EMB-A70M

AMD R-460L(Quad-core)/
R-260H (Dual-core) APU
Mini-ITX
2 Realtek 8111E Ethernet
2 USB3.0, 5 USB2.0, 2 COM
1 PCI-e, 1 Mini PCI-e
1 mSATA

EMB-A70M Manual 1st Ed
August 2013

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 9657666600 Jumper Kit
- 1 1709070800 SATA Cable
- 1 1702151201 SATA Power CABLE
- 1 M20A70M000 I/O Shield
- 1 17592A70M1 CPU Cooler
- 1 Utility DVD
- 1 EMB-A70M

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

The EMB-A70M supports AMD Embedded R-460L (Quad-core)/ R-260H (Dual-core) APU processor which paired with the AMD Hudson M3/A70M chipset offers a high performance computing platform with low power consumption. This new product supports two DDR3 SODIMMs at speeds of 1333/1066 MHz, up to 8 GB. Two SATA interfaces provide ample storage. With dual Gigabit Ethernet, two COM ports, five USB2.0 ports, two USB3.0 ports, one keyboard/mouse port and one Line-in, Mic-in, Line-out port, the EMB-A70M meets the requirements of today's demanding applications.

Display requirements are met with an abundance of interfaces such as HDMI. Display memory is shared from the system memory up to 512MB. EMB-A70M has an integrated AMD Radeon™ HD7 Series graphics engine, up to 1920 x 1200 for HDMI output resolutions.

With all of its integrated features, the EMB-A70M 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

- AMD R-Series APU FP2 Processor
- AMD Hudson M3/A70M
- 204-pin SODIMM x 2 DDR3 1333/1066MHz up to 8 GB
- Realtek 8111E for Gigabit LAN, RJ-45 x 2
- Supporting Static Full HD display by HDMI x 4

  (Note: 1. Minimum of 3 identical monitors for 4 independent display.
  2. Static playback could support 4 independent displays up to FHD 1080P.)
- SATA 6.0Gb/s x 2, mSATA x 1
- USB 2.0 x 1 with Type A Connectors; USB 3.0 x 2, USB 2.0 x 4 with Pin Headers
- MiniPCIe (Full Size) with SIM Socket x 1 , 1 x mini PCIe (Optional PCIe & SATA signal, default for mSATA)
- PCIe [x4] x 1
- DC 12V Power Input

1.3 Specifications

System

● Processor	AMD R-260H (Dual-core) and optional R-460L (Quad core) APU
● System Memory	2 x SoDIMM, DDR3 1333/1066 Non-ECC,Un-buffered Memory, Max. 8GB
● Chipset	AMD® Hudson M3/ A70M
● I/O Chipset	ITE IT8728
● Ethernet	LAN1: Realtek® 8111E PCIe Gigabit LAN controller, RJ-45 X1 LAN2: Realtek® 8111E PCIe Gigabit LAN controller, RJ-45 X1
● BIOS	32 Mb Flash ROM , AMI BIOS, 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	1 x miniPCIe (Full Size) with SIM Socket 1 x mini PCIe (Optional PCIe & SATA signal, default for mSATA) 1 x PCIe [x4] 1x PCIe [x1] Board to board connector for HDA and DP signal(optional reserved)

● Battery	Lithium battery
● Power Requirement	2 x 2pin 12V ATX connector, 1 x CPU fan with 4-pin wafer 1 x System fan with 4-pin wafer, 1 x SATA power with 4-pin wafer, 1x power button switch (optional reserve)
● 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	-4˚F ~158°F (-20°C ~70°C)
● Operating Humidity	5%～90%RH, non-condensing

Display

● Chipset	Integrated AMD® Radeon HD7 series graphics engine
● Memory	Shared system memory up to 512MB
● Resolution	Up to 1920 x 1200 for HDMI output resolution
● Video Interface	HDMI **(Note: Only CN28 HDMI port has audio support.)**

I/O

● Storage	SATA 6.0Gb/s x 2, mSATA x 1
● Serial Port	COM1: RS-232/422/485 with RI/5V/12V x 1 (Internal Header) COM2: RS-232 (Internal Header) 1x COM PORT DB9 connector(optional reserve)

● Audio	Mic-in x 1, Line-out x 1 (on Rear I/O)
● USB	USB 2.0 x 1 with Type A Connectors; USB 3.0 x 2, USB 2.0 x 4 with Pin Headers
● Digital I/O	Supports 8-bit (Programmable)
● PS/2 Port	KB/MS (Internal Header) x 1 PS2 connector (optional reserve) x 1
● Power	DC 12V, ATX mode
● LED	1x dual LED (HDD/POWER) (Optional Reserve)

Chapter

2

Quick Installation Guide

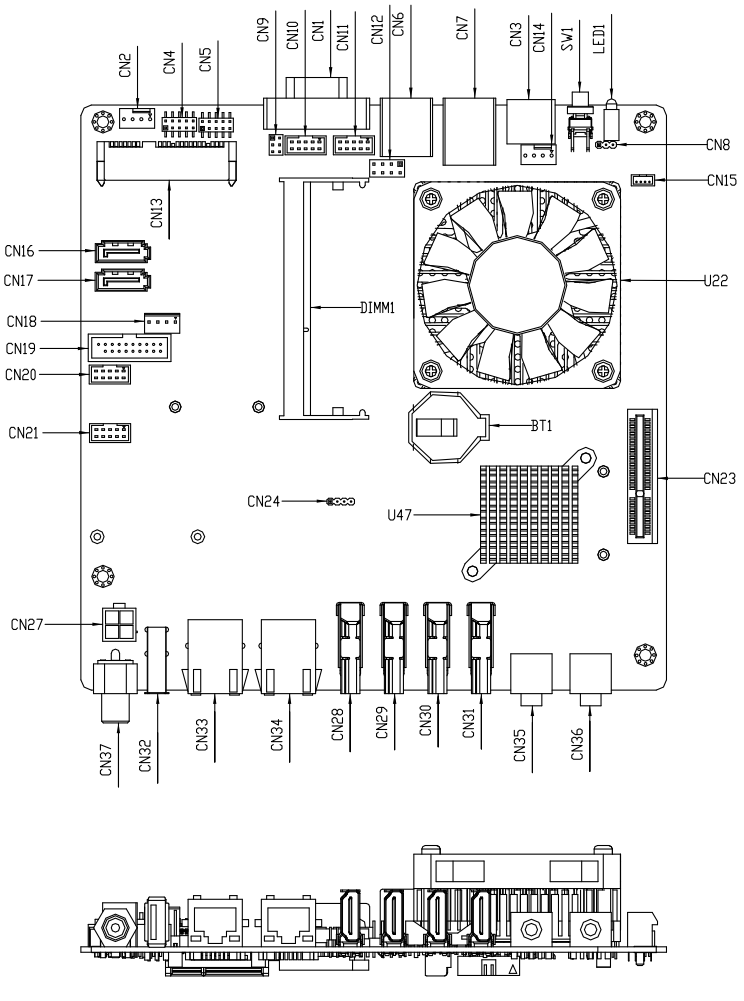
2.1 Safety Precautions

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.

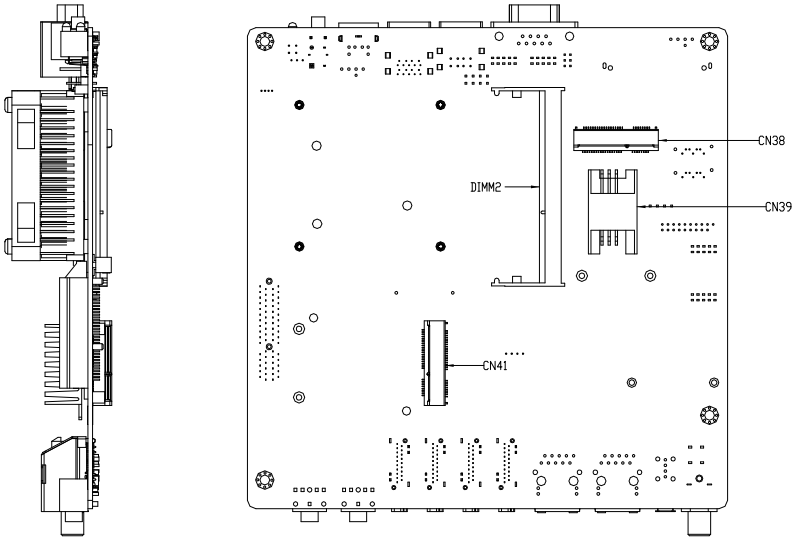
Always ground yourself to remove any static charge before touching the board. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not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

2.2 Location of Connectors and Jumpers

Component Side

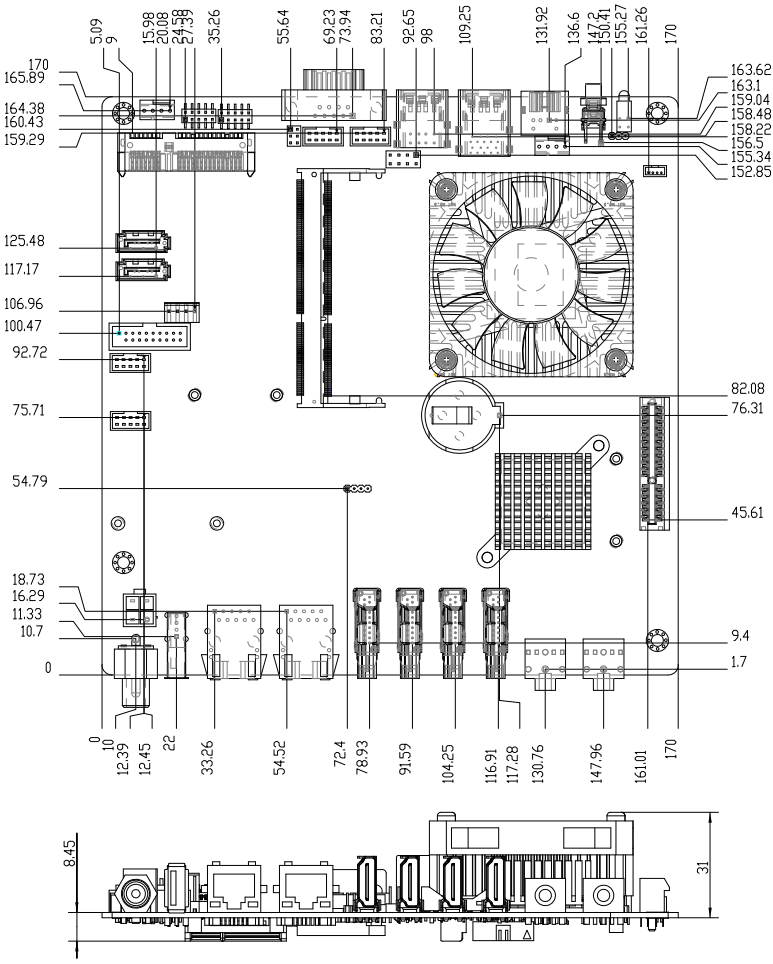


Solder Side

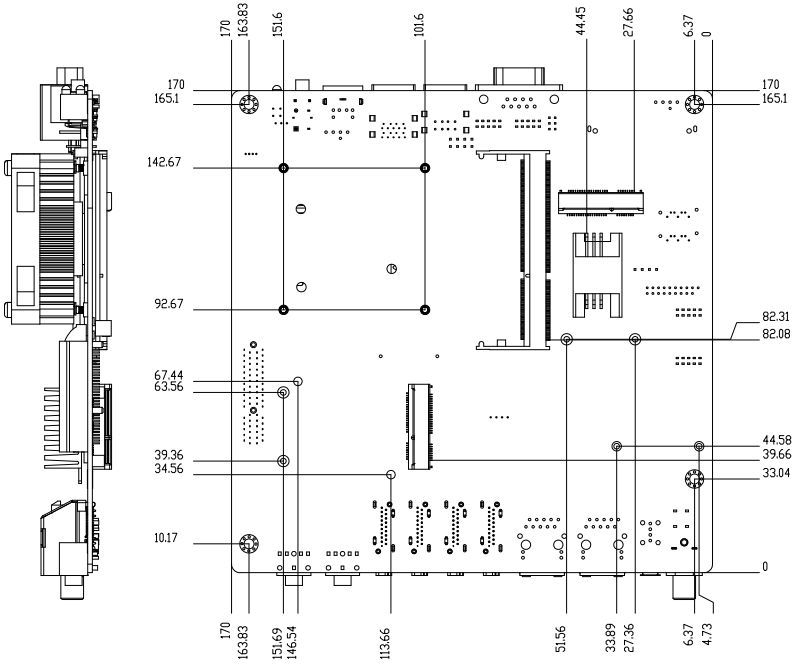


2.3 Mechanical Drawing

Component Side



Solder Side


170
163.83
151.6
101.6
44.45
27.66
6.37
0
170
165.1
142.67
92.67
67.44
63.56
39.36
34.56
10.17
82.31
82.08
44.58
39.66
33.04
0
170
163.83
151.69
146.54
113.66
51.56
33.89
27.36
6.37
4.73

