

EMB-9459T A2.0

Onboard Intel® Atom™ N270

Processor

Mini-ITX

Realtek 8111C Ethernet

8 USB2.0, 6 COM, 1 Parallel

1 PCI, 1 Mini PCI, 2 PCI-E

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Packing List

(Standard, not bulk pack)

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

- 1 1701400453 IDE Cable
- 1 9657666600 Jumper Cap
- 1 1709070500 Serial ATA Cable
- 1 1702151200 Onboard Serial ATA Power Cable
- 1 M209459000 Metal I/O Bracket
- 1 Quick Installation Guide
- 1 Utility CD
- 1 EMB-9459T A2.0

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 EMB-9459T A2.0 supports Intel® Atom™ N270 processor which when paired with the Intel® 945GSE + ICH7M chipset offers a high performance computing platform with low power consumption. This new product supports 240-pin DDR2 DIMM at speeds of 400/533, up to 2GB. One CompactFlash™, two SATA ports and one EIDE interfaces provide ample storage. With dual Gigabit Ethernet, six COM ports, eight USB2.0, one parallel port, the EMB-9459T A2.0 meets the requirements of today's demanding applications.

Display requirements are met with an abundance of interfaces such as CRT, TV-out, 18-bit dual-channel LVDS, and 24-bit dual-channel LVDS. Simultaneous / Dual View are available in LCD/CRT, LCD/LCD, CRT/TV, LCD/ TV configurations. Display memory is shared from the system memory up to 224MB/ DVMT3.0.

With all of its integrated features, the EMB-9459T A2.0 strikes a balance of performance and price. This versatile product targets Industrial Automation, Entertainment, Networking, KIOSK/POS, Transportation, Banking, Healthcare and Digital Signage applications that require high performance and high reliability.

1.2 Features

- Onboard Intel® Atom™ N270 Processor (Fanless)
- Intel® 945GSE + ICH7M
- DDR2 400/533 Memory, Max. 2GB
- Gigabit Ethernet x 2 or 10/100Base-TX x 2
- CRT, TV-out, 18-bit Dual-channel LVDS and 24-bit Dual-channel LVDS
- HD 2CH Audio (Optional 5.1CH S/PDIF)
- SATA II x 2, EIDE x 1 & CompactFlash Type II x 1
- USB2.0 x 8 (One in Mini Card), COM x 6, Parallel x 1
- PCI x 1, Mini-PCI x 1, Mini-card x 1, PCI-E [x1] x 2 in PCI-E [x4] (Through Riser Card)
- +12V Only Operation
- Onboard SATA Power Connector x 1
- Optional TPM

1.3 Specifications

System

- Processor Supports onboard Intel[®] Atom[™] N270 Processor 1.6GHz, FSB533MHz
- System Memory 240-pin DDR2 DIMM x 1, DDR2 400/533 up to 2GB
- Chipset Intel[®] 945GSE + ICH7M
- I/O Chipset ITE8712
- Ethernet Realtek 8111C for 10/100/1000Base-TX, RJ-45 x 2; Realtek 8102E for 10/100Base-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 and temperature monitoring
- Expansion Interface PCI x 1, Mini PCI x 1, Mini-card x 1, PCI-E [x1] x 2 in PCI-E [x4] (Through Riser Card)
- Battery Lithium battery
- Power Requirement DC 12V
- Power Consumption Intel[®] Atom[™] N270 (Typical) 0.65A @ +12V, 1.02A @ +5V
- Board Size 6.7"(L) x 6.7"(W) (170 mm x 170 mm)

- Gross Weight 1.2 lb (0.5 Kg)
- Operating Temperature 32°F~ 140°F (0°C ~ 60°C)
- Storage Temperature -40°F~ 176°F (-40°C ~ 80°C)
- Operating Humidity 0%~90% relative humidity, non-condensing

Display: Supports CRT/LCD, CRT/TV, LCD/TV simultaneous / dual view displays

- Chipset Intel® 945GSE integrated
- Memory Shared system memory up to 224MB w/ DVMT3.0
- Resolution Up to 2048 x 1536 @ 32bpp colors for CRT; Up to 1600 x 1200 @ 18bpp colors for LCD
- LCD Interface 18-bit dual-channel LVDS, 24-bit dual-channel LVDS
- TV-out Supports NTSC and PAL standard, S-Terminal and Composite Video

I/O

- Storage EIDE x 1 (UDMA100 for one device, slave only), SATA II x 2, Type II CompactFlash x 1
- Serial Port RS-232 x 5, RS-232/422/485 x 1
- Audio MIC-In, Line-out (optional Line-in), Stereo amplifier included
- USB USB 2.0 x 8 (One in Mini Card)
- Parallel Port Supports SPP/ EPP/ ECP mode
- PS/2 Port Keyboard x 1, Mouse x1

Chapter

2

Quick Installation Guide

Notice:

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



2.1 Safety Precautions

Warning!

