PCM-5895 Rev.B

Onboard AMD Geode LX 800/900 Processor

Up to 24-bit LVDS LCD

184-pin DDR 333/400 Memory Up to 1GB

4 USB 2.0 / 8-bit Digital I/O / 4 COM

PCM-5895 Manual Rev.B 1st Ed.
Aug. 2008

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Packing List

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

- 1 PCM-5895 Rev.B CPU Card
- 1 Quick Installation Guide
- 1 CD-ROM for manual (in PDF format) and drivers
- 1 9657666600 Jumper Cap

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

Contents

Chapter

1

General Information

1.1 Introduction

PCM-5895 Rev.B adopts an onboard AMD Geode LX 800/900 processor. The AMD LX series processors are ideal for applications that require low power consumption and stable performance. The system memory features 184-pin DDR DIMM up to 1GB. Moreover, the PCM-5895 Rev.B supports PCI, PCI-104 and PC/104 for flexible expansion. Customers are always eager to find a low-priced, multi-functional product. The PCM-5895 Rev.B is definitely your best choice.

Regarding the multimedia performance of PCM-5895 Rev.B, it features CRT/LCD simultaneous display. The LVDS/TTL TFT LCD is up to 24-bit and the rich audio I/O interface that PCM-5895 Rev.B possesses supports MIC-in, Line-in, Line-out and CD-in functions. In addition, PCM-5895 Rev.B deploys 4 COM ports--three RS-232 ports (COM3, 4 only support Tx, Rx) and one RS-232/422/485 port. Four USB2.0, 8-bit Digital I/O and IrDA ports make PCM-5895 Rev.B more flexible for the expansion of system device. Moreover, another key feature of PCM-5895 Rev.B is the two CANBus ports that are an optional feature to enrich device connections.

1.2 Features

- Onboard AMD Geode LX 800/900 Processor
- One DIMM DDR 333/400 up to 1GB
- Up to 24-bit LVDS TFT Panel, TTL/LVDS LCD, CRT
- Dual 10/100Base-TX Ethernet
- Supports PC/104+ Expansion Slot
- AC97 2CH Audio
- USB2.0 x 4/ COM x 4/ 8-bit Digital I/O/ IrDA
- Dual CAN Bus (Optional)

1.3 Specifications

System

● CPU	Onboard AMD Geode LX800 (900 optional) Processors
● System Memory	184-pin DDR DIMM x 1, Max. 1GB (DDR 333/400), optional onboard memory 256MB
● Chipset	AMD Geode LX + CS5536
● I/O Chipset	ITE IT8712 +IT8888G
● PCI to ISA Solution	ITE8888G
● Ethernet	Realtek RTL 8100C, 10/100Base-TX x 2, RJ-45 x 2
● BIOS	Award Plug & Play BIOS--1MB ROM
● Watchdog Timer	ITE IT8712 F/KX-L, Generates a time-out system reset
● H/W status monitoring	Supports power supply voltages and temperature monitoring functions
● SSD	One Type II Compact Flash slot
● Expansion Interface	PCI x 1, Optional PC/104+
● Battery	Lithium battery
● Operating Temperature	32°F~140°F (0°C~60°C)
● Power Requirement	ATX, optional AT

- Board Size: 8”(L) x 5.72” (W) (203mm x 146mm)
- Gross Weight: 1.2 lb (0.5 kg)

Display: Supports CRT/LCD Simultaneous display

- Chipset: AMD Geode LX800/900 integrated graphics
- Memory: Shared system memory up to 254MB
- Resolutions: Up to 1920x1440@24-bit for CRT; Up to 1600x1200@24bit for LCD
- LCD Interface: Up to 24-bit LVDS LCD

I/O

- Storage: PATA-100 x 1 (Supports two ATAPI devices); Type II CompactFlash
- Serial Port: RS-232 x 3 (COM3/4 only support Tx, Rx), RS-232/422/485 x 1
- Parallel Port: Supports SPP/ EPP/ ECP mode
- USB: USB2.0 x 4
- PS/2 Port: One PS/2 Keyboard and one PS/2 mouse support
- Digital I/O: 8-bit Digital I/O (Programmable)

● IrDA	One IrDA Tx/Rx header
● Audio	Realtek ALC203 2CH AC97 Codec, Mic-in/ Line-in/ Line-out/ CD-in
● CAN Bus	Optional dual CAN Bus

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.

