

Mini-ITX

EMB-9658T

**EMB-9658T**

Intel® Core™ 2 Duo/  
Celeron® M Processor,  
Mini-ITX  
Intel® 82573L, 82566MM Ethernet  
TPM 1.2  
VIA VT1708B Audio & Mini PCI

EMB-9658T Manual Rev.A 1<sup>st</sup> Ed.  
July, 2009

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## Packing List

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

- 1 1709070500 SATA Cable
- 1 1702151200 Onboard SATA Power Cable
- 1 M206908T00 Metal I/O Bracket
- 1 Quick Installation Guide
- 1 Utility CD
- 1 EMB-9658T

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

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The EMB-9658T adopts the latest Intel® Core™ 2 Duo/ Celeron® M (Socket-P based) processors and Intel® GME965+ICH8M chipset for better power-management capabilities and enhanced performance.

The system memory of EMB-9658T features two 200-pin DIMM and DDRII 533/667 up to 4GB. The LCD interface is 18/ 24 bit dual-channel LVDS share memory up to 384 MB with DVMT 4.0.

The EMB-9658T features one PCI slot, one PCI-E [ x4 ] slot (through riser card ), one Mini PCI slot, four RS-232 ports, one RS-232/422/485 port, eight USB 2.0 ports, multiple Digital I/O ports, and Type II CFD storage, providing versatile expansion options for many embedded applications.

EMB-9658T with mobile-optimized Intel dual-core processors is the latest embedded motherboard designed to cope with increasingly heavily work-loaded embedded systems found in POS (Point-of-Sale) machines, automated kiosks, medical instruments, advanced automation for buildings and homes, and gaming machines.

## 1.2 Features

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- Intel® Core™ 2 Duo/ Celeron® M (Socket-P Based) Processors
- Intel® GME965 + ICH8M (-E Optional for RAID)
- DDRII 533/667 Memory, Max. 4GB
- Gigabit Ethernet x 2, with one 82566MM support iAMT 2.5
- 18/24 bit Dual-Channel LVDS, DVI/TV/CRT, SDVO Connector for 2nd 18/24 bit Dual-Channel LVDS/DVI
- HD 5.1CH Audio
- SATAII x 2, EIDE x 1, CompactFlash™
- USB2.0 x 8, COM x 5, Parallel x 1, 8-bit Digital I/O
- PCI x 1, Mini PCI x 1 , PCI-Express [x4] x 1 (Through Riser Card)
- DC12V /AT/ATX
- SATA Power Connector Onboard x 1, Optional RAID, TPM

### 1.3 Specifications

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#### System

- Form Factor Mini-ITX
- Processor Intel® Core™ 2 Duo/  
Celeron® M (Socket-P based)  
Processors
- System Memory 200-pin DDRII SODIMM x 2,  
Max. 4GB (DDRII 533/667)
- Chipset Intel® GME965 + ICH8M(-E  
optional for RAID)
- I/O Chipset ITE8712
- Ethernet Intel® 82566MM/82573L for  
10/100/1000Base-TX, RJ-45 x  
2
- BIOSAward Plug & Play SPI BIOS - 2MB  
ROM
- Wake on LAN Yes
- Watchdog Timer ITE.IT8712F/KX-L
- H/W Status Monitoring Supports power supply  
voltages and temperature  
monitoring
- Expansion Interface PCI x 1, Mini PCI x 1 &  
PCI-Express [x4] slot x 1  
(through Riser card)

- Battery Lithium battery
- Power Requirement DC 12V / AT/ ATX
- Board Size 6.7" (L) x 6.7" (W) (170mm x 170mm)
- Gross Weight 1.1lb (0.5kg)
- Operating Temp. 32°F ~ 140°F (0°C ~ 60°C)
- Storage Temp. -40°F ~ 176°F (-40°C ~ 80°C)
- Operating Humidity 0% ~ 90% relative humidity, non-condensing
- MTBF (Hours) —

**Display: Supports LCD/CRT, LCD/DVI, LCD/TV, CRT/DVI, TV/DVI, Dual Simultaneous/ Dual View Displays**

- Chipset Intel® GME965 integrated
- Memory Shared system memory up to 384 MB/DVMT4.0
- Resolutions Up to 2048 x 1536 (QXGA) @ 60Hz for CRT  
Up to 2048 x 1536 (QXGA) for LCD
- LCD Interface Up to 24-bit dual-channel LVDS
- SDVO Supports SDVO x 1
- TV-Out Intel® GME965 integrated, supports NTSC/ PAL/ HDTV  
HDTV supports: 480p/720p/

- DVI 1080i/1080p  
DVI-I x 1
- I/O**
- Storage EIDE x 1 (shared signals with CompactFlash™) SATAII x 2
- Serial Port RS-232 x 4, RS-232/422/485 x 1, TTL x 1
- Parallel Port SPP/ EPP/ ECP mode
- USB USB2.0 x 8
- PS/2 Port Keyboard x 1, Mouse x 1
- Digital I/O Support 8-bit (Programmable)
- IrDA One IrDA Tx/Rx header
- Audio HD 5.1 channel