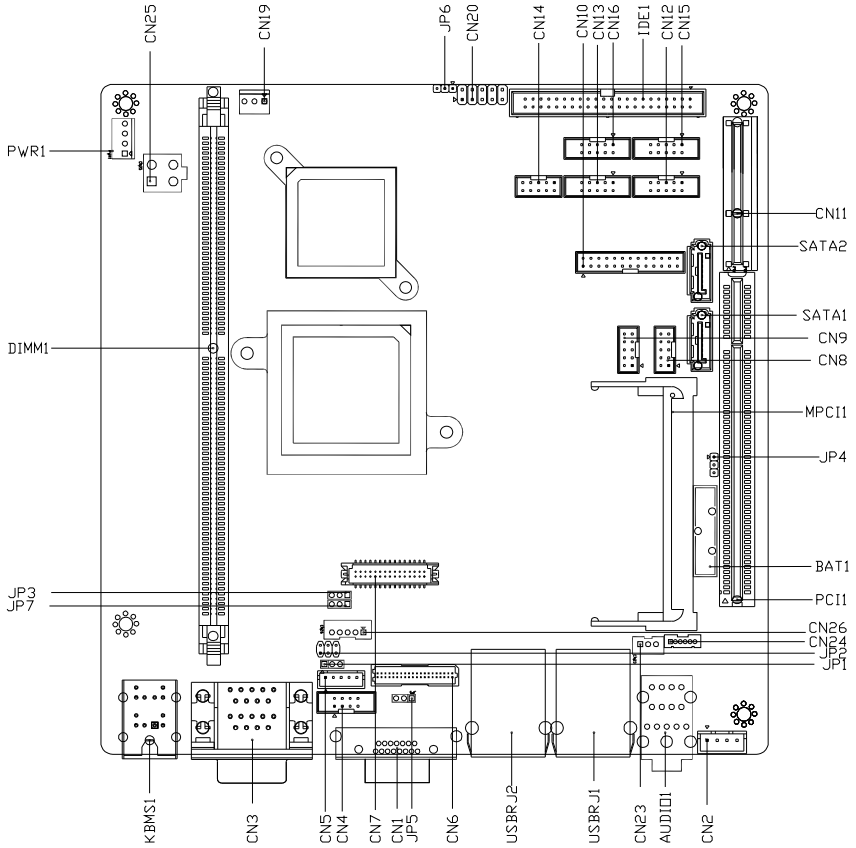
Always completely disconnect the power cord from your board whenever you are working on it. Do not make connections while the power is on, because a sudden rush of power can damage sensitive electronic components.

Caution!

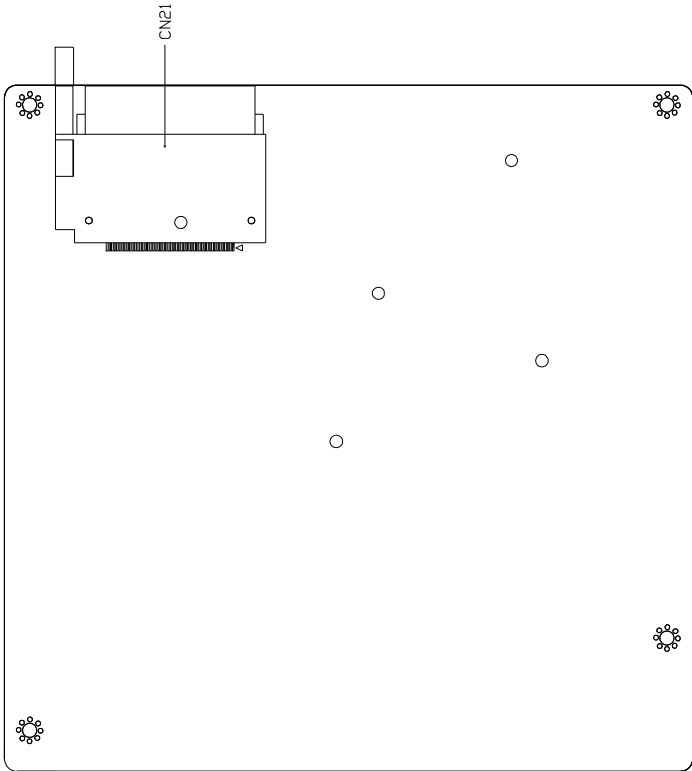
Always ground yourself to remove any static charge before touching the board. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not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

