# 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

EMB-A50M Manual Rev.A 2nd Ed
February 2012

# Copyright Notice

# Acknowledgments

# 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.

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Chapter

1

# General Information

## 1.1 Introduction

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 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

- Onboard AMD Fusion T56N/T44R Dual-Core/Single Core Processor
- AMD Hudson M1/A50M
- 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

### System

| | |
|---|---|
| ● Processor | Onboard AMD Fusion T56N/T44R Dual-Core/Single Core Processor |
| ● System Memory | 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

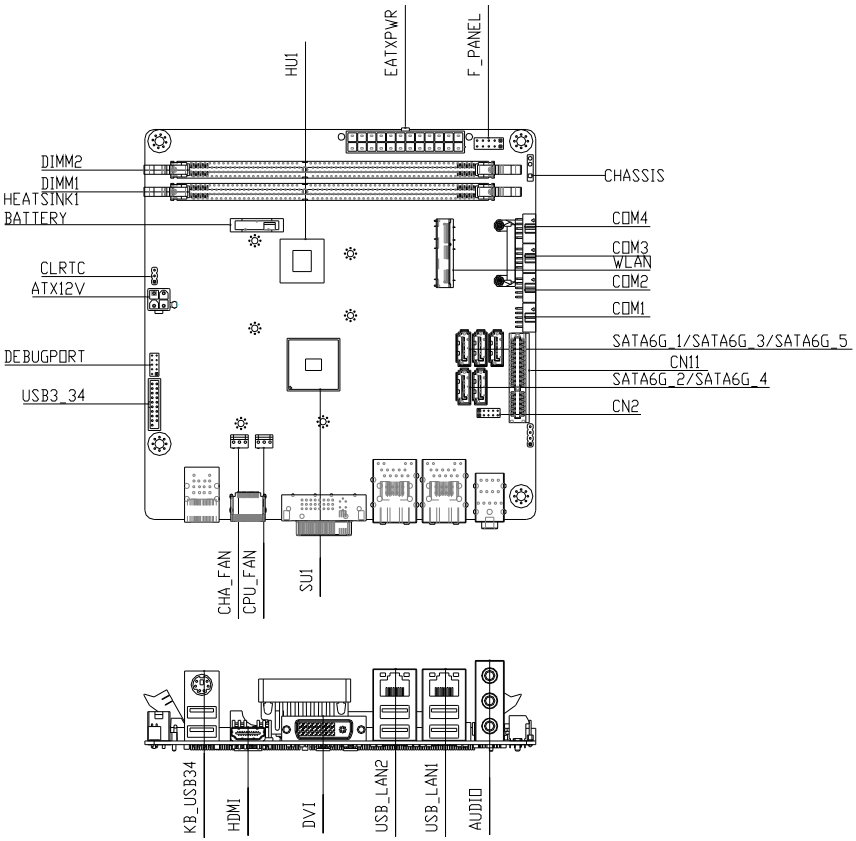
## 2.1 Safety Precautions


*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.*

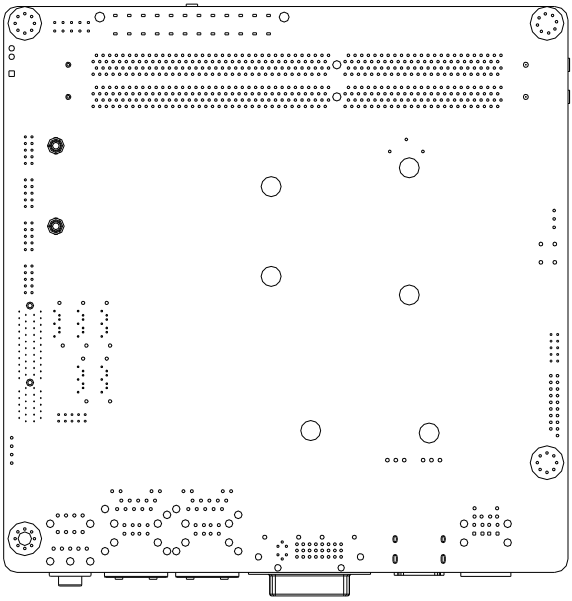

*Always ground yourself to remove any static charge before touching the board. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not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