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

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**Warning!**

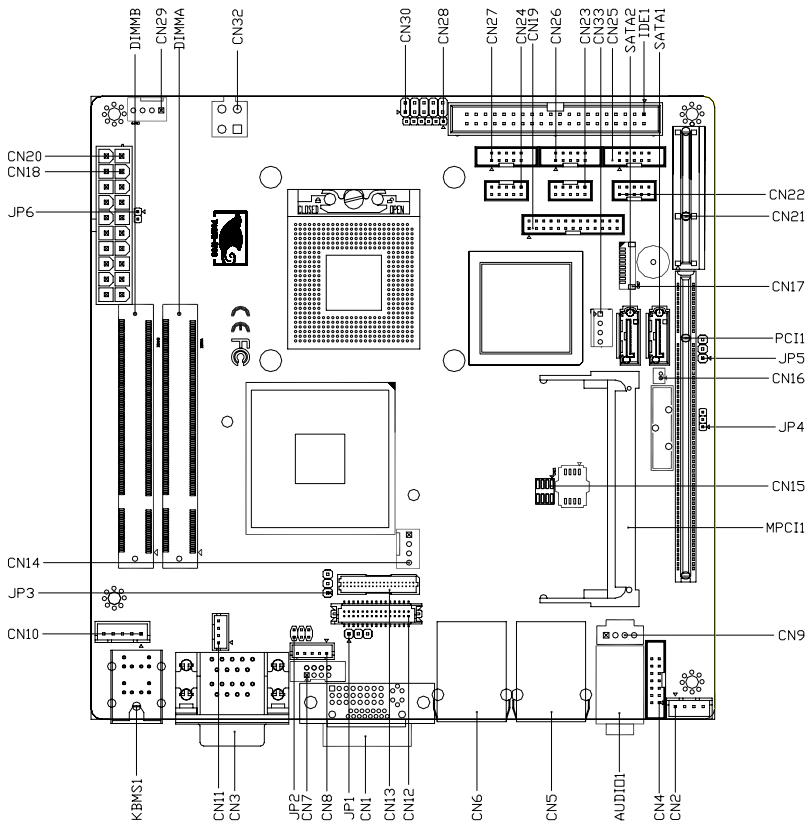
*Always completely disconnect the power cord from your board whenever you are working on it. Do not make connections while the power is on, because a sudden rush of power can damage sensitive electronic components.*

**Caution!**

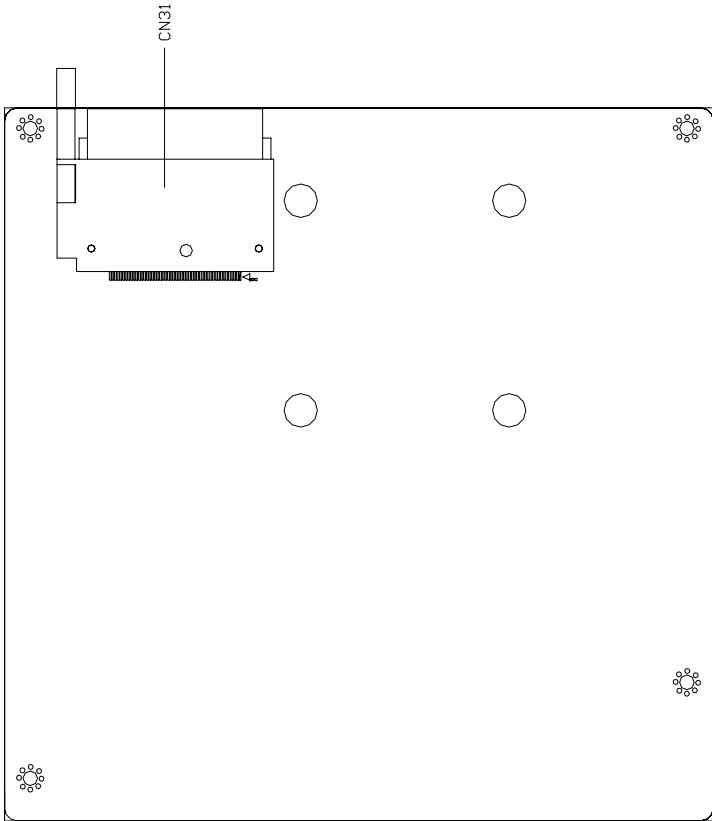
*Always ground yourself to remove any static charge before touching the board. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not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