2.2 Location of Connectors and Jumpers

Component Side

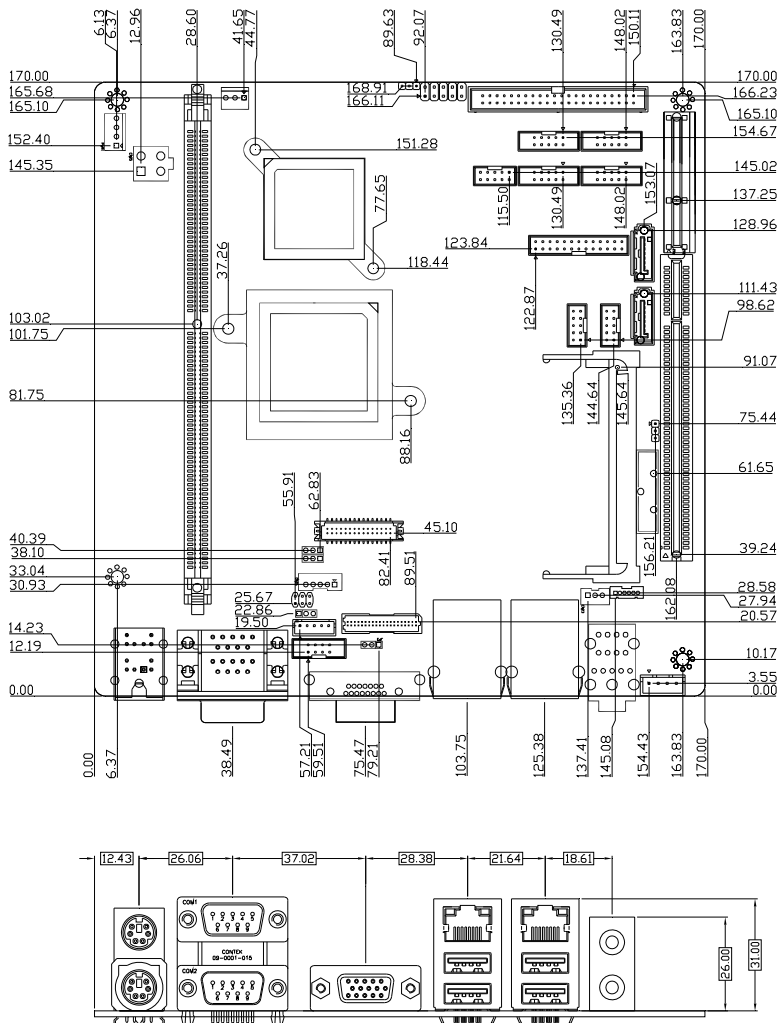


Solder Side

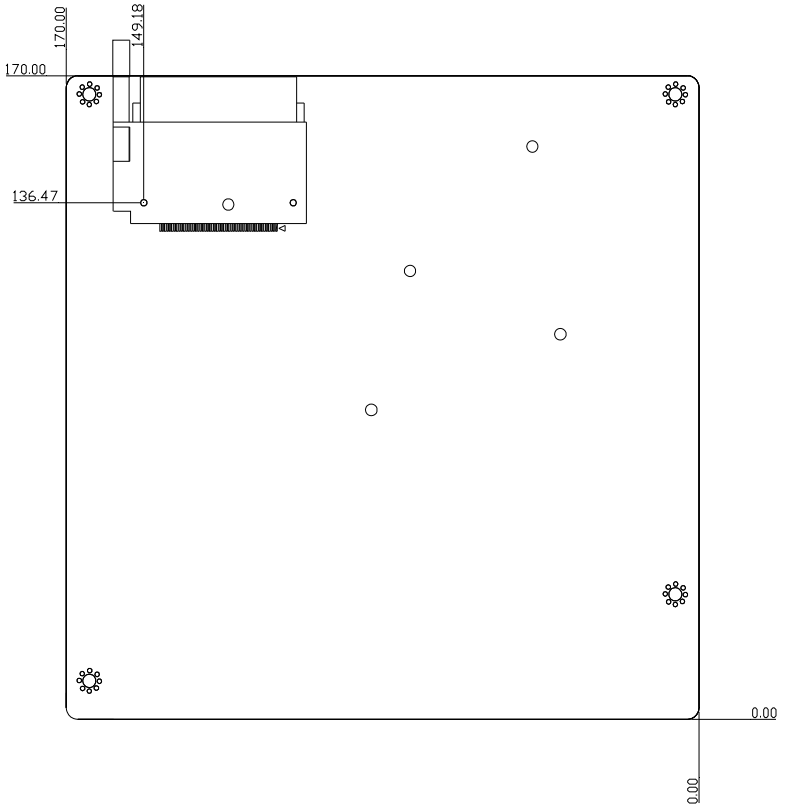


2.3 Mechanical Drawing

Component Side



Solder Side



2.4 List of Jumpers

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

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

Label	Function
JP1	1 st LVDS Inverter Voltage for 18 Bits LCD Selection
JP2	COM2 Ring +5V/+12V Selection
JP3	1 st LVDS Voltage for 18 Bits LCD Selection
JP4	Clear CMOS
JP5	2 nd LVDS Voltage for 24 Bits LCD Selection
JP6	AT/ATX Power Mode Selection
JP7	2 nd LVDS Inverter Voltage for 24 Bits LCD 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 of the board's connectors:

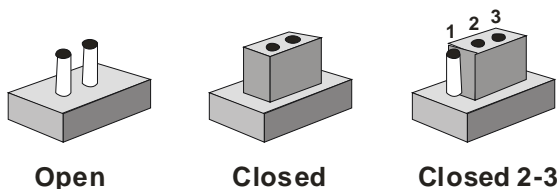
Label	Function
CN1	VGA Display Connector
CN2	Audio 2Watt Speaker Output
CN3	COM1/COM2 Connector
CN4	TV Output Connector
CN5	1 st LVDS Inverter Connector for 18 Bits LCD
CN6	2 nd LVDS Connector for 24 Bits LCD
CN7	1 st LVDS Connector for 18 Bits LCD
CN8	USB Port 4/5 Connector
CN9	USB Port 6 Connector
CN10	LPT Port Connector