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
CN8	Auto Power Button Selection
CN9	COM1 RI Power Selection
CN22	CMOS Setting 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:

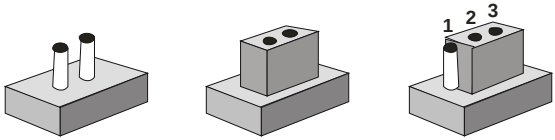
Label	Function
DIMM1	DDR3 SOCKET
DIMM2	DDR3 SOCKET
CN1	COM1 Connector RS232/422/485 (Optional)
CN2	SYSTEM FAN Connector
CN3	KB/MS Connector (Optional)
CN4	Front Panel
CN5	Digital IO
CN6	Dual USB2.0 Connector (Optional)
CN7	Dual USB3.0 Connector (Optional)
CN10	COM1 Box Header
CN11	COM2 Box Header

CN12	KB/MS Pin Header
CN14	CPU FAN Connector
CN15	CPU FAN Connector (Optional)
CN16	SATA Signal Connector
CN17	SATA Signal Connector
CN18	SATA Power Connector
CN19	Dual USB3.0 Box Header
CN20	Dual USB2.0 Box Header
CN21	Dual USB2.0 Box Header
CN23	PCIE x4 Slot
CN25	SPI Programming Pin Header
CN26	Board to Board Connector (Optional)
CN27	DC12V Power Connector (Optional)
CN28	HDMI1 Connector
CN29	HDMI2 Connector
CN30	HDMI3 Connector
CN31	HDMI4 Connector
CN32	Single USB2.0 Connector
CN33	Giga LAN1 Connector
CN34	Giga LAN 2 Connector
CN35	Mic in Connector
CN36	Line out Connector
CN38	Mini PciE Socket
CN39	SIM Card Socket
CN41	mSATA Socket

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 Auto Power Button Setting (CN8)

JP1	Function
1-2	Normal (Default)
2-3	Auto Button

2.8 COM1 RI Power Selection (CN9)

JP1	Function
1-2	12V
3-4	Normal (Default)
5-6	5V

2.9 CMOS Setting (CN22)

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

2.10 Front Panel Connector (F_Penal)

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

2.11 USB Pin Header

Pin	Signal	Pin	Signal
1	+5V	2	GND
3	USBD1-	4	GND
5	USBD1+	6	USBD2+

7	GND	8	USBD2-
9	GND	10	+5V
4	A_JD_FRONT	8	NA
5	LINE2_L	10	LINE IN SENSOR resister

2.12 RS232 /422/485 Pin Header (COM1)

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 (DIO1)

Pin	Signal	Pin	Signal
1	DIO1	2	DIO2
3	DIO3	4	DIO4
5	DIO5	6	DIO6
7	DIO7	8	DIO8
9	+3.3V	10	GND

2.14 FAN Connector

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

2.15 4 pin ATX Power Connector (ATX1)

Pin	Signal	Pin	Signal
1	GND	2	GND

3	+12V	4	+12V

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 USB3.0 Connector (USB3_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	NA	20	NA

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	×	○	○	○	○	○

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 Iinitialization

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 stored in the CMOS memory and BIOS NVRAM. If system configuration is not found or system configuration data error is detected, system will load optimized default and re-boot with this default system configuration automatically.

There are four situations in which you will need to setup system configuration:

1. You are starting your system for the first time
2. You have changed the hardware attached to your system
3. The system configuration is reset by Clear-CMOS jumper
4. The CMOS memory has lost power and the configuration information has been erased.

The EMB-A70M 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 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 and BIOS NVRAM 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

Enable disable boot option for legacy network devices.

Chipset

Host bridge parameters.

Boot

Enables/disable quiet boot option.

Security

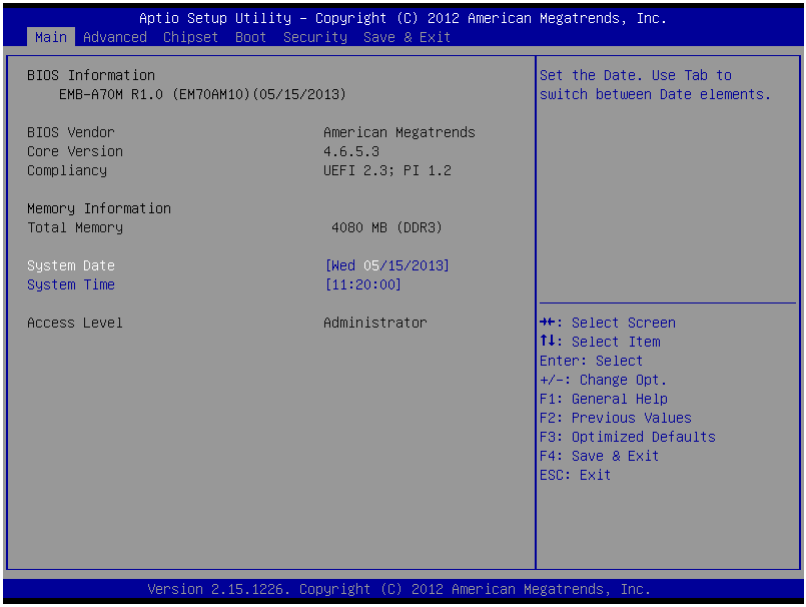
Set setup administrator password.

Save & Exit

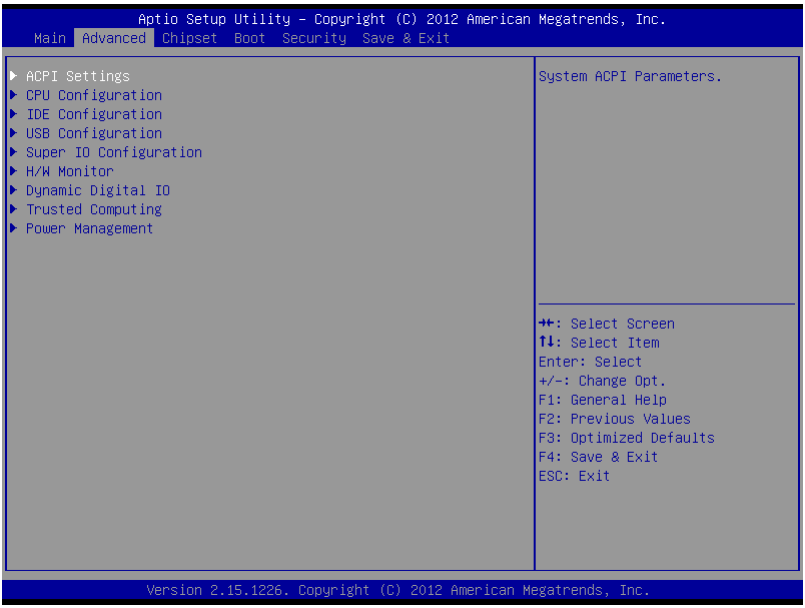
Exit system setup after saving the changes.

Setup Menu

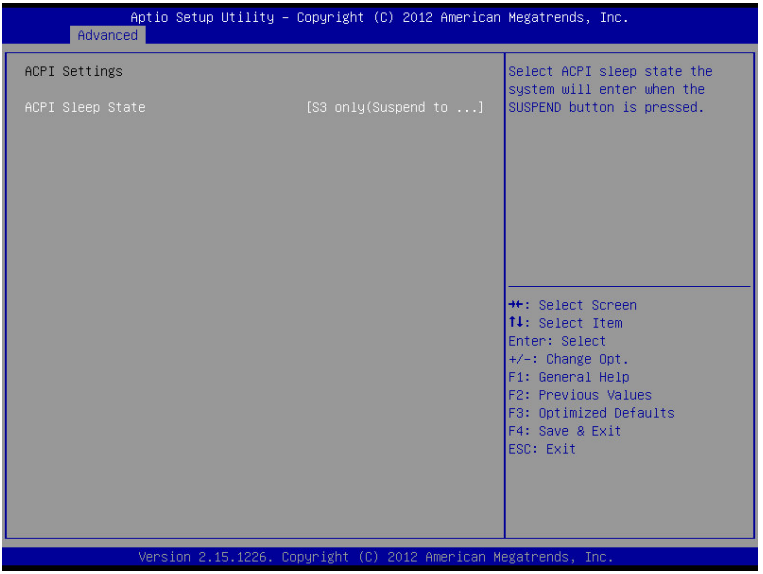
Setup submenu: Main



Setup submenu: Advanced



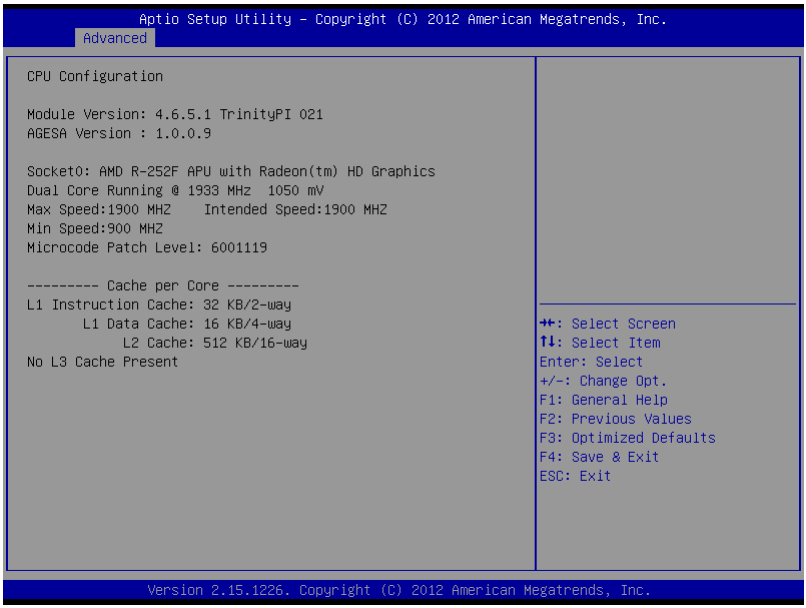
ACPI Settings



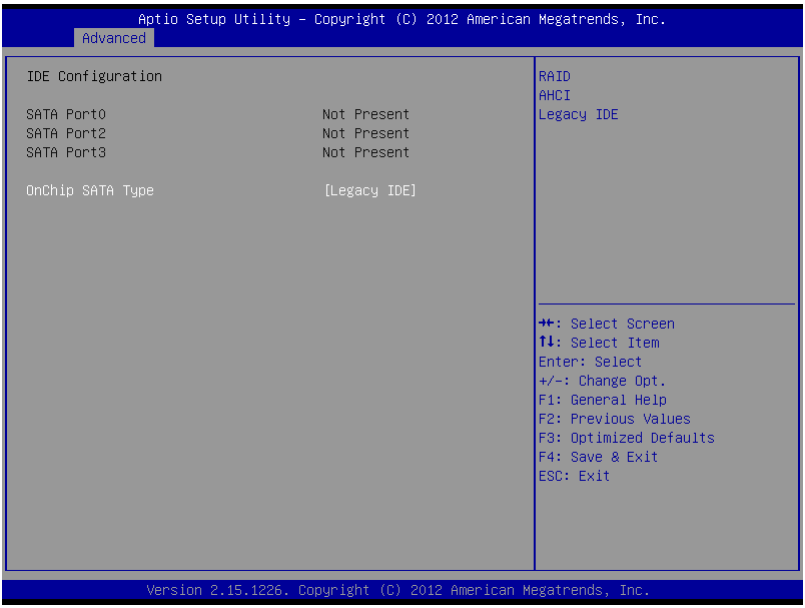
Options summary:

ACPI Sleep State	S3 only (Suspend to RAM)	Optimal Default, Failsafe Default
Select the ACPI state used for System Suspend		