## 2.2 Location of Connectors and Jumpers

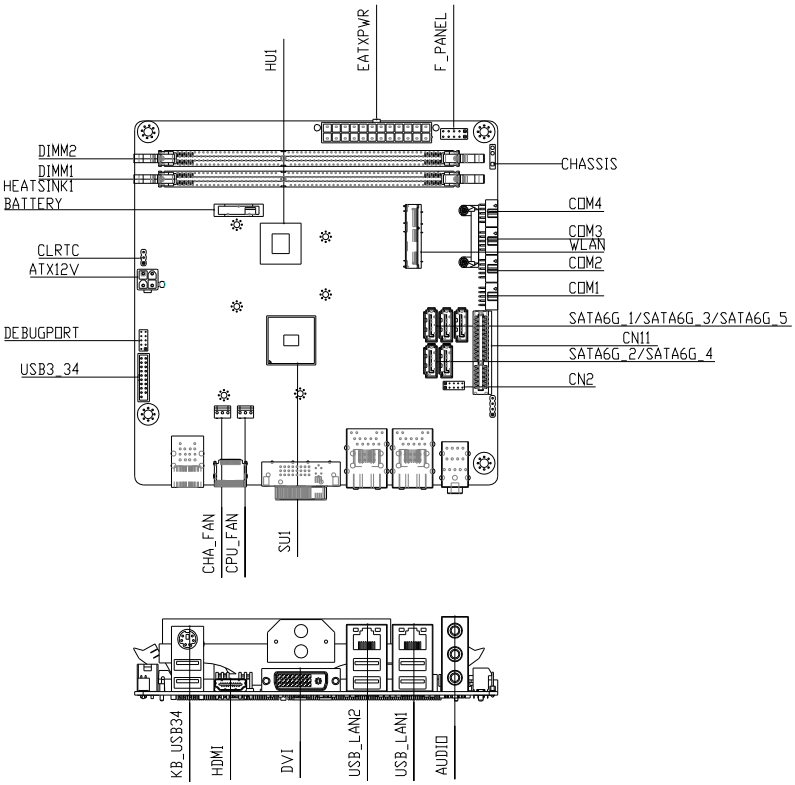
### Component Side (With Fan)



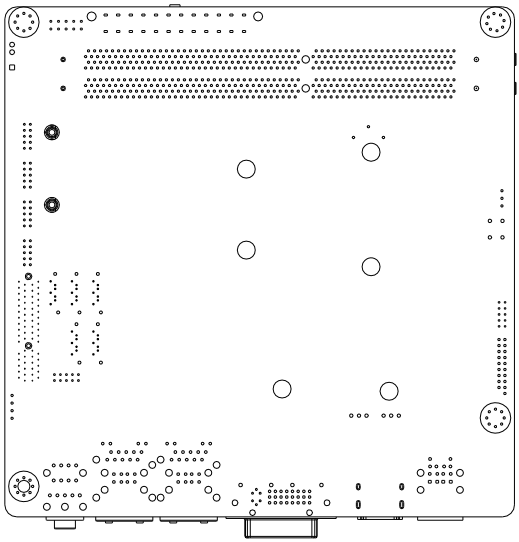
## Solder Side (With Fan)



