KVR400X64SC3A/256		0406PR V58C2256164SBT5
	512MB	DDR266	DDR SODIMM	N	KVR266X64SC25/512		hynix 336AA HY5DU121622AT-H
	512MB	DDR333	DDR SODIMM	N	KVR333X64SC25/512		Infineon HYB25D256800BC-6
	512MB	DDR400	DDR SODIMM	N			Infineon HYB25D512160BE-5
Transcend	128MB	DDR333	DDR SODIMM	N	TS1DSG11800-6S	96SD-128M333NN-TR	Samsung 734 K4H561638H-UCCC(16×16)
	256MB	DDR333	DDR SODIMM	N	TS3DSM11800-6I	96SD-256M333NN-TR	INFINEON HYB25DC512160CE-5C(32×16)
	512MB	DDR266	DDR SODIMM	N	TS6DSJ12202-7S	96SD-512M266NN-TR2	Samsung 719 K4H510838D-UCCC(32×8)
	512MB	DDR333	DDR SODIMM	N	TS6DSM11800-6Y	96SD-512M333NN-TR	hynix 716A HY5DU22CTP-D43
	1GB	DDR333	DDR SODIMM	N	TS2DSA18702-6S	96SD-1G333NN-TR	Samsung 719 K4H510838D-ZCCC(64×8)

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Chapter 1

General Information

This chapter gives background information on the PCA-6781.

Sections include:

- Introduction
- Features
- Specifications
- Board layout and dimensions

1.1 Introduction

The PCA-6781 series is a half-sized ISA bus CPU card designed with powerful Intel Celeron M processor, with Intel 852GM and ICH4 chipset, which supports Dynamic Video Memory Technology. For maximum performance, PCA-6781 also supports one 200 Pin SODIMM socket and DDR memory up to 1 GB. These chipsets provide an optimized on-board integrated graphics solution.

Other onboard features include 1 EIDE, 1 FDD, 1 LPT, 4 USB 2.0, 2 COM ports (1 x RS-232 and 1 x RS-232/422/485), PS/2 KeyBoard/ mouse, watchdog. The SSD solution supports Type I/II CompactFlash cards.

This product uses a Intel 852GM that supports VGA/LVDS interface, 2 channel (36-bit) LVDS LCD panel. PCA-6781 supports AC97 audio with the addition of the optional PCM-231A-00A1E audio module.

The Ethernet interface supports 10/100Base-T Intel 82551QM.

Its dimension follows standard ISA slot PC, this makes it can match with all half-sized chassis and can operate in high vibration environment.

1.2 Features

- Intel Embedded Celeron M Processor 600MHz and 1.0 GHz
- Fanless operation at 0 ~ 60° C
- On-board PCI VGA/LVDS display
- Supports 100Base-T Ethernet on board
- Supports 4 x USB 2.0 ports
- Supports 2 Channel 36 bit LVDS for LCD
- Supports 400 MHz Front Side Bus
- Accepts 128/256/512 bit technologies DDR 200/266 DRAM

1.3 Specifications

1.3.1 Standard SBC Functions

- **CPU:** Supports Intel. Embedded Celeron M Processor, up to 1.0 GHz
- **System chipsets:** Intel 852GM +ICH4
- **BIOS:** Award 4 Mbit Flash BIOS
- **System memory:** 200 pin SODIMM x 1, supports double data rate (DDR) 128 MB to 1 GB, accepts 128/256/512 bit technologies DDR 200/266 DRAM
- **2nd cache memory:** 0 KB or 512 KB on Celeron® M
- **Enhanced IDE Interface:** Supports two enhanced IDE channels. Primary channel supports ATA-100 mode; Secondary channel only supports ATA-33 and PIO mode. CFC card occupies secondary IDE master
- **COM Ports:** Two COM ports: COM1: RS-232; COM2: RS-232/422/ 485
- **Printer Ports:** One printer port, supports SPP/EPP/ECP
- **Keyboard/Mouse Connector:** Supports standard PC/AT Keyboard and a PS/2 Mouse
- **Power Management:** Supports Power Saving Mode, including Normal/ Standard/Suspend modes. APM 1.2 compliant.
- **FDD interface:** Supports up to one FDD device
- **Watchdog Timer:** 0 ~ 255 Sec. System reset or IRQ11
- **Expansion Interface:** 16 bit ISA Slot
- **Battery:** Lithium 3V/196 mAH
- **USB:** 4 USB ports, USB 2.0 compliant

1.3.2 Display Interface

- **Chipset:** Intel 852GM
- **Memory size:** Shared up to 64 MB, supports DVMT
- **LVDS Interface:** Supports 2 channel (36-bit) LVDS LCD Panel
- **Display modes:**
 - **CRT Modes:** 1600 X 1200 at 85 Hz;
 - **LCD Modes:** up to UXGA panel resolution with frequency range from 25 MHz to 112 MHz

1.3.3 Solid State disk


- Supports CompactFlash Card Type I/II

1.3.4 Ethernet interface

- **Chipset:** Intel 82551QM 10/100Mbps LAN Chip
- **Connection:** on-board RJ-45 connector
- **Interface:** IEEE 802.3u (100Base-T) protocol compatible
- **Built-in Boot ROM:** 82551QM
- I/O address switchless setting

1.3.5 Mechanical and Environmental

- **Dimensions (L x W):** 185 x 122 mm (7.3" x 4.8")
- **Power Supply Voltage:** +5 V \pm 5%, +12 V \pm 5%
- **Power Consumption:**
 - **Max:**
2.26 A @ 5 V, 0.5 A @ 12 V
 - **Typical:**
1.22 A @ 5 V (w/Celeron M 1 G + 256 MB RAM)
0.01 A @ 12 V (w/Celeron M 1 G + 256 MB RAM)
- **Operating temperature:** 0 ~ 60° C (32 ~ 140° F) operation
- **Operating humidity:** 0% ~ 90% Relative Humidity, non-condensing

Note!  If your power supply doesn't have +12 V output (+5 V only), PCA-6781 needs to go T-part number to add the components for the 5 V to 12 V converting circuit, but LVDS and PC104 also cannot be used within +5 V only.

1.4 Board layout: dimensions

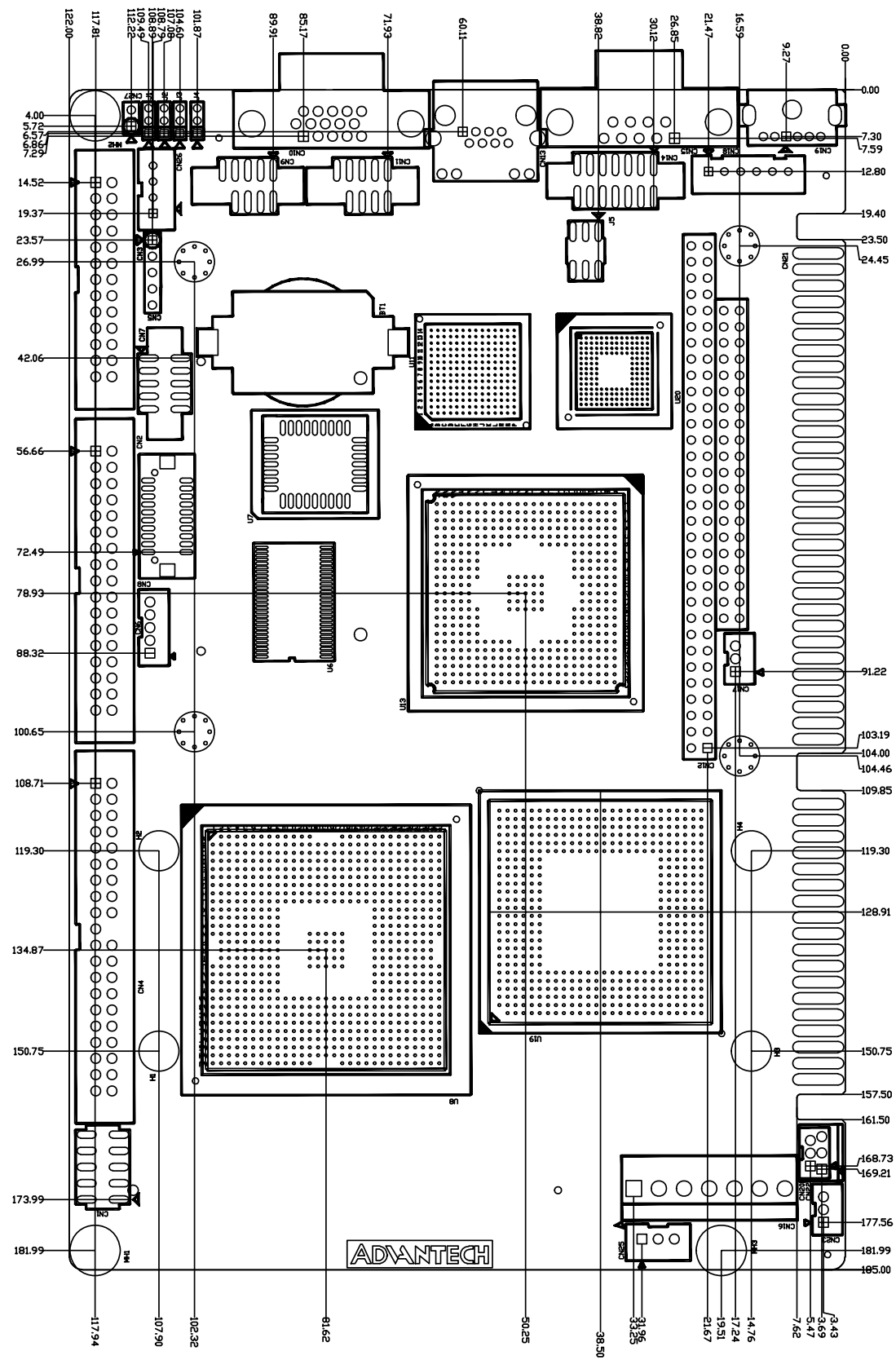


Figure 1.1 Board Layout: Dimensions (Component Side)