CN11	PCI-Express Slot
CN12	COM5 RS-232 Serial Port Connector
CN13	COM6 RS-232 Serial Port Connector
CN14	Digital I/O
CN15	COM4 RS-232 Serial Port Connector
CN16	COM3 RS-232 Serial Port Connector
CN19	3Pin +12V Fan Connector
CN20	Front Panel Connector
CN21	Compact Flash Slot
CN23	SPDIF Connector
CN24	Audio Connector(Surround)
CN25	Power Input Connector
CN26	2 nd LVDS Inverter Connector for 24 Bits LCD
CN27	UIM Card Slot
CN31	MINI Card Slot (with USB Port 7)
AUDIO1	Audio Connector
KBMS1	PS2 Keyboard/Mouse Connector
PWR1	HDD Power Connector (12V/5V)
USBRJ1	USB Port 2/3 & LAN1 Connector
USBRJ2	USB Port 0/1 & LAN2 Connector
IDE1	44Pin 2.0mm IDE Connector (Slave Only)
SATA1/SATA2	Serial ATA Connector
DIMM1	DDR2 DIMM Slot
PCI1	PCI Slot Connector
MPC11	Mini PCI Connector

2.6 Setting Jumpers

You configure your card to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” a jumper you connect the pins with the clip.

To “open” a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2 and 3. In this case you would connect either pins 1 and 2 or 2 and 3.



A pair of needle-nose pliers may be helpful when working with jumpers.

If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any change.

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

2.7 1st LVDS Inverter Voltage for 18 Bits LCD Selection (JP1)

JP1	Function
1-2	+5V (Default)
2-3	+12V

2.8 COM2 Ring/+5V/+12V Selection (JP2)

JP2	Function
1-2	+12V
3-4	+5V
5-6	Ring (Default)

2.9 1st LVDS Voltage for 18 Bits LCD Selection (JP3)

JP3	Function
1-2	+5V
2-3	+3.3V (Default)

2.10 Clear CMOS (JP4)

JP4	Function
1-2	Normal (Default)
2-3	Clear CMOS

2.11 2nd LVDS Voltage for 24 Bits LCD Selection (JP5)

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

2.12 AT/ATX Power Mode Selection (JP6)

JP6	Function
1-2	AT
2-3	ATX (Default)

2.13 2nd LVDS Inverter Voltage for 24 Bits LCD Selection (JP7)

JP7	Function
1-2	+5V (Default)
2-3	+12V

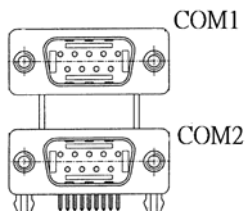
2.14 VGA Display Connector (CN1)

Pin	Signal	Pin	Signal
25	GND	26	GND
29	DDCCLK	32	CRT_HSYNC
33	GREEN	34	GND
37	CRT_PLUG#	36	GND
39	BLUE	38	CRT_VSYNC
41	DDCDATA	40	GND
43	GND	42	RED

2.15 Audio 2Watt Speaker Output (CN2)

Pin	Signal
1	SPK- R+
2	SPK- R-
3	SPK- L+
4	SPK- L-

2.16 COM1 RS-232 & COM2 RS-232/422/485 Connector (CN3)



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

2.17 TV Out Connector (CN4)

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

2.18 1st LVDS Inverter Connector for 18 Bits LCD (CN5)

Pin	Signal
1	VCC of LCD inverter (+5V/+12V)
2	Adjust backlight
3	GND
4	GND
5	ENBKL

Note: Pin1 max rating is 12V @ 0.5A

2.19 2nd LVDS Connector for 24 Bits LCD (CN6)

Pin	Signal	Pin	Signal
1	ENBKL	2	N.C

3	PPVCC	4	GND
5	LVDS3_TXCLK-	6	LVDS3_TXCLK+
7	PPVCC	8	GND
9	LVDS3_TX0-	10	LVDS3_TX0+
11	LVDS3_TX1-	12	LVDS3_TX1+
13	LVDS3_TX2-	14	LVDS3_TX2+
15	LVDS3_TX3-	16	LVDS3_TX3+
17	N.C	18	N.C
19	LVDS4_TX0-	20	LVDS4_TX0+
21	LVDS4_TX1-	22	LVDS4_TX1+
23	LVDS4_TX2-	24	LVDS4_TX2+
25	LVDS4_TX3	26	LVDS4_TX3+
27	PPVCC	28	GND
29	LVDS4_TXCLK-	30	LVDS4_TXCLK+

Note: For VLCD (pin 3, 7, 27), the max. rating of each pin is 5V@0.5A

2.20 1st LVDS Connector for 18 Bits LCD (CN7)

Pin	Signal	Pin	Signal
1	ENBKL	2	BKLCTL/NC
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+

Note: For VLCD (pin 3, 7, 27), the max. rating of each pin is 5V@0.5A

2.21 USB Port 4/5 Connector (CN8)

Pin	Signal	Pin	Signal
1	+5V	2	GND
3	USBD4-	4	GND
5	USBD4+	6	USBD5+
7	GND	8	USBD5-
9	GND	10	+5V

2.22 USB Port 6 Connector (CN9)

Pin	Signal	Pin	Signal
1	+5V	2	GND
3	USBD6-	4	GND
5	USBD6+	6	N.C
7	GND	8	N.C
9	GND	10	+5V

