

EPIC-9457 Rev.A

Intel® Atom™ N270 Processor

DDR2 400/533 Memory

Up to 24-bit Dual-channel LVDS LCD

6 USB 2.0 / 4 COMs / 1 EIDE/

2 SATAII/ 1 CompactFlash/ 1 Digital I/O

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Packing List

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

- 9681945700 Cable Kit
- 1709070500 SATA Cable
- 1700060152 KB/Mouse Cable
- 9657666600 Jumper Cap
- Quick Installation Guide
- Utility CD
- EPIC-9457 Rev.A w/Heatsink

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 EPIC-9457 Rev.A has been designed to fit in diverse applications that demand for fitting in different space limitations and high performance.

EPIC-9457 Rev.A accommodates onboard Intel® Atom™ N270 Processor 1.6 GHz and the Front Side Bus is 400/533MHz. This model features DDR2 400/533 and system memory is up to 2GB. Moreover, EPIC-9457 Rev.A adopts Intel® 945GSE + ICH7M.

In addition, EPIC-9457 Rev.A deploys Intel® 82574L chip and features two RJ-45 ports onboard to display the transcendent performance of network connections. This new EPIC Express Board configures an Intel® 945GSE display chipset to support CRT/LCD simultaneous/ dual view displays.

In addition to the PC/104-Express expansion, EPIC-9457 Rev.A also features one EIDE, two SATA, one Type II CompactFlash for the storage and six USB 2.0 ports, four COM ports, 8-bit Digital I/O for flexible I/O expansion. EPIC-9457 Rev.A is an excellent choice for your vital applications.

1.2 Features

- Intel[®] Atom™ N270 Processor
- Intel[®] 945GSE + ICH7M
- DDR2 400/533 Memory, Max. 2GB
- Gigabit Ethernet x 2
- CRT, DVI or 24-bit Dual-channel LVDS LCD, TV
- AC97 2.0 Codec 2CH Audio
- USB2.0 x 6, COM x 4, 8-bit Digital I/O
- EIDE x 1, SATA x 2, CompactFlash™ x 1
- PCI/104-Express Expansion Connectors
- Wide DC Voltage Input: +12V ~ +19V
- Touch Screen Controller

1.3 Specifications

System

- Form Factor EPIC Express Board
- Processor Onboard Intel[®] Atom™ N270
Processor 1.6GHz, FSB:
400/533MHz
- System Memory 200-pin DDR2 SODIMM x1, Max.
2GB (DDR2 400/533)
- Chipset Intel[®] 945GSE + ICH7M
- I/O Chipset ITE8781
- Ethernet Intel[®] 82574L for 10/100/1000
Base-TX, RJ-45 x 2
- BIOS Award Plug & Play SPI BIOS –
2MB Flash
- Wake On LAN Yes
- Watchdog Timer Generates a time-out system reset
- H/W Status Monitoring Supports power supply voltages
and temperature monitoring
- Expansion Interface PCI/104-Express Expansion
(PCI-104 + PCIe/104)
connectors
- Battery Lithium battery
- Power Requirement +12V ~ +19V
(Typical)

- Board Size 4.5" x 6.5" (115mm x 165mm)
- Gross Weight 1.1 lb (0.5KG)
- Operation Temperature 32°F ~ 140°F (0°C ~ 60°C) or
-4°F ~ 158°F (-20°C ~ 70°C) for
WiTAS1
- Storage Temperature -40°F ~ 176°F (-40°C ~ 80°C)
- Operation Humidity 0% ~ 90% relative humidity,
non-condensing

**Display: Supports CRT/LCD simultaneous/ dual view
displays**

- Chipset Intel[®] 945GSE integrated
- Memory Shared system memory up to
224MB with DVMT3.0
- Resolutions Up to 1920x1440 colors for CRT,
Up to 1600x1200 @ 24bpp
colors for LCD
- LCD Interface 18-bit or 24-bit dual-channel
LVDS
- TV-out Supports NTSC & PAL Standard
S-terminal and Composite video
- DVI DVI-I x 1

I/O

- Storage EIDEx1 (UDMA-100 for two
devices), SATA x 2,

- Serial Port CompactFlash™ x 1
RS-232 x 3, RS-232/422/485 x 1
- Parallel Port SPP/EPP/ECP Mode
- USB USB2.0 x 6
- PS/2 Port Keyboard+Mouse x 1
- Digital I/O Supports 8-bit (programmable)
- Audio Line-in, Line-out, Mic-in & CD-in
- Touch Screen Supports 4/5/8-wire resistive touch screen

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!

