EPIC-9457 Rev. B

EPIC Board

User's Manual 4th Ed

Last Updated: October 26, 2015

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Acknowledgement

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Packing List

Before setting up your product, please make sure the following items have been shipped:

Item	Quantity
● EPIC-9457 Rev. B	1
● Product DVD with User's Manual (in pdf) and drivers	1

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

About this Document

This User's Manual contains all the essential information, such as detailed descriptions and explanations on the product's hardware and software features (if any), its specifications, dimensions, jumper/connector settings/definitions, and driver installation instructions (if any), to facilitate users in setting up their product.

Users may refer to the AAEON.com for the latest version of this document.

Safety Precautions

Please read the following safety instructions carefully. It is advised that you keep this manual for future references

1. All cautions and warnings on the device should be noted.
2. Make sure the power source matches the power rating of the device.
3. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
4. Always completely disconnect the power before working on the system's hardware.
5. No connections should be made when the system is powered as a sudden rush of power may damage sensitive electronic components.
6. If the device is not to be used for a long time, disconnect it from the power supply to avoid damage by transient over-voltage.
7. Always disconnect this device from any AC supply before cleaning.
8. While cleaning, use a damp cloth instead of liquid or spray detergents.
9. Make sure the device is installed near a power outlet and is easily accessible.
10. Keep this device away from humidity.
11. Place the device on a solid surface during installation to prevent falls
12. Do not cover the openings on the device to ensure optimal heat dissipation.
13. Watch out for high temperatures when the system is running.
14. Do not touch the heat sink or heat spreader when the system is running
15. Never pour any liquid into the openings. This could cause fire or electric shock.
16. As most electronic components are sensitive to static electrical charge, be sure to ground yourself to prevent static charge when installing the internal components. Use a grounding wrist strap and contain all electronic components in any static-shielded containers.

17. If any of the following situations arises, please the contact our service personnel:
    i. Damaged power cord or plug
    ii. Liquid intrusion to the device
    iii. Exposure to moisture
    iv. Device is not working as expected or in a manner as described in this manual
    v. The device is dropped or damaged
    vi. Any obvious signs of damage displayed on the device
18. DO NOT LEAVE THIS DEVICE IN AN UNCONTROLLED ENVIRONMENT WHERE THE STORAGE TEMPERATURE IS BELOW -20° C (-4°F) OR ABOVE 60°C (140°F) TO PREVENT DAMAGE.

FCC Statement

This device complies with Part 15 FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received including interference that may cause undesired operation.

Caution:

There is a danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions and your local government's recycling or disposal directives.

Attention:

Il y a un risque d'explosion si la batterie est remplacée de façon incorrecte.
Ne la remplacer qu'avec le même modèle ou équivalent recommandé par le constructeur. Recycler les batteries usées en accord avec les instructions du fabricant et les directives gouvernementales de recyclage.

China RoHS Requirements (CN)

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	×	O	O	O	O	O
外部信号连接器及线材	×	O	O	O	O	O

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。

China RoHS Requirement (EN)

Poisonous or Hazardous Substances or Elements in Products

AAEON Main Board/ Daughter Board/ Backplane

Component	Poisonous or Hazardous Substances or Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (Cr(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
PCB & Other Components	X	O	O	O	O	O
Wires & Connectors for External Connections	X	O	O	O	O	O

O：The quantity of poisonous or hazardous substances or elements found in each of the component's parts is below the SJ/T 11363-2006-stipulated requirement.

X: The quantity of poisonous or hazardous substances or elements found in at least one of the component's parts is beyond the SJ/T 11363-2006-stipulated requirement.

Note: The Environment Friendly Use Period as labeled on this product is applicable under normal usage only

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Chapter 1

Product Specifications

1.1 Specifications

System

Form Factor	EPIC Board
Processor	Onboard Intel® Atom™ N270 Processor 1.6GHz
System Memory	Onboard DDR2 533, up to 1 GB
Chipset	Intel® 945GME + ICH7M
I/O Chipset	ITE8781
Ethernet	Intel® 82574L for 10/100/1000Base-TX, RJ-45 x 2
BIOS	Award Plug & Play SPI BIOS – 2MB ROM
Wake On LAN	Yes
Watchdog Timer	Generates a time-out system reset
H/W Status Monitoring	Supports power supply voltages, fan speed, and temperature monitoring
Expansion Interface	PCI/104-Express Expansion (PCI-104 + PCIe/104) connectors
Battery	Lithium RTC battery
Power Consumption (Typical)	8.5V ~ 19V
Board Size	165 x 115 mm (6.5 x 4.53")
Gross Weight	0.5 kg (1.1 lbs)
Operating Temperature	0 ~ 60°C (32 ~ 140°F)

