

PCM-9150

Intel® Pentium® M / Celeron® M Processors

18/36-bit LVDS TFT Panel

Two DDRII 400/533 SoDIMM Memory

6.1 CH AC-97 2.0 Codec with S/P DIF

4 USB 2.0 / 4 COMs / Digital IO

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Packing List

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

- 1 PCM-9150 CPU Card
- 1 Quick Installation Guide
- 1 CD-ROM for manual (in PDF format) and drivers
- 1 Jumper cap

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

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Chapter

1

**General
Information**

1.1 Introduction

The PCM-9150 is AAEON's latest low power consumption solution featuring Intel® innovation. It adopts Intel's® latest Pentium® M chipset-Mobile Intel® 915GM Express Chipset, which has been validated with Intel® Pentium® M CPUs and the newest PCI-Express interface. Therefore the PCM-9150's peripheral transmission speed can upgrade effectively, especially on multi-port Gigabit LAN applications. For these kinds of applications, PCM-9150 has 2 Gigabit LAN ports onboard to satisfy firewall and small data server demands.

The Greatest Performance on Multimedia applications

For multimedia applications, the Mobile Intel® 915GM Express Chipset has Intel® Graphics media Accelerator (GMA900) function built in the chipset. This feature will be of good use in future KIOSK, advertisement, and information display applications.

Versatile dual view combinations

Besides LCD support, PCM-9150 also allows customer to show different content on CRT, LCD, DVI or TV (two of them) at the same time. It meets dual view demands as the most cost-effective display solution.

Widely Expanded Interfaces

PCM-9150 promises you off-the-shelf expansion possibilities with versatile expansion interfaces-Mini PCI, PCI, and PCI-Express x1. By adopting AAEON's versatile Mini PCI modules, you can extend your onboard features such as adding a third LAN port, sixth or even eighth COM port, and one IEEE 1394a port.

Environment-Friendly applications

The RoHS compliant PCM-9150 is the ideal choice for high performance and energy-saving demands that must be implemented with low power consumption and pleasing multimedia presentation. For environment-friendly applications, the PCM-9150 no doubt is a perfect fit.

1.2 Features

- Intel® Pentium M / Celeron® M Series Processors
- 18/36-bit LVDS TFT Panel
- Two DDRII 400/533 SoDIMM Memory Up to 2GB
- Dual PCI-Express Gigabit LAN (“Boot from LAN” will only boot to LAN2 if both LAN1 and LAN2 are enabled caused by Marvell NIC limitation.)
- 5.1 CH AC97 2.0 Codec With S/P DIF Function
- Mini-PCI
- 4 USB 2.0 / 4 COMs / Digital IO

1.3 Specifications

System

- CPU Up to Socket 478 Intel® Pentium® M 2.13G (400/533MHz FSB) / Celeron® M 1.5G (400MHz FSB)
- System Memory 2 x DDRII SoDIMM support DDRII 400/533 up to 2GB
- Chipset Intel® 915GM + ICH6M + ITE 8712 + Fintek F81216D
- I/O Chipset Intel® ICH6M + ITE 8712 + Fintek F81216D
- Ethernet Marvell 88E8053, 10/100/1000Mb Chip, RJ-45 x 2
- BIOS Award Plug & Play BIOS – 512KB ROM
- Watchdog Timer ITE 8712, generates a time-out system reset
- H/W status monitoring ITE 8712, supports power supply voltages and temperatures monitoring functions
- SSD One Type II Compact Flash Card, Genesys GL813 USB 2.0 interface
- Expansion Interface Mini-PCI socket x 1, PCI x 1, PCI-Express by 1 x 1

- **Battery** Lithium battery
- **Power Requirement** +5V, +5VSB, +12V ATX, supports ATX and AT type of power
- **Board Size** 8"(L) x5.75" (W)
(203mm x 146mm)
- **Gross Weight** 1.2lb (0.5kg)

Display

- **Chipset** Intel® 915GM + Chrontel 7307C
- **Memory** Shared system memory up to 128MB with DVMT (128MB support when the system memory over 256MB)
- **Resolutions** Up to 1600x1200@32bpp for CRT, Up to 1280x1024@24bpp for LCD;
Support: CRT/LCD, CRT/TV, CRT/DVI, LCD/DVI, Dual View/Simultaneous display under Windows Operation System
- **LCD Interface** Up to 36-bit dual channel LVDS
- **TV-Out** Supports NTSC/PAL; Supports RCA and S-terminal connectors

I/O

- MIO EIDE x1(UDMA100 x 1), SATA x 2, RS-232 x 3 (COM1/3/4), RS-232/422/485 x 1 (COM2), Keyboard + Mouse x 1, Parallel x 1
- IrDA One IrDA Tx/Rx header
- Audio MIC-in/ Line-in/ Line-out/ CD-in, S/P DIF in/out, Stereo Amplifier included
- USB Two 5x2 pin headers support 4 USB 2.0 Ports (One for Compact Flash)
- Digital I/O 8 ports Digital I/O (Each port can be programmed to be in or out)

Chapter

2

Quick Installation Guide

Notice:

The Quick Installation Guide is derived from Chapter 2 of user manual. For other chapters and further installation instructions, please refer to the user manual CD-ROM that came with the product.



2.1 Safety Precautions

Warning!