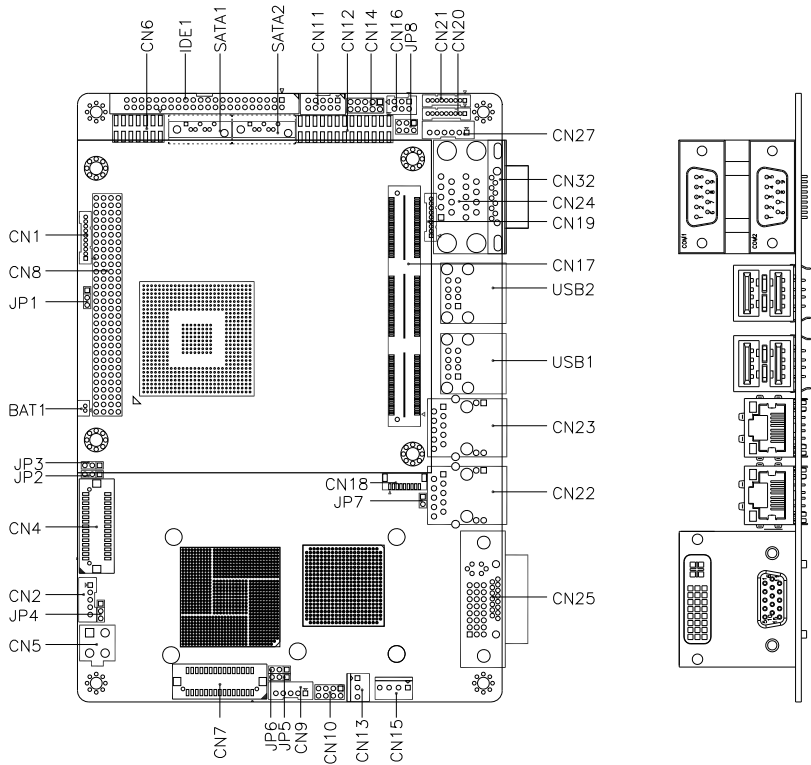
Always completely disconnect the power cord from your board whenever you are working on it. Do not make connections while the power is on, because a sudden rush of power can damage sensitive electronic components.

Caution!

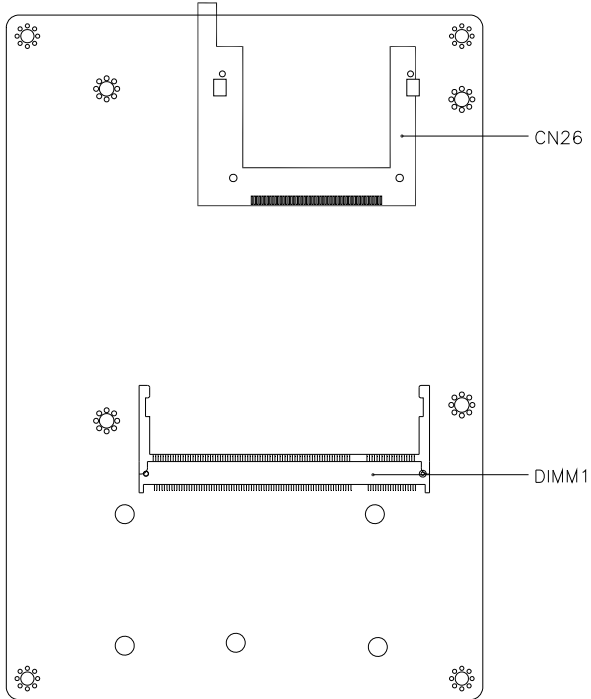
Always ground yourself to remove any static charge before touching the board. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not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

2.2 Location of Connectors and Jumpers

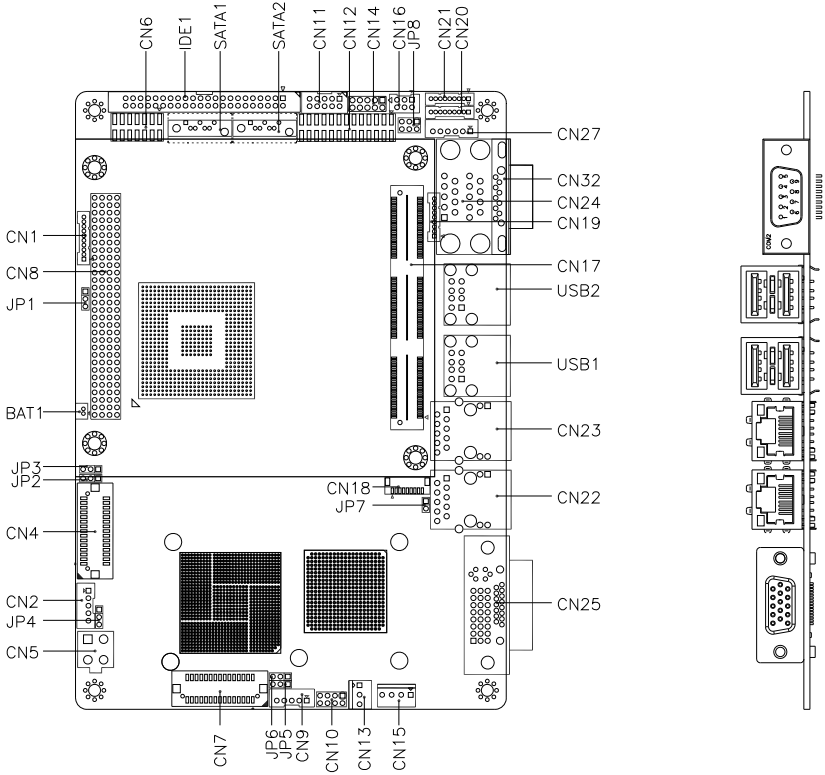
Component Side (2 COM ports)