## Component Side (Fanless)

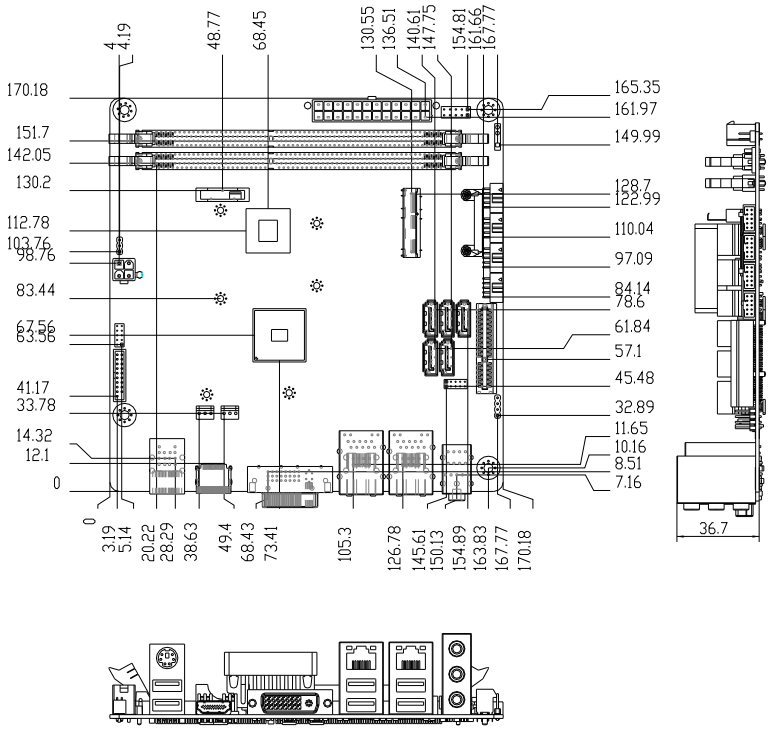


## Solder Side (Fanless)

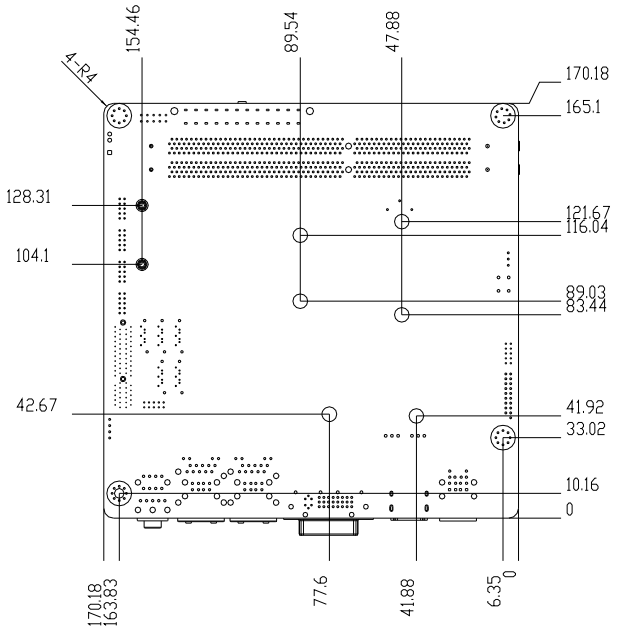


## 2.3 Mechanical Drawing

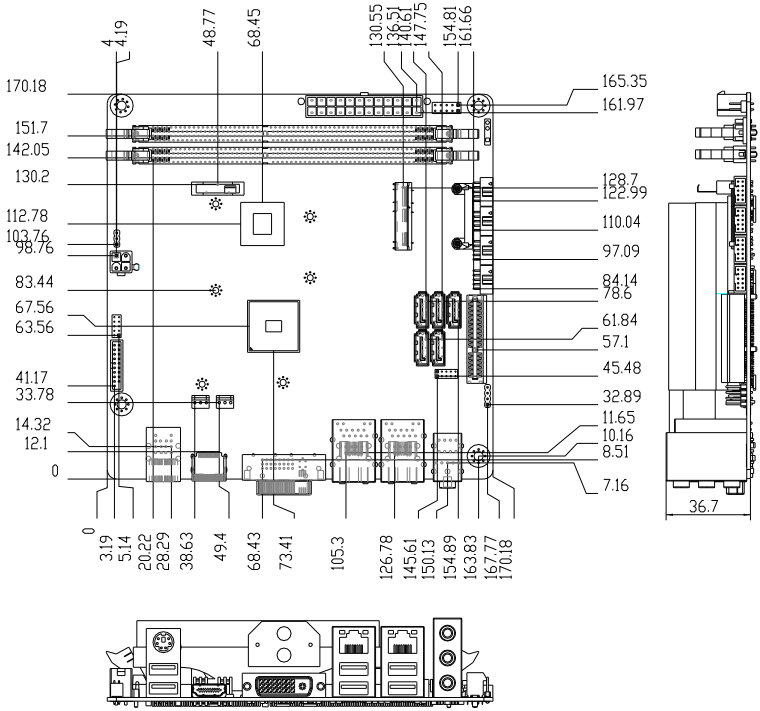
### Component Side (with Fan)



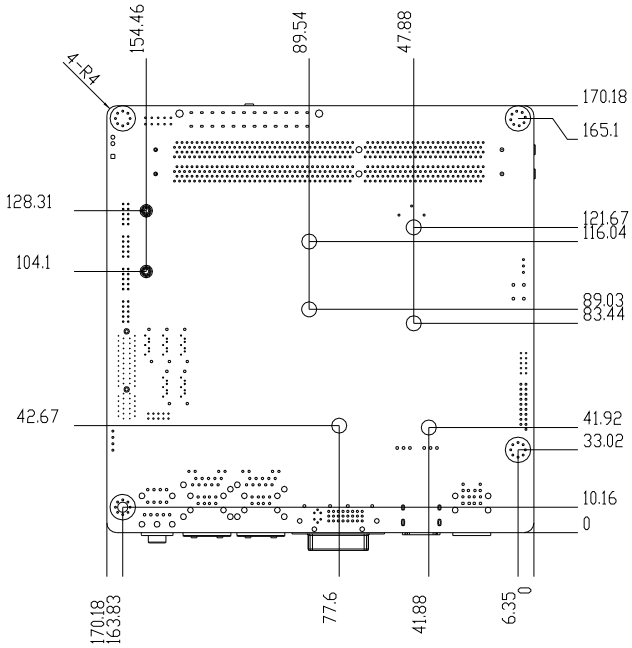
## Solder Side (with Fan)