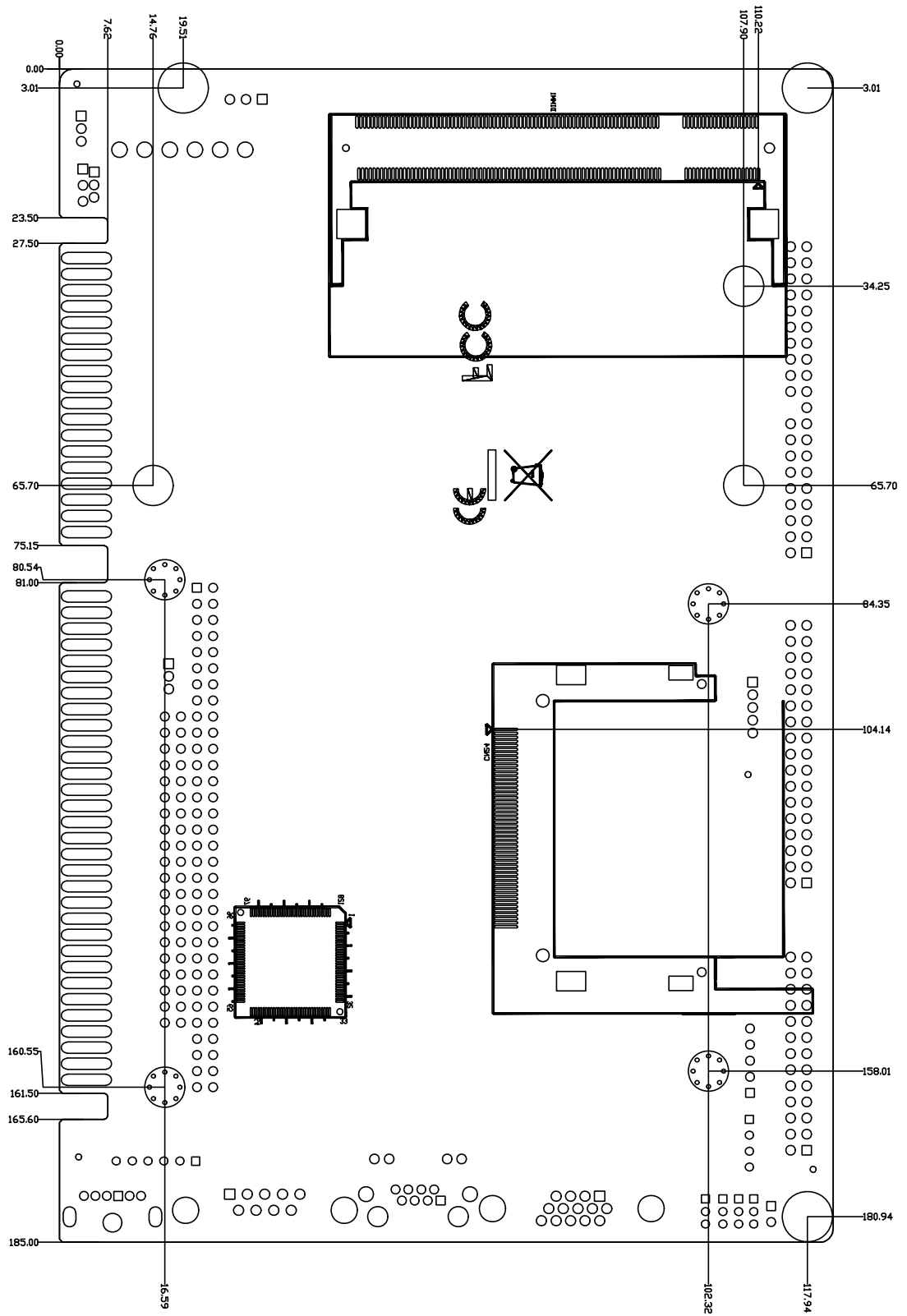


Figure 1.2 Board Layout: Dimensions (Solder Side)

Chapter 2

Installation

This chapter explains the setup procedures of PCA-6781 hardware, including instructions on setting jumpers and connecting peripherals, switches and indicators. Be sure to read all safety precautions before you begin the installation procedure.

2.1 Jumpers

The PCA-6781 has a number of jumpers that allow you to configure your system to suit your application. The table below lists the functions of the various jumpers.

Table 2.1: Jumpers

Label	Function
J1	LVDS Voltage choose
J2	VBR
J3	AT/ATX Power choose jumper
J4	CLEAR CMOS
J5	232/422/485 SEL

2.2 Connectors

Onboard connectors link the PCA-6781 to external devices such as hard disk drives, a keyboard, or floppy drives. The table below lists the function of each of the board's connectors.

Table 2.2: Connectors

Label	Function
CN1	HDD LED/Reset/Power Button
CN2	Floppy Connector
CN3	Printer Port Connector
CN4	Primary IDE Connector
CN5	IR Connector
CN6	LCD Inverter Connector
CN7	Audio Interface Connector
CN8	LVDS Connector
CN9	USB port 1,2 Connector
CN10	D-SUB VGA Connector
CN11	USB port 3,4 Connector
CN12	PC104 Connector
CN13	LAN RJ45 Connector
CN14	COM port 2 (RS-232/422/485)
CN15	COM port 1 (RS-232)
CN16	Main Power Connector
CN17	Negative Power Input Connector
CN18	External KB/mouse Connector
CN19	KB/mouse Connector
CN20	+5 V FAN Connector
CN21	ISA Golden Finger
CN22	+12 V FAN Connector
CN23	ATX Suspend power connector
CN24	CF Connector
CN25	System Fan
CN26	SMBUS Connector
CN27	Hardware fail LED

2.3 Locating Connectors (component side)

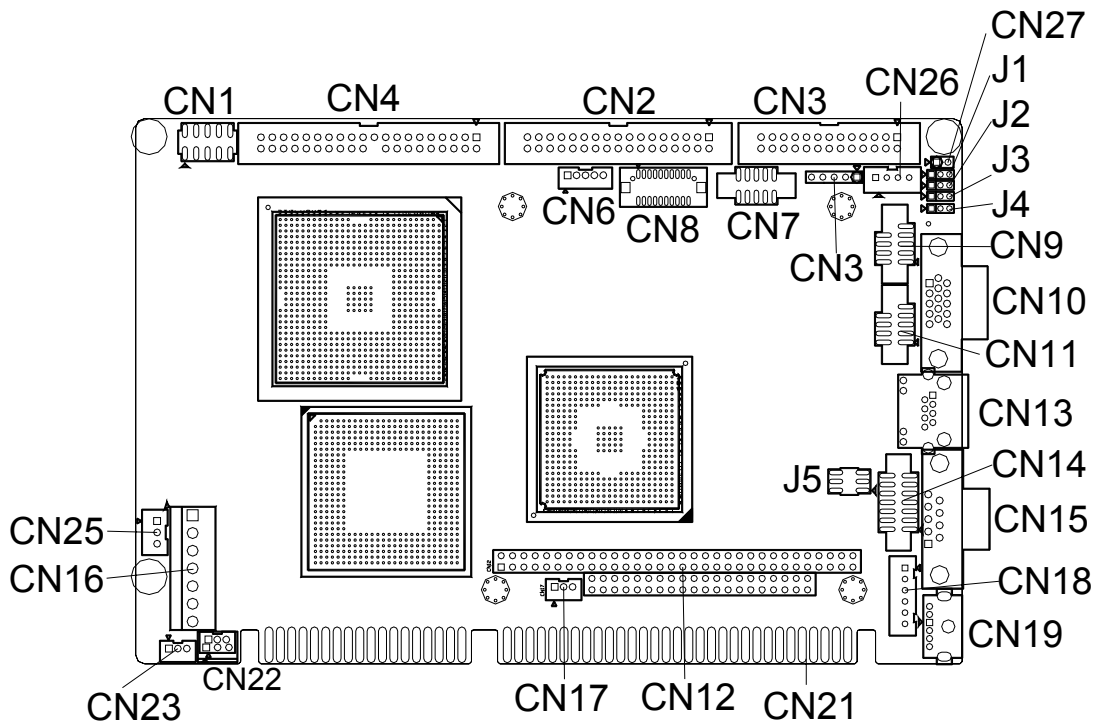


Figure 2.1 Jumper & Connector Locations

2.4 Locating Connectors (solder side)

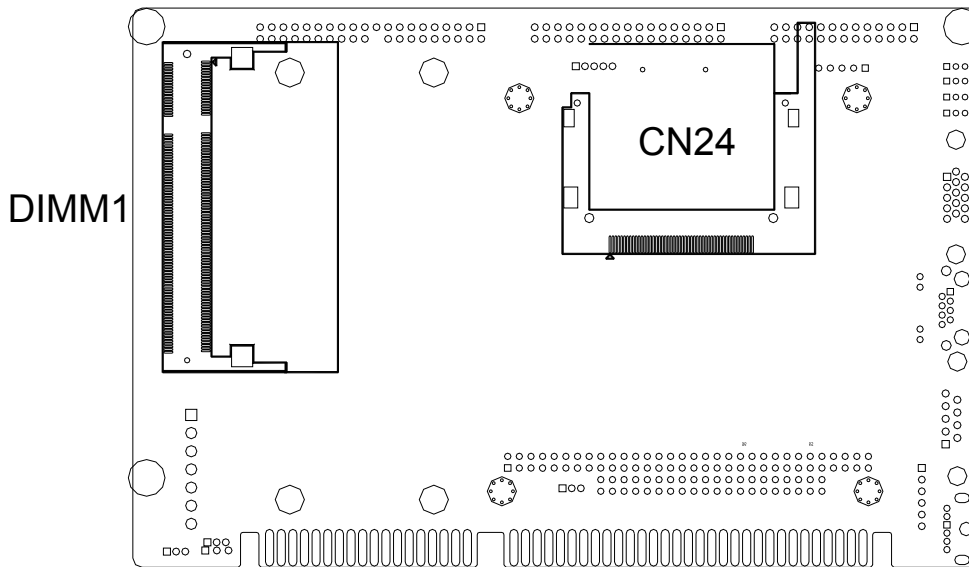
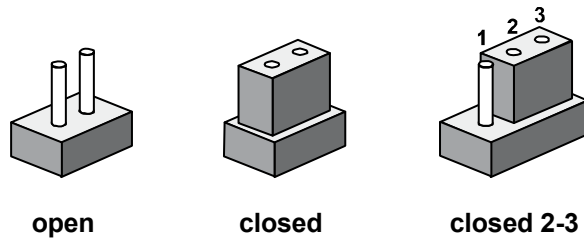


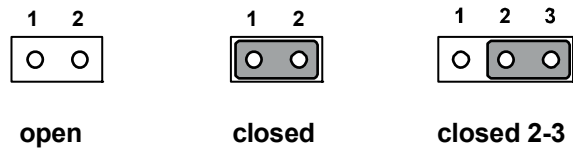
Figure 2.2 Connectors (Component Side)

2.5 Setting Jumpers

You may configure your card to match the needs of your application by setting jumpers. A jumper is a metal bridge used to close an electric 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” a jumper, you connect the pins with the clip. To “open” a jumper, you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2 and 3. In this case you would connect either pins 1 and 2, or 2 and 3.



The jumper settings are schematically depicted in this manual as follows:.



