AEC-6637

Fanless Embedded Controller

Intel® Core™ i7/i5 Mobile Processor

2 Gigabit Ethernet

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

1 Mini Card

AEC-6637 Manual 1st Ed.
September 2012

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Packing List

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

- 1 AEC-6637 Embedded Controller
- 2 Wallmount Brackets
- 1 Screw Package
- 4 RAM Thermal Pads (1998F15003 x 1, 1998666630 x 2, 1998666652 x 1)
- 1 DVD-ROM for manual (in PDF format) and drivers

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

The newest Boxer series AEC-6637 has been introduced by AAEON and it utilizes Intel® Core™ i7/ i5 Mobile processor. This condensed Embedded Controller is a fanless controller with the latest Intel® processor and chipset. The cutting-edge technology has been equipped to the AEC-6637 to satisfy the versatile demands of Factory Automation, Data processing, Fleet management, and Data management.

The AEC-6637 offers low power consumption system that while operating temperatures ranging from -10° to 50°C. The AEC-6637 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 Industrial Automation market. If you are looking for a multifunctional embedded controller, the AEC-6637 is definitely your best choice to fit into your vital applications.

1.2 Features

- Intel® 3rd Generation Core™ i7-3610QE, Core™ i5-3610Mel Processor
- Intel® QM77 Chipset
- Intel® HD Graphics 4000
- COM x 4, USB2.0 x 2, USB3.0 x 2
- VGA x 1
- Gigabit Ethernet x 2
- 2.5” SATA 6.0 Gb/s Hard Disk Drive Bay
- Fanless Operation

1.3 Specifications

CPU		Intel® Core™ i7-3610QE 2.3GHz processor Intel® Core™ i5-3610ME 2.7GHz processor
Chipset		Intel® QM77
System Memory		DDR3 1066/1333/1600 SDRAM SODIMM x 1, Max. 8 GB
Display Interface	**VGA**	DB-15 x 1
Storage Device	**SSD**	Onboard CFast™ x 1
	HDD	2.5" SATA 6.0Gb/s Hard Disk Drive Bay x 1
Network	**LAN**	Gigabit Ethernet
	Wireless	Optional by Mini Card
Front I/O	**USB Host**	USB2.0 x 2
	Audio	1
	Others	Power ON/OFF Switch x 1, antenna hole x 2
Rear I/O	**USB Host**	USB3.0 x 2
	LAN	RJ-45 x 2
	Serial Port	RS-232/422/485 x 1, RS-232 x 3
	Others	Power input x 1, VGA x 1
Expansion	**Mini Card**	1
Indicator	**Front**	Power LED x 1, Hard Disk Drive active LED x 1
Power Requirement		9~30V DC with 3-pin terminal block

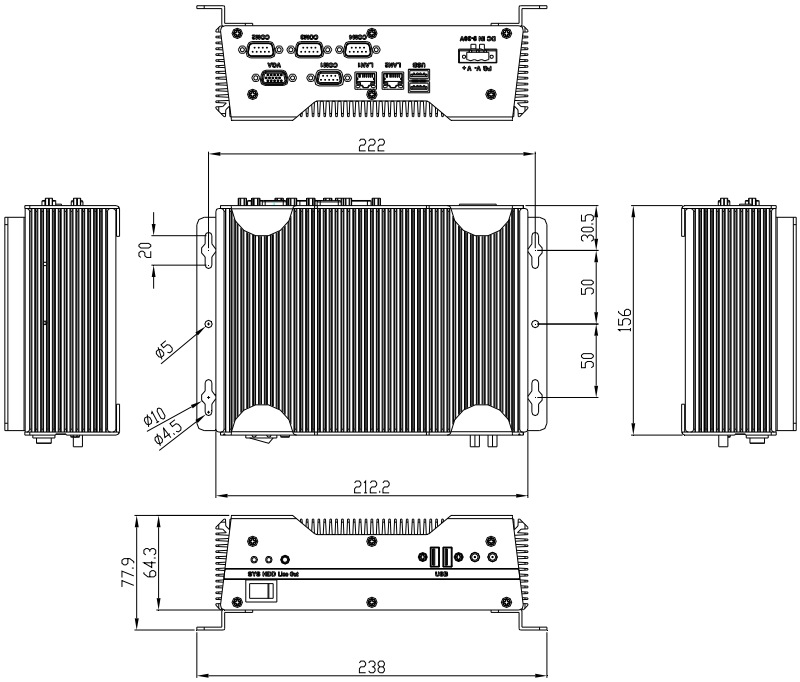
System Cooling		Passive Cooling
Mounting		Wallmount
Operating Temperature		14°F ~ 113°F (-10°C ~ 45°C) CFast™ w/o Airflow 14°F ~ 122°F (-10°C ~ 50°C) HDD w/o Airflow
Storage Temperature		-4°F ~158°F (-20°C~70°C)
Anti-Vibration		5 g rms/5~500 Hz/ random operation (CFast™); 1 g rms/5~500 Hz/ random operation (HDD)
Anti-Shock		50 G peak acceleration (11 msec, duration)-CFast™ 20 G peak acceleration (11 msec, duration)-HDD
Certification	**EMC**	CE/FCC Class A
Dimension		8.35" (W) x 2.52" (H) x 6.2"(D) (212mm x 64mm x 156mm)
Gross Weight		7.94 lb (3.6 kg)
Note		Windows® XP Embedded, Windows® XP, Windows® 7, Ubuntu 11.10 – Kernel 3.0.0.12-generic

Chapter

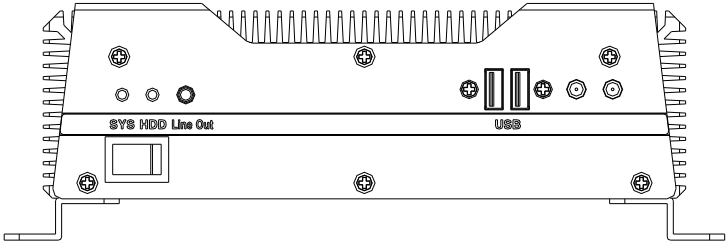
2

Hardware Installation

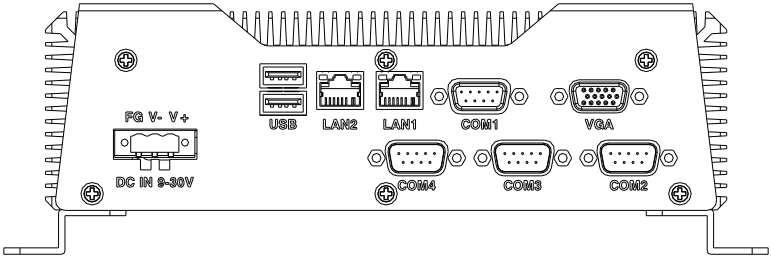
2.1 Dimension & Connectors of AEC-6637



Connectors on the front panel

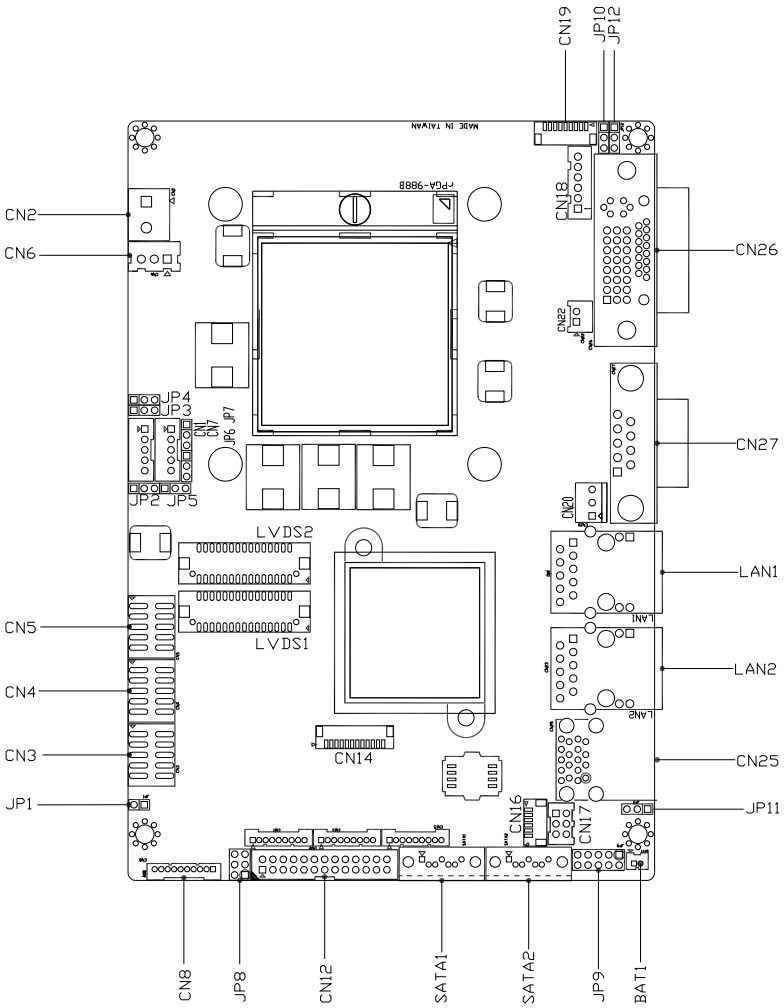


Connectors on the rear panel

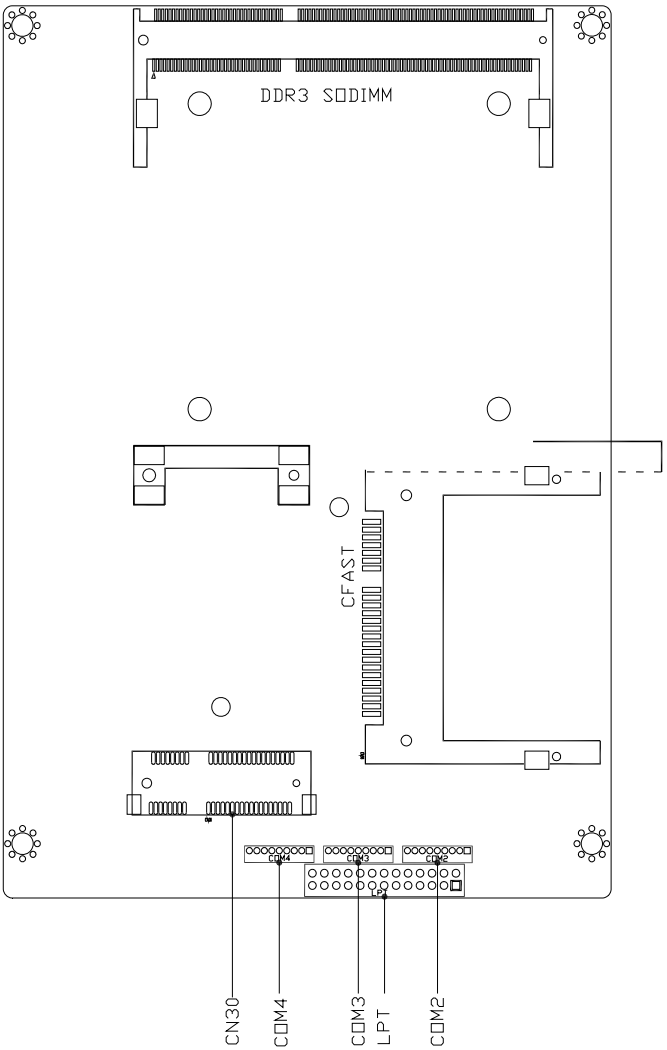


2.2 Connectors and Jumpers of The Main Board

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
JP3	LVDS Port 1 Backlight Inverter VCC Selection
JP5	LVDS Port 1 Operating VDD Selection
JP6	LVDS Port 1 Backlight Lightness Control Mode Selection
JP8	COM2 Pin8 Function Selection
JP9	Front Panel Connector
JP10	Touch Screen 4/5/8-wire Mode Selection
JP11	Clear CMOS Jumper
JP12	AT/ATX Power Supply Mode 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:

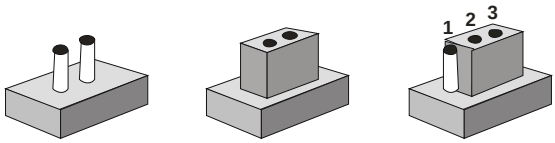
Label	Function
CN1	LVDS Port 1 Inverter / Backlight Connector
CN2	External +12V Input
CN3	USB 2.0 Ports 7 and 8
CN4	USB 2.0 Ports 5 and 6
CN5	USB 2.0 Ports 3 and 4
CN6	External +5VSB Input
CN8	Audio I/O Port
CN9	LVDS Port 1
CN11	COM Port 2
CN12	LPT / Digital I/O Port
CN13	COM Port 3
CN14	LPC Port
CN15	COM Port 4
CN16	UIM Card Module
CN17	PS/2 Keyboard/Mouse Combo Port
CN18	+5VSB Output w/SMBus
CN19	Touch Screen Connector
CN20	CPU FAN
CN22	+5V Output for SATA HDD

CN23	Realtek LAN (RJ-45) Port
CN24	Intel LAN (RJ-45) Port
CN25	USB Ports 1 and 2
CN26	VGA Port
CN27	COM Port 1 (D-SUB 9)
CN28	CFast Slot
CN29	DDR3 SODIMM Slot
CN30	Mini Card Slot
SATA1	SATA Port1 Connector
SATA2	SATA Port 2 Connector

2.5 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.



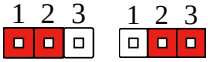
Open Closed Closed 2-3

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.

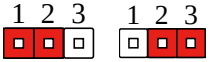
2.6 LVDS Port 1 Backlight Inverter VCC Selection (JP3)



+12V **+5V**

JP3	Function
1-2	+12V
2-3	+5V (Default)

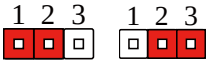
2.7 LVDS Port 1 Operating VDD Selection (JP5)



+5V **+3.3V**

JP5	Function
1-2	+5V
2-3	+3.3V (Default)

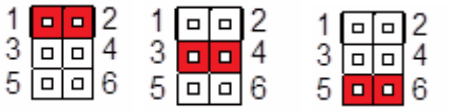
2.8 LVDS Port 1 Backlight Lightness Control Mode Selection (JP6)



VR Mode **PWM Mode**

JP6	Function
1-2	VR Mode (Default)
2-3	PWM Mode

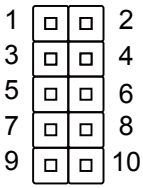
2.9 COM2 Pin8 Function Selection (JP8)



+12V Ring +5V

JP8	Function
1-2	+12V
3-4	Ring (Default)
5-6	+5V

2.10 Front Panel Connector (JP9)



Pin	Signal
1	PWR_BTN-
2	PWR_BTN+
3	HDD_LED-
4	HDD_LED+
5	SPEAKER-
6	SPEAKER+
7	PWR_LED-
8	PWR_LED+
9	H/W RESET-

10	H/W RESET+

2.11 Touch Screen 4/5/8-Wire Selection (JP10)

4/8-wire mode

5-wire mode

JP10	Function
1-2	4/8-wire mode (Default)
2-3	5-wire mode

2.12 Clear CMOS (JP11)

Normal

Clear CMOS

JP11	Function
1-2	Normal (Default)
2-3	Clear CMOS

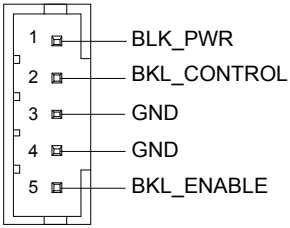
2.13 AT/ATX Power Supply Mode Selection (JP12)

AT Mode

ATX Mode

JP12	Function
1-2	AT Mode (Default)
2-3	ATX Mode

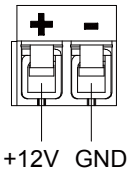
2.14 LVDS Port 1 Inverter/ Backlight Connector (CN1)



Pin	Pin Name	Signal Type	Signal Level
1	BKL_PWR	PWR	+5V / +12V
2	BKL_CONTROL	OUT	
3	GND	GND	
4	GND	GND	
5	BKL_ENABLE	OUT	+5V

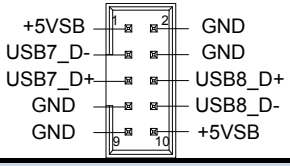
Note: LVDS1 BKL_PWR can be set to +5V or +12V by JP3.
LVDS1 BKL_CONTROL can be set by JP6.

