AEC-VS01

Embedded Controller

4-Channel PoE for Surveillance

Intel® Atom™ D2550 1.86GHz Processor

Dual LAN, 4 USB2.0, 4 COM, 1 VGA

8 DIO, 1 Mini Card

AEC-VS01 Manual 2nd Ed.
January 8th, 2014

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Packing List

Before you begin operating your PC, please make sure that the following materials are enclosed:

- 1 AEC-VS01 Embedded Controller
- 2 Wallmount Brackets
- 1 Screw Package
- 1 CD-ROM for manual (in PDF format) and drivers
- 1 Phoenix Power Connector

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

Safety & Warranty

1. Read these safety instructions carefully.
2. Keep this user's manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Do not use liquid or spray detergents for cleaning. Use a damp cloth.
4. For pluggable equipment, the power outlet must be installed near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a firm surface during installation. Dropping it or letting it fall could cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. DO NOT COVER THE OPENINGS.
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient over-voltage.
12. Never pour any liquid into an opening. This could cause fire or electrical shock.
13. Never open the equipment. For safety reasons, only qualified service personnel should open the equipment.
14. If any of the following situations arises, get the equipment checked by service personnel:
    a. The power cord or plug is damaged.
    b. Liquid has penetrated into the equipment.
    c. The equipment has been exposed to moisture.

d. The equipment does not work well, or you cannot get it to work according to the user's manual.

e. The equipment has been dropped and damaged.

f. The equipment has obvious signs of breakage.

15. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE IS BELOW -20°C (-4°F) OR ABOVE 70°C (158°F). IT MAY DAMAGE THE EQUIPMENT.

FCC

This device complies with Part 15 FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received including interference that may cause undesired operation.

Caution:
There is a danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions and your local government's recycling or disposal directives.

Below Table for China RoHS Requirements
产品中有毒有害物质或元素名称及含量

AAEON Boxer/ Industrial System

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	×	○	○	○	○	○
外壳	×	○	○	○	○	○
中央处理器与内存	×	○	○	○	○	○
硬盘	×	○	○	○	○	○
电源	×	○	○	○	○	○

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：
一、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。
二、上述部件物质中央处理器、内存、硬盘、电源为选购品。

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Chapter

1

General Information

1.1 Introduction

AAEON introduces the newest product in for entry level fanless boxer, AEC-VS01, which utilizes the Intel® Atom™ D2550 processor and 4-channel PoE ports for video surveillance applications. With compact, and aluminum case easily for customers install in the customer's own housing, or as a stand-alone application where space is limited and the environment harsh.

With PoE(Power Over Ethernet) function, customer can easy install their IP Camera anywhere which cable install limitation issue and extra cost for system maintenance.

Also test by 3rd party surveillance software, customers can remote management and maintenance their system.

The AEC-VS01 supports a rich I/O capability, including four serial ports, four USB 2.0 ports, digital I/Os, expand storage, and 4 channel PoE ports, which make AEC-VS01 ideal to integrate, deploy, and manage for system development, and further accelerate time to video surveillance market.

In this era of information explosion, the advertising of consumer products will not be confined to the family television, but will also spread to high-traffic public areas, like department stores, the bus, transportation station, the supermarket etc. The advertising

marketing industry will resort to every conceivable mean to transmit product information to consumers. System integrators will need a multifunction device to satisfy commercial needs for such public advertising.

The AEC-VS01 is a standalone high performance controller designed for long-life operation and with high reliability. It can replace traditional methods and become the mainstream controller for the multimedia entertainment market.

1.2 Features

- Intel® Atom™ D2550 1.86 GHz Processor
- Intel® NM10 Express chipset
- USB2.0 x 4
- COM x 4
- Dual Gigabit Ethernet LAN
- DIO x 8
- USB type 4-CH PoE
- Power input: 24~30V
- VGA Output
- Fanless System Design

1.3 Specifications

System

● CPU	Intel® Atom™ D2550 1.86 GHz Processor
● Memory	DDR3 800/1066 SODIMM x 1, Max. 4GB)
● VGA	VGA x 1
● Ethernet	Gigabit Ethernet, RJ-45 connector x 2
● Hard Disk Storage	2.5” SATA HDD Bay x 1
● Expansion	Mini Card Slot x 1 DIO x 8 4-Channel PoE
● LCD/CRT Controller	Integrated in Processor, shared system memory by Intel® DVMT Technology
● Solid Storage Disk	CFast™ slot x 1 (w/ cover protection)
● Serial Port	RS-232/422/485 x 1, RS-232 x 3 (optional x 2)
● USB	USB 2.0 x 4
● System Control	Power ON/OFF
● LED Indicator	Power LED x 1, Hard disk active LED x 1, CFast™ slot x 1, Antenna hole x 2
● Power Supply	DC power input 12V/ DC 24-30V w/ 3-pin terminal block
● OS Support	Windows® 7, Linux Fedora Core, Windows® XP

Mechanical and Environmental

● Construction	Aluminum Alloy Chassis

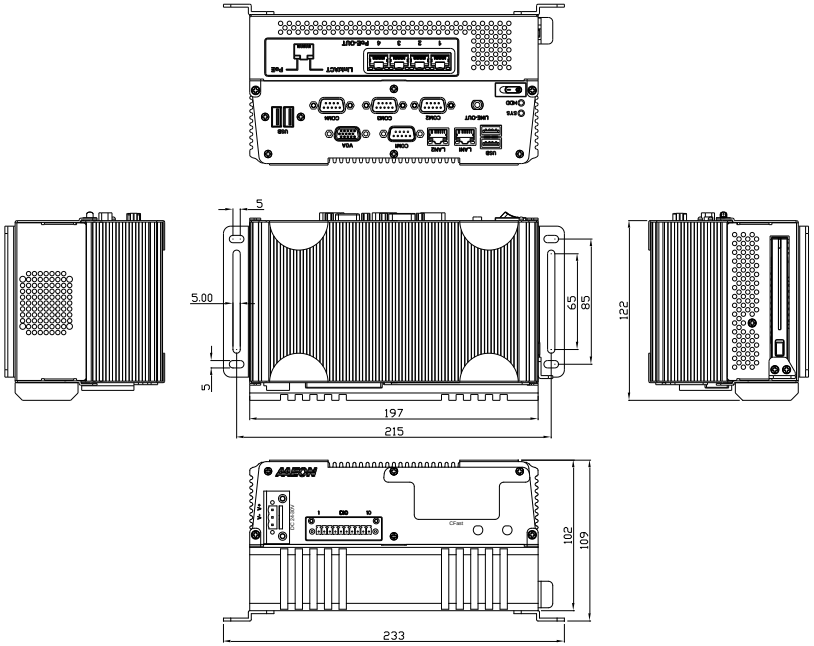
Color	Dark Gray
Mounting	Wallmount
Dimension	7.76”(W) x 4.02”(H) x 4.80”(D) (197 mm x 102 mm x 122 mm)
Gross Weight	9.9 lb (4.5 kg)
Net Weight	7.26 lb (3.3 kg)
Operating Temperature	32°F ~ 113°F (0°C ~ 45°C)
Storage Temperature	32°F ~ 158°F (0°C ~ 70°C)
Storage Humidity	5 ~ 95% @ 40°C, non-condensing
Vibration	1 g rms/ 5~500Hz/ random operation –HDD
Shock	20 G peak acceleration (11msec. duration) –HDD
EMC	CE/FCC Class A

Chapter

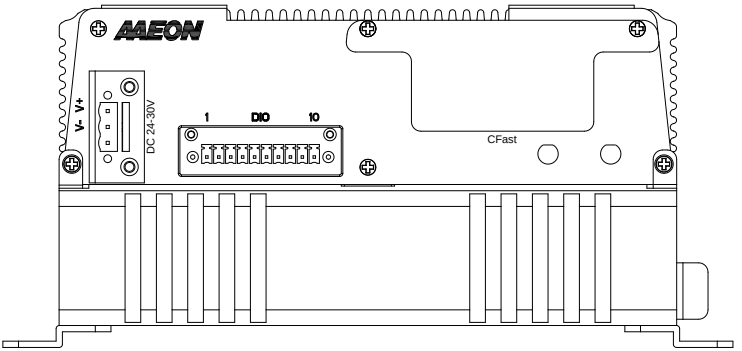
2

Hardware Installation

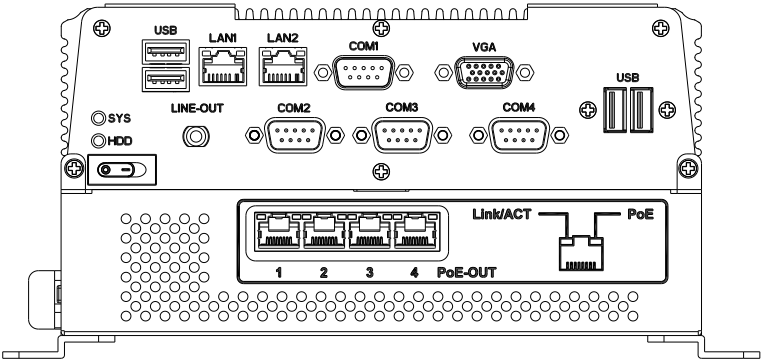
2.1 Dimension and I/O of AEC-VS01



Front View

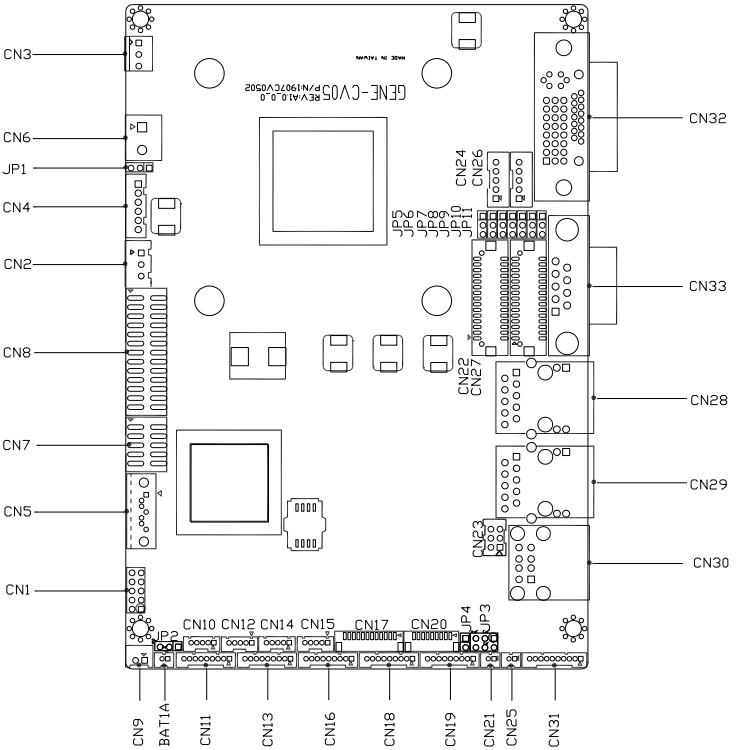


Rear View

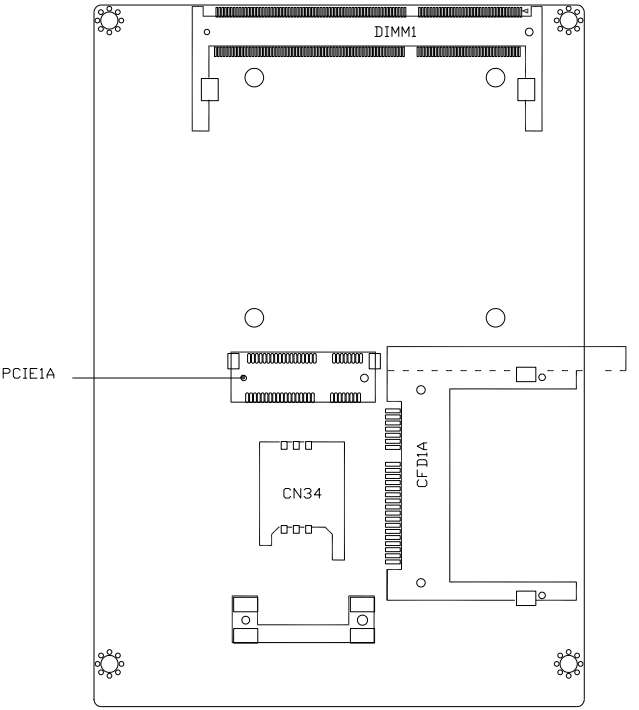


2.2 Connectors and Jumpers of The Main Board

Component Side



Solder Side



2.3 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
JP1	Auto Power Button Selection
JP2	Clear CMOS
JP3	COM2 RI/+5/+12V Selection
JP4	Touch Screen 4/5/8-wires Mode Selection
JP5	Brightness Control for 2nd LVDS
JP6	2nd LVDS Backlight Bias/PWM Mode Selection
JP7	2nd LVDS Operating Voltage Selection
JP8	2nd LVDS Inverter Voltage Selection
JP9	1st LVDS Inverter Voltage Selection
JP10	1st LVDS Backlight Bias/PWM Mode Selection
JP11	1st LVDS Operating Voltage Selection