Solder Side

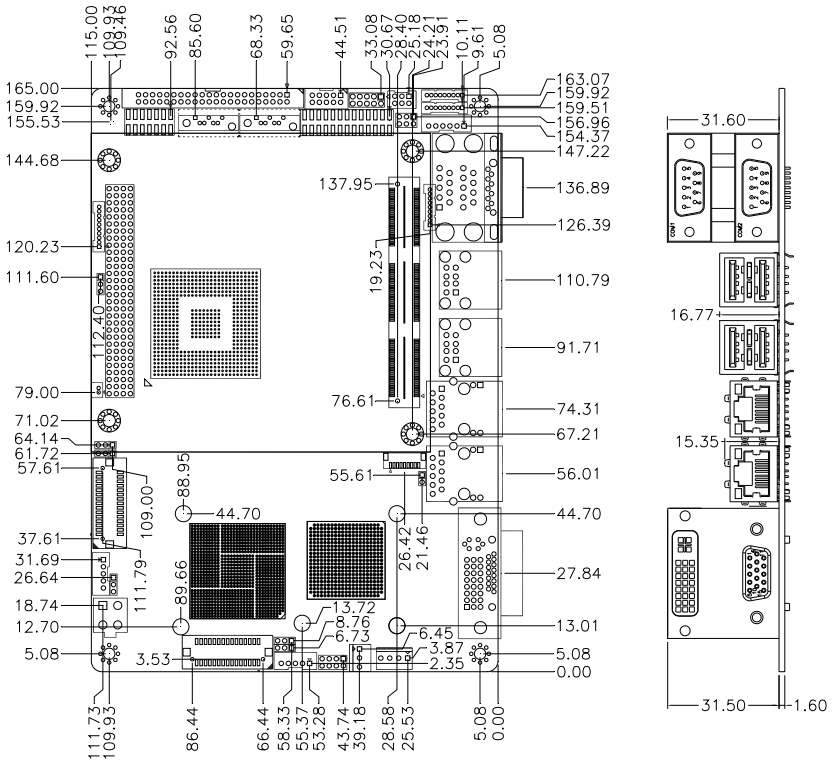


Component Side (1 COM port)

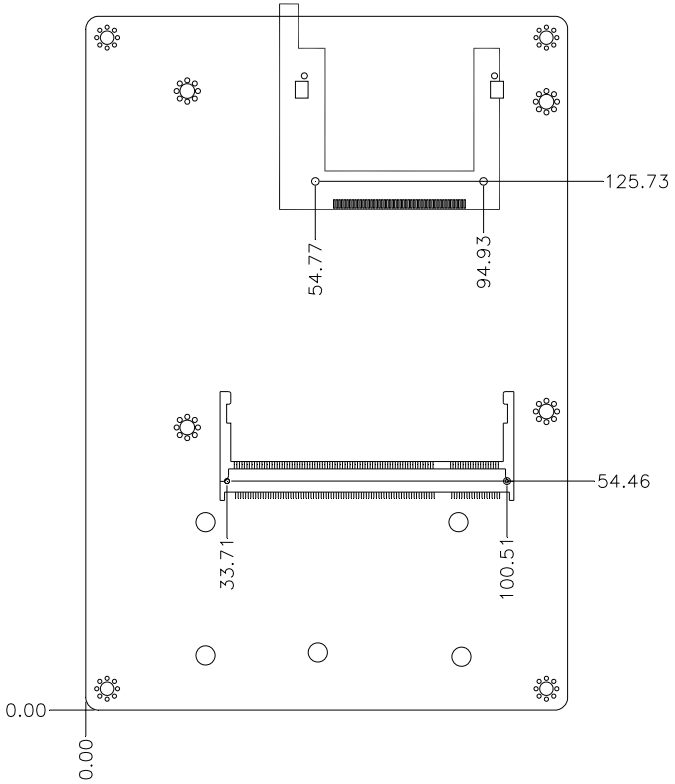


2.3 Mechanical Drawing

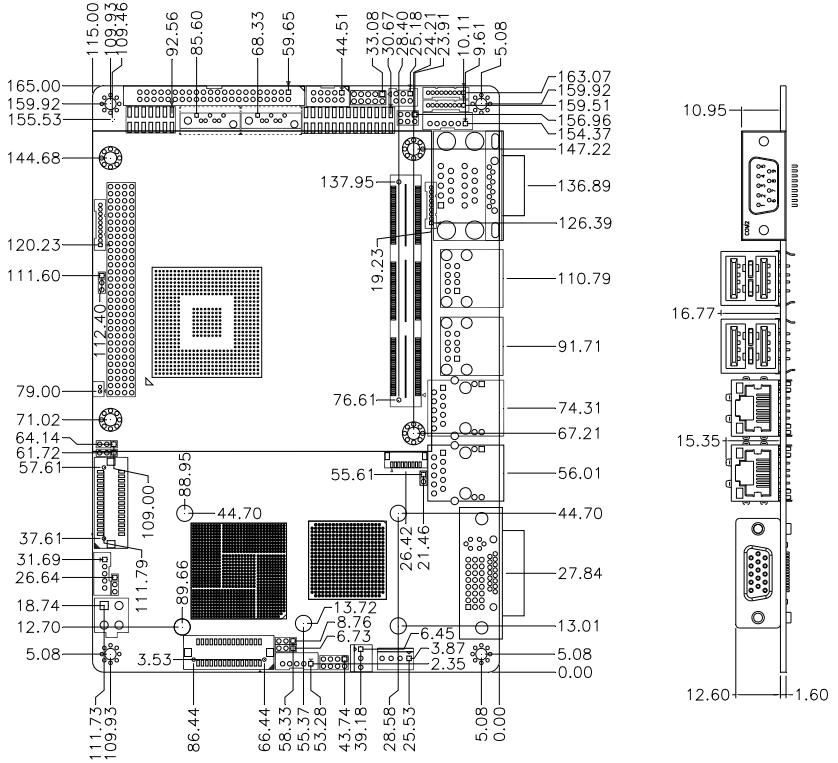
Component Side (2 COM ports)



Solder Side



Component Side (1 COM port)



