

**EMB-9459T Rev.B**

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  
ATX Power Type

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# Packing List

(For Standard only, not for 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 Rev.B

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-9459T Rev.B 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 DDRII 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 Rev.B 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, 24-bit dual-channel LVDS and DVI. Simultaneous / Dual View is available in LCD/CRT, LCD/LCD, LCD/DVI, CRT/DVI, 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 Rev.B 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

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- Onboard Intel® Atom™ N270 Processor (Fanless)
- Intel® 945GSE + ICH7M
- DDRII 400/533 Memory, Max. 2GB
- Gigabit Ethernet x 2 or 10/100Base-TX x 2
- CRT, TV-out, DVI, 18-bit Dual-channel LVDS and 2<sup>nd</sup> 18/24-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, COM x 6, Parallel x 1
- PCI x 1, Mini PCI x 1, PCI-E [x1] x 2 in PCI-E [x4] (Through Riser Card)
- AT/ATX Power Operation
- Onboard SATA Power Connector x 1
- Optional TPM

### 1.3 Specifications

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#### System

- Processor Supports onboard Intel<sup>®</sup> Atom<sup>™</sup> N270 Processor  
1.6GHz, FSB533MHz
- System Memory 240-pin DDRII DIMM x 1,  
DDRII 400/533 up to 2GB
- Chipset Intel<sup>®</sup> 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, PCI-E  
[ x1 ] x 2 in PCI-E [ x4 ]  
(Through Riser Card)

- Battery Lithium battery
- Power Requirement AT/ATX
- Power Consumption Intel<sup>®</sup> Atom<sup>™</sup> 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/DVI, LCD/DVI, CRT/TV, LCD/TV simultaneous/ dual view displays**

- Chipset Intel<sup>®</sup> 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 and DVI
- TV-out Supports NTSC and PAL

standard, S-Terminal and  
Composite Video

- DVI DVI-I x 1

## **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
- 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

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**Warning!**

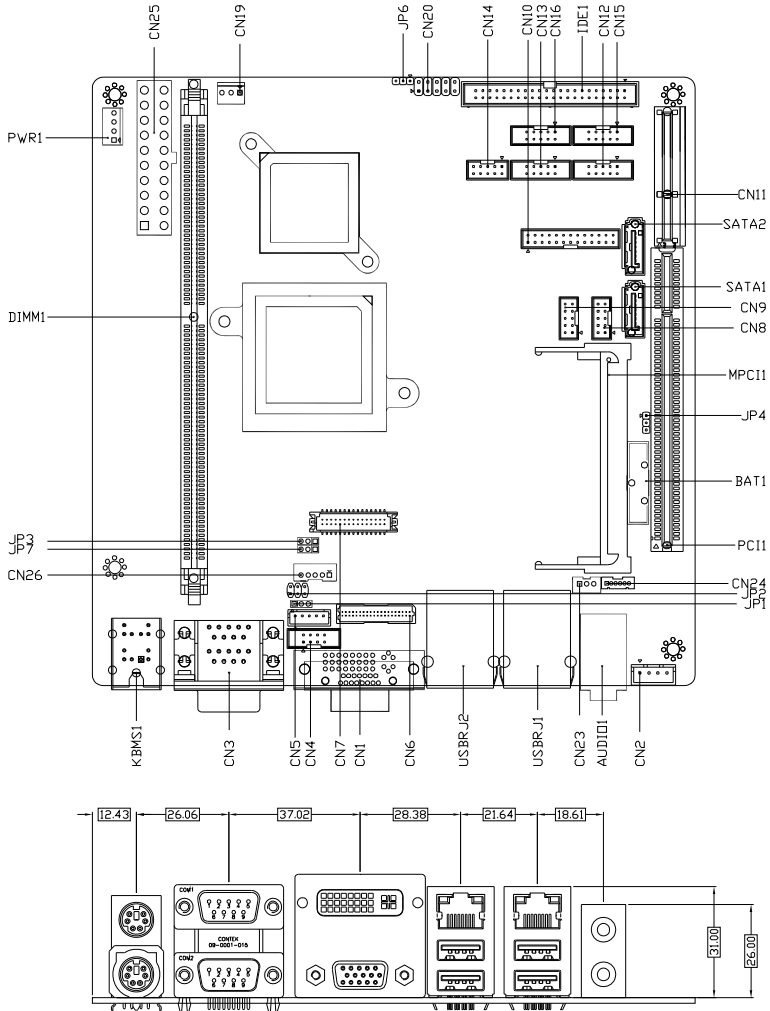
*Always completely disconnect the power cord from your board whenever you are working on it. Do not make connections while the power is on, because a sudden rush of power can damage sensitive electronic components.*