2.15 External +12V Input (CN2)



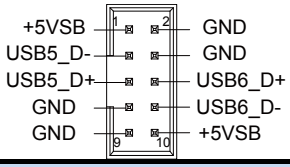
Pin	Pin Name	Signal Type	Signal Level
1	+12V	PWR	+12V
2	GND	GND	

2.16 USB2.0 Port 7 and Port 8 (CN3)



Pin	Pin Name	Signal Type	Signal Level
1	+5VSB	PWR	+5V
2	GND	GND	
3	USB7_D-	DIFF	
4	GND	GND	
5	USB7_D+	DIFF	
6	USB8_D+	DIFF	
7	GND	GND	
8	USB8_D-	DIFF	
9	GND	GND	
10	+5VSB	PWR	+5V

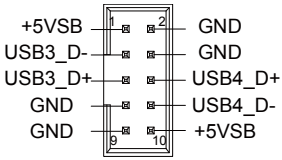
2.17 USB2.0 Port 5 and Port 6 (CN4)



Pin	Pin Name	Signal Type	Signal Level
1	+5VSB	PWR	+5V
2	GND	GND	
3	USB5_D-	DIFF	

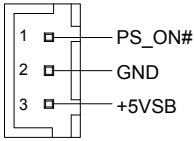
4	GND	GND	
5	USB5_D+	DIFF	
6	USB6_D+	DIFF	
7	GND	GND	
8	USB6_D-	DIFF	
9	GND	GND	
10	+5VSB	PWR	+5V

2.18 USB2.0 Port 3 and Port 4 (CN5)



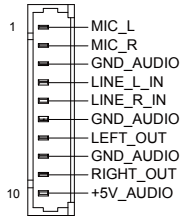
Pin	Pin Name	Signal Type	Signal Level
1	+5VSB	PWR	+5V
2	GND	GND	
3	USB3_D-	DIFF	
4	GND	GND	
5	USB3_D+	DIFF	
6	USB4_D+	DIFF	
7	GND	GND	
8	USB4_D-	DIFF	
9	GND	GND	
10	+5VSB	PWR	+5V

2.19 External +5VSB Input (CN6)



Pin	Pin Name	Signal Type	Signal Level
1	PS_ON#	OUT	+3.3V
2	GND	GND	
3	+5VSB	PWR	+5V

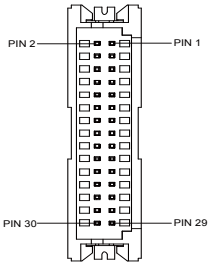
2.20 Audio I/O Port Connector (CN8)



Pin	Pin Name	Signal Type	Signal Level
1	MIC_L	IN	
2	MIC_R	IN	
3	GND_AUDIO	GND	
4	LINE_L_IN	IN	
5	LINE_R_IN	IN	
6	GND_AUDIO	GND	
7	LEFT_OUT	OUT	
8	GND_AUDIO	GND	

9	RIGHT_OUT	OUT	
10	+5V_AUDIO	PWR	+5V

2.21 LVDS Port 1 Connector (CN9)

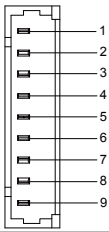


Pin	Pin Name	Signal Type	Signal Level
1	BKL_ENABLE	OUT	
2	BKL_CONTROL	OUT	
3	LCD_PWR	PWR	+3.3V/+5V
4	GND	GND	
5	LVDS_A_CLK-	DIFF	
6	LVDS_A_CLK+	DIFF	
7	LCD_PWR	PWR	+3.3V/+5V
8	GND	GND	
9	LVDS_DA0-	DIFF	
10	LVDS_DA0+	DIFF	
11	LVDS_DA1-	DIFF	
12	LVDS_DA1+	DIFF	
13	LVDS_DA2-	DIFF	

14	LVDS_DA2+	DIFF	
15	LVDS_DA3-	DIFF	
16	LVDS_DA3+	DIFF	
17	DDC_DATA	I/O	+3.3V
18	DDC_CLK	I/O	+3.3V
19	LVDS_DB0-	DIFF	
20	LVDS_DB0+	DIFF	
21	LVDS_DB1-	DIFF	
22	LVDS_DB1+	DIFF	
23	LVDS_DB2-	DIFF	
24	LVDS_DB2+	DIFF	
25	LVDS_DB3-	DIFF	
26	LVDS_DB3+	DIFF	
27	LCD_PWR	PWR	+3.3V/+5V
28	GND	GND	
29	LVDS_B_CLK-	DIFF	
30	LVDS_B_CLK+	DIFF	

Note: LVDS1 LCD_PWR can be set to +3.3V or +5V by JP5.

2.22 COM Port 2 Connector (CN11)



RS-232

Pin	Pin Name	Signal Type	Signal Level
1	DCD	IN	
2	DSR	IN	
3	RX	IN	
4	RTS	OUT	±9V
5	TX	OUT	±9V
6	CTS	IN	
7	DTR	OUT	±9V
8	RI/+5V/+12V	IN/ PWR	+5V/+12V
9	GND	GND	

RS-422

Pin	Pin Name	Signal Type	Signal Level
1	RS422_TX-	OUT	±5V
2	NC		
3	RS422_RX+	IN	
4	NC		
5	RS422_TX+	OUT	±5V
6	NC		
7	RS422_RX-	IN	
8	NC/+5V/+12V	PWR	+5V/+12V
9	GND	GND	

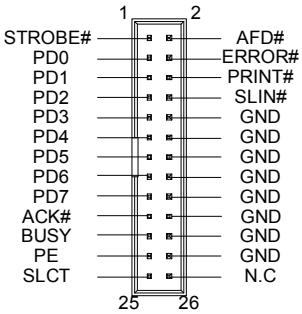
RS-485

Pin	Pin Name	Signal Type	Signal Level
1	RS485_D-	I/O	±5V
2	NC		
3	NC		
4	NC		
5	RS485_D+	I/O	±5V
6	NC		
7	NC		
8	NC/+5V/+12V	PWR	+5V/+12V
9	GND	GND	

Note: COM2 RS-232/422/485 can be set by BIOS setting. Default is RS-232. Pin 8 function can be set by JP8.

2.23 LPT/ Digital I/O Port Connector (CN12)

LPT Mode

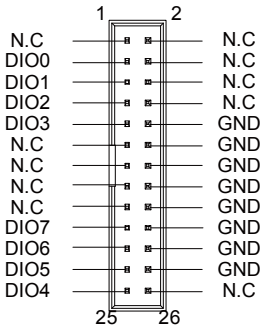


Pin	Pin Name	Signal Type	Signal Level
1	STROBE#	IN	
2	AFD#	I/O	
3	PD0	I/O	
4	ERROR#	IN	
5	PD1	I/O	
6	PRINT#	I/O	
7	PD2	I/O	
8	SLIN#	I/O	
9	PD3	I/O	
10	GND	GND	
11	PD4	I/O	
12	GND	GND	
13	PD5	I/O	
14	GND	GND	
15	PD6	I/O	
16	GND	GND	
17	PD7	I/O	
18	GND	GND	
19	ACK#	IN	
20	GND	GND	
21	BUSY	IN	
22	GND	GND	
23	PE	IN	

24	GND	GND	
25	SLCT	IN	
26	NC		

Note: LPT / Digital IO can be set by BIOS setting. Default is LPT Function

DIO Mode

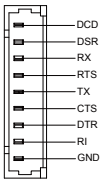


Pin	Pin Name	Signal Type	Signal Level
1	NC		
2	NC		
3	DIO0	I/O	+5V
4	NC		
5	DIO1	I/O	+5V
6	NC		
7	DIO2	I/O	+5V
8	NC		
9	DIO3	I/O	+5V
10	GND	GND	

11	NC		
12	GND	GND	
13	NC		
14	GND	GND	
15	NC		
16	GND	GND	
17	NC		
18	GND	GND	
19	DIO7	I/O	+5V
20	GND	GND	
21	DIO6	I/O	+5V
22	GND	GND	
23	DIO5	I/O	+5V
24	GND	GND	
25	DIO4	I/O	+5V
26	NC		

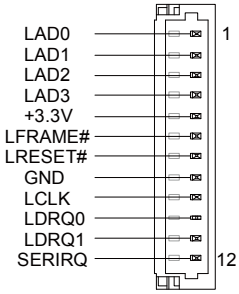
GPIO Port # / Pin Name	Location (Pin #)	I/O Port Access Address
Port 1/DIO0	3	Bit 0 of 0xA06
Port 2/DIO1	5	Bit 1 of 0xA06
Port 3/DIO2	7	Bit 2 of 0xA06
Port 4/DIO3	9	Bit 3 of 0xA06
Port 5/DIO4	25	Bit 0 of 0xA07
Port 6/DIO5	23	Bit 1 of 0xA07
Port 7/DIO6	21	Bit 2 of 0xA07
Port 8/DIO7	19	Bit 3 of 0xA07

2.24 COM Port 3 Connector (CN13)



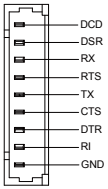
Pin	Pin Name	Signal Type	Signal Level
1	DCD	IN	
2	DSR	IN	
3	RX	IN	
4	RTS	OUT	±9V
5	TX	OUT	±9V
6	CTS	IN	
7	DTR	OUT	±9V
8	RI	IN	
9	GND	GND	

2.25 LPC Port Connector (CN14)



Pin	Pin Name	Signal Type	Signal Level
1	LAD0	I/O	+3.3V
2	LAD1	I/O	+3.3V
3	LAD2	I/O	+3.3V
4	LAD3	I/O	+3.3V
5	+3.3V	PWR	+3.3V
6	LFRAME#	IN	
7	LRESET#	OUT	+3.3V
8	GND	GND	
9	LCLK	OUT	
10	LDRQ0	IN	
11	LDRQ1	IN	
12	SERIRQ	I/O	+3.3V

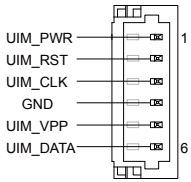
2.26 COM Port 4 Connector (CN15)



Pin	Pin Name	Signal Type	Signal Level
1	DCD	IN	
2	DSR	IN	
3	RX	IN	

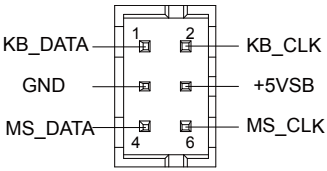
4	RTS	OUT	±9V
5	TX	OUT	±9V
6	CTS	IN	
7	DTR	OUT	±9V
8	RI	IN	
9	GND	GND	

2.27 UIM Card Module (CN16)



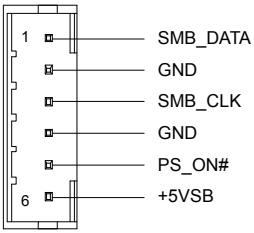
Pin	Pin Name	Signal Type	Signal Level
1	UIM_PWR	PWR	
2	UIM_RST	IN	
3	UIM_CLK	IN	
4	GND	GND	
5	UIM_VPP	PWR	
6	UIM_DATA	I/O	

2.28 PS/2 Keyboard/Mouse Combo Port Connector (CN17)



Pin	Pin Name	Signal Type	Signal Level
1	KB_DATA	I/O	+5V
2	KB_CLK	I/O	+5V
3	GND	GND	
4	+5VSB	PWR	+5V
5	MS_DATA	I/O	+5V
6	MS_CLK	I/O	+5V

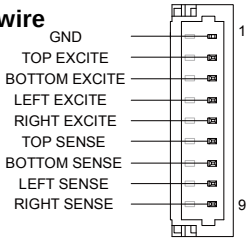
2.29 +5VSB Output w/SMBus (CN18)



Pin	Pin Name	Signal Type	Signal Level
1	SMB_DATA	I/O	+3.3V
2	GND	GND	
3	SMB_CLK	I/O	+3.3V
4	GND	GND	
5	PS_ON#	OUT	+3.3V
6	+5VSB	PWR	+5V

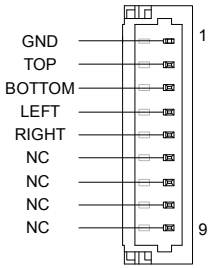
2.30 Touch Screen Connector (CN19)

8-wire



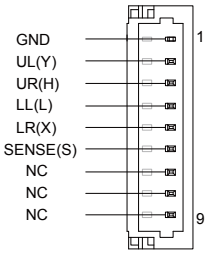
Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	TOP EXCITE	IN	
3	BOTTOM EXCITE	IN	
4	LEFT EXCITE	IN	
5	RIGHT EXCITE	IN	
6	TOP SENSE	IN	
7	BOTTOM SENSE	IN	
8	LEFT SENSE	IN	
9	RIGHT SENSE	IN	

4-wire



Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	TOP	IN	
3	BOTTOM	IN	
4	LEFT	IN	
5	RIGHT	IN	
6	NC		
7	NC		
8	NC		
9	NC		

5-wire

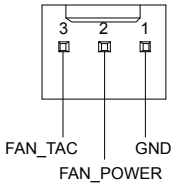


Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	UL(Y)	IN	
3	UR(H)	IN	
4	LL(L)	IN	
5	LR(X)	IN	
6	SENSE(S)	IN	

7	NC
8	NC
9	NC

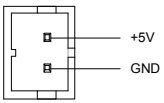
Note: Touch mode can be set by JP10

2.31 CPU FAN Connector (CN20)



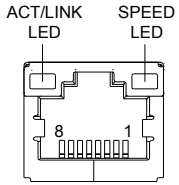
Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	FAN_POWER	PWR	+5V
3	FAN_TAC	IN	

2.32 +5V Output for SATA HDD (CN22)