- **Storage Temperature** -40 ~ 80°C (-40 ~ 176°F)
- **Operation Humidity** 0 ~ 90% Relative Humidity, Non-Condensing

Display

- **Chipset** Intel® 945GME integrated + CH7308 + CH7307C
- **Memory** Shared system memory up to 224 MB
- **Resolution** CRT up to 2048x1536
  LCD up to 1920x1200 @ 24bpp colors
- **Display Interface** CRT/LCD
  CRT/TV
  LCD/TV
- **LCD Interface** 24-bit dual-channel LVDS
- **Display Combination** Simultaneous/ Dual view displays

I/O

- **Storage** SATA x 2,
  Type II CompactFlash™ x 1
- **USB** USB 2.0 x 6
- **Serial Port** RS-232 x 3
  RS-232/422/485 x 1
- **Parallel Port** SPP/EPP/ECP mode
- **DI/O** Supports 8-bit (programmable)
- **Audio** Line-in

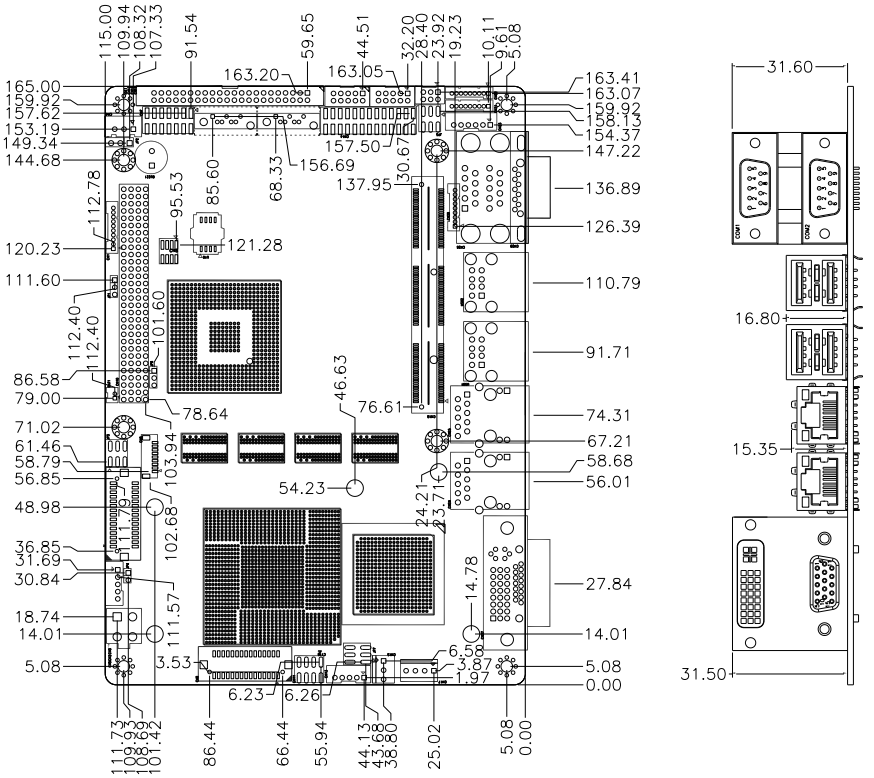
	Line-out
	Mic-in & CD-in
● PS/2 Port	PS/2 Keyboard & Mouse x 1