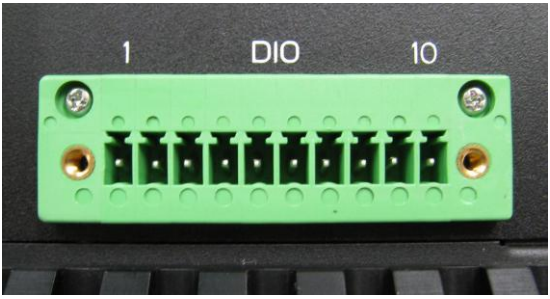
2.4 List of Connectors

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 board's connectors:

Label	Function
CN1	Front Panel
CN2	External +5VSB Input
CN3	CPU FAN
CN4	+5VSB Output w/ SMBus
CN5	SATA Port
CN6	External 12V Input
CN7	Digital I/O
CN8	Parallel Port
CN9	+5V Output for SATA HDD using
CN10	USB Port #6
CN11	COM Port #6
CN12	USB Port #5
CN13	COM Port #5
CN14	USB Port #4
CN15	USB Port #3
CN16	COM Port #4
CN17	LPC Expansion I/F
CN18	COM Port #3
CN19	COM Port #2
CN20	Touch Screen
CN21	Stereo-R Channel
CN22	2nd LVDS (Dual channel 18/24bit)
CN23	PS/2 Keyboard & Mouse
CN24	2nd LVDS Inverter

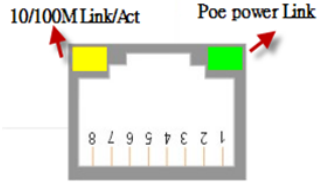
CN25	Stereo-L Channel
CN26	1st LVDS Inverter
CN27	1st LVDS (Single channel 18/24bit)
CN28	2nd RJ-45 Ethernet
CN29	1st RJ-45 Ethernet
CN30	USB Port #1 and #2
CN31	Audio Line In/Out and MIC
CN32	CRT/DVI (Configured by manufacturing)
CN33	COM Port #1
CN34	SIM Card Socket
CFD1	CFAST™
PCIE1	Mini Card/ mSATA (Configured by manufacturing)
DIMM1	DDR3 SODIMM Slot

2.5 DIO Pin Definition



Pin	Signal	Pin	Signal
1	Port 1	2	Port 2
3	Port 3	4	Port 4
5	Port 5	6	Port 6
7	Port 7	8	Port 8
9	+3.3 Volt.	10	Ground

2.6 PoE1~4 Port Pin Definition (MID-SPAN)



Green LED: PoE Power Link
Yellow LED: 10/100M Link/Act

Pin	Signal	Pin	Signal
1	Tx+	2	Tx-
3	Rx+	4	48V+
5	48V+	6	Rx-
7	48V-	8	48V-

2.7 Hard Disk Drive Installation

Step 1: Unfasten two screws of the safety bracket

Step 2: Push to open the HDD cover

Step 3: Insert the HDD to the HDD slot

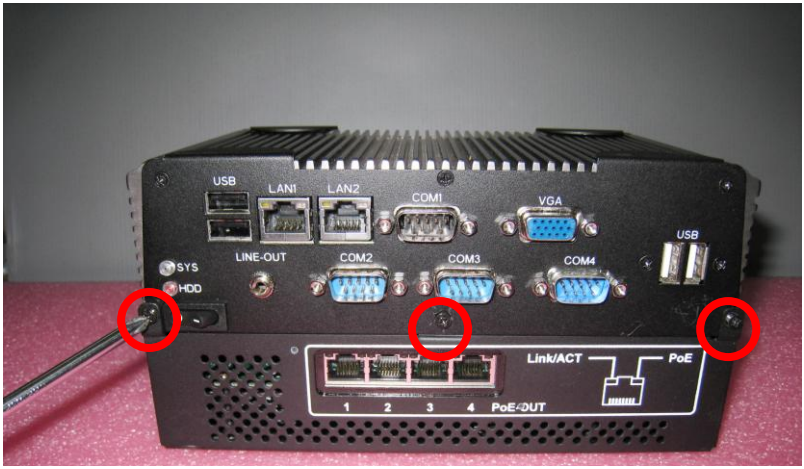
Step 4: Close the HDD cover and push to lock the cover

Step 5: Fasten two screws of the safety bracket to lock the HDD cover

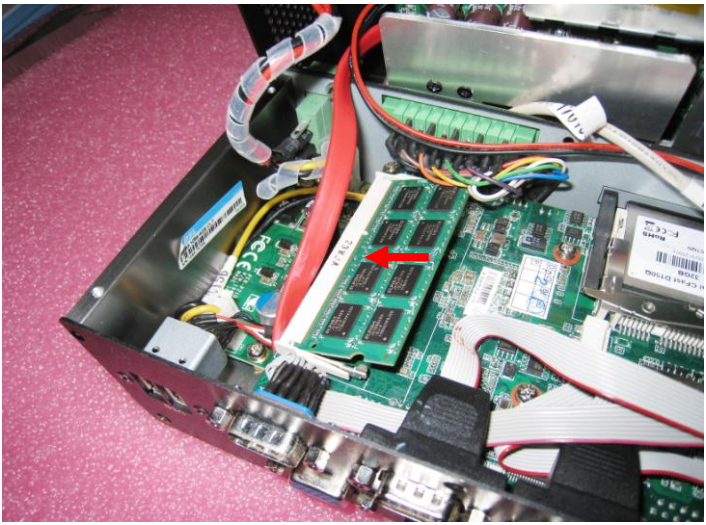
2.8 RAM Installation

Step 1: Loosen the three screws of the front case

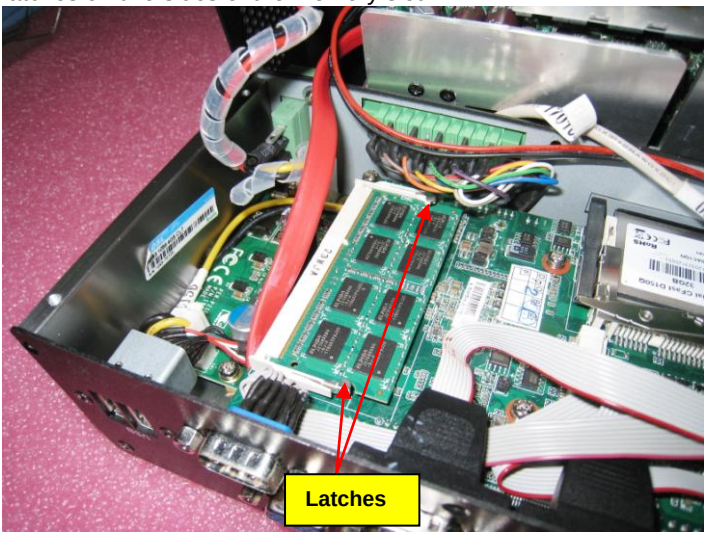
Step 2: Loosen the three screws of the rear case



Step 3: Insert the RAM to the memory slot



Step 4: Press the RAM and make sure that it has been inserted properly. P.S. If you are going to remove the RAM, you have to release the two latches on two sides of the memory slot.



2.9 CFast Card Installation

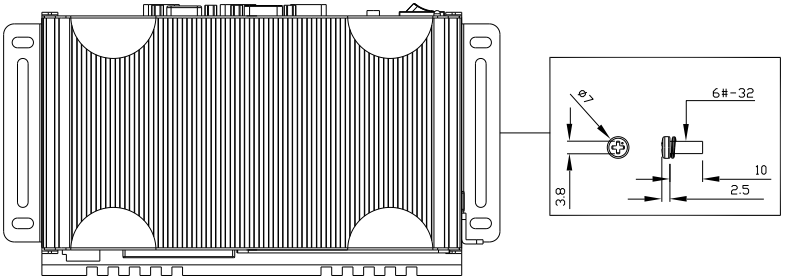
Step 1: Loosen the two screws to release the baffle board on CFast slot

Step 2: Insert the CFast Card to the CFast slot

2.10 Wallmount Installation

Step 1: Get the two brackets and four screws ready

Step 2: Fasten the brackets with the four screws.



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 AEC-VS01 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.

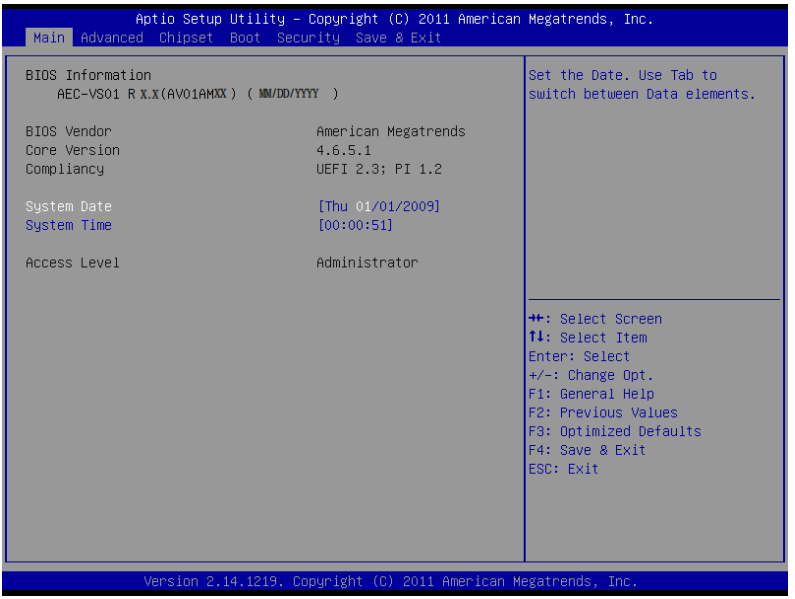
Save&Exit

Exit system setup after saving the changes.