## Component Side (Fanless)



## Solder Side (Fanless)



## 2.4 List of Jumpers

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:

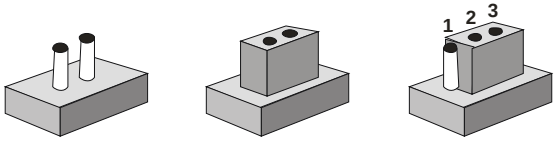
| Label | Function |
|---|---|
| DIMM1 | DDR3 SOCKET |
| DIMM2 | DDR3 SOCKET |
| 24P ATX POWER | ATX POWER SUPPLY INPUT |
| 4P ATX POWER | ATX POWER SUPPLY INPUT |
| COM1.2.3.4 | ONLY COM2 SUPPORT RS/422/485 |
| WLAN | MINI CARD SOCKET |
| SATA1.2.3.4.5 | SATA INTERFACE |
| USB56.78 | USB2.0 INTERFACE |
| 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 |
| 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

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

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




**Open** **Closed** **Closed 2-3**

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

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

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

## 2.7 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 |

| | | | |
|---|---|---|---|
| 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 | × | ○ | ○ | ○ | ○ | ○ |
| | | | | | | |
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| | | | | | | |

**O**：表示该有毒有害物质在该部件所有均质材料中的含量均在 **SJ/T 11363-2006** 标准规定的限量要求以下。

**X**：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 **SJ/T 11363-2006** 标准规定的限量要求。

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。

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

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:

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

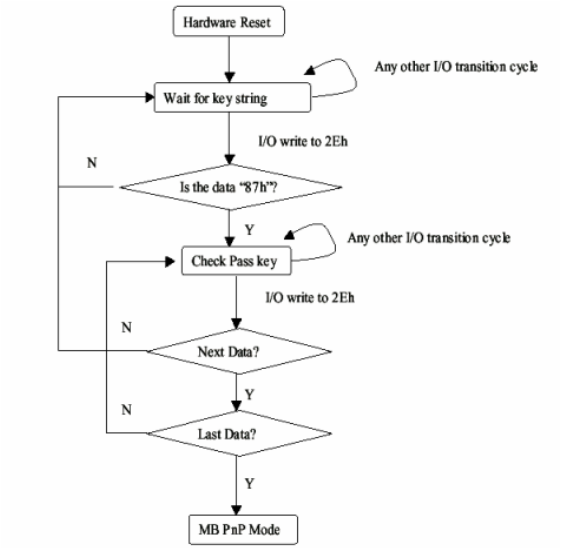
# Programming the Watchdog Timer

## 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 opera-tions 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<br>This bit is self-cleared. |
| 0 | WDT Status |

| | |
|---|---|
| | 1: WDT value is equal to 0.<br>0: WDT value is not equal to 0. |

