

EMB-6908T

AMD Athlon™ 64/ Athlon 64 x2
(AM2 Socket) Processor,

Mini-ITX

Intel® 82573L, Dual Gigabit Ethernet

PCI-E [x1] x 2 (optional)/

PCI/ Mini PCI/ HD 5.1CH Audio

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Packing List

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

- 1 1701400453 IDE Cable
- 1 1709070500 Serial ATA Cable
- 1 1702150150 Serial ATA Power Cable
- 1 9657666600 Jumper Cap
- 1 M206908T00 I/O Shield, DVI + VGA Type
- 1 Quick Installation Guide
- 1 Utility DVD
- 1 EMB-6908T

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-6908T adopts the latest AMD Athlon (AM2 Socket) processor and AMD M690T+ SB600 chipset for a lower power consumption and higher performance solution. EMB-6908T utilizes two DDRII 240-pin DIMM system memory that supports ECC dual-channel DDRII 533/667 up to 4GB. It is the latest embedded motherboard designed to cope with increasingly heavily worked-loaded embedded systems, such as digital signage, POS (Point of Sales) machines, banking machine, medical instruments, gaming machine, and etc.

The EMB-6908T accommodates two optional PCI-Express [x1] slots, one PCI slot and one Mini PCI slot for a flexible expansion. Moreover, it supports various storages including one EIDE, and four SATA ports. The I/O expansion of EMB-6908T features six COM ports, 10 USB2.0, one Parallel port, one DVI-I port, two Gigabit Ethernet ports, and HD 5.1CH Audio that are enable for expanding system functions.

The EMB-6908T provides numerous features for the embedded systems and will be the best solution for your complicated applications.

1.2 Features

- AMD Athlon 64/ Athlon 64 x2 (AM2 Socket) Processors
- AMD 690E + SB600
- ECC Dual-channel DDRII 533/667 Memory, Up To 4GB
- Gigabit Ethernet x 2
- CRT, Up to 24-bit Dual-channel LVDS LCD, DVI
- HD 5.1CH Audio
- EIDE x 1, SATA x 4
- COM x 6, USB2.0 x 10, 16-bit Digital I/O
- PCI x 1, Mini PCI x 1, PCI-E [x1] x 2 in PCI-E [x4] Slot
(Through Riser Card)
- TPM 1.2 (Optional)
- ATX

1.3 Specifications

System

- Processor AMD Athlon™ 64/ Athlon™ 64 x2 (AM2 Socket)
Processors (Low Power Version Only: Athlon 2000+, Athlon 2600+, Athlon 3400e)
- System Memory 240-pin DDRII DIMM Socket x 2, total up to 4GB (DDRII 533/667), supports ECC function
- Chipset AMD M690E + SB600
- I/O Chipset ITE IT8712F-A/IX-L
- Ethernet Intel® 82573L,
10/100/1000Base-TX,
RJ-45 x 2
- BIOS Award
- Watchdog Timer ITE IT8712F-A/IX-L
- Wake on LAN Yes
- H/W Status Monitoring Supports power supply voltages, fan speed and temperature monitoring
- Power Requirement ATX
- Power Consumption 3000+ 1.8GHz, DDRII 533

- | | |
|-------------------------|--|
| (Typical) | 1GB; 3.19A @ +12V, 2.78A @ +5V |
| ● Board Size | 6.7"(L) x 6.7"(W) (170 mm x 170 mm) |
| ● Gross Weight | 1.32lb (0.6kg) |
| ● 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 |
| ● MTBF (Hours) | 90,000 |

Display: Supports LCD/CRT, LCD/DVI, CRT/DVI

Simultaneous/Dual View Display

- Chipset AMD M690T integrated
- Memory Shared system memory up to 256MB
- Resolution **CRT:** up to 2560 x 1440 @ 75Hz;
LCD: up to 2048 x 1536 (QXGA);
Single Link DVI: up to 1600 x 1200 @ 60Hz with pixel clock 162MHz; up to 1920 x 1200 @ 60Hz with pixel clock 154MHz;
Dual-Link DVI: up to 2560 x

1600 @ 60Hz with pixel clock
268MHz

- LCD Interface Up to 24-bit dual-channel LVDS
- Side Port 1 x 16-bit memory interface,
supports up to 128MB DDRII
800 memory
(TF-EMB-6908T-A12-01 only)

I/O

- Storage EIDE x 1 (one device), SATA x 4
- Serial Port RS-232 x 5, RS-232/422/485 x 1
- Parallel Port SPP/ EPP/ ECP mode
- USB USB2.0 x 10
- PS/2 Port Keyboard x 1, Mouse x 1
- Digital I/O Supports 16-bit (Programmable)
- IrDA One IrDA Tx/Rx header
- Audio 5.1CH audio

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!