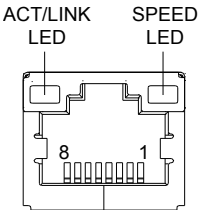
Pin	Pin Name	Signal Type	Signal Level
1	+5V	PWR	+5V
2	GND	GND	

2.33 Realtek LAN (RJ-45) Port (CN23)



Pin	Pin Name	Signal Type	Signal Level
1	MDI0+	DIFF	
2	MDI0-	DIFF	
3	MDI1+	DIFF	
4	MDI2+	DIFF	
5	MDI2-	DIFF	
6	MDI1-	DIFF	
7	MDI3+	DIFF	
8	MDI3-	DIFF	

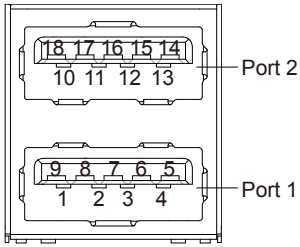
2.34 Intel LAN (RJ-45) Port (CN24)



Pin	Pin Name	Signal Type	Signal Level
1	MDI0+	DIFF	

2	MDI0-	DIFF
3	MDI1+	DIFF
4	MDI2+	DIFF
5	MDI2-	DIFF
6	MDI1-	DIFF
7	MDI3+	DIFF
8	MDI3-	DIFF

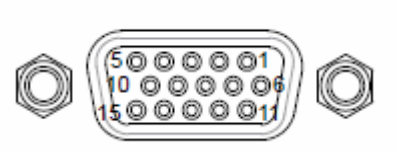
2.35 USB Port 1 and Port 2 (CN25)



Pin	Pin Name	Signal Type	Signal Level
1	+5VSB	PWR	+5V
2	USB1_D-	DIFF	
3	USB1_D+	DIFF	
4	GND	GND	
5	USB1_SSRX−	DIFF	
6	USB1_SSRX+	DIFF	
7	GND	GND	
8	USB1_SSTX−	DIFF	
9	USB1_SSTX+	DIFF	

10	+5VSB	PWR	+5V
11	USB2_D-	DIFF	
12	USB2_D+	DIFF	
13	GND	GND	
14	USB2_SSRX−	DIFF	
15	USB2_SSRX+	DIFF	
16	GND	GND	
17	USB2_SSTX−	DIFF	
18	USB2_SSTX+	DIFF	

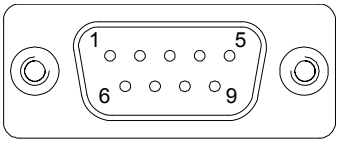
2.36 VGA Port (CN26)



Pin	Pin Name	Signal Type	Signal Level
1	RED	OUT	
2	GREEN	OUT	
3	BLUE	OUT	
4	NC		
5	GND	GND	
6	RED_GND_RTN	GND	
7	GREEN_GND_RTN	GND	
8	BLUE_GND_RTN	GND	

9	+5V	PWR	+5V
10	GND	GND	
11	NC		
12	DDC_DATA	I/O	+5V
13	HSYNC	OUT	
14	VSYNC	OUT	
15	DDC_CLK	I/O	+5V

2.37 COM Port 1 (D-SUB 9) (CN27)



Pin	Pin Name	Signal Type	Signal Level
1	DCD	IN	
2	RX	IN	
3	TX	OUT	±9V
4	DTR	OUT	±9V
5	GND	GND	
6	DSR	IN	
7	RTS	OUT	±9V
8	CTS	IN	
9	RI	IN	

2.38 CFast Slot (CN28)

Pin	Pin Name	Signal Type	Signal Level
S1	GND	GND	
S2	SATA_TX+	DIFF	
S3	SATA_TX-	DIFF	
S4	GND	GND	
S5	SATA_RX-	DIFF	
S6	SATA_RX+	DIFF	
S7	GND	GND	
PC1	NC		
PC2	GND	GND	
PC3	NC		
PC4	NC		
PC5	NC		
PC6	NC		
PC7	GND	GND	
PC8	NC		
PC9	NC		
PC10	NC		
PC11	NC		
PC12	NC		
PC13	+3.3V	PWR	+3.3V
PC14	+3.3V	PWR	+3.3V

PC15	GND	GND	
PC16	GND	GND	
PC17	NC		

2.39 DDR3 SODIMM Slot (CN29)

Standard specification

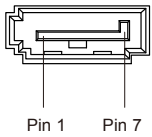
2.40 Mini Card Slot (CN30)

Pin	Pin Name	Signal Type	Signal Level
1	PCIE_WAKE#	IN	
2	+3.3VSB	PWR	+3.3V
3	NC		
4	GND	GND	
5	NC		
6	+1.5V	PWR	+1.5V
7	PCIE_CLK_REQ#	IN	
8	UIM_PWR	PWR	
9	GND	GND	
10	UIM_DATA	I/O	
11	PCIE_REF_CLK-	DIFF	
12	UIM_CLK	IN	
13	PCIE_REF_CLK+	DIFF	
14	UIM_RST	IN	
15	GND	GND	
16	UIM_VPP	PWR	

17	NC		
18	GND	GND	
19	NC		
20	W_DISABLE#	OUT	+3.3V
21	GND	GND	
22	PCIE_RST#	OUT	+3.3V
23	PCIE_RX-	DIFF	
24	+3.3VSB	PWR	+3.3V
25	PCIE_RX+	DIFF	
26	GND	GND	
27	GND	GND	
28	+1.5V	PWR	+1.5V
29	GND	GND	
30	SMB_CLK	I/O	+3.3V
31	PCIE_TX-	DIFF	
32	SMB_DATA	I/O	+3.3V
33	PCIE_TX+	DIFF	
34	GND	GND	
35	GND	GND	
36	USB_D-	DIFF	
37	GND	GND	
38	USB_D+	DIFF	
39	+3.3VSB	PWR	+3.3V
40	GND	GND	

41	+3.3VSB	PWR	+3.3V
42	NC		
43	GND	GND	
44	NC		
45	NC		
46	NC		
47	NC		
48	+1.5V	PWR	+1.5V
49	NC		
50	GND	GND	
51	NC		
52	+3.3VSB	PWR	+3.3V

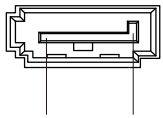
2.41 SATA Port 1 (SATA1)



Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	SATA_TX+	DIFF	
3	SATA_TX-	DIFF	
4	GND	GND	
5	SATA_RX-	DIFF	
6	SATA_RX+	DIFF	

7	GND	GND

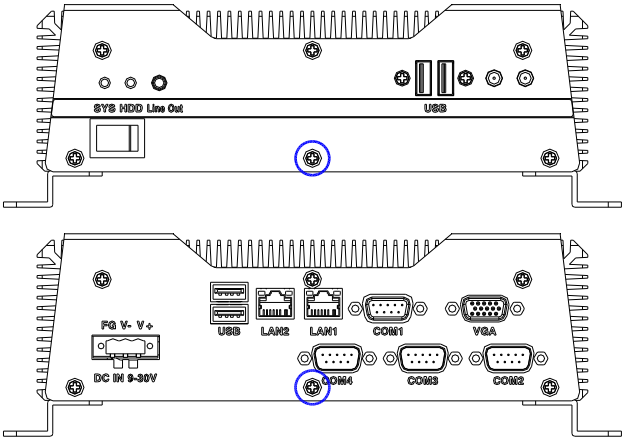
2.42 SATA Port 2 (SATA2)



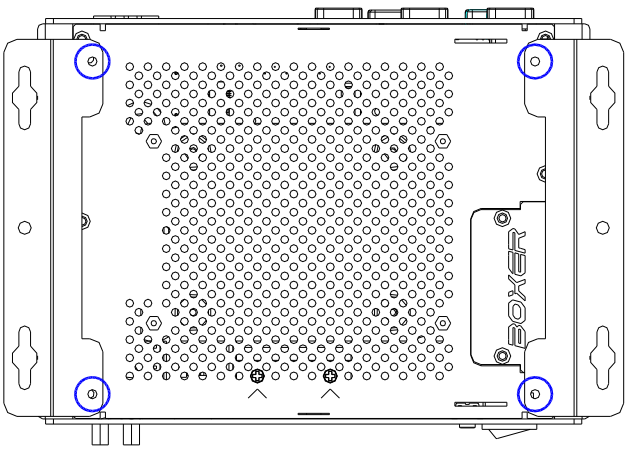
Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	SATA_TX+	DIFF	
3	SATA_TX-	DIFF	
4	GND	GND	
5	SATA_RX-	DIFF	
6	SATA_RX+	DIFF	
7	GND	GND	

2.43 CFast™ Card Installation

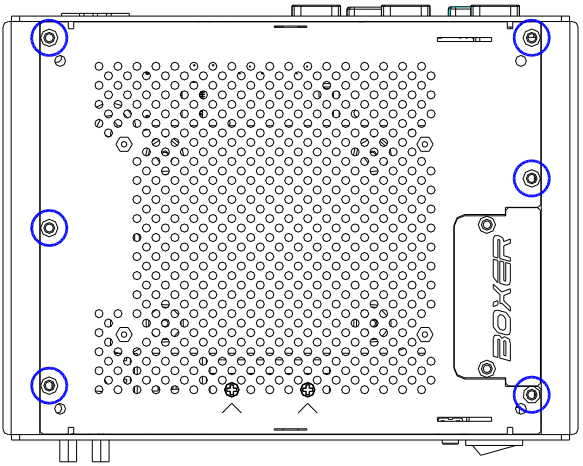
Step 1: Unfasten the two screws of the AEC-6637



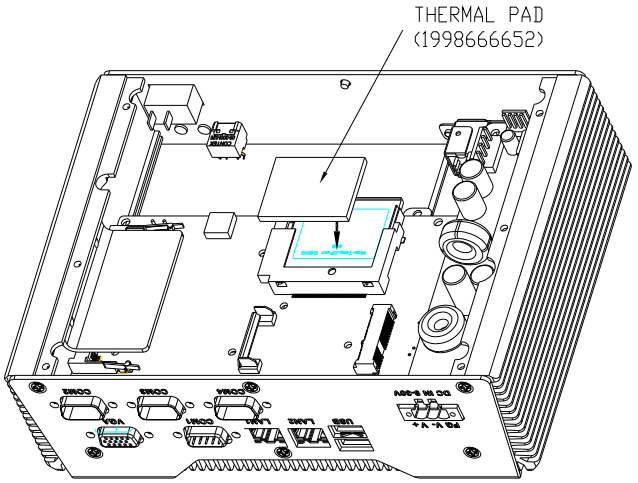
Step 2: Unfasten the four screws of the brackets



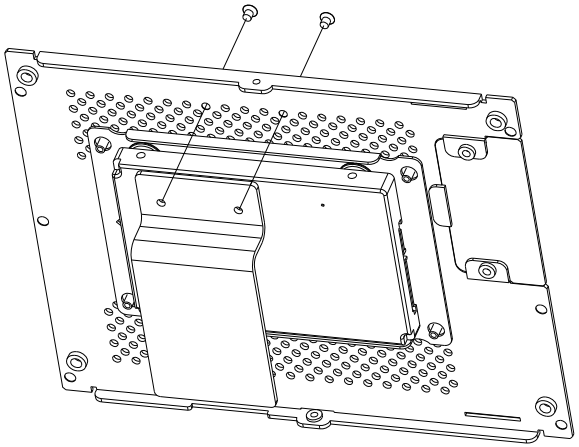
Step 3: Unfasten the six screws of the bottom cover



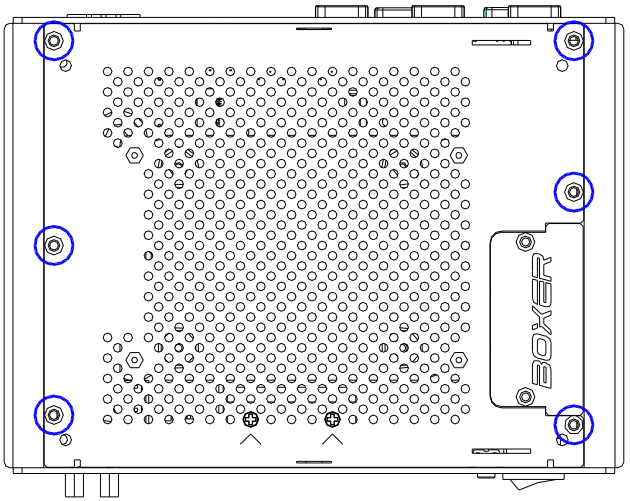
Step 4: Unfasten the two screws of the CFast™ bracket



Step 5: Install the CFast™ Card to the CFast™ slot and adhere the thermal pad onto the CFast™ Card. Then cover with the CFast™ Bracket

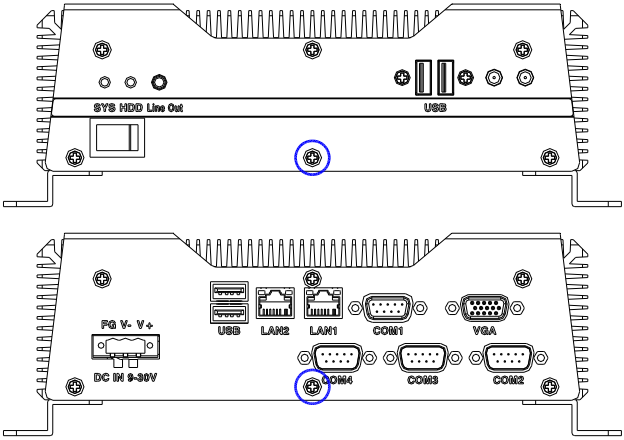


Step 6: Fasten the two screws of the CFast™ bracket and finish the installation

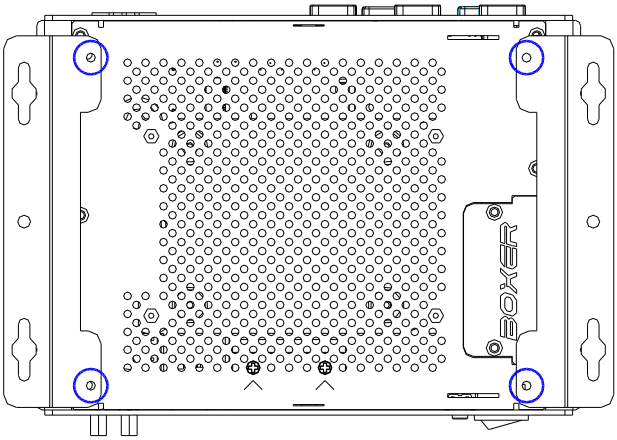


2.44 Hard Disk Drive (HDD) Installation

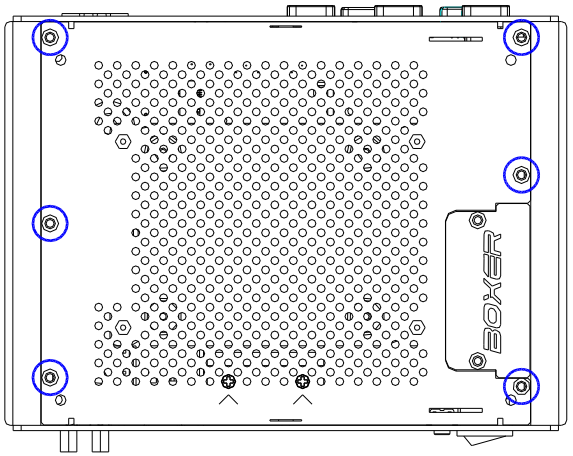
Step 1: Unfasten the two screws of the AEC-6637