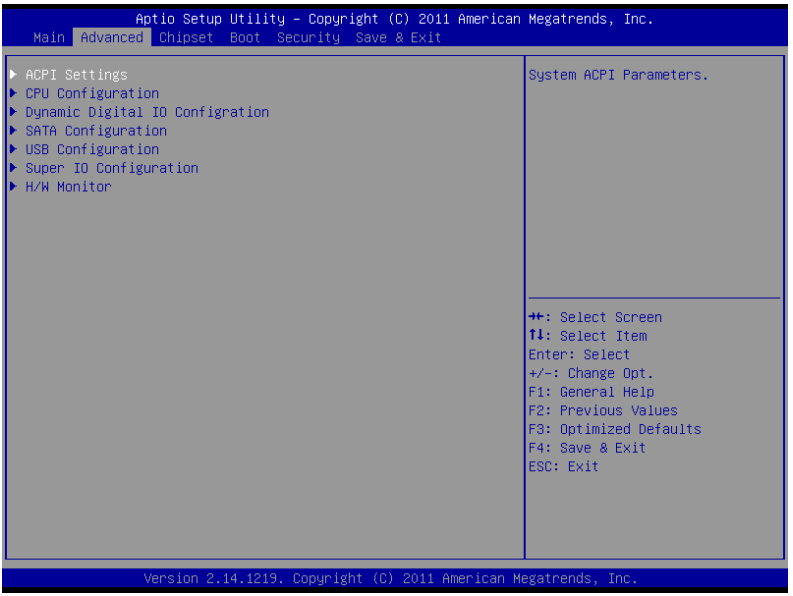
BIOS Setup Menu

Press '*Delete*' Key to enter Setup

Main



Advanced

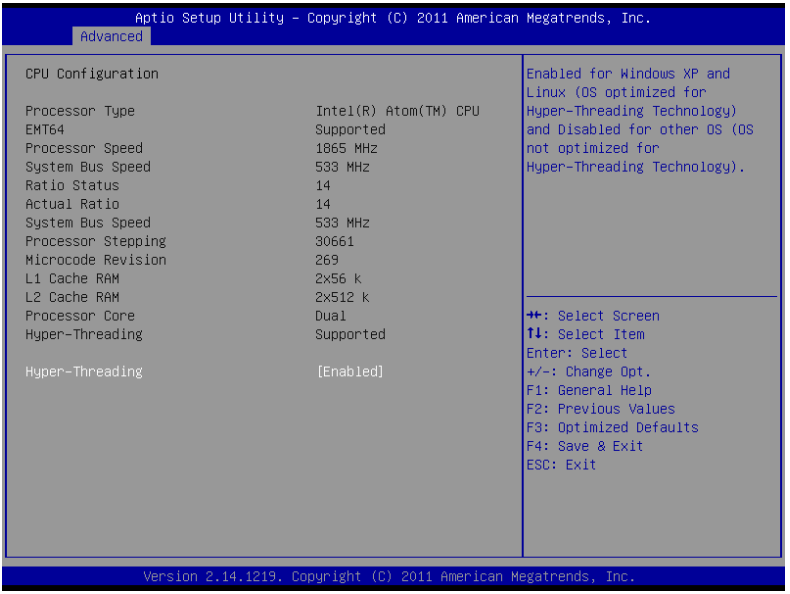

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
ACPI Settings
CPU Configuration
Dynamic Digital IO Configration
SATA Configuration
USB Configuration
Super IO Configuration
H/W Monitor
System ACPI Parameters.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

ACPI Settings

Options summary:

Suspend mode	Suspend Disabled S1 (CPU Stop Clock)	
	S3 (Suspend to RAM)	Optimal Default, Failsafe Default
Select the ACPI state used for System Suspend		

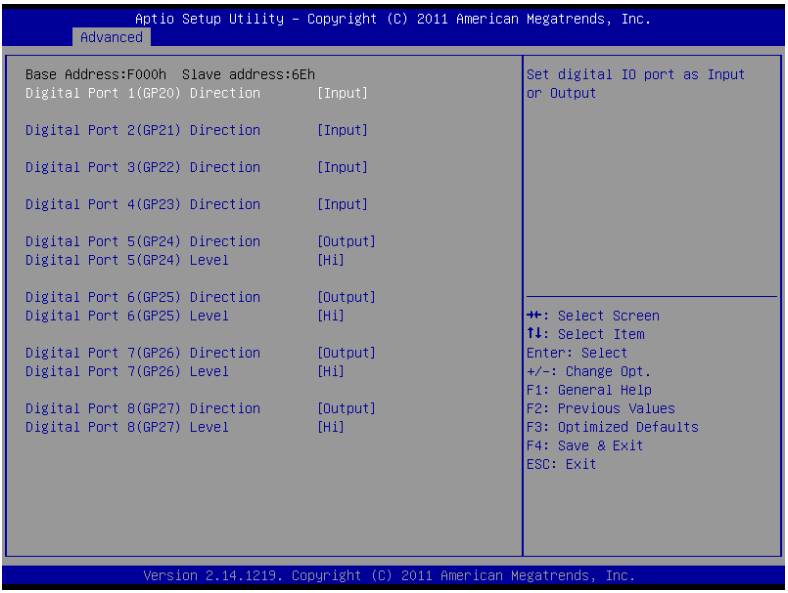
CPU Configuration



Options summary:

Hyper-Threading	Disabled	Optimal Default, Failsafe Default
	Enabled	
En/Disable CPU Hyper-Threading function		

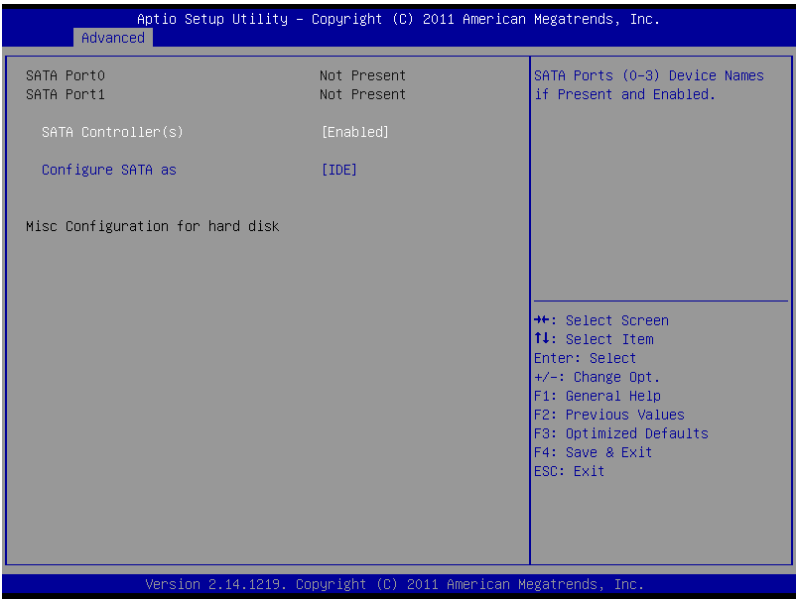
Dynamic Digital IO Configuration



Options summary:

Digital Port Direction	Input	
	Output	
Set digital IO port as Input or Output		
Digital Port Level	Hi	
	Lo	
Set digital IO level as High or Low		

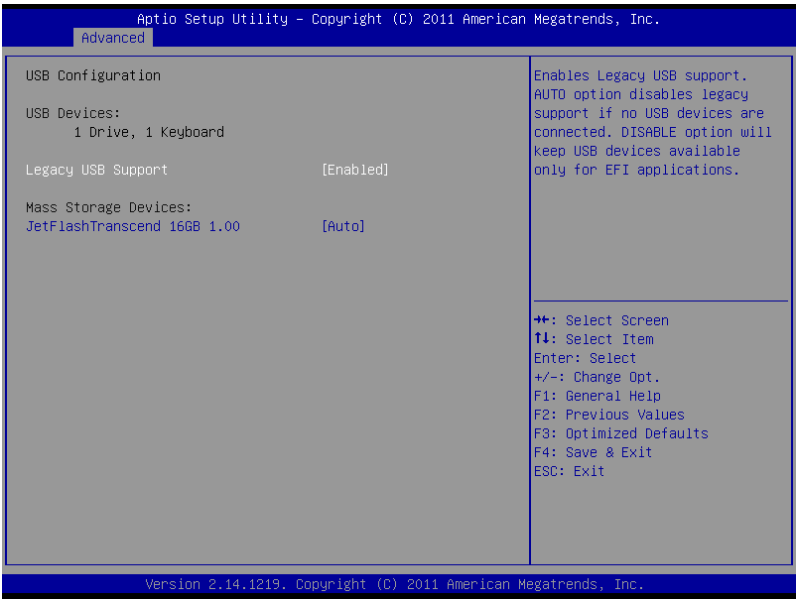
SATA Configuration



Options summary:

SATA Controller(s)	Enable	Default
	Disable	
SATA Ports (0-3) Device Names if present and Enable		
Configure SATA as	IDE	Default
	AHCI	
IDE: Configure SATA controllers as legacy IDE AHCI: Configure SATA controllers to operate in AHCI mode		

USB Configuration

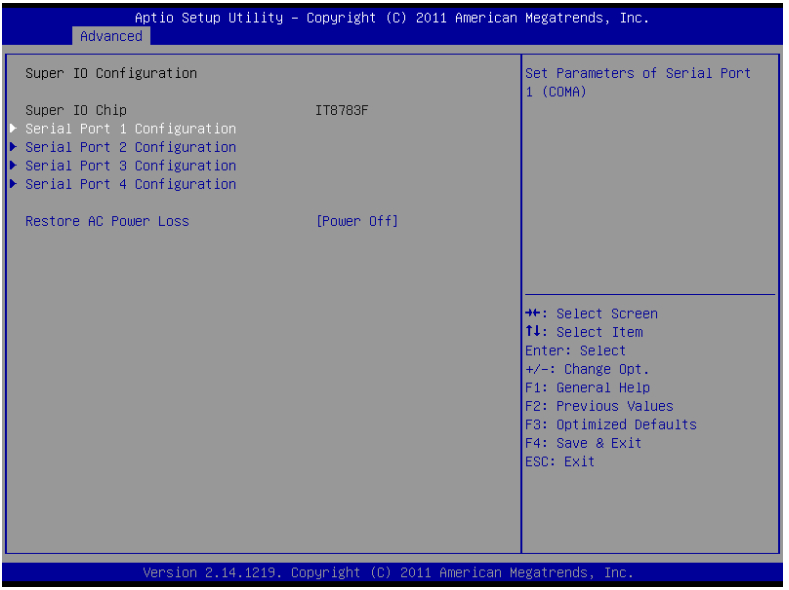


Options summary:

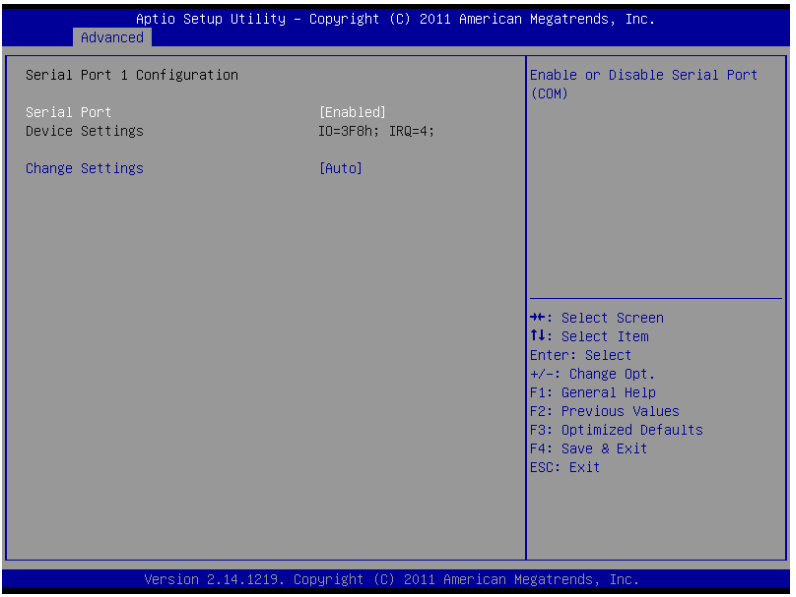
Legacy USB Support	Enabled	Optimal Default, Failsafe Default
	Disabled	
	Auto	
Enables BIOS Support for Legacy USB Support. When enabled, USB can be functional in legacy environment like DOS. AUTO option disables legacy support if no USB devices are connected		
Device Name (Emulation Type)	Auto	Optimal 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)		