A pair of needle-nose pliers may be helpful when working with jumpers. If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes. Generally, you simply need a standard cable to make most connections.

2.5.1 LVDS Panel Power Select (J1)

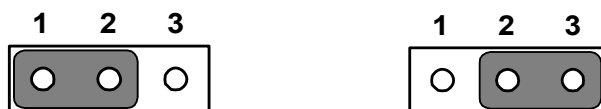


Table 2.3: LVDS Panel Power Select

Pin	Function
1-2 (default)	+3.3 V
2-3	+5 V

2.5.2 LVDS VBR Select (J2)



Table 2.4: LVDS VBR Select

Pin	Function
1-2	High
2-3	Low

2.5.3 AT/ATX Power choose jumper(J3)



Table 2.5: AT/ATX Power choose jumper

Pin	Function
1-2 (default)	ATX Power
2-3	AT Power

2.5.4 Clear CMOS (J4)

Warning! To avoid damaging the computer, always turn off the power supply before setting "Clear CMOS". Before turning on the power supply, set the jumper back to "3.0 V Battery On".



This jumper is used to erase CMOS data and reset system BIOS information.

The procedure for clearing CMOS is:

1. Turn off the system.
2. Short pin 2 and pin 3.
3. Turn on the system. The BIOS is now reset to its default setting.

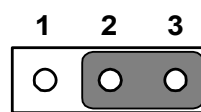
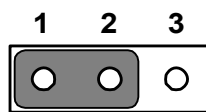


Table 2.6: Clear CMOS

Pin	Function
1-2 (default)	Normal
2-3	Clear CMOS

2.5.5 COM2 RS-232/422/485 Select (J5)

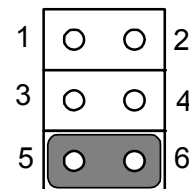
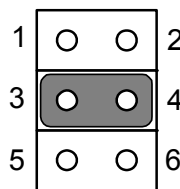
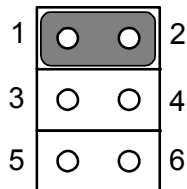


Table 2.7: COM2 RS-232/422/485 Select

Pin	Function
1-2 (default)	RS-232
3-4	RS-422
5-6	RS-485

2.6 Installing SODIMMs

Note! *The modules can only fit into a socket one way. The gold pins must point down into the SODIMM socket.*



1. The procedure for installing SODIMMs appears below. Please follow these steps carefully.
2. Make sure that all power supplies to the system are switched off
3. Install the SODIMM card. Install the SODIMM so that its gold pins point down into the SODIMM socket.
4. Slip the SODIMM into the socket at a 45 degree angle and carefully fit the bottom of the card against the connectors.
5. Gently push the SODIMM into a perpendicular position until the clips on the ends of the SODIMM sockets snap into place.
6. Check to ensure that the SODIMM is correctly seated and all connector contacts touch. The SODIMM should not move around in its socket.

2.7 Main Power Connector (CN16)

Supplies main power (+5 V and +12 V) to PCA-6781, and it is a 7 pins power connector.

Important! *Make sure that the ATX power supply can take at least a 10 mA load on the 5 V standby lead (5 VSB). If not, you may have difficulty powering on your system.*



Note! *If your power supply doesn't have +12 V output (+5 V only), PCA-6781 needs to go T-part number to add the components for the 5 V to 12 V converting circuit, but LVDS and PC104 also cannot be used within +5 V only.*



2.8 Printer port Connector (CN3)

Normally, the printer port is used to connect the card to a printer. The PCA-6781 includes a multi-mode (SPP/EPP/ECP) printer port accessed via CN4 and a 26-pin flat-cable connector. You will need an adapter cable if you use a traditional DB-25 connector. The adapter cable has a 26-pin connector on one end, and a DB-25 connector on the other.

The printer port is designated as LPT1, and can be disabled or changed to LPT2 or LPT3 in the system BIOS setup.

The printer port interrupt channel is designated to be IRQ7.

You can select ECP/EPP DMA channel via BIOS setup.

2.9 CompactFlash Socket

The PCA-6781 provides a 50-pin socket for CompactFlash card type I/II.

2.9.1 CompactFlash (CN24)

The CompactFlash card occupies a secondary IDE channel which can be enabled/disabled via the BIOS settings.

2.10 Floppy Connector (CN2)

You can attach up to two floppy drives to the PCA-6781's on-board controller. You can use any combination of 5.25" (360 KB and 1.2 MB) and/ or 3.5" (720 KB, 1.44 MB, and 2.88 MB) drives.

A 34-pin daisy-chain drive connector cable is required for a dual-drive system. On one end of the cable is a 34-pin flat-cable connector. On the other end are two sets of floppy disk drive connectors. Each set consists of a 34-pin flat-cable connector (usually used for 3.5" drives) and a printed-circuit board connector (usually used for 5.25" drives).

2.10.1 Connecting the floppy drive

1. Plug the 34-pin flat-cable connector into CN3. Make sure that the red wire corresponds to pin one on the connector.
2. Attach the appropriate connector on the other end of the cable to the floppy drive(s). You can use only one connector in the set. The set on the end (after the twist in the cable) connects to the A: drive. The set in the middle connects to the B: drive.
3. If you are connecting a 5.25" floppy drive, line up the slot in the printed circuit board with the blocked-off part of the cable connector.

If you are connecting a 3.5" floppy drive, you may have trouble determining which pin is number one. Look for a number printed on the circuit board indicating pin number one. In addition, the connector on the floppy drive may have a slot. When the slot is up, pin number one should be on the right. Check the documentation that came with the drive for more information.

If you desire, connect the B: drive to the connectors in the middle of the cable as described above.

In case you need to make your own cable, you can find the pin assignments for the board's connector in Appendix B.

2.11 IDE Connector (CN4)

The PCA-6781 provides one IDE channels to which you can attach up to two Enhanced Integrated Device Electronics hard disk drives or CDROM to the PCA-6781's internal controller. The PCA-6781's IDE controller uses a PCI interface. This advanced IDE controller supports faster data transfer, PIO Mode 3 or Mode 4, UDMA 33/66/100 mode.

2.11.1 Connecting the hard drive

Connecting drives is done in a daisy-chain fashion. It requires one of two cables (not included in this package), depending on the drive size. 1.8" and 2.5" drives need a 1 x 44-pin to 2 x 44-pin flat-cable connector. 3.5" drives use a 1 x 44-pin to 2 x 40-pin connector.

Wire number 1 on the cable is red or blue, and the other wires are gray.

1. Connect one end of the cable to CN2. Make sure that the red (or blue) wire corresponds to pin 1 on the connector, which is labeled on the board (on the right side).
2. Plug the other end of the cable into the Enhanced IDE hard drive, with pin 1 on the cable corresponding to pin 1 on the hard drive. (See your hard drive's documentation for the location of the connector.)

If desired, connect a second drive as described above.

Unlike floppy drives, IDE hard drives can connect to either end of the cable. If you install two drives, you will need to set one as the master and one as the slave by using jumpers on the drives. If you install only one drive, set it as the master.

2.12 VGA/LVDS interface connections

The PCA-6781's display interface can drive conventional CRT displays and is capable of driving a wide range of LVDS flat panel displays as well. The board has two display connectors: one for standard CRT VGA monitors, and one for LVDS flat panel displays.

2.12.1 CRT display Connector (CN10)

CN10 is a standard 15-pin D-SUB connector used for conventional CRT displays. Users can drive a standard progressive scan analog monitor with pixel resolution up to 1600 X 1200 at 85 Hz. Pin assignments for CRT display connector CN10 are detailed in Appendix B.

2.12.2 LVDS LCD panel Connector (CN8)

PCA-6781 uses the Intel 852GM to supports single or dual-channel LVDS panels up to UXGA panel resolution with frequency range from 25MHz to 112MHz.

The display mode can be 2 channels (2 x 18 bits) LVDS LCD panel displays Users can connect to either an 18, 24 or 36 bits LVDS LCD with CN8.

2.12.3 LCD Inverter Connector (CN6)

The LCD inverter is connected to CN6 via a 5-pin connector to provide +5 V/+12 V power to the LCD display.

2.13 USB Connectors (CN9,CN11)

The PCA-6781 board provides up to four USB (Universal Serial Bus) ports. This gives complete Plug and Play, and hot attach/detach for up to 127 external devices. The USB interfaces comply with USB specification Rev. 2.0, and are fuse protected.

The USB interface is accessed through the 5 x 2-pin flat-cable connector, CN9 (USB1, 2),CN11 (USB3, 4). You will need an adapter cable if you use a standard USB connector. The adapter cable has a 5 x 2-pin connector on one end and a USB connector on the other.

The USB interfaces can be disabled in the system BIOS setup.

2.14 Ethernet configuration

The PCA-6781 is equipped with a high performance 32-bit PCI-bus Ethernet interface which is fully compliant with IEEE 802.3u 10/ 100 Mbps CSMA/CD standards. It is supported by all major network operating systems.

The PCA-6781 supports 10/100Base-T Ethernet connections with onboard RJ-45 connectors (CN13).

2.14.1 LAN Connector (CN13)

10/100Base-T or 1000Base-T connects to the PCA-6781 via a cable to a standard RJ-45 connector.

2.14.2 Network boot

The Network Boot feature can be utilized by incorporating the Boot ROM image files for the appropriate network operating system. The Boot ROM BIOS files are included in the system BIOS.

2.15 HDD LED/Reset/Power Button (CN1)

Next, you may want to install external switches to monitor and control the PCA-6781. These features are optional: install them only if you need them. CN1 is an 2 x 5 pin header, 180 degree, male. It provides connections for reset and power & hard disk indicator.

2.15.1 HDD LED (Pin 1&Pin 2)

The HDD LED indicator for hard disk access is an active low signal (24 mA sink rate).

2.15.2 POWER LED (Pin3 & Pin4)

+5 V POWER LED indicator would light when the power is on.

2.15.3 Suspend led (PIN 5&Pin 6)

Suspend led indicator would light when the computer is suspend.

2.15.4 Reset (Pin7&Pin8)

If you install a reset switch, it should be an open single pole switch.

Momentarily pressing the switch will activate a reset. The switch should be rated for 10 mA, 5 V.

2.15.5 Power Button (Pin9&Pin10)

PCA-6781 also supports power on/off button.

2.16 COM port Connector (CN14,CN15)

The PCA-6781 provides two COM ports (COM1: RS-232 and COM2: RS-232/422/485). CN14 supports COM2, CN15 supports COM1. And J5 is for COM RS-232/422/485 selection. It provides connections for serial devices (a mouse, etc.) or a communication network. You can find the pin assignments for the COM port connector in Appendix B.

