

## **EMB-A50M**

AMD T56N/T44R Processor

Mini-ITX

Realtek 8111E Ethernet

2 USB3.0, 10 USB2.0, 4 COM

1 PCI-Express 2.0[x4], 1 Mini PCIe

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# Packing List

(Standard, not bulk pack)

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

- 1 Serial ATA Cable
- 1 Metal I/O Bracket
- 1 Utility DVD
- 1 EMB-A50M

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

# Contents

## Chapter 1 General Information

1.1 Introduction.....	1-2
1.2 Features .....	1-3
1.3 Specifications .....	1-4

## Chapter 2 Quick Installation Guide

2.1 Safety Precautions .....	2-2
2.2 Location of Connectors and Jumpers .....	2-3
2.3 Mechanical Drawing .....	2-7
2.4 List of Jumpers .....	2-11
2.5 List of Connectors .....	2-11
2.6 Setting Jumpers .....	2-13
2.7 CMOS Setting (CLRTC) (JP1) .....	2-14
2.8 CHASSIS INTRUDER (CHASSIS) (JP2).....	2-14
2.9 Pin Header (USB 56, 78) .....	2-14
2.10 USB 3.0 Connector (USB 3_34) .....	2-14
2.11 RS-232 Pin Header (COM 1, 3, 4) .....	2-15
2.12 RS-232/422/485 Pin Header (COM 2) .....	2-15
2.13 Digital I/O Pin Header (DIO 1).....	2-15
2.14 4-pin ATX Power Connector (ATX 1) .....	2-16
2.15 24-pin ATX Power Connector (ATX 2).....	2-16
2.16 SATA Connector (SATA 1~5) .....	2-16
2.17 Front Panel Connector (F_Panel) .....	2-17

2.18 AAFP Header (AAFP) .....	2-17
2.19 FAN Connector (FAN 1, 2).....	2-17

### **Chapter 3 AMI BIOS Setup**

3.1 System Test and Initialization. ....	3-2
3.2 AMI BIOS Setup .....	3-3

### **Chapter 4 Driver Installation**

4.1 Installation.....	4-3
-----------------------	-----

### **Appendix A Programming The Watchdog Timer**

A.1 Programming .....	A-2
A.2 ITE8771E Watchdog Timer Initial Program.....	A-6

### **Appendix B I/O Information**

B.1 I/O Address Map .....	B-2
B.2 Memory Address Map.....	B-4
B.3 IRQ Mapping Chart.....	B-5
B.4 DMA Channel Assignments.....	B-8

### **Appendix C Mating Connector**

C.1 List of Mating Connectors and Cables.....	C-2
---	-----

### **Appendix D AHCI Setting**

D.1 Setting AHCI .....	D-2
------------------------	-----

Chapter

1

**General  
Information**

## 1.1 Introduction

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The EMB-A50M supports AMD T56N/T44R Dual Core/Single Core processor which when paired with the AMD Hudson M1/A50M chipset offers a high performance computing platform with low power consumption. This new product supports two 240-pin DDR3 DIMMs at speeds of 800/1066, up to 8GB. Five SATA interfaces provide ample storage. With dual Gigabit Ethernet, four COM ports, ten USB2.0 ports, two USB3.0 ports, one keyboard/mouse port and one Line-in, Mic-in, Line-out port, the EMB-A50M meets the requirements of today's demanding applications.

Display requirements are met with an abundance of interfaces such as HDMI and DVI-I. Display memory is shared from the system memory up to 512MB. EMB-A50M has an integrated AMD Radeon™ HD 6310 graphics engine, up to 1920 x 1200 for HDMI/DVI output resolutions.

With all of its integrated features, the EMB-A50M 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 AMD Fusion T56N/T44R Dual-Core/Single Core Processor
- AMD Hudson M1/A50M
- 240-pin DDR3 800/1066 DIMM x 2, Max. 8GB
- Gigabit Ethernet x 2
- HDMI, DVI-I
- SATA 6.0Gb/S x 5
- USB3.0 x 2, USB2.0 x 10, COM x 4
- PCI-Express x 1, Mini PCIe x 1

### 1.3 Specifications

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#### System

- Processor Onboard AMD Fusion T56N/T44R  
Dual-Core/Single Core Processor
- System Memory 240-pin DDR3 800/1066 DIMM x 2, Max. 8GB
- Chipset AMD Hudson M1/A50M
- I/O Chipset ITE IT8771E
- Ethernet Realtek 8111E for 10/100/1000Base-TX, RJ-45 x 2
- BIOS AMI BIOS, 32 Mb Flash ROM, PnP, DMI 2.0, WfM 2.0, ACPI 2.0a, SM BIOS 2.6
- Wake On LAN Yes
- Watchdog Timer System reset: 1~255 steps programmable
- H/W Status Monitoring Supports system temperature, voltage and cooling fan status monitoring
- Expansion Interface PCI-Express 2.0 [x4] x 1, Mini PCIe (Half size x 1)
- Battery Lithium battery
- Power Requirement Standard 24-pin ATX connector x 1, 4-pin 12V ATX connector x 1
- Board Size 6.7"(L) x 6.7"(W) (170 mm x 170 mm)
- Gross Weight 1.1 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**

- Chipset Integrated AMD Radeon™ HD 6310 (6250 for T44R) graphics engine
- Memory Shared system memory up to 512MB
- Resolution Up to 1920 x 1200 for HDMI/DVI output resolution
- Video Interface HDMI, DVI-I

**I/O**

- Storage SATA 6.0Gb/s x 5 (supports AHCI mode)
- Serial Port RS-232 x 3, RS-232/422/485 x 1
- Audio Line-in, Mic-in, Line-out
- USB USB3.0 x 2, USB2.0 x 10
- Digital I/O Supports 8-bit (Programmable)
- PS/2 Port Keyboard + Mouse x 1

Chapter

2

**Quick  
Installation  
Guide**

## 2.1 Safety Precautions

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**Warning!**

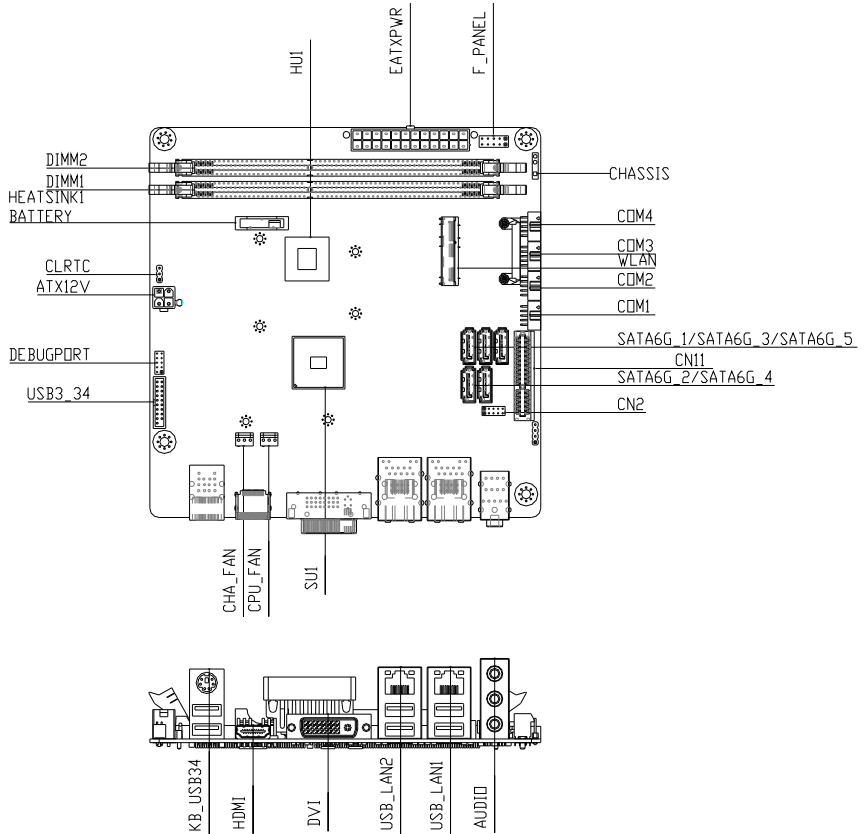
*Always completely disconnect the power cord from your board whenever you are working on it. Do not make connections while the power is on, because a sudden rush of power can damage sensitive electronic components.*