2.23 LPT Port Connector (CN10)

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

2.24 PCI-Express Slot (CN11)

Pin	Signal	Pin	Signal
A1	N.C	B1	+12V
A2	+12V	B2	+12V
A3	+12V	B3	+12V
A4	GND	B4	GND
A5	N.C	B5	SMBCLK
A6	N.C	B6	SMBDAT
A7	N.C	B7	GND
A8	N.C	B8	+3.3V
A9	+3.3V	B9	N.C
A10	+3.3V	B10	+3.3VSB
A11	PCIE_RST#	B11	PCIE_WAKE#
A12	GND	B12	N.C
A13	PCIE_CLK	B13	GND
A14	PCIE_CLK#	B14	PCIE_TXP3
A15	GND	B15	PCIE_TXN3
A16	PCIE_RXP3	B16	GND
A17	PCIE_RXN3	B17	N.C

A18	GND	B18	GND
A19	N.C	B19	PCIE_TXP4
A20	GND	B20	PCIE_TXN4
A21	PCIE_RXP4	B21	GND
A22	PCIE_RXN4	B22	GND
A23	GND	B23	PCIE_TXP5
A24	GND	B24	PCIE_TXN5
A25	PCIE_RXP5	B25	GND
A26	PCIE_RXN5	B26	GND
A27	GND	B27	PCIE_TXP6
A28	GND	B28	PCIE_TXN6
A29	PCIE_RXP6	B29	GND
A30	PCIE_RXN6	B30	N.C
A31	GND	B31	N.C
A32	N.C	B32	GND

2.25 COM5 RS-232 Serial Port Connector (CN12)

Pin	Signal	Pin	Signal
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI	10	N.C

2.26 COM6 RS-232 Serial Port Connector (CN13)

Pin	Signal	Pin	Signal
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR

7	RTS	8	CTS
9	RI	10	N.C

2.27 Digital I/O (CN14)

This connector offers 4-pair of digital I/O functions and address is 2A1H. The pin definitions are illustrated below:

Pin	Signal	Pin	Signal
1	Digital- IN/OUT	2	Digital- IN/OUT
3	Digital- IN/OUT	4	Digital- IN/OUT
5	Digital- IN/OUT	6	Digital- IN/OUT
7	Digital- IN/OUT	8	Digital- IN/OUT
9	+5V	10	GND

The pin definitions and registers mapping are illustrated below:
Address: 2A1H

4 in / 4 out

Pin1	Pin2	Pin3	Pin4	Pin5	Pin6	Pin7	Pin8
GPI 27	GPI 26	GPI 25	GPI 24	GPO 23	GPO 22	GPO 21	GPO 20
MSB							LSB

8 in

Pin1	Pin2	Pin3	Pin4	Pin5	Pin6	Pin7	Pin8
GPI 27	GPI 26	GPI 25	GPI 24	GPI 23	GPI 22	GPI 21	GPI 20
MSB							LSB

8 out

Pin1	Pin2	Pin3	Pin4	Pin5	Pin6	Pin7	Pin8
GPO 27	GPO 26	GPO 25	GPO 24	GPO 23	GPO 22	GPO 21	GPO 20
MSB							LSB

Note: The max. rating of Pin1 ~ Pin8 is 5V @ 8mA; the max. rating of Pin9 is 5V @ 0.5A

2.28 COM4 RS-232 Serial Port Connector (CN15)

Pin	Signal	Pin	Signal
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI	10	N.C

2.29 COM3 RS-232 Serial Port Connector (CN16)

Pin	Signal	Pin	Signal
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI	10	N.C

2.30 CPU FAN Connector (CN19)

Pin	Signal
1	GND
2	+5V(Optional)/+12V
3	FAN Sense

2.31 Front Panel Connector (CN20)

Pin	Signal	Pin	Signal
1	Power On Button (-)	2	Power On Button (+)
3	IDE LED (-)	4	IDE LED (+)
5	External Buzzer (-)	6	External Buzzer (+)
7	Power LED (-)	8	Power LED (+)
9	Reset Switch (-)	10	Reset Switch (+)

2.32 CompactFlash Slot (CN21)

Pin	Signal	Pin	Signal
1	GND	26	GND
2	PDD3	27	PDD11
3	PDD4	28	PDD12
4	PDD5	29	PDD13
5	PDD6	30	PDD14
6	PDD7	31	PDD15
7	PDCS1#	32	PDCS3#
8	GND	33	GND
9	GND	34	PDIOR#
10	GND	35	PDIOW#
11	GND	36	+3.3V
12	GND	37	IRQ14
13	+3.3V	38	+3.3V
14	GND	39	CSEL#
15	GND	40	N.C
16	GND	41	IDERST#
17	GND	42	PIORDY
18	PDA2	43	DMAREQ
19	PDA1	44	DMACK#
20	PDA0	45	DASP
21	PDD0	46	PDIAG#
22	PDD1	47	PDD8
23	PDD2	48	PDD9
24	N/C	49	PDD10
25	GND	50	GND

2.33 SPDIF Connector (CN23)

Pin	Signal
1	SPDIFO-N
2	GND
3	SPDIFI-N

2.34 Audio Connector (Surround) (CN24)

Pin	Signal
1	SURROUND-R
2	SURROUND-L
3	GND
4	GND
5	LFEOUT
6	CENOUT

2.35 Power Input Connector (CN25)

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

2.36 2nd LVDS Inverter Connector for 24 Bits LCD (CN26)

Pin	Signal
1	VCC of LCD inverter (+5V/+12V)
2	Adjust backlight
3	GND
4	GND
5	ENBKL

Note: The max. rating of Pin1 is 12V @ 0.5A.