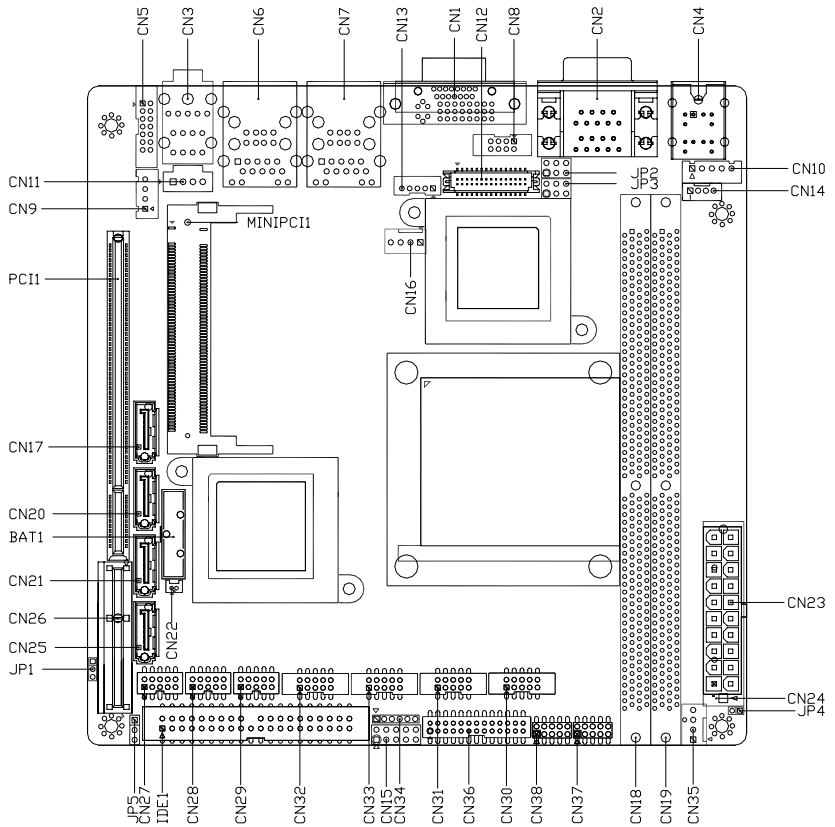
Always completely disconnect the power cord from your board whenever you are working on it. Do not make connections while the power is on, because a sudden rush of power can damage sensitive electronic components.

Caution!

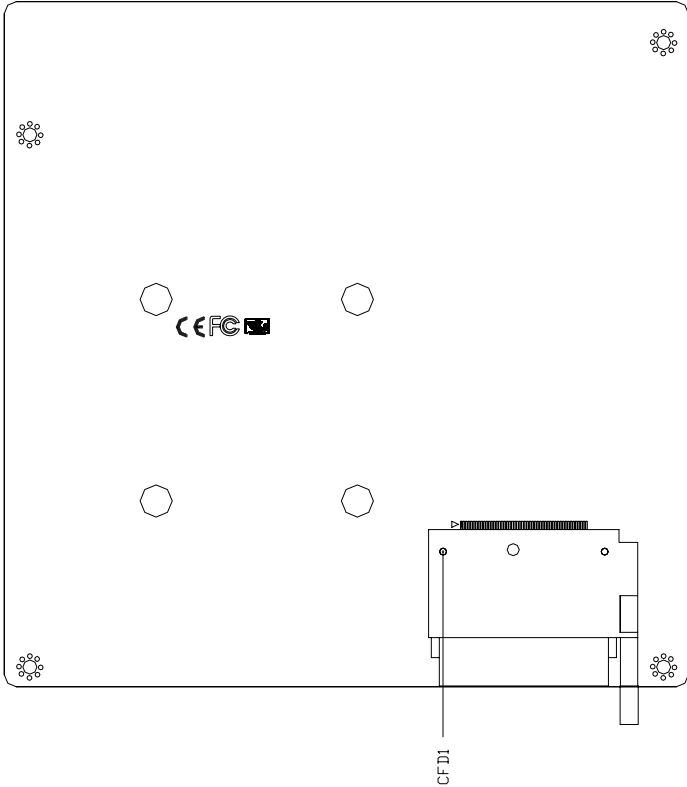
Always ground yourself to remove any static charge before touching the board. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not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

2.2 Location of Connectors and Jumpers

Locating Connectors and Jumpers (Component Side)