**Caution!**

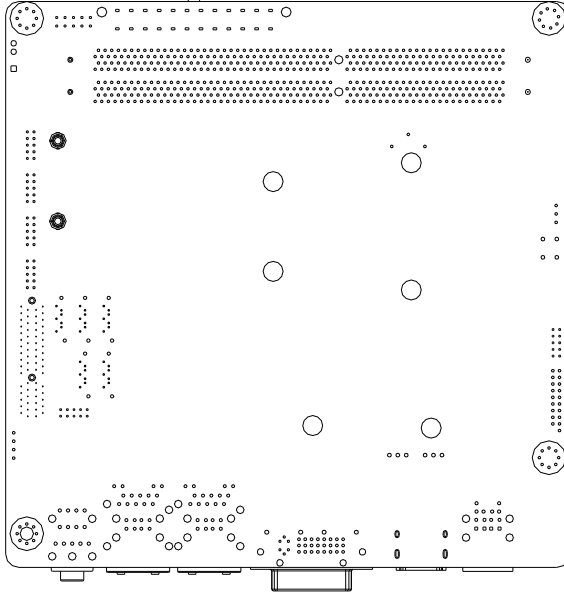
*Always ground yourself to remove any static charge before touching the board. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not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

## 2.2 Location of Connectors and Jumpers

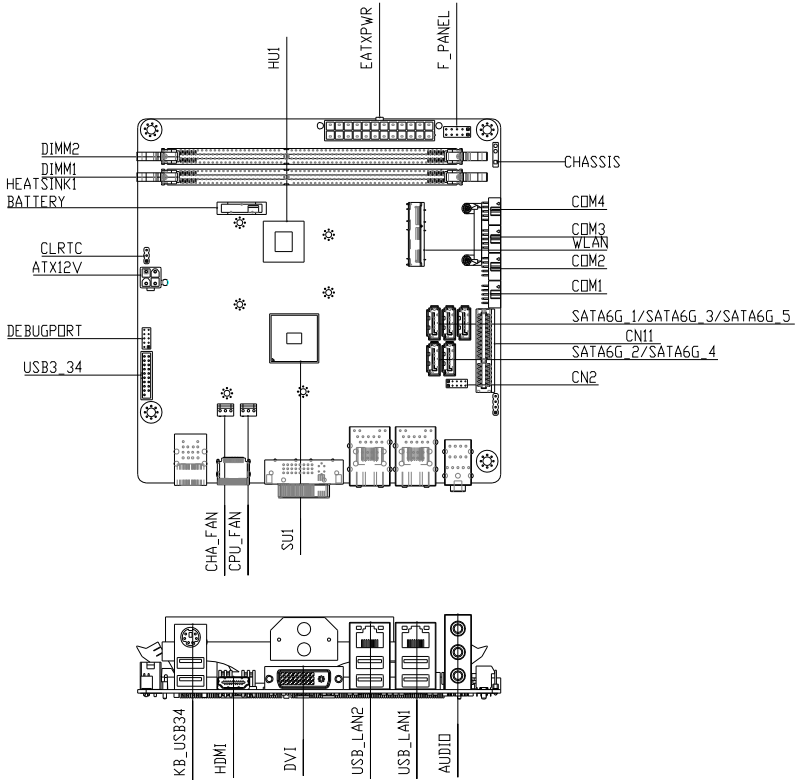
### Component Side (With Fan)



Solder Side (With Fan)

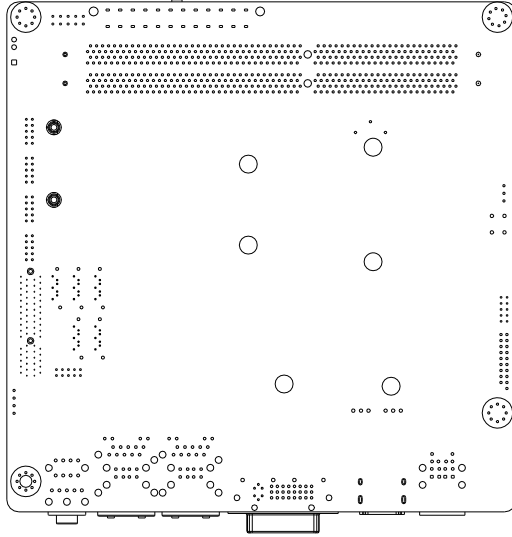


Component Side (Fanless)