CPU Configuration



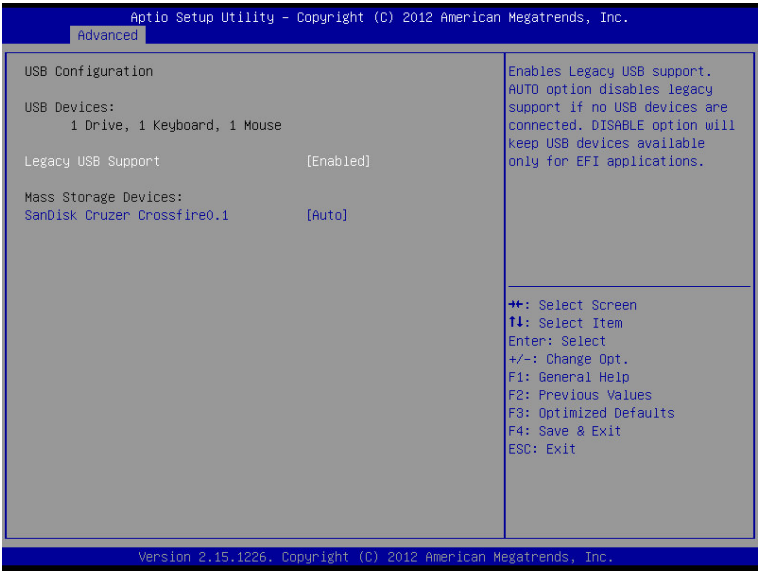
IDE Configuration (IDE)



Options summary:

OnChip SATA Type	RAID	Optimal Default, Failsafe Default
	AHCI	
	Legacy IDE	

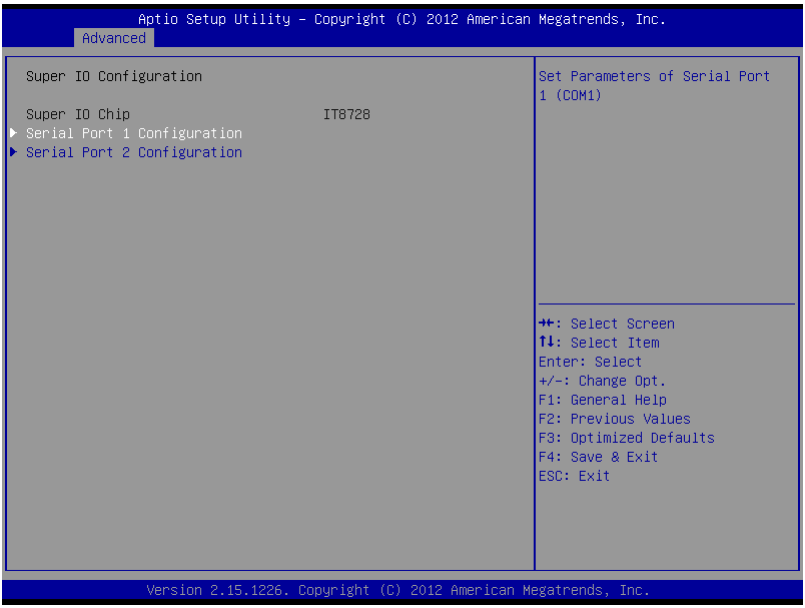
USB Configuration



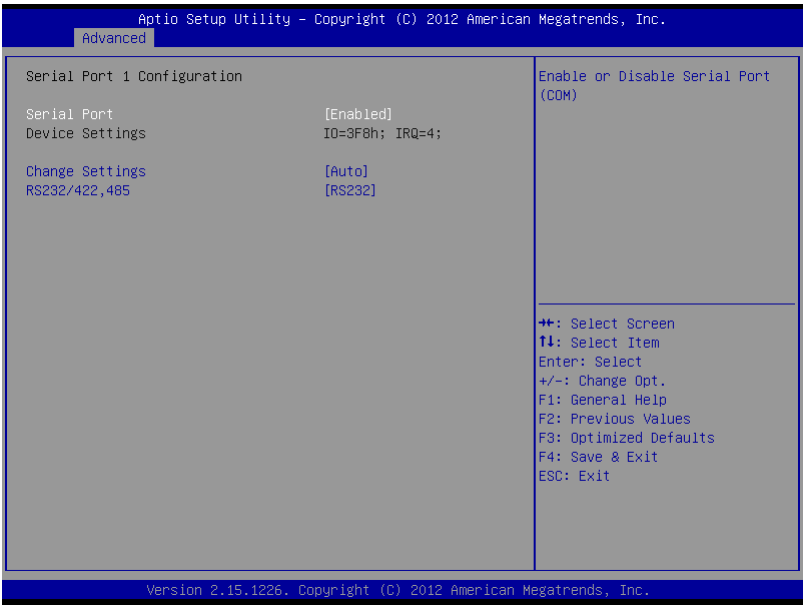
Options summary:

Legacy USB Support	Enabled	Optimal Default, Failsafe Default
	Disabled	
	Auto	
Enables BIOS Support for Legacy USB Support. When enabled, USB can be functional in legacy environment like DOS. AUTO option disables legacy support if no USB devices are connected		
Device Name (Emulation Type)	Auto	Optimal Default, Failsafe Default
	Floppy	
	Forced FDD	
	Hard Disk	
	CDROM	
If Auto. USB devices less than 530MB will be emulated as Floppy and remaining as Floppy and remaining as hard drive. Forced FDD option can be used to force a HDD formatted drive to boot as FDD(Ex. ZIP drive)		

Super IO Configuration



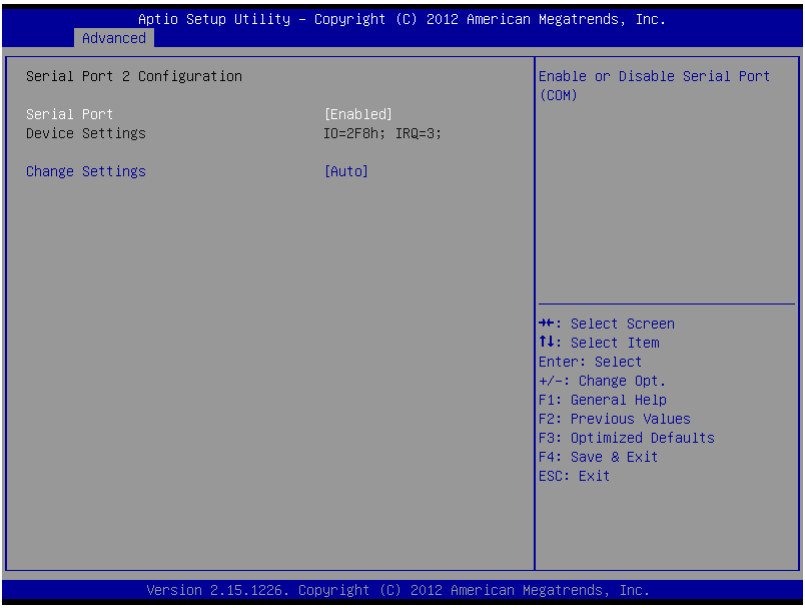
Serial Port 1 Configuration



Options summary:

Serial Port	Disabled	
	Enabled	Optimal Default, Failsafe Default
Allows BIOS to En/Disable correspond serial port.		
Change Settings	Auto	Optimal Default, Failsafe Default
	IO=3F8h;IRQ=4;	
	IO=2F8h;IRQ=3;	
Allows BIOS to Select Serial Port resource.		
RS232/422,485	RS232	Optimal Default, Failsafe Default
	RS422	
	RS485	
RS232/422,485 switch		

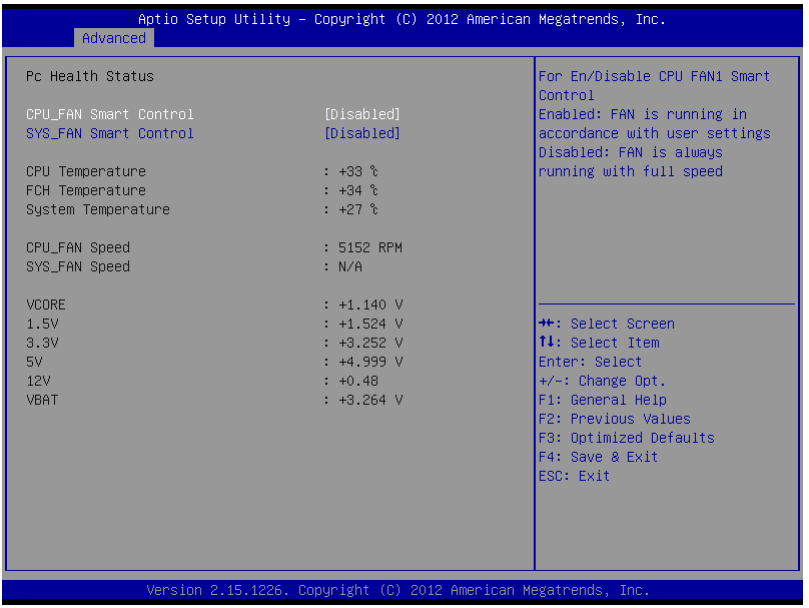
Serial Port 2 Configuration



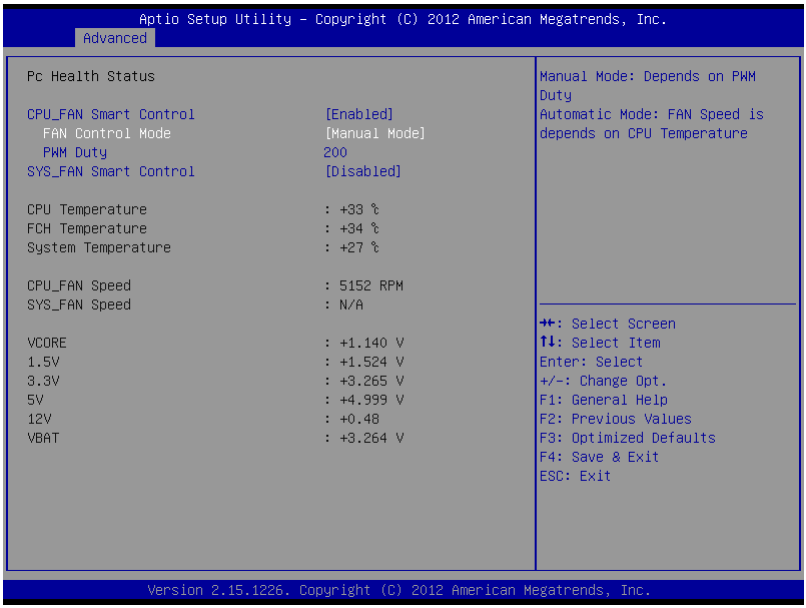
Options summary:

Serial Port	Disabled	Optimal Default, Failsafe Default
	Enabled	
Allows BIOS to En/Disable correspond serial port.		
Change Settings	Auto	Optimal Default, Failsafe Default
	IO=3F8h;IRQ=4;	
	IO=2F8h;IRQ=3;	
Allows BIOS to Select Serial Port resource.		

H/W Monitor


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
Pc Health Status
CPU_FAN Smart Control [Disabled]
SYS_FAN Smart Control [Disabled]
CPU Temperature : +33 °C
FCH Temperature : +34 °C
System Temperature : +27 °C
CPU_FAN Speed : 5152 RPM
SYS_FAN Speed : N/A
VCORE : +1.140 V
1.5V : +1.524 V
3.3V : +3.252 V
5V : +4.999 V
12V : +0.48
VBAT : +3.264 V
For En/Disable CPU FAN1 Smart Control
Enabled: FAN is running in accordance with user settings
Disabled: FAN is always running with full speed
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1226. Copyright (C) 2012 American Megatrends, Inc.