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

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

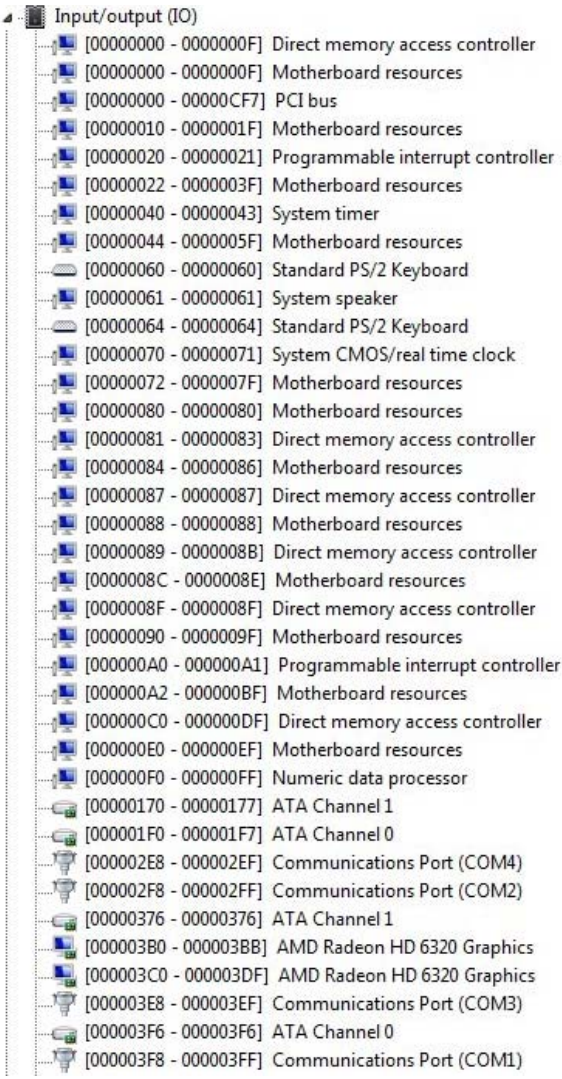
00h: no interrupt selected

Appendix

B

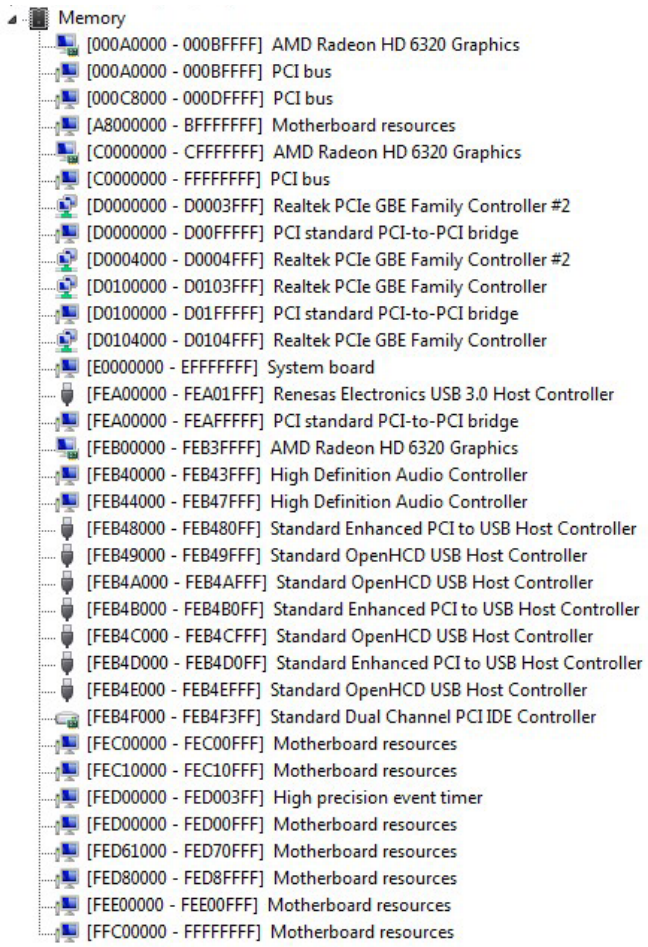
# I/O Information

## B.1 I/O Address Map

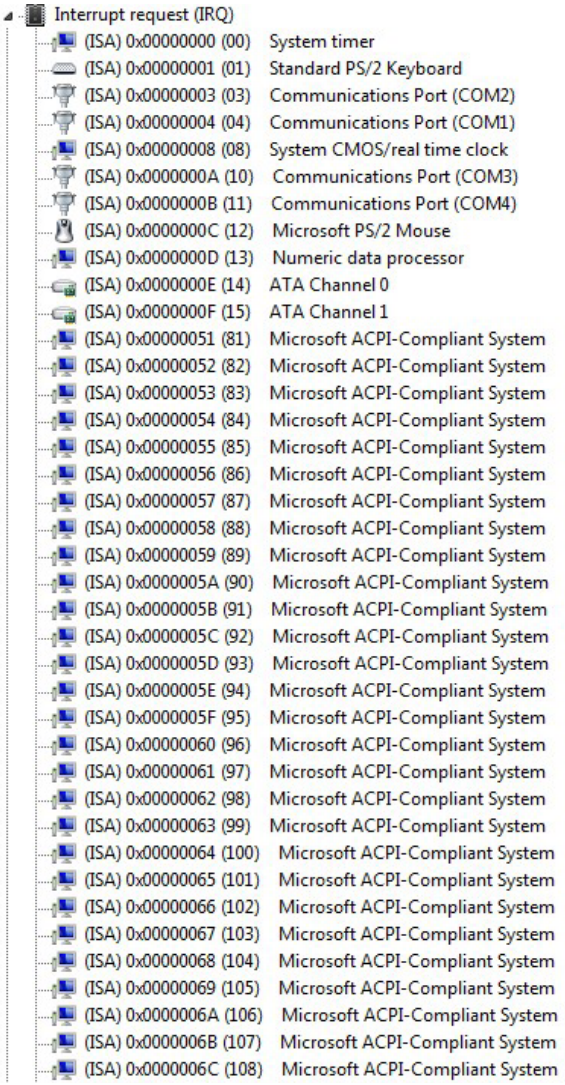


- [0000040B - 0000040B] Motherboard resources
- [000004D0 - 000004D1] Motherboard resources
- [000004D6 - 000004D6] Motherboard resources
- [00000500 - 0000051F] Motherboard resources
- [00000520 - 0000052F] Motherboard resources
- [00000530 - 0000053F] Motherboard resources
- [00000800 - 0000089F] Motherboard 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 PCI IDE Controller
- [0000F150 - 0000F15F] Standard Dual Channel PCI IDE Controller