2.37 UIM Card Slot (CN27)

Pin	Signal	Pin	Signal
1	UIM_PWR	2	GND
3	UIM_RESET	4	UIM_VPP
7	UIM_CLK	6	UIM_DATA

2.38 HDD Power Connector (PWR1)

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

Note: The max. rating of Pin1 is 12V @ 1A; the max. rating of Pin4 is 5V @ 1A.

2.39 44Pin 2.0mm IDE Connector (IDE1)

Pin	Signal	Pin	Signal
1	IDERST#	2	GND
3	D7	4	D8
5	D6	5	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	N.C
33	A1	34	Cable Detect
35	A0	36	A2
37	CS1#	38	CS3#
39	ACT#	40	GND
41	+5V	42	+5V
43	GND	44	N.C

2.40 Serial ATA Connector (SATA1)

Pin	Signal
1	GND
2	TX0+
3	TX0-
4	GND
5	RX0-
6	RX0+
7	GND

2.41 Serial ATA Connector (SATA2)

Pin	Signal
1	GND
2	TX1+
3	TX1-
4	GND
5	RX1-
6	RX1+
7	GND

2.42 DDR2 DIMM Slot (DIMM1)

Standard Specification

2.43 PCI Slot Connector (PCI1)

Standard Specification

2.44 Mini PCI Connector (MPCI1)

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

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 EMB-9459T A2.0 CMOS memory has an integral lithium battery backup for data retention. However, you will need to replace the complete unit when it finally runs down.

3.2 Award BIOS Setup

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

Entering Setup

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

Standard CMOS Features

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

Advanced BIOS Features

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

Advanced Chipset Features

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

Integrated Peripherals

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

Power Management Setup

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

PnP/PCI Configurations

This entry appears if your system supports PnP/PCI.

PC Health Status

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

Frequency/Voltage Control

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

Load Fail-Safe Defaults

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

Load Optimized Defaults

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

Set Supervisor/User Password

Use this menu to set Supervisor/User Passwords.

Save and Exit Setup

Save CMOS value changes to CMOS and exit setup.

Exit Without Saving

Abandon all CMOS value changes and exit setup.

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

Note:

When Testing PXE boot with LAN 1 (USB RJ1) and SATA HDD, BIOS setting needs to be adjusted as below for preventing system hang:
Integrated peripheral --> on-chip IDE device --> on-chip Serial ATA --> "COMBINE MODE" or "SATA ONLY"

And this adjustment will be only required with SATA HDD, No need with IDE PATA HDD

Chapter

4

**Driver
Installation**

The EMB-9459T A2.0 comes with an AutoRun CD-ROM that contains all drivers and utilities that can help you to install the driver automatically.

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

Follow the sequence below to install the drivers:

- Step 1 – Install INF Driver
- Step 2 – Install VGA Driver
- Step 3 – Install Audio Device
- Step 4 – Install LAN Driver
- Step 5 – Install TPM Driver

Please read instructions below for further detailed installations.

4.1 Installation:

Insert the EMB-9459T A2.0 CD-ROM into the CD-ROM drive. And install the drivers from Step 1 to Step 5 in order.

Step 1 – Install INF Driver

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

Step 2 – Install VGA Driver

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

Step 3 –Install Audio Device

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

Step 4 –Install LAN Driver

1. Click on the **Step 4 –LAN** folder and select the OS folder your system is
2. Double click on the **setup.exe** located in each OS folder
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

Step 5 –Install TPM Driver

1. Click on the **Step 5 – TPM** 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

Appendix

A

Programming the Watchdog Timer

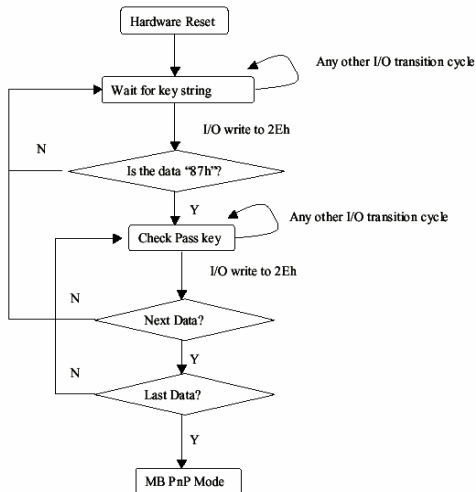
A.1 Programming

EMB-9459T A2.0 utilizes ITE 8712 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 8712 enters the normal mode with all logical devices disabled except KBC. The initial state (enable bit) of this logical device (KBC) is determined by the state of pin 121 (DTR1#) at the falling edge of the system reset during power-on reset.