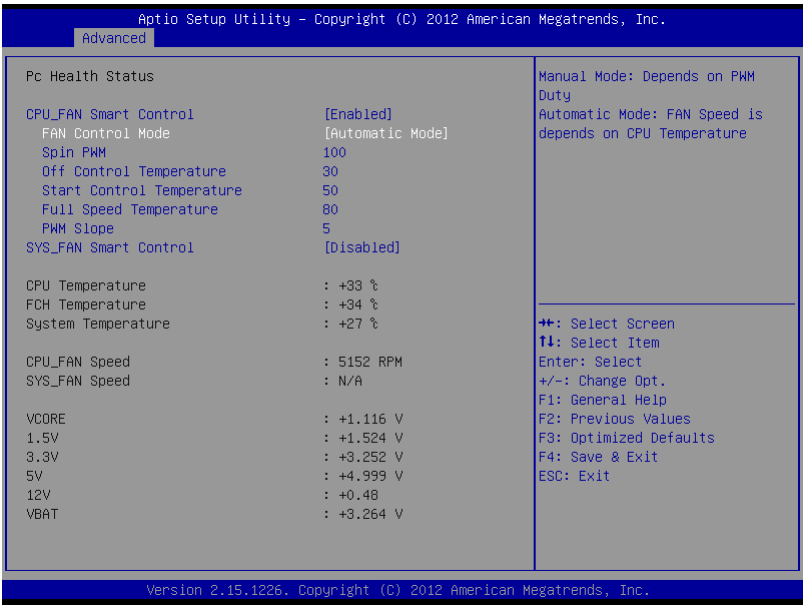
Smart Fan Mode Configuration (Manual Mode)



Options Summary :

CPU Fan Control (SYS Fan Control)	Disabled Enabled	 Default
For En/Disable CPU(SYS) Fan1 Control Enabled: Fan is running in accordance with user settings Disabled: Fan is always running with full speed		
Fan Control Mode	Manual Mode Automatic Mode	Default
Manual Mode: Depends on PWM Duty Automatic Mode: Fan Speed is depends on CPU Temperature		
PWM Duty	200 0~255	Default
Manual Mode PWM Duty value		

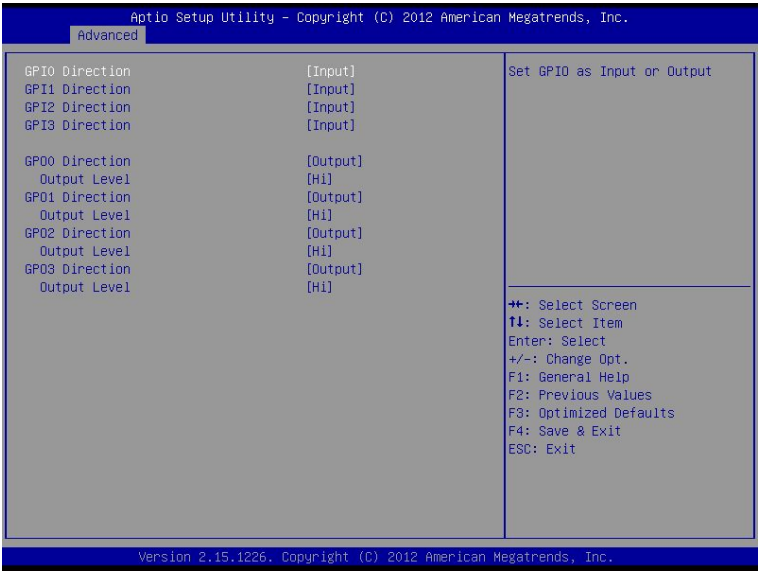
Smart Fan Mode Configuration (Thermal Cruise Mode)



Options Summary :

Spin PWM	100 255	Default
The PWM Duty of Fan Spin		
Off Control Temperature	30	Default
Temperature Limit Value of Fan Off. Note: Some fans have the minimum speed even if the PWM value is 0		
Start Control Temperature	50	Default
Temperature Limit Value of Fan Start Control		
Full Speed Temperature	80	Default
Temperature Limit Value of Fan Full Speed		
PWM Slope	5	Default
Slope PWM value/degree C for FAN speed control		

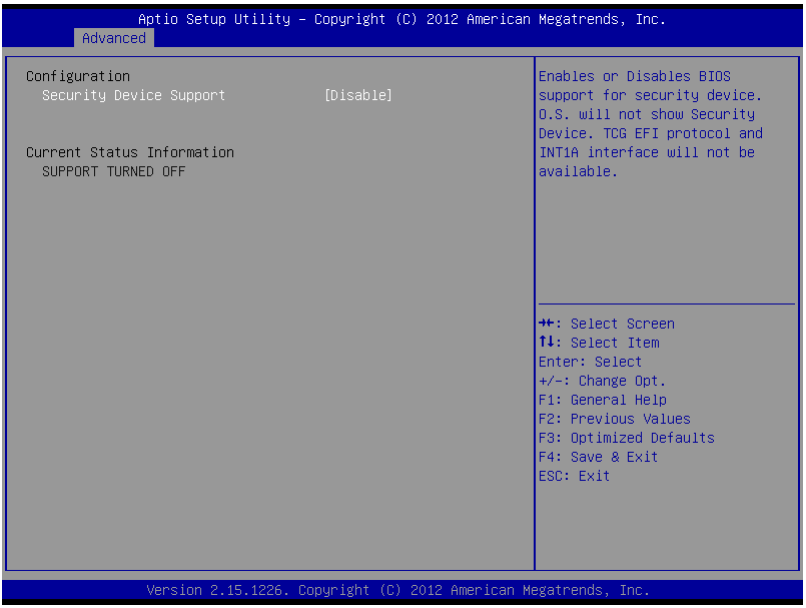
Dynamic Digital IO



Options summary:

GPI0~GPI3 Direction	Input	Optimal Default, Failsafe Default
	Output	
Set GPIO as Input or Output		
GPO0~GPI3 Direction	Input	Optimal Default, Failsafe Default
	Output	
Set GPIO as Input or Output		
Output Level	Hi	Optimal Default, Failsafe Default
	Low	
Set GPIO Output as Hi or Low		

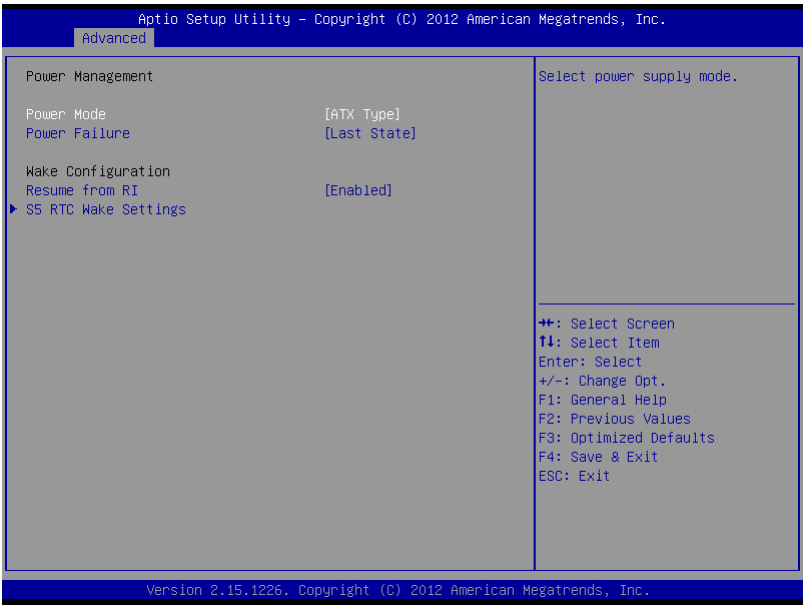
Trusted Computing



Options summary:

Security Device Support	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enable/Disable Security Device. NOTE: Your Computer will reboot during restart in order to change State of the Device.		

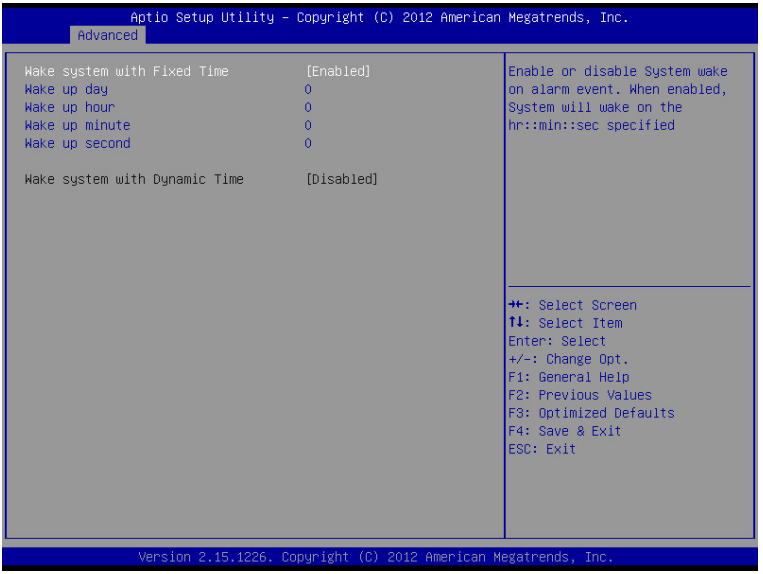
Power Management



Options summary:

Power Mode	ATX Type	Optimal Default, Failsafe Default
	AT Type	
Select power supply mode.		
Resume from RI	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enable/Disable Resume from RI		

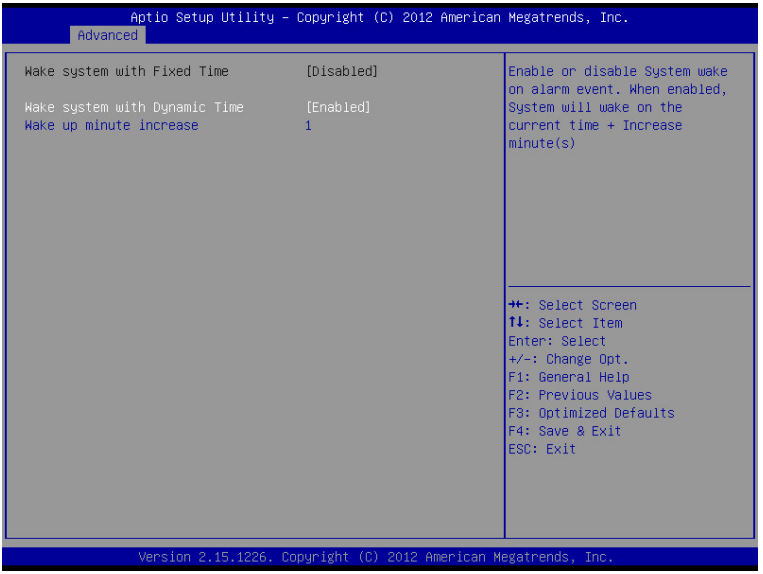
S5 RTC Wake Settings (Fixed Time)



Options summary:

Wake system with Fixed Time	Disabled	Optimal Default, Failsafe Default
	Enabled	
En/Disable System wake on alarm event. When enabled, System will wake on the hr:min:sec specified		
Wake up day	0-31	Default 0
Select 0 for daily system wake up, 1-31 for witch day of the moth that you would like the system to wake up.		
Wake up day	0-23	Default 0
Select 0-23 For example enter 3 for 3am and 15 for 3pm		
Wake up day	0-59	Default 0
Select 0-59		
Wake up day	0-59	Default 0
Select 0-59		

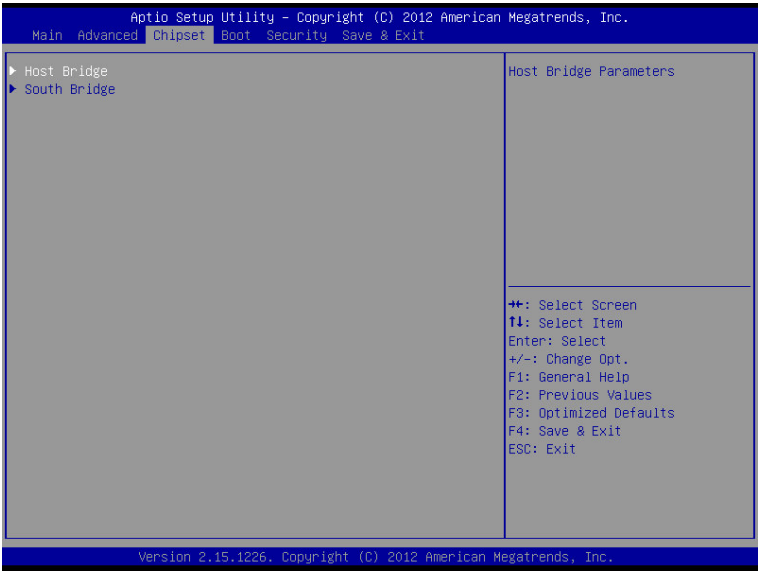
S5 RTC Wake Settings (Dynamic Time)



Options summary:

Wake system with Dynamic Time	Disabled	Optimal Default, Failsafe Default
	Enabled	
En/Disable System wake on alarm event. When enabled, System will wake on current time + Increases minutese(s)		
Wake up day	1-5	Default 1
Select 1-5		

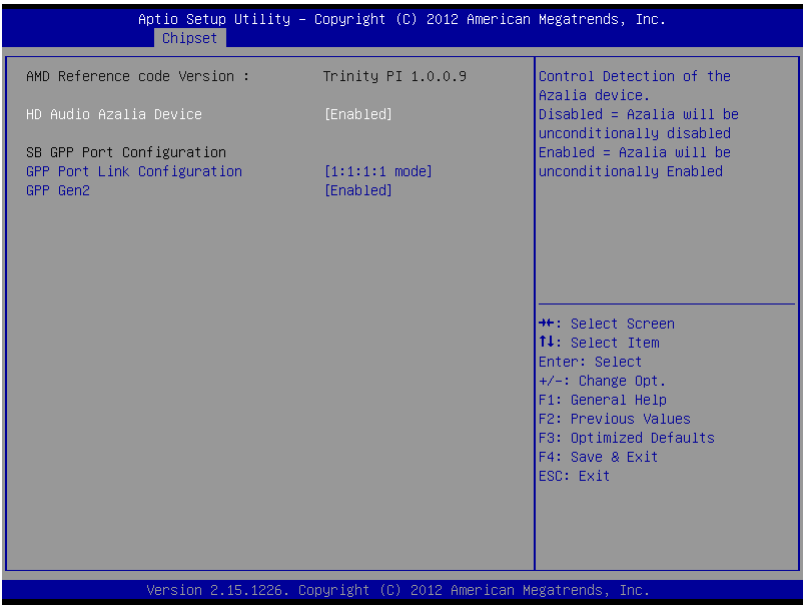
Setup submenu: Chipset



HOST Bridge


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Chipset
North Bridge Configuration
Dimm0: size=4096 MB, frequency=1334 MHz
Dimm1: Not Present
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1226. Copyright (C) 2012 American Megatrends, Inc.