Chapter 2

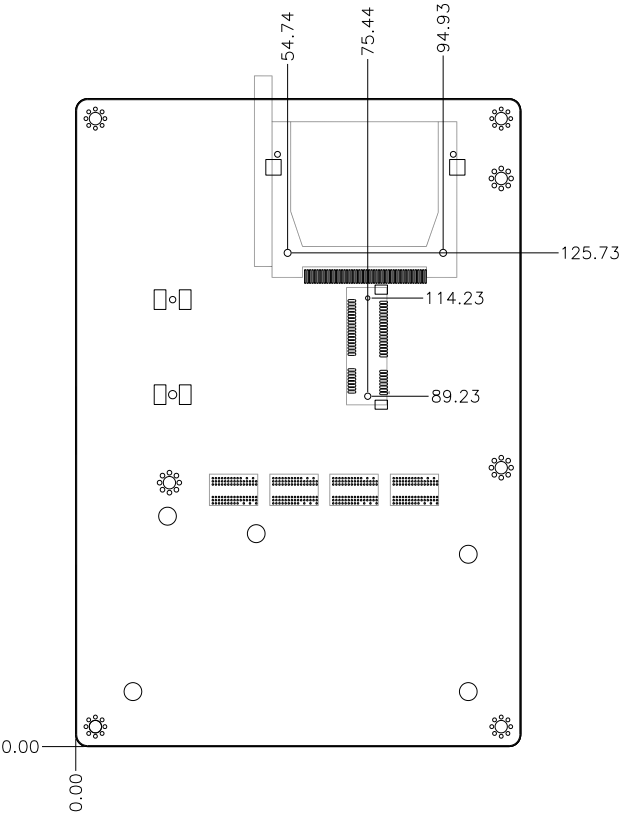
Hardware Information

2.1 Dimensions

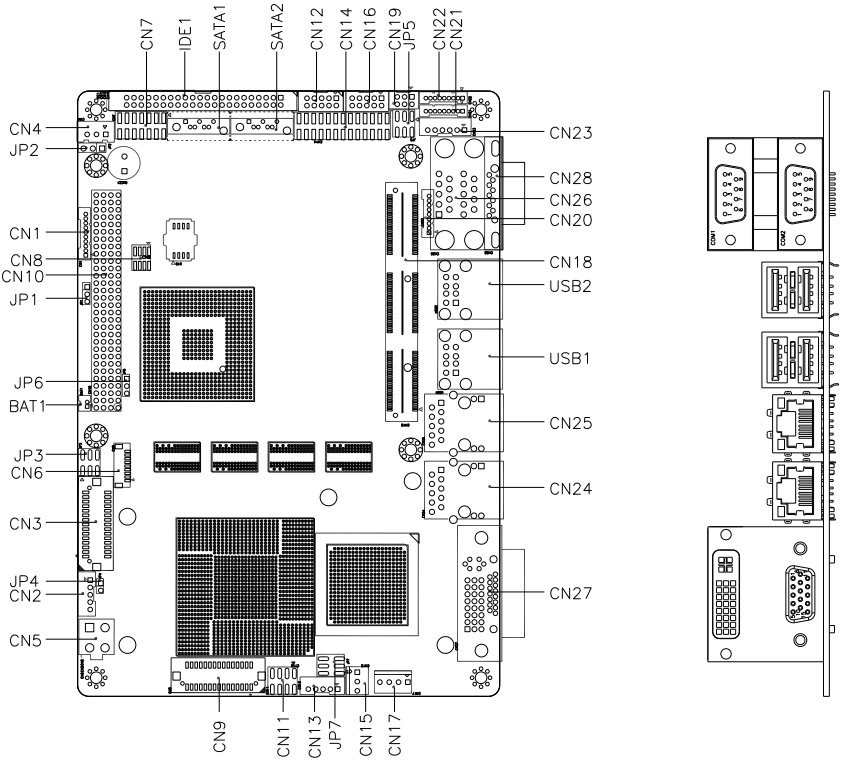
Component Side



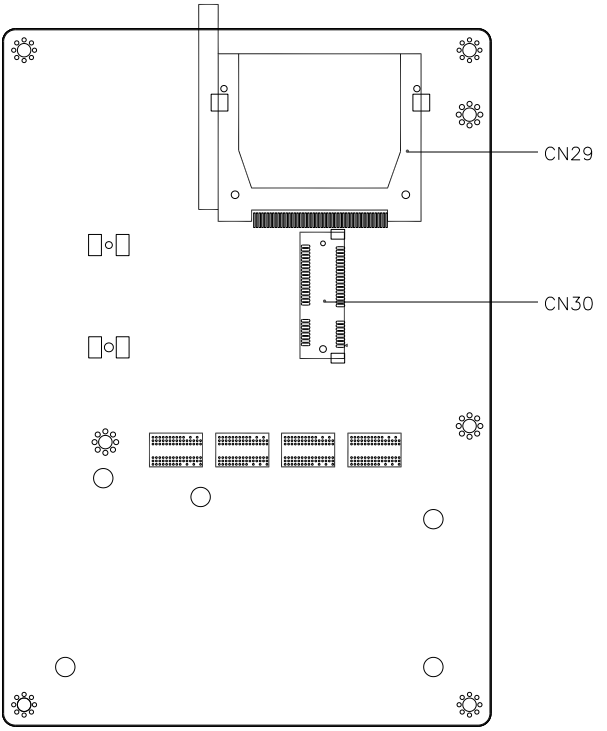
Solder Side



2.2 Jumpers and Connectors



Solder Side



2.3 List of Jumpers

Please refer to the table below for all of the board's jumpers that you can configure for your application