2.17 MINI Keyboard Connector (CN19)

The PCA-6781 board provides a keyboard connector that supports both a keyboard and a PS/2 style mouse. In most cases, especially in embedded applications, a keyboard is not used. If the keyboard is not present, the standard PC/AT BIOS will report an error or fail during power-on self-test (POST) after a reset. The PCA-6781's BIOS standard setup menu allows you to select "All, but Keyboard" under the "Halt On" selection. This allows no-keyboard operation in embedded system applications, without the system halting under POST.

2.18 External Keyboard Connector (CN18)

In addition to the Mini keyboard connector on the PCA-6781's rear plate, there is an additional onboard external keyboard connector, allowing for greater flexibility in system design.

2.19 Audio Interface Connector (CN7)

The Audio Interface link is a 10 pin connector, the PCA-6781 can support Audio with the addition of optional PCM-231A-00A1. Detailed pin assignment refer to Appendix B.

2.20 PC/104 connector(CN12)

The PCA-6781 is equipped with a 8/16 bit ISA signal PC/104 connector for future expansion.

2.21 IR connector(CN5)

This connector supports the optional wireless infrared transmitting and receiving module. This module mounts on the system case. You must configure the setting through BIOS setup. Detailed pin definition you will find in Appendix B.

Note! When using PCA-6781's IR function, please remove J5 jumper.



2.22 Negative Power Input (CN17)

The PCA-6781 is equipped with a Negative Power Input connector providing -5 V and -12 V power if your applications need.

2.23 +12 V FAN connector (CN22)

The PCA-6781 is equipped with a 3-pin FAN connector providing +12 V power for CPU FAN. PCA-6781 is designed to Fanless, in general case, you won't need to connect CN22.

2.24 ATX Suspend Power connector(CN23)

The PCA-6781 can support an advanced soft power switch function, if an ATX power supply is used. To enable the soft power switch function:

1. Get the specially designed ATX-to-EBX power cable
2. Connect the 3-pin plug of the cable to CN23 (ATX feature connector).
3. Connect the power on/off button to CN1.

Important Make sure that the ATX power supply can take at least a 10 mA load on the 5 V standby lead (5 VSB). If not, you may have difficulty powering on your system.

2.25 System FAN connector (CN25)

The PCA-6781 is equipped with a 3-pin FAN connector providing +12 V power for system FAN.

2.26 SMBus connector (CN26)

The PCA-6781 is equipped with a 4-pin SMBus connector providing SMBus for peripheral usage.

2.27 Hardware Fail LED (CN27)

The PCA-6781 is equipped with 2-pin hardware fail pin header to connector with LED. If you connect CN27 with LED, LED will light when buzzer on PCA-6781 has a warning noise.

Chapter 3

BIOS Operation

This chapter describes how to set BIOS configuration data.

Sections include:

- BIOS Introduction
- BIOS Setup

3.1 BIOS Introduction

Advantech provide full-featured Award BIOS 6.0 and delivers the superior performance, compatibility and functionality that manufactures of Industry PC and Embedded boards, it's many options and extensions let you customize your products to a wide range of designs and target markets.

The modular, adaptable Award BIOS 6.0 supports the broadest range of third-party peripherals and all popular chipsets, plus Intel, AMD, nVidia, VIA, and compatible CPUs from 386 through Pentium and AMD Geode, K7 and K8 (including multiple processor platforms), and VIA Eden C3 and C7 CPU.

You can use Advantech's utilities to select and install features to suit your designs for customers need.

3.2 BIOS Setup

The PCA-6781 system has build-in Award BIOS with a CMOS SETUP utility which allows user to configure required settings or to activate certain system features.

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

When the power is turned on, press the button during the BIOS POST (Power-On Self Test) will take you to the CMOS SETUP screen.

Control Keys

< ↑ >> ↓ >> ← >> → > Move to select item.

<Enter> Select Item.

<Esc> Main Menu - Quit and not save changes into CMOS.

Sub Menu - Exit current page and return to Main Menu.

Page Up/+> Increase the numeric value or make changes.

<Page Down/-> Decrease the numeric value or make changes.

<F1> General help, for Setup Sub Menu.

<F2> Item Help.

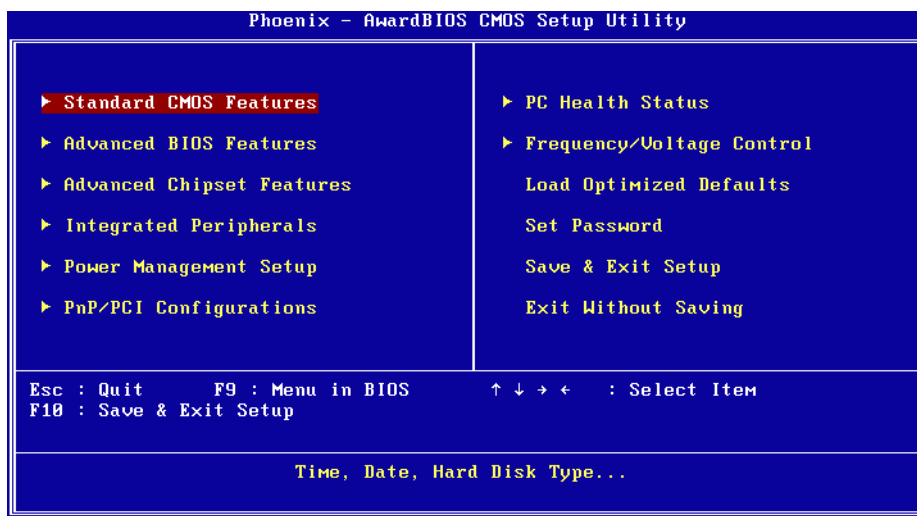
<F5> Load Previous Values.

<F7> Load Optimized Default.

<F10> Save all CMOS changes.

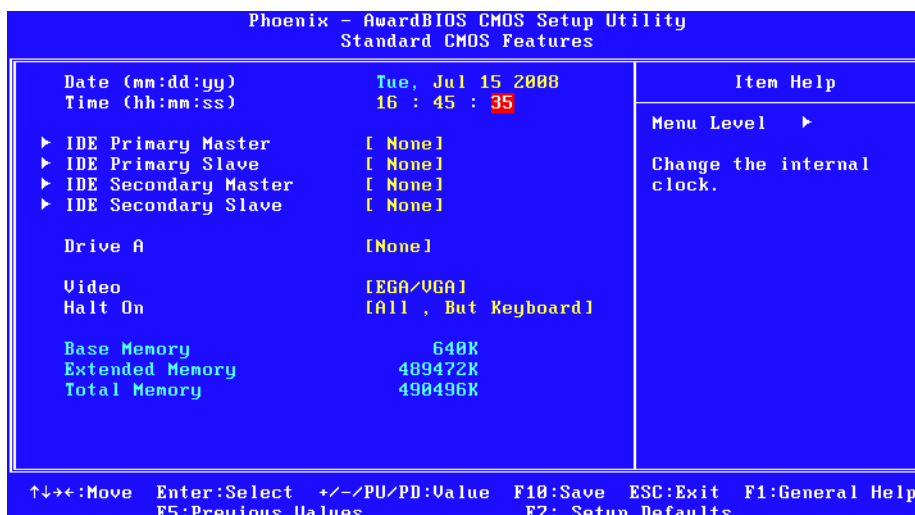
3.2.1 Main Menu

Press to enter Award 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.



- **Standard CMOS Features**
This setup page includes all the items in standard compatible BIOS.
- **Advanced BIOS Features**
This setup page includes all the items of Award BIOS enhanced features.
- **Advanced Chipset Features**
This setup page includes all the Chipset configuration features.
- **Integrated Peripherals**
This setup page includes all onboard peripheral devices.
- **Power Management Setup**
This setup page includes all the Power Management features.
- **PnP/PCI Configurations**
This setup page includes PnP OS and PCI device configuration.
- **PC Health Status**
This setup page includes the system auto detect CPU and system temperature, voltage, fan speed.
- **Frequency/Voltage Control**
This setup page includes CPU host clock control, frequency ratio and voltage.
- **Load Optimized Defaults**
This setup page includes Load system optimized value, and the system would be in best performance configuration.
- **Set Password**
Establish, change or disable password.
- **Save & Exit Setup**
Save CMOS value settings to CMOS and exit BIOS setup.
- **Exit Without Saving**
Abandon all CMOS value changes and exit BIOS setup.

3.2.2 Standard CMOS Features

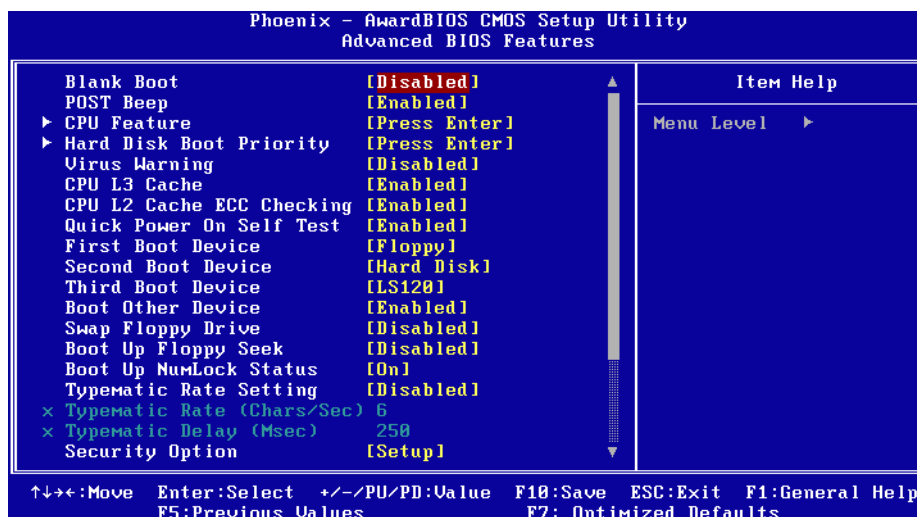


- **Date**
The date format is <weekday>, <month>, <day>, <year>.
 Weekday From Sun to Sat, determined and displayed by BIOS only
 Month From Jan to Dec
 Day From 1 to 31
 Year From 1999 through 2098
- **Time**
The times format in <hour> <minute> <second>, based on a 24-hour day.
- **IDE Channel 0 Master/Slave**
IDE HDD Auto-Detection Press "Enter" for automatic device detection.
- **IDE Channel 1 Master/Slave**
IDE HDD Auto-Detection Press "Enter" for automatic device detection.
- **Drive A**
The Item identifies the types of floppy disk drive A.
 None No floppy drive installed
 360K, 5.25" 5.25 inch PC-type standard drive; 360 K byte capacity
 1.2M, 5.25" 5.25 inch AT-type high-density drive; 1.2 M byte capacity
 720K, 3.5" 3.5 inch double-sided drive; 720 K byte capacity
 1.44M, 3.5" 3.5 inch double-sided drive; 1.4 4M byte capacity
 2.88M, 3.5" 3.5 inch double-sided drive; 2.88 M byte capacity.