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

(1) Enter the MB PnP Mode

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

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

(2) Modify the Data of the Registers

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

(3) Exit the MB PnP Mode

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

WatchDog Timer Configuration Registers

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

Configure Control (Index=02h)

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

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

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

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

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

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

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

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

A.2 IT8712 Watchdog Timer Initial Program

```
.MODEL SMALL
```

```
.CODE
```

Main:

```
CALL Enter_Configuration_mode
```

```
CALL Check_Chip
```

```
mov cl, 7
```

```
call Set_Logic_Device
```

```
;time setting
```

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

```
dec al
```

Watch_Dog_Setting:

```
;Timer setting
```

```
mov al, cl
```

```
mov cl, 73h
```

```
call Superio_Set_Reg
```

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

```
mov al, 0f0h
```

```
mov cl, 71h
```

```
call Superio_Set_Reg
```

```
;unit is second.
```

```
mov al, 0C0H
```

```
mov cl, 72h
```

```
call Superio_Set_Reg
```

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

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

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

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

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

RET

Exit_Configuration_Mode ENDP

Check_Chip PROC NEAR

MOV AL,20h

CALL Read_Configuration_Data

CMP AL,87h

JNE Not_Initial

MOV AL,21h

CALL Read_Configuration_Data

CMP AL,12h

JNE Not_Initial

Need_Initial:

STC

RET

Not_Initial:

CLC

RET

Check_Chip ENDP

Read_Configuration_Data PROC NEAR

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

OUT DX,AL

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

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

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

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

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

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

END Main

Note: Interrupt level mapping

0Fh-Dh: not valid

0Ch: IRQ12

.

.

03h: IRQ3

02h: not valid

01h: IRQ1

00h: no interrupt selected

Appendix

B

I/O Information

B.1 I/O Address Map

Address Range	Device Name
[00000000 - 00000CF7]	PCI bus
[00000000 - 0000000F]	Direct memory access controller
[00000010 - 0000001F]	Motherboard resources
[00000020 - 00000021]	Programmable interrupt controller
[00000022 - 0000003F]	Motherboard resources
[00000040 - 00000043]	System timer
[00000044 - 0000004D]	Motherboard resources
[00000050 - 0000005E]	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
[00000290 - 0000029F]	Motherboard resources
[000002E0 - 000002E7]	Communications Port (COM6)
[000002E8 - 000002EF]	Communications Port (COM4)
[000002F0 - 000002F7]	Communications Port (COM5)
[000002F8 - 000002FF]	Communications Port (COM2)
[00000378 - 0000037F]	Printer Port (LPT1)
[00000380 - 0000038B]	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
[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 - 27D0
[0000C000 - 0000CFFF]	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D6
[0000CE00 - 0000CEFF]	Realtek RTL8168C(P)/8111C(P) PCI-E Gigabit Ethernet NIC #2
[0000D000 - 0000DFFF]	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D4
[0000DE00 - 0000DEFF]	Realtek RTL8168C(P)/8111C(P) PCI-E Gigabit Ethernet NIC
[0000F500 - 0000F50F]	Standard Dual Channel PCI IDE Controller
[0000F600 - 0000F603]	Standard Dual Channel PCI IDE Controller
[0000F700 - 0000F707]	Standard Dual Channel PCI IDE Controller
[0000F800 - 0000F803]	Standard Dual Channel PCI IDE Controller
[0000F900 - 0000F907]	Standard Dual Channel PCI IDE Controller
[0000FA00 - 0000FA0F]	Standard Dual Channel PCI IDE Controller
[0000FB00 - 0000FB1F]	Standard Universal PCI to USB Host Controller
[0000FC00 - 0000FC1F]	Standard Universal PCI to USB Host Controller
[0000FD00 - 0000FD1F]	Standard Universal PCI to USB Host Controller
[0000FE00 - 0000FE1F]	Standard Universal PCI to USB Host Controller
[0000FF00 - 0000FF07]	Mobile Intel(R) 945 Express Chipset Family

B.2 Memory Address Map

Address Range	Device
[00000000 - 0009FFFF]	System board
[000A0000 - 000BFFFF]	PCI bus
[000A0000 - 000BFFFF]	Mobile Intel(R) 945 Express Chipset Family
[000C0000 - 000DFFFF]	PCI bus
[000E0000 - 000EFFFF]	System board
[000F0000 - 000FFFFF]	System board
[00100000 - 0F6DFFFF]	System board
[0F6E0000 - 0F6FFFFF]	System board
[0F750000 - FEBFFFFF]	PCI bus
[D0000000 - DFFFFFFF]	Mobile Intel(R) 945 Express Chipset Family
[E0000000 - EFFFFFFF]	Motherboard resources
[FD600000 - FD6FFFFF]	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D0
[FD900000 - FD9FFFFF]	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D0
[FDA00000 - FDAFFFFF]	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D6
[FDAF0000 - FDAFFFFF]	Realtek RTL8168C(P)/8111C(P) PCI-E Gigabit Ethernet NIC #2
[FDB00000 - FDBFFFFF]	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D6
[FDBFF000 - FDBFFFFF]	Realtek RTL8168C(P)/8111C(P) PCI-E Gigabit Ethernet NIC #2
[FDC00000 - FDCFFFFF]	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D4
[FDCF0000 - FDCFFFFF]	Realtek RTL8168C(P)/8111C(P) PCI-E Gigabit Ethernet NIC
[FDD00000 - FDDFFFFF]	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D4
[FDDFF000 - FDDFFFFF]	Realtek RTL8168C(P)/8111C(P) PCI-E Gigabit Ethernet NIC
[FDE80000 - FDEFFFFF]	Mobile Intel(R) 945 Express Chipset Family
[FDF80000 - FDFBFFFF]	Mobile Intel(R) 945 Express Chipset Family
[FDFF8000 - FDFFBFFF]	Microsoft UAA Bus Driver for High Definition Audio
[FDFFE000 - FDFFE3FF]	Standard Dual Channel PCI IDE Controller
[FDFFF000 - FDFFF3FF]	Standard Enhanced PCI to USB Host Controller
[FEB80000 - FEBFFFFF]	Mobile Intel(R) 945 Express Chipset Family
[FEC00000 - FEC0FFFF]	System board
[FED13000 - FED1DFFF]	System board
[FED20000 - FED3FFFF]	System board
[FED40000 - FED44FFF]	PCI bus
[FED45000 - FED8FFFF]	System board
[FEE00000 - FEE0FFFF]	System board
[FFB00000 - FFB7FFFF]	System board
[FFB80000 - FFBFFFFF]	Intel(R) 82802 Firmware Hub Device
[FFF00000 - FFFFFFFF]	System board