Label	Function
JP1	VIO Voltage Selection
*JP2	Power In Type Selection
JP3	External LVDS Operating Voltage Selection and External Power Selection
JP4	Touch Screen 4,5,8 Wire Selection
JP5	COM2 Ring/+5V/+12V Selection
JP6	Clear CMOS
JP7	Internal LVDS Operating Voltage Selection and Inverter Power Selection
*S1	Boot Up mode (AT/ATX) Selection

* Please see appendix A for details on boot up modes

2.3.1 VIO Voltage Selection (JP1)

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

2.3.2 Power In Type Selection (JP2)

Pin	Function
1-2	AT Power (CN5 only) (Default)
2-3	ATX Power (CN4 +CN5)

2.3.3 External LVDS Operating Voltage Selection and External Power Selection (JP3)

External Power Selection

Pin	Function
1-3	+5V (Default)
3-5	+12V

LVDS Operating Voltage Selection

Pin	Function
2-4	+5V
4-6	+3.3V (Default)

2.3.4 Touchscreen 4/5/8 Wire Mode Selection (JP4)

Pin	Function
1-2	4, 8 Wire (Default)
Open	5 Wire

2.3.5 COM2 Ring/ +5V/ +12V Selection (JP5)

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

2.3.6 Clear CMOS (JP6)

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

2.3.7 Internal LVDS Operating Voltage Selection and Inverter Power Selection (JP7)

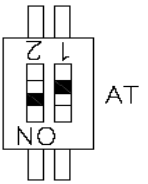
LVDS Operating Voltage

Pin	Function
1-3	+5V
3-5	+3.3V (Default)

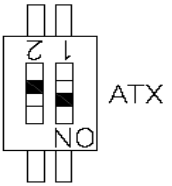
Inverter Power

Pin	Function
2-4	+5V (Default)
4-6	+12V

2.3.8 Boot Up mode (AT/ATX) Selection (S1)



Boot up by Power-in



Boot up by Power Button

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

2.4 List of Connectors

Please refer to the table below for all of the board's connectors that you can configure for your application

Label	Function
CN1	Front Panel Connector
CN2	External LVDS Inverter Power Connector
CN3	External LVDS Connector
CN4	Standby Power Input Connector (Optional)
CN5	(Wide Voltage) Main Power Input Connector
CN6	Touch Screen Connector
CN7	Audio Connector
CN8	SPI Programming Connector
CN9	Internal LVDS Connector
CN10	PCI-104 Connector
CN11	TV-out Connector
CN12	USB5, USB6 Connectors
CN13	Internal LVDS Inverter Power Connector
CN14	LPT Port Connector
CN15	System Fan Connector
CN16	Digital I/O Connector
CN17	Power Output Connector
CN18	PCI-Express Connector
CN19	PS2 Keyboard/Mouse Connector
CN20	Co-lay COM1 Connector
CN21	COM3 Connector
CN22	COM4 Connector
CN23	Standby power output Connector

CN24	GIGA Ethernet Connector
CN25	GIGA Ethernet Connector
CN26	COM1, COM2 Connector
CN27	VGA + DVI Display Connector
CN28	Co-lay COM2 Connector
CN29	Compact Flash Disk Connector
CN30	Mini Card Connector
IDE1	EIDE Connector
SATA1	Secondary SATA Connector
SATA2	Primary SATA Connector
USB1	USB1, USB2 Connectors
USB2	USB3, USB4 Connectors

2.4.1 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 (-)