## 2.2 Location of Connectors and Jumpers

### Locating Connectors and Jumpers (Component Side)

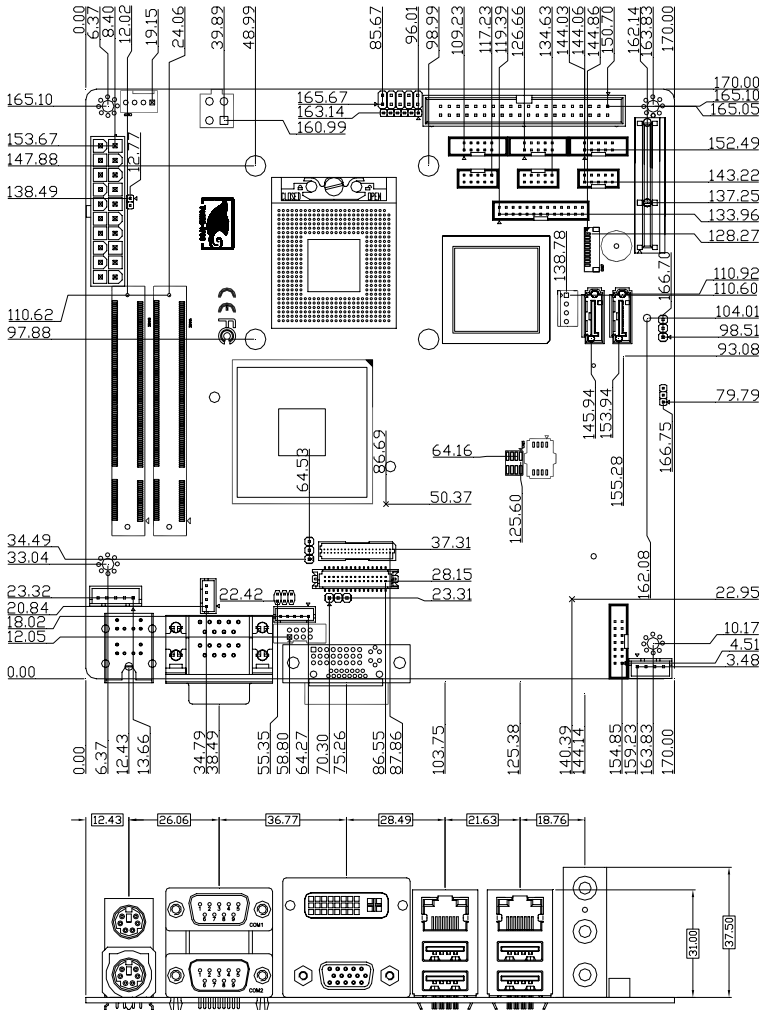


### Locating Connectors and Jumpers (Solder Side)

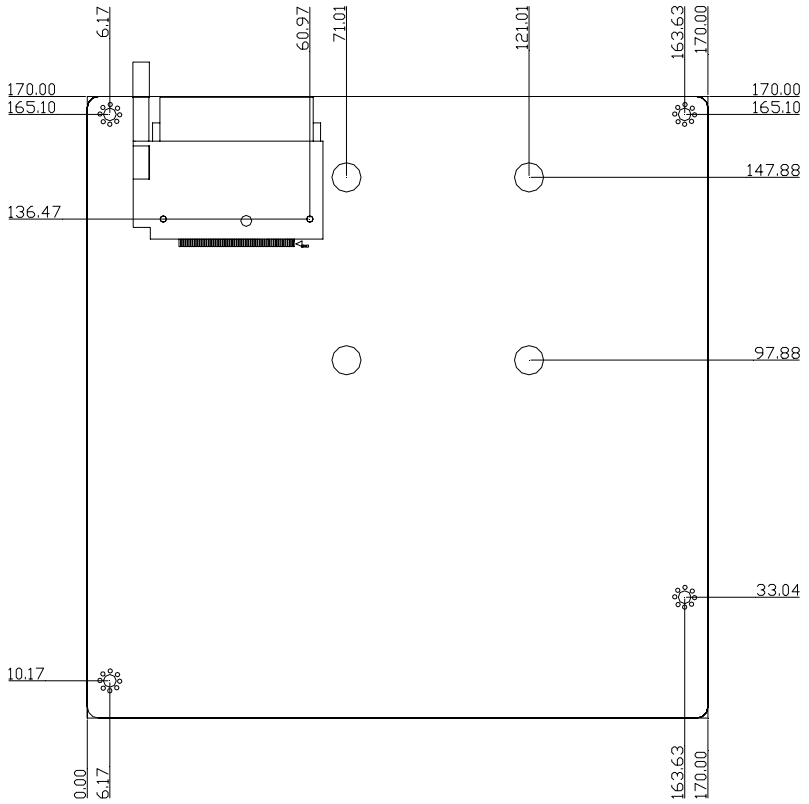


### 2.3 Mechanical Drawing

#### Component Side



Solder Side



## 2.4 List of Jumpers

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

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

### Jumpers

Label	Function
JP1	LCD INVERTER Voltage Selection
JP2	COM2 Ring/+5V/+12V Selection
JP3	LVDS Voltage Selection
JP4	Auto power button
JP5	Clear CMOS
JP6	ATX Power simulate AT Power

## 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	DVI Connector /VGA Display Connector
CN2	Audio Speaker Output
CN3	COM1 RS-232 & COM2 RS-232/422/485
CN4	Audio 5.1 Channel / SPDIF Connector
CN5	USB Connector / 10 /100 /1000 Base-Tx Ethernet Connector
CN6	USB Connector / 10 /100 /1000 Base-Tx Ethernet Connector
CN7	TV Out Connector
CN8	LCD Inverter Connector
CN9	CD-IN Connector
CN10	Internal Keyboard Connector
CN11	Internal Mouse Connector
CN12	LVDS LCD Connector
CN13	SDVO Connector
CN14	System Fan Connector
CN16	RTC Battery Connector
CN17	GPS Connector
CN18	ATX Power Connector