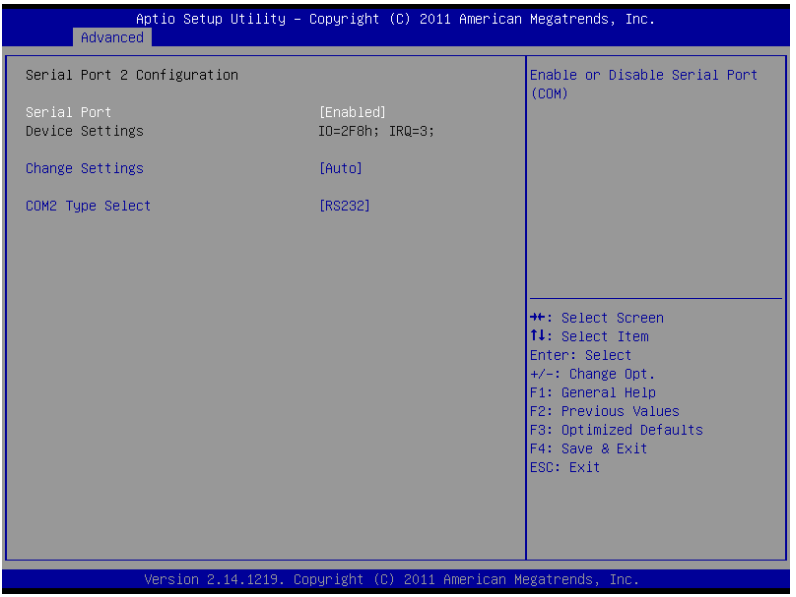
Super IO Configuration



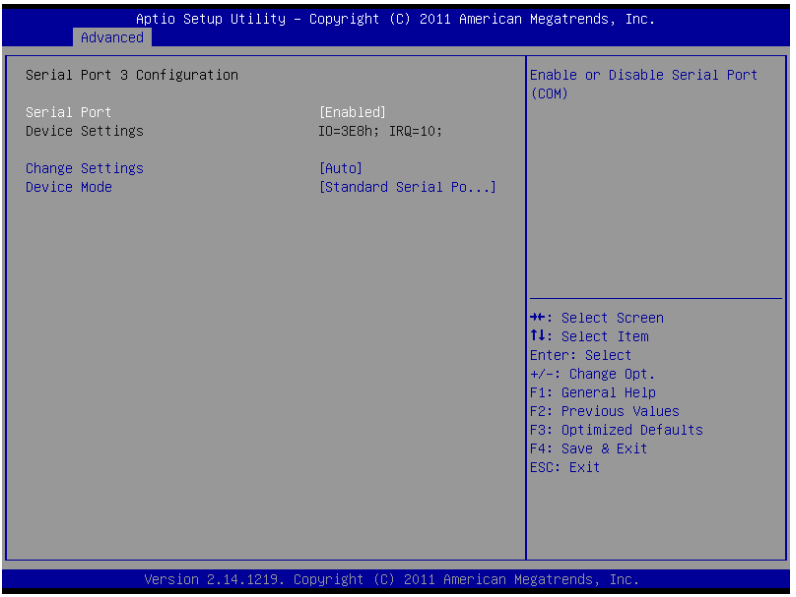
Serial Port 1 Configuration



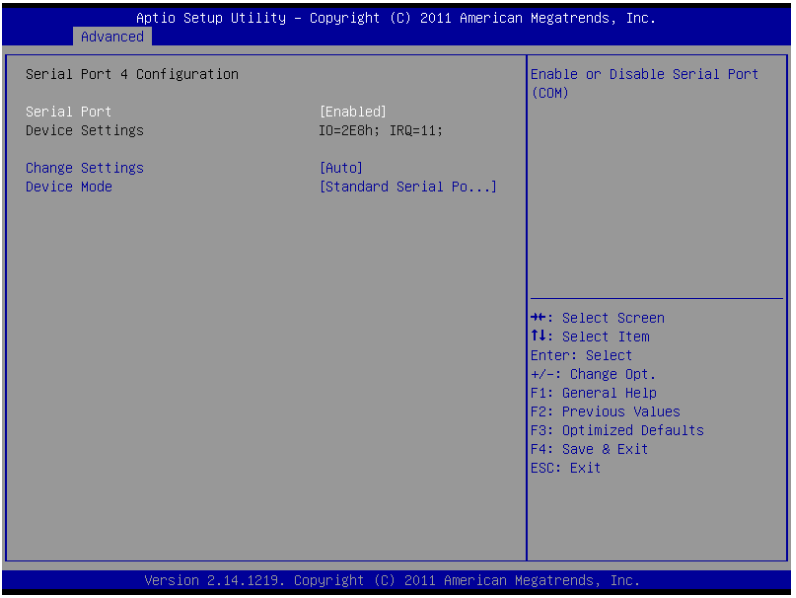
Serial Port 2 Configuration



Serial Port 3 Configuration



Serial Port 4 Configuration



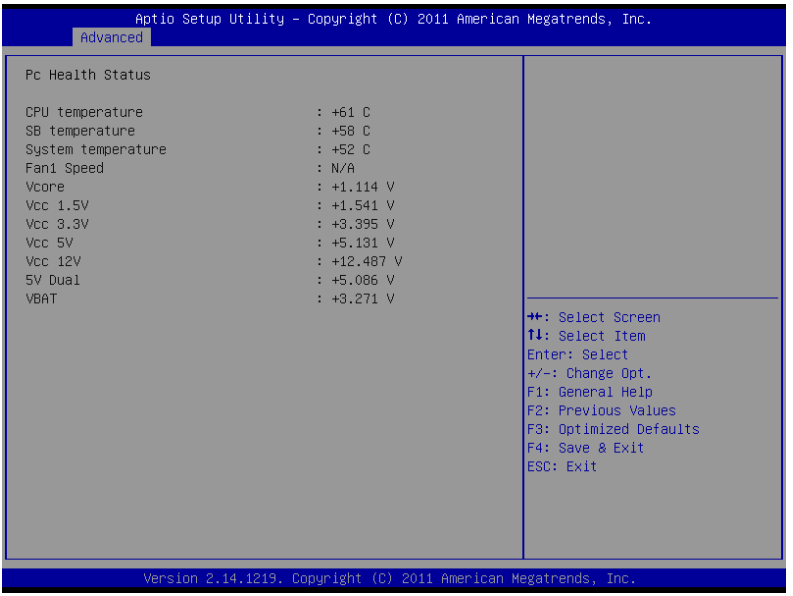
Options summary:

Serial Port	Disabled	
	Enabled	Default
Allows BIOS to En/Disable correspond serial port.		
Change Settings (Serial Port 1)	Auto	Default
	IO=3F8h; IRQ=4;	
	IO=3F8h; IRQ=3,4;	
	IO=2F8h; IRQ=3,4;	
	IO=3E8h; IRQ=10,11;	
	IO=2E8h; IRQ=10,11	

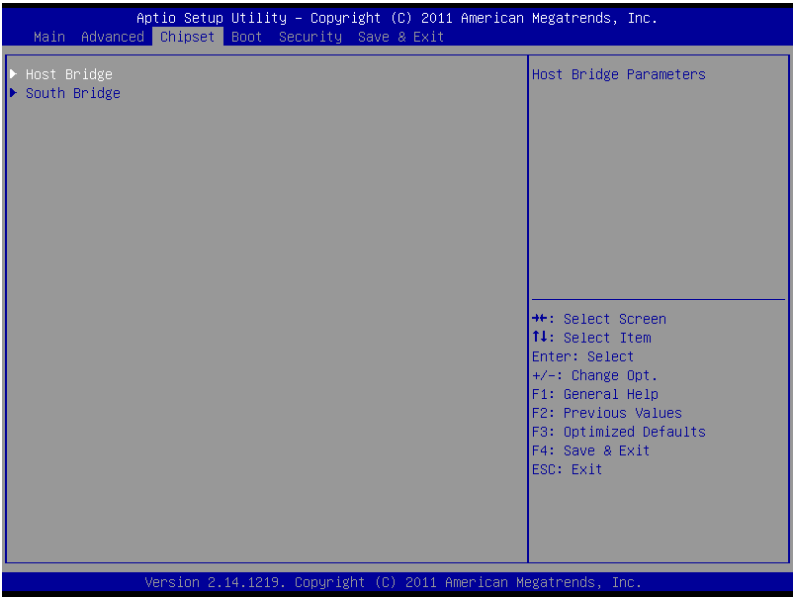
Allows BIOS to Select Serial Port resource.		
Change Settings (Serial Port 2)	Auto	Default
	IO=2F8h; IRQ=3;	
	IO=3F8h; IRQ=3,4;	
	IO=2F8h; IRQ=3,4;	
	IO=3E8h; IRQ=10,11;	
	IO=2E8h; IRQ=10,11	
COM2 Type Select	RS232	Default
	RS422	
	RS485	
Allows BIOS to Select Serial Port resource.		
Change Settings (Serial Port 3)	Auto	Default
	IO=3E8h; IRQ=11;	
	IO=3E8h; IRQ=10,11;	
	IO=2E8h; IRQ=10,11;	
	IO=3E8h; IRQ=10,11;	
	IO=2E8h; IRQ=10,11	
Device Mode	Standard Serial Port Mode	Default
	IrDA 1.0 (HP SIR) Mode	
	ASKIR Mode	
Change Settings (Serial Port 4)	Auto	Default
	IO=3E8h; IRQ=11;	

	IO=3E8h; IRQ=10,11;	
	IO=2E8h; IRQ=10,11;	
	IO=3E8h; IRQ=10,11;	
	IO=2E8h; IRQ=10,11	
Device Mode	Standard Serial Port Mode	Default
	IrDA 1.0 (HP SIR) Mode	
Restore on AC Power Loss	Power Off	Default
	Power On	
	Last State	
Select the action system to take when restoring from power loss.		

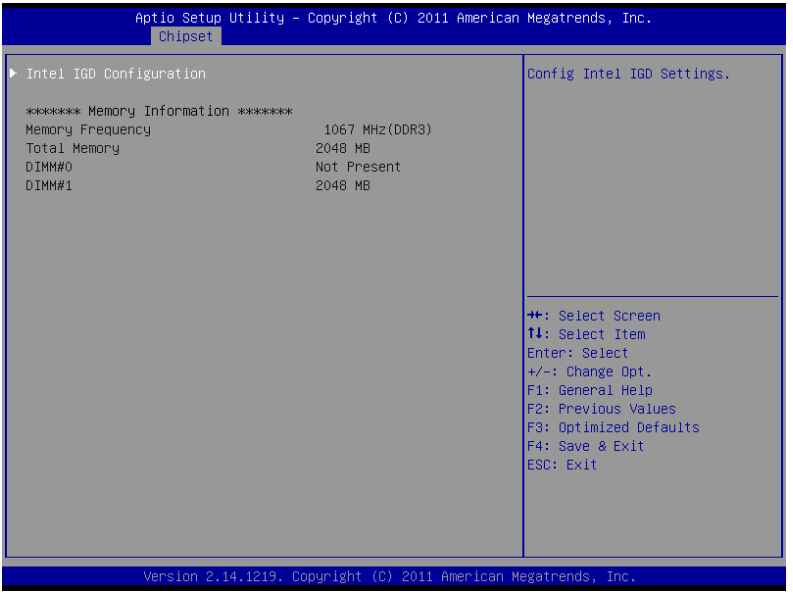
H/W Monitor


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Advanced
Pc Health Status
CPU temperature : +61 C
SB temperature : +58 C
System temperature : +52 C
Fan1 Speed : N/A
Vcore : +1.114 V
Vcc 1.5V : +1.541 V
Vcc 3.3V : +3.395 V
Vcc 5V : +5.131 V
Vcc 12V : +12.487 V
5V Dual : +5.086 V
VBAT : +3.271 V
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