- **Halt on**
The item determines whether the computer will stop if an error is detected during power up.

No Errors	The system boot will not stop for any error
All Errors	Whenever the BIOS detects a non-fatal error the system will be stopped
All, But Keyboard	The system boot will not stop for a keyboard error; it will stop for all other errors (Default value)
All, But Diskette	The system boot will not stop for a disk error; it will stop for all other errors.
All, But Disk/Key	The system boot will not stop for a keyboard or disk error; it will stop for al other errors.
- **Base Memory**
The POST of the BIOS will determine the amount of base (or conventional) memory installed in the system.
- **Extended Memory**
The POST of the BIOS will determine the amount of extended memory (above 1MB in CPU's memory address map) installed in the system.
- **Total Memory**
This item displays the total system memory size.

3.2.3 Advanced BIOS Features



- Blank Boot [Disabled] (* Advantech feature enhancement)
This item allows system only displays blank screen during BIOS Post stage.
- POST Beep [Enabled] (* Advantech feature enhancement)
This item allows system send out Beep sound during BIOS Post stage.
- CPU Feature
This item allows user to adjust CPU features, CPU ratio, VID and Thermal and special feature like XD flag.
- Hard Disk Boot Priority
This item allows user to select boot sequence for system device HDD, SCSI, RAID.
- Virus Warning [Disabled]
This item allows user to choose the VIRUS Warning feature for IDE Hard Disk boot sector protection.
- CPU L3 Cache [Enabled]
This item allows user to enable CPU L3 cache.
- CPU L2 Cache ECC Checking [Enabled]
This item allows user to enable CPU L2 cache and ECC checking function.
- Quick Power On Self Test [Enabled]
This field speeds up the Power-On Self Test (POST) routine by skipping retesting a second, third and fourth time. Setup setting default is enabled.
- First / Second / Third / Other Boot Drive

Floppy	Floppy gets this priority.
LS120	LS120 gets this priority.
Hard Disk	Hard Disk gets this priority.
CDROM	CDROM gets this priority.
ZIP	ZIP gets this priority.
USB-FDD	USB-FDD gets this priority.
USB-ZIP	USB-ZIP gets this priority.
USB-CDROM	USB-CDROM gets this priority.
USB-HDD	USB-HDD gets this priority.
LAN	LAN gets this priority.

- Disabled Disable this boot function
- Swap Floppy Drive [Disabled]

This item enables users to swap floppy “A” and “B” identified without change hardware cable connection.
 - Boot Up Floppy Seek [Disabled]

When enabled, the BIOS will seek the floppy “A” drive one time
 - Boot Up NumLock Status [Disabled]

This item enables users to activate the Number Lock function upon system boot.
 - Typematic Rate Setting

This item enables users to set the two typematic controls items.

This field controls the speed at

Typematic Rate (Chars/Sec)	This item controls the speed with which the system autorepeats keystrokes. Eight settings are 6, 8, 10, 12, 15, 20, 24 and 30.
Typematic Delay (Msec)	This item sets the time delay before auto repeat kicks in. Four delay rate options are 250, 500, 750 and 1000.
 - Security Option [Setup]

System	Correct password required before system can boot, and for Setup access.
Setup	Correct password required for Setup access.
 - MPS Version Control for OS[1.4]

This item sets the operating system multiprocessor support version.
 - OS Select For DRAM > 64M[Non-OS2]

Select OS2 only if system is running OS/2 operation system with greater than 64 MB of RAM on the system.
 - Video BIOS Shadow [Enabled]

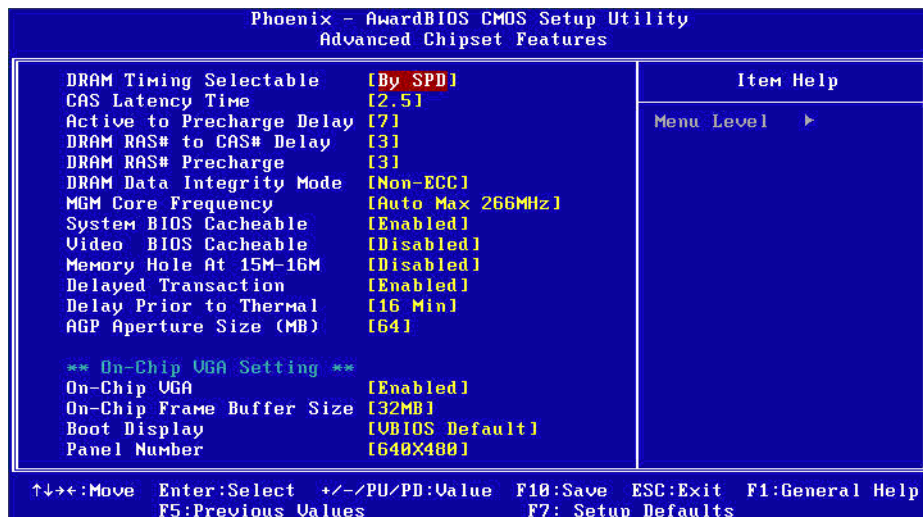
Enabled copies Video BIOS to shadow RAM improves performance.
 - Full Screen Logo Show [Enabled]


Show full screen logo during post stage, and the Logo picture can be customization.
 - Small Logo (EPA) Show [Enabled]

Show EPA logo during system post stage.
 - Summary Screen Show [Enabled]

Show system status in Summary screen page.

3.2.4 Advanced Chipset Features

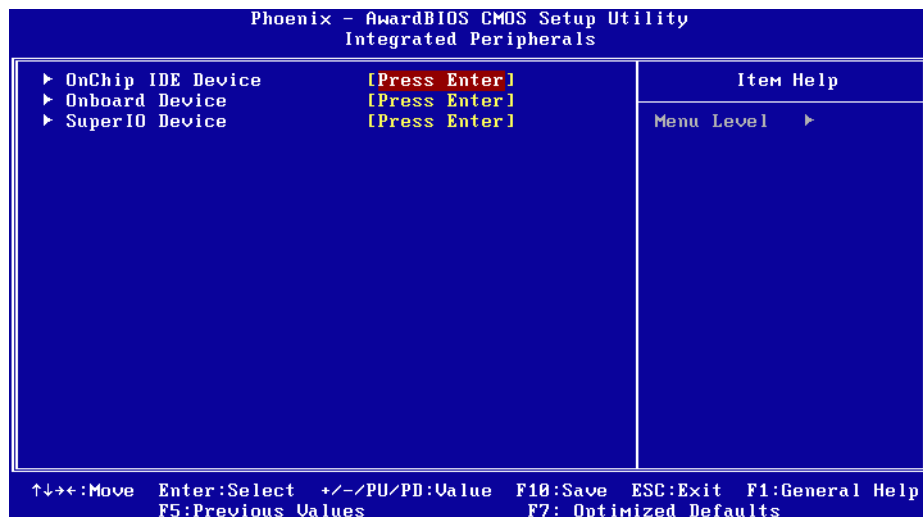


Note!  This "Advanced Chipset Features" option controls the configuration of the board's chipset, this page is developed by Chipset independent, for control chipset register setting and fine tune system performance. It is strongly recommended that only technical users make changes to the default settings.

- DRAM Timing Selectable [By SPD]
This item enables users to set the optimal timings for items 2 through 5, system default setting of "By SPD" to follow the SPD information and ensure the system running in stable and optimal performance.
- CAS Latency Time[2.5]
This item enables users to set the timing delay in clock cycles before SDRAM start a read command after receiving it.
- Active to Precharge Delay[7]
This item enables users to control the memory back's minimum row active time (tRAS), system default is setting to "7" to reference value.
- DRAM RAS# to CAS# Delay[3]
This item enables users to set the timing of the transition from RAS (row address strobe) to CAS (column address strobe) as both rows and column are separately addressed shortly after DRAM is refreshed.
- DRAM RAS# Precharge[3]
This item enables users to set the DRAM RAS# precharge timing, system default is setting to "3" to reference value.
- DRAM Data Integrity Mode [Non-ECC]
This item enables users to set the DRAM Type of Error data correction, system default is setting to "Non-ECC" to reference value.
- MGM Core Frequency [Auto Max 266 MHz]
This item enables users to set the operation speed of internal Graphic Chip FSB and DRAM, system default is setting to "Auto Max 266 MHz" to reference value.
- System BIOS Cacheable [Enabled]
This item allows the system BIOS to be cached to allow faster execution and better performance.

- Video BIOS Cacheable [Disabled]
This item allows the video BIOS to be cached to allow faster execution and better performance.
- Memory Hole At 15 M-16 M [Disabled]
This item reserves 15 MB-16 MB memory address space to ISA expansion cards that specifically require the setting. Memory from 15 MB-16 MB will be unavailable to the system because of the expansion cards can only access memory at this area.
- DRAM Data Integrity Mode [Non-ECC]
This item enables users to set the DRAM Type of Error data correction, system default is setting to “Non-ECC” to reference value.
- Delayed Transaction [Enabled]
This items enables users to actives PCI delayed Transaction feature, it can have better PCI performance and meet PCI 2.1 specifications.
- Delay Period to Thermal [16 Min]
This items enables users to select the time period of system detect CPU Thermal, system default is setting to “16 Min” to reference value.
- AGP Aperture Size (MB) [64]
This item enables users to select size of system memory to support AGP graphic usage, system default is setting to “64 MB” to reference value.
- On-Chip VGA Setting
This platform support On-Chip VGA function and will continue to VGA related setting.
- On-Chip VGA [Enabled]
This item enables users to Enabled or Disabled On-Chip VGA device, system default is setting to “Enabled” to reference value.
- On-Chip Frame Buffer Size [32 MB]
This Item enables users to set Video Memory size, system default is setting to “32 MB” to reference value.
- Boot Display [VBIOS Default]
This Item enables users to set Initial display device of system boot up, system default is setting to “VBIOS Default” to reference value.
- Panel Number [640 X 480]
This item enables users to set the Resolution of Panel Type, system default is setting to “640 X 480” to reference value.