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
JP1	VIO Voltage Selection
JP2	24-bit LVDS Operating Voltage Selection
JP3	Clear CMOS
JP4	24-bit LCD Inverter power select
JP5	18-bit LVDS Operating Voltage Selection
JP6	18-bit LVDS Inverter power select
JP7	Touch Screen 4,5,8 Wire Selection
JP8	COM2 Ring/+5V/+12V Selection
S1	AT/ATX 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

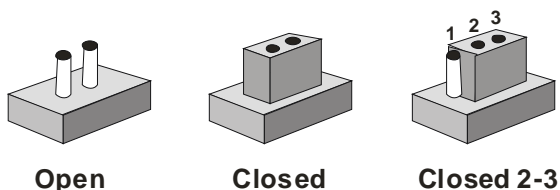
Label	Function
CN1	Front Panel Connector
CN2	24-bit Inverter Power Connector
CN4	24-bit LVDS Connector
CN5	Wide Voltage Power Connector
CN6	Audio Connector
CN7	18-bit LVDS Connector
CN8	PCI-104 Connector
CN9	18-bit Inverter power Connector
CN10	TV-out Connector
CN11	USB5, USB6 Connectors
CN12	LPT port Connector
CN13	System Fan Connector
CN14	Digital I/O Connector
CN15	Power Output Connector
CN16	PS2 Keyboard/Mouse Connector
CN17	PCI-Express Connector
CN18	Touch Screen Connector
CN19	Co-lay COM1 Connector
CN20	COM3 Connector

CN21	COM4 Connector
CN22, CN23	GIGA Ethernet Connector
CN24	COM1, COM2 Connector
CN25	VGA + DVI Display Connector
CN26	Compact Flash Disk Connector
CN27	Stand by power output Connector
CN28	Onboard BIOS Programming I/F
CN32	Co-lay COM2 Connector
DIMM1	DDR II SODIMM Connector
IDE1	Primary EIDE Connector
SATA1, SATA2	SATA Connector
USB1	USB1, USB2 Connectors
USB2	USB3, USB4 Connectors

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 VIO Voltage Selection (JP1)

JP1	Function
1-2	+5V
2-3	+3.3V (Default)

2.8 24-bit LVDS Operating Voltage Selection (JP2)

JP2	Function
1-2	+5V
2-3	+3.3V (Default)

2.9 Clear CMOS (JP3)

JP3	Function
1-2	Protected (Default)
2-3	Clear

2.10 24-bit LVDS Inverter Power Selection (JP4)

JP4	Function
1-2	+5V (Default)
2-3	+12V

2.11 18-bit LVDS Operating Voltage Selection (JP5)

JP5	Function
1-2	+5V
2-3	+3.3V (Default)

2.12 18-bit LVDS Inverter Power Selection (JP6)

JP6	Function
1-2	+5V (Default)

2-3 +12V

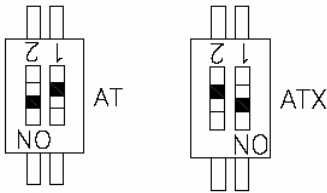
2.13 Touch Screen 4, 5, 8 Wire Selection (JP7)

JP7	Function
1-2	4, 8 wire (Default)
Open	5 wire

2.14 COM2 Ring/ +5V/ +12V Selection (JP8)

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

2.15 AT/ATX Selection (S1)



Label	Function
1(ON), 2(OFF)	ATX (Default)
1(OFF), 2(ON)	AT

2.16 Front Panel Connector (CN1)

Pin	Signal	Pin	Signal
1	Power On Button (+)	2	Power On Button (-)
3	External Buzzer (+)	4	External Buzzer (-)

5	IDE LED (+)	6	IDE LED (-)
7	Power LED (+)	8	Power LED (-)
9	Reset Switch (+)	10	Reset Switch (-)

2.17 24-bit Inverter Power Connector (CN2)

Pin	Signal	Pin	Signal
1	LCD Inverter Power	2	Backlight Control
3	GND	4	GND
5	Backlight Enable		

2.18 24-bit LVDS Connector (CN4)

Pin	Signal	Pin	Signal
1	ENBKL	2	N.C
3	PPVCC	4	GND
5	LVDS1_TXCLK-	6	LVDS1_TXCLK+
7	PPVCC	8	GND
9	LVDS1_TX0-	10	LVDS1_TX0+
11	LVDS1_TX1-	12	LVDS1_TX1+
13	LVDS1_TX2-	14	LVDS1_TX2+
15	LVDS1_TX3-	16	LVDS1_TX3+
17	N.C	18	N.C
19	LVDS2_TX0-	20	LVDS2_TX0+
21	LVDS2_TX1-	22	LVDS2_TX1+
23	LVDS2_TX2-	24	LVDS2_TX2+
25	LVDS2_TX3-	26	LVDS2_TX3+
27	PPVCC	28	GND
29	LVDS2_TXCLK-	30	LVDS2_TXCLK+

2.19 Wide Voltage Power Connector (CN5)

Pin	Signal	Pin	Signal
1	PGND	2	PGND
3	DC In	4	DC In

The minimum power consumption for booting is 25Watts without any connecting device. As this board is design for the lower power consumption, please do not using over 40Watts with all of extra device. If user is not using the power connect from the board for extra device, the above rule is not suitable.