- [0000F160 - 0000F163] Standard Dual Channel PCI IDE Controller
- [0000F170 - 0000F177] Standard Dual Channel PCI IDE Controller
- [0000F180 - 0000F183] Standard Dual Channel PCI IDE Controller
- [0000F190 - 0000F197] Standard Dual Channel PCI IDE Controller
- [0000FE00 - 0000FEFE] Motherboard resources

## B.2 Memory Address Map

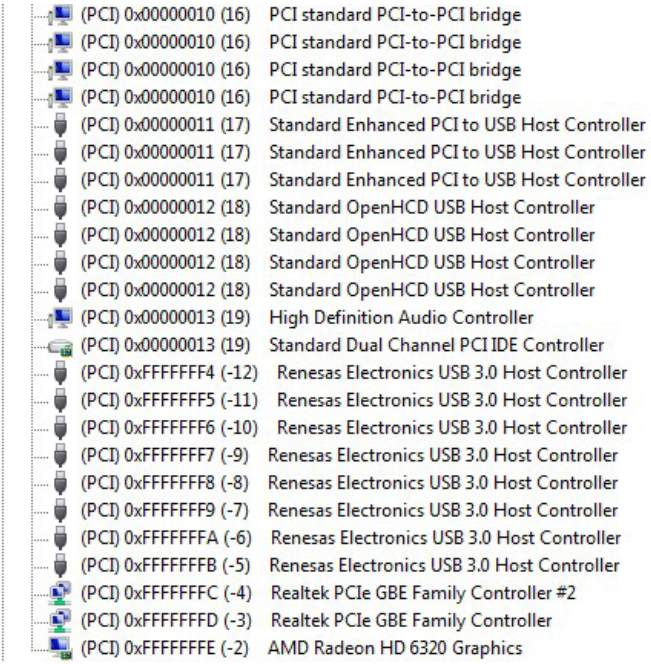


## B.3 IRQ Mapping Chart

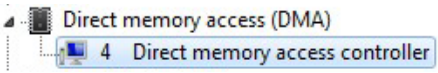


(ISA) 0x0000006D (109) Microsoft ACPI-Compliant System
(ISA) 0x0000006E (110) Microsoft ACPI-Compliant System
(ISA) 0x0000006F (111) Microsoft ACPI-Compliant System
(ISA) 0x00000070 (112) Microsoft ACPI-Compliant System
(ISA) 0x00000071 (113) Microsoft ACPI-Compliant System
(ISA) 0x00000072 (114) Microsoft 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