Part No. 2007589520 Printed in Taiwan Aug. 2008

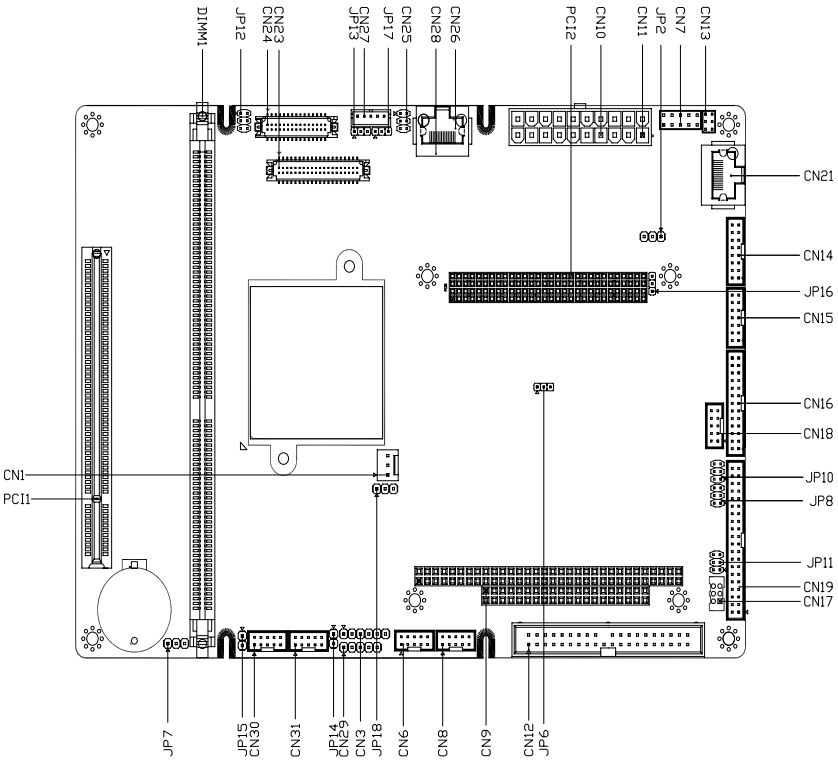
2.1 Safety Precautions

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.

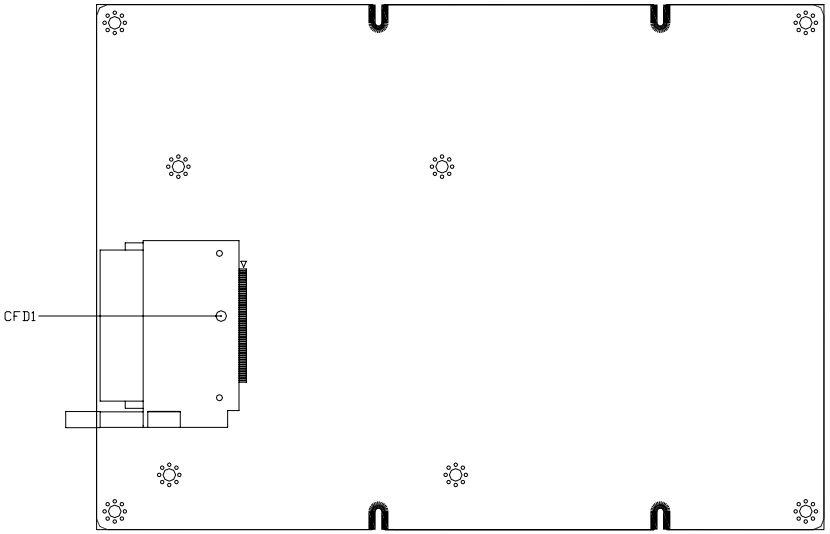
Always ground yourself to remove any static charge before touching the board. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not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