2.20 Audio Connector (CN6)

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

2.21 18-bit LVDS Connector (CN7)

Pin	Signal	Pin	Signal
1	ENBKL	2	N.C
3	PPVCC	4	GND
5	LVDS1_TXCLK-	6	LVDS1_TXCLK+
7	PPVCC	8	GND
9	LVDS1_TX0-	10	LVDS1_TX0+

11	LVDS1_TX1-	12	LVDS1_TX1+
13	LVDS1_TX2-	14	LVDS1_TX2+
15	N.C	16	N.C
17	N.C	18	N.C
19	LVDS2_TX0-	20	LVDS2_TX0+
21	LVDS2_TX1-	22	LVDS2_TX1+
23	LVDS2_TX2-	24	LVDS2_TX2+
25	N.C	26	N.C
27	PPVCC	28	GND
29	LVDS2_TXCLK-	30	LVDS2_TXCLK+

2.22 18-bit Inverter Power Connector (CN9)

Pin	Signal	Pin	Signal
1	LCD Inverter Power	2	Backlight Control
3	GND	4	GND
5	Backlight Enable		

2.23 TV-out Connector (CN10)

Pin	Signal	Pin	Signal
1	Y	2	CVBS
3	GND	4	GND
5	C	6	N.C
7	GND	8	N.C

2.24 USB Connector (CN11)

Pin	Signal	Pin	Signal
1	+5V	2	GND
3	USBD5-	4	GND

5	USBD5+	6	USBD6+
7	GND	8	USBD6-
9	GND	10	+5V

2.25 LPT Port Connector (CN12)

Pin	Signal	Pin	Signal
1	#STROBE	2	#AFD
3	DATA0	4	#ERROR
5	DATA1	6	#INIT
7	DATA2	8	#SLIN
9	DATA3	10	GND
11	DATA4	12	GND
13	DATA5	14	GND
15	DATA6	16	GND
17	DATA7	18	GND
19	#ACK	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SELECT	26	N.C

2.26 System Fan Connector (CN13)

Pin	Signal
1	GND
2	+12V
3	Speed Sense

2.27 Digital I/O Connector (CN14)

Pin	Signal	Pin	Signal
1	Port1	2	Port2
3	Port3	4	Port4
5	Port5	6	Port6
7	Port7	8	Port8
9	+5V	10	GND

Mapping Table:

BIOS Setting	Connector Definition	Address	IT8781 GPIO Setting
Port 8 @684h	CN14 Pin 8	GPIO Set 5 / Bit 2	U26 Pin 9 (GPIO 52)
Port 7 @684h	CN14 Pin 7	GPIO Set 5 / Bit 1	U26 Pin 10 (GPIO 51)
Port 6 @682h	CN14 Pin 6	GPIO Set 3 / Bit 7	U26 Pin 11 (GPIO 37)
Port 5 @682h	CN14 Pin 5	GPIO Set 3 / Bit 6	U26 Pin 12 (GPIO 36)
Port 4 @680h	CN14 Pin 4	GPIO Set 1 / Bit 4	U26 Pin 31 (GPIO 14)
Port 3 @680h	CN14 Pin 3	GPIO Set 1 / Bit 3	U26 Pin 32 (GPIO 13)
Port 2 @680h	CN14 Pin 2	GPIO Set 1 / Bit 2	U26 Pin 33 (GPIO 12)
Port 1 @680h	CN14 Pin 1	GPIO Set 1 / Bit 1	U26 Pin 34 (GPIO 11)

Digital I/O Address is 680,682,684H

2.28 Power Output Connector (CN15)

Pin	Signal	Pin	Signal
1	+12V	2	GND
3	GND	4	+5V

2.29 PS2 Keyboard/Mouse Connector (CN16)

Pin	Signal	Pin	Signal
1	KB_DATA	2	KB_CLK
3	GND	4	+5V
5	MS_DATA	6	MS_CLK

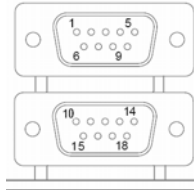
2.30 Touch Screen Connector (CN18)

Pin	8-wire Signal	4-wire Signal	5-wire Signal
1	Ground	Ground	Ground
2	Top Excite	Top	UL(Y)
3	Bottom Excite	Bottom	UR(H)
4	Left Excite	Left	LL(L)
5	Right Excite	Right	LR(X)
6	Top Sense	N.C	SENSE
7	Bottom Sense	N.C	N.C
8	Left Sense	N.C	N.C
9	Right Sense	N.C	N.C

2.31 RS-232 Serial Port Connector (CN19, CN20, CN21)

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

2.32 COM1/2 Connectors (CN24)



Pin	Signal	Pin	Signal
1	DCD1	2	RXD1
3	TXD1	4	DTR1
5	GND	6	DSR1
7	RTS1	8	CTS1
9	RI1	10	DCD2 (422TXD-/485DATA-)
11	RXD2 (422RXD-)	12	TXD2 (422TXD+/485DATA+)
13	DTR2 (422RXD+)	14	GND
15	DSR2	16	RTS2
17	CTS2	18	RI2/+5V/+12V

2.33 Stand By Power Output Connector (CN27)

Pin	Signal
1	SMBDAT_SBY
2	GND
3	SMBCLK_SBY
4	GND
5	PS_ON#
6	+5V_SBY

2.34 Onboard BIOS Programming I/F (CN28)

Pin	Signal	Pin	Signal
1	+3.3 Volt.	2	Ground
3	SPI_CE#	4	SPI_CLK
5	SPI_SO	6	SPI_SI
7	N.C	8	N.C