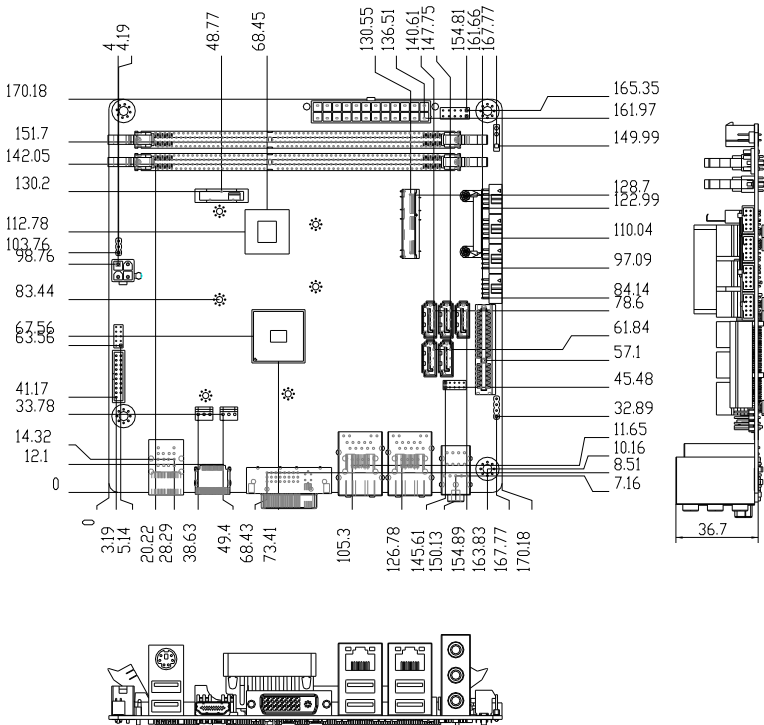


**Solder Side (Fanless)**

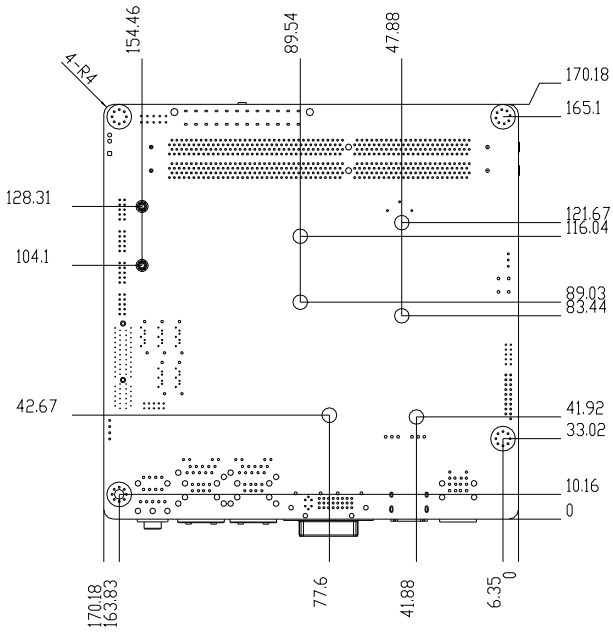


## 2.3 Mechanical Drawing

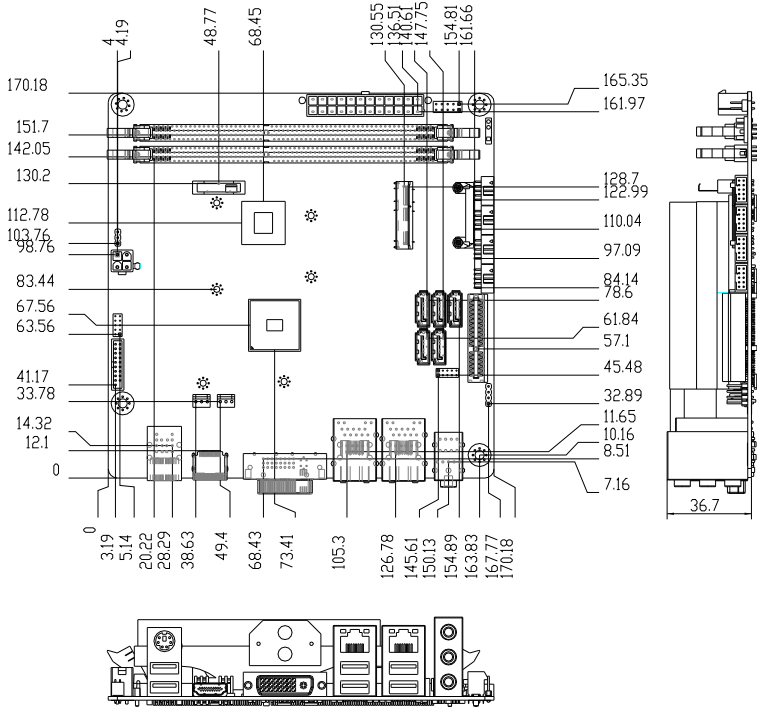
### Component Side (with Fan)



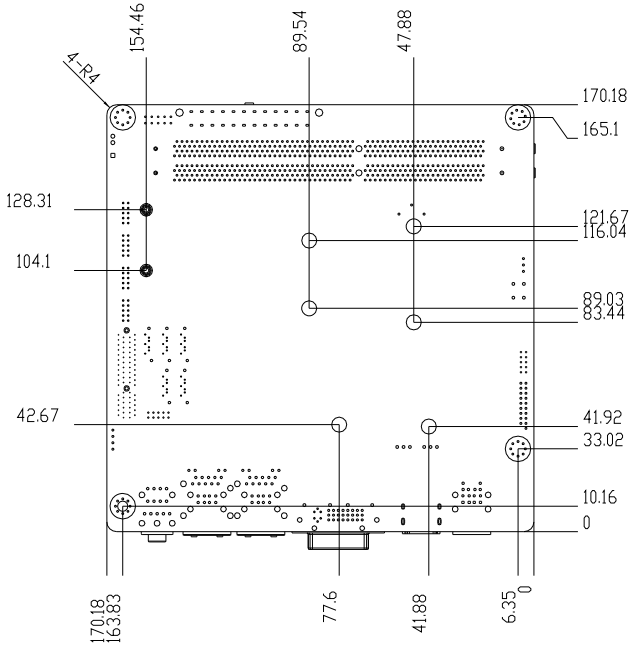
Solder Side (with Fan)



Component Side (Fanless)



Solder Side (Fanless)



## 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:

Label	Function
CLRTC	CMOS Setting Selection
CHASSIS	CHASSIS INTRUDER

## 2.5 List of Connectors

---

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

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

Label	Function
DIMM1	DDR3 SOCKET
DIMM2	DDR3 SOCKET
24P ATX POWER	ATX POWER SUPPLY INPUT
4P ATX POWER	ATX POWER SUPPLY INPUT
COM1.2.3.4	ONLY COM2 SUPPORT RS/422/485
WLAN	MINI CARD SOCKET
SATA1.2.3.4.5	SATA INTERFACE
USB5.6.7.8	USB2.0 INTERFACE
LAN1+USB*2	GIGA LAN+USB2.0
LAN2+USB*2	GIGA LAN+USB2.0
DVI	DVI-I OUTPUT
HDMI	HDMI OUTPUT

**Mini-ITX****EMB-A50M**

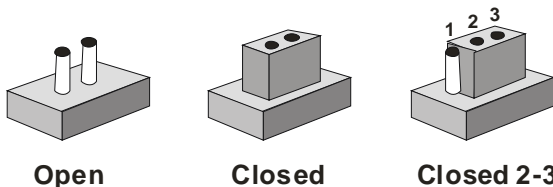
KB_USB34	KB/MS+USB2.0
USB3_34	USB3.0
CN2	Digital I/O
CN11	PCIE x4 Slots
F_Panel	PWRBTN,RESET,PW/HD LED
SPDIF	SPDIF OUT
LPC_Debug	Debug use
DIMM1	DDR3 SOCKET
DIMM2	DDR3 SOCKET
24P ATX POWER	ATX POWER SUPPLY INPUT
4P ATX POWER	ATX POWER SUPPLY INPUT
COM1.2.3.4	ONLY COM2 SUPPORT RS/422/485
WLAN	MINI CARD SOCKET
SATA1.2.3.4.5	SATA INTERFACE
USB56.78	USB2.0 INTERFACE
LAN1+USB*2	GIGA LAN+USB2.0
LAN2+USB*2	GIGA LAN+USB2.0
DVI	DVI-I OUTPUT
HDMI	HDMI OUTPUT
KB_USB34	KB/MS+USB2.0
USB3_34	USB3.0

## 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 CMOS Setting (CLRTC) (JP1)

JP1	Function
1-2	Normal (Default)
2-3	Clear CMOS

## 2.8 CHASSIS INTRUDER (CHASSIS) (JP2)

JP2	Function
3-4	Normal
OPEN	CHASSIS INTRUDER

## 2.9 Pin Header (USB 56, 78)

Pin	Signal	Pin	Signal
1	+5V	2	GND
3	USBD1-	4	GND
5	USBD1+	6	USBD2+
7	GND	8	USBD2-
9	GND	10	+5V

## 2.10 USB 3.0 Connector (USB 3\_34)

Pin	Signal	Pin	Signal
1	+5V_USB3_2_P1	11	+5V_USB3_2_P2
2	U3_2_U3RXDN1	12	U3_2_U3RXDN2
3	U3_2_U3RXDP1	13	U3_2_U3RXDP2
4	GND	14	GND
5	U3_2_U3TXDN1	15	U3_2_U3TXDN2
6	U3_2_U3TXDP1	16	U3_2_U3TXDP2
7	GND	17	GND
8	U3_2_U2DN1	18	U3_2_U2DN2
9	U3_2_U2DP1	19	U3_2_U2DP2
10	N.C	20	N.C

### 2.11 RS-232 Pin Header (COM 1, 3, 4)

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

### 2.12 RS-232/422/485 Pin Header (COM 2)

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

### 2.13 Digital I/O Pin Header (DIO 1)

The memory address is 0xFED80180~ 0xFED80187.