3.2.5 Integrated Peripherals

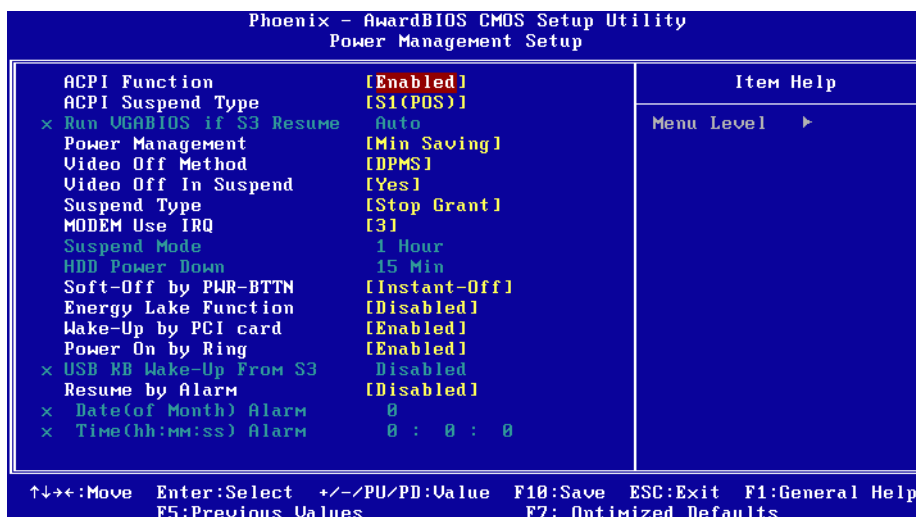


Note! This "Integrated Peripherals" option controls the configuration of the board's chipset, includes IDE, ATA, SATA, USB, AC97, MC97 and Super IO and Sensor devices; this page is chipset dependent.



- OnChip IDE Device
This item enables users to set the OnChip IDE device status, includes enable IDE devices and setting PIO and DMA access mode, and some of new chipset also support for SATA device (Serial-ATA).
- Onboard Device
This item enables users to set the Onboard device status, includes enable USB, AC97, MC97 and LAN devices.
- Super IO Device
This item enables users to set the Super IO device status, includes enable Floppy, COM, LPT, IR and control GPIO and Power fail status.

3.2.6 Power Management Setup



Note! This "Power management Setup" option configure system to most effectively saving energy while operating in a manner consistent with your intended computer use.



- **ACPI Function [Enabled]**
This item defines the ACPI (Advanced Configuration and Power Management) feature that makes hardware status information available to the operating system, and communicate PC and system devices for improving the power management.
- **ACPI Suspend Type[S1 (POS)]**
This item allows user to select sleep state when suspend.

S1(POS)	The suspend mode is equivalent to a software power down.
---------	--
- **Power Management [Min Saving]**
This item allows user to select system power saving mode.

Min Saving	Minimum power management. Suspend Mode=1 hr.
Max Saving	Maximum power management. Suspend Mode=1 min.
User Define	Allows user to set each mode individually. Suspend Mode= Disabled or 1 min ~1 hr.
- **Video Off Method [DPMS]**
This item allows user to determine the manner in which the monitor is blanked.

V/H SYNC+Blank	This option will cause system to turn off vertical and horizontal synchronization ports and write blanks to the video buffer.
Blank Screen	This option only writes blanks to the video buffer.
DPMS	Initial display power management signaling.
- **Video Off In Suspend [Yes]**
This item allows user to turn off Video during system enter suspend mode.
- **Suspend Type [Stop Grant]**
This item allows user to determine the suspend type.
- **Modem use IRQ[3]**

This item allows user to determine the IRQ which the MODEM can use.

- Suspend Mode [1 Hour]

This item allows user to determine the time of system inactivity, all devices except the CPU will be shut off.

- HDD Power Down Mode[15 Min]

This item allows user to determine the time of system inactivity, the hard disk drive will be powered down.

- Soft-Off by PWR-BTTN [Enabled]

This item allows user to define function of power button.

Instant-Off Press power button then Power off instantly.

Delay 4 Sec Press power button 4 sec. to Power off.

- Wake-Up by PCI card [Enabled]

This item allows user to defines PCI cards to wake up the system from the suspend mode.

- Power On by Ring [Enabled]

This item allows user to define the system will resume by activating of modem ring.

- Resume by Alarm [Disabled]

This item allows user to enable and key in Date/time to power on system.

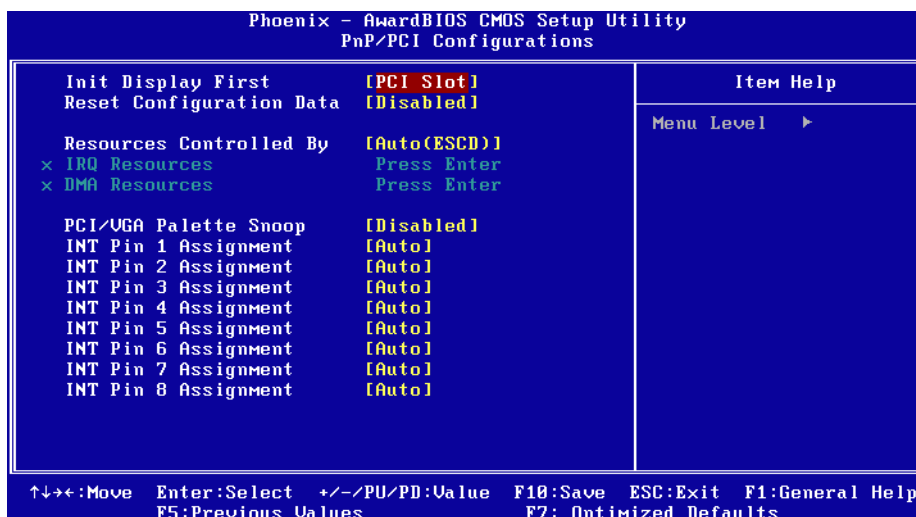
Disabled Disable this function.

Enabled Enable alarm function to power on system.

Data (of month) Alarm1-31

Time (HH:MM:SS) Alarm(0-23) : (0-59) : 0-59)

3.2.7 PnP/PCI Configurations



Note! This "PnP/PCI Configurations" option is setting up the IRQ and DMA (both PnP and PCI bus assignments).



- Init Display First [PCI Slot]
This item is setting for start up Video output from PCI or Onboard device.
- Reset Configuration Data [Disabled]
This item allow user to clear any PnP configuration data stored in the BIOS.
- Resources Controlled By [Auto (ESCD)]
 - IRQ Resources This item allows you respectively assign an interrupt for IRQ-3, 4, 5, 7, 9, 10, 11, 12, 14, and 15.
 - DMA Resources This item allows you respectively assign an interrupt for DMA, 0, 1, 2, 3, 4, 5, 6, and 7.
- PCI VGA Palette Snoop [Disabled]
The item is designed to solve problems caused by some non-standard VGA cards. A built-in VGA system does not need this function.
- INT Pin 1~8 Assignment [Auto]
The interrupt request (IRQ) line assigned to a device connected to the PCI interface on your system.

3.2.8 PC Health Status

Phoenix - AwardBIOS CMOS Setup Utility		Item Help
PC Health Status		Menu Level ▶
Current CPU Temperature	42°C	
Current System Temperature	29°C	
3.3V	3.43V	
1.05V	1.09V	
2.5V	2.47V	
5 V	5.18V	
12 V	12.28V	
Fan1 Speed	0 RPM	

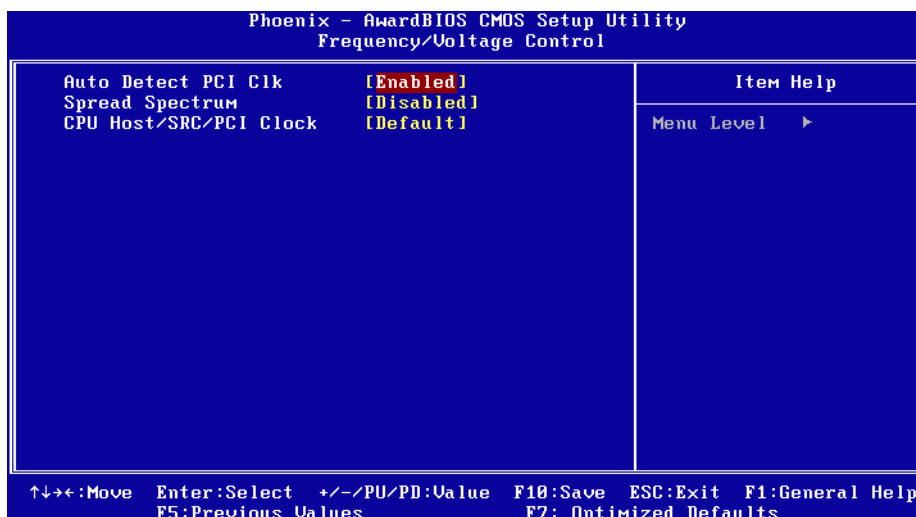
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7: Setup Defaults

Note! This "PC Health Status" option controls the Thermal, FAN and Voltage status of the board; this page is chipset dependent.



- Current System/CPU Temp [Show Only]
This item displays current system and CPU temperature.
- 3.3 V / 1.05 V / 2.5 V / 5 V / 12 V [Show Only]
This item displays current CPU and system Voltage.

3.2.9 Frequency/Voltage Control

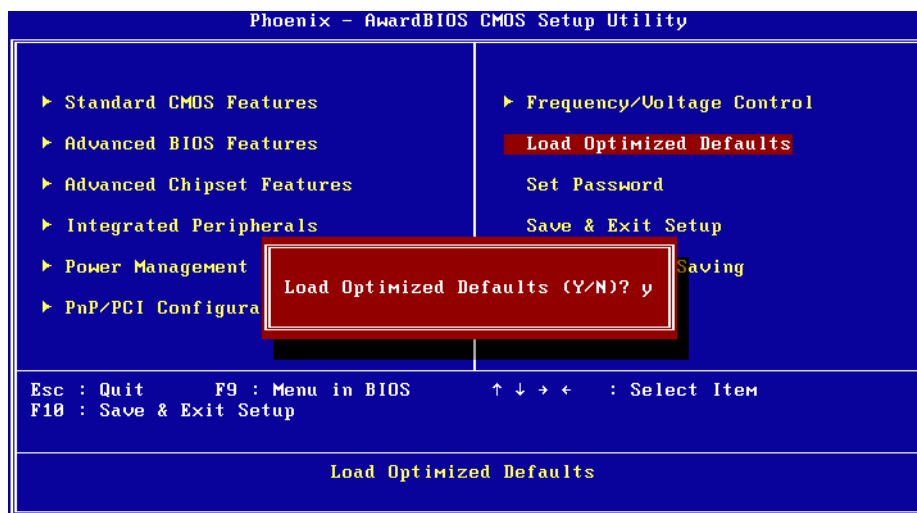



Note! *This "Frequency/Voltage Control" option controls the CPU Host and PCI frequency; this page is chipset dependent. Some items will show up when you install a processor which supports those functions.*