2.35 Primary EIDE Connector (IDE1)

Pin	Signal	Pin	Signal
1	IDE RESET	2	GND
3	DATA7	4	DATA8
5	DATA6	6	DATA9
7	DATA5	8	DATA10
9	DATA4	10	DATA11
11	DATA3	12	DATA12
13	DATA2	14	DATA13
15	DATA1	16	DATA14
17	DATA0	18	DATA15
19	GND	20	N.C
21	REQ	22	GND
23	IO WRITE	24	GND
25	IO READ	26	GND
27	IO READY	28	GND
29	DACK	30	GND
31	IRQ14	32	N.C
33	ADDR1	34	UDMA DETECT
35	ADDR0	36	ADDR2

EPIC Board**EPIC-9457 Rev.A**

37	CS#1	38	CS#3
39	LED	40	GND
41	+5V	42	+5V
43	GND	44	N.C

Note: User can use internal power (CN15) with IDE Device only.

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 EPIC-9457 Rev.A 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. (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

Use this menu to set PC Health Status.

Frequency/Voltage Control

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

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 Password

Use this menu to set Supervisor Password.

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 EPIC-9457 Rev.A comes with a CD-ROM that contains all drivers and utilities that meet your needs.

Follow the sequence below to install the drivers:

- Step 1 – Install INF Update Utility v8.2.0.1014 Driver
- Step 2 – Install Intel Graphics Media Accelerator Driver
- Step 3 – Install Intel Ethernet Driver
- Step 4 – Install Realtek ALC655 Audio Driver v3.71
- Step 5 – Install PenMount 6300 Touch 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 EPIC-9457 Rev.A CD-ROM into the CD-ROM Drive. And install the drivers from Step 1 to Step 5 in order.

Step 1 – Install INF Update Utility v8.2.0.1014 Driver

1. Click on the **Step 1 - INF Update Utility v8.2.0.1014 Driver** folder and then double click on the **Setup.exe**
2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

Step 2 – Install Intel Graphics Media Accelerator Driver

1. Click on the **Step 2 - Intel Graphics Media Accelerator Driver** folder and select the OS folder your system is
2. Double click on the **Setup.exe** in the OS folder
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

Step 3 – Install Intel Ethernet Driver

1. Click on the **Step 3 - Intel Ethernet Driver** folder and select the OS folder your system is
2. Double click on the **.exe** file in the OS folder
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

Step 4 – Install Realtek ALC655 Audio Driver v3.71

1. Click on the **Step 4 – Realtek ALC655 Audio Driver**
-

- v3.71** folder and select the OS folder your system is
2. Double click on the **setup.exe** file in the OS folder
 3. Follow the instructions that the window shows
 4. The system will help you install the driver automatically

Step 5 – Install PenMount 6300 Touch Driver

1. Click on the **Step 5 – PenMount 6300 Touch Driver** folder and select the OS folder your system is
2. Double click on the **Setup.exe** file in the OS folder
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

Appendix

A

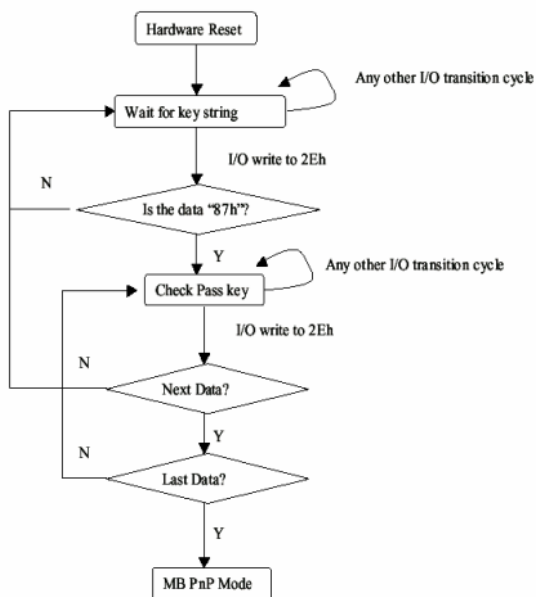
Programming the Watchdog Timer

A.1 Programming

EPIC-9457 Rev.A utilizes ITE 8781 chipset as its watchdog timer controller. Below are the procedures to complete its configuration and the AAEON 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 8781 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	NA	Configure Control

07h	71h	R/W	00h	Watch Dog Timer Control Register
07h	72h	R/W	001s0000b	Watch Dog Timer Configuration Register
07h	73h	R/W	38h	Watch Dog Timer Time-out Value (LSB) Register
07h	74h	R/W	00h	Watch Dog 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.

Watch Dog Timer 1, 2, 3 Control Register (Index=71h,81h,91h Default=00h)

Bit	Description
7	WDT Timeout Enable(WTE) 1: Disable. 0: Enable.
6	WDT Reset upon Mouse Interrupt(WRKMI) 0: Disable. 1: Enable.
5	WDT Reset upon Keyboard Interrupt(WRKBI) 0: Disable. 1: Enable.
4	Reserved
3-2	Reserved
1	Force Time-out(FTO) This bit is self-clearing.
0	WDT Status(WS) 1: WDT value reaches 0. 0: WDT value is not 0.