2.2 Location of Connectors and Jumpers

Component Side

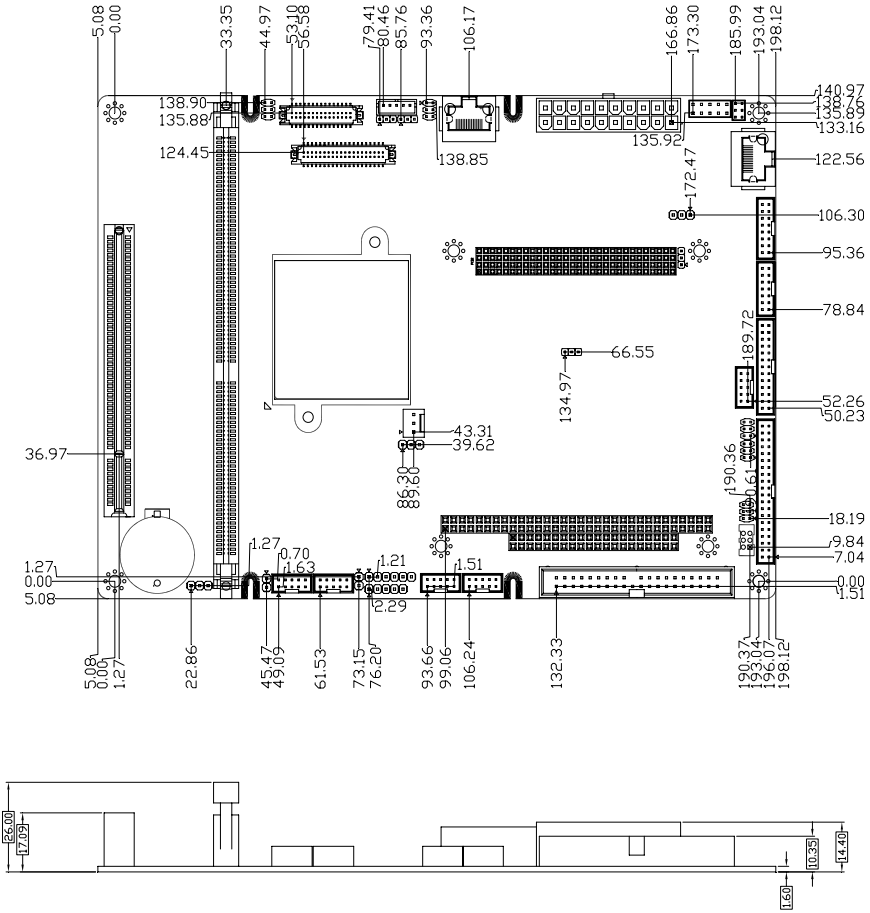


Solder Side

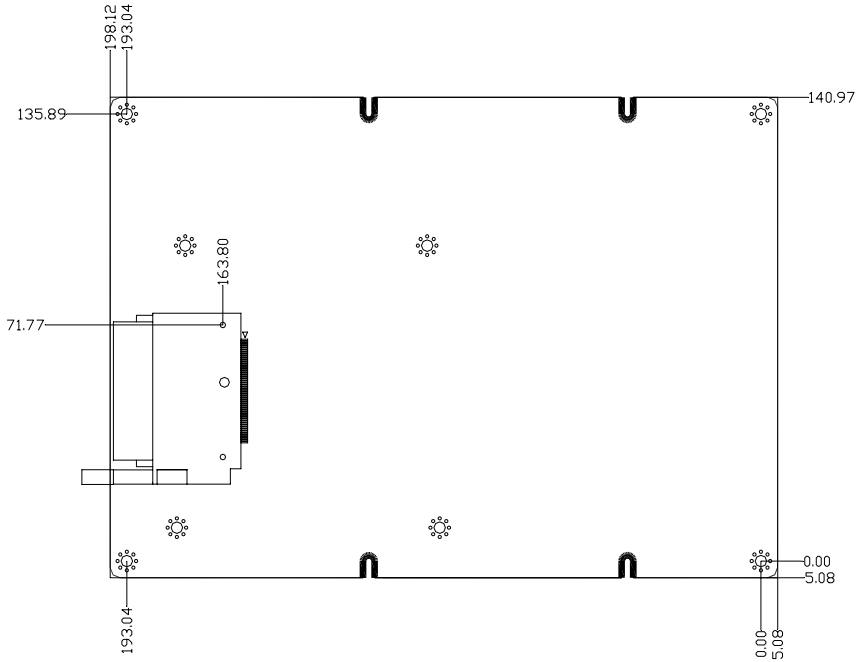


2.3 Mechanical Drawing

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	AT/ATX Power Type Selection
JP6	CFD Master/Slave Selection
JP7	Clear CMOS
JP8, JP10	COM Ports RI/+5V/+12V Selection
JP11	COM Ports +5V/+12V Selection
JP12	LCD Clock and Power Selection
JP13	Inverter Voltage Selection
JP14, JP15	CAN Bus Termination
JP16	PCI 104 Power Selection
JP17	Contrast IC Power Selection
JP18	Fan Control Circuit Power 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

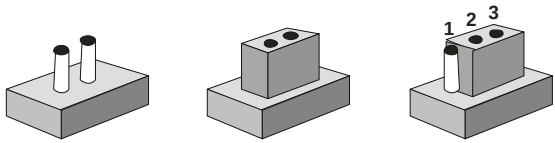
Label	Function
CN1	System FAN
CN3	CPLD JTAG
CN6	USB Port #1 and Port #2
CN7	Front Panel
CN8	USB Port #3 and Port #4
CN9	PC/104 / ISA Interface
CN10	ATX Power Socket
CN11	AT Power Socket
CN12	IDE Hard Drive
CN13	LAN1 LED
CN14	CRT Display
CN15	Audio Input/ Output/ CDin/ MIC
CN16	Parallel Port
CN17	KB/MS Connector
CN18	Digital I/O
CN19	Serial Port
CN21	Ethernet 10/100 Base-TX RJ-45 Phone Jack (LAN1)

CN23	TFT LCD Connector
CN24	LVDS Connector
CN25	LAN2 LED
CN26	Ethernet 10/100Base-TX RJ-45 Phone Jack (LAN1)
CN27	LCD Inverter Connector
CN28	Ethernet 10/100Base-TX RJ-45 Phone Jack (LAN2)
CN29	IrDA
CN30	CAN2 Connector
CN31	CAN1 Connector
CFD1	CompactFlash Disk
PCI1	PCI Slot
PCI2	PCI-104

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.



Open **Closed** **Closed 2-3**

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 AT/ATX Power Type Selection (JP2)

JP2	Function
2-3	ATX Power Supply (Default)
1-2	AT Power Supply

2.8 CFD Master/Slave Selection (JP6)

JP6	Function
1-2	Slave (Default)
2-3	Master

2.9 Clear CMOS (JP7)

JP7	Function
1-2	Normal (Default)
2-3	Clear CMOS

2.10 COM Ports RI/+5V/+12V Selection (JP8, JP10, JP11)

COM1

JP8	Function
1-2	+12V
3-4	+5V
5-6	RI (Default)

COM2

JP10	Function
1-2	+12V

3-4	+5V
5-6	RI (Default)

COM3, COM4

JP11	Function
1-3 2-4	+12V
3-5 4-6	+5V (Default)

2.11 LCD Power & Clock Selection (JP12)

JP12	Function
1-3	Normal (Default)
3-5	Inverse
2-4	+5Vlcd
4-6	+3Vlcd (Default)

2.12 Inverter Voltage Selection (JP13)

JP13	Function
1-2	+12V
2-3	+5V (Default)

2.13 Contrast IC Power Selection (JP17)

JP17	Function
1-2	+5V (Default)
2-3	+3.3V

2.14 Fan Control Circuit Power Selection (JP18)

JP18	Function
1-2	+12V (Default)
2-3	+5V

2.15 FAN Connector (CN1)

Pin	Signal
1	GND
2	+12V
3	FAN Sense

2.16 USB Port #1 and Port #2 (CN6)

Pin	Signal	Pin	Signal
1	VDD0	2	GND
3	D0-	4	GND
5	D0+	6	D1+
7	GND	8	D1-
9	GND	10	VDD1