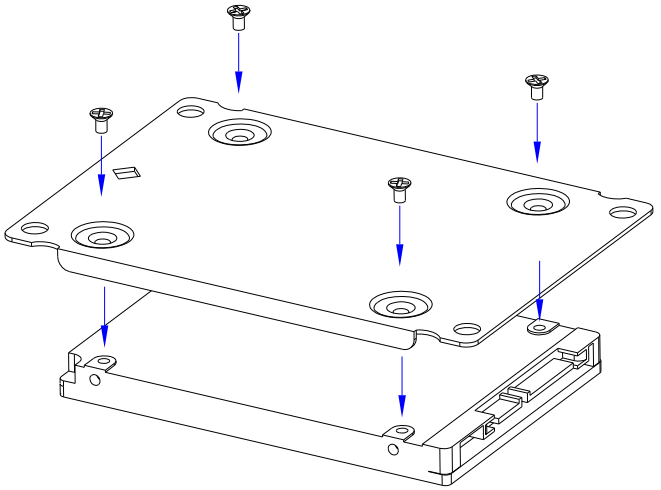
Step 2: Unfasten the four screws of the brackets



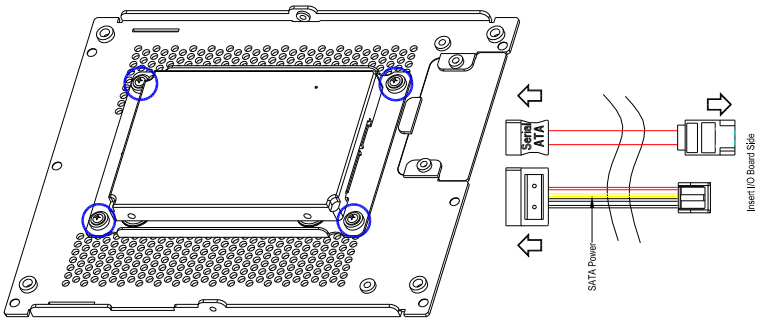
Step 3: Unfasten the six screws of the bottom cover



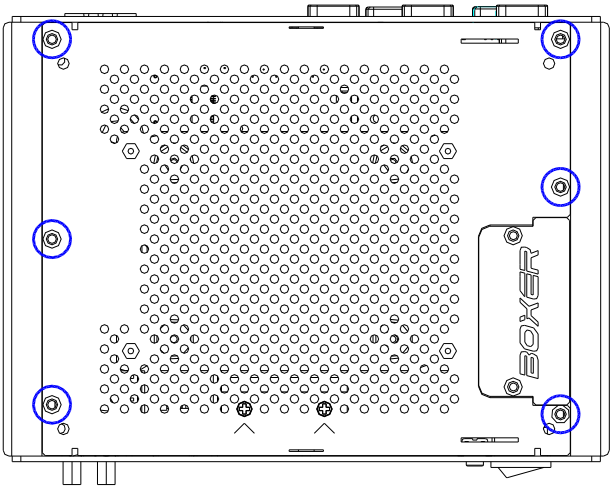
Step 4: Get the HDD and HDD Bracket ready. Fasten the four screws to fix the HDD and HDD bracket



Step 5: Connect the SATA cable to the HDD

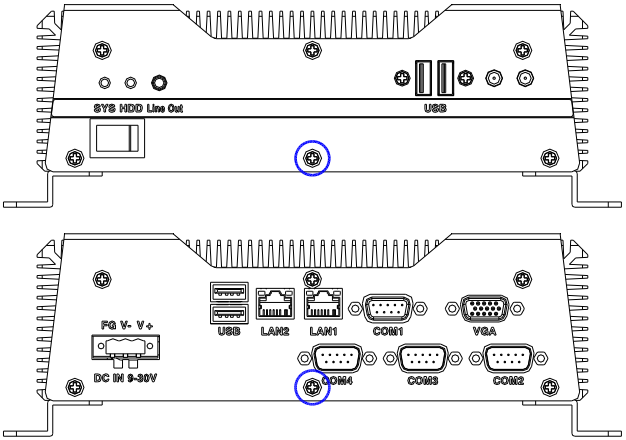


Step 6: Close the bottom cover of the AEC-6637 and fasten the screws

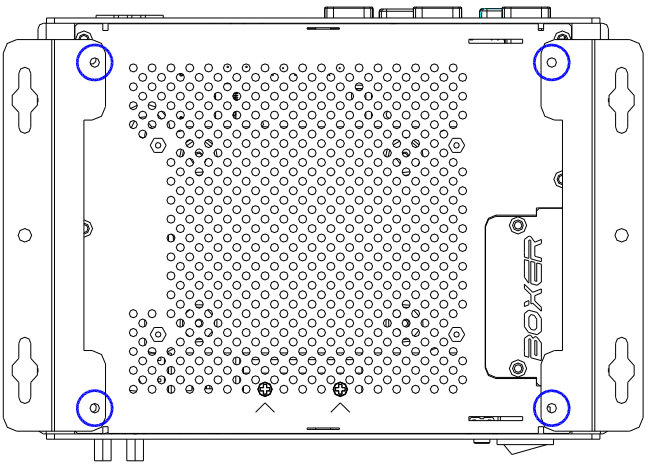


2.45 Memory Card Installation

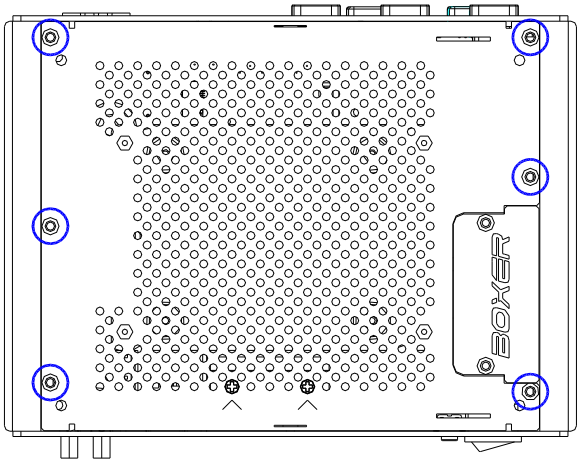
Step 1: Unfasten the two screws of the AEC-6637



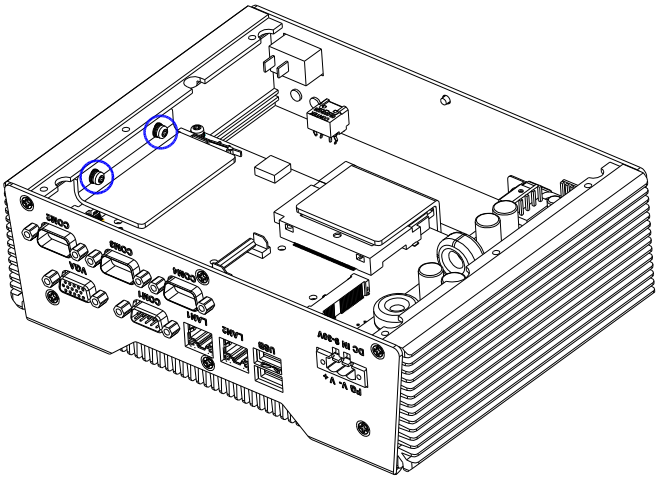
Step 2: Unfasten the four screws of the brackets



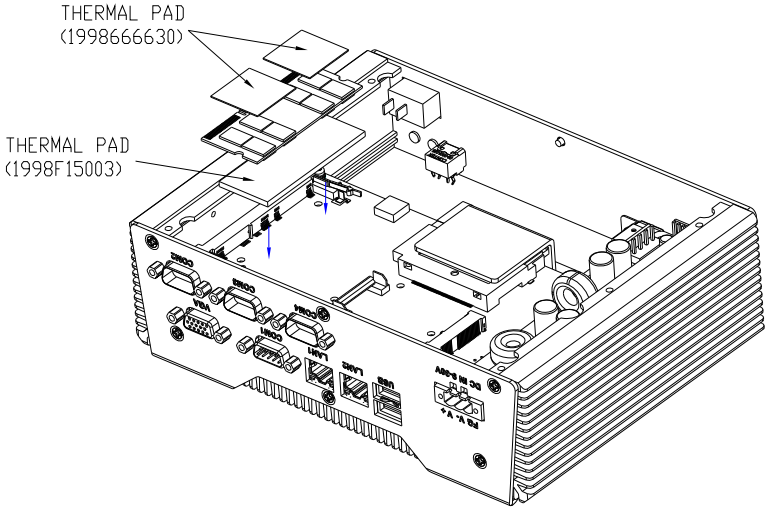
Step 3: Unfasten the six screws of the bottom cover



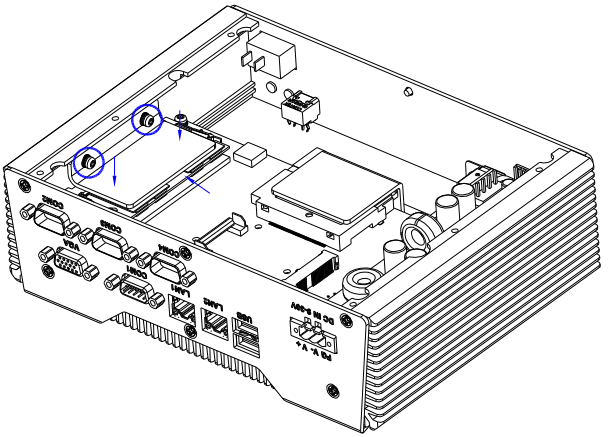
Step 4: Unfasten the screws of the bracket of Memory Card



Step 5: Adhere the Thermal pads onto the top and bottom of the Memory Card, and then insert the RAM at 30-degree angle to the memory slot and press

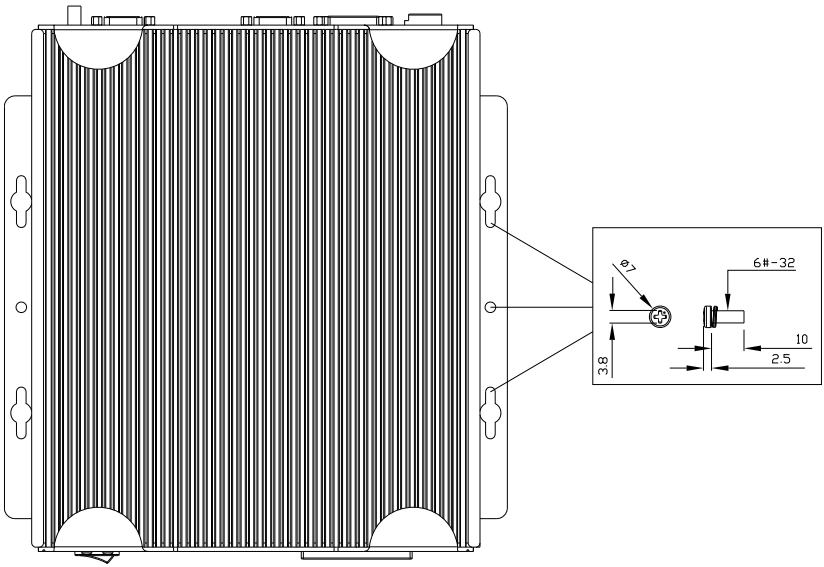


Step 6: Fasten the screws of the bracket of Memory Card and finish the installation



2.46 Wallmount Kit Installation

Get the brackets ready and fasten appropriate four screws on each bracket. After fastening the two brackets on the bottom lid of AEC-6637, the wallmount kit installation has been finished.



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-6637 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 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

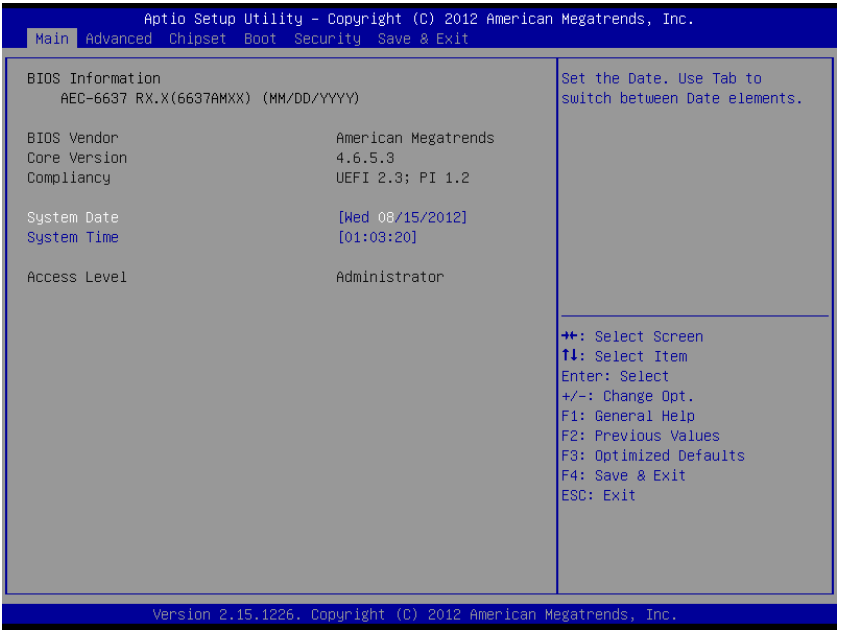
Set setup administrator password.

Save&Exit

Exit system setup after saving the changes.

Setup Menu

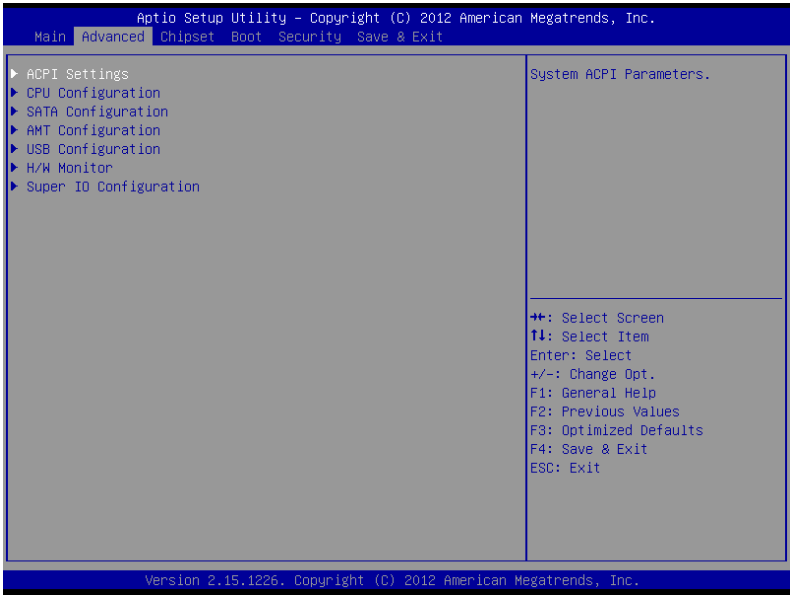
Setup submenu: Main



Options summary: (***default setting***)

System Date	Day MM:DD:YYYY	
Change the month, year and century. The 'Day' is changed automatically.		
System Time	HH : MM : SS	
Change the clock of the system.		