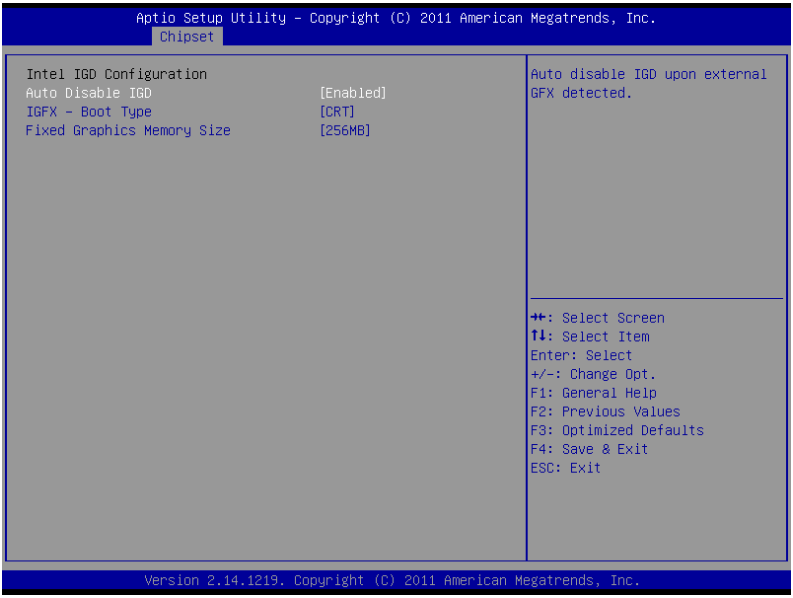
Chipset


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
Host Bridge
South Bridge
Host Bridge Parameters
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

Host Bridge


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Chipset
Intel IGD Configuration
******* Memory Information *******
Memory Frequency 1067 MHz(DDR3)
Total Memory 2048 MB
DIMM#0 Not Present
DIMM#1 2048 MB
Config Intel IGD Settings.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

Intel IGD Configuration

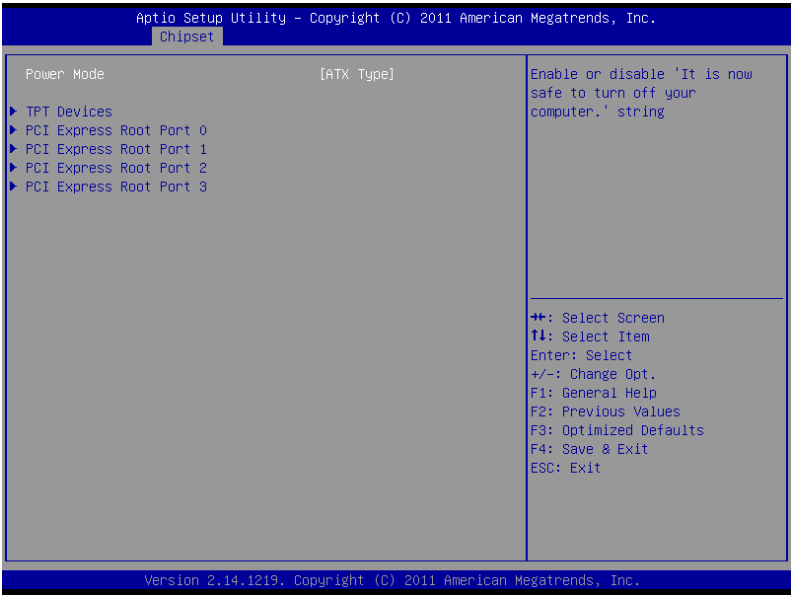


Options summary:

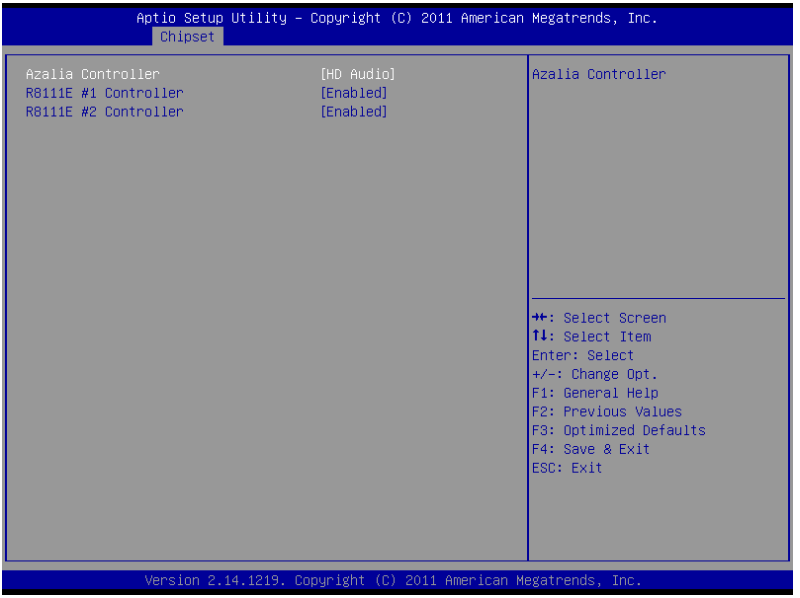
Auto Disable IGE	Disable	
	Enable	Default
Atuo disable IGE upon external GFX detected		
IGFX – Boot Type	VBIOS Default	
	CRT	Default
	1st LVDS	

	CRT+1st LVDS	
Select boot display device VBIOS Default – Display automatically according to VBIOS algorithm		
Fixed Graphics Memory Size	128MB	
	256MB	Default
Configure Fixed Graphics Memory Size		

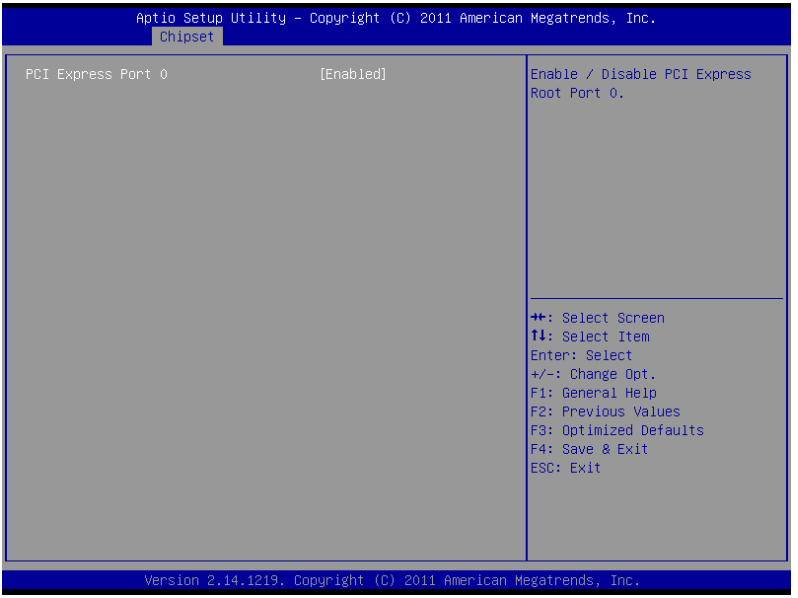
South Bridge



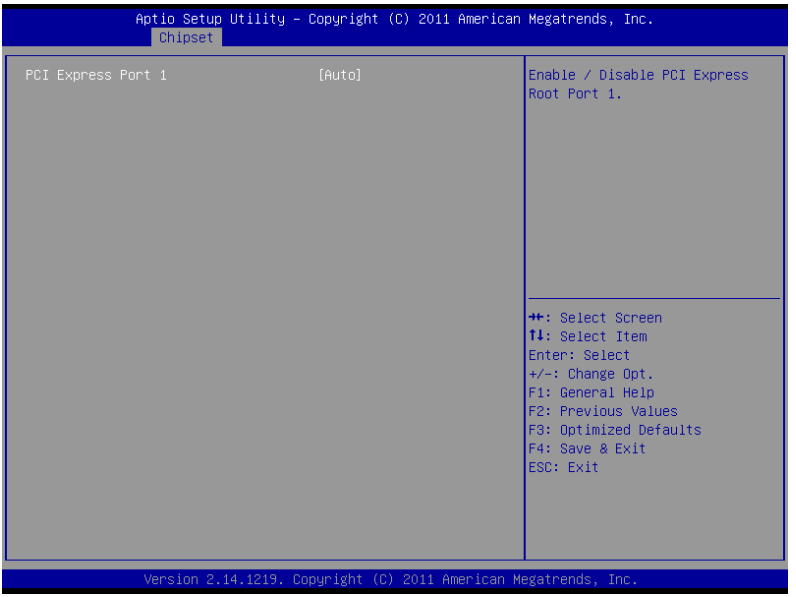
TPT Device


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Chipset
Azalia Controller [HD Audio]
R8111E #1 Controller [Enabled]
R8111E #2 Controller [Enabled]
Azalia Controller
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