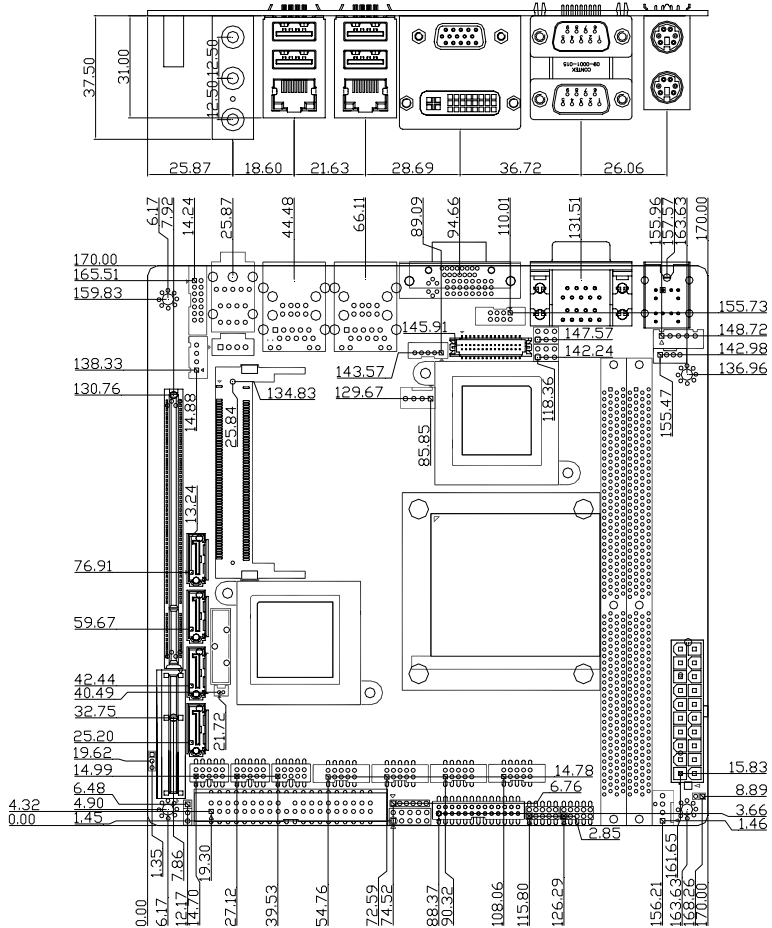


Locating Connectors and Jumpers (Solder Side)

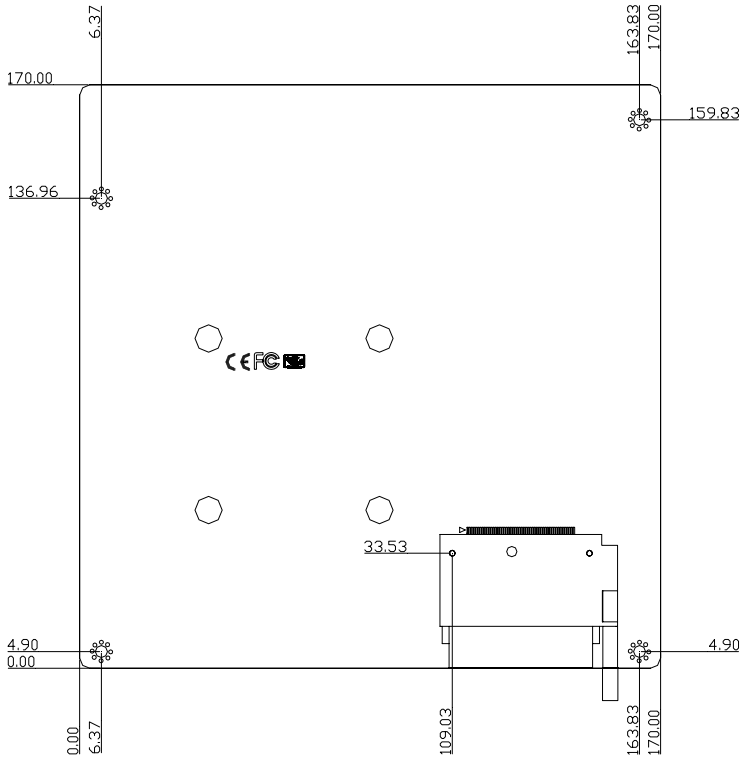


2.3 Mechanical Drawing

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
JP2	COM2 Ring/+5V/+12V Selection
JP3	LVDS-LCD Voltage/ LCD INVERTER Voltage Selection
JP4	Simulate AT Selection
JP5	Clear CMOS

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:

Connectors

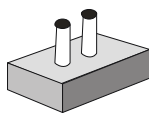
Label	Function
CN1	CRT / DVI Connector
CN2	COM1 RS-232 & COM2 RS-232/422/485 Serial Port Connector
CN3	Audio Connector
CN4	PS/2 Keyboard / Mouse Connector
CN5	Audio 5.1 Channel / SPDIF Connector
CN6	3rd USB Connector 10/100/1000Base-TX Ethernet Connector (2)
CN7	1st USB Connector 10/100/1000Base-TX Ethernet Connector (1)
CN9	Audio Speak Out Connector
CN10	Internal Keyboard Connector
CN11	CD-IN Connector
CN12	LVDS-LCD Connector for 24/48-bit
CN13	LCD Inverter Connector
CN14	Internal Mouse Connector
CN15	Front Panel Connector
CN16	Fan1 Connector
CN17	3rd Serial ATA Connector

CN18	DDRII DIMM Slot
CN19	DDRII DIMM Slot
CN20	4th Serial ATA Connector
CN21	2nd Serial ATA Connector
CN22	External RTC Connector
CN23	ATX Power Connector
CN25	1st Serial ATA Connector
CN26	PCI-Express Slot
CN27	5th USB Connector
CN28	4th USB Connector
CN29	2nd USB Connector
CN30	COM6 RS-232 Serial Port Connector
CN31	COM5 RS-232 Serial Port Connector
CN32	COM3 RS-232 Serial Port Connector
CN33	COM4 RS-232 Serial Port Connector
CN34	IrDA Connector
CN35	Fan2 Connector
CN36	LPT Port Connector
CN37	Digital I/O Connector (1)
CN38	Digital I/O Connector (2)
CFD1	CompactFlash Slot
MINIPCI1	Mini-PCI Slot
IDE1	IDE Connector
PCI1	PCI Slot

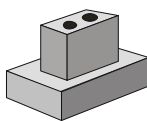
2.6 Setting Jumpers

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

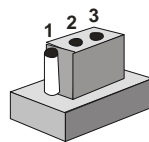
To “open” a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2 and 3. In this case you would connect either pins 1 and 2 or 2 and 3.