2.17 Front Panel (CN7)

Pin	Signal
1-2	ATX Power-on Button
3-4	HDD Active LED
5-6	External Speaker

7-8	Power LED
9-10	System Reset Button

2.18 USB Port #3 & Port #4 (CN8)

Pin	Signal	Pin	Signal
1	VDD3	2	GND
3	D3-	4	GND
5	D3+	6	D4+
7	GND	8	D4-
9	GND	10	VDD4

2.19 PC/104 ISA Interface (CN9)

	J1/P1	
Pin	**A**	**B**
1	IOCHCK*	GND
2	D7	RSTDRV
3	D6	+5V
4	D5	IRQ9
5	D4	-5V
6	D3	DRQ2
7	D2	-12V
8	D1	ENDXFR*
9	D0	+12V
10	IOCHRDY	GND/KEY

11	AEN	SMEMW*
12	A19	SMEMR*
13	A18	IOW*
14	A17	IOR*
15	A16	DACK3*
16	A15	DRQ3
17	A14	DACK1*
18	A13	DRQ1
19	A12	REFRESH*
20	A11	SYSCLK
21	A10	IRQ7
22	A9	IRQ6
23	A8	IRQ5
24	A7	IRQ4
25	A6	IRQ3
26	A5	DACK2*
27	A4	TC
28	A3	BALE
29	A2	+5V
30	A1	OSC
31	A0	GND
32	GND	GND

	J2/P2	
Pin	**D**	**C**
1	GND	GND
2	MEMCS16*	SBHE*
3	IOCS16*	LA23
4	IRQ10	LA22
5	IRQ11	LA21
6	IRQ12	LA20
7	IRQ15	LA19
8	IRQ14	LA18
9	DACK0*	LA17
10	DRQ0	MEMR*
11	DACK5*	MEMW*
12	DRQ5	SD8
13	DACK6*	SD9
14	DRQ6	SD10
15	DACK7*	SD11
16	DRQ7	SD12
17	+5V	SD13
18	MASTER*	SD14
19	GND	SD15
20	GND	GND/KEY

PCM-5895 Rev.B does not support PC/104 way legacy ISA-DMA mode cause by AMD architecture.

I/O Resource Allocation Method of PC/104 card is for the PCM-5895 Rev.B.

PC/104 connector at the PCM-5895 Rev.B cannot automatically get related I/O resource when a new PC/104 card is added because of AMD Geode's architecture limitation. The following steps are for setting up the I/O resources manually for your reference.

1. Retrieve the resource of the PC/104 card. The information is typically contained in the manual of the PC/104 card.
2. Push a function key "Delete" to get into the BIOS
3. Enable the resource of the device in BIOS setup
4. Disable the resource of the device for which conflicts the resource of the device mentioned above in BIOS setup
5. Save above BIOS setup and restart the system
6. Install the driver in the operating system

Open your Control Panel (click Start, then pick Setting and Control Panel) Double click on the System icon and choose the Device Manager tab. Find the device of which you want to enable. Click the plus sign (+) next to the various categories click on the device you want to update, and then click on "Resource" and choose the resource that is the same as the hardware setup.

2.20 ATX Power Socket (CN10)

Pin	Signal	Pin	Signal
1	+3.3V	11	+3.3V
2	+3.3V	12	-12V
3	GND	13	GND
4	+5V	14	PS-ON
5	GND	15	GND
6	+5V	16	GND
7	GND	17	GND
8	NC	18	-5V

9	5VSB	19	+5V
10	+12V	20	+5V

2.21 AT Power Socket (CN11)

Pin	Signal
1	NC
2	+5V
3	+12V
4	-12V
5	GND
6	GND
7	GND
8	GND
9	-5V
10	+5V
11	+5V
12	+5V

2.22 IDE Hard Drive (CN12)

Pin	Signal	Pin	Signal
1	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	N/C
21	DREQ	22	GND
23	IOW#	24	GND
25	IOR#	26	GND
27	IORDY	28	GND
29	DACK#	30	GND
31	IRQ14	32	NC
33	DA1	34	PDIAG#
35	DA0	36	DA2
37	CS#1	38	CS#3
39	Active LED#	40	GND

2.23 CRT Display (CN14)

Pin	Signal	Pin	Signal
1	RED	2	+5V
3	GREEN	4	GND
5	BLUE	6	NC
7	NC	8	DDCSDA
9	GND	10	HSYNC

11	GND	12	VSYNC
13	GND	14	DDCSCL
15	GND	16	GND

2.24 Audio Input/ Output/ CD-in/ MIC (CN15)

Pin	Signal	Pin	Signal
1	MIC	2	MIC_VCC
3	Audio Ground	4	CD_GND
5	LINE_IN L	6	CD_L
7	LINE_IN R	8	CD_GND
9	Audio Ground	10	CD_R
11	LINE_OUT L	12	LINE_OUT R
13	Audio Ground	14	Audio Ground

2.25 Parallel Port (CN16)

Pin	Signal	Pin	Signal
1	STB#	2	AFD#
3	PTD0	4	ERR#
5	PTD1	6	PINIT#
7	PTD2	8	SLIN#
9	PTD3	10	GND
11	PTD4	12	GND
13	PTD5	14	GND
15	PTD6	16	GND