Pin	Signal	Pin	Signal
1	DIO1	2	DIO2
3	DIO3	4	DIO4
5	DIO5	6	DIO6
7	DIO7	8	DIO8
9	+5V	10	GND

BIOS Setting	Connector Definition	AMD Chipset GPIO Address
DIO_P#8 @MIO:FED80187	Pin 8	GPIOD135
DIO_P#7 @MIO:FED80186	Pin 7	GPIOD134

DIO_P#6 @MIO:FED80185	Pin 6	GPIOD133
DIO_P#5 @MIO:FED80184	Pin 5	GPIOD132
DIO_P#4 @MIO:FED80183	Pin 4	GPIOD131
DIO_P#3 @MIO:FED80182	Pin 3	GPIOD130
DIO_P#2 @MIO:FED80181	Pin 2	GPIOD129
DIO_P#1 @MIO:FED80180	Pin 1	GPIOD128

### 2.14 4-pin ATX Power Connector (ATX 1)

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

### 2.15 24-pin ATX Power Connector (ATX 2)

Pin	Signal	Pin	Signal
1	+3.3V	2	+3.3V
3	GND	4	+5V
5	GND	6	+5V
7	GND	8	PWROK
9	+5VSB	10	+12V
11	+12V	12	+3.3V
13	+3.3V	14	-12V
15	GND	16	PS_ON
17	GND	18	GND
19	GND	20	NC
21	+5V	22	+5V
23	+5V	24	GND

### 2.16 SATA Connector (SATA 1~5)

Pin	Signal	Pin	Signal
1	GND	2	TXP

**Mini-ITX****EMB - A 5 0 M**

3	TXN	4	GND
5	RXN	6	RXP
7	GND		

**2.17 Front Panel Connector (F\_Panel)**

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

**2.18 AAFP Header (AAFP)**

Pin	Signal	Pin	Signal
1	MIC2_R	2	GND
2	MIC2_L	4	N.C
3	LINE2_R	6	MIC SENSOR resister
4	A_JD_FRONT	8	N.C
5	LINE2_L	10	LINE IN SENSOR resister

**2.19 FAN Connector (FAN 1, 2)**

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

## 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 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

**AMI  
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.

#### **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-A50M CMOS memory has an integral lithium battery backup for data retention. However, you will need to replace the complete unit when it runs down.

## 3.2 AMI BIOS Setup

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AMI 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> or <F2> immediately. This will allow you to enter Setup.

### Main

Set the date, use tab to switch between date elements.

### Advanced

Advanced BIOS Features Setup including TPM, ACPI, etc.

### Chipset

host bridge parameters.

### Boot

Enables/disable quiet boot option.

### Security

Set setup administrator password.

### Save&Exit

Exit system setup after saving the changes.



Chapter

4

**Driver  
Installation**

The EMB-A50M comes with an Autorun DVD-ROM that contains all drivers and utilities that can help you to install the driver automatically.

Insert the driver DVD, the driver DVD-title will automatically 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 AMD Total Driver
- Step 3 – Install LAN Device
- Step 4 – Install Audio Driver
- Step 5 – Install USB3.0 Driver
- Step 6 – Install AHCI Driver

Please read instructions below for further detailed installations.

## 4.1 Installation:

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Insert the EMB-A50M DVD-ROM into the DVD-ROM drive. And install the drivers from Step 1 to Step 6 in order.

### Step 1 – Install Chipset Driver

1. Click on the **Step 1 - CPU** 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

**Note:** This driver is for Windows® XP only. You do not need to install this driver if the OS is Windows® 7.

### Step 2 – Install AMD Total Driver

1. Click on the **Step 2 - AMD Total Driver** folder and select the OS folder your system is
2. Double click on the **Setup.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** folder and select the OS folder your system is
2. Double click on the **setup.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 4 –Install Audio Driver

1. Click on the **Step 4 - Audio** folder and select the OS folder for your system
2. Double click on the **Setup.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 5 –Install USB3.0 Driver

1. Click on the **Step 5 - USB3.0** 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

#### Step 6 –Install AHCI Driver

Please refer to the Appendix D AHCI Setting

Appendix

**A**

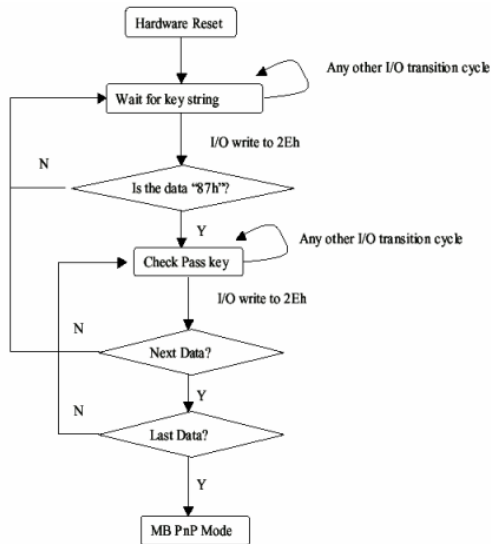
# Programming the Watchdog Timer

## A.1 Programming

EMB-A50M utilizes ITE 8771E 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 a customized program to fit your application.

### Configuring Sequence Description

After the hardware reset or power-on reset, the ITE 8771E 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

07h	71h	R/W	00h	Watch Dog Timer Control Register
07h	72h	R/W	20h	Watch Dog Timer Configuration Register
07h	73h	R/W	38h	Watch Dog Timer Time-out Value (LSB) Register
07h	74h	R/W	00h	Watch Dog Timer Time-out Value (MSB) Register

### Configure Control (Index=02h)

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

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

### Watch Dog Timer 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	Reserved
3-2	Reserved
1	Force Time-out This bit is self-cleared.
0	WDT Status



1: WDT value is equal to 0.  
0: WDT value is not equal to 0.

### Watch Dog Timer Configuration Register (Index=72h, Default=001s0000b)

Bit	Description
	<b>WDT Time-out Value Select 1</b>
7	1: Second 0: Minute
6	WDT Output through KRST (pulse) Enable 1: Enable 0: Disable
	<b>WDT Time-out Value Extra Select</b>
5	1: 64ms x WDT Time-out value (default=4s) 0: Determined by WDT Time-out value select 1 (bit 7 of this register)
	<b>WDT Output through PWRGD Enable</b>
4	1: Enable 0: Disable <i>During LRESET# this bit is selected by JP2 power-on strapping option.</i>
3-0	<b>Interrupt Level Select for WDT</b> Please refer to Table 8-9 Interrupt Level Mapping Table

### Watch Dog Timer Time-out Value (LSB) Register (Index=73h, Default=38h)

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

### Watch Dog Timer Time-out Value (MSB) Register (Index=74h, Default=00h)

Bit	Description
7-0	WDT Time-out Value 15-8

## A.2 ITE8771E Watchdog Timer Initial Program

---

```
.MODEL SMALL
.CODE
Main:
CALL Enter_Configuration_mode
CALL Check_Chip
mov cl, 7
call Set_Logic_Device
;time setting
mov cl, 10 ; 10 Sec
dec al
Watch_Dog_Setting:
;Timer setting
mov al, cl
mov cl, 73h
call Superio_Set_Reg
;Clear by keyboard or mouse interrupt
mov al, 0f0h
mov cl, 71h
call Superio_Set_Reg
;unit is second.
mov al, 0C0H
mov cl, 72h
```

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

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

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

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

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

CALL Write\_Configuration\_Data

RET

Exit\_Configuration\_Mode ENDP

Check\_Chip PROC NEAR

MOV AL,20h

CALL Read\_Configuration\_Data

CMP AL,87h

JNE Not\_Initial

MOV AL,21h

CALL Read\_Configuration\_Data

CMP AL,81h

JNE Not\_Initial

Need\_Initial:

STC

RET

Not\_Initial:

CLC

RET

Check\_Chip ENDP

Read\_Configuration\_Data PROC NEAR

MOV DX,WORD PTR CS:[Cfg\_Port+04h]

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

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

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

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

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

## END Main

Note: Interrupt level mapping

0Fh-Dh: not valid

0Ch: IRQ12

.