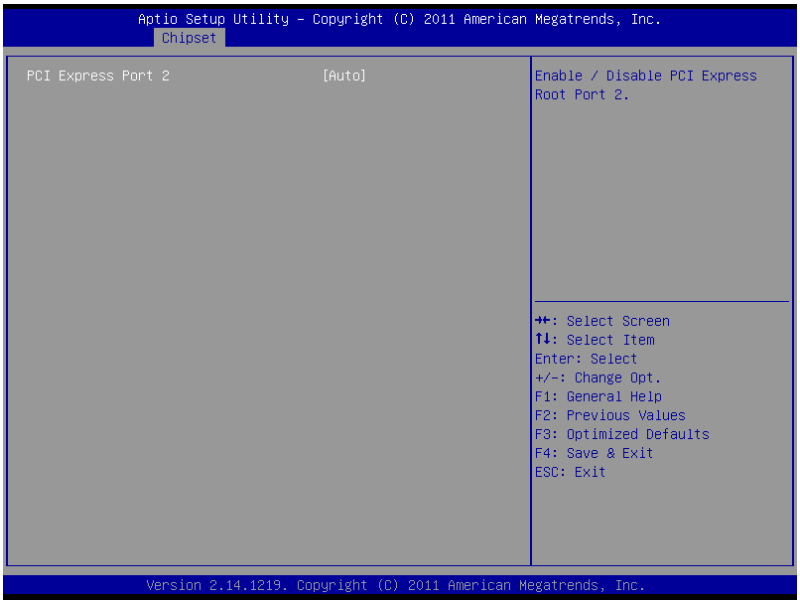
PCI Express Root Port 0



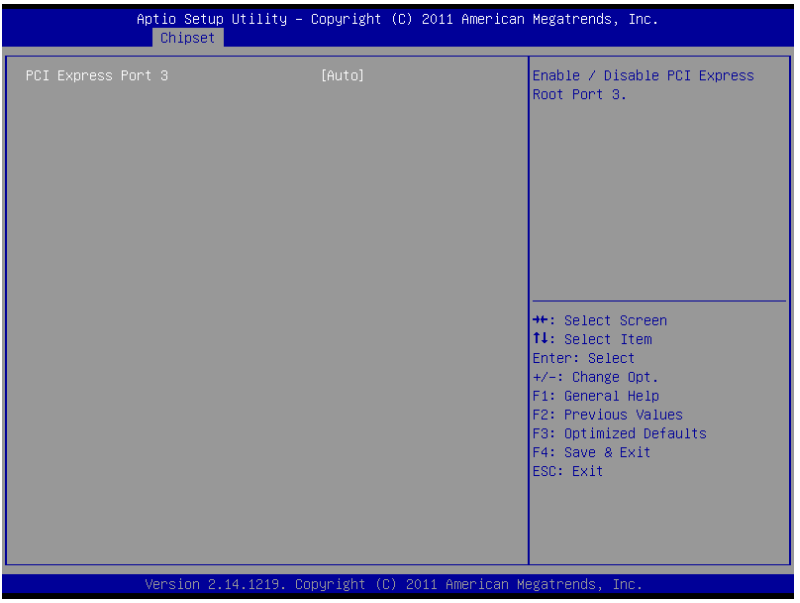
PCI Express Root Port 1



PCI Express Root Port 2



PCI Express Root Port 3

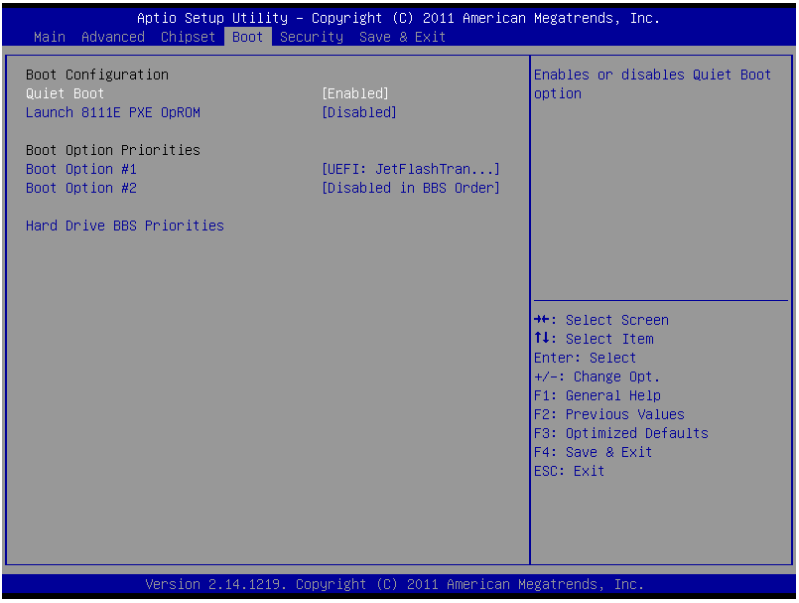


Options summary:

Power Mode	ATX Type	Optimal Default, Failsafe Default
	AT Type	
Select Power Mode: ATX Type: Normal ACPI support AT Type: Suspend/Sleep disabled, and Always On when restoring from power failure.		
Azalia HD Audio	Disabled	

	HD Audio	Optimal Default, Failsafe Default
Enabling/Disabling HD Audio controller.		
R8111 #x Controller	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enabling/Disabling 8111E controller		
PCI Express Root Port 0	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enabling/Disabling PCI Express root ports		
PCI Express Root Port x	Disabled Enabled	
	Auto	Optimal Default, Failsafe Default
Enabling/Disabling PCI Express root ports		

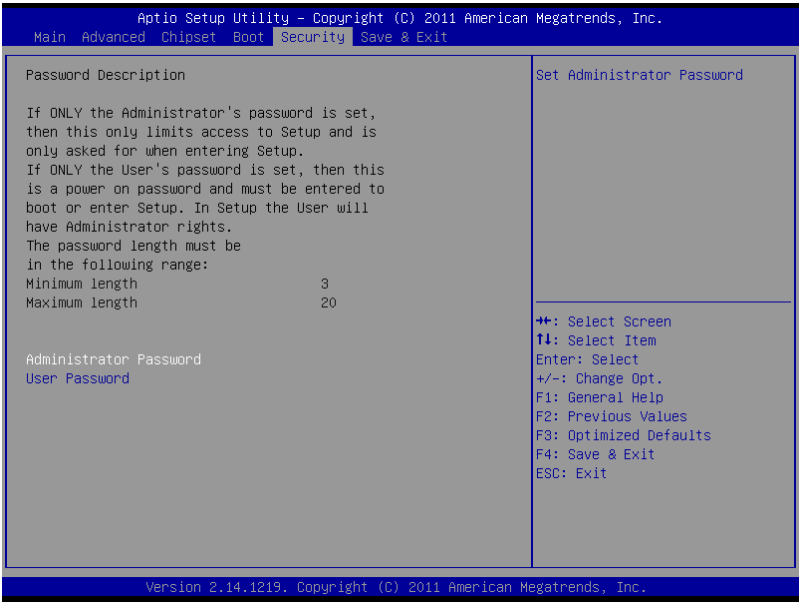
Boot



Options summary:

Quiet Boot	Disabled	
	Enabled	Default
En/Disable showing boot logo.		
Launch 8111E PXE OpROM	Disabled	Default
	Enabled	
En/Disable PXE boot for 8111E LAN		

Security



Change User/Supervisor Password

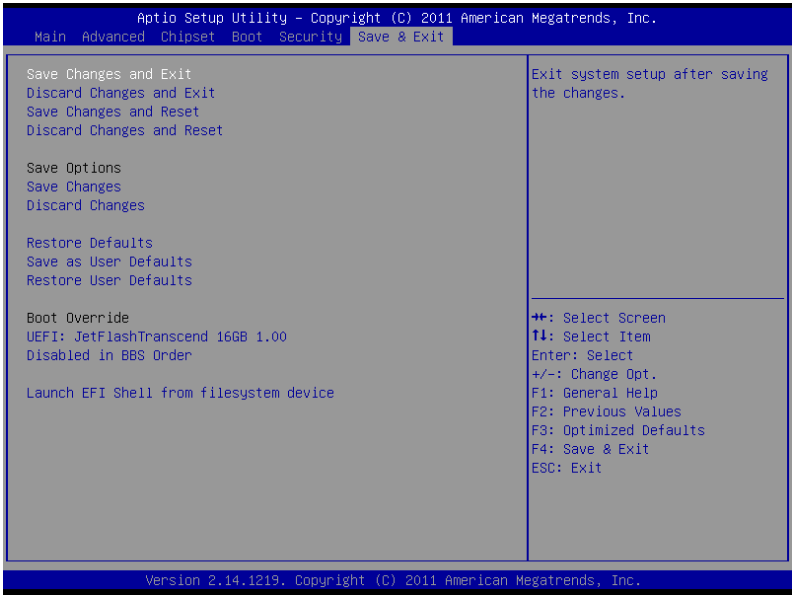
You can install a Supervisor password, and if you install a supervisor password, you can then install a user password. A user password does not provide access to many of the features in the Setup utility.

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.

Save & Exit


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
Save Changes and Exit
Discard Changes and Exit
Save Changes and Reset
Discard Changes and Reset
Save Options
Save Changes
Discard Changes
Restore Defaults
Save as User Defaults
Restore User Defaults
Boot Override
UEFI: JetFlashTranscend 16GB 1.00
Disabled in BBS Order
Launch EFI Shell from filesystem device
Exit system setup after saving the changes.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

Chapter

4

Driver Installation

The AEC-VS01 comes with a DVD-ROM that contains all drivers and utilities that meet your needs.

Follow the sequence below to install the drivers:

Step 1 – Install Chipset Driver

Step 2 – Install VGA Driver

Step 3 – Install LAN Driver

Step 4 – Install Audio Driver

Step 5 – Install AHCI Driver

Step 6 – Install Serial Port Driver (Optional)

Step 7 – Install PER-T263 Driver

4.1 Installation:

Insert the AEC-VS01 DVD-ROM into the DVD-ROM drive, and then install the drivers from Step 1 to Step 7 in order.

Step 1 – Install Chipset Driver

1. Click on the ***STEP1-CHIPEST*** folder and select the OS folder your system is
2. Double click on the ***.exe*** located in each OS folder
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

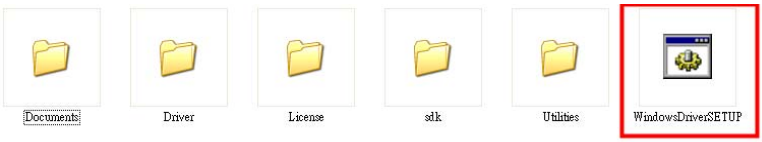
Step 2 – Install VGA Driver

For Windows® 7

1. Click on the ***STEP2-VGA*** folder and select the folder of ***WIN7_32***
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

For Windows® XP

1. Click on the ***STEP2-VGA*** folder and select the folder of ***WINXP_32***
2. Double click on the ***WindowsDriverSETUP.cmd***
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 ***STEP3-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 ***STEP4-AUDIO*** 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 5 – Install AHCI Driver

Please refer to Appendix D AHCI Settings

Step 6 – Install Serial Port Driver (Optional)

1. Click on the ***STEP6-Serial Port Driver (Optional)*** folder and select the OS folder your system is
2. Double click on the ***Serial Patch v1.0.1_Eng.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

Note: If the OS is Chinese version, you may click on ***Serial Patch v1.0.1. exe*** file located in each OS folder.

Step 7 – Install PER-T263 Driver

1. Click on the ***STEP7-PER-T263*** 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

Appendix

A

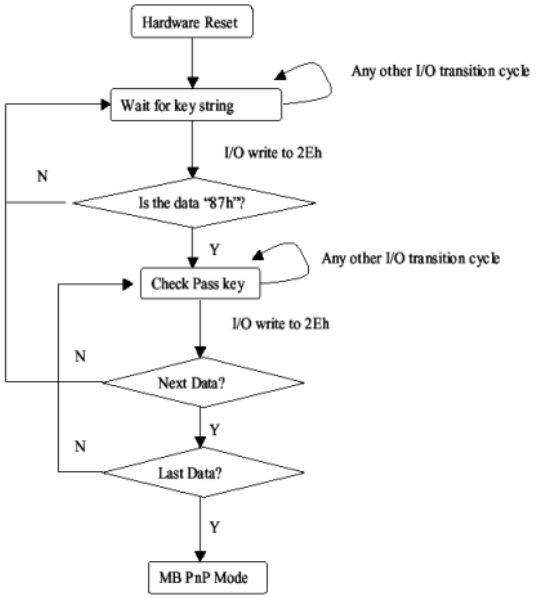
Programming the Watchdog Timer

A.1 Programming

AEC-VS01 utilizes the ITE 8783 chipset as its watchdog timer controller. Below are the procedures to complete its configuration and the AAEON initial watchdog timer program is also attached based on which you can develop customized program to fit your application.

Configuring Sequence Description

After the hardware reset or power-on reset, the ITE 8783 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

LDN	Index	R/W	Reset	Configuration Register or Action
All	02h	W	NA	Configure Control

07h	71h	R/W	00h	Watch Dog Timer Control Register
07h	72h	R/W	001s0000b	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 1, 2, 3 Control Register (Index=71h,81h,91h Default=00h)

Bit	Description
7	**WDT Timeout Enable(WTE)** 1: Disable. 0: Enable.
6	**WDT Reset upon Mouse Interrupt(WRKMI)** 0: Disable. 1: Enable.
5	**WDT Reset upon Keyboard Interrupt(WRKBI)** 0: Disable. 1: Enable.
4	**Reserved**
3-2	**Reserved**
1	**Force Time-out(FTO)** This bit is self-clearing.
0	**WDT Status(WS)** 1: WDT value reaches 0. 0: WDT value is not 0.