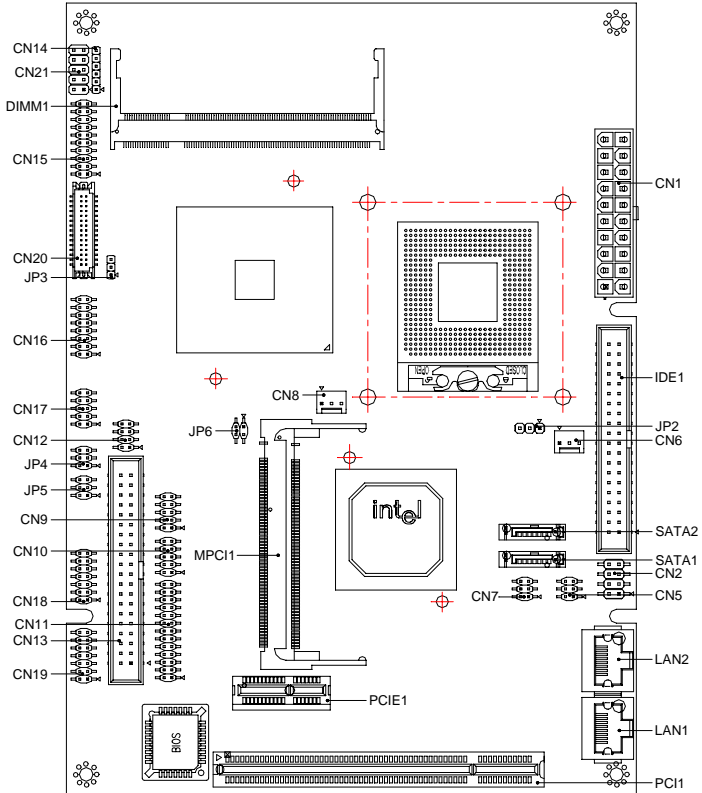
Always completely disconnect the power cord from your board whenever you are working on it. Do not make connections while the power is on, because a sudden rush of power can damage sensitive electronic components.

Caution!

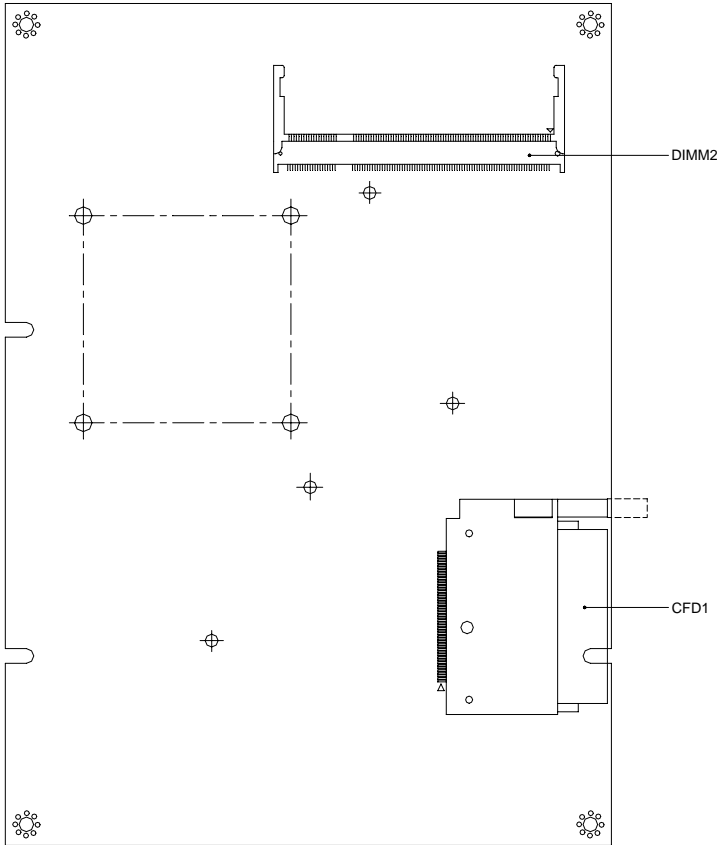
Always ground yourself to remove any static charge before touching the board. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis

2.2 Location of Connectors and Jumpers

Component Side

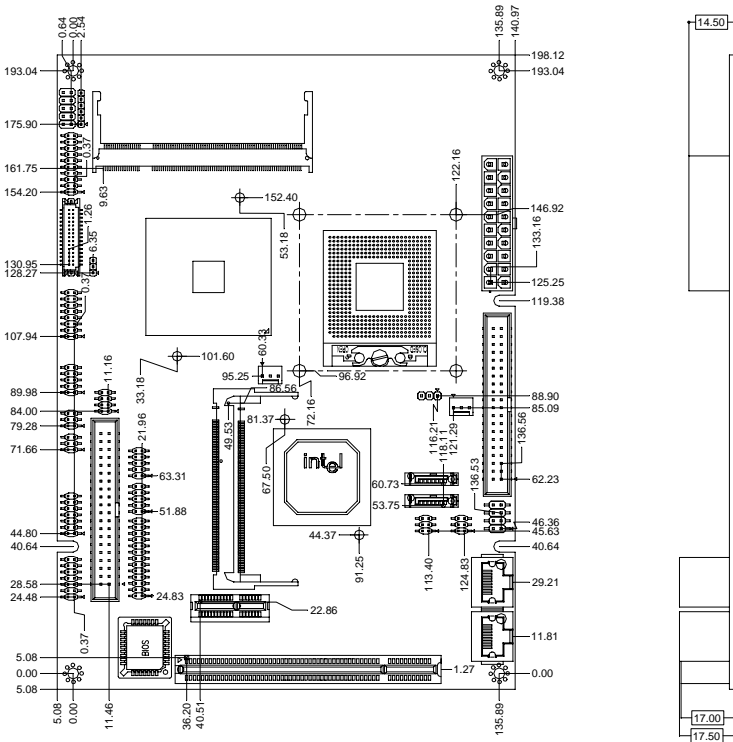


Solder Side

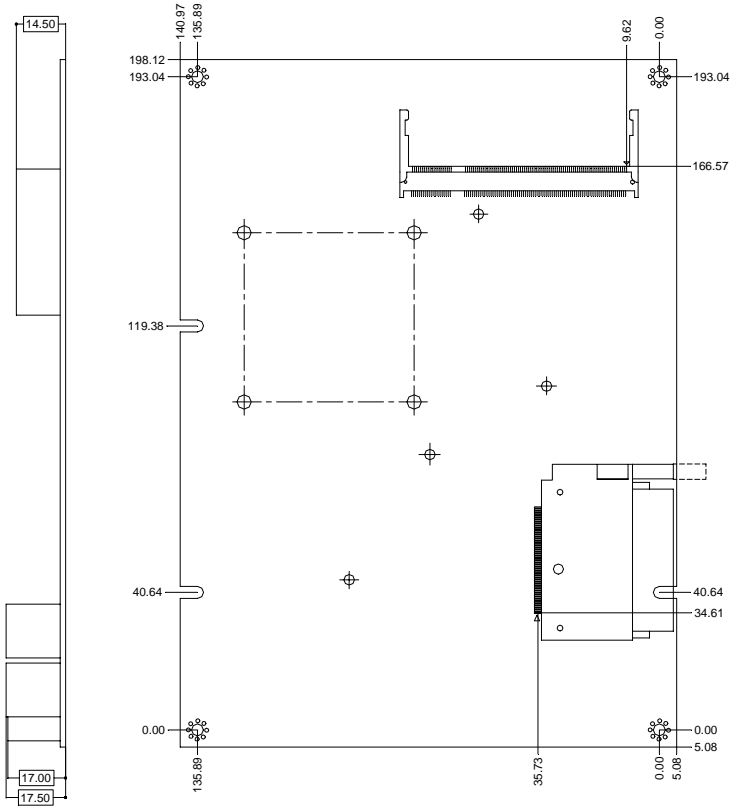


2.3 Mechanical Drawing

Component Side



Solder Side



2.4 List of Jumpers

The board has a number of jumpers that allow you to configure your system to suit your application.

The table below shows the function of each of the board's jumpers:

Jumpers

Label	Function
JP2	Clear CMOS Selection
JP3	LVDS Voltage Selection
JP4	COM4 Ring Voltage Selection
JP5	COM3 Ring Voltage Selection

2.5 List of Connectors

The board has a number of connectors that allow you to configure your system to suit your application. The table below shows the function of each board's connectors:

Connectors

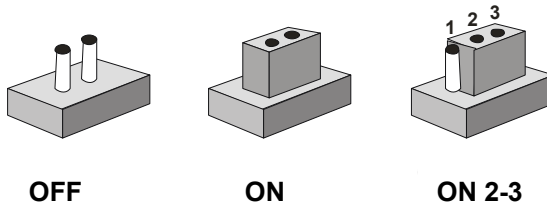
Label	Function
CN1	ATX Power Connector
CN2	Keyboard/Mouse Connector
CN3	LAN2 Pin Header (Option)
CN4	LAN1 Pin Header (Option)
CN5	LAN1 LED Connector
CN6	CPU FAN Connector
CN7	LAN2 LED Connector
CN8	SYSTEM FAN Connector
CN9	USB1/2 Connector
CN10	USB3/4 Connector
CN11	Parallel Port Connector
CN12	TV-Out Connector
CN13	COM1~COM4 Connector
CN14	IrDA Connector
CN15	DVI Connector
CN16	CRT Connector
CN17	Digital IO Connector

CN18	5.1 Channel Audio Connector
CN19	2.1 Channel Audio Connector
CN20	LVDS Connector
CN21	Front Panel Connector
DIMM1	DDR2 SO-DIMM Channel 1 Connector
DIMM2	DDR2 SO-DIMM Channel 2 Connector
LAN1	LAN1 Connector
LAN2	LAN2 Connector

2.6 Setting Jumpers

You configure your card to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch. 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.



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 change.

Generally, you simply need a standard cable to make most connections.

2.7 Clear CMOS Selection (JP2)

√ Normal			Clear CMOS		
1	2	3	1	2	3
■	●	○	□	●	●

2.8 LVDS Panel Voltage Select (JP3)

√ 3.3V			5V		
1	2	3	1	2	3
□	●	●	■	●	○

2.9 COM4 RI pin voltage select (JP4)

√ RI			5V			12V		
2	4	6	2	4	6	2	4	6
○	○	●	○	●	○	●	○	○
□	○	●	□	●	○	■	○	○
1	3	5	1	3	5	1	3	5

2.10 COM3 RI pin voltage select (JP5)

√ RI			5V			12V		
2	4	6	2	4	6	2	4	6
○	○	●	○	●	○	●	○	○
□	○	●	□	●	○	■	○	○
1	3	5	1	3	5	1	3	5

2.11 ATX Power Connector (CN1)

Pin	Signal	Pin	Signal
1	NC	11	NC
2	NC	12	-12V
3	GND	13	GND
4	5V	14	PSON
5	GND	15	GND
6	5V	16	GND
7	GND	17	GND
8	PWROK	18	-5V.
9	5VSB	19	5V
10	12V	20	5V