17	PTD7	18	GND
19	ACK#	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SLCT	26	NC

2.26 Keyboard/Mouse Connector (CN17)

Pin	Signal	Pin	Signal
1	Keyboard Data	2	Keyboard Clock
3	GND	4	+5V
5	Mouse Data	6	Mouse Clock

2.27 Digital I/O (CN18) (Mapping with GPIO pins of super I/O)

Pin	Signal	Pin	Signal
1	IN0	2	IN1
3	IN2	4	IN3
5	OUT0	6	OUT1
7	OUT2	8	OUT3
9	+5V	10	GND

DIO Address is 801H

BIOS Setting	Connector Definition	Address	IT8712 GPIO Setting
Port 1	CN18. pin 1	Bit 7	U40. pin 20 (GPIO27)
Port 2	CN18. pin 2	Bit 6	U40. pin 21 (GPIO26)
Port 3	CN18. pin 3	Bit 5	U40. pin 22 (GPIO25)

Port 4	CN18. pin 4	Bit 4	U40. pin 23 (GPIO24)
Port 5	CN18. pin 5	Bit 3	U40. pin 24 (GPIO23)
Port 6	CN18. pin 6	Bit 2	U40. pin 25 (GPIO22)
Port 7	CN18. pin 7	Bit 1	U40. pin 26 (GPIO21)
Port 8	CN18. pin 8	Bit 0	U40. pin 27 (GPIO20)

2.28 Serial Port (CN19)

Note: COM 1 & COM 2 support full modem control signals and COM 3 & COM 4 support TX & RX only.

COM/ RS-232 mode

Pin	Signal	Pin	Signal
1	DCD1	2	DSR1
3	RXD1	4	RTS1
5	TXD1	6	CTS1
7	DTR1	8	RI1/+5V/+12V
9	GND	10	NC
11	DCD2	12	DSR2
13	RXD2	14	RTS2
15	TXD2	16	CTS2
17	DTR2	18	RI2/+5V/+12V
19	GND	20	NC
21	NC	22	NC
23	RXD3	24	NC
25	TXD3	26	NC
27	NC	28	+5V/+12V

29	GND	30	NC
31	NC	32	NC
33	RXD4	34	NC
35	TXD4	36	NC
37	NC	38	+5V/+12V
39	GND	40	NC

COM/ RS-422 mode

Pin	Signal	Pin	Signal
11	TXD-	12	NC
13	RXD+	14	NC
15	TXD+	16	NC
17	RXD-	18	NC
19	GND	20	NC

COM/ RS-485 mode

Pin	Signal	Pin	Signal
11	TXD-	12	NC
13	NC	14	NC
15	TXD+	16	NC
17	NC	18	NC
19	GND	20	NC

2.29 Ethernet 10/100Base-TX RJ-45 Phone Jack (CN21, CN28)

Pin	Signal	Pin	Signal
1	TXD+	2	TXD-

3	RXD+	4	NC (N GND)
5	NC (N GND)	6	RXD-
7	NC (C GND)	8	NC (C GND)
9	GND	10	GND

2.30 LAN LED (CN13, CN25)

Pin	Signal	Pin	Signal
1	RX	2	+3.3V
3	LINK10/100	4	+3.3V
5	TX	6	+3.3V

2.31 TFT LCD (CN23)

For 24-bit TFT LCD

Pin	Signal	Pin	Signal
1	+5VLCD	2	+5VLCD
3	GND	4	GND
5	+3.3VLCD	6	+3.3VLCD
7	BKL_EN	8	GND
9	B0	10	B1
11	B2	12	B3
13	B4	14	B5
15	B6	16	B7
17	G0	18	G1
19	G2	20	G3
21	G4	22	G5

23	G6	24	G7
25	R0	26	R1
27	R2	28	R3
29	R4	30	R5
31	R6	32	R7
33	GND	34	GND
35	LCD_CLK	36	LCD_VS
37	LCD_DE	38	LCD_HS
39	NC	40	TP

For 18-bit TFT LCD

Pin	Signal	Pin	Signal
1	+5VLCD	2	+5VLCD
3	GND	4	GND
5	+3.3VLCD	6	+3.3VLCD
7	BKL_EN	8	GND
9	NC	10	NC
11	B0	12	B1
13	B2	14	B3
15	B4	16	B5
17	NC	18	NC
19	G0	20	G1
21	G2	22	G3
23	G4	24	G5
25	NC	26	NC

27	R0	28	R1
29	R2	30	R3
31	R4	32	R5
33	GND	34	GND
35	LCD_CLK	36	LCD_VS
37	LCD_DE	38	LCD_HS
39	NC	40	TP

2.32 LVDS (CN24)

Pin	Signal	Pin	Signal
1	BKL_EN	2	NC
3	VLCD	4	GND
5	LVDS_CLK#	6	LVDS_CLK
7	VLCD	8	GND
9	TX0#	10	TX0
11	TX1#	12	TX1
13	TX2#	14	TX2
15	TX3#	16	TX3
17	NC	18	NC
19	NC	20	NC
21	NC	22	NC
23	NC	24	NC
25	NC	26	NC
27	VLCD	28	GND

29	NC	30	NC

2.33 Ethernet 10/100Base-TX Connector (CN26)

Pin	Signal	Pin	Signal
1	RXD-	2	RXD+
3	NC (N GND)	4	NC (N GND)
5	GND	6	GND
7	NC (C GND)	8	NC (C GND)
9	TXD+	10	TXD-