.

03h: IRQ3

02h: not valid

01h: IRQ1

00h: no interrupt selected

Appendix



































**B**

**I/O Information**

## B.1 I/O Address Map

Input/output (IO)	
[00000000 - 0000000F]	Direct memory access controller
[00000000 - 0000000F]	Motherboard resources
[00000000 - 00000CF7]	PCI bus
[00000010 - 0000001F]	Motherboard resources
[00000020 - 00000021]	Programmable interrupt controller
[00000022 - 0000003F]	Motherboard resources
[00000040 - 00000043]	System timer
[00000044 - 0000005F]	Motherboard resources
[00000060 - 00000060]	Standard PS/2 Keyboard
[00000061 - 00000061]	System speaker
[00000064 - 00000064]	Standard PS/2 Keyboard
[00000070 - 00000071]	System CMOS/real time clock
[00000072 - 0000007F]	Motherboard resources
[00000080 - 00000080]	Motherboard resources
[00000081 - 00000083]	Direct memory access controller
[00000084 - 00000086]	Motherboard resources
[00000087 - 00000087]	Direct memory access controller
[00000088 - 00000088]	Motherboard resources
[00000089 - 0000008B]	Direct memory access controller
[0000008C - 0000008E]	Motherboard resources
[0000008F - 0000008F]	Direct memory access controller
[00000090 - 0000009F]	Motherboard resources
[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]	ATA Channel 1
[000001F0 - 000001F7]	ATA Channel 0
[000002E8 - 000002EF]	Communications Port (COM4)
[000002F8 - 000002FF]	Communications Port (COM2)
[00000376 - 00000376]	ATA Channel 1
[000003B0 - 000003BB]	AMD Radeon HD 6320 Graphics
[000003C0 - 000003DF]	AMD Radeon HD 6320 Graphics
[000003E8 - 000003EF]	Communications Port (COM3)
[000003F6 - 000003F6]	ATA Channel 0
[000003F8 - 000003FF]	Communications Port (COM1)



	[0000040B - 0000040B]	Motherboard resources
	[000004D0 - 000004D1]	Motherboard resources
	[000004D6 - 000004D6]	Motherboard resources
	[00000500 - 0000051F]	Motherboard resources
	[00000520 - 0000052F]	Motherboard resources
	[00000530 - 0000053F]	Motherboard resources
	[00000800 - 0000089F]	Motherboard resources
	[00000900 - 0000090F]	Motherboard resources
	[00000910 - 0000091F]	Motherboard resources
	[00000B20 - 00000B3F]	Motherboard resources
	[00000C00 - 00000C01]	Motherboard resources
	[00000C14 - 00000C14]	Motherboard resources
	[00000C50 - 00000C51]	Motherboard resources
	[00000C52 - 00000C52]	Motherboard resources
	[00000C6C - 00000C6C]	Motherboard resources
	[00000C6F - 00000C6F]	Motherboard resources
	[00000CD0 - 00000CD1]	Motherboard resources
	[00000CD2 - 00000CD3]	Motherboard resources
	[00000CD4 - 00000CD5]	Motherboard resources
	[00000CD6 - 00000CD7]	Motherboard resources
	[00000CD8 - 00000CDF]	Motherboard resources
	[00000D00 - 0000FFFF]	PCI bus
	[0000D000 - 0000D0FF]	Realtek PCIe GBE Family Controller #2
	[0000D000 - 0000DFFF]	PCI standard PCI-to-PCI bridge
	[0000E000 - 0000E0FF]	Realtek PCIe GBE Family Controller
	[0000E000 - 0000EFFF]	PCI standard PCI-to-PCI bridge
	[0000F000 - 0000F0FF]	AMD Radeon HD 6320 Graphics
	[0000F100 - 0000F10F]	Standard Dual Channel PCIIDE Controller
	[0000F150 - 0000F15F]	Standard Dual Channel PCIIDE Controller
	[0000F160 - 0000F163]	Standard Dual Channel PCIIDE Controller
	[0000F170 - 0000F177]	Standard Dual Channel PCIIDE Controller
	[0000F180 - 0000F183]	Standard Dual Channel PCIIDE Controller
	[0000F190 - 0000F197]	Standard Dual Channel PCIIDE Controller
	[0000FE00 - 0000FEFE]	Motherboard resources











































## B.2 Memory Address Map

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Memory	
[000A0000 - 000BFFFF]	AMD Radeon HD 6320 Graphics
[000A0000 - 000BFFFF]	PCI bus
[000C8000 - 000DFFFF]	PCI bus
[A8000000 - BFFFFFFF]	Motherboard resources
[C0000000 - CFFFFFFF]	AMD Radeon HD 6320 Graphics
[C0000000 - FFFFFFFF]	PCI bus
[D0000000 - D0003FFF]	Realtek PCIe GBE Family Controller #2
[D0000000 - D00FFFFF]	PCI standard PCI-to-PCI bridge
[D0004000 - D0004FFF]	Realtek PCIe GBE Family Controller #2
[D0100000 - D0103FFF]	Realtek PCIe GBE Family Controller
[D0100000 - D01FFFFF]	PCI standard PCI-to-PCI bridge
[D0104000 - D0104FFF]	Realtek PCIe GBE Family Controller
[E0000000 - EFFFFFFF]	System board
[FEA00000 - FEA01FFF]	Renesas Electronics USB 3.0 Host Controller
[FEA00000 - FEAFFFFF]	PCI standard PCI-to-PCI bridge
[FEB00000 - FEB3FFFF]	AMD Radeon HD 6320 Graphics
[FEB40000 - FEB43FFF]	High Definition Audio Controller
[FEB44000 - FEB47FFF]	High Definition Audio Controller
[FEB48000 - FEB480FF]	Standard Enhanced PCI to USB Host Controller
[FEB49000 - FEB49FFF]	Standard OpenHCD USB Host Controller
[FEB4A000 - FEB4AFFF]	Standard OpenHCD USB Host Controller
[FEB4B000 - FEB4B0FF]	Standard Enhanced PCI to USB Host Controller
[FEB4C000 - FEB4CFFF]	Standard OpenHCD USB Host Controller
[FEB4D000 - FEB4D0FF]	Standard Enhanced PCI to USB Host Controller
[FEB4E000 - FEB4EFFF]	Standard OpenHCD USB Host Controller
[FEB4F000 - FEB4F3FF]	Standard Dual Channel PCI IDE Controller
[FEC00000 - FEC00FFF]	Motherboard resources
[FEC10000 - FEC10FFF]	Motherboard resources
[FED00000 - FED003FF]	High precision event timer
[FED00000 - FED00FFF]	Motherboard resources
[FED61000 - FED70FFF]	Motherboard resources
[FED80000 - FED8FFFF]	Motherboard resources
[FEE00000 - FEE00FFF]	Motherboard resources
[FFC00000 - FFFFFFFF]	Motherboard resources

