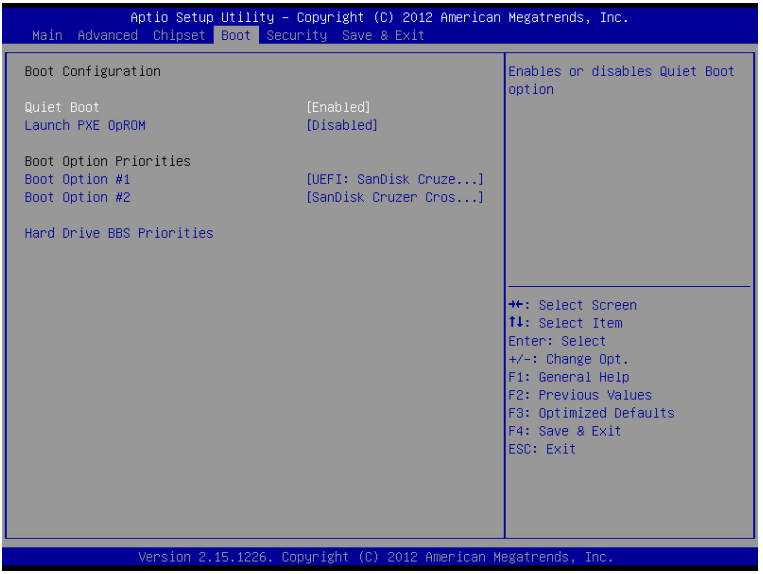
South Bridge



Options summary:

HD Audio Azalia Device	Auto	Optimal Default, Failsafe Default
	Disabled	
	Enabled	
Control Detection of the Azalia device.\n\nDisabled = Azalia will be unconditionally disabled\n\nEnabled = Azalia will be unconditionally Enabled		
GPP Port Link Configuration	x4 mode	Optimal Default, Failsafe Default
	2:2 mode	
	2:1:1 mode	
	1:1:1:1 mode	
GPP Port mode selection.		
GPP Gen2	Disabled	Optimal Default, Failsafe Default
	Enabled	
GPP Port link speed.		

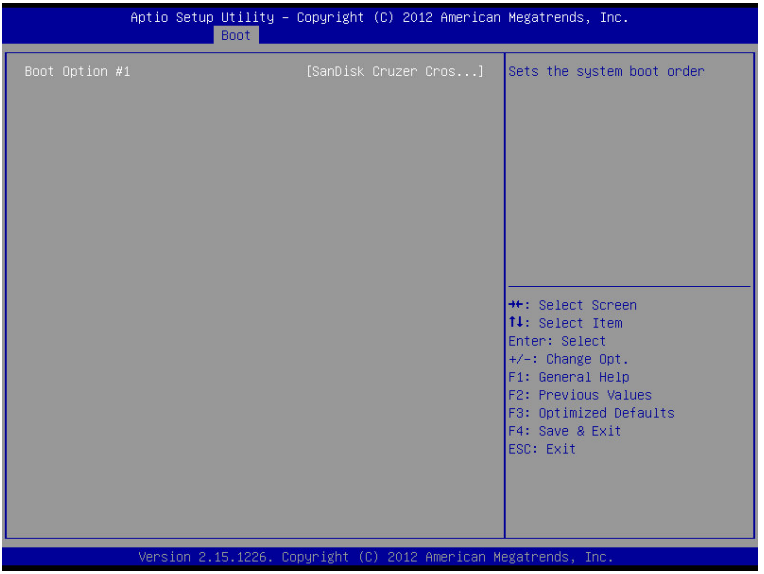
Setup submenu: Boot



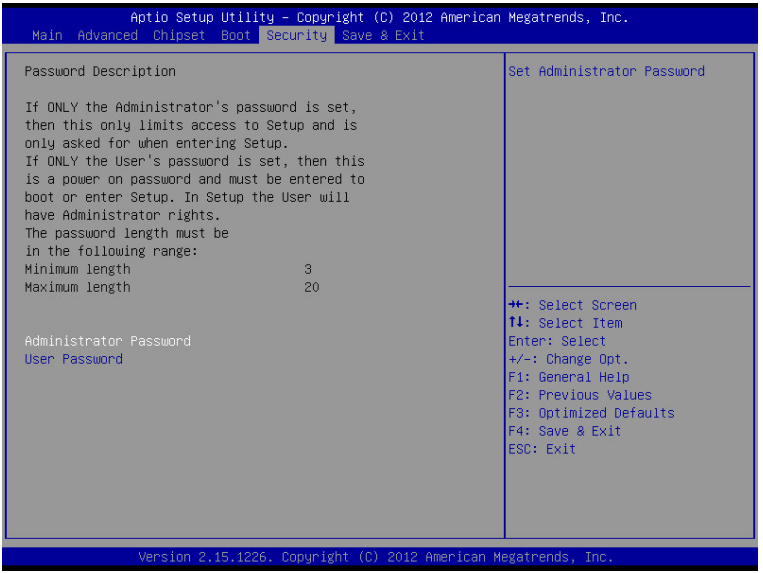
Options summary:

Bootup NumLock State	On	Default
	Off	
Select the keyboard NumLock state		
Quiet Boot	Disabled	
	Enabled	Default
En/Disable showing boot logo.		
Launch I82579LM PXE OpROM	Disabled	Default
	Enabled	
En/Disable Legacy Boot Option for I82579LM.		
Launch I82583V PXE OpROM	Disabled	Default
	Enabled	
En/Disable Legacy Boot Option for I82583V.		
Option ROM Messages	Force BIOS	Default
	Keep Current	
Set display mode for Option ROM.		
INT19 Trap Response	Immediate	Default
	Postponed	
BIOS reaction on INT19 trapping by Option ROM: IMMEDIATE – execute the trap right away; POSTPONED – execute the trap during legacy boot.		

BBS Priorities



Security



Change User/Supervisor Password

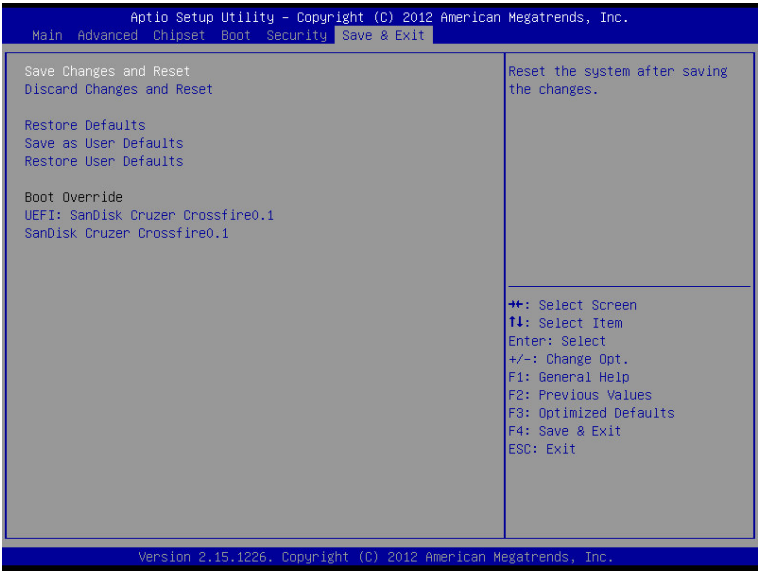
You can install a Supervisor password, and if you install a supervisor password, you can then install a user password. A user password does not provide access to many of the features in the Setup utility.

If you highlight these items and press Enter, a dialog box appears which lets you enter a password. You can enter no more than six letters or numbers. Press Enter after you have typed in the password. A second dialog box asks you to retype the password for confirmation. Press Enter after you have retyped it correctly. The password is required at boot time, or when the user enters the Setup utility.

Removing the Password

Highlight this item and type in the current password. At the next dialog box press Enter to disable password protection.

Setup submenu: Exit



Chapter

4

Driver Installation

.

The EMB-A70M 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 & VGA Driver

Step 2 – Install AHCI Driver

Step 3 – Install LAN Device

Step 4 – Install AUDIO Driver

Step 5 – Install TPM Driver

Step 6 – Install Serial Port Driver

Please read instructions below for further detailed installations.

4.1 Installation:

Insert the EMB-A70M DVD-ROM into the DVD-ROM drive. And install the drivers from Step 1 to Step 6 in order.

Step 1 – Install Chipset & VGA Driver

1. Click on the ***Step 1 - Chipset & VGA*** folder and select the OS folder your system is
2. Double click on the***Setup.exe*** file
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

Step 2 – Install AHCI_RAID Driver

Please refer to the Appendix E AHCI Setting

Step 3 – Install LAN Device

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 TPM Driver

1. Click on the ***STEP5-TPM*** 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

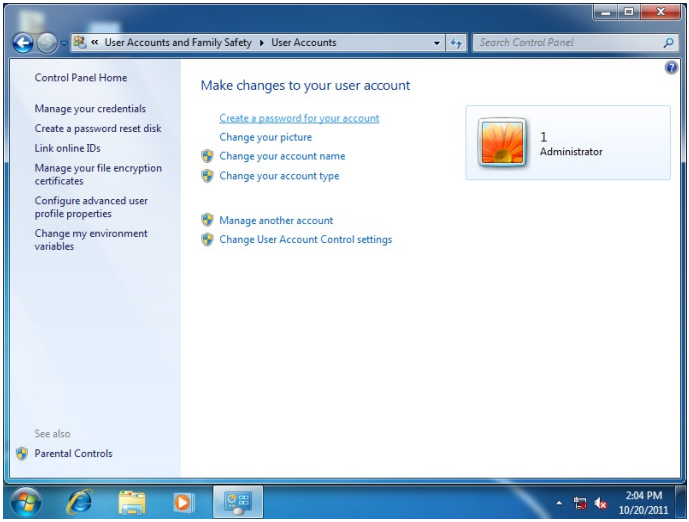
Step 6 – Install Serial Port Driver (Optional)

For Windows® XP:

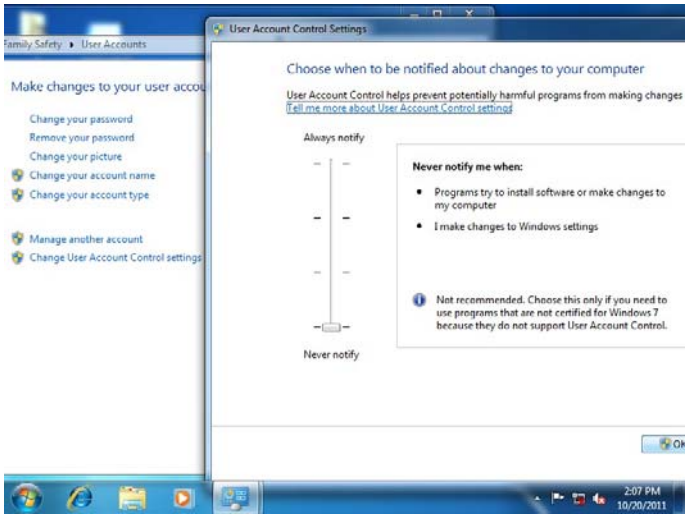
1. Click on the ***STEP6-Serial Port Driver (Optional)*** and Enter the "Windows" folder
2. Double click on ***Serial Patch v1.0.2.bat*** file
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

For Windows® 7:

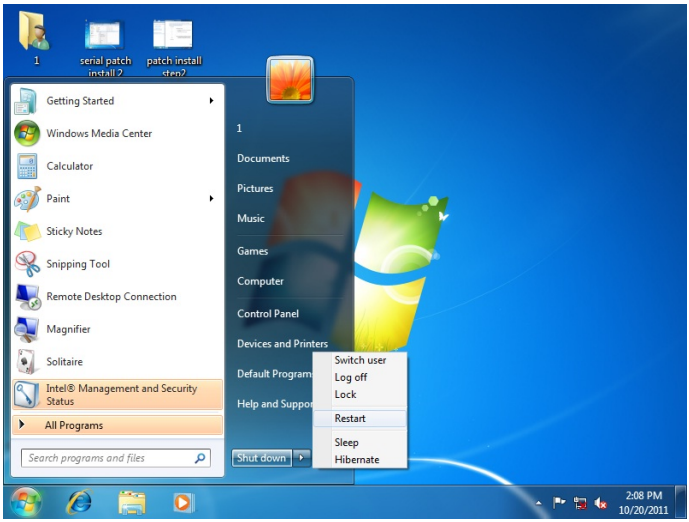
1. Create a password for Administrator account.