**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*

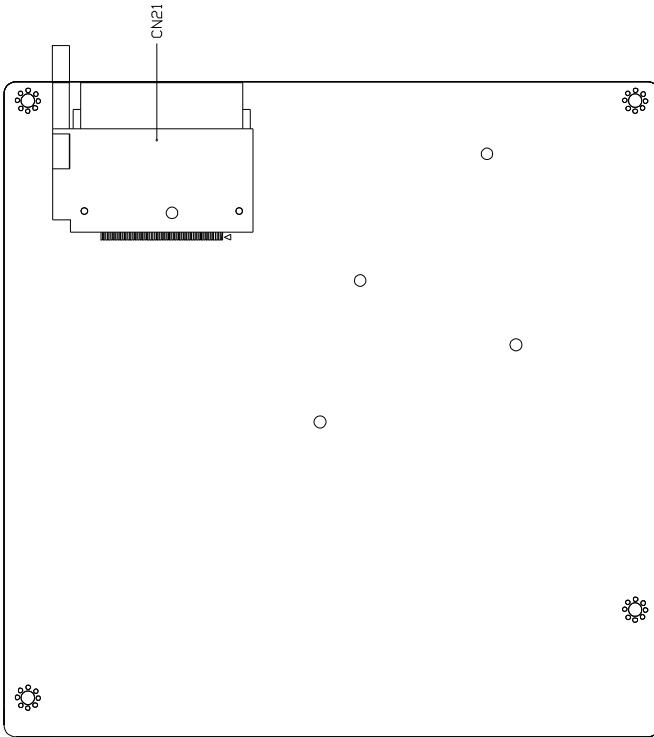
## 2.2 Location of Connectors and Jumpers