Open



Closed



Closed 2-3

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

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

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

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

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

2.8 LVDS-LCD Voltage Selection (JP3)

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

2.9 LCD INVERTER Voltage Selection (JP3)

JP3	Function
2-4	+5V(Default)
4-6	+12V

2.10 Simulate AT Selection (JP4)

JP4	Function
1-2	AT

2.11 Clear CMOS (JP5)

JP5	Function
1-2	Protected (Default)
2-3	Clear

2.12 CRT/ DVI Connector (CN1)

Pin	Signal	Pin	Signal
1	DVI_TD2#	2	DVI_TD2
3	GND	4	DVI_TD4#
5	DVI_TD4	6	DVI_I2C_CLK

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7	DVI_DDC_DATA	8	CRT_VSYNC
9	DVI_TD1#	10	DVI_TD1
11	GND	12	DVI_TD3#
13	DVI_TD3	14	+5V
15	GND	16	HPDET#
17	DVI_TD0#	18	DVI_TD0
19	GND	20	DVI_TD5#
21	DVI_TD5	22	GND
23	DVI_TDC	24	DVI_TDC#
25	GND	26	GND
27	GND	28	GND
29	_DDC_SCLK	30	NC
31	+5V	32	HSYNC
33	GREEN	34	GND
35	NC	36	GND
37	CRT_PLUG#	38	VSYNC
39	BLUE	40	GND
41	DDC_SDATA	42	RED
43	GND		

2.13 COM1/COM2 RS-232 Serial Port Connector (CN2)

Pin	Signal	Pin	Signal
1	DCD1	2	RXD1
3	TXD1	4	DTR1
5	GND1	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

2.14 Audio Connector Line-IN/Line-OUT/Mic-IN (CN3)

Pin	Signal	Pin	Signal
A1	LINEIN_L	A2	GND
A3	LINE_JD	A4	LINEIN_R
B1	LINEOUT_L	B2	GND
B3	FRONT_JD	B4	LINEOUT_R
C1	MIC_L	C2	GND
C3	MIC_JD	C4	MIC_R

2.15 PS/2 Keyboard / Mouse Connector (CN4)

Pin	Signal	Pin	Signal
1	KDAT	2	NC
3	GND	4	+KB_VCC
5	KCLK	6	NC
7	MDAT	8	NC
9	GND	10	+KB_VCC
11	MCLK	12	NC

2.16 Audio 5.1 Channel / SPDIF Connector (CN5)

Pin	Signal	Pin	Signal
1	Front-OUT-R	2	GND
3	Front-OUT-L	4	GND
5	Surr-OUT-R	6	GND
7	Surr-OUT-L	8	GND
9	LFE-OUT	10	GND
11	CNE-OUT	12	GND

13	SPDIF-OUT	14	SPDIF-IN
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Note:

For supporting Audio 7.1 CH, you have to plug CN5& CN3 synchronized.

2.17 3rd USB Connector/ 10/100/1000Base-TX Ethernet Connector (2) (CN6)

Pin	Signal	Pin	Signal
1	LAN2_TCT	2	LAN2_MDI0+
3	LAN2_MDI0-	4	LAN2_MDI1+
5	LAN2_MDI1-	6	LAN2_MDI2+
7	LAN2_MDI2-	8	LAN2_MDI3+
9	LAN2_MDI3-	10	LAN2_RCT
11	LAN2_Active-	12	LAN2_Active+
13	LAN2_S100LED	14	LAN2_S1000LED
19	+5V	20	USB5D-
21	USB5D+	22	GND
23	+5V	24	USB4D-
25	USB4D+	26	GND

2.18 1st USB Connector/ 10/100/1000Base-TX Ethernet Connector (1) (CN7)

Pin	Signal	Pin	Signal
1	LAN1_TCT	2	LAN1_MDI0+
3	LAN1_MDI0-	4	LAN1_MDI1+
5	LAN1_MDI1-	6	LAN1_MDI2+
7	LAN1_MDI2-	8	LAN1_MDI3+
9	LAN1_MDI3-	10	LAN1_RCT
11	LAN1_Active-	12	LAN1_Active+
13	LAN1_S100LED	14	LAN1_S1000LED
19	+5V	20	USB0D-

21	USBD0+	22	GND
23	+5V	24	USBD1-
25	USBD1+	26	GND

2.19 Audio Speak Out Connector (CN9)

Pin	Signal	Pin	Signal
1	SPK_R+	2	SPK_R-
3	SPK_L+	4	SPK_L-

2.20 Internal Keyboard Connector (CN10)

Pin	Signal
1	KB_CLK
2	KB_DATA
3	NC
4	GND
5	+5V

2.21 CD-IN Connector (CN11)

Pin	Signal
1	CD_IN_L
2	CD_GND
3	CD_GND
4	CD_IN_R

2.22 LVDS-LCD Connector (CN12)

Pin	Signal	Pin	Signal
1	ENBKL	2	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	LVDS1_TX3-	16	LVDS1_TX3+
17	I2C_DATA	18	I2C_CLK
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+

2.23 LCD Inverter Connector (CN13)

Pin	Signal
1	+5V/+12V
2	Adjust backlight
3	GND
4	GND
5	ENBKL

2.24 Internal Mouse Connector (CN14)

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

2.25 Front Panel Connector (CN15)

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 (+)

2.26 Fan1 Connector (CN16)

Pin	Signal
1	GND
2	+12V
3	Speed Sense
4	Speed Control

2.27 3rd Serial ATA Connector (CN17)