2.4.2 External LVDS Inverter Power Connector (CN2)

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

2.4.3 External LVDS Power Connector (CN2)

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+

2.4.4 Standby Power Input Connector (CN4) (Optional)

Pin	Signal
1	PS_ON#
2	GND
3	+5VSB

2.4.5 (Wide Voltage) Main Power Input Connector

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

2.4.6 Touch Screen Connector (CN6)

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

2.4.7 Audio Connector (CN7)

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

2.4.8 Internal LVDS Connector (CN9)

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+

2.4.9 TV-out Connector (CN11)

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

2.4.10 USB Connector (CN12)

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

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

2.4.11 Internal Inverter Power Connector (CN13)

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

2.4.12 LPT Port Connector (CN14)

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

2.4.13 System Fan Connector (CN15)

Pin	Signal
1	GND
2	+12V
3	Speed Sense

2.4.14 Digital I/O Connector (CN16)

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	CN16 Pin 8	GPIO Set 5 / Bit 2	U30 Pin 9 (GPIO 52)
Port 7 @684h	CN16 Pin 7	GPIO Set 5 / Bit 1	U30 Pin 10 (GPIO 51)
Port 6 @682h	CN16 Pin 6	GPIO Set 3 / Bit 7	U30 Pin 11 (GPIO 37)
Port 5 @682h	CN16 Pin 5	GPIO Set 3 / Bit 6	U30 Pin 12 (GPIO 36)
Port 4 @680h	CN16 Pin 4	GPIO Set 1 / Bit 4	U30 Pin 31 (GPIO 14)
Port 3 @680h	CN16 Pin 3	GPIO Set 1 / Bit 3	U30 Pin 32 (GPIO 13)
Port 2 @680h	CN16 Pin 2	GPIO Set 1 / Bit 2	U30 Pin 33 (GPIO 12)
Port 1 @680h	CN16 Pin 1	GPIO Set 1 / Bit 1	U30 Pin 34 (GPIO 11)

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

2.4.15 Power Output Connector (CN17)

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

2.4.16 PS2 Keyboard/Mouse Connector (CN19)

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

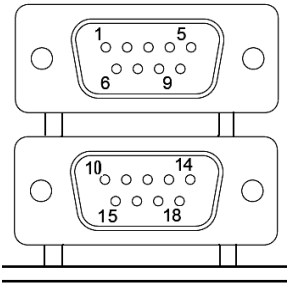
2.4.17 RS-232 Serial Port Connector (CN20, CN21, CN22)

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

2.4.18 Standby Power Output Connector (CN23)

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

2.4.18 Standby Power Output Connector (CN23)



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

2.4.19 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	IRQ15	32	N.C
33	ADDR1	34	UDMA DETECT
35	ADDR0	36	ADDR2

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

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.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. (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

Drivers Installation

4.1 Product CD/DVD

The EPIC-9457 Rev. B comes with a product DVD that contains all the drivers and utilities you need to setup your product. Insert the DVD and follow the steps in the autorun program to install the drivers.

In case the program does not start, follow the sequence below to install the drivers.

> * USB 2.0 Drivers are available for download with 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/.

Step 1 – Install INF Update Utility Drivers

1. Open the **Step 1 –INF Update Utility v8.2.0.1014 Driver** folder followed by **SetupChipset.exe**
2. Follow the instructions
3. Drivers will be installed automatically

Step 2 – Install Intel Graphics Media Accelerator Driver

1. Open the **STEP2 - Intel Graphics Media Accelerator** folder and select your OS
2. Open the **Setup.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

Step 3 – Install Ethernet Driver

1. Open the **STEP3 – Intel Ethernet Driver** folder and select your OS
2. Open the .**exe** file in the folder

3. Follow the instructions
4. Drivers will be installed automatically

Step 4 – Install Audio Driver

1. Open the **STEP4 – Realtek ALC655 Audio v3.71** folder and select your OS
2. Open the **Setup.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

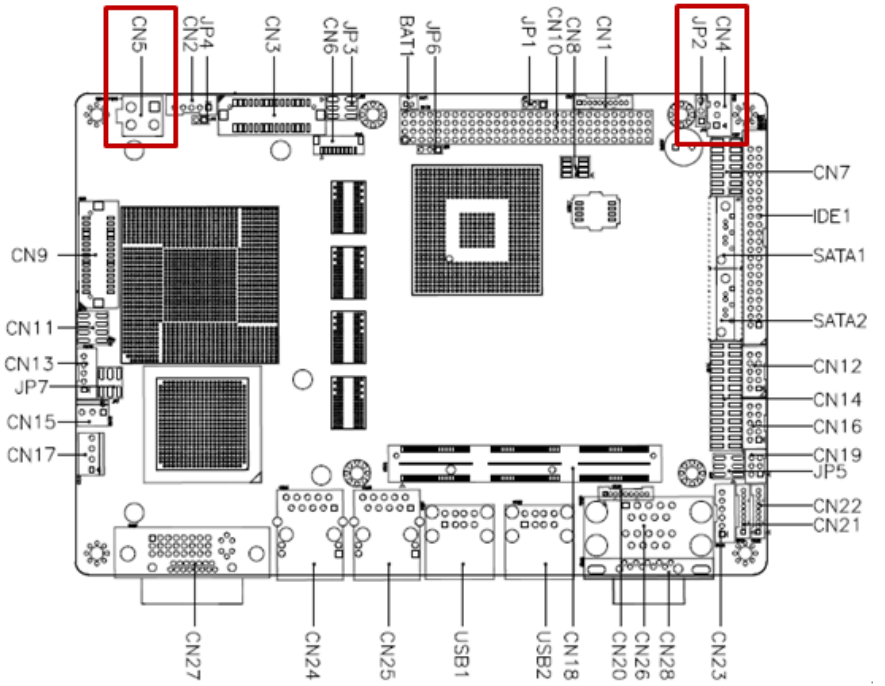
Step 5 – Install Touch Driver

1. Open the **STEP5 – PenMount 6300 Touch Driver** folder select your OS
2. Open the **Setup.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