## B.4 DMA Channel Assignments



# Appendix C

# Mating Connecotor

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

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

Appendix

D

# AHCI Setting

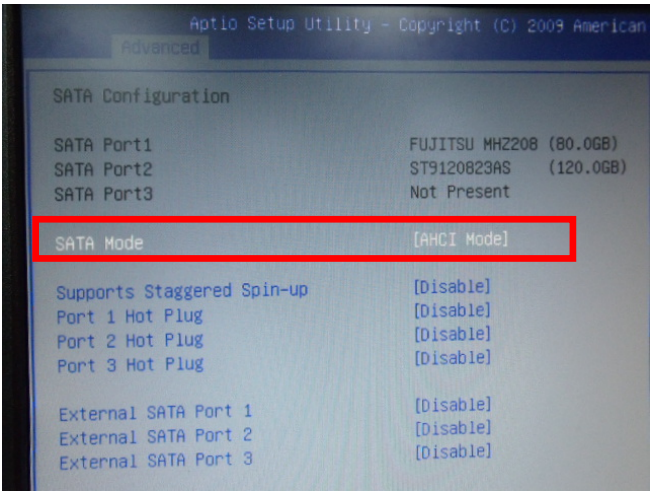
## D.1 Setting AHCI

OS installation to setup AHCI Mode

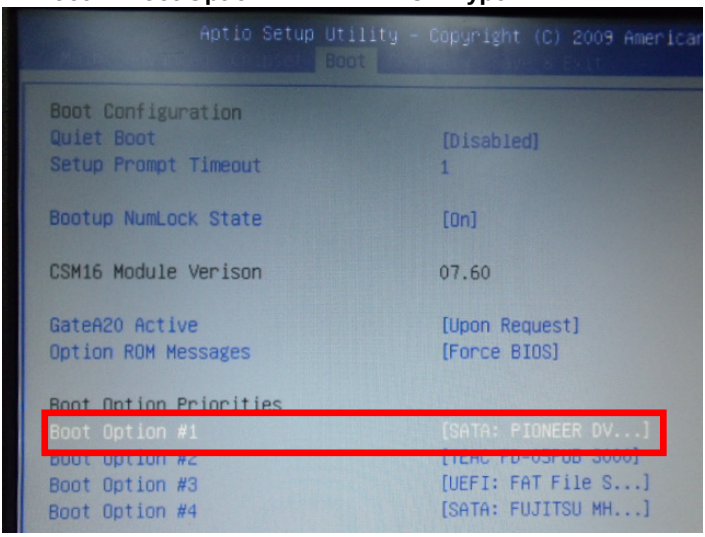
Step 1: Copy the files below from "***Driver CD ->Step 6 - AHCI -> Floppy ->x86***" to Disk


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

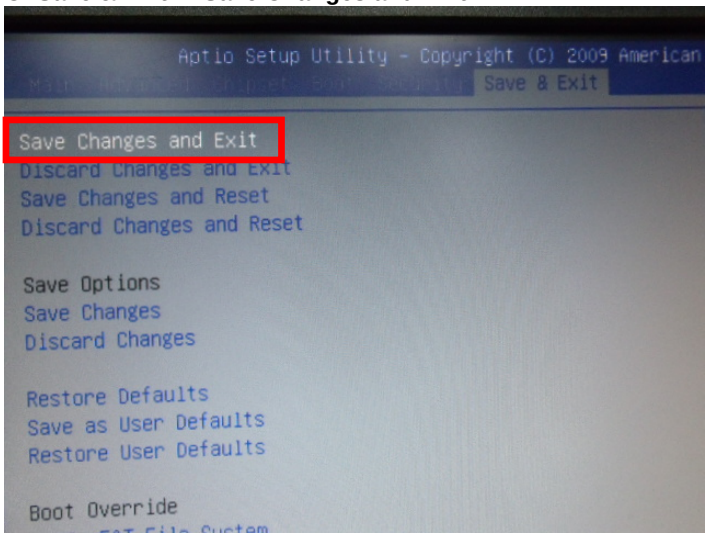
Step 3: The setting procedures " **In BIOS Setup Menu**"
**A: Advanced -> SATA Configuration -> SATA Configuration -> SATA Mode -> AHCI Mode**



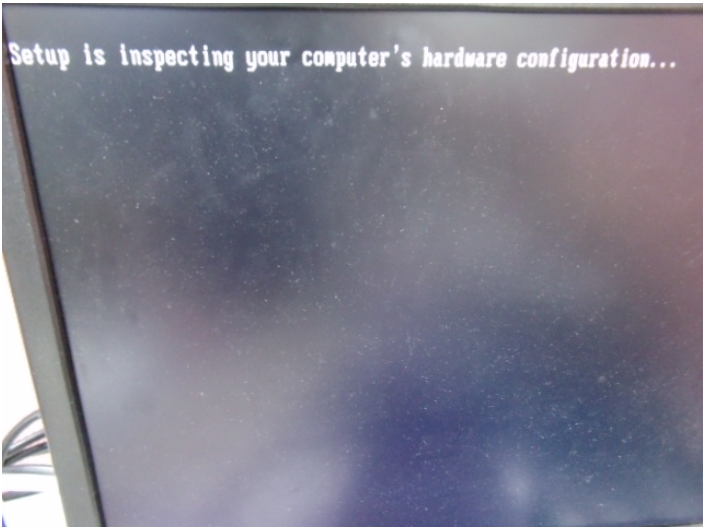

Step 4: The setting procedures "**In BIOS Setup Menu"**
**B: Boot -> Boot Option #1 -> DVD-ROM Type**