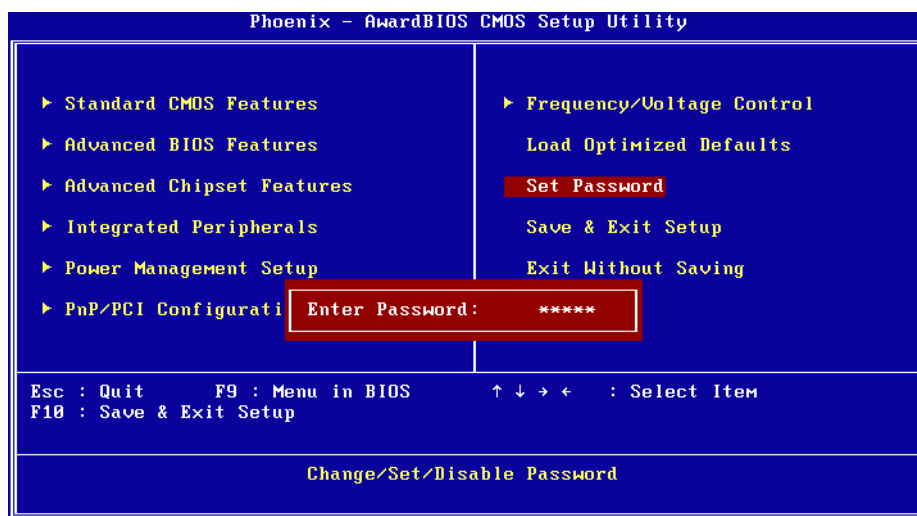
- Auto Detect PCI Clk [Enabled]
This item enables users to set the PCI Clock by system automatic detection or by manual.
- Spread Spectrum [Disabled]
This item enables users to set the spread spectrum modulation.
- CPU Host/SRC/PCI Clock [Default]
This item enables users to set the CPU Host and PCI clock by system automatic detection or by manual.


3.2.10 Load Optimized Defaults



Note!  Load Optimized Defaults loads the default system values directly from ROM. If the stored record created by the Setup program should ever become corrupted (and therefore unusable). These defaults will load automatically when you turn the PCA-6781 system on.

3.2.11 Set Password



Note!  To enable this feature, you should first go to the Advanced BIOS Features menu, choose the Security Option, and select either Setup or System, depending on which aspect you want password protected. Setup requires a password only to enter Setup. System requires the password either to enter Setup or to boot the system. A password may be at most 8 characters long.

To Establish Password

1. Choose the Set Password option from the CMOS Setup Utility main menu and press <Enter>.
2. When you see “Enter Password”, enter the desired password and press <Enter>.
3. At the “Confirm Password” prompt, retype the desired password, then press <Enter>.
4. Select Save to CMOS and EXIT, type <Y>, then <Enter>.

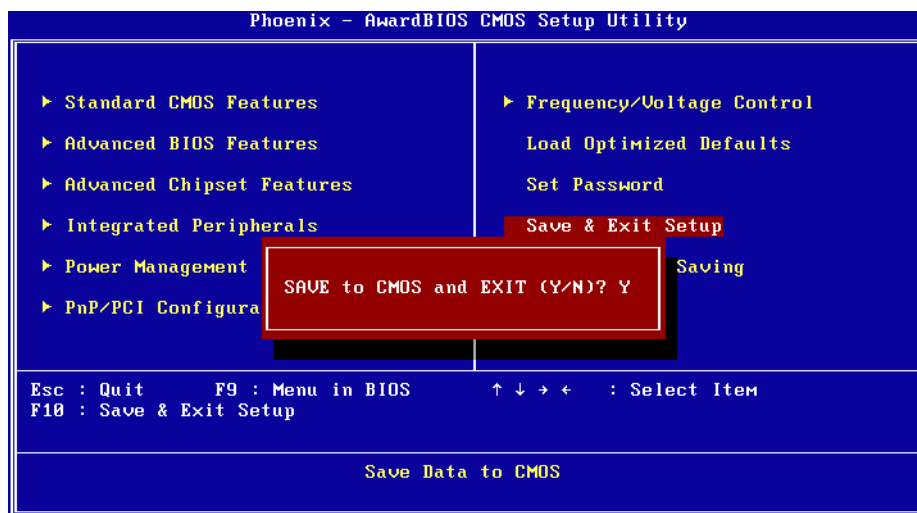
To Change Password

1. Choose the Set Password option from the CMOS Setup Utility main menu and press <Enter>.
2. When you see “Enter Password”, enter the existing password and press <Enter>.
3. You will see “Confirm Password”. Type it again, and press <Enter>.
4. Select Set Password again, and at the “Enter Password” prompt, enter the new password and press <Enter>.
5. At the “Confirm Password” prompt, retype the new password, and press <Enter>.
6. Select Save to CMOS and EXIT, type <Y>, then <Enter>.

To Disable Password

1. Choose the Set Password option from the CMOS Setup Utility main menu and press <Enter>.
2. When you see “Enter Password”, enter the existing password and press <Enter>.
3. You will see “Confirm Password”. Type it again, and press <Enter>.
4. Select Set Password again, and at the “Enter Password” prompt, please don’t enter anything; just press <Enter>.
5. At the “Confirm Password” prompt, again, don’t type in anything; just press <Enter>.
6. Select Save to CMOS and EXIT, type <Y>, then <Enter>.

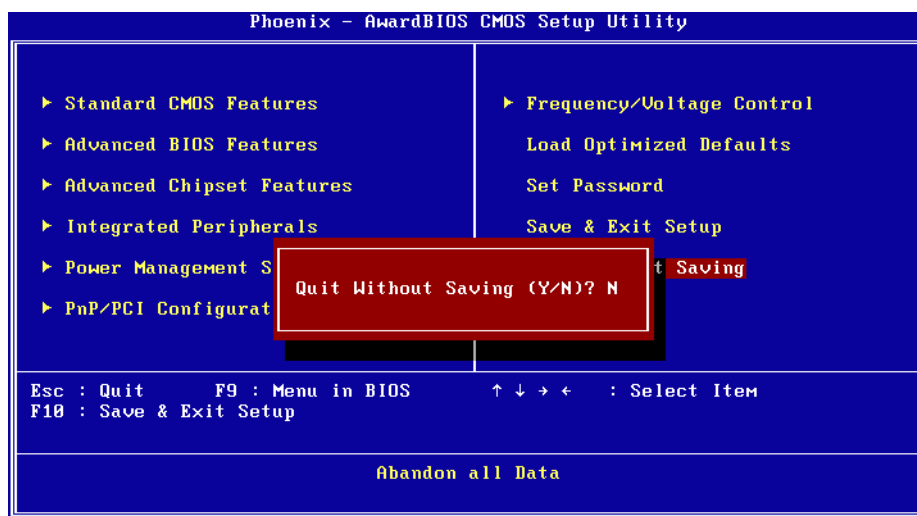
3.2.12 Save & Exit Setup



Note! Typing "Y" will quit the BIOS Setup Utility and save user setup value to CMOS.
Typing "N" will return to BIOS Setup Utility.



3.2.13 Quit Without Saving



Note! Typing "Y" will quit the BIOS Setup Utility without saving to CMOS.
Typing "N" will return to BIOS Setup Utility.



Chapter 4

Driver Installation

This chapter gives you the driver installation information on the PCA-6781 Half-size CPU card.


Sections include:

- Driver Introduction
- Driver Installation

4.1 Driver Introduction

The CD shipped with PCA-6781 should contain the drivers below; please follow this sequence to complete the driver installation.

1. Install Intel INF Update Driver for Windows XP/2000.
2. Install Intel Graphic Driver for Windows XP/2000.
3. Install Intel 82551QM Ethernet Driver for Windows XP/2000.

Note!  For Windows XP Embedded, Windows CE 5.0 and Linux support, please contact sales representative or technical person. Note: Downloading the update for Windows XP or Windows 2000 may be required for enabling USB 2.0 function. Details information please refers to below web link.

<http://www.microsoft.com/whdc/system/bus/USB/USB2support.msp>

4.2 Driver Installation

Insert the PCA-6781 CD into the CD-ROM device, and follow below installation process from Step 1 to Step 4.

4.2.1 Step 1- Install Intel INF Update Driver for Windows XP/2000

1. Click on the “Chipset” folder and double click the “*.exe” file.
2. Follow the instructions that the driver installation wizard shows.
3. The system will help you to complete the driver installation.

4.2.2 Step 2- Install Intel Graphic Driver for Windows XP/ 2000

1. Click on the “VGA” folder and double click the “*.exe” file.
2. Follow the instructions that the driver installation wizard shows.
3. The system will help you to complete the driver installation.

4.2.3 Step 3- Install Intel Ethernet Driver for Windows XP/2000

1. Click on the “LAN” folder and double click the “*.exe” file.
2. Follow the instructions that the driver installation wizard shows.
3. The system will help you to complete the driver installation.

Appendix **A**

Watchdog Timer

The board is equipped with a watchdog timer that resets the CPU or generates an interrupt if processing comes to a standstill for any reason. This feature ensures system reliability in industrial standalone or unmanned environments.

A.1 Watchdog Programming

```
;The SCH3114 Runtime base I/O address is 800h
;Setting WatchDog time value location at offset 66h
;If set value "0", it is mean disable WatchDog function.
Superio_GPIO_Port = 800h
mov dx,Superio_GPIO_Port + 66h
mov al,00h
out dx,al

.model small
.486p
.stack 256
.data
SCH3114_IO EQU 800h
.code
org 100h
.STARTup
;=====
;47H
;enable WDT function bit [3:2]=11
;=====

mov dx,SCH3114_IO + 47h
mov al,8EH
out dx,al

;=====
;65H
;bit [1:0]=Reserved
;bit [6:2]Reserve=00000
;bit [7] WDT time-out Value Units Select
;Minutes=0 (default) Seconds=1
;=====

mov dx,SCH3114_IO + 65h ;
mov al,080h
out dx,al

;=====
;66H
;WDT timer time-out value
;bit[7:0]=0~255
;=====

mov dx,SCH3114_IO + 66h
```

```
mov al,01h  
out dx,al
```

```
;=====  
;bit[0] status bit R/W  
;WD timeout occurred =1  
;WD timer counting = 0  
;=====
```

```
mov dx,SCH3114_IO + 68h  
mov al,01h  
out dx,al  
.exit  
END
```


Appendix **B**

Pin Assignments

This appendix contains information of a detailed or specialized nature.