2.12 Keyboard/Mouse Connector (CN2)

Pin	Signal	Pin	Signal
1	KBDT	2	KBCK
3	GND	4	KBVCC
5	MSDT	6	MSCK
7	N/C		

2.13 LAN Pin Header (CN3), (CN4) (Optional)

Pin	Signal	Pin	Signal
1	TX2-	2	TX2+

3	TX4+	4	TX4-
5	LAN_GND	6	LAN_GND
7	TX3+	8	TX3-
9	TX1+	10	TX1-

2.14 LAN LED Connector (CN5), (CN7)

Pin	Signal	Pin	Signal
1	3.3V	2	Link/Active
3	3.3V	4	100M
5	3.3V	6	1000M

2.15 CPU Fan Connector (CN6)

Pin	Signal
3	FAN Sense
2	5V
1	GND

2.16 System Fan Connector (CN8)

Pin	Signal
3	FAN Sense
2	5V
1	GND

2.17 USB1/2 Connector (CN9)

Pin	Signal	Pin	Signal
1	USB_VDD	2	USB_GND
3	USBD0-	4	USB_GND
5	USBD0+	6	USBD1+
7	USB_GND	8	USBD1-
9	USB_GND	10	USB_VDD

2.18 USB3/4 Connector (CN10)

Pin	Signal	Pin	Signal
1	USB_VDD	2	USB_GND
3	USBD2-	4	USB_GND
5	USBD2+	6	USBD3+
7	USB_GND	8	USBD3-
9	USB_GND	10	USB_VDD

2.19 Parallel Port Connector (CN11)

Pin	Signal	Pin	Signal
1	STB-	14	AFD-
2	PTD0	15	ERR-
3	PTD1	16	INI-
4	PTD2	17	SLIN-
5	PTD3	18	GND

6	PTD4	19	GND
7	PTD5	20	GND
8	PTD6	21	GND
9	PTD7	22	GND
10	ACK-	23	GND
11	BUSYY	24	GND
12	PEE	25	GND
13	SLCTT	26	N/C

2.20 TV-Out Connector (CN12)

Pin	Signal	Pin	Signal
1	TV_DACB (Luminance)	2	TV_DACA (Composite)
3	TV_GND	4	TV_GND
5	TV_DACC(Chrominance)	6	N/C
7	TV_GND	8	N/C

2.21 COM 1~COM 4 Connector (CN13)

Pin	Signal	Pin	Signal
1	DCD1	2	DSR1
3	RXD1	4	RTS1
5	TXD1	6	CTS1
7	DTR1	8	RI1
9	GND	10	N/C
11	DCD2(422TXD-/485DATA-)	12	DSR12

13	RXD2(422RXD+)	14	RTS2
15	TXD2(422TXD+/485DATA+)	16	CTS2
17	DTR2(422RXD-)	18	RI2
19	GND	20	N/C
21	DCD3	22	DSR3
23	RXD3	24	RTS3
25	TXD3	26	CTS3
27	DTR3	28	RI3/+12V/+5V
29	GND	30	N/C
31	DCD4	32	DSR4
33	RXD4	34	RTS4
35	TXD4	36	CTS4
37	DTR4	38	RI4/+12V/+5V
39	GND	40	N/C

2.22 IR Connector (CN14)

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

2.23 DVI Connector (CN15)

Pin	Signal	Pin	Signal
1	TD1	2	TD1#
3	GND	4	GND
5	TDC	6	TDC#
7	GND	8	5V
9	HPDET#	10	5V
11	TD2	12	TD2#
13	GND	14	GND
15	TD0	16	TD0#
17	NC	18	NC
19	DDCDATA	20	DDCCLK

2.24 CRT Connector (CN16)

Pin	Signal	Pin	Signal
1	RED	2	VCC
3	GREEN	4	GND
5	BLUE	6	N/C
7	N/C	8	CRT_DDCDATA
9	GND	10	HSYNC
11	GND	12	VSYNC
13	GND	14	CRT_DDCCLK
15	GND	16	GND

2.25 Digital IO Connector (CN17) Digital I/O Port Address = 2A1

Pin	Signal	Pin	Signal
1	DIO1	2	DIO2
3	DIO3	4	DIO4
5	DIO5	6	DIO6
7	DIO7	8	DIO8
9	5V	10	GND

BIOS Setting	Connector Definition	Address	IT8712 GPIO Setting
DIO-1	CN17 Pin 1	Bit 0	U42 Pin 27 (GPIO 20)
DIO-2	CN17 Pin 2	Bit 1	U42 Pin 26 (GPIO 21)
DIO-3	CN17 Pin 3	Bit 2	U42 Pin 25 (GPIO 22)
DIO-4	CN17 Pin 4	Bit 3	U42 Pin 24 (GPIO 23)
DIO-5	CN17 Pin 5	Bit 4	U42 Pin 23 (GPIO 24)
DIO-6	CN17 Pin 6	Bit 5	U42 Pin 22 (GPIO 25)
DIO-7	CN17 Pin 7	Bit 6	U42 Pin 21 (GPIO 26)
DIO-8	CN17 Pin 8	Bit 7	U42 Pin 20 (GPIO 27)

2.26 5.1 Channel Audio Connector (CN18)

Pin	Signal	Pin	Signal
1	LOUT_R	2	A_GND
3	LOUT_L	4	A_GND
5	SURROUND_R	6	A_GND

7	SURROUND_L	8	A_GND
9	LFE_O	10	A_GND
11	CEN_O	12	A_GND
13	SPDIF_O	14	SPDIF_I

2.27 2.1 Channel Audio Connector (CN19)

Pin	Signal	Pin	Signal
1	MIC_IN	2	MIC_VCC
3	A_GND	4	CD_GND
5	LIN_L	6	CD_L
7	LIN_R	8	CD_GND
9	A_GND	10	CD_R
11	LOUT_L	12	LOUT_R
13	A_GND	14	A_GND