Pin	Signal
1	GND
2	SATA_TX2+
3	SATA_TX2-
4	GND
5	SATA_RX2-
6	SATA_RX2+
7	GND
8	GND
9	GND

2.28 4th Serial ATA Connector (CN20)

Pin	Signal
1	GND
2	SATA_TX3+
3	SATA_TX3-

4	GND
5	SATA_RX3-
6	SATA_RX3+
7	GND
8	GND
9	GND

2.29 2nd Serial ATA Connector (CN21)

Pin	Signal
1	GND
2	SATA_TX1+
3	SATA_TX1-
4	GND
5	SATA_RX1-
6	SATA_RX1+
7	GND
8	GND
9	GND

2.30 External RTC Connector (CN22)

Pin	Signal
1	+RTCBAT
2	GND

2.31 ATX Power Connector (CN23)

Pin	Signal	Pin	Signal
1	+3.3V	11	+3.3V
2	+3.3V	12	-12V
3	GND	13	GND
4	+5V	14	PS_ON

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5	GND	15	GND
6	+5V	16	GND
7	GND	17	GND
8	POWER OK	18	-5V
9	+5VSB	19	+5V
10	+12V	20	+5V

2.33 1st Serial ATA Connector (CN25)

Pin	Signal
1	GND
2	SATA_TX0+
3	SATA_TX0-
4	GND
5	SATA_RX0-
6	SATA_RX0+
7	GND
8	GND
9	GND

2.33 PCI-Express Connector (CN26)

Pin	Signal	Pin	Signal
A1	GND	B1	+12V
A2	+12V	B2	+12V
A3	+12V	B3	+12V
A4	GND	B4	GND
A5	NC	B5	SMCLK
A6	NC	B6	SMDAT
A7	NC	B7	GND
A8	NC	B8	+3.3V

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A9	+3.3V	B9	NC
A10	+3.3V	B10	+3.3V
A11	PERST#	B11	+3.3V
A12	GND	B12	NC
A13	PE0_CLK+	B13	GND
A14	PE0_CLK-	B14	PETp0
A15	GND	B15	PETn0
A16	PERp0	B16	GND
A17	PERn0	B17	NC
A18	GND	B18	GND
A19	NC	B19	PETp1
A20	GND	B20	PETn1
A21	PERp1	B21	GND
A22	PERn1	B22	GND
A23	GND	B23	NC
A24	GND	B24	NC
A25	NC	B25	GND
A26	NC	B26	GND
A27	GND	B27	NC
A28	GND	B28	NC
A29	NC	B29	GND
A30	NC	B30	PE1_CLK-
A31	GND	B31	NC
A32	PE1_CLK+	B32	GND

2.34 5th USB Connector (CN27)

Pin	Signal	Pin	Signal
1	+5V	2	GND
3	USBD8-	4	GND
5	USBD8+	6	USBD9+

7	GND	8	USBD9-
9	GND	10	+5V

2.35 4th USB Connector (CN28)

Pin	Signal	Pin	Signal
1	+5V	2	GND
3	USBD6-	4	GND
5	USBD6+	6	USBD7+
7	GND	8	USBD7-
9	GND	10	+5V

2.36 2nd USB Connector (CN29)

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

2.37 COM6 RS-232 Serial Port Connector (CN30)

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

2.38 COM5 RS-232 Serial Port Connector (CN31)

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

2.39 COM3 RS-232 Serial Port Connector (CN32)

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

2.40 COM4 RS-232 Serial Port Connector (CN33)

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

2.41 IrDA Connector (CN34)

Pin	Signal
1	+5V
2	N.C.
3	IRRX

4	GND
5	IRTX
6	NC

2.42 Fan2 Connector (CN35)

Pin	Signal
1	GND
2	+12V
3	Speed Sense
4	Speed Control

2.43 LPT Port Connector (CN36)

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

2.44 Digital I/O Connector (CN37, CN38)

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

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:

4 in / 4 out (CN37)

Pin8	Pin7	Pin6	Pin5	Pin4	Pin3	Pin2	Pin1
GPI 10	GPI 11	GPI 12	GPI 13	GPO 14	GPO 15	GPO 16	GPO 17
LSB						MSB	

8 in (CN37)

Pin8	Pin7	Pin6	Pin5	Pin4	Pin3	Pin2	Pin1
GPI 10	GPI 11	GPI 12	GPI 13	GPO 14	GPO 15	GPO 16	GPO 17
LSB						MSB	

8 out (CN37)

Pin8	Pin7	Pin6	Pin5	Pin4	Pin3	Pin2	Pin1
GPI 10	GPI 11	GPI 12	GPI 13	GPO 14	GPO 15	GPO 16	GPO 17
LSB						MSB	

4 in / 4 out (CN38)

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

8 in (CN38)

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

8 out (CN38)

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

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-6908T CMOS memory has an integral lithium battery backup for data retention. However, you will need to replace the complete unit when it finally runs down.

3.2 Award BIOS Setup

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

Entering Setup

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

Standard CMOS Features

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

Advanced BIOS Features

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

Advanced Chipset Features

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

Integrated Peripherals

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

Power Management Setup

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

PnP/PCI Configurations

This entry appears if your system supports PnP/PCI.

PC Health Status

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

Frequency/Voltage Control

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

Load Fail-Safe Defaults

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

Load Optimized Defaults

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

Set Supervisor/User Password

Use this menu to set Supervisor/User Passwords.