2.34 LCD Inverter (CN27)

Pin	Signal	Pin	Signal
1	12V/5V	4	GND
2	VCON	5	BKL_EN
3	GND		

2.35 IrDA (CN29)

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

2.36 CAN Bus Connector (CN30, CN31)

Pin	Signal	Pin	Signal
1	NC	2	CAN_L
3	ISO_GND	4	NC
5	NC	6	NC
7	CAN_H	8	NC
9	NC	10	NC

2.37 CompactFlash Disk Slot (CFD1)

Pin	Signal	Pin	Signal
1	GND	26	GND
2	D3	27	D11
3	D4	28	D12
4	D5	29	D13
5	D6	30	D14
6	D7	31	D15
7	CS#0	32	CS#1
8	GND	33	GND
9	GND	34	IOR#
10	GND	35	IOW#
11	GND	36	+5V/+3.3V
12	GND	37	IRQ14
13	+5V/+3.3V	38	+5V/+3.3V

14	GND	39	CSEL#
15	GND	40	NC
16	GND	41	RESET#
17	GND	42	IORDY
18	DA2	43	DREQ
19	DA1	44	DACK#
20	DA0	45	DASP#
21	D0	46	PDIAG#
22	D1	47	D8
23	D2	48	D9
24	IO16#	49	D10
25	GND	50	GND

Note: There is a limitation when supports Compact Flash and a hard disk drive on the same IDE channel. Below information is from AMD.

Frequently Asked Question - FAQ.179
Question: Can the AMD Geode™ LX DB800 development board support Compact Flash and a hard disk drive on the same IDE channel?

Answer:
The AMD Geode™ LX DB800 development board has a Compact Flash (CF) socket and a 40-pin IDE header on the motherboard. The IDE header is typically used for a Hard Disk Drive (HDD) or some other IDE device. It is possible to use a configuration containing a CF and HDD, with certain restrictions and considerations.

An easy mistake is to have master and slave devices (HDD, CD-ROM, etc.) on the cable and CF on the motherboard. This does not work because it puts three devices on an interface architected for only two drives.

The cable should be carefully considered. It must connect PDIAG- between the HDD and CF.

The problem is related to the fact that one device is on the cable and the other is populated on the motherboard.

A 40-pin cable has PDIAG- available on all its connectors. Therefore, PDIAG- may be signaled from the cable-based HDD, through the motherboard, and to the CF (or vice versa).

Unfortunately, the higher UDMA modes cannot be supported on a 40-pin cable.

An 80-pin cable is typically marked with the specific connectors intended for motherboard and drives. The PDIAG- signal is allowed to travel between the two drives on the cable, but is not connected to the motherboard. Inside the cable's motherboard connector, the PDIAG- signal is disconnected from the two drives, and grounded for the motherboard. As a result, the PDIAG- signal cannot travel between the HDD (on the cable) and a CF (on the motherboard).

There are three options for supporting configurations with both HDD and CF:
1) Use a 40-pin cable. This solution limits the user to the lower UDMA speeds.
2) Abandon the CF socket on the LX DB800 baseboard and use a CF adapter that attaches directly to the 80-pin cable. This solution allows the HDD to operate at the higher UDMA speeds and also maintains support for the 80-pin cable detection.
3) Modify an 80-pin cable (or build a modified cable). Cutting off the host end of the 80-pin cable at the point where it attaches to the first drive connector allows the PDIAG- signal to pass from the HDD to the CF socket. This also removes the hardware support for detecting the presence of the 80-pin cable, and requires the BIOS be modified so that 80-pin support is the default.

2.38 PCI-104 Slot (PCI1)

Standard Specification

2.39 PCI-104 Slot (PCI2)

Standard Specification

Below Table for China RoHS Requirements

产品中有毒有害物质或元素名称及含量

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	×	○	○	○	○	○

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。

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。

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。

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-5895 Rev.B 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 <Del> 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.

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.

Chapter 4

Driver Installation

4.1 Software Drivers

This chapter describes the operation and installation of the display drivers supplied on the Supporting CD-ROM that are shipped with your product. The onboard VGA adapter is based on the AMD LX VGA Flat Panel/CRT controller. This controller offers a large set of extended functions and higher resolutions. The purpose of the enclosed software drivers is to take advantage of the extended features of the AMD LX VGA Flat Panel/CRT controller.

Hardware Configuration

Some of the high-resolution drivers provided in this package will work only in certain system configurations. If a driver does not display correctly, try the following:

1. Change the display controller to CRT-only mode, rather than flat panel or simultaneous display mode. Some high-resolution drivers will display correctly only in CRT mode.

2. If a high-resolution mode does not support your system, try to use a lower-resolution mode. For example, 1024 x 768 mode will not work on some systems, but 800 x 600 mode supports the most.

4.2 Necessary to Know

The instructions in this manual assume that you understand elementary concepts of MS-DOS and the IBM Personal Computer. Before you attempt to install any driver from the *Supporting CD-RO*M, you should:

- Know how to copy files from a CD-ROM to a directory on the hard disk
- Understand the MS-DOS directory structure

  If you are uncertain about any of these concepts, please refer to the DOS or OS/2 user reference guides for more information before you proceed with the installation.

Before you begin

The Supporting CD-ROM contains different drivers for corresponding Windows OS, please choose the specific driver for your Windows OS.

4.3 Installing VGA Driver

Win XP / Win XPe VGA

Place the Driver CD-ROM into your CD-ROM drive and follow the steps below to install.