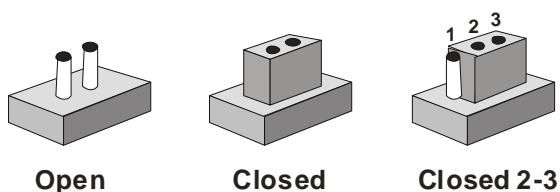
CN19	LPT Port Connector
CN20	AT Power Connector
CN21	PCI Express Slot
CN22	USB Connector
CN23	USB Connector
CN24	Digital I/O Connector
CN25	COM4 RS-232 Serial Port Connector
CN26	COM3 RS-232 Serial Port Connector
CN27	COM6 RS-232 Serial Port Connector
CN28	IrDA Connector
CN29	CPU FAN Connector
CN30	Front Panel Connector
CN31	CompactFlash Slot
CN32	ATX Power_12V Connector
CN33	SATA Power connector
KBMS1	PS2 Keyboard / Mouse Connector
AUDIO1	Audio Connector
MPCI1	Mini PCI Slot
PCI1	PCI Slot
SATA1	Primary Serial ATA Connector
SATA2	Secondary Serial ATA Connector
DIMMA	DDR2 DIMM Slot
DIMMB	DDR2 DIMM Slot
IDE1	EIDE Connector

## 2.6 Setting Jumpers

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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 LCD INVERTER Voltage Selection (JP1)

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

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

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

## 2.9 LCD Voltage Selection (JP3)

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

## 2.10 Auto Power Button (JP4)

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JP4	Function
1-2	Auto power button
2-3	Not use auto power button (Default)

## 2.11 Clear CMOS (JP5)

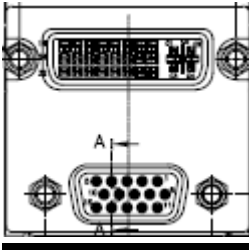
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JP5	Function
1-2	Protected (Default)
2-3	Clear

## 2.12 ATX Power Simulate AT Power (JP6)

JP6	Function
NC	ATX or AT standard (Default)
1-2	ATX Power Simulate AT Power

## 2.13 Connector Pin Assignment



## 2.14 DVI+CRT Connector (CN1)

Pin	Signal	Pin	Signal
1	DVI_TX2-	2	DVI_TX2+
3	GND	4	N.C
5	N.C	6	SM_CLK
7	SM_DAT	8	VSYNC
9	DVI_TX1-	10	DVI_TX1+
11	GND	12	N.C
13	N.C	14	+5V
15	GND	16	HPDET
17	DVI_TX0-	18	DVI_TX0+
19	GND	20	N.C
21	N.C	22	GND
23	DVI_TXCLK+	24	DVI_TXCLK-
25	GND	26	GND

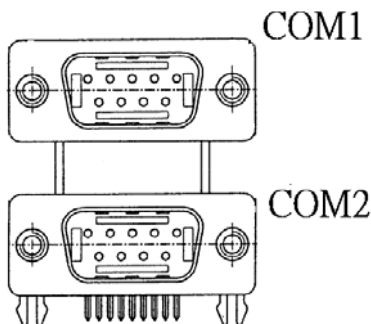
**Mini-ITX****EMB-9658T**

27	N.C	28	N.C
C1	RED	C2	GREEN
C3	BLUE	C4	HSYNC
C5	GND	C6	GND
29	DDCCLK	30	N.C
31	+5V	32	HSYNC
33	GREEN	34	GND
35	N.C	36	GND
37	GND	38	VSYNC
39	BLUE	40	GND
41	DDCDAT	42	RED
43	GND		

**2.15 Audio Speaker Output (CN2)**

<b>Pin</b>	<b>Signal</b>
1	SPK-R+
2	SPK-R-
3	SPK-L+
4	SPK-L-

## 2.16 COM1 RS-232&COM2 RS-232/422/485 (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 Audio 5.1 Channel / SPDIF Connector (CN4)

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

## 2.18 USB Connector/10/100/1000 Base-Tx Ethernet Connector(1) (CN5)

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	USBD2-
21	USBD2+	22	GND
23	+5V	24	USBD3-
25	USBD3+	26	GND

## 2.19 USB Connector/10/100/1000 Base-Tx Ethernet Connector(2) (CN6)

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

## 2.20 TV\_Out Connector (CN7)

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

## 2.21 LCD Inverter Connector (CN8)

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

## 2.22 CD-IN Connector (CN9)

Pin	Signal
1	CD_IN_L
2	CD_GND
3	CD_GND
4	CD_IN_R

### 2.23 Internal Keyboard Connector (CN10)

Pin	Signal
1	KB_CLK
2	KB_DATA
3	N.C.
4	GND
5	+5V

### 2.24 Internal Mouse Connector (CN11)

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

### 2.25 LVDS-LCD Connector (CN12)

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	NC	16	NC
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	NC	26	NC
27	PPVCC	28	GND
29	LVDS2_TXCLK-	30	LVDS2_TXCLK+