Step 5: The setting procedures "**In BIOS Setup Menu"**
**C: Save & Exit -> Save Changes and Exit**

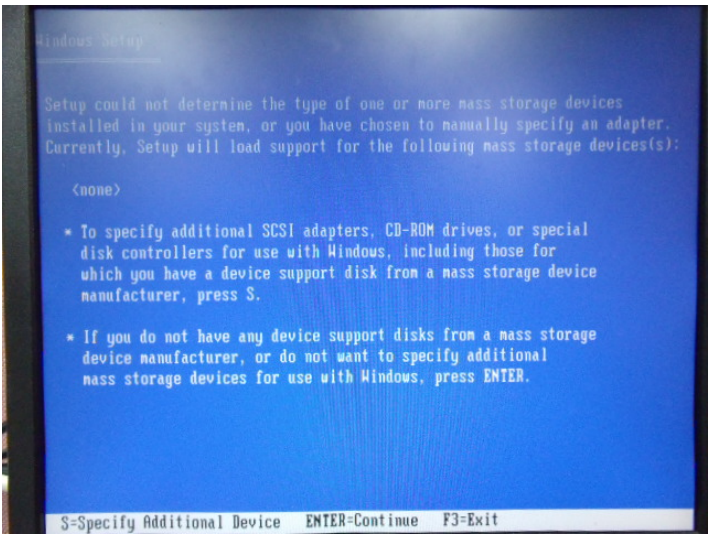



Step 6: Setup OS

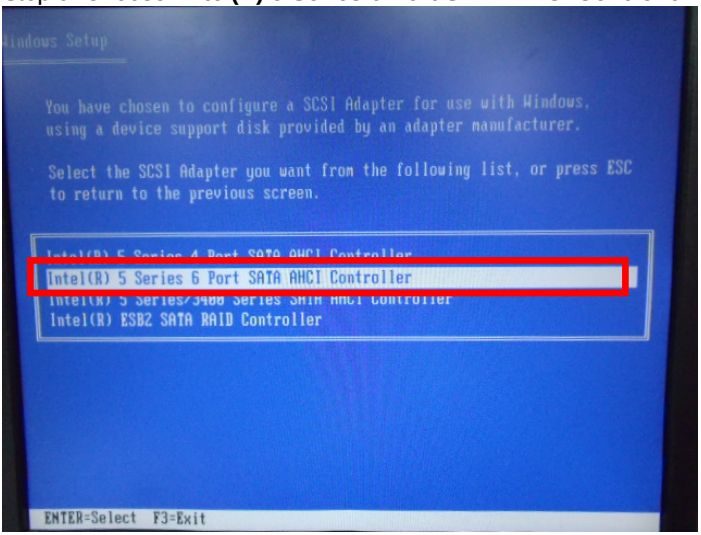


Step 7: Press "**F6**"

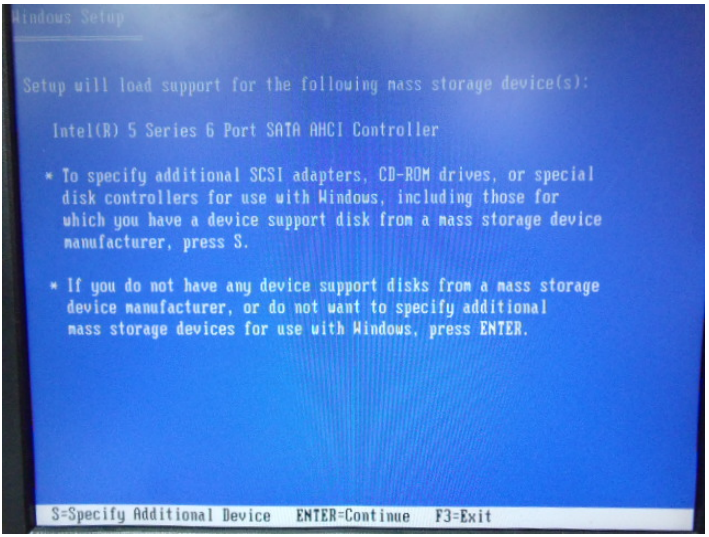

Step 8: Choose "**S**"



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