### B.3 IRQ Mapping Chart

Interrupt request (IRQ)	Device
(ISA) 0x00000000 (00)	System timer
(ISA) 0x00000001 (01)	Standard PS/2 Keyboard
(ISA) 0x00000003 (03)	Communications Port (COM2)
(ISA) 0x00000004 (04)	Communications Port (COM1)
(ISA) 0x00000008 (08)	System CMOS/real time clock
(ISA) 0x0000000A (10)	Communications Port (COM3)
(ISA) 0x0000000B (11)	Communications Port (COM4)
(ISA) 0x0000000C (12)	Microsoft PS/2 Mouse
(ISA) 0x0000000D (13)	Numeric data processor
(ISA) 0x0000000E (14)	ATA Channel 0
(ISA) 0x0000000F (15)	ATA Channel 1
(ISA) 0x00000051 (81)	Microsoft ACPI-Compliant System
(ISA) 0x00000052 (82)	Microsoft ACPI-Compliant System
(ISA) 0x00000053 (83)	Microsoft ACPI-Compliant System
(ISA) 0x00000054 (84)	Microsoft ACPI-Compliant System
(ISA) 0x00000055 (85)	Microsoft ACPI-Compliant System
(ISA) 0x00000056 (86)	Microsoft ACPI-Compliant System
(ISA) 0x00000057 (87)	Microsoft ACPI-Compliant System
(ISA) 0x00000058 (88)	Microsoft ACPI-Compliant System
(ISA) 0x00000059 (89)	Microsoft ACPI-Compliant System
(ISA) 0x0000005A (90)	Microsoft ACPI-Compliant System
(ISA) 0x0000005B (91)	Microsoft ACPI-Compliant System
(ISA) 0x0000005C (92)	Microsoft ACPI-Compliant System
(ISA) 0x0000005D (93)	Microsoft ACPI-Compliant System
(ISA) 0x0000005E (94)	Microsoft ACPI-Compliant System
(ISA) 0x0000005F (95)	Microsoft ACPI-Compliant System
(ISA) 0x00000060 (96)	Microsoft ACPI-Compliant System
(ISA) 0x00000061 (97)	Microsoft ACPI-Compliant System
(ISA) 0x00000062 (98)	Microsoft ACPI-Compliant System
(ISA) 0x00000063 (99)	Microsoft ACPI-Compliant System
(ISA) 0x00000064 (100)	Microsoft ACPI-Compliant System
(ISA) 0x00000065 (101)	Microsoft ACPI-Compliant System
(ISA) 0x00000066 (102)	Microsoft ACPI-Compliant System
(ISA) 0x00000067 (103)	Microsoft ACPI-Compliant System
(ISA) 0x00000068 (104)	Microsoft ACPI-Compliant System
(ISA) 0x00000069 (105)	Microsoft ACPI-Compliant System
(ISA) 0x0000006A (106)	Microsoft ACPI-Compliant System
(ISA) 0x0000006B (107)	Microsoft ACPI-Compliant System
(ISA) 0x0000006C (108)	Microsoft ACPI-Compliant System

 (ISA) 0x0000006D (109)	Microsoft ACPI-Compliant System
 (ISA) 0x0000006E (110)	Microsoft ACPI-Compliant System
 (ISA) 0x0000006F (111)	Microsoft ACPI-Compliant System
 (ISA) 0x00000070 (112)	Microsoft ACPI-Compliant System
 (ISA) 0x00000071 (113)	Microsoft ACPI-Compliant System
 (ISA) 0x00000072 (114)	Microsoft ACPI-Compliant System
 (ISA) 0x00000073 (115)	Microsoft ACPI-Compliant System
 (ISA) 0x00000074 (116)	Microsoft ACPI-Compliant System
 (ISA) 0x00000075 (117)	Microsoft ACPI-Compliant System
 (ISA) 0x00000076 (118)	Microsoft ACPI-Compliant System
 (ISA) 0x00000077 (119)	Microsoft ACPI-Compliant System
 (ISA) 0x00000078 (120)	Microsoft ACPI-Compliant System
 (ISA) 0x00000079 (121)	Microsoft ACPI-Compliant System
 (ISA) 0x0000007A (122)	Microsoft ACPI-Compliant System
 (ISA) 0x0000007B (123)	Microsoft ACPI-Compliant System
 (ISA) 0x0000007C (124)	Microsoft ACPI-Compliant System
 (ISA) 0x0000007D (125)	Microsoft ACPI-Compliant System
 (ISA) 0x0000007E (126)	Microsoft ACPI-Compliant System
 (ISA) 0x0000007F (127)	Microsoft ACPI-Compliant System
 (ISA) 0x00000080 (128)	Microsoft ACPI-Compliant System
 (ISA) 0x00000081 (129)	Microsoft ACPI-Compliant System
 (ISA) 0x00000082 (130)	Microsoft ACPI-Compliant System
 (ISA) 0x00000083 (131)	Microsoft ACPI-Compliant System
 (ISA) 0x00000084 (132)	Microsoft ACPI-Compliant System
 (ISA) 0x00000085 (133)	Microsoft ACPI-Compliant System
 (ISA) 0x00000086 (134)	Microsoft ACPI-Compliant System
 (ISA) 0x00000087 (135)	Microsoft ACPI-Compliant System
 (ISA) 0x00000088 (136)	Microsoft ACPI-Compliant System
 (ISA) 0x00000089 (137)	Microsoft ACPI-Compliant System
 (ISA) 0x0000008A (138)	Microsoft ACPI-Compliant System
 (ISA) 0x0000008B (139)	Microsoft ACPI-Compliant System
 (ISA) 0x0000008C (140)	Microsoft ACPI-Compliant System
 (ISA) 0x0000008D (141)	Microsoft ACPI-Compliant System
 (ISA) 0x0000008E (142)	Microsoft ACPI-Compliant System
 (ISA) 0x0000008F (143)	Microsoft ACPI-Compliant System
 (ISA) 0x00000090 (144)	Microsoft ACPI-Compliant System
 (ISA) 0x00000091 (145)	Microsoft ACPI-Compliant System
 (ISA) 0x00000092 (146)	Microsoft ACPI-Compliant System
 (ISA) 0x00000093 (147)	Microsoft ACPI-Compliant System
 (ISA) 0x00000094 (148)	Microsoft ACPI-Compliant System
 (ISA) 0x00000095 (149)	Microsoft ACPI-Compliant System
 (ISA) 0x00000096 (150)	Microsoft ACPI-Compliant System