## 2.26 SDVO Connector (CN13)

Pin	Signal	Pin	Signal
1	SDVO_SPC	2	SDVO_RST#
3	SDVO_SPD	4	SMBCLK
5	NC	6	SMBDATA
7	GND	8	GND
9	SDVO_RED#	10	SDVO_FLDSTALL#
11	SDVO_RED	12	SDVO_FLDSTALL
13	GND	14	GND
15	SDVO_BLUE#	16	SDVO_INT#
17	SDVO_BLUE	18	SDVO_INT
19	GND	20	GND
21	SDVO_GREEN#	22	SDVO_CLK#
23	SDVO_GREEN	24	SDVO_CLK
25	GND	26	GND
27	+2.5V	28	+5V
29	+2.5V	30	+5V
31	+2.5V	32	GND
33	GND	34	+12V
35	+3.3V	36	+12V
37	+3.3V	38	GND
39	GND	40	GND

### 2.27 System Fan Connector(CN14)

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Pin	Signal
1	GND
2	VCC of FAN
3	Speed Sense
4	Speed Control

### 2.28 RTC Battery Connector(CN16)

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Pin	Signal
1	Battery Power input
2	GND

### 2.29 GPS Connector(CN17)

---

Pin	Signal
1	NC
2	NC
3	GND
4	GPS_LED
5	GPS_TXD
6	GPS_RXD
7	VCC3.3_BAT
8	+3.3V
9	GPS_RST#
10	GND

### 2.30 ATX Power Connector (CN18)

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Pin	Signal	Pin	Signal
1	NC	11	NC

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2	NC	12	-12V
3	GND	13	GND
4	+5V	14	PS_ON
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

**2.31 LPT Port Connector (CN19)**

<b>Pin</b>	<b>Signal</b>	<b>Pin</b>	<b>Signal</b>
1	STROBE	2	AFD
3	PTD0	4	ERROR
5	PTD1	6	INIT
7	PTD2	8	SLIN
9	PTD3	10	GND
11	PTD4	12	GND
13	PTD5	14	GND
15	PTD6	16	GND
17	PTD7	18	GND
19	ACK	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SELECT	26	N.C.

### 2.32 AT POWER Connector(CN20)

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

### 2.33 PCI Express Slot (CN21)

Pin	Signal	Pin	Signal
A1	NC	B1	+12V
A2	+12V	B2	+12V
A3	+12V	B3	+12V
A4	GND	B4	GND
A5	NC	B5	SMBCLK
A6	NC	B6	SMBDAT
A7	NC	B7	GND
A8	NC	B8	+3.3V
A9	+3.3V	B9	NC
A10	+3.3V	B10	+3.3VSB
A11	PCIE_RESET#	B11	PCIE_WAKE#
A12	GND	B12	NC

A13	PCIE1_CLKP	B13	GND
A14	PCIE1_CLKN	B14	PCIE1_TXP
A15	GND	B15	PCIE1_TXN
A16	PCIE1_RXP	B16	GND
A17	PCIE1_RXN	B17	NC
A18	GND	B18	GND
A19	NC	B19	PCIE2_TXP
A20	GND	B20	PCIE2_TXN
A21	PCIE2_RXP	B21	GND
A22	PCIE2_RXN	B22	GND
A23	GND	B23	PCIE3_TXP
A24	GND	B24	PCIE3_TXN
A25	PCIE3_RXP	B25	GND
A26	PCIE3_RXN	B26	GND
A27	GND	B27	PCIE4_TXP
A28	GND	B28	PCIE4_TXN
A29	PCIE4_RXP	B29	GND
A30	PCIE4_RXN	B30	PCIE2_CLKN
A31	GND	B31	NC
A32	PCIE2_CLKP	B32	GND

### 2.34 USB Connector(CN22)

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

### 2.35 USB Connector(CN23)

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

### 2.36 Digital I/O Connector (CN24)

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

### 2.37 COM4 RS-232 Serial Port Connector (CN25)

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.

### 2.38 COM3 RS-232 Serial Port Connector (CN26)

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.

### 2.39 COM6 RS-232 Serial Port Connector (CN27)

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.

### 2.40 IrDA Connector (CN28)

Pin	Signal
1	+5V
2	N.C.
3	IRRX
4	GND
5	IRTX
6	N.C.

### 2.41 CPU Fan Connector (CN29)

Pin	Signal
1	GND
2	VCC of FAN
3	Speed Sense
4	Speed Control

## 2.42 Front Panel Connector (CN30)

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 (+)

## 2.43 CompactFlash Connector(CN31)

Pin	Signal	Pin	Signal
1	GND	26	GND
2	D3	27	D11
3	D4	28	D12
4	D5	29	D13
5	D6	30	D14
6	D7	31	D15
7	CS1#	32	CS3#
8	N/C	33	GND
9	GND	34	IOR#
10	N/C	35	IOW#
11	N/C	36	VCC
12	N/C	37	IRQ14
13	VCC	38	VCC
14	N/C	39	MASTER
15	N/C	40	N/C
16	N/C	41	RESET#
17	N/C	42	IORDY
18	A2	43	DMAREQ
19	A1	44	DAMACK

**Mini-ITX****EMB-9658T**

---

20	A0	45	ACTIVE#
21	D0	46	PDIAG#
22	D1	47	D8
23	D2	48	D90
24	N/C	49	D10
25	GND	50	GND

---

**2.44 ATX Power\_12V Connector(CN32)**

---

---

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

---

**2.45 SATA Power Connector (CN33)**

---

---

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

---

## 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><b>O:</b> 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><b>X:</b> 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-9658T CMOS memory has an integral lithium battery backup for data retention. However, you will need to replace the complete unit when it finally runs down.