2.28 LVDS Connector (CN20)

Pin	Signal	Pin	Signal
1	BKL_EN	2	BKL_CTL
3	LVDS_VCC	4	GND
5	LVDS_CH1_CLK-	6	LVDS_CH1_CLK+
7	LVDS_VCC	8	GND
9	LVDS_CH1_DATA0-	10	LVDS_CH1_DATA0+
11	LVDS_CH1_DATA1-	12	LVDS_CH1_DATA1+
13	LVDS_CH1_DATA2-	14	LVDS_CH1_DATA2+

15	N/C	16	N/C
17	LVDS_DATA	18	LVDS_CLK
19	LVDS_CH2_DATA0-	20	LVDS_CH2_DATA0+
21	LVDS_CH2_DATA1-	22	LVDS_CH2_DATA1+
23	LVDS_CH2_DATA2-	24	LVDS_CH2_DATA2+
25	N/C	26	N/C
27	LVDS_VCC	28	GND
29	LVDS_CH2_CLK-	30	LVDS_CH2_CLK+

2.29 Front Panel (CN21)

Pin	Signal	Pin	Signal
1	GND	2	Power Switch
3	HD_LED	4	3.3V
5	BEEP	6	5V
7	GND	8	Power LED
9	GND	10	Reset

2.30 DDR2 SO-DIMM Channel 1 Connector (DIMM1)

Standard DDR2 SO-DIMM Connector

2.31 DDR2 SO-DIMM Channel 2 Connector (DIMM2)

Standard DDR2 SO-DIMM Connector

2.32 LAN1 Connector (LAN1)

Standard RJ-45 Connector

2.33 LAN2 Connector (LAN2)

Standard RJ-45 Connector

2.34 IDE Connector (IDE1)

Pin	Signal	Pin	Signal
1	IDERST	2	GND
3	PID7	4	PID8
5	PID6	6	PID9
7	PID5	8	PID10
9	PID4	10	PID11
11	PID3	12	PID12
13	PID2	14	PID13
15	PID1	16	PID14
17	PID0	18	PID15
19	GND	20	N/C
21	PDREQ	22	GND
23	PIOW#	24	GND
25	PIOR#	26	GND
27	PRDY	28	GND
29	PACK#	30	GND
31	PIRQ14	32	N/C
33	PPDA1	34	ATA66_DET
35	PPDA0	36	PPDA2
37	PPCS1#	38	PPCS3#

39	HDLED#	40	GND
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2.35 S-ATA1 Connector (SATA1)

Standard S-ATA Connector

2.36 S-ATA2 Connector (SATA2)

Standard S-ATA Connector

2.37 Compact Flash Connector (CFD1)

Standard Compact Flash Connector (Type I & II)

2.38 PCI Slot Connector (PCI1)

Standard PCI Slot Connector

2.39 Mini PCI Connector (MPCI1)

Standard Mini PCI Connector

2.40 PCI-Express Connector (PCI1)

Standard PCI-Express (1X) Slot

Below Table for China RoHS Requirements

产品中有毒有害物质或元素名称及含量

AAEON Main Board/ Daughter Board/ Backplane

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷电路板 及其电子组件	×	○	○	○	○	○
外部信号 连接器及线材	×	○	○	○	○	○
<p>O: 表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T 11363-2006 标准规定的限量要求以下。</p> <p>X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11363-2006 标准规定的限量要求。</p> <p>备注: 此产品所标示之环保使用期限, 系指在一般正常使用状况下。</p>						

Chapter

3

**Award
BIOS Setup**

3.1 System Test and Initialization

These routines test and initialize board hardware. If the routines encounter an error during the tests, you will either hear a few short beeps or see an error message on the screen. There are two kinds of errors: fatal and non-fatal. The system can usually continue the boot up sequence with non-fatal errors. Non-fatal error messages usually appear on the screen along with the following instructions:

Press <F1> to RESUME

Write down the message and press the F1 key to continue the boot up sequence.

System configuration verification

These routines check the current system configuration against the values stored in the CMOS memory. If they do not match, the program outputs an error message. You will then need to run the BIOS setup program to set the configuration information in memory.

There are three situations in which you will need to change the CMOS settings:

1. You are starting your system for the first time
2. You have changed the hardware attached to your system
3. The CMOS memory has lost power and the configuration information has been erased.

The PCM-9150 CMOS memory has an integral lithium battery backup for data retention. However, you will need to replace the complete unit when it finally runs down.

3.2 Award BIOS Setup

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

Entering Setup

Power on the computer and press immediately. This will allow you to enter Setup.



Standard CMOS Features

Use this menu for basic system configuration. (Date, time, IDE, etc.)

Advanced BIOS Features

Use this menu to set the advanced features available on your system.

Advanced Chipset Features

Use this menu to change the values in the chipset registers and optimize your system performance.

Integrated Peripherals

Use this menu to specify your settings for integrated peripherals. (Primary slave, secondary slave, keyboard, mouse etc.)

Power Management Setup

Use this menu to specify your settings for power management. (HDD power down, power on by ring, KB wake up, etc.)

PnP/PCI Configurations

This entry appears if your system supports PnP/PCI.

PC Health Status

This menu allows you to set the shutdown temperature for your system.

Frequency/Voltage Control

Use this menu to specify your settings for auto detect DIMM/PCI clock and spread spectrum.

Load Fail-Safe Defaults

Use this menu to load the BIOS default values for the minimal/stable performance for your system to operate.