Appendix A

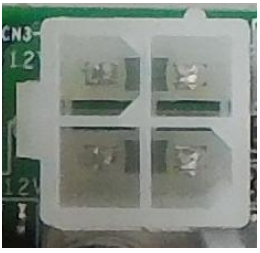
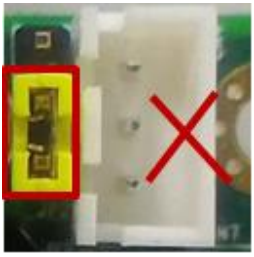
Boot Up Guide

A.1 AT Power



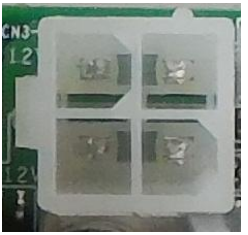
1. CN5 + JP2(1-2) + S1 (1:OFF,2:ON)

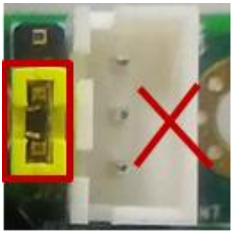
   Auto simulated a power button signal then the M/B can be booted up

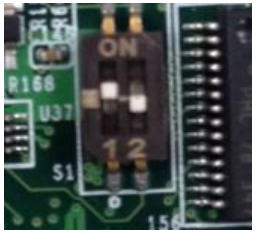




2. CN5 + JP2(1-2) + S1 (1:ON,2:OFF)

   Press front panel power button then the M/B can be booted up.





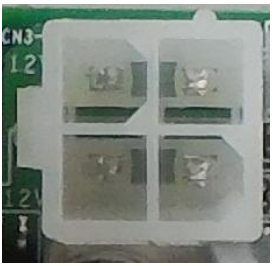


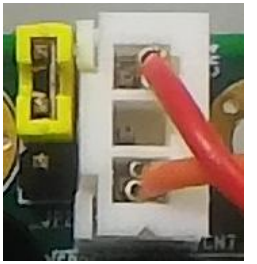
A.2 ATX Power

CN5 + JP2 (2-3) + CN4 + S1 (1:ON, 2:OFF)

Press front panel power button for PS_ON#, then boot up

(CN4: Provide external 5VSB power)





Appendix B

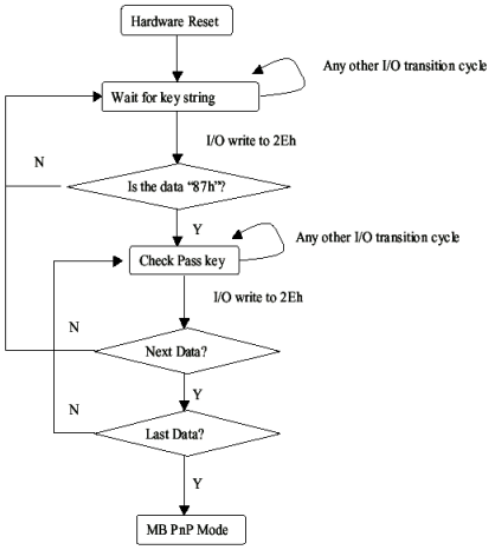
Watchdog Timer Programming

B.1 Programming

EPIC-9457 Rev.B 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 e 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)