Watch Dog Timer 1, 2, 3 Configuration Register (Index=72h,

82h, 92h Default=001s0000b)

Bit	Description
7	**WDT Time-out Value Select 1 (WTVS)** 1: Second 0: Minute
6	**WDT Output through KRST (Pulse) Enable(WOKE)** 1: Enable 0: Disable
5	**WDT Time-out value Extra select(WTVES)** 1: 64ms x WDT Timer-out value (default = 4s) 0: Determined by WDT Time-out value select 1 (bit 7 of this register)
4	**WDT Output through PWROK (Pulse) Enable(WOPE)** 1: Enable 0: Disable During LRESET#, this bit is selected by JP7 power-on strapping option
3-0	**Select interrupt level** Note1 **for WDT(SIL)**

Watch Dog Timer 1,2,3 Time-Out Value (LSB) Register (Index=73h,83h,93h, Default=38h)

Bit	Description
7-0	**WDT Time-out Value 7-0(WTV)**

Watch Dog Timer 1,2,3 Time-Out Value (MSB) Register (Index=74h,84h,94h Default=00h)

Bit	Description
7-0	**WDT Time-out Value 15-8(WTV)**

A.2 ITE8783 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

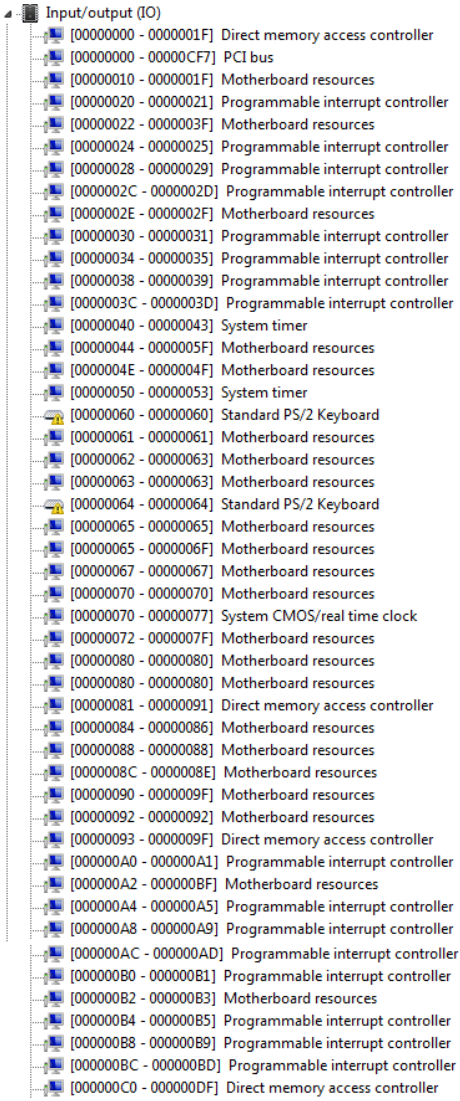
00h: no interrupt selected

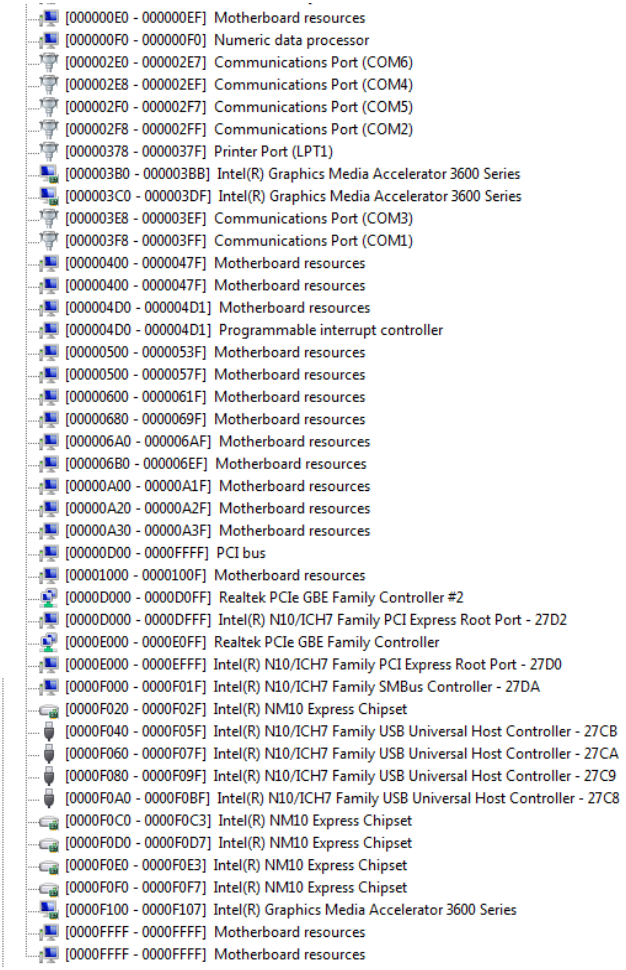
Appendix

B

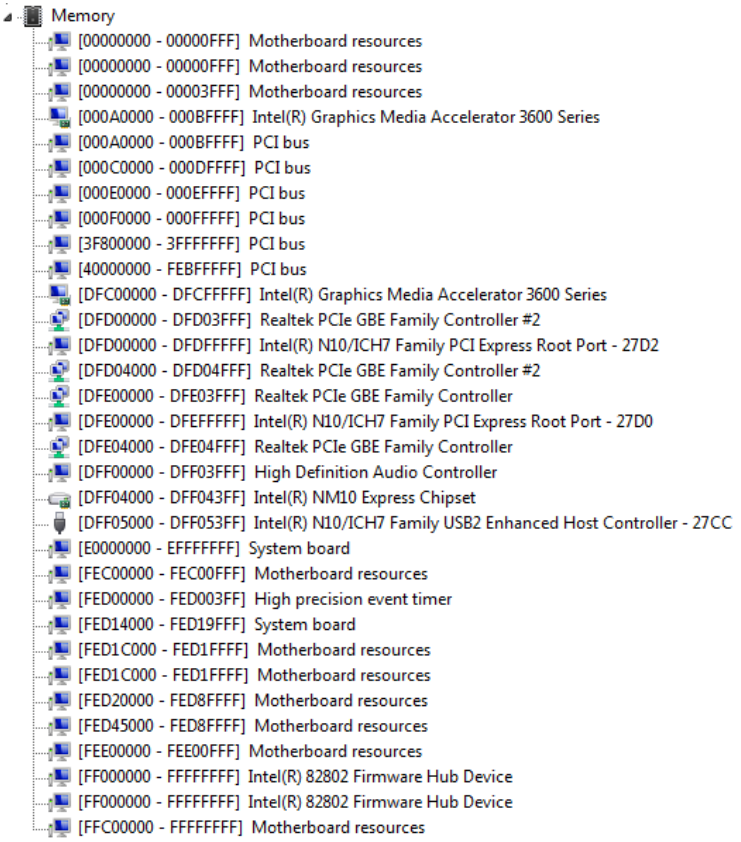
I/O Information

B.1 I/O Address Map

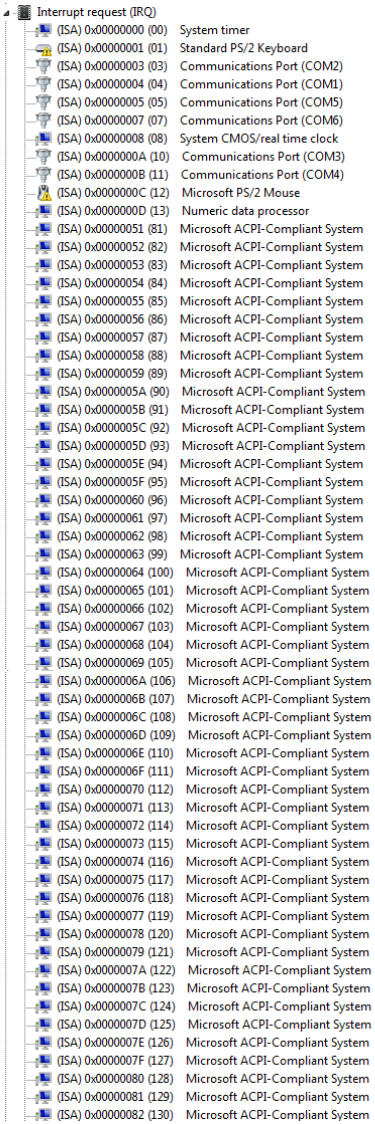



[000000E0 - 000000EF] Motherboard resources
[000000F0 - 000000F0] Numeric data processor
[000002E0 - 000002E7] Communications Port (COM6)
[000002E8 - 000002EF] Communications Port (COM4)
[000002F0 - 000002F7] Communications Port (COM5)
[000002F8 - 000002FF] Communications Port (COM2)
[00000378 - 0000037F] Printer Port (LPT1)
[000003B0 - 000003BB] Intel(R) Graphics Media Accelerator 3600 Series
[000003C0 - 000003DF] Intel(R) Graphics Media Accelerator 3600 Series
[000003E8 - 000003EF] Communications Port (COM3)
[000003F8 - 000003FF] Communications Port (COM1)
[00000400 - 0000047F] Motherboard resources
[00000400 - 0000047F] Motherboard resources
[000004D0 - 000004D1] Motherboard resources
[000004D0 - 000004D1] Programmable interrupt controller
[00000500 - 0000053F] Motherboard resources
[00000500 - 0000057F] Motherboard resources
[00000600 - 0000061F] Motherboard resources
[00000680 - 0000069F] Motherboard resources
[000006A0 - 000006AF] Motherboard resources
[000006B0 - 000006EF] Motherboard resources
[00000A00 - 00000A1F] Motherboard resources
[00000A20 - 00000A2F] Motherboard resources
[00000A30 - 00000A3F] Motherboard resources
[00000D00 - 0000FFFF] PCI bus
[00001000 - 0000100F] Motherboard resources
[0000D000 - 0000D0FF] Realtek PCIe GBE Family Controller #2
[0000D000 - 0000DFFF] Intel(R) N10/ICH7 Family PCI Express Root Port - 27D2
[0000E000 - 0000E0FF] Realtek PCIe GBE Family Controller
[0000E000 - 0000EFFF] Intel(R) N10/ICH7 Family PCI Express Root Port - 27D0
[0000F000 - 0000F01F] Intel(R) N10/ICH7 Family SMBus Controller - 27DA
[0000F020 - 0000F02F] Intel(R) NM10 Express Chipset
[0000F040 - 0000F05F] Intel(R) N10/ICH7 Family USB Universal Host Controller - 27CB
[0000F060 - 0000F07F] Intel(R) N10/ICH7 Family USB Universal Host Controller - 27CA
[0000F080 - 0000F09F] Intel(R) N10/ICH7 Family USB Universal Host Controller - 27C9
[0000F0A0 - 0000F0BF] Intel(R) N10/ICH7 Family USB Universal Host Controller - 27C8
[0000F0C0 - 0000F0C3] Intel(R) NM10 Express Chipset
[0000F0D0 - 0000F0D7] Intel(R) NM10 Express Chipset
[0000F0E0 - 0000F0E3] Intel(R) NM10 Express Chipset
[0000F0F0 - 0000F0F7] Intel(R) NM10 Express Chipset
[0000F100 - 0000F107] Intel(R) Graphics Media Accelerator 3600 Series
[0000FFFF - 0000FFFF] Motherboard resources
[0000FFFF - 0000FFFF] Motherboard resources

B.2 1st MB Memory Address Map



B.3 IRQ Mapping Chart



- (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

B.4 DMA Channel Assignments

- Direct memory access (DMA)
  - 4 Direct memory access controller

Appendix

C

Digital I/O

C.1 Digital I/O

The F75111 provides one serial access interface, I2C Bus, to read/write internal registers. The address of Serial Bus is 0x6E (0110_1110)

The related register for configuring DIO is list as follows:

Configuration and Control Register-Index 01h

Power-on default [7:0]=0000_1000b

Bit	Name	R/W	PWR	Description
7	INIT	R/W	VSB3V	Software reset for all registers including Test Mode registers. Users use only.
6	Reserved	R/W	VSB3V	
5	EN_WDT10	R/W	VSB3V	Enable Reset Out. If set to 1, enable WDTOUT10# output. Default is disable.
4	Reserved	R/W	VSB3V	
3	Reserved	R/W	VSB3V	
2	Reserved	R/W	VSB3V	
1	SMART_POWR_MAGEMENT	R/W	VSB3V	Set this bit to 1 will enable auto power down mode, when all function are idle then 20ms the chip will auto power down, it will wakeup when GPIO state change or read write register
0	SOFT_POWR_DOWN	R/W	VSB3V	Set this bit to 1 will power down all of the analog block and stop internal clock, write 0 to clear this bit or when GPIO state change will auto clear this bit to 0.