Save and Exit Setup

Save CMOS value changes to CMOS and exit setup.

Exit Without Saving

Abandon all CMOS value changes and exit setup.

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

Chapter

4

**Driver
Installation**

The EMB-6908T 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 Chipset Driver
- Step 2 – Install LAN Driver
- Step 3 – Install ATI HDMI Audio Device
- Step 4 – Install Audio Driver
- Step 5 – Install TPM 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 EMB-6908T CD-ROM into the CD-ROM drive. And install the drivers from Step 1 to Step 5 in order.

Step 1 – Install Chipset Driver

1. Click on the **Step 1 – Chipset Driver** folder and select the OS folder your system is

Note:

If your system is Windows XP, please select **WIN XP 32-Bit** or **WIN XP 64-Bit** folder located in **WinXP** folder. After entering the **WIN XP 32-Bit** or **WIN XP 64-Bit** folder, click on the folder of **Step 1-Microsoft .NET Framework 2.0** or **Step 1-Microsoft .NET Framework 2.0 (x64)**. You have to click on the **dotnetfx** or **NetFx64** located in the folders above to install the driver first before going to the next step.

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 2 – Install LAN Driver

1. Click on the **Step 2 – Lan Driver** 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 ATI HDMI Audio Device

1. Click on the **Step 3 – ATI HDMI Audio Device** folder and double click on the **HDMI_R168.exe** file
2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

Step 4 –Install Audio Driver

1. Click on the **Step 4 –Audio Driver** 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 Driver** 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

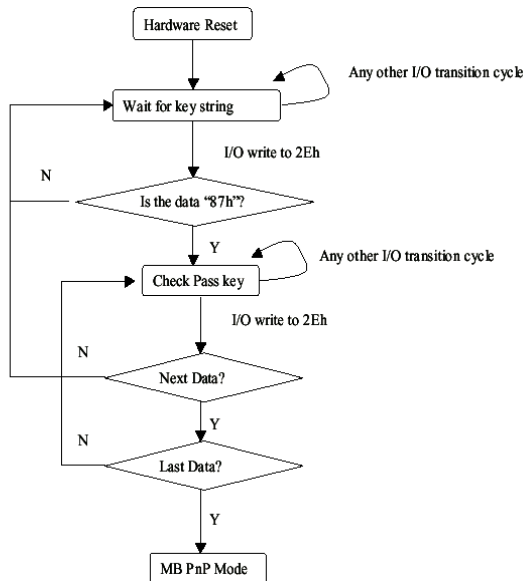
A.1 Programming

EMB-6908T 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

Input/output (I/O)	
[00000000 - 0000000F]	Direct memory access controller
[00000000 - 00000CF7]	PCI bus
[00000010 - 0000001F]	Motherboard resources
[00000020 - 00000021]	Programmable interrupt controller
[00000022 - 0000003F]	Motherboard resources
[00000040 - 00000043]	System timer
[00000044 - 0000004D]	Motherboard resources
[00000050 - 0000005E]	Motherboard resources
[00000060 - 00000060]	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
[00000061 - 00000061]	System speaker
[00000062 - 00000063]	Motherboard resources
[00000064 - 00000064]	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
[00000065 - 0000006F]	Motherboard resources
[00000070 - 00000073]	System CMOS/real time clock
[00000074 - 0000007F]	Motherboard resources
[00000080 - 00000090]	Direct memory access controller
[00000091 - 00000093]	Motherboard resources
[00000094 - 0000009F]	Direct memory access controller
[000000A0 - 000000A1]	Programmable interrupt controller
[000000A2 - 000000BF]	Motherboard resources
[000000C0 - 000000DF]	Direct memory access controller
[000000E0 - 000000EF]	Motherboard resources
[000000F0 - 000000FF]	Numeric data processor
[00000170 - 00000177]	Secondary IDE Channel
[000001F0 - 000001F7]	Primary IDE Channel
[00000228 - 0000022F]	Motherboard resources
[00000238 - 0000023F]	Communications Port (COM5)
[00000274 - 00000277]	ISAPNP Read Data Port
[00000279 - 00000279]	ISAPNP Read Data Port
[000002E8 - 000002EF]	Communications Port (COM4)
[000002F8 - 000002FF]	Communications Port (COM2)
[00000338 - 0000033F]	Communications Port (COM6)
[00000376 - 00000376]	Secondary IDE Channel
[00000378 - 0000037F]	Printer Port (LPT1)
[00000380 - 0000038B]	ATI Radeon X1270
[00000380 - 0000038B]	PCI standard PCI-to-PCI bridge
[000003C0 - 000003DF]	ATI Radeon X1270
[000003C0 - 000003DF]	PCI standard PCI-to-PCI bridge
[000003E8 - 000003EF]	Communications Port (COM3)
[000003F0 - 000003F5]	Standard floppy disk controller
[000003F6 - 000003F6]	Primary IDE Channel
[000003F7 - 000003F7]	Standard floppy disk controller
[000003F8 - 000003FF]	Communications Port (COM1)
[0000040B - 0000040B]	Motherboard resources
[000004D0 - 000004D1]	Motherboard resources
[000004D6 - 000004D6]	Motherboard resources
[00000A79 - 00000A79]	ISAPNP Read Data Port
[00000B00 - 00000B0F]	ATI SMBus
[00000B10 - 00000B1F]	Motherboard resources
[00000C00 - 00000C01]	Motherboard resources
[00000C14 - 00000C14]	Motherboard resources
[00000C50 - 00000C52]	Motherboard resources
[00000C6C - 00000C6D]	Motherboard resources
[00000C6F - 00000C6F]	Motherboard resources
[00000CD0 - 00000CD1]	Motherboard resources
[00000CD2 - 00000CD3]	Motherboard resources