## 3.2 Award BIOS Setup

---

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

### Entering Setup

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



### Standard CMOS Features

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

### Advanced BIOS Features

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

## **Advanced Chipset Features**

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

## **Integrated Peripherals**

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

## **Power Management Setup**

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

## **PnP/PCI Configurations**

This entry appears if your system supports PnP/PCI.

## **PC Health Status**

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

## **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.

### **Note:**

1. Due to the system resource conflict, BIOS automatically disables COM5/COM6 when "ACPI function" is disabled in BIOS setup.

Chapter

4

**Driver  
Installation**

The EMB-9658T 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 chip Driver

Step 2 – Install vga Driver

Step 3 – Install LAN Driver

Step 4 – Install Audio Driver

Step 5 – Install TPM Driver

USB 2.0 Drivers are available for download using Windows<sup>®</sup> Update for both Windows<sup>®</sup> XP and Windows<sup>®</sup> 2000. For additional information regarding USB 2.0 support in Windows<sup>®</sup> XP and Windows<sup>®</sup> 2000, please visit [www.microsoft.com/hwdev/usb/](http://www.microsoft.com/hwdev/usb/).

Please read instructions below for further detailed installations.

## 4.1 Installation:

---

Insert the EMB-9658T CD-ROM into the CD-ROM drive. And install the drivers from Step 1 to Step 5 in order.

### Step 1 – Install chip Driver

1. Click on the **Step 1-chip** folder and then double click on the ***infinst\_autol.exe***
2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

### Step 2 – Install vga Driver

1. Click on the **Step 2-vga** folder and choose the folder your system is
2. Double click on **.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 LAN Driver

1. Click on the **Step 3-LAN driver** folder
2. Select the **Windows2000** folder and then double click on ***Autorun.exe***
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

#### Step 4 – Install Audio Driver

1. Click on the **Step 4- Audio Driver** folder and then double click on the **SETUP.exe**
2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

#### Step 5 – Install TPM DRIVER

1. Click on the **Step 5-TPM DRIVER** folder and then double click on the **setup.exe**
2. Follow the instructions that the windows shows
3. The system will help you install the driver automatically

Appendix

A

# Programming the Watchdog Timer

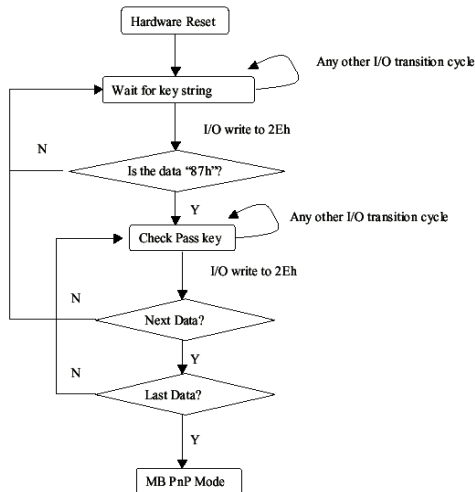
## A.1 Programming

EMB-9658T 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)**

<b>Bit</b>	<b>Description</b>
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 <sup>Note</sup> for WDT

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

<b>Bit</b>	<b>Description</b>
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