Setup submenu: Advanced

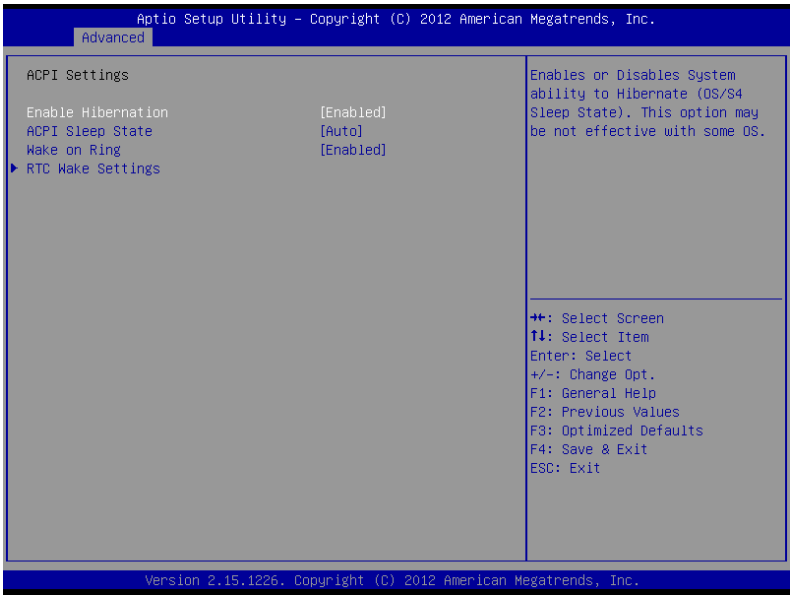


Options summary: (***default setting***)

ACPI Settings		
System ACPI Parameters		
CPU Configuration		
CPU Configuration Parameters		
SATA Configuration		
SATA Device Options Settings		
AMT Configuration		
AMT Configuration Parameters		
USB Configuration		

USB Configuration Parameters		
H/W Monitor		
Monitor hardware status		
Super IO Configuration		
Super IO Configuration Parameters		

ACPI Settings

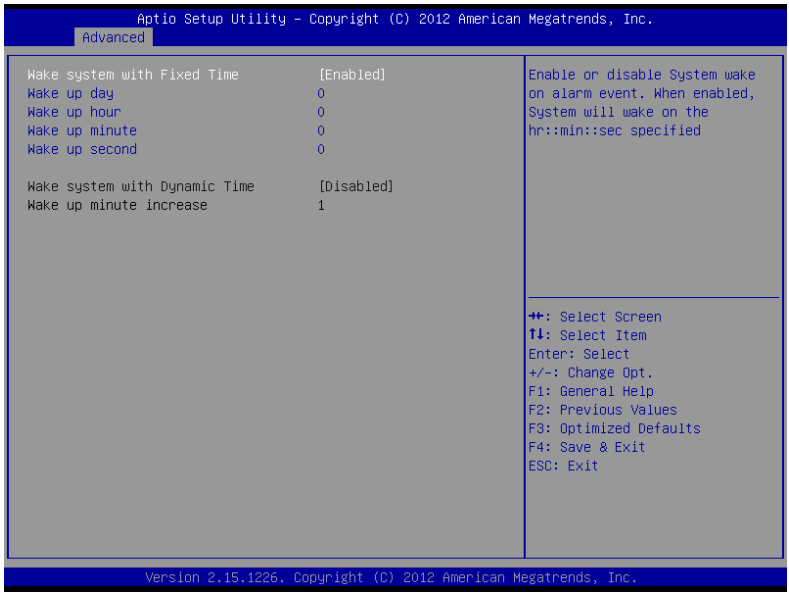


Options summary: (***default setting***)

Enable Hibernation	***Enabled***	
	Disabled	
Enabled or disabled hibernate (OS/S4 Sleep State).		
ACPI Sleep State	Suspend Disabled	

	S1 only(CPU Stop Clock)	
	S3 only(Suspend to RAM)	
	Auto	
Select the ACPI state used for System Suspend		
Wake on Ring	***Enabled***	
	Disabled	
Enabled or disabled wake on ring function.		
RTC Wake Settings		
Enable system to wake from S5 using RTC alarm.		

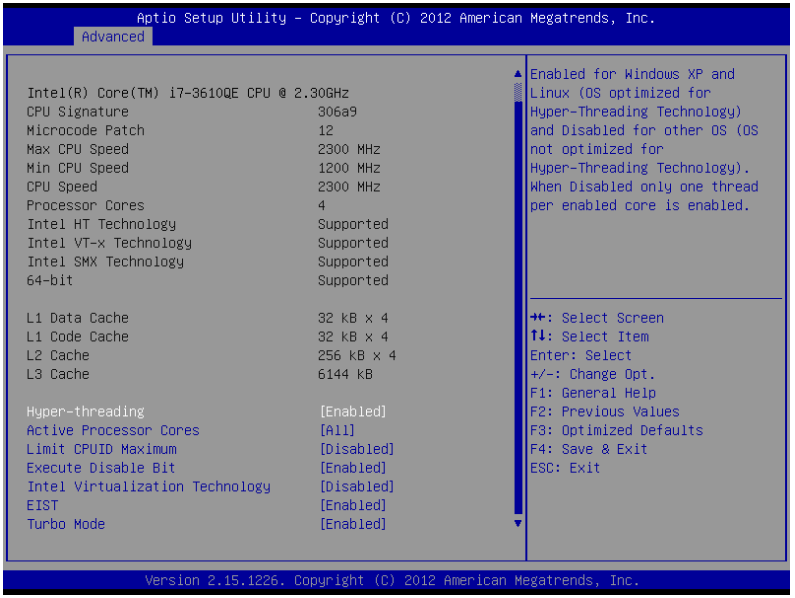
RTC Wake Settings



Options summary: (***default setting***)

Wake system with Fixed Time	***Disabled***	
	Enabled	
Enable or disable System wake on alarm event. Wake up time is setting by following settings.		
Wake up day	0-31	
Select 0 for daily system wake up 1-31 for which day of the month that you would like the system to wake up		
Wake up hour	0-23	
Wake up minute	0-59	
Wake up second	0-59	
Wake system with Dynamic Time	***Disabled***	
	Enabled	
Enable or disable System wake on alarm event. Wake up time is current time + Increase minutes.		
Wake up minute increase	1-5	

CPU Configuration

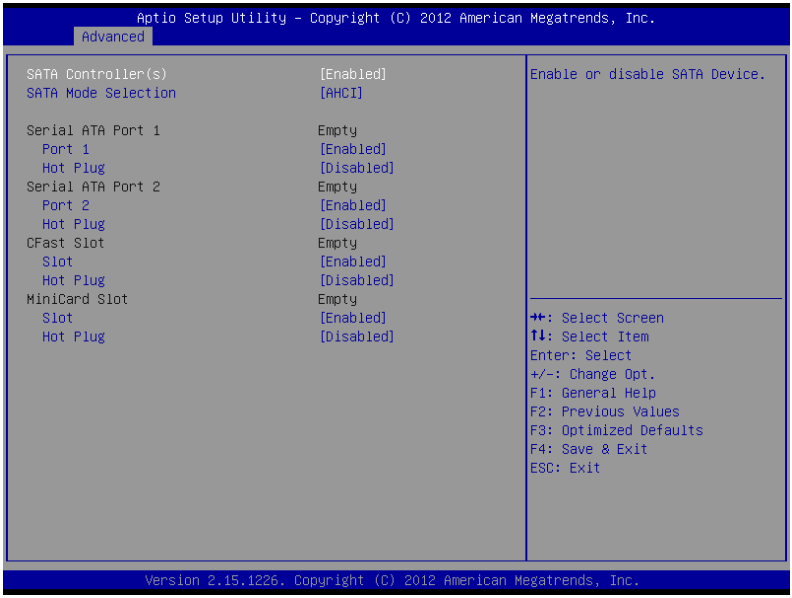


Options summary: (***default setting***)

Hyper-Threading	Disabled	
	Enabled	
En/Disable CPU Hyper-Threading function		
Active Processor	***ALL***	
Cores	1 to Max CPU cores	
Number of CPU cores to be active.		
Limit CPUID	***Disabled***	
Maximum	Enabled	
Disabled for Windows XP		

Execute Disable Bit	Disabled	
	Enabled	
En/Disable XD bit for supporting OS		
Intel Virtualization Technology	***Disabled***	
	Enabled	
En/Disable Intel VT-x function		
EIST	Disabled	
	Enabled	
En/Disable Intel SpeedStep		
Turbo Mode	Disabled	
	Enabled	
En/Disable Intel Turbo Mode		

SATA Configuration

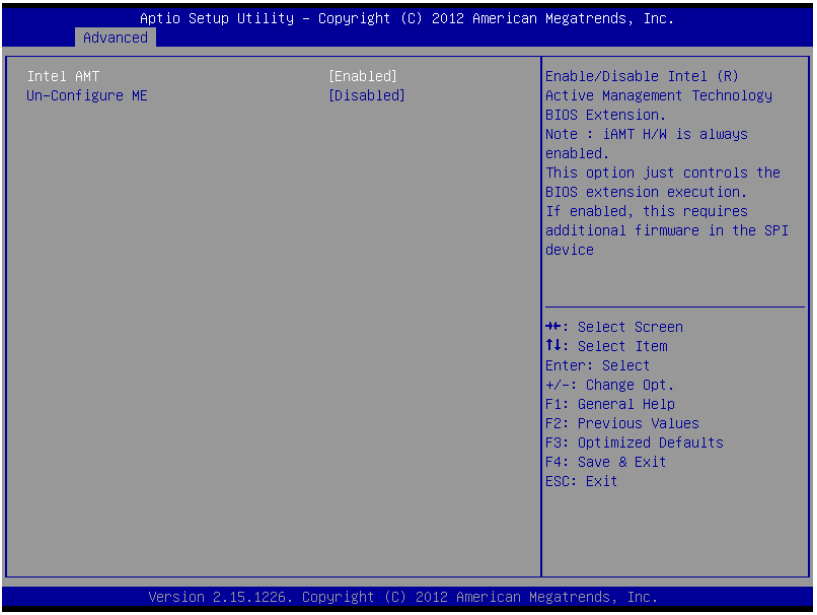


Options summary: (***default setting***)

SATA Controller(s)	Disabled	
	Enabled	
En/Disable SATA controller		
Configure SATA as	***IDE***	
	AHCI	
	RAID	
Configure SATA controller operating as IDE/AHCI/RAID mode.		
Port 1/Port 2/CFast Slot/Minicard Slot	Disabled	
	Enabled	

En/Disable the selected port.		
Hot Plug	***Disabled***	
	Enabled	
En/Disable Hot Plug feature for specified port.		

AMT Configuration



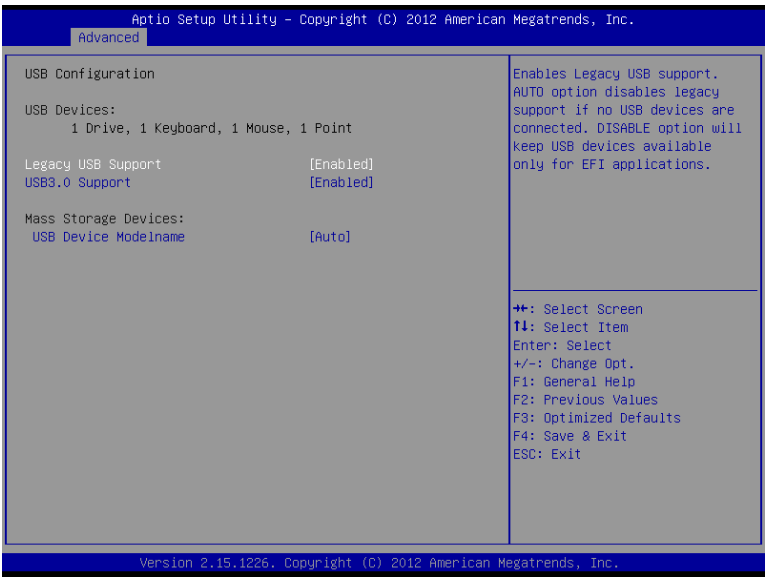
Options summary: (***default setting***)

Intel AMT	***Enabled***	
	Disabled	

En/Disable Intel® Active Management Technology BIOS Extension. Note: iAMT H/W is always enabled. This option just controls the BIOS extension execution. If enabled, this requires additional firmware in the SPI device

Un-Configure ME	Enabled	
	Disabled	
OEMFlag Bit 15: Un-Configure ME without password		

USB Configuration

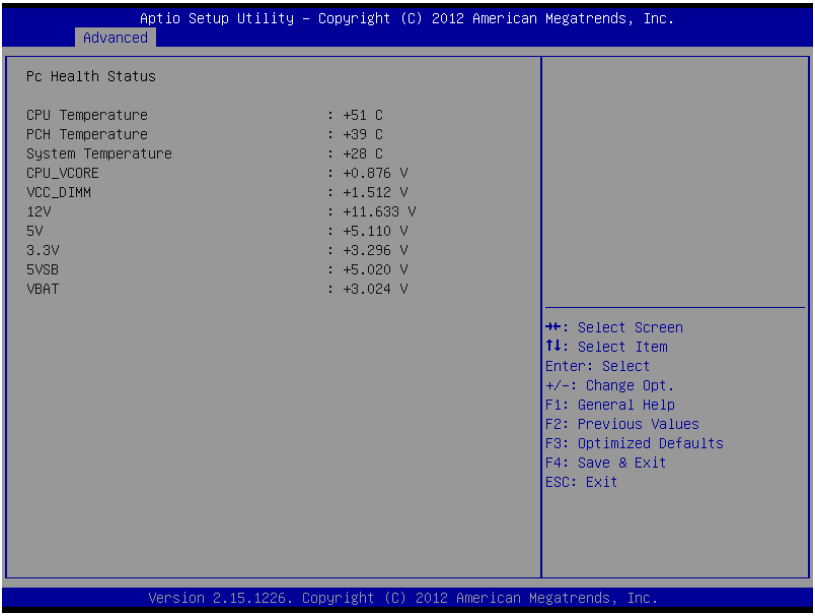


Options summary: (***default setting***)

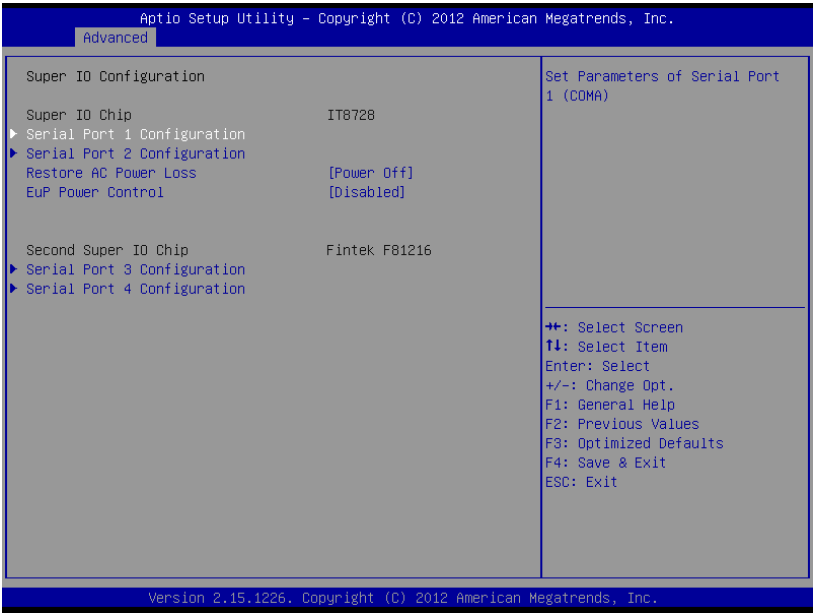
Legacy USB Support	***Enabled***	
	Disabled	
	Auto	

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. DISABLE option will keep USB devices available only for EFI application		
USB3.0 Support	***Enabled***	
	Disabled	
Enables BIOS Support for USB3.0 (XHCI). When disabled, PCH USB3.0 controller will also be disabled.		
Device Name (Emulation Type)	**Auto**	
	Floppy	
	Forced FDD	
	Hard Disk	
	CD-ROM	
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)		

H/W Monitor


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
Pc Health Status
CPU Temperature : +51 C
PCH Temperature : +39 C
System Temperature : +28 C
CPU_VCORE : +0.876 V
VCC_DIMM : +1.512 V
12V : +11.633 V
5V : +5.110 V
3.3V : +3.296 V
5VSB : +5.020 V
VBAT : +3.024 V
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1226. Copyright (C) 2012 American Megatrends, Inc.