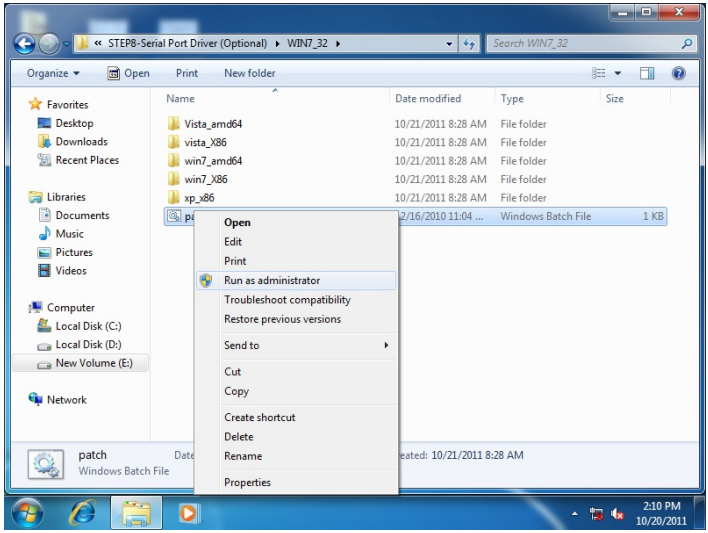
2. Change User Account Control Settings to [Never notify]



3. Reboot and Administrator login.



4. To run patch.bat with [Run as administrator].



Appendix

A

Programming the Watchdog Timer

A.1 Watchdog Timer Initial Program

Table 1 : SuperIO relative register table		
	Default Value	**Note**
Index	**0x2E**(Note1)	SIO MB PnP Mode Index Register 0x2E or 0x4E
Data	**0x2F**(Note2)	SIO MB PnP Mode Data Register 0x2F or 0x4F

Table 2 : Watchdog relative register table					
	LDN	**Register**	**BitNum**	**Value**	**Note**
Timer Counter	**0x07**(Note3)	**0x73**(Note4)		(Note24)	Time of watchdog timer (0~255) This register is byte access
Counting Unit	**0x07**(Note5)	**0x72**(Note6)	**7**(Note7)	**1**(Note8)	Select time unit. 1: second 0: minute
Watchdog Enable (KRST)	**0x07**(Note9)	**0x72**(Note10)	**6**(Note11)	**1**(Note12)	0: Disable 1: Enable
Timeout Status	**0x07**(Note13)	**0x71**(Note14)	**0**(Note15)	**1**	1: Clear timeout status

```
*****************************************************************************
// SuperIO relative definition (Please reference to Table 1)
#define byte   SIOIndex   //This parameter is represented from Note1
#define byte   SIOData    //This parameter is represented from Note2
#define   void   IOWriteByte(byte IOPort, byte Value);
#define   byte   IOReadByte(byte IOPort);
// Watch Dog relative definition (Please reference to Table 2)
#define byte   TimerLDN    //This parameter is represented from Note3
#define byte   TimerReg    //This parameter is represented from Note4
#define byte   TimerVal    // This parameter is represented from Note24
#define byte   UnitLDN     //This parameter is represented from Note5
#define byte   UnitReg     //This parameter is represented from Note6
#define byte   UnitBit     //This parameter is represented from Note7
#define byte   UnitVal     //This parameter is represented from Note8
#define byte   EnableLDN   //This parameter is represented from Note9
#define byte   EnableReg   //This parameter is represented from Note10
#define byte   EnableBit   //This parameter is represented from Note11
#define byte   EnableVal   //This parameter is represented from Note12
#define byte   StatusLDN   // This parameter is represented from Note13
#define byte   StatusReg   // This parameter is represented from Note14
#define byte   StatusBit   // This parameter is represented from Note15
*****************************************************************************
```

```
**********************************************************************************
VOID   Main(){
        // Procedure : AaeonWDTConfig
        // (byte)Timer : Time of WDT timer.(0x00~0xFF)
        // (boolean)Unit : Select time unit(0: second, 1: minute).
        AaeonWDTConfig();

        // Procedure : AaeonWDTEnable
        // This procudure will enable the WDT counting.
        AaeonWDTEnable();
}
**********************************************************************************
```

```
*****************************************************************************
// Procedure : AaeonWDTEnable
VOID   AaeonWDTEnable (){
        WDTEnableDisable(EnableLDN, EnableReg, EnableBit, 1);
}

// Procedure : AaeonWDTConfig
VOID   AaeonWDTConfig (){
        // Disable WDT counting
        WDTEnableDisable(EnableLDN, EnableReg, EnableBit, 0);
        // Clear Watchdog Timeout Status
        WDTClearTimeoutStatus();
        // WDT relative parameter setting
        WDTParameterSetting();
}

VOID   WDTEnableDisable(byte LDN, byte Register, byte BitNum, byte Value){
        SIOBitSet(LDN, Register, BitNum, Value);
}

VOID   WDTParameterSetting(){
        // Watchdog Timer counter setting
        SIOByteSet(TimerLDN, TimerReg, TimerVal);
        // WDT counting unit setting
        SIOBitSet(UnitLDN, UnitReg, UnitBit, UnitVal);
}

VOID   WDTClearTimeoutStatus(){
        SIOBitSet(StatusLDN, StatusReg, StatusBit, 1);
}
*****************************************************************************
```

```
**************************************************************************************
VOID    SIOEnterMBPnPMode(){
        Switch(SIOIndex){
                Case 0x2E:
                        IOWriteByte(SIOIndex, 0x87);
                        IOWriteByte(SIOIndex, 0x01);
                        IOWriteByte(SIOIndex, 0x55);
                        IOWriteByte(SIOIndex, 0x55);
                        Break;
                Case 0x4E:
                        IOWriteByte(SIOIndex, 0x87);
                        IOWriteByte(SIOIndex, 0x01);
                        IOWriteByte(SIOIndex, 0x55);
                        IOWriteByte(SIOIndex, 0xAA);
                        Break;
        }
}

VOID    SIOExitMBPnPMode(){
        IOWriteByte(SIOIndex, 0x02);
        IOWriteByte(SIOData, 0x02);
}

VOID    SIOSelectLDN(byte LDN){
        IOWriteByte(SIOIndex, 0x07); // SIO LDN Register Offset = 0x07
        IOWriteByte(SIOData, LDN);
}
**************************************************************************************
```

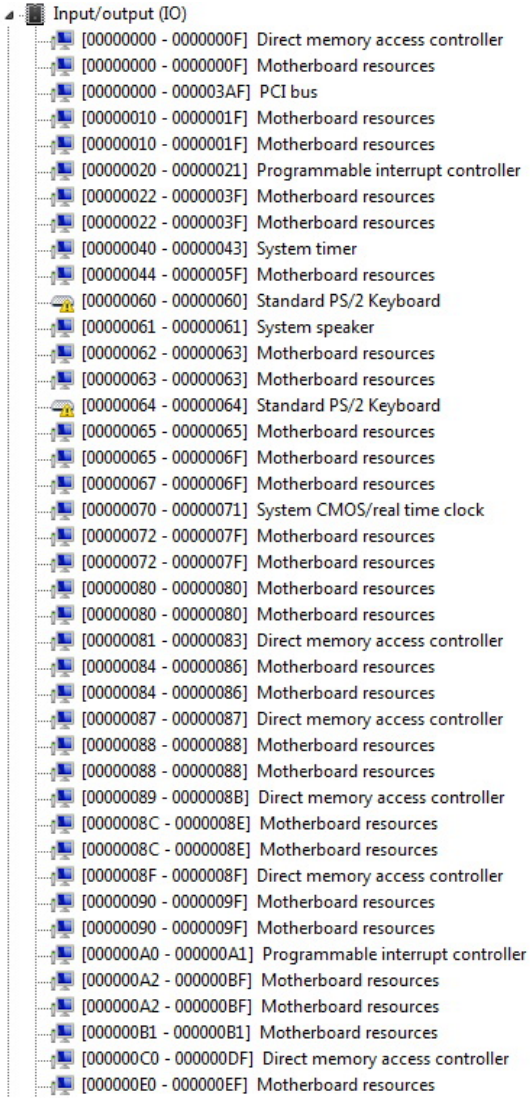
```
*************************************************************************************
VOID    SIOBitSet(byte LDN, byte Register, byte BitNum, byte Value){
        Byte TmpValue;

        SIOEnterMBPnPMode();
        SIOSelectLDN(byte LDN);
        IOWriteByte(SIOIndex, Register);
        TmpValue = IOReadByte(SIOData);
        TmpValue &= ~(1 << BitNum);
        TmpValue |= (Value << BitNum);
        IOWriteByte(SIOData, TmpValue);
        SIOExitMBPnPMode();
}

VOID    SIOByteSet(byte LDN, byte Register, byte Value){
        SIOEnterMBPnPMode();
        SIOSelectLDN(LDN);
        IOWriteByte(SIOIndex, Register);
        IOWriteByte(SIOData, Value);
        SIOExitMBPnPMode();
}
*************************************************************************************
```