B.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

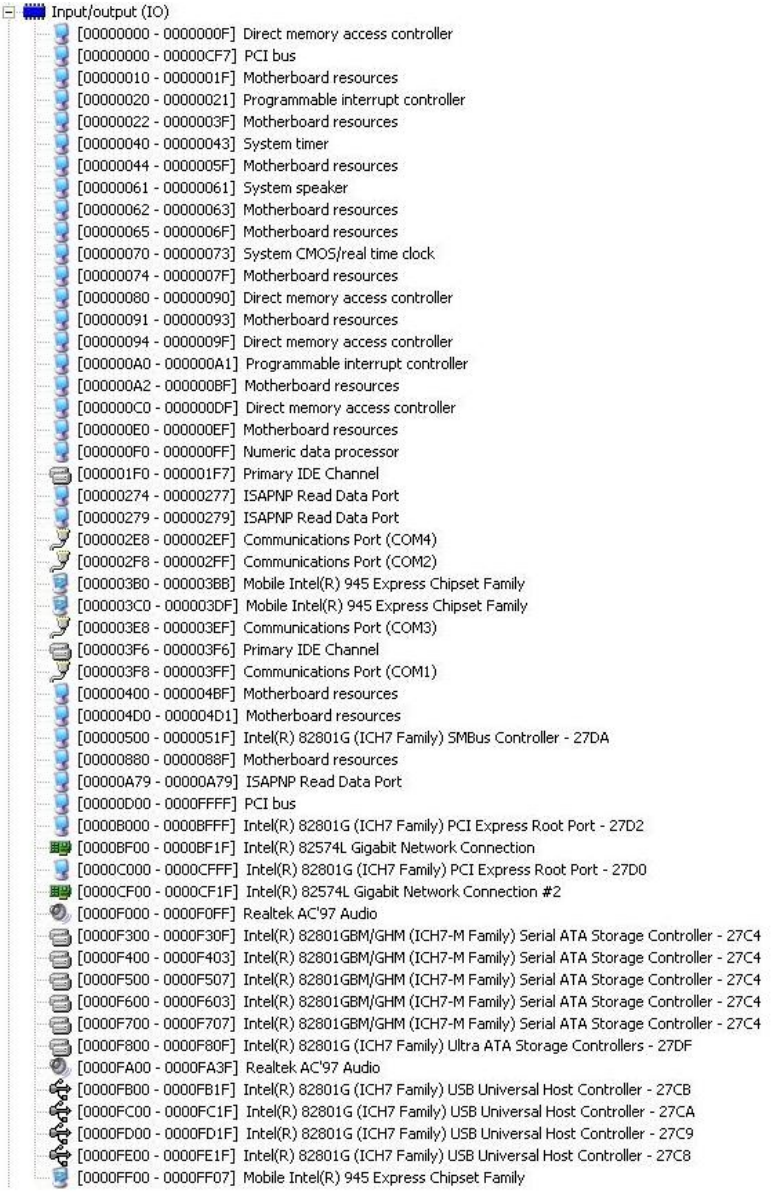
01h: IRQ1

00h: no interrupt selected

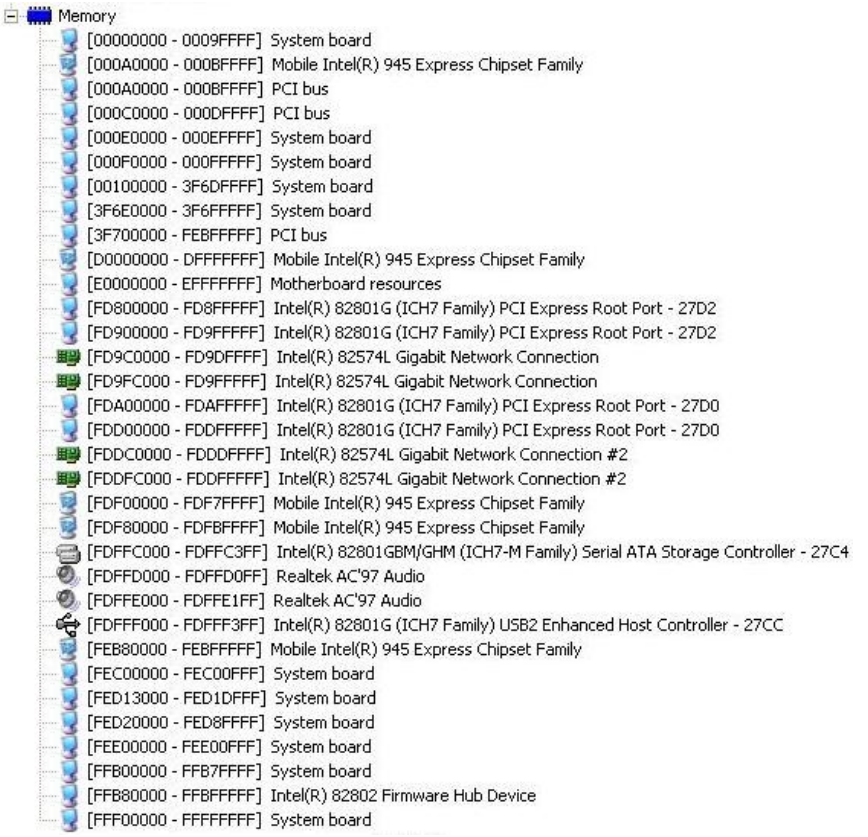
Appendix C

I/O Information

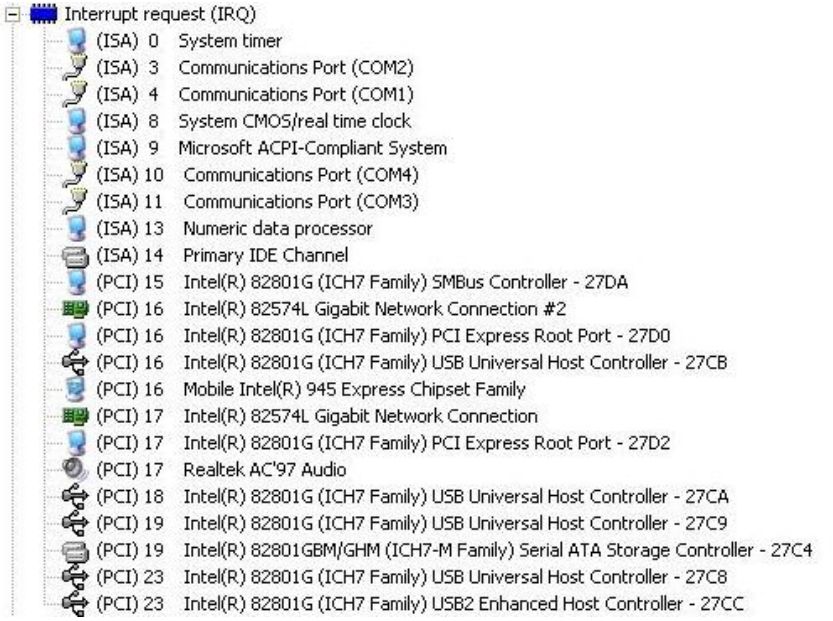
C.1 I/O Address Map



C.2 1st MB Memory Address Map



C.3 IRQ Mapping Chart



C.4 DMA Channel Assignments

Appendix D

Mating Connectors

D.1 List of Mating Connectors and Cables

Connector Label	Function	Mating Connector		Available Cable	Cable P/N
		Vendor	Model no		
CN1	Front Panel Connector	LIAN TAY	1.25mm Pitch 10 pins (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)	N/A	N/A
CN3	LVDS Connector	Hirose	1.25mm Pitch 30 pins (CATCH H716 or compatible)	N/A	N/A
CN4	Standby power input	JST	2.54mm Pitch 3 pins (JST XHP-3 or compatible)	Power input cable	170220020B
CN5	Power Connector	LIAN TAY	4.2mm pitch 4pins (LIAN TAY H756-04 or compatible)	Power cable	1702040151
CN6	Touch Screen Connector	LIAN TAY	1.0mm pitch 9pins (LIAN TAY H746-09 or compatible)	N/A	N/A
CN7	Audio Connector	CATCH	2.0mm pitch 14pins (CATCH H709-2 or compatible)	Audio Cable	1700140510
CN9	LVDS Connector	Hirose	1.25mm Pitch 30 pins (CATCH H716 or compatible)	N/A	N/A