	[00000CD4 - 00000CDF] Motherboard resources
	[00000D00 - 0000FFFF] PCI bus
	[00004000 - 000040FE] Motherboard resources
	[00004100 - 0000411F] Motherboard resources
	[00004210 - 00004217] Motherboard resources
	[0000C000 - 0000CFFF] PCI standard PCI-to-PCI bridge
	[0000CE00 - 0000CEFF] ATI Radeon X1270
	[0000D000 - 0000DFFF] PCI standard PCI-to-PCI bridge
	[0000DC00 - 0000DCFF] Intel(R) PRO/1000 PL Network Connection
	[0000E000 - 0000EFFF] PCI standard PCI-to-PCI bridge
	[0000EC00 - 0000ECFF] Intel(R) PRO/1000 PL Network Connection #2
	[0000F900 - 0000F90F] AMD PCI IDE Controller
	[0000FB00 - 0000FB0F] AMD SATA Controller(Native IDE Mode)
	[0000FC00 - 0000FC03] AMD SATA Controller(Native IDE Mode)
	[0000FD00 - 0000FD07] AMD SATA Controller(Native IDE Mode)
	[0000FE00 - 0000FE03] AMD SATA Controller(Native IDE Mode)
	[0000FF00 - 0000FF07] AMD SATA Controller(Native IDE Mode)

B.2 Memory Address Map

Address Range	Device
[00000000 - 00000FFF]	Motherboard resources
[00000000 - 0009FFFF]	System board
[000A0000 - 000BFFFF]	ATI Radeon X1270
[000A0000 - 000BFFFF]	PCI bus
[000A0000 - 000BFFFF]	PCI standard PCI-to-PCI bridge
[000C0000 - 000DFFFF]	PCI bus
[000F0000 - 000FFFFF]	System board
[00100000 - 6FEDFFFF]	System board
[6FEE0000 - 6FEFFFFF]	System board
[6FF00000 - 6FFFFFFF]	System board
[70000000 - 7FFFFFFF]	System board
[7FFF0000 - FFFFFFFF]	PCI bus
[D0000000 - DFFFFFFF]	ATI Radeon X1270
[D0000000 - DFFFFFFF]	PCI standard PCI-to-PCI bridge
[FC800000 - FCBFFFFF]	Intel(R) PRO/1000 PL Network Connection
[FC800000 - FCBFFFFF]	PCI standard PCI-to-PCI bridge
[FCFE0000 - FCFEFFFF]	Intel(R) PRO/1000 PL Network Connection
[FD000000 - FD3FFFFF]	Intel(R) PRO/1000 PL Network Connection #2
[FD000000 - FD7FFFFF]	PCI standard PCI-to-PCI bridge
[FD7E0000 - FD7FFFFF]	Intel(R) PRO/1000 PL Network Connection #2
[FDA00000 - FDAFFFFF]	PCI standard PCI-to-PCI bridge
[FDB00000 - FDBFFFFF]	ATI Radeon X1270
[FDB00000 - FDCFFFFF]	PCI standard PCI-to-PCI bridge
[FDCE0000 - FDCEFFFF]	ATI Radeon X1270
[FDCFC000 - FDCFFFFF]	Microsoft UAA Bus Driver for High Definition Audio
[FDF00000 - FDFFFFFF]	PCI standard PCI-to-PCI bridge
[FE020000 - FE023FFF]	Microsoft UAA Bus Driver for High Definition Audio
[FE029000 - FE0290FF]	Standard Enhanced PCI to USB Host Controller
[FE02A000 - FE02AFFF]	Standard OpenHCD USB Host Controller
[FE02B000 - FE02BFFF]	Standard OpenHCD USB Host Controller
[FE02C000 - FE02CFFF]	Standard OpenHCD USB Host Controller
[FE02D000 - FE02DFFF]	Standard OpenHCD USB Host Controller
[FE02E000 - FE02EFFF]	Standard OpenHCD USB Host Controller
[FE02F000 - FE02F3FF]	AMD SATA Controller(Native IDE Mode)
[FEC00000 - FEC00FFF]	System board
[FED00000 - FED000FF]	System board
[FED00000 - FED003FF]	High precision event timer
[FEE00000 - FEE00FFF]	System board
[FEE00400 - FEE00FFF]	Motherboard resources
[FFF80000 - FFF8FFFF]	System board
[FFFF0000 - FFFFFFFF]	System board