Super IO Configuration

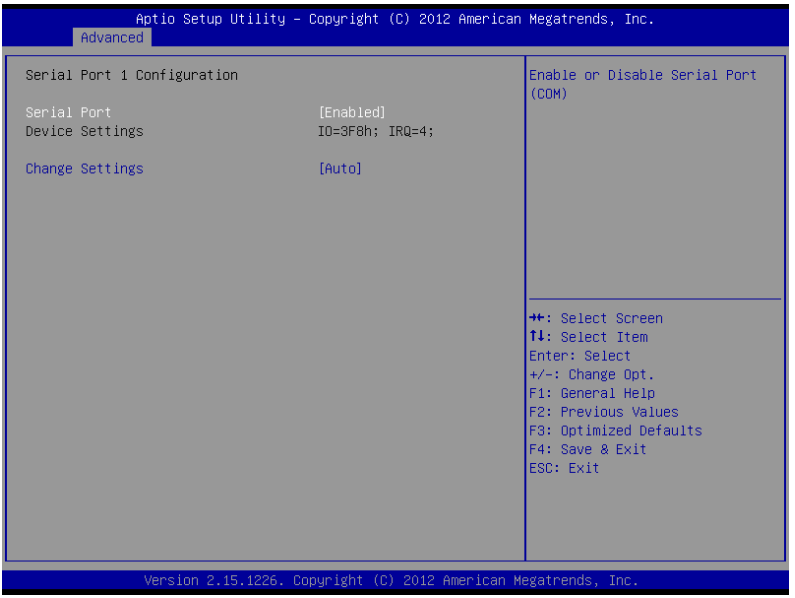


Options summary: (***default setting***)

Serial Port 1/2/3/4 Configuration		
Set Parameters of Serial Port 1/2		
Restore AC Power Loss	***Power Off***	
	Power On	
	Last State	
Select AC power state when power is re-applied after a power failure.		
EuP Power Control	***Disabled***	

	Enabled	
Configure Energy-using Product(EuP) Power Control.		

Serial Port 1 Configuration

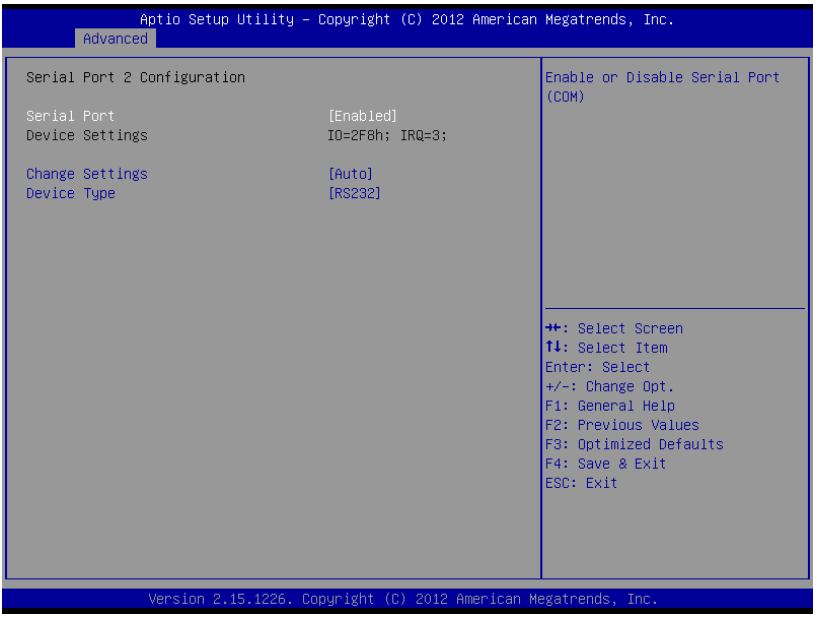


Options summary: (***default setting***)

Serial Port	Disabled	
	Enabled	
En/Disable specified serial port.		
Change Settings	***Auto***	
	IO=3F8h; IRQ=4;	
	IO=3F8h; IRQ=3,4,5,7,10,11,12;	

	IO=2F8h; IRQ=3,4,5,7,10,11,12;	
	IO=3E8h; IRQ=3,4,5,7,10,11,12;	
	IO=2E8h; IRQ=3,4,5,7,10,11,12;	
Select a resource setting for Super IO device.		

Serial Port 2 Configuration

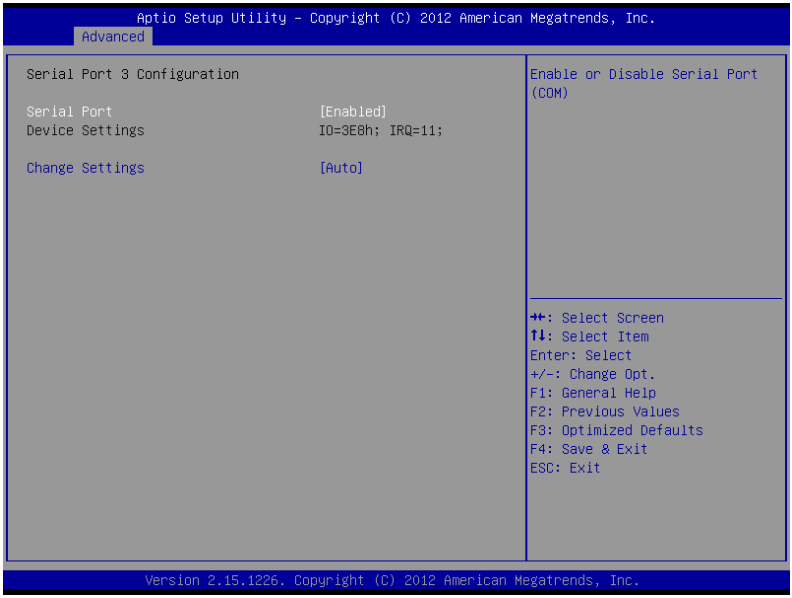


Options summary: (***default setting***)

Serial Port	Disabled	
	Enabled	

En/Disable specified serial port.		
Change Settings	***Auto***	
	IO=2F8h; IRQ=3;	
	IO=3F8h; IRQ=3,4,5,7,10,11,12;	
	IO=2F8h; IRQ=3,4,5,7,10,11,12;	
	IO=3E8h; IRQ=3,4,5,7,10,11,12;	
	IO=2E8h; IRQ=3,4,5,7,10,11,12;	
Select a resource setting for Super IO device.		
Device Type	***RS232***	
	RS422	
	RS485	
Configure COM2 operated as RS232, RS422 or RS485.		

Serial Port 3 Configuration

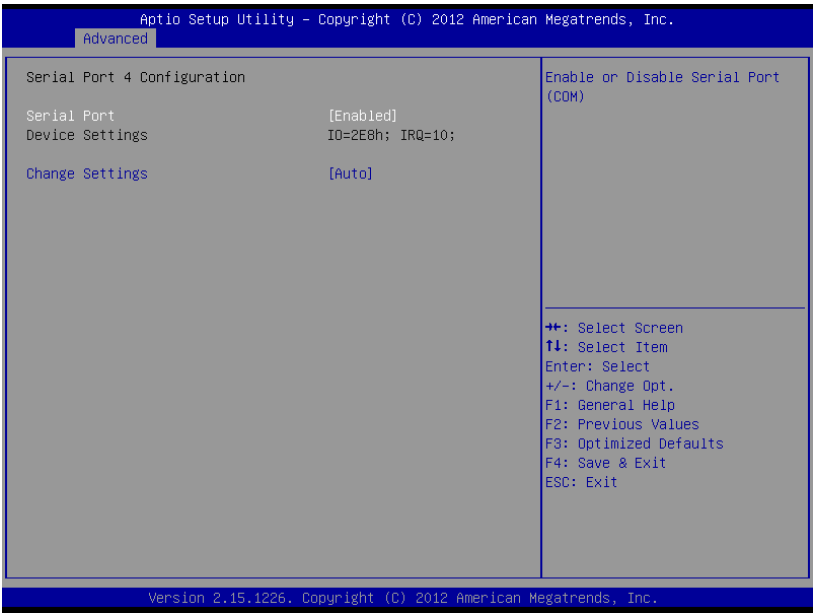


Options summary: (***default setting***)

Serial Port	Disabled	
	Enabled	
En/Disable specified serial port.		
Change Settings	***Auto***	
	IO=3E8h; IRQ=11;	
	IO=3F8h; IRQ=3,4,5,7,10,11,12;	
	IO=2F8h; IRQ=3,4,5,7,10,11,12;	

	IO=3E8h; IRQ=3,4,5,7,10,11,12;	
	IO=2E8h; IRQ=3,4,5,7,10,11,12;	
Select a resource setting for Super IO device.		

Serial Port 4 Configuration



Options summary: (***default setting***)

Serial Port	Disabled	
	Enabled	
En/Disable specified serial port.		
Change Settings	***Auto***	

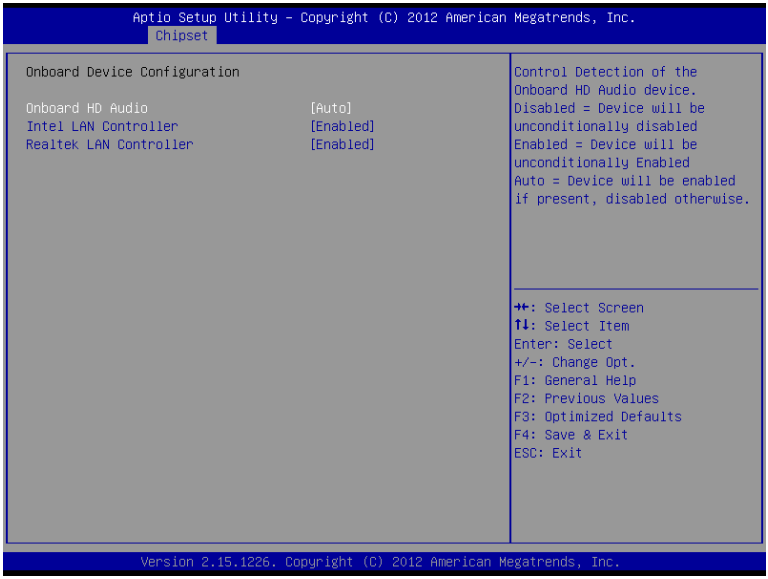
	IO=2E8h; IRQ=10;	
	IO=3F8h; IRQ=3,4,5,7,10,11,12;	
	IO=2F8h; IRQ=3,4,5,7,10,11,12;	
	IO=3E8h; IRQ=3,4,5,7,10,11,12;	
	IO=2E8h; IRQ=3,4,5,7,10,11,12;	
Select a resource setting for Super IO device.		

Setup submenu: Chipset

Options summary: (***default setting***)

Onboard Device		
Configure Onboard Devices		
PCI-IO Configuration		
South Bridge Parameters		
Memory Configuration		
Memory Parameters		
Graphic Configuration		
Graphic Parameters		

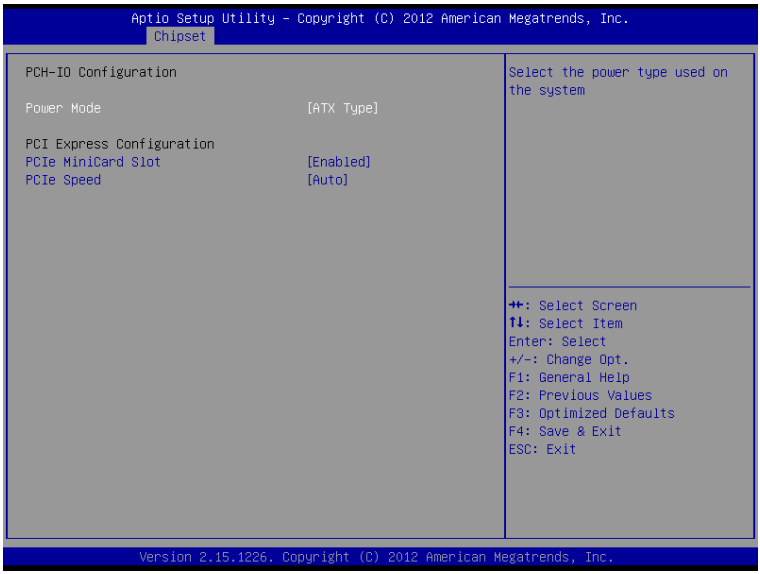
Onboard Device



Options summary: (***default setting***)

Onboard HD Audio	Disabled	
	Enabled	
	Auto	
En/Disabled HD Audio controller.		
Intel LAN Controller	***Enabled***	
	Disabled	
En/Disabled Intel i82579 NIC		
Realtek LAN Controller	***Enabled***	
	Disabled	
En/Disabled Realtek RTL8111E NIC		

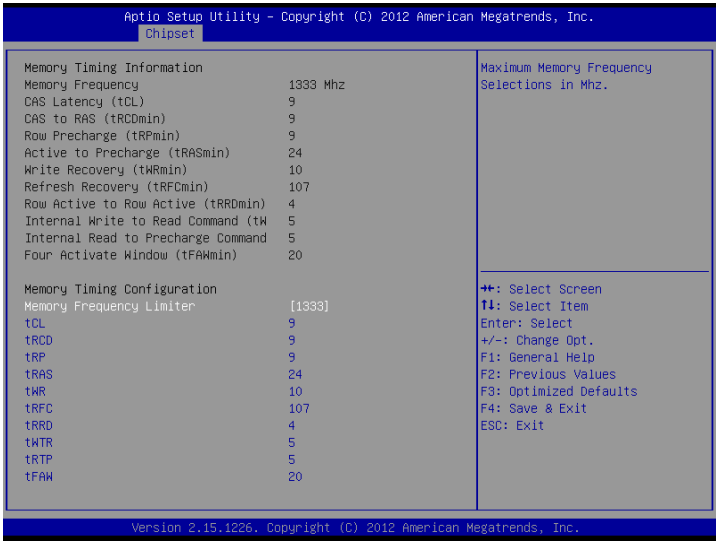
PCH-IO Configuration



Options summary: (***default setting***)

Power Mode	***128MB***	
	256MB	
Select the poer type used on the system		
PCIe MiniCard Slot	Disabled	
	Enabled	
Control the PCI Express Root Port.		
PCIe Speed	***Auto***	
	Gen1	
	Gen2	
Select PCI Express port speed. Some PCIe carsd must set to Gen1 for operation.		