1. Click on **Start** button
2. Click on **Settings** button
3. Click on **Control Panel** button
4. Click on **System** button
5. Select **Hardware** and click on **Device Manager…**
6. Double click on **Video Controller (VGA Compatible)**
7. Click on **Update Driver…**
8. Click on **Next**
9. Select **Search for a suitable driver…**, then click on **Next**
10. Select **Specify a location**, then click on **Next**
11. Click on **Browse**
12. Select "l**x_win"** file from CD-ROM **(Driver/Step 1 – LX_Graphics)** then click on **Open**
13. Click on **OK**
14. Click on **Next**
15. Click on **Yes**
16. Click on **Finish**

Note: The user must install this system driver before install other device drivers.

4.4 Installing AES Driver

Win XP / Win XPe AES

Place the Driver CD-ROM into your CD-ROM drive and follow the steps below to install.

1. Click on **Start** button
2. Click on **Settings** button
3. Click on **Control Panel** button
4. Click on **System** button
5. Select **Hardware** and click on **Device Manager…**
6. Double click on **Entertainment Encryption/Decryption Controller**
7. Click on **Update Driver…**
8. Click on **Next**
9. Select **Search for a suitable driver…**, then click on **Next**
10. Select **Specify a location**, then click on **Next**
11. Click on **Browse**
12. Select **"LXAES"** file from CD-ROM **(Driver/Step 2 – AES)** then click on **Open**
13. Click on **OK**
14. Click on **Next**
15. Click on **Finish**

4.5 Installing PCI to ISA Bridge Driver

Win XP / Win XPe System

Place the Driver CD-ROM into your CD-ROM drive and follow the following steps to install.

1. Click on **Start** button
2. Click on **Settings** button
3. Click on **Control Panel** button
4. Click on **System** button
5. Select **Hardware** and click on **Device Manager…**
6. Double click on **Other PCI Bridge Device**
7. Click on **Update Driver…**
8. Click on **Next**
9. Select **Search for a suitable driver…**, then click on **Next**.
10. Select **Specify a location**, then click on **Next**
11. Click on **Browse**
12. Select "**Ite**" file from CD-ROM **(Driver/Step 3- PCI to ISA Bridge)** then click on **open**
13. Click on **OK**
14. Click on **Next**
15. Click on **Finish**

4.6 Installing LAN Driver

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

4.7 Ethernet Software Configuration

The onboard Ethernet interface supports all major network operating systems. I/O addresses and interrupts are easily configured via the Insyde BIOS Setup. To configure the medium type, to view the current configuration, or to run diagnostics, please refer to the following instruction:

1. Power the main board on. Ensure that the RSET8139.EXE file is located in the working drive.
2. At the prompt, type RSET8139.EXE and press <ENTER>. The Ethernet configuration program will then be displayed.
3. This simple screen shows all the available options for the Ethernet interface. Just highlight the option you wish to change by using the Up and DOWN keys. To change a selected item, press <ENTER>, and a screen will appear with the available options. Highlight your option and press <ENTER>. Each highlighted option has a helpful message guide displayed at the bottom of the screen for additional

information.

4. After you have made your selections and the configuration is what you want, press <ESC>. A prompt will appear asking if you want to save the configuration. Press "Y" if you want to save.

There are three very useful diagnostic functions offered in the Ethernet Setup Menu as follows:

1. Run EEPROM test
2. Run Diagnostics on Board
3. Run Diagnostics on Network

Each option has its own display screen, which shows the format and result of any diagnostic tests undertaken.

4.8 Installing Audio Driver

Win XP / Win XPe Audio

Place the Driver CD-ROM into your CD-ROM drive and follow the steps below to install.

1. Click on **Start** button
2. Click on **Settings** button
3. Click on **Control Panel** button
4. Click on **System** button
5. Select **Hardware** and click on **Device Manager…**
6. Double click on **Multimedia Audio Controller**
7. Click on **Update Driver…**

8. Click on **Next**
9. Select **Search for a suitable driver…**, then click on **Next**
10. Select **Specify a location**, then click on **Next**
11. Click on **Browse**
12. Select **"LXWDMAU"** file from CD-ROM **(Driver/Step 5 – Audio)** then click on **Open**
13. Click on **OK**
14. Click on **Next**
15. Click on **Yes**
16. Click on **Finish**

4.9 Installing CAN Bus Driver

1. Click on the ***Step 6 –CAN bus*** folder and select the ***XP*** folder
2. Double click on the ***canbus.*exe**
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

Appendix A

Programming the Watchdog Timer

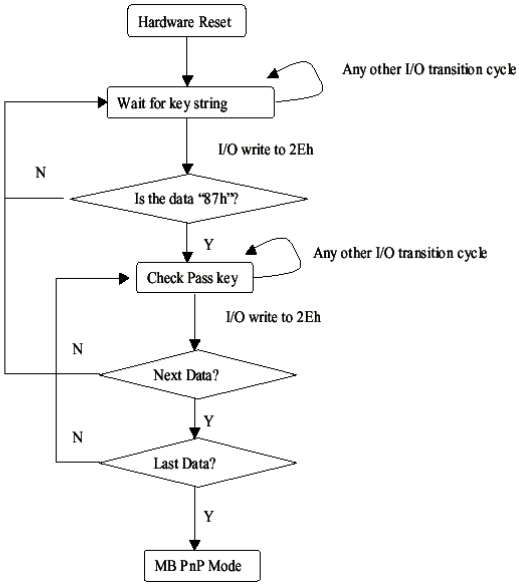
A.1 Programming

PCM-5895 Rev.B utilizes ITE 8712 chipset as its watchdog timer controller. (K version)

Below are the procedures to complete its configuration and the intial 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.