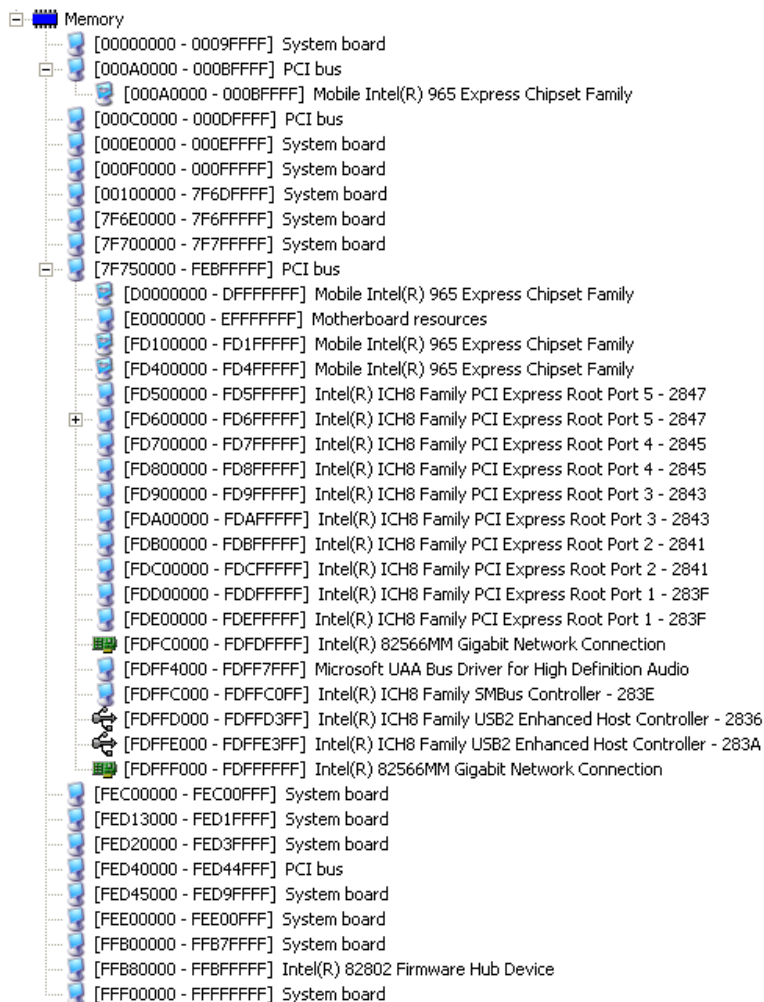
# I/O Information

## B.1 I/O Address Map

FRCYW-DAE649F94	
+	Direct memory access (DMA)
-	Input/output (IO)
-	[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
	[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
	[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)
	[000003B0 - 000003BB] Mobile Intel(R) 965 Express Chipset Family
	[000003C0 - 000003DF] Mobile Intel(R) 965 Express Chipset Family
	[000003E8 - 000003EF] Communications Port (COM3)
	[000003F6 - 000003F6] Primary IDE Channel
	[000003F8 - 000003FF] Communications Port (COM1)

	[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)
	[000003B0 - 000003BB]	Mobile Intel(R) 965 Express Chipset Family
	[000003C0 - 000003DF]	Mobile Intel(R) 965 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) ICH8 Family SMBus Controller - 283E
	[00000880 - 0000088F]	Motherboard resources
	[00000A79 - 00000A79]	ISAPNP Read Data Port
	[00000D00 - 0000FFFF]	PCI bus
	[00009000 - 00009FFF]	Intel(R) ICH8 Family PCI Express Root Port 5 - 2847
	[0000A000 - 0000AFFF]	Intel(R) ICH8 Family PCI Express Root Port 4 - 2845
	[0000C000 - 0000CFFF]	Intel(R) ICH8 Family PCI Express Root Port 3 - 2843
	[0000D000 - 0000DFFF]	Intel(R) ICH8 Family PCI Express Root Port 2 - 2841
	[0000E000 - 0000EFFF]	Intel(R) ICH8 Family PCI Express Root Port 1 - 283F
	[0000F200 - 0000F20F]	Intel(R) ICH8M 3 port Serial ATA Storage Controller - 2828
	[0000F300 - 0000F30F]	Intel(R) ICH8M 3 port Serial ATA Storage Controller - 2828
	[0000F400 - 0000F403]	Intel(R) ICH8M 3 port Serial ATA Storage Controller - 2828
	[0000F500 - 0000F507]	Intel(R) ICH8M 3 port Serial ATA Storage Controller - 2828
	[0000F600 - 0000F603]	Intel(R) ICH8M 3 port Serial ATA Storage Controller - 2828
	[0000F700 - 0000F707]	Intel(R) ICH8M 3 port Serial ATA Storage Controller - 2828
	[0000F800 - 0000F80F]	Intel(R) ICH8M Ultra ATA Storage Controllers - 2850
	[0000F900 - 0000F91F]	Intel(R) ICH8 Family USB Universal Host Controller - 2832
	[0000FA00 - 0000FA1F]	Intel(R) ICH8 Family USB Universal Host Controller - 2831
	[0000FB00 - 0000FB1F]	Intel(R) ICH8 Family USB Universal Host Controller - 2830
	[0000FC00 - 0000FC1F]	Intel(R) ICH8 Family USB Universal Host Controller - 2835
	[0000FD00 - 0000FD1F]	Intel(R) ICH8 Family USB Universal Host Controller - 2834
	[0000FE00 - 0000FE1F]	Intel(R) 82566MM Gigabit Network Connection
	[0000FF00 - 0000FF07]	Mobile Intel(R) 965 Express Chipset Family