Load Optimized Defaults

Use this menu to load the BIOS default values that are factory settings for optimal performance system operations. While AWARD has designated the custom BIOS to maximize performance, the factory has the right to change these defaults to meet their needs.

Set Supervisor/User Password

Use this menu to set Supervisor/User Passwords.

Save and Exit Setup

Save CMOS value changes to CMOS and exit setup.

Exit Without Saving

Abandon all CMOS value changes and exit setup.

You can refer to the "AAEON BIOS Item Description.pdf" file in the CD for the meaning of each setting in this chapter.

Chapter

4

**Driver
Installation**

The PCM-9150 comes with an AutoRun CD-ROM that contains all drivers and utilities that can help you to install the driver automatically.

Insert the driver CD, the driver CD-title will auto start and show the installation guide. If not, please follow the sequence below to install the drivers.

Follow the sequence below to install the drivers:

Step 1 – Install Intel INF Update

Step 2 – Install VGA Driver

Step 3 – Install LAN Driver

Step 4 – Install Audio Driver

USB 2.0 Drivers are available for download using Windows® Update for both Windows® XP and Windows® 2000. For additional information regarding USB 2.0 support in Windows® XP and Windows® 2000, please visit www.microsoft.com/hwdev/usb/.

Please read instructions below for further detailed installations.

4.1 Installation:

Insert the PCM-9150 CD-ROM into the CD-ROM drive and install the drivers from Step 1 to Step 4 in order.

Step 1 – Install Intel INF Update

1. Click on the **Step 1 –INF** folder and then double click on the ***infinst_autol.exe***
2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

Step 2 – Install VGA Driver

1. Click on the **Step 2 –VGA** folder and then click on the ***W2K_xp*** folder
2. Double click on the ***win2k_xp1414.exe***
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

Remark: You can choose the different display ways by pressing below hot key,

Ctrl+Alt+F1=CRT, Ctrl+Alt+F2=LCD, Ctrl+Alt+F3=TV,
Ctrl+Alt+F4=DVI, Ctrl+Alt+F12=Graphic Control Panel

Step 3 –Install LAN Driver

1. Click on the **Step 3 –LAN** folder and double click on

SetupYukonWin.exe

2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

Step 4 – Install Audio Driver

1. Click on the **Step 4 –AC97** folder and click on the **Win98ME2KXP** folder
2. Double click on the **wdm_a371.exe**
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

Note:

Under the Window OS environment, if the CRT connector is connected to display monitor by the data switch device, the user need to set the color and resolution from Intel Graphic utility (VGA driver) instead of setting from the control panel in case of the wrong display appearance.

Appendix

A

Programming the Watchdog Timer

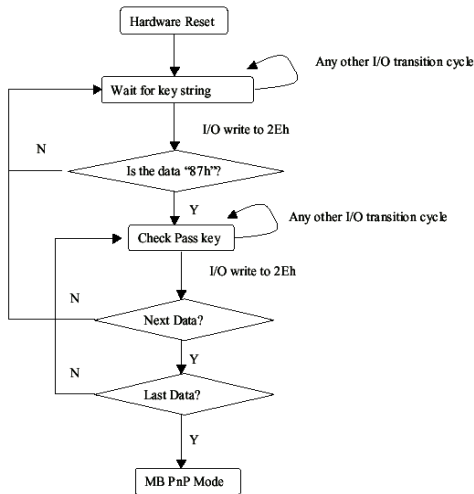
A.1 Programming

PCM-9150 utilizes ITE 8712 chipset as its watchdog timer controller.

Below are the procedures to complete its configuration and the AAEMON initial watchdog timer program is also attached based on which you can develop customized program to fit your application.

Configuring Sequence Description

After the hardware reset or power-on reset, the ITE 8712 enters the normal mode with all logical devices disabled except KBC. The initial state (enable bit) of this logical device (KBC) is determined by the state of pin 121 (DTR1#) at the falling edge of the system reset during power-on reset.



There are three steps to complete the configuration setup: (1) Enter the MB PnP Mode; (2) Modify the data of configuration registers; (3) Exit the MB PnP Mode. Undesired result may occur if the MB PnP Mode is not exited normally.

(1) Enter the MB PnP Mode

To enter the MB PnP Mode, four special I/O write operations are to be performed during Wait for Key state. To ensure the initial state of the key-check logic, it is necessary to perform four write operations to the Special Address port (2EH). Two different enter keys are provided to select configuration ports (2Eh/2Fh) of the next step.

	Address Port	Data Port
87h, 01h, 55h, 55h:	2Eh	2Fh

(2) Modify the Data of the Registers

All configuration registers can be accessed after entering the MB PnP Mode. Before accessing a selected register, the content of Index 07h must be changed to the LDN to which the register belongs, except some Global registers.

(3) Exit the MB PnP Mode

Set bit 1 of the configure control register (Index=02h) to 1 to exit the MB PnP Mode.

WatchDog Timer Configuration Registers

LDN Index R/W Reset Configuration Register or Action				
All	02H	W	N/A	Configure Control
07H	71H	R/W	00H	WatchDog Timer Control Register
07H	72H	R/W	00H	WatchDog Timer Configuration Register
07H	73H	R/W	00H	WatchDog Timer Time-out Value Register

Configure Control (Index=02h)

This register is write only. Its values are not sticky; that is to say, a hardware reset will automatically clear the bits, and does not require the software to clear them.

Bit	Description
7-2	Reserved
1	Returns to the Wait for Key state. This bit is used when the configuration sequence is completed
0	Resets all logical devices and restores configuration registers to their power-on states.