	(ISA) 0x00000097 (151)	Microsoft ACPI-Compliant System
	(ISA) 0x00000098 (152)	Microsoft ACPI-Compliant System
	(ISA) 0x00000099 (153)	Microsoft ACPI-Compliant System
	(ISA) 0x0000009A (154)	Microsoft ACPI-Compliant System
	(ISA) 0x0000009B (155)	Microsoft ACPI-Compliant System
	(ISA) 0x0000009C (156)	Microsoft ACPI-Compliant System
	(ISA) 0x0000009D (157)	Microsoft ACPI-Compliant System
	(ISA) 0x0000009E (158)	Microsoft ACPI-Compliant System
	(ISA) 0x0000009F (159)	Microsoft ACPI-Compliant System
	(ISA) 0x000000A0 (160)	Microsoft ACPI-Compliant System
	(ISA) 0x000000A1 (161)	Microsoft ACPI-Compliant System
	(ISA) 0x000000A2 (162)	Microsoft ACPI-Compliant System
	(ISA) 0x000000A3 (163)	Microsoft ACPI-Compliant System
	(ISA) 0x000000A4 (164)	Microsoft ACPI-Compliant System
	(ISA) 0x000000A5 (165)	Microsoft ACPI-Compliant System
	(ISA) 0x000000A6 (166)	Microsoft ACPI-Compliant System
	(ISA) 0x000000A7 (167)	Microsoft ACPI-Compliant System
	(ISA) 0x000000A8 (168)	Microsoft ACPI-Compliant System
	(ISA) 0x000000A9 (169)	Microsoft ACPI-Compliant System
	(ISA) 0x000000AA (170)	Microsoft ACPI-Compliant System
	(ISA) 0x000000AB (171)	Microsoft ACPI-Compliant System
	(ISA) 0x000000AC (172)	Microsoft ACPI-Compliant System
	(ISA) 0x000000AD (173)	Microsoft ACPI-Compliant System
	(ISA) 0x000000AE (174)	Microsoft ACPI-Compliant System
	(ISA) 0x000000AF (175)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B0 (176)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B1 (177)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B2 (178)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B3 (179)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B4 (180)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B5 (181)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B6 (182)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B7 (183)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B8 (184)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B9 (185)	Microsoft ACPI-Compliant System
	(ISA) 0x000000BA (186)	Microsoft ACPI-Compliant System
	(ISA) 0x000000BB (187)	Microsoft ACPI-Compliant System
	(ISA) 0x000000BC (188)	Microsoft ACPI-Compliant System
	(ISA) 0x000000BD (189)	Microsoft ACPI-Compliant System
	(ISA) 0x000000BE (190)	Microsoft ACPI-Compliant System
	(PCI) 0x00000010 (16)	High Definition Audio Controller
	(PCI) 0x00000010 (16)	PCI standard PCI-to-PCI bridge

	(PCI) 0x00000010 (16)	PCI standard PCI-to-PCI bridge
	(PCI) 0x00000010 (16)	PCI standard PCI-to-PCI bridge
	(PCI) 0x00000010 (16)	PCI standard PCI-to-PCI bridge
	(PCI) 0x00000010 (16)	PCI standard PCI-to-PCI bridge
	(PCI) 0x00000011 (17)	Standard Enhanced PCI to USB Host Controller
	(PCI) 0x00000011 (17)	Standard Enhanced PCI to USB Host Controller
	(PCI) 0x00000011 (17)	Standard Enhanced PCI to USB Host Controller
	(PCI) 0x00000012 (18)	Standard OpenHCD USB Host Controller
	(PCI) 0x00000012 (18)	Standard OpenHCD USB Host Controller
	(PCI) 0x00000012 (18)	Standard OpenHCD USB Host Controller
	(PCI) 0x00000012 (18)	Standard OpenHCD USB Host Controller
	(PCI) 0x00000013 (19)	High Definition Audio Controller
	(PCI) 0x00000013 (19)	Standard Dual Channel PCI IDE Controller
	(PCI) 0xFFFFFFF4 (-12)	Renesas Electronics USB 3.0 Host Controller
	(PCI) 0xFFFFFFF5 (-11)	Renesas Electronics USB 3.0 Host Controller
	(PCI) 0xFFFFFFF6 (-10)	Renesas Electronics USB 3.0 Host Controller
	(PCI) 0xFFFFFFF7 (-9)	Renesas Electronics USB 3.0 Host Controller
	(PCI) 0xFFFFFFF8 (-8)	Renesas Electronics USB 3.0 Host Controller
	(PCI) 0xFFFFFFF9 (-7)	Renesas Electronics USB 3.0 Host Controller
	(PCI) 0xFFFFFFFA (-6)	Renesas Electronics USB 3.0 Host Controller
	(PCI) 0xFFFFFFFB (-5)	Renesas Electronics USB 3.0 Host Controller
	(PCI) 0xFFFFFFFC (-4)	Realtek PCIe GBE Family Controller #2
	(PCI) 0xFFFFFFFDD (-3)	Realtek PCIe GBE Family Controller
	(PCI) 0xFFFFFFFEE (-2)	AMD Radeon HD 6320 Graphics

## B.4 DMA Channel Assignments

---

	Direct memory access (DMA)
	4 Direct memory access controller

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	AAEON Cable P/N
		Vendor	Model no		
USB3_34	USB3.0 Connector	PINREX	BOX HEADER.10*2P.180D(M).DIP.2.0mm.L-BLUE.K20.PINREX.52X-40-20GV52	USB3.0 Cable	1700200301
CN2	Digital IO		(TF)PIN HEADER.5*2P.180D.(M).2.0mm.DIP	N/A	N/A
USB56	USB56 Connector	CATCH	(TF)USB Cable.10pin.(5Px2, 2.0mm Housing).20cm.W/O Bracket.	USB Cable	1709100208
USB78	USB78 Connector	CATCH	(TF)USB Cable.10pin.(5Px2, 2.0mm Housing).20cm.W/O Bracket.	USB Cable	1709100208
COM1	RS-232 Serial Port Connector	CATCH	(TF)Flat Cable.9P DB 9P MALE.10P 2.00mm Pitch Housing.20cm	Serial Port Cable	1701100206
COM2	RS-232 Serial Port Connector	CATCH	(TF)Flat Cable.9P DB 9P MALE.10P 2.00mm	Serial Port Cable	1701100206



			Pitch Housing.20c m		
COM3	RS-232 Serial Port Connector	CATCH	(TF)Flat Cable.9P DB 9P MALE.10P 2.00mm Pitch Housing.20c m	Serial Port Cable	1701100206
COM4	RS-232 Serial Port Connector	CATCH	(TF)Flat Cable.9P DB 9P MALE.10P 2.00mm Pitch Housing.20c m	Serial Port Cable	1701100206

**Note:** The AAEON Cable P/N with “\*” sign is for WiTAS series products.

Appendix

D

**AHCI Setting**

## D.1 Setting AHCI

---

OS installation to setup AHCI Mode

Step 1: Copy the files below from “**Driver CD ->Step 6 - AHCI -> Floppy** ->**x86**” to Disk

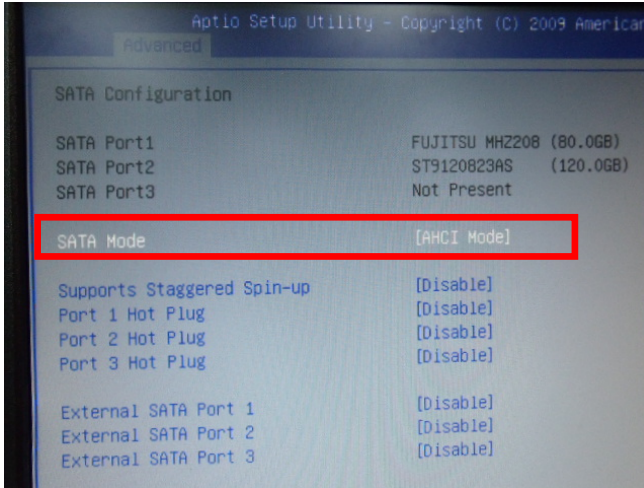


Step 2: Connect the USB Floppy (disk with RAID files) to the board



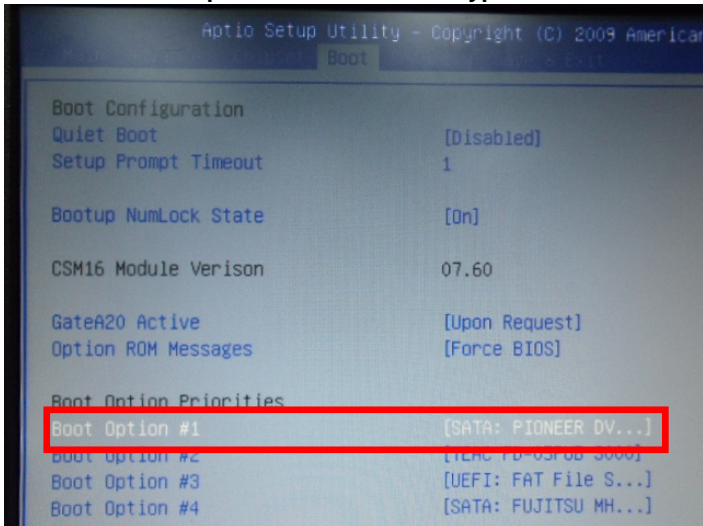
Step 3: The setting procedures “In BIOS Setup Menu”