## B.2 Memory Address Map

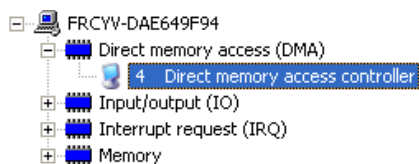


### B.3 IRQ Mapping Chart

FRCYV-DAE649F94	
+	Direct memory access (DMA)
+	Input/output (IO)
-	Interrupt request (IRQ)
	(ISA) 0 System timer
	(ISA) 1 Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
	(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) ICH8 Family SMBus Controller - 283E
	(PCI) 16 Intel(R) ICH8 Family PCI Express Root Port 1 - 283F
	(PCI) 16 Intel(R) ICH8 Family PCI Express Root Port 5 - 2847
	(PCI) 16 Intel(R) ICH8 Family USB Universal Host Controller - 2834
	(PCI) 16 Intel(R) PRO/1000 PL Network Connection
	(PCI) 16 Mobile Intel(R) 965 Express Chipset Family
	(PCI) 17 Intel(R) ICH8 Family PCI Express Root Port 2 - 2841
	(PCI) 18 Intel(R) ICH8 Family PCI Express Root Port 3 - 2843
	(PCI) 18 Intel(R) ICH8 Family USB Universal Host Controller - 2832
	(PCI) 18 Intel(R) ICH8 Family USB2 Enhanced Host Controller - 283A
	(PCI) 19 Intel(R) ICH8 Family PCI Express Root Port 4 - 2845
	(PCI) 19 Intel(R) ICH8 Family USB Universal Host Controller - 2831
	(PCI) 19 Intel(R) ICH8M 3 port Serial ATA Storage Controller - 2828
	(PCI) 20 Intel(R) 82566MM Gigabit Network Connection
	(PCI) 21 Intel(R) ICH8 Family USB Universal Host Controller - 2835
	(PCI) 22 Microsoft UAA Bus Driver for High Definition Audio
	(PCI) 23 Intel(R) ICH8 Family USB Universal Host Controller - 2830
	(PCI) 23 Intel(R) ICH8 Family USB2 Enhanced Host Controller - 2836

## B.4 DMA Channel Assignments

---



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		
CN2	Speaker Output	Catch	2.5mm Pitch 4 pins (Catch 1191-700-04S or compatible)	NA	NA
CN4	Audio 5.1 Channel/ SPDIF	Catch	2.00mm Pitch 14 pins (Catch 1147-000-14S or compatible)	Audio Cable	1700140164
CN7	TV-Out	Astron	2.00mm Pitch 8 pins(Astron.26-41-204-1G-R or compatible)	TV-Out Cable	1700080180
CN8	LCD Inverter	Catch	2.0mm Pitch 5pins(Catch.1192-700-05S or compatible)	NA	NA
CN9	CD-IN	Catch	2.54mm Pitch 4 pins Catch.1138-000-04S or compatible)	CDROM Cable	1703040400
CN10	Internal Keyboard	HO-BASE	2.5mm Pitch 5 pins (HO-BASE 2503-WS-5 or compatible)	NA	NA
CN11	Internal Mouse	Catch	2.0mm Pitch 4 pins (Catch.1192-700-04S	NA	NA

			or compatible)		
CN12	LVDS LCD	E-CALL	1.25mm Pitch 30 Pins(E-call.011 0-01-553-300 or compatible)	NA	NA
CN13	SDVO	Catch	1.0mm Pitch 40 pins(Catch.120 4-710-40SM or compatible)		
CN14	Fan	Catch	2.54mm Pitch 3 pins (Catch 1190-700-042 or compatible)	NA	NA
CN16	RTC Battery	Catch	1.25mm Pitch 2 pins (Catch.1201-70 0-02S or compatible)	NA	NA
CN17	GPS	Catch	1.0mm Pitch 10 pins (Catch 1204-700-10S MR or compatible)	NA	NA
CN18	ATX Power Socket	Catch	3.50 mm Pitch 20 pins (Catch 1121-700-20S or compatible)	NA	NA
CN19	Parallel Port	Catch	2.0mm Pitch 26 pins Catch.1147-00 0-26MSP	Parallel Port Cable	1701260200
CN22	USB Port	Catch	2.00mm Pitch 10 pins (Catch.1147-00	USB Cable	1709100201

			0-10MSP or compatible)		
CN23	USB Port	Catch	2.00mm Pitch 10 pins (Catch.1147-00 0-10MSP or compatible)	USB Cable	1709100201
CN24	Digital I/O	Catch	2.00mm Pitch 10 pins(Catch.114 7-000-10MSP or compatible)	NA	NA
CN25	RS-232 Serial Port	Catch	2.00mm Pitch 10 pins (Catch.1147-00 0-10MP or compatible)	Serial Port Cable	1701100206
CN26	RS-232 Serial Port	Catch	2.00mm Pitch 10 pins(Catch.114 7-000-10MP or compatible)	Serial Port Cable	1701100206
CN27	RS-232 Serial Port	Catch	2.00mm Pitch 10 pins (Catch.1147-00 0-10MP or compatible)	Serial Port Cable	1701100206
CN28	IrDA	JIH VEI	2.0mm Pitch 6 pins(JIH VEI.21B12050- 06S10B-01G-4/ 2.8 or compatible)	NA	NA
CN29	Fan	Catch	2.54mm Pitch 4 pins (Catch 1190-700-042	NA	NA

			or compatible)		
CN30	Front Panel	JIH VEI	2.54mm Pitch 10 pins (JIH VEI.21N22564- 10S10B-01G-6/ 3 or compatible)	NA	NA
CN32	ATX Power Socket	Catch	3.5mm Pitch 4Pins (Catch 1121-700-04S or compatible)	NA	NA
CN33	SATA Power connector	HO- BASE	2.5mm Pitch 4Pins HO- BASE P201-04 <b>or compatible)</b>	NA	NA
IDE1	EIDE Connector	Astron	2.54mm Pitch 40pins (Astron.26-03-2 20L-1G-ATB1- R or compatible)	EIDE Cable	1701400453