WatchDog Timer Control Register (Index=71h, Default=00h)

Bit	Description
7	WDT is reset upon a CIR interrupt
6	WDT is reset upon a KBC (mouse) interrupt
5	WDT is reset upon a KBC (keyboard) interrupt
4	WDT is reset upon a read or a write to the Game Port base address
3-2	Reserved
1	Force Time-out. This bit is self-clearing
0	WDT Status
	1: WDT value reaches 0.
	0: WDT value is not 0

WatchDog Timer Configuration Register (Index=72h,**Default=00h)**

Bit	Description
7	WDT Time-out value select
	1: Second
	0: Minute
6	WDT output through KRST (pulse) enable
5-4	Reserved
3-0	Select the interrupt level ^{Note} for WDT

WatchDog Timer Time-out Value Register (Index=73h,**Default=00h)**

Bit	Description
7-0	WDT Time-out value 7-0

A.2 IT8712 Watchdog Timer Initial Program

```
.MODEL SMALL
```

```
.CODE
```

Main:

```
CALL Enter_Configuration_mode
```

```
CALL Check_Chip
```

```
mov cl, 7
```

```
call Set_Logic_Device
```

```
;time setting
```

```
mov cl, 10 ; 10 Sec
```

```
dec al
```

Watch_Dog_Setting:

```
;Timer setting
```

```
mov al, cl
```

```
mov cl, 73h
```

```
call Superio_Set_Reg
```

```
;Clear by keyboard or mouse interrupt
```

```
mov al, 0f0h
```

```
mov cl, 71h
```

```
call Superio_Set_Reg
```

```
;unit is second.
```

```
mov al, 0C0H
```

```
mov cl, 72h
```

```
call Superio_Set_Reg
```

```
; game port enable  
mov cl, 9  
call Set_Logic_Device
```

```
Initial_OK:  
CALL Exit_Configuration_mode  
MOV AH,4Ch  
INT 21h
```

```
Enter_Configuration_Mode PROC NEAR  
MOV SI,WORD PTR CS:[Offset Cfg_Port]
```

```
MOV DX,02Eh  
MOV CX,04h  
Init_1:  
MOV AL,BYTE PTR CS:[SI]  
OUT DX,AL  
INC SI  
LOOP Init_1  
RET  
Enter_Configuration_Mode ENDP
```

```
Exit_Configuration_Mode PROC NEAR  
MOV AX,0202h  
CALL Write_Configuration_Data
```

RET

Exit_Configuration_Mode ENDP

Check_Chip PROC NEAR

MOV AL,20h

CALL Read_Configuration_Data

CMP AL,87h

JNE Not_Initial

MOV AL,21h

CALL Read_Configuration_Data

CMP AL,12h

JNE Not_Initial

Need_Initial:

STC

RET

Not_Initial:

CLC

RET

Check_Chip ENDP

Read_Configuration_Data PROC NEAR

MOV DX,WORD PTR CS:[Cfg_Port+04h]

OUT DX,AL

```
MOV DX,WORD PTR CS:[Cfg_Port+06h]
IN AL,DX
RET
Read_Configuration_Data ENDP
```

```
Write_Configuration_Data PROC NEAR
MOV DX,WORD PTR CS:[Cfg_Port+04h]
OUT DX,AL
XCHG AL,AH
MOV DX,WORD PTR CS:[Cfg_Port+06h]
OUT DX,AL
RET
Write_Configuration_Data ENDP
```

```
Superio_Set_Reg proc near
push ax
MOV DX,WORD PTR CS:[Cfg_Port+04h]
mov al,cl
out dx,al
pop ax
inc dx
out dx,al
ret
Superio_Set_Reg endp.Set_Logic_Device proc near
Set_Logic_Device proc near
```

```
push ax
push cx
xchg al,cl
mov cl,07h
call Superio_Set_Reg
pop cx
pop ax
ret
Set_Logic_Device endp
```

```
;Select 02Eh->Index Port, 02Fh->Data Port
Cfg_Port DB 087h,001h,055h,055h
```

```
DW 02Eh,02Fh
```

END Main

Note: Interrupt level mapping

0Fh-Dh: not valid

0Ch: IRQ12

.

.