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 opera-tions 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	Configuration 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 (LSB) Register
07H	74H	R/W	00H	WatchDog Timer Time-out Value (MSB) 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	WDT Time-out value Extra select 1: 4s. 0: Determine by WDT Time-out value select (bit7 of this register)
4	WDT output through PWROK1/PWROK2 (pulse) enable
3	Select the interrupt level[note] for WDT

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

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

WatchDog Timer Time-out Value (MSB) Register (Index=74h, Default=00h)

Bit	Description
7-0	WDT Time-out value 15-8

A.2 ITE8712 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	Description	User Address
000-01F	DMA Controller #1	000-000F
020-03F	Interrupt Controller #1, Master	020-021
040-05F	System Time	040-043
060-06F	8042 (Keyboard Controller)	060-064
070-07F	Real time Clock, NMI (non-maskable Interrupt) Mask	070-073
080-09F	DMA Page Register	080-08F
0A0-0BF	Interrupt Controller #2	0A0-0A1
0C0-0DF	DMA Controller #2	0C0-0DF
0F0-0FF	Math Coprpcessor	0F0-0FF
1F0-1F7	Primary IDE Channel	1F0-1F7
2E8-2EF	Serial Port 4	2E8-2EF
2F8-2FF	Serial Port 2	2F8-2FF
378-37F	Parallel Printer Port 1	378-37F
3B0-3DF	EGA / VGA card	3B0-3DF
3E8-3EF	Serial Port 3	3E8-3EF
3F8-3FF	Serial Port 1	3F8-3FF

B.2 1st MB Memory Address Map

Memory Address	Description
00000-9FFFF	System memory
A0000-BFFFF	VGA buffer
C0000-CBFFF	VGA BIOS
E0000-FFFFF	System BIOS

B.3 IRQ Mapping Chart

IRQ0	System Timer	IRQ8	System CMOS / Real time clock
IRQ1	Keyboard	IRQ9	Microsoft ACPI – Compliant system
IRQ2	Cascade to IRQ Controller	IRQ10	COM3
IRQ3	COM2	IRQ11	COM4
IRQ4	COM1	IRQ12	PS/2 mouse
IRQ5	Unused	IRQ13	FPU
IRQ6	Floppy	IRQ14	Primary IDE
IRQ7	Printer	IRQ15	Reserved

B.4 DMA Channel Assignments

DMA Channel	Function
0	Available
1	Available
2	Floppy
3	Available

Appendix C

Mating Connecotor

C.1 List of Mating Connectors and Cables

The table notes mating connectors and available cables.

Connector Label	Function	Mating Connector		Available Cable	Cable P/N
		Vendor	Model no		
CN1	System FAN	Catch	【2.54mm】1190-700-03S		
CN6	USB Port #1 and Port #2	Catch	【2.0mm】1147-000-10-SS	USB Cable	1709100201
CN7	Front Panel	Catch	【2.54mm】1130-010-10S		
CN8	USB Port #3 and Port #4	Catch	【2.0mm】1147-000-10-SS	USB Cable	1709100201
CN9	PC-104 / ISA Interface	Catch	【3.40mm】1232-251-40 1147-000-10-SS		
CN9	PC-104 / ISA Interface	Catch	【3.40mm】1232-251-64		
CN10	ATX Power Socket	Catch	【3.50mm】1121-700-20S		
CN11(Option)	AT Power Socket	Ho-Base	【3.96mm】401-12T		
CN12	IDE Hard Drive	Catch	【2.54mm】1137-020-40SA	IDE Cable	1701400453
CN13	LAN1 LED	Catch	【2.0mm】1140-010-06S		
CN14	CRT Display	Astron	【2.0mm】26-4101-208-1G-R	CRT Cable	1701160201
CN15	Audio Input/Output/CDin/MIC	Astron	【2.0mm】26-4101-207-1G-R	Audio Cable	1700140510

CN16	Parallel Port	Astron	【2.0mm】 26-4101-213-1G-R	Parallel Port Cable	1701260200
CN17	KB/MS Connector	Ho-Base	【2.0mm】 2005-2WS-6	Keyboard & Mouse Cable	1700060152
CN18	Digital I/O	Catch	【2.0mm】 1147-000-10-SS		
CN19	Serial Port	Astron	【2.0mm】 26-4101-220-1G-R	Serial Port Cable	1701401800
CN23	TFT LCD Connector	E-Call	【1.25mm】 0110-01-553-400		
CN24	LVDS Connector	E-Call	【1.25mm】 0110-01-553-300		
CN25	LAN2 LED	Catch	【2.0mm】 1140-010-06S		
CN27	LCD Inverter Connector	Catch	【2.0mm】 1192-700-05S		
CN29	IrDA	JIH VEI	【2.54mm】 21B12564-05S10 B-01G-6/3		
CN30	CAN2 BUS	Catch	【2.0mm】 1147-000-10-SS	CAN Cable	1701100206 (Male) 170110020A (Female)
CN31	CAN1 BUS	Catch	【2.0mm】 1147-000-10-SS	CAN Cable	1701100206 (Male) 170110020A (Female)