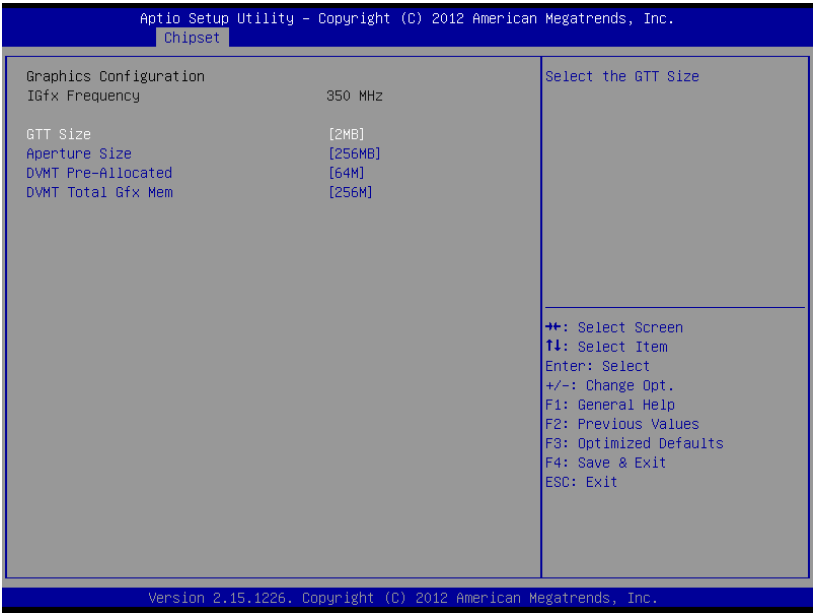
Memory Configuration



Options summary: (***default setting***)

DIMM Profile	***Default DIMM profile***	
	XMP Profile 1	
	XMP Profile 2	
Select DIMM timing profile that should be used		
Memory Frequency Limiter	***Auto***	
	1067	
	1333	
	1600	
Maximum Memory Frequency Selections in Mhz.		
Max TOLUD	***Dynamic***	
	1 GB	
	1.25 GB	
	1.5 GB	
	1.75 GB	
	2 GB	
	2.25 GB	
	2.5 GB	
	2.75 GB	
	3 GB	
	3.25 GB	
Maximum Value of TOLUD. Dynamic assignment would adjust TOLUD automatically based on largest MMIO length of install graphic controller.		

Graphic Configuration

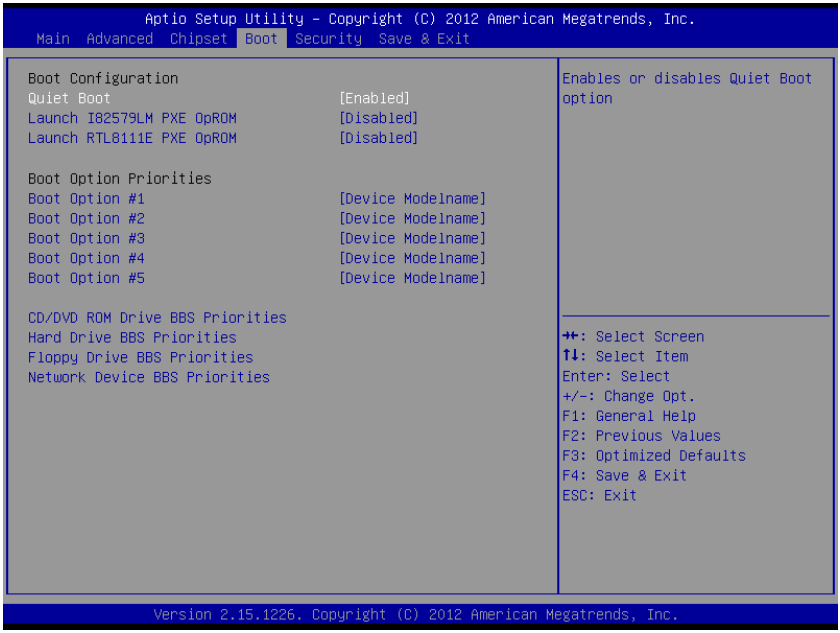


Options summary: (***default setting***)

GTT Size	1MB	
	2MB	
Select the GTT Size		
Aperture Size	128MB	
	256MB	
	512MB	
Select the Aperture Size		
DVMT	***64MB***	
Pre-Allocated	32MB~1024MB	

Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.		
DVMT Total Gfx Mem	128MB	
	256MB	
	Max	
Select DVMT 5.0 Total Graphic Memory size used by the Internal Graphics Device.		

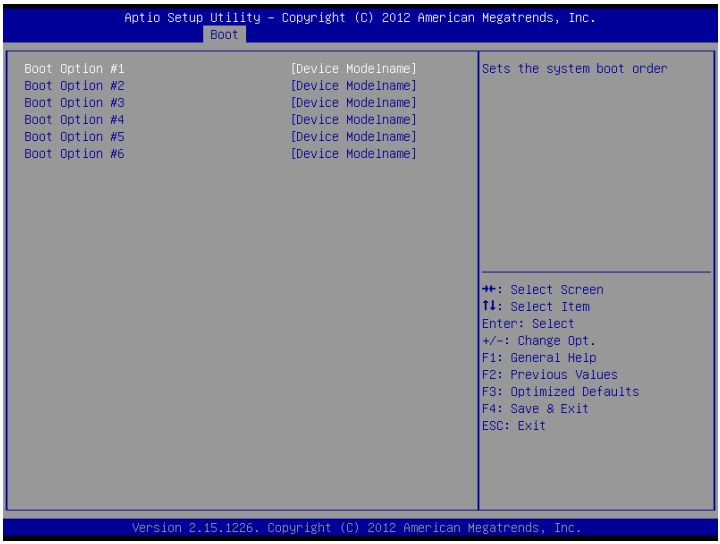
Setup submenu: Boot



Options summary: (***default setting***)

Quiet Boot	Disabled	
	Enabled	
En/Disable showing boot logo.		
Launch I82579LM/ RTL8111E PXE OpROM	***Disabled***	
	Enabled	
En/Disable PXE boot for I82579LM/RTL8111E LAN		
Boot Option #X/ XXXX Drive BBS Priorities		
The order of boot priorities.		

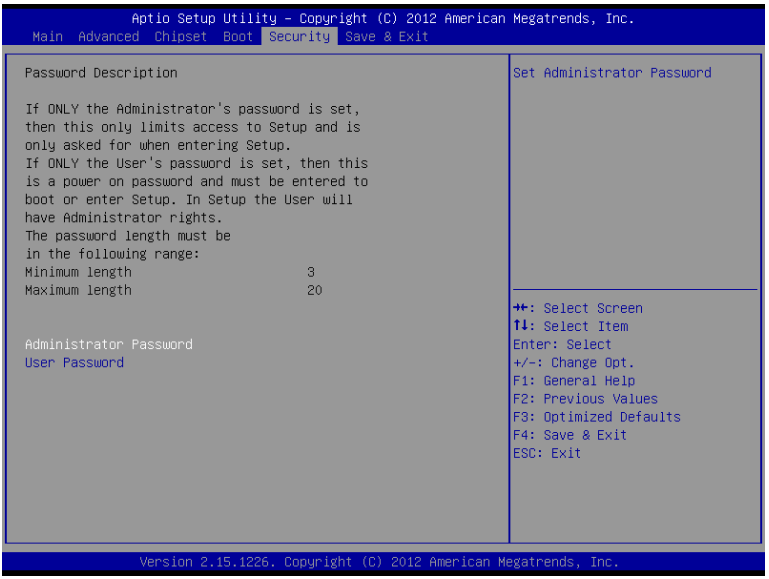
BBS Priorities



Options summary: (***default setting***)

Boot Option #x	Disabled	
	Device name	
Sets the system boot order		

Setup submenu: Security



Options summary: (***default setting***)

Administrator Password/ User Password	***Not set***	

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.

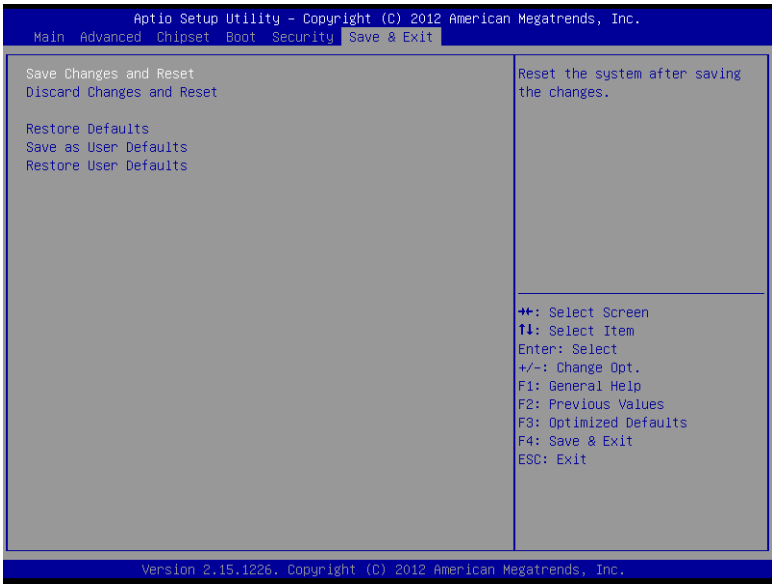
Install the Password:

Press Enter on this item, 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



Options summary: (***default setting***)

Save Changes and Reset		
Reset the system after saving the changes		
Discard Changes and Reset		
Reset system setup without saving any changes		
Restore Defaults		
Restore/Load Default values for all the setup options.		
Save as User Defaults		

Save the changes done so far as User Defaults		
Restore User Defaults		
Restore the User Defaults to all the setup options		

Chapter

4

Driver Installation

.

The AEC-6637 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 auto start and show the installation guide. If not, please follow the sequence below to install the drivers.

Follow the sequence below to install the drivers:

Step 1 – Install Chipset Driver

Step 2 – Install VGA Driver

Step 3 – Install LAN1 Driver (Realtek LAN Chip)

Step 4 – Install LAN2 Driver (Intel® LAN Chip)

Step 5 – Install Audio Driver

Step 6 – Install ME Driver

Step 7 – Install RAID & AHCI Driver

Step 8 – Install USB3.0 Driver

Please read instructions below for further detailed installations.

4.1 Installation:

Insert the AEC-6637 DVD-ROM into the DVD-ROM drive. And install the drivers from Step 1 to Step 8 in order.

Step 1 – Install Chipset Driver

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

Step 2 – Install VGA Driver

1. Click on the ***STEP2-VGA*** 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

Note 1:

- This motherboard supports VGA and LVDS display devices. In Single Display mode, use the hot keys to switch between VGA to LVDS device or vice versa. By default, press **<Ctrl>+<Alt>+<F1>** to switch to VGA device and press **<Ctrl>+<Alt>+<F3>** to switch to LVDS device.
- Before removing the current display device, connect the display device that you want to use, and then press the hot keys to switch to that device.

Note 2: If the OS is Windows® XP, you have to install the driver of dotNet Framework first. Simply click on ***dotnetfx35.exe*** located in ***dotNet Framwork*** folder.

Step 3 –Install LAN1 Driver (Realtek Chip)

1. Click on the ***STEP3-LAN1(Realtek)*** 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 LAN2 Driver (Intel® LAN Chip)

1. Click on the ***STEP4-LAN2(Intel)*** folder and select the OS folder your system is
2. Double click on the ***.exe*** file located in each OS folder
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

Step 5 –Install Audio Driver

1. Click on the ***STEP5-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 6 – Install ME Driver

1. Click on the ***STEP6-ME SW*** 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 7 – Install RAID & AHDI Driver

Please refer to the ***Appendix C RAID & AHDI Settings***

Step 8 –Install USB3.0 Driver

1. Click on the ***STEP8-USB 3.0*** folder and select the OS folder your system is
1. 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

Appendix

A

Programming the Watchdog Timer

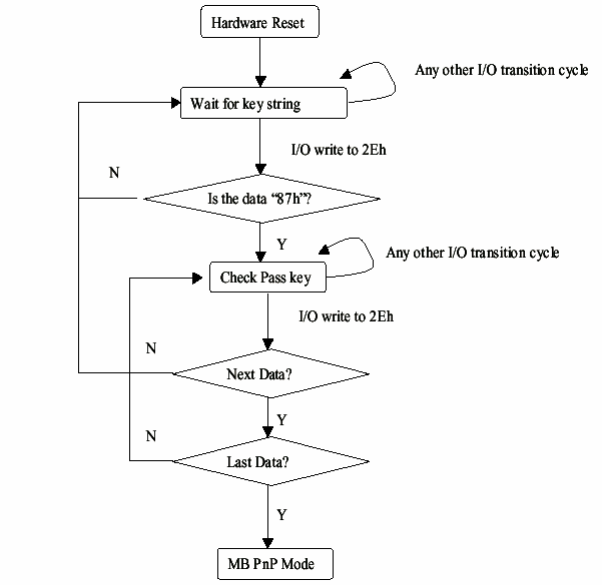
A.1 Programming

AEC-6637 utilizes ITE IT8728F chipset as its watchdog timer controller.

Below are the procedures to complete its configuration and the AAEON intial 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 8728F enters the normal mode with all logical devices disabled except KBC. The initial state (enable bit) of this logical device (KBC) is determined by the state of pin 121 (DTR1#) at the falling edge of the system reset during power-on reset.



There are three steps to complete the configuration setup: (1) Enter the MB PnP Mode; (2) Modify the data of configuration registers; (3) Exit the MB PnP Mode. Undesired result may occur if the MB PnP Mode is not exited normally.