Watch Dog Timer 1, 2, 3 Configuration Register (Index=72h, 82h, 92h Default=001s0000b)

Bit	Description
7	WDT Time-out Value Select 1 (WTVS) 1: Second 0: Minute
6	WDT Output through KRST (Pulse) Enable(WOKE) 1: Enable 0: Disable
5	WDT Time-out value Extra select(WTVES) 1: 64ms x WDT Timer-out value (default = 4s) 0: Determined by WDT Time-out value select 1 (bit 7 of this register)
4	WDT Output through PWROK (Pulse) Enable(WOPE) 1: Enable 0: Disable During LRESET#, this bit is selected by JP7 power-on strapping option
3-0	Select interrupt level^{Note1} for WDT(SIL)

Watch Dog Timer 1,2,3 Time-Out Value (LSB) Register (Index=73h,83h,93h, Default=38h)

Bit	Description
7-0	WDT Time-out Value 7-0(WTV)

Watch Dog Timer 1,2,3 Time-Out Value (MSB) Register (Index=74h,84h,94h Default=00h)

Bit	Description
7-0	WDT Time-out Value 15-8(WTV)

A.2 ITE8781 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,81h

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
[00000000 - 0000000F]	Direct memory access controller
[00000000 - 000000CF7]	PCI bus
[00000010 - 0000001F]	Motherboard resources
[00000020 - 00000021]	Programmable interrupt controller
[00000022 - 0000003F]	Motherboard resources
[00000040 - 00000043]	System timer
[00000044 - 0000005F]	Motherboard resources
[00000061 - 00000061]	System speaker
[00000062 - 00000063]	Motherboard resources
[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 - 000000DF]	Direct memory access controller
[000000E0 - 000000EF]	Motherboard resources
[000000F0 - 000000FF]	Numeric data processor
[000001F0 - 000001F7]	Primary IDE Channel
[00000274 - 00000277]	ISAPNP Read Data Port
[00000279 - 00000279]	ISAPNP Read Data Port
[000002E8 - 000002EF]	Communications Port (COM4)
[000002F8 - 000002FF]	Communications Port (COM2)
[000003B0 - 000003BB]	Mobile Intel(R) 945 Express Chipset Family
[000003C0 - 000003DF]	Mobile Intel(R) 945 Express Chipset Family
[000003E8 - 000003EF]	Communications Port (COM3)
[000003F6 - 000003F6]	Primary IDE Channel
[000003F8 - 000003FF]	Communications Port (COM1)
[00000400 - 000004BF]	Motherboard resources
[000004D0 - 000004D1]	Motherboard resources
[00000500 - 0000051F]	Intel(R) 82801G (ICH7 Family) SMBus Controller - 27DA
[00000880 - 0000088F]	Motherboard resources
[00000A79 - 00000A79]	ISAPNP Read Data Port
[00000D00 - 0000FFFF]	PCI bus
[0000B000 - 0000BFFF]	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D2
[0000BF00 - 0000BF1F]	Intel(R) 82574L Gigabit Network Connection
[0000C000 - 0000CFFF]	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D0
[0000CF00 - 0000CF1F]	Intel(R) 82574L Gigabit Network Connection #2
[0000F000 - 0000F0FF]	Realtek AC'97 Audio
[0000F300 - 0000F30F]	Intel(R) 82801GBM/GHM (ICH7-M Family) Serial ATA Storage Controller - 27C4
[0000F400 - 0000F403]	Intel(R) 82801GBM/GHM (ICH7-M Family) Serial ATA Storage Controller - 27C4
[0000F500 - 0000F507]	Intel(R) 82801GBM/GHM (ICH7-M Family) Serial ATA Storage Controller - 27C4
[0000F600 - 0000F603]	Intel(R) 82801GBM/GHM (ICH7-M Family) Serial ATA Storage Controller - 27C4
[0000F700 - 0000F707]	Intel(R) 82801GBM/GHM (ICH7-M Family) Serial ATA Storage Controller - 27C4
[0000F800 - 0000F80F]	Intel(R) 82801G (ICH7 Family) Ultra ATA Storage Controllers - 27DF
[0000FA00 - 0000FA3F]	Realtek AC'97 Audio
[0000FB00 - 0000FB1F]	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27CB
[0000FC00 - 0000FC1F]	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27CA
[0000FD00 - 0000FD1F]	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27C9
[0000FE00 - 0000FE1F]	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27C8
[0000FF00 - 0000FF07]	Mobile Intel(R) 945 Express Chipset Family

B.2 1st MB Memory Address Map

Address Range	Device
[00000000 - 0009FFFF]	System board
[000A0000 - 000BFFFF]	Mobile Intel(R) 945 Express Chipset Family
[000A0000 - 000BFFFF]	PCI bus
[000C0000 - 000DFFFF]	PCI bus
[000E0000 - 000EFFFF]	System board
[000F0000 - 000FFFFFFF]	System board
[00100000 - 3F6DFFFF]	System board
[3F6E0000 - 3F6FFFFFFF]	System board
[3F700000 - FEBFFFFFFF]	PCI bus
[D0000000 - DFFFFFFF]	Mobile Intel(R) 945 Express Chipset Family
[E0000000 - EFFFFFFF]	Motherboard resources
[FD800000 - FD8FFFFFFF]	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D2
[FD900000 - FD9FFFFFFF]	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D2
[FD9C0000 - FD9DFFFF]	Intel(R) 82574L Gigabit Network Connection
[FD9FC000 - FD9FFFFFFF]	Intel(R) 82574L Gigabit Network Connection
[FDA00000 - FDAFFFFFFF]	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D0
[FDD00000 - FDDFFFFFFF]	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D0
[FDDC0000 - FDDDFFFF]	Intel(R) 82574L Gigabit Network Connection #2
[FDDFC000 - FDDFFFFFFF]	Intel(R) 82574L Gigabit Network Connection #2
[FDF00000 - FDF7FFFF]	Mobile Intel(R) 945 Express Chipset Family
[FDF80000 - FDFBFFFF]	Mobile Intel(R) 945 Express Chipset Family
[FDFFC000 - FDFFC3FF]	Intel(R) 82801GBM/GHM (ICH7-M Family) Serial ATA Storage Controller - 27C4
[FDFFD000 - FDFFD0FF]	Realtek AC'97 Audio
[FDFFE000 - FDFFE1FF]	Realtek AC'97 Audio
[FDFFF000 - FDFFF3FF]	Intel(R) 82801G (ICH7 Family) USB2 Enhanced Host Controller - 27CC
[FEB80000 - FEBFFFFFFF]	Mobile Intel(R) 945 Express Chipset Family
[FEC00000 - FEC00FFF]	System board
[FED13000 - FED1DFFF]	System board
[FED20000 - FED8FFFF]	System board
[FEE00000 - FEE00FFF]	System board
[FFB00000 - FFB7FFFF]	System board
[FFB80000 - FFBFFFFFFF]	Intel(R) 82802 Firmware Hub Device
[FFF00000 - FFFFFFFF]	System board