03h: IRQ3

02h: not valid

01h: IRQ1

00h: no interrupt selected

Appendix

B

I/O Information

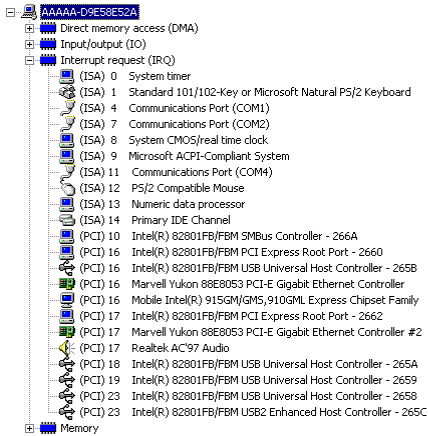
B.1 I/O Address Map

Address Range	Device Name
AAAA-D9E8E32A	Direct memory access (DMA)
	Input/output (I/O)
[00000000 - 0000000F]	Direct memory access controller
[00000000 - 00000CF7]	PCI bus
[00000010 - 0000001F]	Motherboard resources
[00000020 - 00000021]	Programmable interrupt controller
[00000022 - 0000003F]	Motherboard resources
[00000040 - 00000043]	System timer
[00000044 - 0000005F]	Motherboard resources
[00000060 - 00000060]	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
[00000061 - 00000061]	System speaker
[00000062 - 00000063]	Motherboard resources
[00000064 - 00000064]	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
[00000065 - 0000006F]	Motherboard resources
[00000070 - 00000073]	System CMOS/real time clock
[00000074 - 0000007F]	Motherboard resources
[00000080 - 00000090]	Direct memory access controller
[00000091 - 00000093]	Motherboard resources
[00000094 - 0000009F]	Direct memory access controller
[000000A0 - 000000A1]	Programmable interrupt controller
[000000A2 - 000000BF]	Motherboard resources
[000000C0 - 000000CF]	Direct memory access controller
[000000E0 - 000000EF]	Motherboard resources
[000000F0 - 000000FF]	Numeric data processor
[000001F0 - 000001F7]	Primary IDE Channel
[00000274 - 00000277]	ISA/PNP Read Data Port
[00000279 - 00000279]	ISA/PNP Read Data Port
[00000290 - 0000029F]	Motherboard resources
[00000295 - 00000314]	Motherboard resources
[000002F8 - 000002FF]	Communications Port (COM4)
[00000378 - 0000037F]	Printer Port (LPT1)
[000003B0 - 000003BB]	Mobile Intel(R) 915GM/GMS,910GML Express Chipset Family
[000003C0 - 000003DF]	Mobile Intel(R) 915GM/GMS,910GML Express Chipset Family
[000003E8 - 000003EF]	Communications Port (COM2)
[000003F6 - 000003F6]	Primary IDE Channel
[000003F8 - 000003FF]	Communications Port (COM1)
[00000400 - 000004BF]	Motherboard resources
[000004D0 - 000004D1]	Motherboard resources
[00000500 - 0000051F]	Intel(R) 82801FB/FBM SMBus Controller - 266A
[00000880 - 0000088F]	Motherboard resources
[00000A79 - 00000A79]	ISA/PNP Read Data Port
[00000D00 - 0000FFFF]	PCI bus
[0000B000 - 0000B0FF]	Marvell Yukon 88E8053 PCI-E Gigabit Ethernet Controller
[0000B000 - 0000BFFF]	Intel(R) 82801FB/FBM PCI Express Root Port - 2660
[0000C000 - 0000C0FF]	Marvell Yukon 88E8053 PCI-E Gigabit Ethernet Controller #2
[0000C000 - 0000CFFF]	Intel(R) 82801FB/FBM PCI Express Root Port - 2662
[0000D000 - 0000D0FF]	Realtek AC'97 Audio
[0000D800 - 0000D81F]	Intel(R) 82801FB/FBM USB Universal Host Controller - 2659
[0000D900 - 0000D91F]	Intel(R) 82801FB/FBM USB Universal Host Controller - 265A
[0000DA00 - 0000DA1F]	Intel(R) 82801FB/FBM USB Universal Host Controller - 2658
[0000DB00 - 0000DB07]	Mobile Intel(R) 915GM/GMS,910GML Express Chipset Family
[0000DC00 - 0000DC3F]	Realtek AC'97 Audio
[0000DD00 - 0000DD1F]	Intel(R) 82801FB/FBM USB Universal Host Controller - 2658
[0000F000 - 0000F00F]	Intel(R) 82801FBM Ultra ATA Storage Controllers - 2653

B.2 Memory Address Map

Address Range	Device
[00000000 - 0009FFFF]	System board
[000A0000 - 000BFFFF]	Mobile Intel(R) 915GM/GMS,910GML Express Chipset Family
[000A0000 - 000BFFFF]	PCI bus
[000C0000 - 000DFFFF]	PCI bus
[000D3800 - 000D3FFF]	System board
[000E0000 - 000EFFFF]	System board
[000F0000 - 000F7FFF]	System board
[000F8000 - 000FBFFF]	System board
[000FC000 - 000FFFFF]	System board
[00100000 - 1F7FFFFF]	System board
[1F7F0000 - 1F7FFFFF]	System board
[1F800000 - FEBFFFFF]	PCI bus
[C0000000 - CFFFFFFF]	Mobile Intel(R) 915GM/GMS,910GML Express Chipset Family
[D0000000 - D00FFFFF]	Intel(R) 82801FB/FBM PCI Express Root Port - 2660
[D0020000 - D0023FFF]	Marvell Yukon 88E8053 PCI-E Gigabit Ethernet Controller
[D0100000 - D01FFFFF]	Intel(R) 82801FB/FBM PCI Express Root Port - 2662
[D0120000 - D0123FFF]	Marvell Yukon 88E8053 PCI-E Gigabit Ethernet Controller #2
[D0200000 - D027FFFF]	Mobile Intel(R) 915GM/GMS,910GML Express Chipset Family
[D0280000 - D02FFFFF]	Mobile Intel(R) 915GM/GMS,910GML Express Chipset Family
[D0300000 - D033FFFF]	Mobile Intel(R) 915GM/GMS,910GML Express Chipset Family
[D0340000 - D03403FF]	Intel(R) 82801FB/FBM USB2 Enhanced Host Controller - 265C
[D0341000 - D03411FF]	Realtek AC'97 Audio
[D0342000 - D03420FF]	Realtek AC'97 Audio
[E0000000 - EFFFFFFF]	Motherboard resources
[FEC00000 - FEC00FFF]	System board
[FED13000 - FED10FFF]	System board
[FED20000 - FED8FFFF]	System board
[FEE00000 - FEE00FFF]	System board
[FFB00000 - FFB7FFFF]	System board
[FFB80000 - FFB7FFFF]	Intel(r) 82802 Firmware Hub Device
[FFF00000 - FFFFFFFF]	System board

B.3 IRQ Mapping Chart



B.4 DMA Channel Assignments