### Component Side



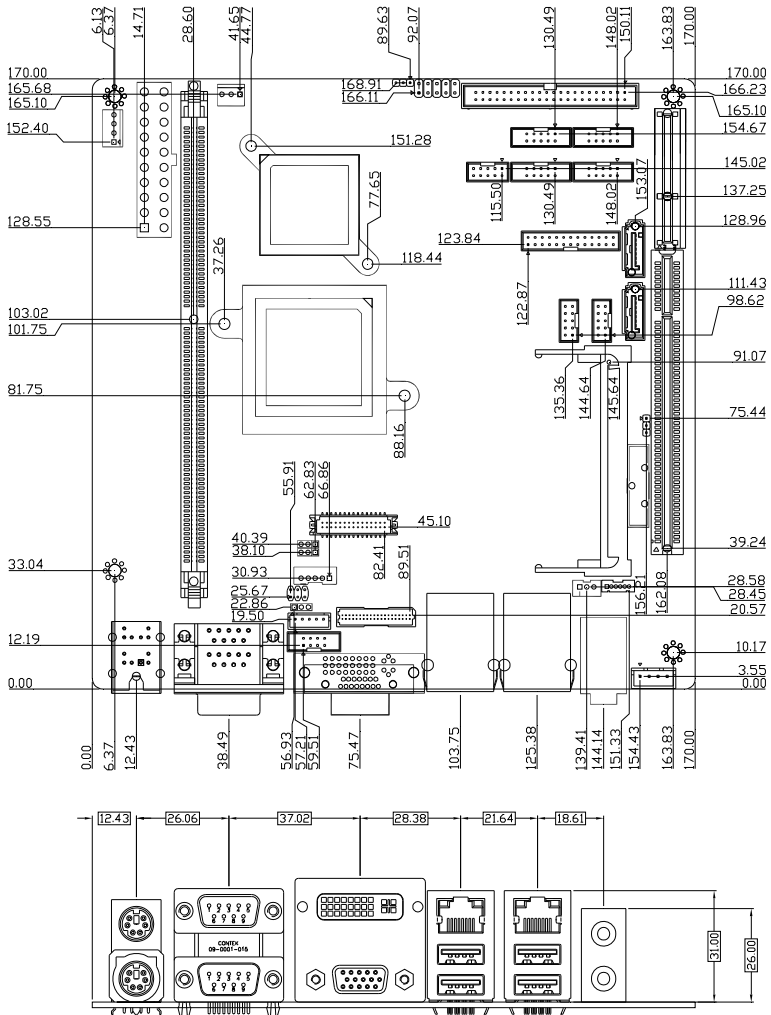


Solder Side

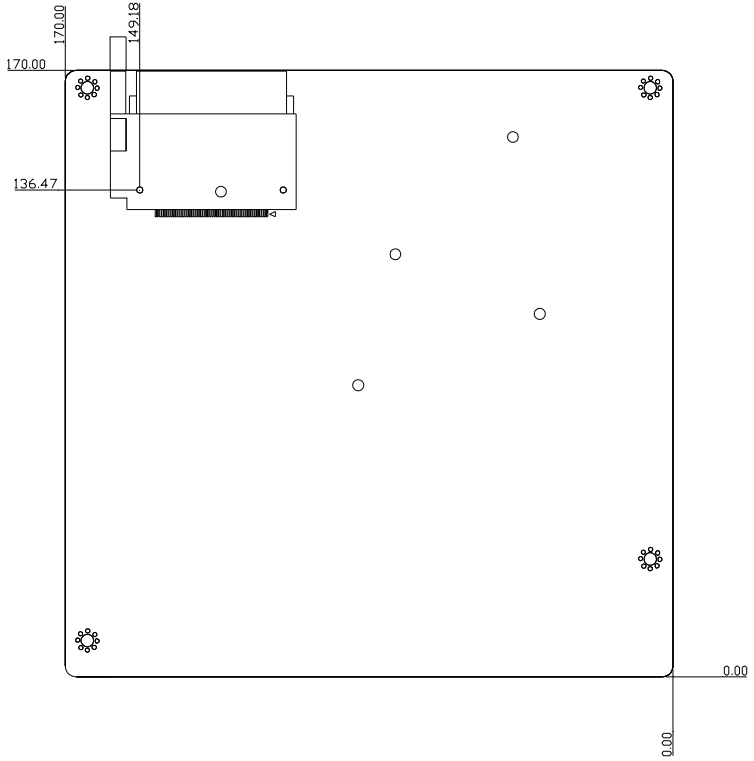


## 2.3 Mechanical Drawing

### 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:

<b>Label</b>	<b>Function</b>
JP1	1 <sup>st</sup> 18-bit LCD Inverter Voltage selection
JP2	COM2 Ring +5V/+12V selection
JP3	1 <sup>st</sup> 18-bit LCD Voltage selection
JP4	Clear CMOS
JP5	2 <sup>nd</sup> 24-bit LCD Voltage selection
JP6	AT/ATX selection
JP7	2 <sup>nd</sup> 24-bit LCD Inverter Voltage 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:

<b>Label</b>	<b>Function</b>
AUDIO1	Audio Connector
KBMS1	PS/2 Keyboard/Mouse Connector
PWR1	HDD Power Connector (12V/5V)
USB RJ1	USB/LAN1 Connector
USB RJ2	USB/LAN2 Connector
IDE1	44-Pin 2.0mm IDE Connector (Slave only)
SATA1/SATA2	Serial ATA Connector
DIMM1	DDR II DIMM Slot
PCI1	PCI Slot Connector
MPC11	Mini PCI Connector
CN1	VGA Display Connector
CN2	Audio 2Watt Speaker Output
CN3	COM1/COM2 Connector
CN4	TV Output Connector
CN5	LCD Inverter Connector 18-bit
CN6	2nd LVDS Connector (24-bit)
CN7	1st LVDS Connector (18-bit)
CN8/ CN9	Front USB Connector
CN10	LPT Port Connector
CN11	PCI-Express Slot

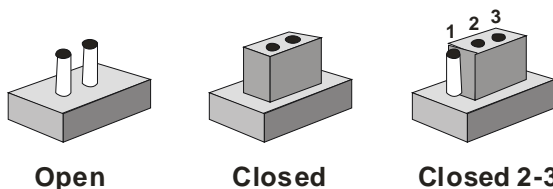
CN12	COM 5 RS-232 Serial Port Connector
CN13	COM 6 RS-232 Serial Port Connector
CN14	Digital I/O
CN15	COM 4 RS-232 Serial Port Connector
CN16	COM 3 RS-232 Serial Port Connector
CN19	3-Pin +12V Fan Connector
CN20	Front Panel Connector
CN21	Compact Flash Slot
CN23	SPDIF Connector
CN24	Audio Connector (Surround)
CN25	ATX power connector
CN26	2nd Inverter connector for 2nd LVDS 24-Bit