B.3 IRQ Mapping Chart

Bus Type	Device ID	Device Name
		Interrupt request (IRQ)
(ISA)	0	System timer
(ISA)	3	Communications Port (COM2)
(ISA)	4	Communications Port (COM1)
(ISA)	8	System CMOS/real time clock
(ISA)	9	Microsoft ACPI-Compliant System
(ISA)	10	Communications Port (COM4)
(ISA)	11	Communications Port (COM3)
(ISA)	13	Numeric data processor
(ISA)	14	Primary IDE Channel
(PCI)	15	Intel(R) 82801G (ICH7 Family) SMBus Controller - 27DA
(PCI)	16	Intel(R) 82574L Gigabit Network Connection #2
(PCI)	16	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D0
(PCI)	16	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27CB
(PCI)	16	Mobile Intel(R) 945 Express Chipset Family
(PCI)	17	Intel(R) 82574L Gigabit Network Connection
(PCI)	17	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D2
(PCI)	17	Realtek AC'97 Audio
(PCI)	18	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27CA
(PCI)	19	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27C9
(PCI)	19	Intel(R) 82801GBM/GHM (ICH7-M Family) Serial ATA Storage Controller - 27C4
(PCI)	23	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27C8
(PCI)	23	Intel(R) 82801G (ICH7 Family) USB2 Enhanced Host Controller - 27CC

B.4 DMA Channel Assignments

AAEON-3C2C950DC	
+	Direct memory access (DMA)
	4 Direct memory access controller
+	Input/output (IO)
+	Interrupt request (IRQ)
+	Memory

Appendix

C

Mating Connector

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	Front Panel Connector	LIAN TAY	(LIAN TAY H752-10 or compatible)	Front Panel cable	N/A
CN2	LCD Inverter Connector	CATCH	2.0mm pitch 5 pin (CATCH HS-5P-2.0 or compatible)	LCD Inverter cable	N/A
CN4	LVDS Connector	Hirose	1.25mm Pitch 30 pins (CATCH H716 or compatible)	LVDS cable	N/A
CN5	AT Power Connector	LIAN TAY	(LIAN TAY H756-04 or compatible)	Power cable	1702040151
CN6	Audio Connector	CATCH	2.00mm Pitch 14 pins (CATCH H709-2 or compatible)	Audio Cable	1700140510
CN7	LVDS Connector	Hirose	1.25mm Pitch 30 pins (CATCH H716 or compatible)	LVDS cable	N/A
CN9	LCD Inverter Connector	CATCH	2.0mm pitch 5 pin (CATCH HS-5P-2.0 or compatible)	LCD Inverter cable	N/A
CN10	TV_out Connector	CATCH	2.00mm Pitch 8 pins (CATCH H754-2x4 or compatible)	TV-Out Cable	1700080180
CN11	USB5 & USB6 Connector	CATCH	2.00mm Pitch 10 pins (CATCH H754-2x5 or	USB Cable	1709100208

			compatible)		
CN12	LPT port Connector	CATCH	2.00mm Pitch 26 pins (CATCH H754-2x13 or compatible)	LPT cable	1701260308
CN13	System Fan Connector	HoBase	(HoBase 2543-WS-3 or compatible)	CPU fan cable	N/A
CN14	Digital I/O Connector	CATCH	2.00mm Pitch 10 pins (CATCH H754-2x5 or compatible)	Digital I/O cable	N/A
CN15	Power Output Connector	HoBase	(HoBase 2543-H-4 or compatible)	Power output cable	1702040109
CN16	PS2 Keyboard/Mouse Connector	CATCH	(CATCH MD-6PS or compatible)	Keyboard / Mouse Cable	1700060152
CN18	Touch Screen Connector	LIAN TAY	(LIAN TAY H746-09 or compatible)	Touch Screen Cable	N/A
CN19	Co-lay COM1 Connector	LIAN TAY	(LIAN TAY H752-09 or compatible)	UART Cable	1701090150
CN20	COM3 Connector	LIAN TAY	(LIAN TAY H752-09 or compatible)	UART Cable	1701090150
CN21	COM4 Connector	LIAN TAY	(LIAN TAY H752-09 or compatible)	UART Cable	1701090150
IDE1	Primary EIDE Connector	CATCH	2.00mm Pitch 44 pins (CATCH H820-2 or compatible)	EIDE Cable	1701440500