GPIO2x Output Control Register-Index 20h

Power-on default [7:0]=0000_0000b

Bit	Name	R/W	PWR	Description
7	GP27_OCTRL	R/W	VSB3V	GPIO 27 output control. Set to 1 for output function. Set to 0 for input function (default).
6	GP26_OCTRL	R/W	VSB3V	GPIO 26 output control. Set to 1 for output function. Set to 0 for input function (default).
5	GP25_OCTRL	R/W	VSB3V	GPIO 25 output control. Set to 1 for output function. Set to 0 for input function (default).
4	GP24_OCTRL	R/W	VSB3V	GPIO 24 output control. Set to 1 for output function. Set to 0 for input function (default).
3	GP23_OCTRL	R/W	VSB3V	GPIO 23 output control. Set to 1 for output function. Set to 0 for input function (default).
2	GP22_OCTRL	R/W	VSB3V	GPIO 22 output control. Set to 1 for output function. Set to 0 for input function (default).
1	GP21_OCTRL	R/W	VSB3V	GPIO 21 output control. Set to 1 for output function. Set to 0 for input function (default).
0	GP20_OCTRL	R/W	VSB3V	GPIO 20 output control. Set to 1 for output function. Set to 0 for input function (default).

GPIO2x Output Data Register-Index 21h

Power-on default [7:0]=0000_0000b

Bit	Name	R/W	PWR	Description
7	GP27_ODATA	R/W	VSB3V	GPIO 27 output data.
6	GP26_ODATA	R/W	VSB3V	GPIO 26 output data.
5	GP25_ODATA	R/W	VSB3V	GPIO 25 output data.

4	GP24_ODATA	R/W	VSB3V	GPIO 24 output data.
3	GP23_ODATA	R/W	VSB3V	GPIO 23 output data.
2	GP22_ODATA	R/W	VSB3V	GPIO 22 output data.
1	GP21_ODATA	R/W	VSB3V	GPIO 21 output data.
0	GP20_ODATA	R/W	VSB3V	GPIO 20 output data.

GPIO2x Input Status Register-Index 22h

Power-on default [7:0]=xxxx_xxxxb

Bit	Name	R/W	PWR	Description
7	GP27_PSTS	RO	VSB3V	Read the GPIO27 data on the pin.
6	GP26_PSTS	RO	VSB3V	Read the GPIO26 data on the pin.
5	GP25_PSTS	RO	VSB3V	Read the GPIO25 data on the pin.
4	GP24_PSTS	RO	VSB3V	Read the GPIO24 data on the pin.
3	GP23_PSTS	RO	VSB3V	Read the GPIO23 data on the pin.
2	GP22_PSTS	RO	VSB3V	Read the GPIO22 data on the pin.
1	GP21_PSTS	RO	VSB3V	Read the GPIO21 data on the pin.
0	GP20_PSTS	RO	VSB3V	Read the GPIO20 data on the pin.

The following is a sample code for 8 input

```
.MODEL          SMALL
.CODE
```

```
begin:
                mov    cl,01h
                mov    al,80h
                call   CT_I2CWriteByte
                call   Delay5ms

            mov al,00h
                mov    cl,20h
                call   CT_I2CWriteByte

                mov    cl,22h
                call   CT_I2CReadByte

;Input  : CL - register index
;              CH - device ID
;Output : AL - Value read

Ct_I2CReadByte      Proc    Near
                mov    ch,06eh
                mov        dx, 0f000h + 00h ; Host Control Register
              mov        al, 0ffh                        ; Clear previous
commands
              out        dx, al
```

```
        call    Delay5ms

        mov     dx, 0f000h + 04h        ; Transmit Slave Address
Register
        inc     ch                      ; Set the slave address and
        mov     al, ch                  ; prepare for a READ command
        out     dx, al

        mov     dx, 0f000h + 03h        ; Host Command Register
        mov     al, cl                  ; offset to read
        out     dx, al

        mov     dx, 0f000h + 05h
      xor       al, al                  ; Clear old data
      out       dx, al

        mov     dx, 0f000h + 02h ; Host Control Reegister
        mov     al, 48h     ; Start a byte access
        out     dx, al

        call    CT_Chk_SMBus_Ready
        mov     dx, 0f000h + 05h
        in      al, dx

        ret
```

```
Ct_I2CReadByte      Endp

;Input : CL - register index
;           CH - device ID
;           AL - Value to write
;Output: none

Ct_I2CWriteByte     Proc    Near
                    mov     ch,06eh
                    xchg    ah, al
                    mov         dx, 0f000h + 00h ; Host Control Register
                  mov         al, 0ffh                        ; Clear previous
commands
                  out         dx, al

                    call      Delay5ms

                    mov         dx, 0f000h + 04h          ; Transmit Slave Address
Register
                    mov     al, ch                  ; Set the slave address and
                    out         dx, al                          ; prepare for a WRITE
command

                    mov         dx, 0f000h + 03h          ; Host Command Register
                    mov         al, cl                          ; offset to write
```

```
                out     dx, al

                mov     dx, 0f000h + 05h
                mov     al, ah
               out      dx, al

                mov      dx, 0f000h + 00h ; Host Control Register
                mov      al, 48h     ; Start a byte access
                out      dx, al

                call     CT_Chk_SMBus_Ready
                ret
Ct_I2CWriteByte     Endp

; Wait until the busy bit clears, indicating that the SMBUS
; activity has concluded.

CT_Chk_SMBus_Ready    Proc   Near
                mov     dx,0f000h+ 0;status port
                clc
                mov     cx,0800h
Chk_I2c_OK:
                in      al,dx           ;get status
                call    Delay5ms
```

```
                out     dx,al           ;clear status
                call    Delay5ms

                test    al, 02H                 ;termination of command ?
                jnz     short Clear_final

                and     al, NOT 40H  ;mask INUSE bit
                or      al,al           ;status OK ?
                jz      short Clear_final

                test    al,04h          ;device error
                jnz     short SMBus_Err

                loop    short Chk_I2c_OK
        ;SMbus error due to timeout
SMBus_Err:

                stc
                ret
Clear_final:
                clc
                ret
CT_Chk_SMBus_Ready    Endp

END    begin
```

Appendix

D

AHCI Setting

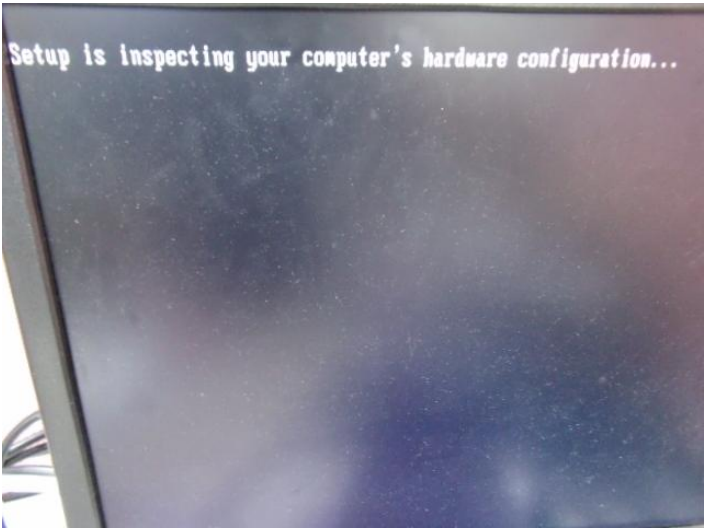
D.1 Setting AHCI

OS installation to setup AHCI Mode.

Step 1: Copy the files below from “Driver CD -> ***STEP5-AHCI\WIN7_32\F6 Install Floppy Create for 32 and 64 bit Windows***” to Disk

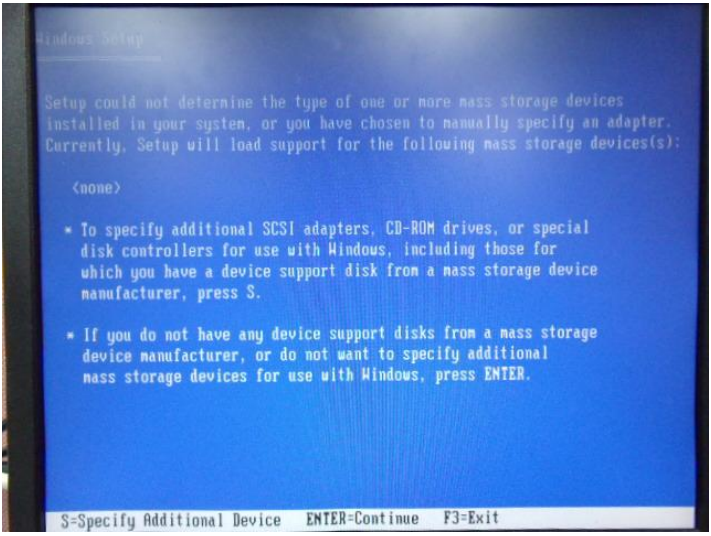
Step 2: Connect the USB Floppy to the board

Step 3: Setup OS

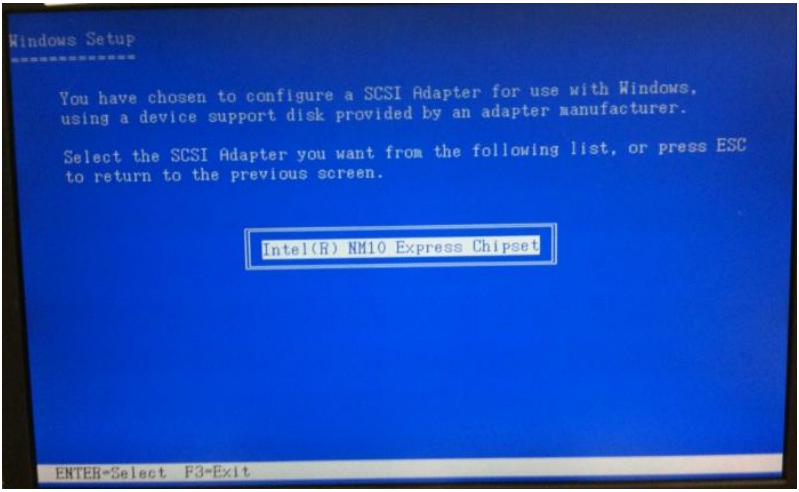


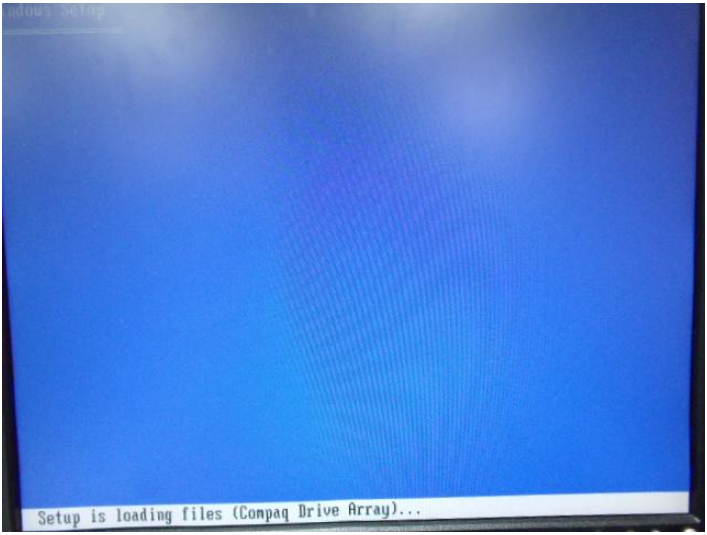
Step 4: Press "**F6**"

Step 5: Choose "**S**"



Step 6: Choose "**Intel(R) NM10 Express Chipset**"



Step 7: It will show the model number you select and then press “**ENTER**

Step 8: Setup is loading files