Appendix

B

I/O Information

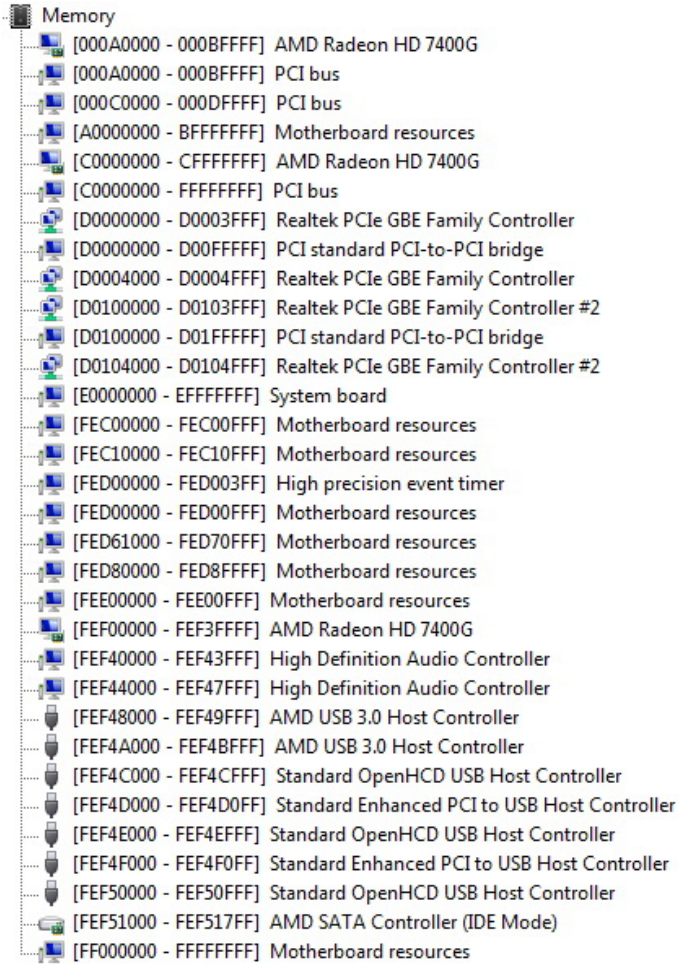
B.1 I/O Address Map



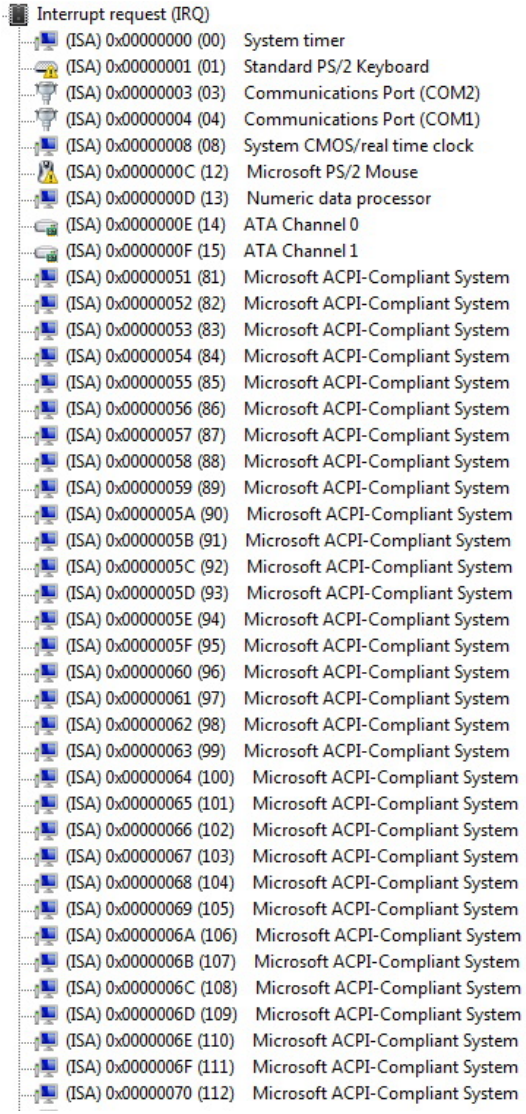
- [000000C0 - 000000DF] Direct memory access controller
- [000000E0 - 000000EF] Motherboard resources
- [000000E0 - 000000EF] Motherboard resources
- [000000F0 - 000000FF] Numeric data processor
- [00000170 - 00000177] ATA Channel 1
- [000001F0 - 000001F7] ATA Channel 0
- [000002F8 - 000002FF] Communications Port (COM2)
- [00000376 - 00000376] ATA Channel 1
- [000003B0 - 000003BB] AMD Radeon HD 7400G
- [000003B0 - 000003DF] PCI bus
- [000003C0 - 000003DF] AMD Radeon HD 7400G
- [000003E0 - 00000CF7] PCI bus
- [000003F6 - 000003F6] ATA Channel 0
- [000003F8 - 000003FF] Communications Port (COM1)
- [0000040B - 0000040B] Motherboard resources
- [000004D0 - 000004D1] 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
- [0000D000 - 0000DFFF] PCI standard PCI-to-PCI bridge
- [0000E000 - 0000E0FF] Realtek PCIe GBE Family Controller #2
- [0000E000 - 0000EFFF] PCI standard PCI-to-PCI bridge
- [0000F000 - 0000F0FF] AMD Radeon HD 7400G

- [000003B0 - 000003DF] PCI bus
- [000003C0 - 000003DF] AMD Radeon HD 7400G
- [000003E0 - 00000CF7] PCI bus
- [000003F6 - 000003F6] ATA Channel 0
- [000003F8 - 000003FF] Communications Port (COM1)
- [0000040B - 0000040B] Motherboard resources
- [000004D0 - 000004D1] 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
- [0000D000 - 0000DFFF] PCI standard PCI-to-PCI bridge
- [0000E000 - 0000E0FF] Realtek PCIe GBE Family Controller #2
- [0000E000 - 0000EFFF] PCI standard PCI-to-PCI bridge
- [0000F000 - 0000F0FF] AMD Radeon HD 7400G
- [0000F100 - 0000F10F] AMD PCI IDE Controller
- [0000F110 - 0000F113] AMD PCI IDE Controller
- [0000F120 - 0000F127] AMD PCI IDE Controller
- [0000F130 - 0000F133] AMD PCI IDE Controller
- [0000F140 - 0000F147] AMD PCI IDE Controller
- [0000F150 - 0000F15F] AMD SATA Controller (IDE Mode)
- [0000FE00 - 0000FEFE] Motherboard resources

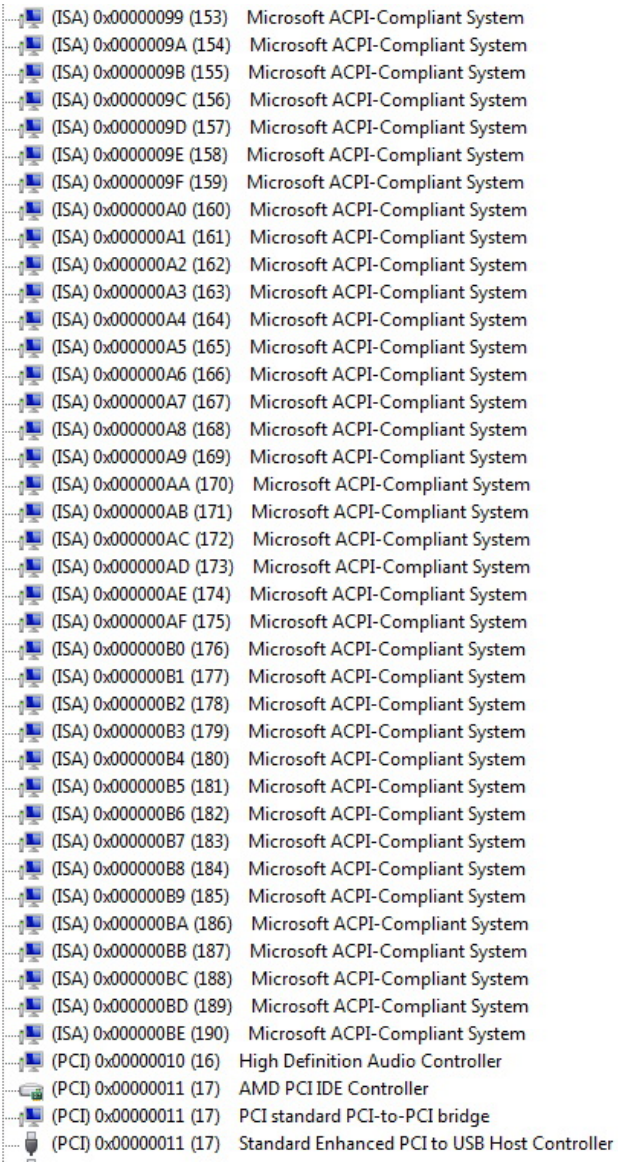
B.2 Memory Address Map



B.3 IRQ Mapping Chart

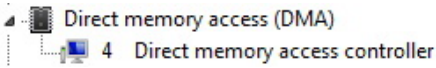


(ISA) 0x00000070 (112) Microsoft ACPI-Compliant System
(ISA) 0x00000071 (113) Microsoft ACPI-Compliant System
(ISA) 0x00000072 (114) Microsoft ACPI-Compliant System
(ISA) 0x00000073 (115) Microsoft ACPI-Compliant System
(ISA) 0x00000074 (116) Microsoft ACPI-Compliant System
(ISA) 0x00000075 (117) Microsoft 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) 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) 0x00000011 (17) AMD PCI IDE Controller
(PCI) 0x00000011 (17) PCI standard PCI-to-PCI bridge
(PCI) 0x00000011 (17) Standard Enhanced PCI to USB Host Controller

(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) 0x00000011 (17) AMD PCI IDE Controller
(PCI) 0x00000011 (17) 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) 0x00000012 (18) High Definition Audio Controller
(PCI) 0x00000012 (18) PCI standard PCI-to-PCI bridge
(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) PCI standard PCI-to-PCI bridge
(PCI) 0xFFFFFFEC (-20) AMD USB 3.0 Host Controller
(PCI) 0xFFFFFFED (-19) AMD USB 3.0 Host Controller
(PCI) 0xFFFFFFEE (-18) AMD USB 3.0 Host Controller
(PCI) 0xFFFFFFEF (-17) AMD USB 3.0 Host Controller
(PCI) 0xFFFFFFF0 (-16) AMD USB 3.0 Host Controller
(PCI) 0xFFFFFFF1 (-15) AMD USB 3.0 Host Controller
(PCI) 0xFFFFFFF2 (-14) AMD USB 3.0 Host Controller
(PCI) 0xFFFFFFF3 (-13) AMD USB 3.0 Host Controller
(PCI) 0xFFFFFFF4 (-12) AMD USB 3.0 Host Controller
(PCI) 0xFFFFFFF5 (-11) AMD USB 3.0 Host Controller
(PCI) 0xFFFFFFF6 (-10) AMD USB 3.0 Host Controller
(PCI) 0xFFFFFFF7 (-9) AMD USB 3.0 Host Controller
(PCI) 0xFFFFFFF8 (-8) AMD USB 3.0 Host Controller
(PCI) 0xFFFFFFF9 (-7) AMD USB 3.0 Host Controller
(PCI) 0xFFFFFFFA (-6) AMD USB 3.0 Host Controller
(PCI) 0xFFFFFFFB (-5) AMD USB 3.0 Host Controller
(PCI) 0xFFFFFFFC (-4) Realtek PCIe GBE Family Controller
(PCI) 0xFFFFFFFD (-3) Realtek PCIe GBE Family Controller #2
(PCI) 0xFFFFFFFE (-2) AMD Radeon HD 7400G

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		
CN32	USB Connector	Upright	HO-BASE.K S-001V-ANW	NA	NA
CN33	LAN Connector	UDE	RT7-17FAA M1A	NA	NA
CN34	LAN Connector	UDE	RT7-17FAA M1A	NA	NA
CN28	HDMI Connector	FOXCO NN	QJ3119C-W FB1-4F	NA	NA
CN29	HDMI Connector	FOXCO NN	QJ3119C-W FB1-4F	NA	NA
CN30	HDMI Connector	FOXCO NN	QJ3119C-W FB1-4F	NA	NA
CN31	HDMI Connector	FOXCO NN	QJ3119C-W FB1-4F	NA	NA
CN4	Front Panel Connector	PINREX	222-97-05GB E1	N/A	N/A
CN5	DIO Connector	PINREX	222-97-05GB E1	N/A	N/A
CN10	RS-232 Serial Port Connector	CATCH	2.00mm Pitch 10 pins (CATCH H754-2x5 or compatible)	Serial Port Cable	1701100206
CN11	RS-232 Serial Port Connector	CATCH	2.00mm Pitch 10 pins (CATCH H754-2x5 or compatible)	Serial Port Cable	1701100206
CN35	MIC Connector	TACT	C1F2R1-560 -R	NA	NA

CN35	LINE OUT Connector	TACT	C1F2R1-570-R	NA	NA
CN20	USB Connector	CATCH	2.00mm Pitch 10 pins (CATCH H754-2x5 or compatible)	USB Cable	1709100208
CN21	USB Connector	CATCH	2.00mm Pitch 10 pins (CATCH H754-2x5 or compatible)	USB Cable	1709100208
CN19	USB3.0 Connector	PINREX	52X-40-20G V52	USB3.0 Cable	1700200301
CN16	SATA Connector	TECHBEST	161S01-029A-L	SATA Cable	1709070150
CN17	SATA Connector	TECHBEST	161S01-029A-L	SATA Cable	1709070150
CN12	PS2 Connector	凱迅	1130-010-08SA	NA	NA
CN2	FAN Connector	CATCH	1190-700-042	NA	NA
CN18	POWER Connector	何迪	P201-04	NA	NA

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

Appendix

D

Programming the Digital I/O

D.1 DIO Programming

EMB-A70M utilizes ITE8728 chipset as its Digital I/O controller. Below are the procedures to complete its configuration which you can develop customized program to fit your application.