## 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 (JP1-18 bits, JP7-24 bits)**

JP1/JP7	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 LCD Voltage Selection (JP3-18 bits, JP5-24 bits)**

JP3/JP8	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 AT/ATX Power Mode Selection (JP6)**

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

**2.12 HDD Power Connector (PWR1)**

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



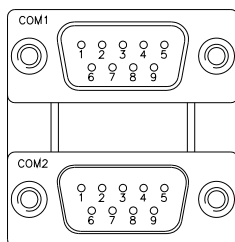
**Note:**

The max. rating of Pin 1 is 12V @ 1A

The max. rating of Pin 4 is 5V @ 1A

**2.13 Audio 2Watt Speaker Output (CN2)**

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

**2.14 COM1 RS-232 & COM2 RS-232/422/485 Serial Port Connector (CN3)****COM1**

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

**COM2**

Pin	Signal	Pin	Signal
1	DCD(422TXD-/485DATA-)	2	RXD (422 RXD+)
3	TXD(422TXD+/485DATA+)	4	DTR (422 RXD-)
5	GND	6	DSR

7	RTS	8	CTS
9	RI/+5V/+12V		

### 2.15 TV Output Connector (CN4)

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

### 2.16 LCD Inverter Connector (CN5, CN26)

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

**Note:**

The max. rating of Pin 1 is 12V @ 0.5A

### 2.17 LVDS LCD Connector (CN6, CN7)

Pin	Signal	Pin	Signal
1	ENBKL	2	N.C
3	PPVCC	4	GND
5	LVDS1_TXCLK-	6	LVDS1_TXCLK+
7	PPVCC	8	GND
9	LVDS1_TX0-	10	LVDS1_TX0+
11	LVDS1_TX1-	12	LVDS1_TX1+
13	LVDS1_TX2-	14	LVDS1_TX2+
15	LVDS1_TX3-(CN6-24bit only)	16	LVDS1_TX3+(CN6-24bit only)

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-(CN6-24bit only)	26	LVDS2_TX3+(CN6-24bit only)
27	PPVCC	28	GND
29	LVDS2_TXCLK-	30	LVDS2_TXCLK+

**Note:**

The max. rating for LCD (Pin 3, Pin 7, Pin 27) is 5V @ 0.5A

### 2.18 USB Connector (CN8, CN9)

Pin	Signal	Pin	Signal
1	+5V	2	GND
3	USB1-	4	GND
5	USB1+	6	USB2+
7	GND	8	USB2-
9	GND	10	+5V

### 2.19 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

## 2.20 COM5, COM6, COM4, COM3 RS-232 Serial Port Connector (CN12, CN13, CN15, 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

## 2.21 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

### **Note:**

The max. rating of Pin 1~ Pin 8 is 5V @ 8mA

The max. rating of Pin 9 is 5V @0.5A

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
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**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

**2.22 Front Panel Connector (CN20)**

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

**2.23 SPDIF Connector (CN23)**

Pin	Signal
1	SPDIF Output
2	GND
3	SPDIF Input

**2.24 Audio Connector (Surround) (CN24)**

Pin	Signal
1	SURROUND-R
2	SURROUND-L
3	GND

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4	GND
5	LFEOUT
6	CENOUT

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## 2.25 ATX Power Connector (CN25)

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Pin	Signal	Pin	Signal
1	N.C.	11	N.C.
2	N.C.	12	N.C.
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	N.C.
9	+5VSB	19	+5V
10	+12V	20	+5V

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## 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><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 <b>SJ/T 11363-2006</b> 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 <b>SJ/T 11363-2006</b> 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 Rev.B CMOS memory has an integral lithium battery backup for data retention. However, you will need to replace the complete unit when it finally runs down.

## 3.2 Award BIOS Setup

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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.