**A: Advanced -> SATA Configuration -> SATA Configuration -> SATA Mode -> AHCI Mode**



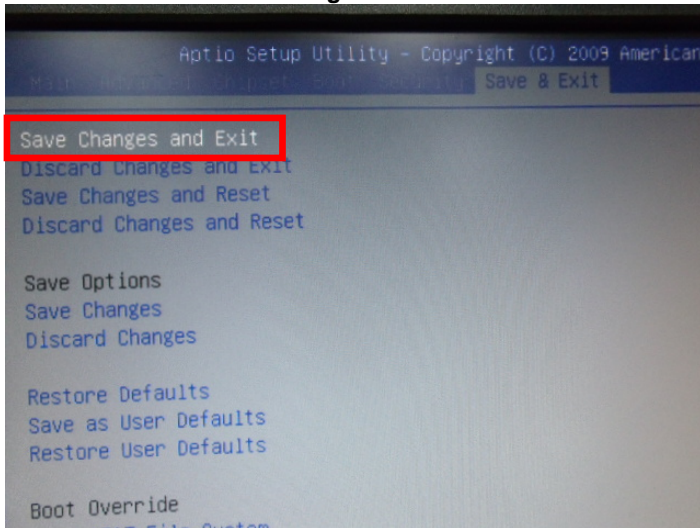
Step 4: The setting procedures “In BIOS Setup Menu”

**B: Boot -> Boot Option #1 -> DVD-ROM Type**

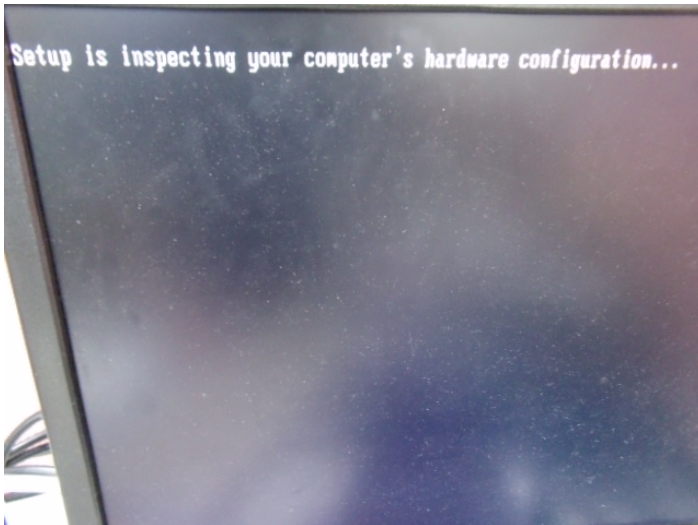


Step 5: The setting procedures "In BIOS Setup Menu"

**C: Save & Exit -> Save Changes and Exit**



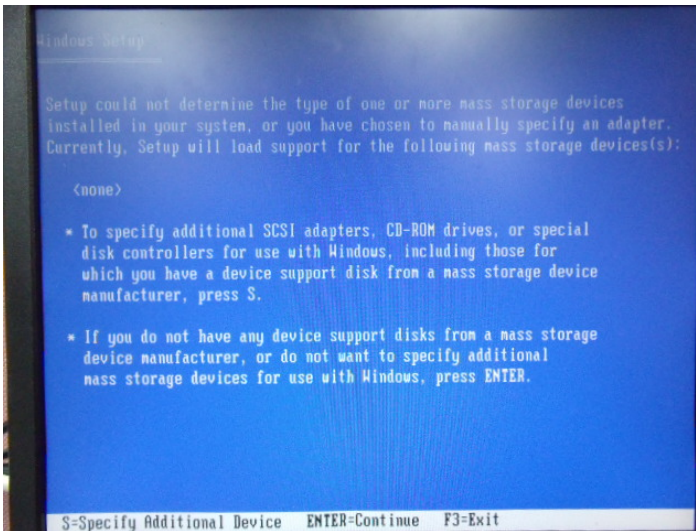
Step 6: Setup OS



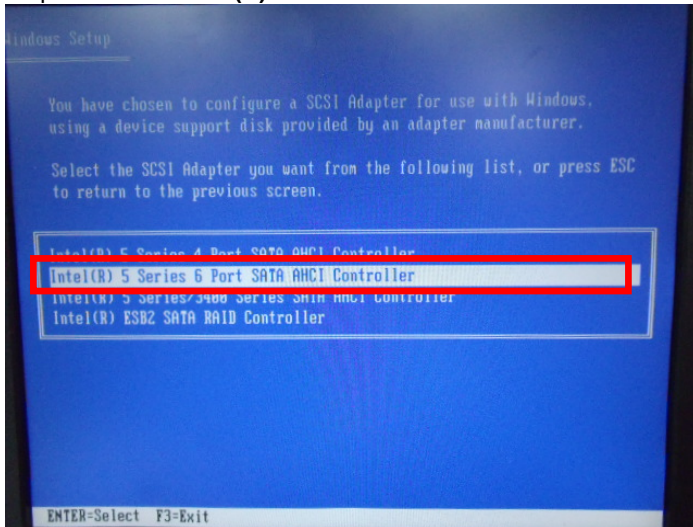
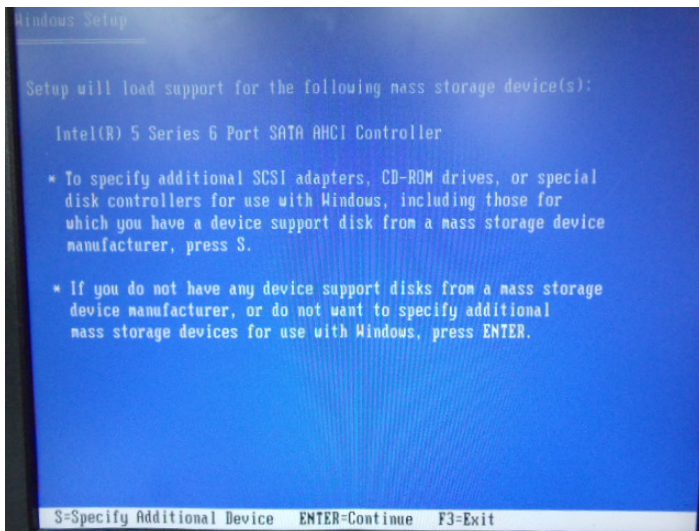
## Step 7: Press "F6"



## Step 8: Choose "S"





**Step 9: Choose “Intel(R) 5 Series 6 Port SATA AHCI Controller”****Step 10: It will show the model number you select and then press “ENTER”**

Step 11: Setup is loading files