B.3 IRQ Mapping Chart

Device	IRQ
Input/output (IO)	
Interrupt request (IRQ)	
(ISA) 0	High precision event timer
(ISA) 1	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
(ISA) 3	Communications Port (COM2)
(ISA) 4	Communications Port (COM1)
(ISA) 6	Standard floppy disk controller
(ISA) 8	High precision event timer
(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) 12	PS/2 Compatible Mouse
(ISA) 13	Numeric data processor
(ISA) 14	Primary IDE Channel
(ISA) 15	Secondary IDE Channel
(PCI) 16	Intel(R) PRO/1000 PL Network Connection #2
(PCI) 16	Microsoft UAA Bus Driver for High Definition Audio
(PCI) 16	Standard OpenHCD USB Host Controller
(PCI) 17	Intel(R) PRO/1000 PL Network Connection
(PCI) 17	Standard OpenHCD USB Host Controller
(PCI) 17	Standard OpenHCD USB Host Controller
(PCI) 18	ATI Radeon X1270
(PCI) 18	Standard OpenHCD USB Host Controller
(PCI) 18	Standard OpenHCD USB Host Controller
(PCI) 19	Microsoft UAA Bus Driver for High Definition Audio
(PCI) 19	Standard Enhanced PCI to USB Host Controller
(PCI) 22	AMD SATA Controller(Native IDE Mode)

B.4 DMA Channel Assignments

Device	DMA Channel
BBB-6BC285F7695	
Direct memory access (DMA)	
2	Standard floppy disk controller
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		
CN5	Audio 5.1 Channel / SPDIF Connector	Catch	2.00mm Pitch 14 pins (Catch H709-2 or compatible)	Audio Cable	1700140164
CN9	Audio Speak Out Connector	HO-BASE	2.54mm Pitch 4 pins (HO-BASE 2503-H-4 or compatible)	NA	NA
CN10	Internal Keyboard Connector	HO-BASE	2.54mm Pitch 5 pins (HO-BASE 2503-H-5 or compatible)	NA	NA
CN11	CD-IN Connector	HO-BASE	2.54mm Pitch 4 pins (HO-BASE 2541-1H-4 or compatible)	CDROM Cable	1703040400
CN12	LVDS-LCD Connector for 24/48 bit	ComWeal	1.25mm Pitch 30 Pins(ComWeal 103-303M or compatible)	NA	NA
CN13	LCD Inverter Connector	HO-BASE	2.0mm Pitch 5 pins (HO-BASE 2002-H-5 or compatible)	NA	NA
CN14	Internal Mouse Connector	HO-BASE	2.0mm Pitch 4 pins (HO-BASE 2002-H-4 or compatible)	NA	NA
CN15	Front Panel Connector	HO-BASE	2.54mm Pitch 10 pins (HO-BASE 2541-2H-2X5 or compatible)	NA	NA

CN16	Fan1 Connector	Catch	2.54mm Pitch 3 pins (Catch 1190-700-03S or compatible)	NA	NA
CN17	3rd Serial ATA Connector	Catch	1.27mm Pitch 7 pins (Catch H16A30 00-00 or compatible)	SATA Cable	1709070500
CN20	4th Serial ATA Connector	Catch	1.27mm Pitch 7 pins (Catch H16A30 00-00 or compatible)	SATA Cable	1709070500
CN21	2nd Serial ATA Connector	Catch	1.27mm Pitch 7 pins (Catch H16A30 00-00 or compatible)	SATA Cable	1709070500
CN22	External RTC Connector	Molex	1.25mm Pitch 2 pins (Molex 51021-0200 or compatible)	NA	NA
CN23	ATX Power Connector	Catch	3.50 mm Pitch 20 pins (Catch 1121-700-20S or compatible)	NA	NA
CN25	1st Serial ATA Connector	Catch	1.27mm Pitch 7 pins (Catch H16A30 00-00 or compatible)	SATA Cable	1709070500
CN27	5th USB Connector	Catch	2.00mm Pitch 10 pins (Catch H754-2x5 or compatible)	USB Cable	1709100201
CN28	4th USB Connector	Catch	2.00mm Pitch 10 pins (Catch H754-2x5 or compatible)	USB Cable	1709100201
CN29	2nd USB Connector	Catch	2.00mm Pitch 10 pins (Catch H754-2x5 or compatible)	USB Cable	1709100201
CN30	COM6 RS-232	Catch	2.00mm Pitch 10 pins (Catch	Serial Port	1701100206

	Serial Port Connector		H754-2x5 or compatible)	Cable	
CN31	COM5 RS-232 Serial Port Connector	Catch	2.00mm Pitch 10 pins (Catch H754-2x5 or compatible)	Serial Port Cable	1701100206
CN32	COM3 RS-232 Serial Port Connector	Catch	2.00mm Pitch 10 pins (Catch H754-2x5 or compatible)	Serial Port Cable	1701100206
CN33	COM4 RS-232 Serial Port Connector	Catch	2.00mm Pitch 10 pins (Catch H754-2x5 or compatible)	Serial Port Cable	1701100206
CN34	IrDA Connector	HO-BASE	2.0mm Pitch 6 pins (HO-BASE 2000-1H-6 or compatible)	NA	NA
CN35	Fan2 Connector	Catch	2.54mm Pitch 3 pins (Catch 1190-700-03S or compatible)	NA	NA
CN36	LPT Port Connector	HR	2.0mm Pitch 26 pins (HR A2016H-N-2X13 P-A)	Parallel Port Cable	1701260201
CN37	Digital I/O Connector (1)	Catch	2.00mm Pitch 10 pins (Catch H754-2x5 or compatible)	NA	NA
CN38	Digital I/O Connector (2)	Catch	2.00mm Pitch 10 pins (Catch H754-2x5 or compatible)	NA	NA
IDE1	IDE Connector	Catch	【2.54mm】 1137-020-40SA (or compatible)	EIDE Cable	1701400453