B.3 IRQ Mapping Chart

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 (COM3)
(ISA) 10	Communications Port (COM5)
(ISA) 11	Communications Port (COM4)
(ISA) 11	Communications Port (COM6)
(ISA) 13	Numeric data processor
(ISA) 14	Primary IDE Channel
(PCI) 15	Intel(R) 82801G (ICH7 Family) SMBus Controller - 27DA
(PCI) 16	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D0
(PCI) 16	Microsoft UAA Bus Driver for High Definition Audio
(PCI) 16	Mobile Intel(R) 945 Express Chipset Family
(PCI) 16	Standard Universal PCI to USB Host Controller
(PCI) 18	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D4
(PCI) 18	Realtek RTL8168C(P)/8111C(P) PCI-E Gigabit Ethernet NIC
(PCI) 18	Standard Universal PCI to USB Host Controller
(PCI) 19	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D6
(PCI) 19	Realtek RTL8168C(P)/8111C(P) PCI-E Gigabit Ethernet NIC #2
(PCI) 19	Standard Dual Channel PCI IDE Controller
(PCI) 19	Standard Universal PCI to USB Host Controller
(PCI) 23	Standard Enhanced PCI to USB Host Controller
(PCI) 23	Standard Universal PCI to USB Host Controller

B.4 DMA Channel Assignments

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	DVI+VGA Connector	Astron	45Pin-90D-DIP (Astron 1860044-006-R or compatible)	N/A	N/A
CN2	Audio 2Watt Speaker output	CATCH	WAFER BOX-4Pin-180D-Pitch 2.5mm(CATC H.1191-700-04 S compatible)	N/A	N/A
CN3	COM1and COM2 Connector	Contek	D-SUB 9 Connector Dual Port (Contek.B-DG N10910101 or compatible)	N/A	N/A
CN4	TV_out Connector	CATCH	2.00mm Pitch 8 pins (CATCH H754-2x4 or compatible)	TV-Out Cable	1700080180
CN5	LCD Inverter Connector	CATCH	2.0mm pitch 5 pin (CATCH HS-5P-2.0 or compatible)	N/A	N/A
CN6	LVDS Connector	E-Call	Board-Wire Connector-30P -Pitch=1.25mm(E-call.0110-01-553-300 or compatible)	N/A	N/A

CN7	LVDS Connector	E-Call	Board-Wire Connector-30P -Pitch=1.25mm m(E-call.0110-01-553-300 or compatible)	N/A	N/A
CN8	USB4 & USB5 Connector	CATCH	2.00mm Pitch 10 pins (CATCH H754-2x5 or compatible)	USB Cable	1709100208
CN9	USB6 Connector	CATCH	2.00mm Pitch 10 pins (CATCH H754-2x5 or compatible)	USB Cable	1709100208 (But only one USB function)
CN10	LPT port Connector	CATCH	2.00mm Pitch 26 pins (CATCH. A003-268 or compatible)	LPT cable	1701260200
CN11	PCI Express X4 Connector	FOXCONN	PCI-E X4 (FOXCONN.2 EG03217-D2D -DF or compatible)	N/A	N/A
CN12	COM5 Connector	CATCH	2.00mm Pitch 10 pins (CATCH H754-2x5 or compatible)	Serial Port Cable	1701100206
CN13	COM6 Connector	CATCH	2.00mm Pitch 10 pins (CATCH H754-2x5 or compatible)	Serial Port Cable	1701100206
CN14	Digital I/O Connector	CATCH	2.00mm Pitch 10 pins (CATCH H754-2x5 or compatible)	N/A	N/A
CN15	COM4 Connector	CATCH	2.00mm Pitch 10 pins	Serial Port	1701100206

			(CATCH H754-2x5 or compatible)	Cable	
CN16	COM3 Connector	CATCH	2.00mm Pitch 10 pins (CATCH H754-2x5 or compatible)	Serial Port Cable	1701100206
CN19	FAN Connector	CATCH	2.54mm Pitch 3 pins. (CATCH.1190- 700-03S or compatible)	N/A	N/A
CN20	Front Panel Connector	Ho-Base	2.54mm Pitch 10 pins (Ho-Base 2541-2H-2x5 or compatible)	N/A	N/A
CN23	SPDIF Connector	CATCH	2.00mm pitch 3 pins (CATCH 1192-700-03S or compatible)	SPDIF Cable	1709030150
CN24	Audio Connector (Surround)	CATCH	1.25mm pitch 6 pins(CATCH A003-746 or compatible)	Audio Cable	1700060156