D.2 Digital I/O Register

Table 1 : Digital I/O relative register table				
	Register			
DIO access Base Address	0x500(Note3)			
	Register	BitNum	Value	Note
DIO-1 Pin Status	Base Address+0(Note4)	1(Note5)	(Note6)	GPIO11
DIO-2 Pin Status	Base Address+0(Note7)	2(Note8)	(Note9)	GPIO12
DIO-3 Pin Status	Base Address+0(Note10)	4(Note11)	(Note12)	GPIO14
DIO-4 Pin Status	Base Address+2(Note13)	4(Note14)	(Note15)	GPIO34
DIO-5 Pin Status	Base Address+2(Note16)	5(Note17)	(Note18)	GPIO35
DIO-6 Pin Status	Base Address+2(Note19)	6(Note20)	(Note21)	GPIO36
DIO-7 Pin Status	Base Address+2(Note22)	7(Note23)	(Note24)	GPIO37
DIO-8 Pin Status	Base Address+5(Note25)	3(Note26)	(Note27)	GPIO63

D.3 Digital I/O Sample Program

```
**********************************************************************************
#define   void   IOWriteByte(byte IOPort, byte Value);
#define   byte   IOReadByte(byte IOPort);
// Digital Input Status relative definition (Please reference to Table 1)
#define byte   DIOBaseAddress   // This parameter is represented from Note3
#define byte   DIO1Reg   // This parameter is represented from Note4
#define byte   DIO1Bit   // This parameter is represented from Note5
#define byte   DIO1Val   // This parameter is represented from Note6
#define byte   DIO2Reg   // This parameter is represented from Note7
#define byte   DIO2Bit   // This parameter is represented from Note8
#define byte   DIO2Val   // This parameter is represented from Note9
#define byte   DIO3Reg   // This parameter is represented from Note10
#define byte   DIO3Bit   // This parameter is represented from Note11
#define byte   DIO3Val   // This parameter is represented from Note12
#define byte   DIO4Reg   // This parameter is represented from Note13
#define byte   DIO4Bit   // This parameter is represented from Note14
#define byte   DIO4Val   // This parameter is represented from Note15
#define byte   DIO5Reg   // This parameter is represented from Note16
#define byte   DIO5Bit   // This parameter is represented from Note17
#define byte   DIO5Val   // This parameter is represented from Note18
#define byte   DIO6Reg   // This parameter is represented from Note19
#define byte   DIO6Bit   // This parameter is represented from Note20
#define byte   DIO6Val   // This parameter is represented from Note21
#define byte   DIO7Reg   // This parameter is represented from Note22
#define byte   DIO7Bit   // This parameter is represented from Note23
#define byte   DIO7Val   // This parameter is represented from Note24
#define byte   DIO8Reg   // This parameter is represented from Note25
#define byte   DIO8Bit   // This parameter is represented from Note26
#define byte   DIO8Val   // This parameter is represented from Note27
**********************************************************************************
```

```
**********************************************************************************
VOID   Main(){
        Boolean PinStatus ;

        // Procedure : AaeonReadPinStatus
        // Input :
        //        Example, Read Digital I/O Pin 3 status
        // Output :
        //        InputStatus :
        //                0: Digital I/O Pin level is low
        //                1: Digital I/O Pin level is High
        PinStatus = AaeonReadPinStatus(DIO3Reg, DIO3Bit);

        // Procedure : AaeonSetOutputLevel
        // Input :
        //        Example, Set Digital I/O Pin 6 level
        AaeonSetOutputLevel(DIO6Reg, DIO6Bit, DIO6Val);
}
**********************************************************************************
```

```
**************************************************************************************
Boolean    AaeonReadPinStatus(byte Register, byte BitNum){
        Boolean PinStatus ;

        PinStatus = DIOBitRead(Register, BitNum);
        Return PinStatus ;
}
VOID    AaeonSetOutputLevel(byte Register, byte BitNum, byte Value){
        DIOBitSet(Register, BitNum, Value);
}

Boolean    DIOBitRead(byte Register, byte BitNum){
        Byte TmpValue;

        TmpValue = IOReadByte(Register);
        TmpValue &= (1 << BitNum);
        If(TmpValue == 0)
                Return 0;
        Return 1;
}

VOID    DIOBitSet(byte Register, byte BitNum, byte Value){
        Byte TmpValue;

        TmpValue = IOReadByte(Register);
        TmpValue &= ~(1 << BitNum);
        TmpValue |= (Value << BitNum);
        IOWriteByte(Register, TmpValue);
}
**************************************************************************************
```

Appendix

E

AHCI Setting

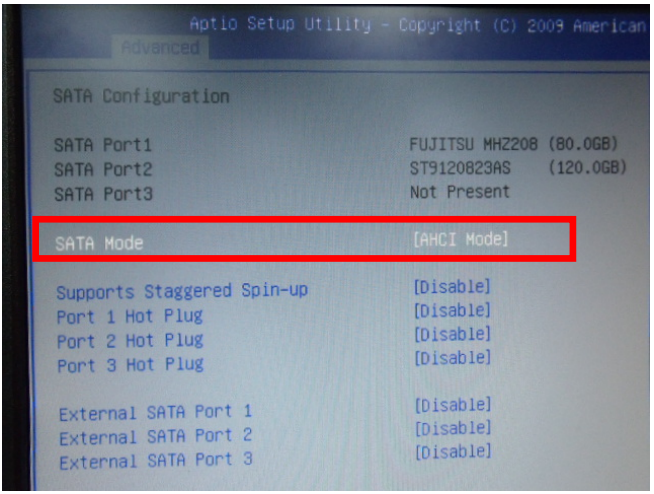
E.1 Setting AHCI

OS installation to setup AHCI Mode

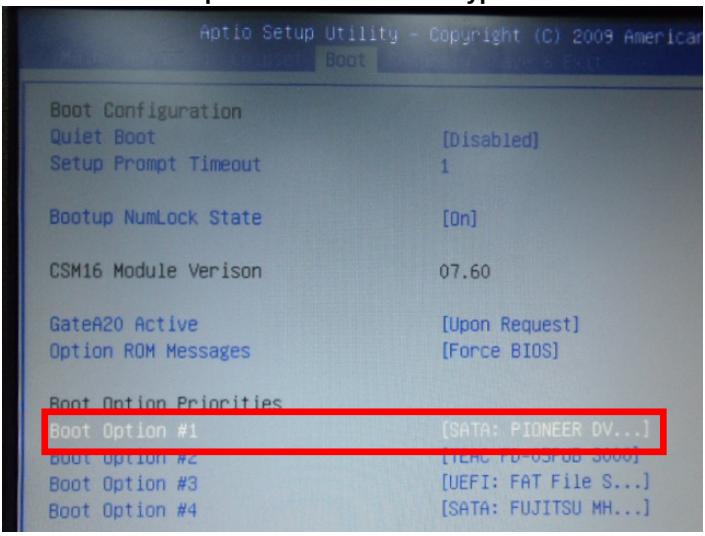
Step 1: Copy the files below from "***Driver CD ->Step 2 – AHCI_RAID -> Floppy -> WinXP -> 3.3.1540.26 -> x86***" to Disk

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

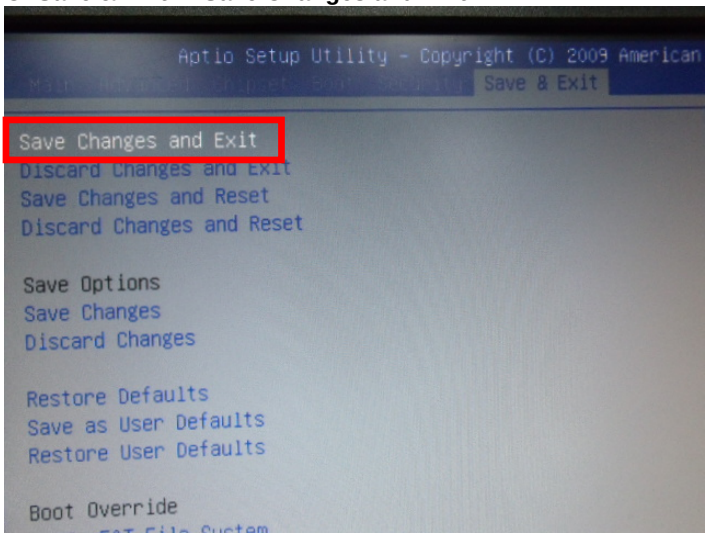
Step 3: The setting procedures " **In BIOS Setup Menu**"
A: Advanced -> SATA Configuration -> SATA Configuration -> SATA Mode -> AHCI Mode



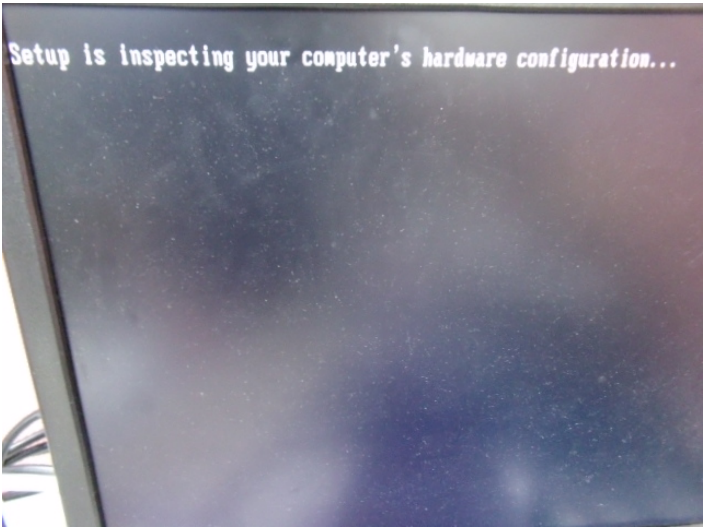
Step 4: The setting procedures "**In BIOS Setup Menu"**
B: Boot -> Boot Option #1 -> DVD-ROM Type



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

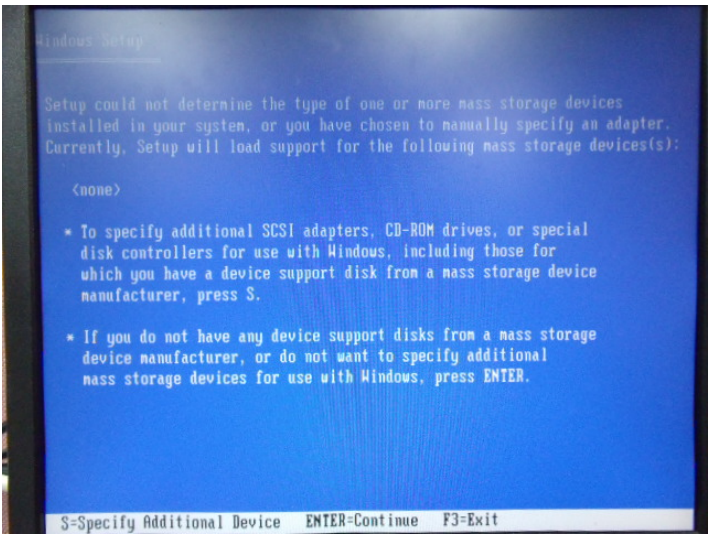


Step 6: Setup OS

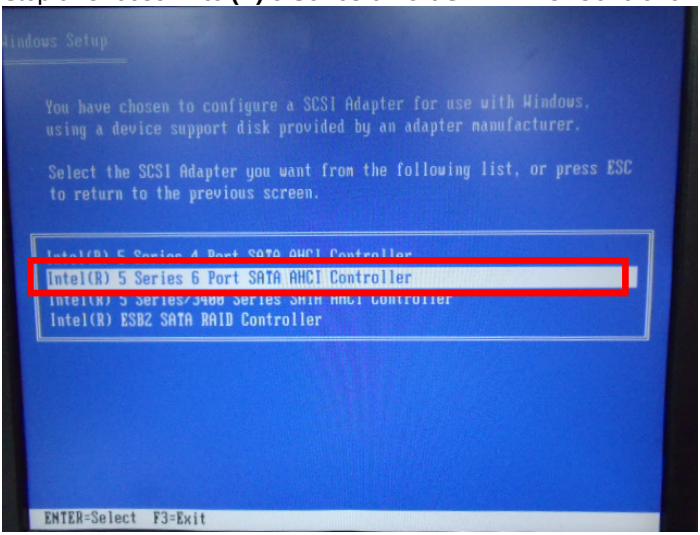


Step 7: Press "**F6**"

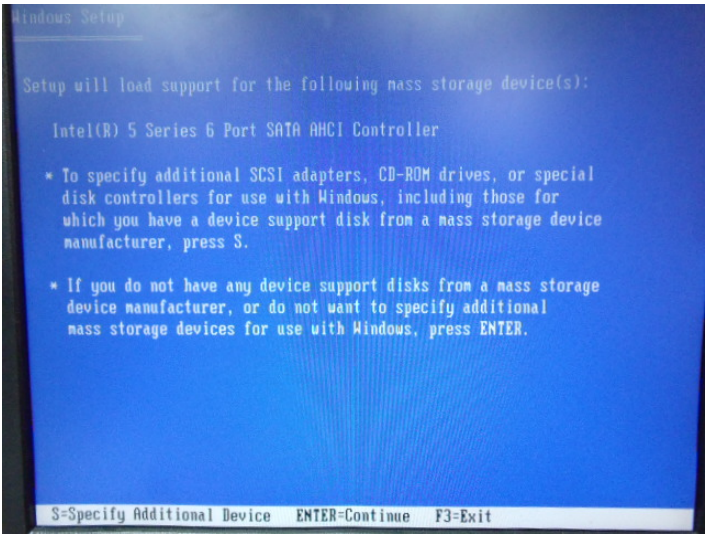
Step 8: Choose "**S**"



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