**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 Rev.B 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:

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Insert the EMB-9459T Rev.B 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



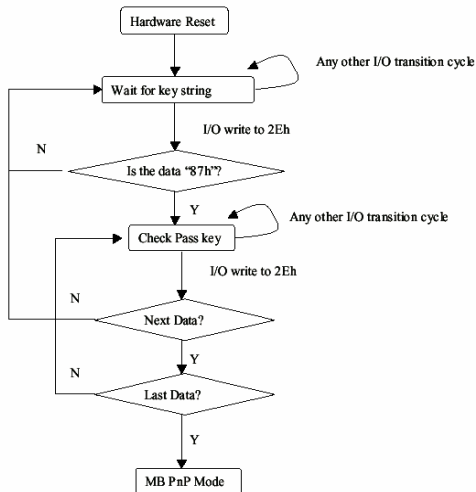
## A.1 Programming

EMB-9459T Rev.B 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.

	<b>Address Port</b>	<b>Data Port</b>
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 <sup>Note</sup> 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

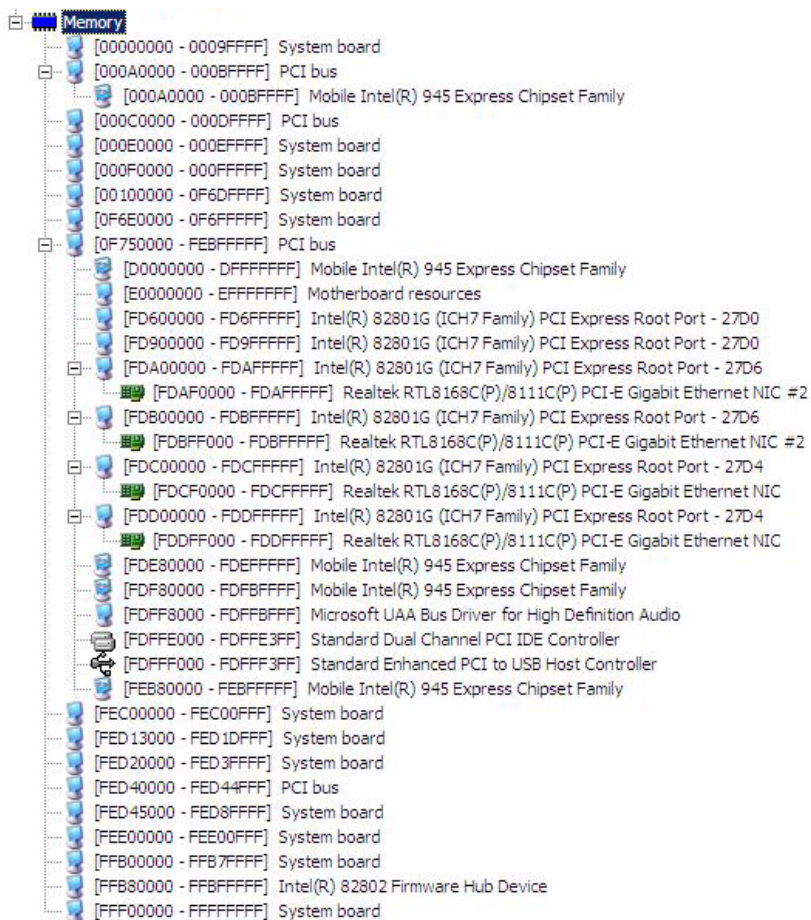
**B**

# 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



### 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(CATCH.1 191-700-04S compatible)	N/A	N/A
CN3	COM1and COM2 Connector	Contek	D-SUB 9 Connector Dual Port (Contek.B-DGN1 0910101 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( 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	USB2 & USB3 Connector	CATCH	2.00mm Pitch 10 pins ( CATCH H754-2x5 or compatible)	USB Cable	1709100208
CN10	LPT port Connector	CATCH	2.00mm Pitch 26 pins (CATCH.A003-26 8 or compatible)	LPT cable	1701260200
CN11	PCI-Express X4 Connector	FOX-CONN	PCI-E X4 (FOXCONN.2EG 03217-D2D-DF or compatible)		
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)		
CN15	COM4 Connector	CATCH	2.00mm Pitch 10 pins ( CATCH H754-2x5 or compatible)	Serial Port Cable	1701100206
CN16	COM3 Connector	CATCH	2.00mm Pitch 10 pins ( CATCH H754-2x5 or compatible)	Serial Port Cable	1701100206
CN18	IrDA Connector		2.00mm Pitch 6 pins ( 1x6 or compatible)	N/A	N/A
CN19	FAN Connector	CATCH	2.54mm Pitch 3 pins. (CATCH.1190-70	N/A	N/A



			0-03S or compatible)		
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