B.1 Connectors

B.1.1 HDD LED/Reset/Power Button (CN1)

Table B.1: HDD LED/Reset/Power Button (CN1)

Pin	Signal	Pin	Signal
1	+5 V	2	HDD_LED
3	PWR_LED	4	GND
5	SUSPEND	6	5 VSB
7	RESET	8	GND
9	5 VSB	10	PWR_Button

B.1.2 Primary IDE Connector (CN4)

Table B.2: Primary IDE Connector (CN4)

Pin	Signal	Pin	Signal
1	IDE Reset	2	GND
3	D7	4	D8
5	D6	6	D9
7	D5	8	D10
9	D4	10	D11
11	D3	12	D12
13	D2	14	D13
15	D1	16	D14
17	D0	18	D15
19	GND	20	NC
21	DRQ	22	GND
23	IOW	24	GND
25	IOR	26	GND
27	IORDY	28	Cable Select
29	DACK	30	GND
31	IRQ14	32	NC
33	A1	34	DIAG#
35	A0	36	A2
37	CS#1	38	CS#3
39	Active	40	GND

B.1.3 Floppy Connector(CN2)

Table B.3: Floppy Connector (CN2)

Pin	Signal	Pin	Signal
1	GND	2	RWC#
3	GND	4	NC
5	GND	6	NC
7	GND	8	INDEX#
9	GND	10	MOA#
11	GND	12	NC
13	GND	14	DSA#
15	GND	16	NC
17	GND	18	DIR#
19	GND	20	STEP#
21	GND	22	WD#
23	GND	24	WE#
25	GND	26	TRAK0#
27	GND	28	WP#
29	GND	30	RDATA#
31	GND	32	HEAD#
33	GND	34	DSKCHG#

B.1.4 Printer Port Connector (CN3)

Table B.4: Printer Port Connector (CN3)

Pin	Signal	Pin	Signal
1	STB#	2	AFD#
3	D0	4	ERR#
5	D1	6	INIT#
7	D2	8	SLIN
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	NC

B.1.5 IR Connector (CN5)

Table B.5: IR Connector (CN5)

Pin	Signal	Pin	Signal
1	+5 V	2	NC
3	RX	4	GND
5	TX		

B.1.6 LCD Inverter Connector (CN6)

Table B.6: LCD Inverter Connector (CN6)

Pin	Signal	Pin	Signal
1	+12 V output	2	GND
3	Back-light enable signal	4	Back-light VBR signal output
5	+5 V output		

B.1.7 Audio Interface (CN7)

Table B.7: Audio Interface (CN7)

Pin	Signal	Pin	Signal
1	+5 V	2	BitCLK
3	Data in	4	GND
5	GND	6	Sync
7	Data out	8	ACRST
9	+5 V	10	SPKR

B.1.8 LVDS Connector (CN8)

Table B.8: LVDS Connector (CN8)			
Pin	Signal	Pin	Signal
1	GND	2	GND
3	LVDS0_D0+	4	LVDS1_D0+
5	LVDS0_D0-	6	LVDS1_D0-
7	LVDS0_D1+	8	LVDS1_D1+
9	LVDS0_D1-	10	LVDS1_D1-
11	LVDS0_D2+	12	LVDS1_D2+
13	LVDS0_D2-	14	LVDS1_D2-
15	LVDS0_CLK+	16	LVDS1_CLK+
17	LVDS0_CLK-	18	LVDS1_CLK-
19	LVDS power	20	LVDS power

B.1.9 USB port 1, 2 Connector (CN9)

Table B.9: USB port 1,2 Connector (CN9)			
Pin	Signal	Pin	Signal
1	+5 V	2	+5 V
3	USB0-	4	USB1-
5	USB0+	6	USB1+
7	GND	8	GND
9	GND	10	NC

B.1.10 D-SUB VGA Connector (CN10)

Table B.10: D-SUB VGA Connector (CN10)			
Pin	Signal	Pin	Signal
1	R	2	G
3	B	4	NC
5,6,7,8, 10,16,17	GND	11	NC
12	VGA_DDAT	13	HSYNC
14	VSYNC	15	VGA_DCLK
9	+5 V_VGA		

B.1.11 USB port 3,4 Connector (CN11)

Table B.11: USB port 3,4 Connector (CN11)

Pin	Signal	Pin	Signal
1	+5 V	2	+5 V
3	USB2-	4	USB3-
5	USB2+	6	USB3+
7	GND	8	GND
9	GND	10	NC

B.1.12 PC 104 Connector

B.1.13 LAN RJ45 Connector (CN13)

Table B.12: LAN RJ45 Connector (CN13)

Pin	Signal	Pin	Signal
1	TX+	2	TX-
3	RX+	4	GND
5	GND	6	RX-
7	GND	8	GND
9	LILED	10	VCC_LAN
11	ACTLED	12	VCC_LAN
13	GND	14	GND

B.1.14 COM port 1 (RS-232)(CN15)

Table B.13: COM port 1 (RS-232) (CN15)

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

B.1.15 COM port 2 (RS-232/422/485)(CN14)**Table B.14: COM port 2 (RS-232/422/485) (CN14)**

Pin	Signal	Pin	Signal
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTS
7	DTR	8	RI
9	GND	10	GND
11	TXD485+	12	TXD485-
13	RXD485+	14	RXD485

B.1.16 ATX Power Connector (CN16)**Table B.15: ATX Power Connector (CN16)**

Pin	Signal	Pin	Signal
1	+5 V	2	GND
3	GND	4	+12 V
5	NC	6	GND
7	+5 V		

B.1.17 KB/MS Connector (CN19)**Table B.16: KB/MS Connector (CN19)**

Pin	Signal	Pin	Signal
1	KBDATA	2	MSDATA
3	GND	4	+5V
5	KBCLK	6	MSCLK

B.1.18 External KB/mouse Connector (CN18)**Table B.17: External KB/mouse Connector (CN18)**

Pin	Signal	Pin	Signal
1	KBCLK	2	KBDATA
3	NC	4	GND
5	+5 V		

B.1.19 ISA Gold Finger (CN21)

B.1.20 ATX Suspend Power Connector (CN23)

Table B.18: ATX Suspend Power Connector (CN23)

Pin	Signal	Pin	Signal
1	+5 VSB	2	+5 V
3	PS_ON signal		

B.1.21 Negative Power Input (CN17)

Table B.19: Negative Power Input (CN17)

Pin	Signal	Pin	Signal
1	-5 V	2	GND
3	-12 V		

B.1.22 CF Connector (CN24)

B.1.23 +12V FAN connector(CN22)

Table B.20: +12 V FAN connector (CN22)

Pin	Signal	Pin	Signal
1	FAN_PWM	2	+12 V
3	FAN-SPD		

B.1.24 System FAN connector (CN25)

Table B.21: System FAN connector (CN25)

Pin	Signal	Pin	Signal
1	FAN_PWM	2	+12 V
3	FAN-SPD		

B.1.25 SMBUS connector (CN26)

Table B.22: SMBUS connector (CN26)

Pin	Signal	Pin	Signal
1	+5 V	2	+SMB_CLK
3	SMB_DAT	4	GND

B.1.26 HW Fail LED (CN27)

Table B.23: HW Fail LED (CN27)

Pin	Signal	Pin	Signal
1	HWM_INT#	2	GND

B.2 Jumpers

B.2.1 LVDS Voltage Choose (JP1)

Table B.24: LVDS Voltage Choose (JP1)

Pin	Signal	Pin	Signal
1-2	+5V	2-3	+3.3V

B.2.2 Clear CMOS (J1)

Table B.25: CLEAR CMOS (J1)

Pin	Signal	Pin	Signal
1-2	Normal	2-3	Clear CMOS

B.2.3 232/422/485 SEL (J2)

Table B.26: 232/422/485 SEL (J2)

Pin	Signal	Pin	Signal
1-2	RS232 *	2-3	RS422
5-6	RS485		

Appendix **C**

System Assignments

This appendix contains information of a detailed nature.

Sections include:

- System I/O ports
- 1st MB memory map
- DMA channel assignments
- Interrupt assignments

C.1 System I/O Ports

Table C.1: System I/O Ports

Addr. range (Hex)	Device
00-0F	Master DMA controller
20-21F	Master Interrupt controller
40-5F	Timer/Counter
60-6F	Keyboard controller
(60h)	KBC Data
(61h)	Misc Functions & Spkr Ctrl
(64h)	KBC Command/Status
70-77	RTC/COMS/NMI-Disable
78-7F	-available for system use-
80	-reserved-(debug port)
81-8F	DMA Page Registers
90-91	-available for system use-
92	System Control
93-9F	-available for system use-
A0-A1H	Slave Interrupt Controller
C0-DF	Slave DMA Controller
E0-FF	-available for system use-
100-CF7	-available for system use-
CF8-CFB	PCI Configuration Address
CFC-CFF	PCI Configuration Data
D00-FFFF	-available for system use-
200-20F	Game Port
2F8-2FF	COM2
378-37F	Printer Port (Standard & AFF)
3F0-3F1	Configuration Index/Data
3F0-3F7	Floppy Controller
3F8-3FF	COM1
778-77A	Printer Port (ECP Extensions) (Port 378+400)
800h~87fh	Super I/O runtime reg

C.2 1st MB Memory Map

Table C.2: 1st MB Memory Map

Addr. range (Hex)	Device
F0000h - FFFFFh	System ROM
*CC000h - EFFFFh	Unused (reserved for Ethernet ROM)
C0000h - CBFFFh	Expansion ROM (for VGA BIOS)
B8000h - BFFFFh	CGA/EGA/VGA text
B0000h - B7FFFh	Unused
A0000h - AFFFFh	EGA/VGA graphics
00000h - 9FFFFh	Base memory
* If Ethernet boot ROM is disabled	
* E0000 - EFFFF is reserved for BIOS POST	

C.3 DMA Channel Assignments

Table C.3: DMA Channel Assignments

Channel	Function
0	Available
1	Available (audio)
2	Floppy disk (8-bit transfer)
3	Available (printer port)
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available
* Audio DMA select 1, 3, or 5	
** Printer port DMA select 1 (LPT2) or 3 (LPT1)	

C.4 Interrupt Assignments

Table C.4: Interrupt Assignments

Interrupt#	Interrupt source
IRQ 0	Interval timer
IRQ 1	Keyboard
IRQ 2	Interrupt from controller 2 (cascade)
IRQ 3	COM2
IRQ 4	COM1
IRQ 5	Unused
IRQ 6	FDD
IRQ 7	LPT1
IRQ 8	RTC
IRQ 9	ACPI
IRQ 10	Unused
IRQ 11	Unused
IRQ 12	PS/2 mouse
IRQ 13	INT from co-processor
IRQ 14	Primary IDE
IRQ 15	Secondary IDE for CFC

* Ethernet interface IRQ select: 5, 9, 10, 11
* PNP USB IRQ select: 5, 9, 10, 11

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