CN11	TV-out Connector	CATCH	2.00mm Pitch 8 pins (CATCH	TV-Out Cable	1700080180

			H754-2x4 or compatible)		
CN12	USB Connector	CATCH	2.00mm Pitch 10 pins (CATCH H754-2x5 or compatible)	USB Cable	1709100208
CN13	LCD Inverter Connector	CATCH	2.0mm pitch 5 pin (CATCH HS-5P-2.0 or compatible)	N/A	N/A
CN14	LPT port Connector	CATCH	2.00mm Pitch 26 pins (CATCH H754-2x13 or compatible)	LPT cable	1701260308
CN15	System Fan Connector	HoBase	2.54mm pitch 3 pins (HoBase 2543-WS-3 or compatible)	N/A	N/A
CN16	Digital I/O Connector	CATCH	2.00mm Pitch 10 pins (CATCH H754-2x5 or compatible)	N/A	N/A
CN17	Power Output Connector	HoBase	2.54mm pitch 4 pins (HoBase 2543-H-4 or compatible)	Power output cable	1702040109
CN19	PS2 Keyboard/Mouse Connector	CATCH	2.0mm pitch 6 pins (CATCH MD-6PS or compatible)	Keyboard / Mouse Cable	1700060152
CN21	COM3 Connector	LIAN TAY	1.25mm pitch 9 pins (LIAN TAY H752-09 or compatible)	COM Cable	1701090150
CN22	COM4 Connector	LIAN TAY	1.25mm pitch 9 pins (LIAN TAY H752-09 or compatible)	COM Cable	1701090150

IDE1	Primary EIDE Connector	CATCH	2.00mm Pitch 44 pins (CATCH H820-2 or compatible)	EIDE Cable	1701440500