(1) Enter the MB PnP Mode

To enter the MB PnP Mode, four special I/O write operations are to be performed during Wait for Key state. To ensure the initial state of the key-check logic, it is necessary to perform four write operations to the Special Address port (2EH). Two different enter keys are provided to select configuration ports (2Eh/2Fh) of the next step.

	Address Port	Data Port
87h, 01h, 55h, 55h:	2Eh	2Fh

(2) Modify the Data of the Registers

All configuration registers can be accessed after entering the MB PnP Mode. Before accessing a selected register, the content of Index 07h must be changed to the LDN to which the register belongs, except some Global registers.

(3) Exit the MB PnP Mode

Set bit 1 of the configure control register (Index=02h) to 1 to exit the MB PnP Mode.

WatchDog Timer Configuration Registers

LDN	Index	R/W	Reset	Configuration Register or Action
All	02H	W	N/A	Configure Control
07H	71H	R/W	00H	WatchDog Timer Control Register
07H	72H	R/W	00H	WatchDog Timer Configuration Register
07H	73H	R/W	00H	WatchDog Timer Time-out Value Register

Configure Control (Index=02h)

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

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

WatchDog Timer Control Register (Index=71h, Default=00h)

Bit	Description
7	WDT is reset upon a CIR interrupt
6	WDT is reset upon a KBC (mouse) interrupt
5	WDT is reset upon a KBC (keyboard) interrupt
4	WDT is reset upon a read or a write to the Game Port base address
3-2	Reserved
1	Force Time-out. This bit is self-clearing
0	WDT Status
	1: WDT value reaches 0.
	0: WDT value is not 0

WatchDog Timer Configuration Register (Index=72h, Default=00h)

Bit	Description
7	WDT Time-out value select
	1: Second
	0: Minute
6	WDT output through KRST (pulse) enable
5-4	Reserved
3-0	Select the interrupt level[Note] for WDT

WatchDog Timer Time-out Value Register (Index=73h, Default=00h)

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

A.2 ITE8728F Watchdog Timer Initial Program

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

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

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

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

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

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

```
        RET
        Exit_Configuration_Mode ENDP

        Check_Chip PROC NEAR

        MOV AL,20h
        CALL Read_Configuration_Data
        CMP AL,87h
        JNE Not_Initial

        MOV AL,21h
        CALL Read_Configuration_Data
        CMP AL,12h
        JNE Not_Initial

Need_Initial:
        STC
        RET
Not_Initial:
        CLC
        RET
        Check_Chip ENDP
        Read_Configuration_Data PROC NEAR
        MOV DX,WORD PTR CS:[Cfg_Port+04h]
        OUT DX,AL
```

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

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

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

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

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

DW 02Eh,02Fh
```

END Main

Note: Interrupt level mapping

0Fh-Dh: not valid

0Ch: IRQ12

.

.

03h: IRQ3

02h: not valid

01h: IRQ1

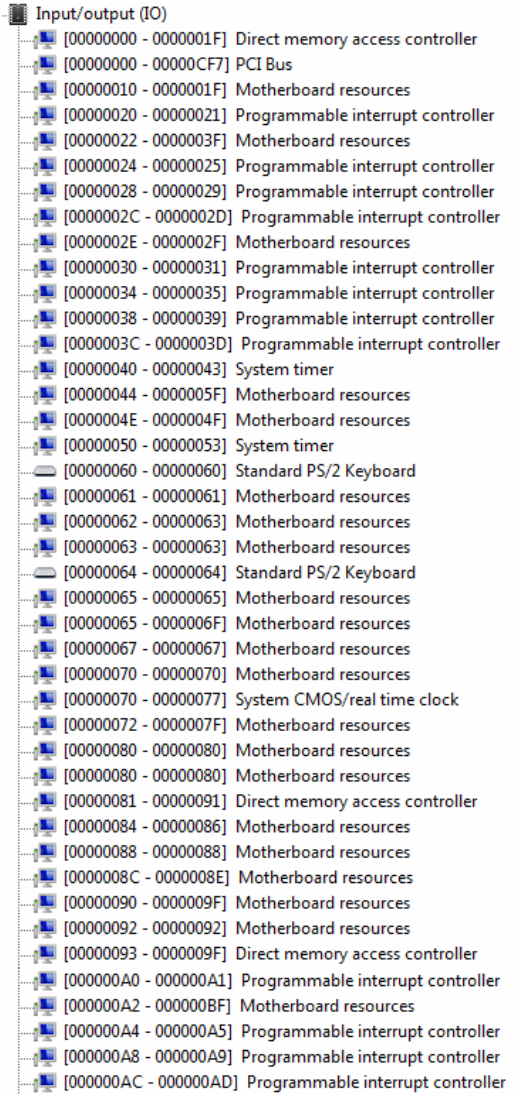
00h: no interrupt selected

Appendix

B

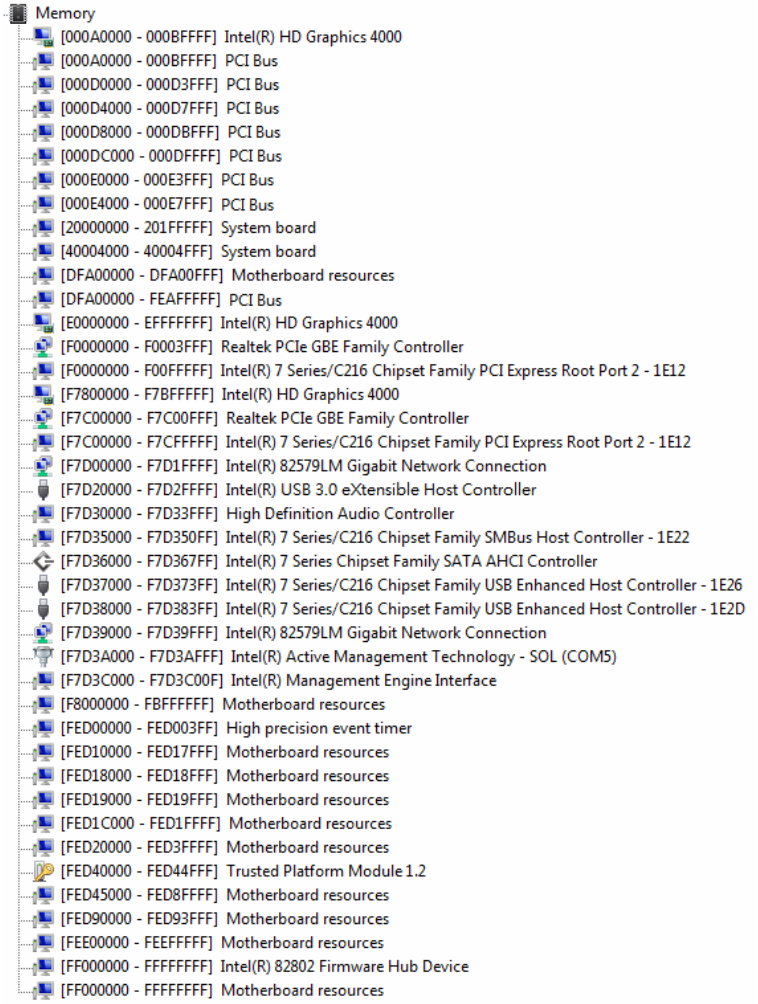
I/O Information

B.1 I/O Address Map

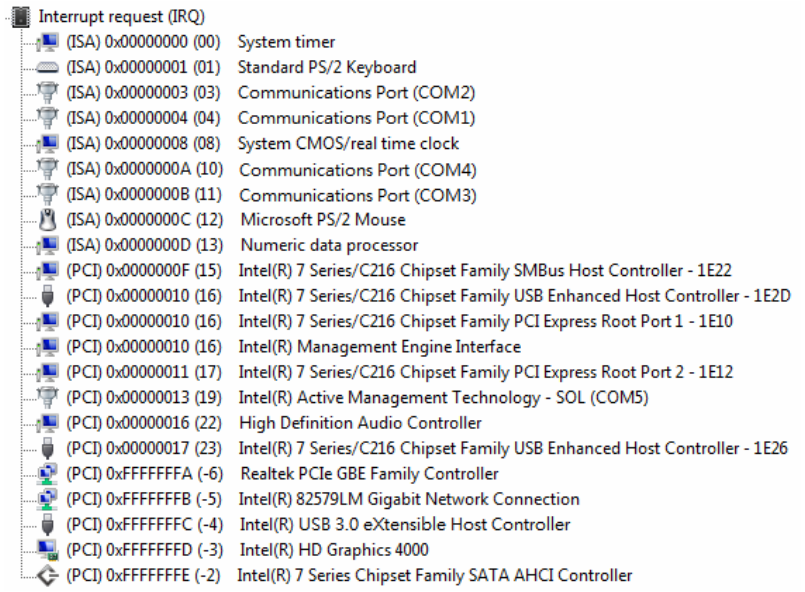


- [000000B0 - 000000B1] Programmable interrupt controller
- [000000B2 - 000000B3] Motherboard resources
- [000000B4 - 000000B5] Programmable interrupt controller
- [000000B8 - 000000B9] Programmable interrupt controller
- [000000BC - 000000BD] Programmable interrupt controller
- [000000C0 - 000000DF] Direct memory access controller
- [000000E0 - 000000EF] Motherboard resources
- [000000F0 - 000000FF] Numeric data processor
- [00000200 - 0000020F] Motherboard resources
- [000002E8 - 000002EF] Communications Port (COM4)
- [000002F8 - 000002FF] Communications Port (COM2)
- [00000378 - 0000037F] Printer Port (LPT1)
- [000003B0 - 000003BB] Intel(R) HD Graphics 4000
- [000003C0 - 000003DF] Intel(R) HD Graphics 4000
- [000003E8 - 000003EF] Communications Port (COM3)
- [000003F8 - 000003FF] Communications Port (COM1)
- [00000400 - 00000453] Motherboard resources
- [00000454 - 00000457] Motherboard resources
- [00000458 - 0000047F] Motherboard resources
- [000004D0 - 000004D1] Motherboard resources
- [000004D0 - 000004D1] Programmable interrupt controller
- [00000500 - 0000057F] Motherboard resources
- [00000680 - 0000069F] Motherboard resources
- [00000A00 - 00000A1F] Motherboard resources
- [00000A20 - 00000A2F] Motherboard resources
- [00000A30 - 00000A3F] Motherboard resources
- [00000D00 - 0000FFFF] PCI Bus
- [00001000 - 00001003] Motherboard resources
- [0000164E - 0000164F] Motherboard resources
- [0000E000 - 0000E0FF] Realtek PCIe GBE Family Controller
- [0000E000 - 0000EFFF] Intel(R) 7 Series/C216 Chipset Family PCI Express Root Port 2 - 1E12
- [0000F000 - 0000F03F] Intel(R) HD Graphics 4000
- [0000F040 - 0000F05F] Intel(R) 7 Series/C216 Chipset Family SMBus Host Controller - 1E22
- [0000F060 - 0000F07F] Intel(R) 7 Series Chipset Family SATA AHCI Controller
- [0000F0A0 - 0000F0A3] Intel(R) 7 Series Chipset Family SATA AHCI Controller
- [0000F0B0 - 0000F0B7] Intel(R) 7 Series Chipset Family SATA AHCI Controller
- [0000F0C0 - 0000F0C3] Intel(R) 7 Series Chipset Family SATA AHCI Controller
- [0000F0D0 - 0000F0D7] Intel(R) 7 Series Chipset Family SATA AHCI Controller
- [0000F0E0 - 0000F0E7] Intel(R) Active Management Technology - SOL (COM5)
- [0000FFFF - 0000FFFF] Motherboard resources

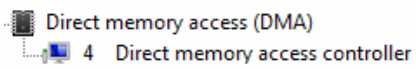
B.2 Memory Address Map



B.3 IRQ Mapping Chart



B.4 DMA Channel Assignments



Appendix

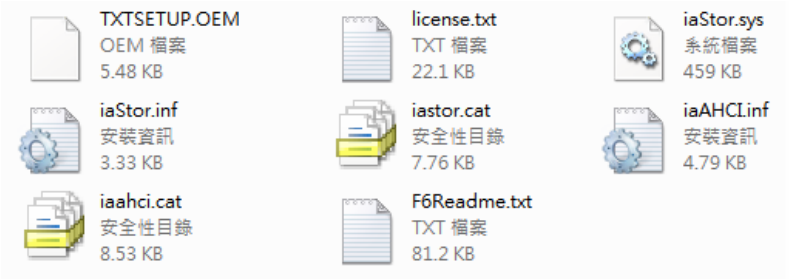
C

RAID & AHCI Settings

C.1 Setting RAID

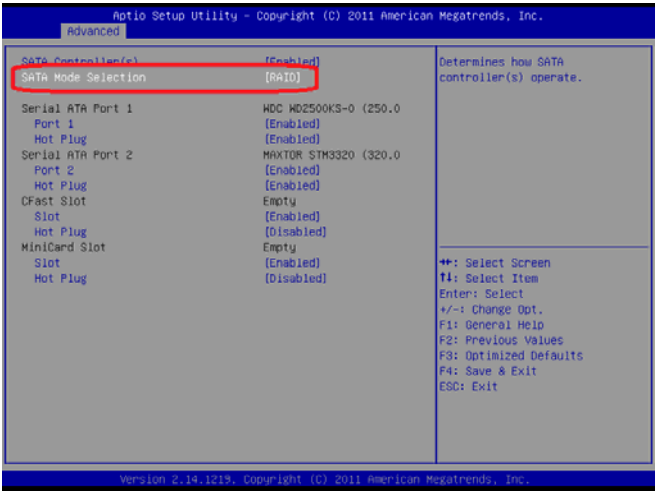
OS installation to SETUP RAID Mode

Step 1: Copy below files from “Driver CD -> Step7-RAID&AHCI\ WinXP_32” to diskette.

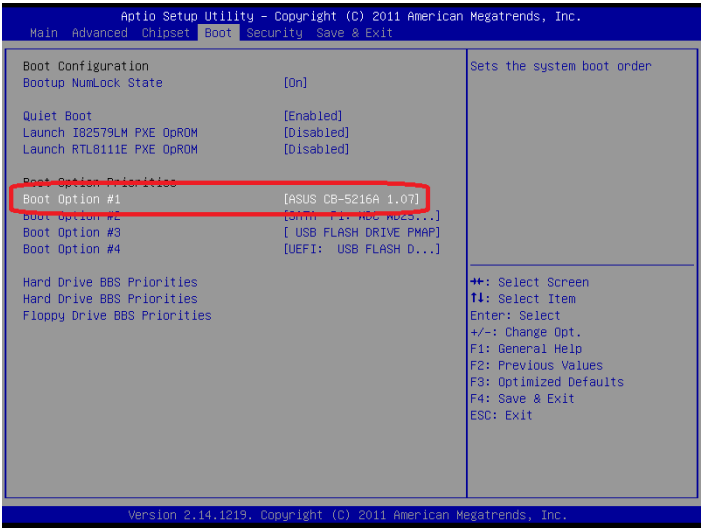


Step 2: Connect the USB Floppy drive to the board and insert the diskette from previous step.

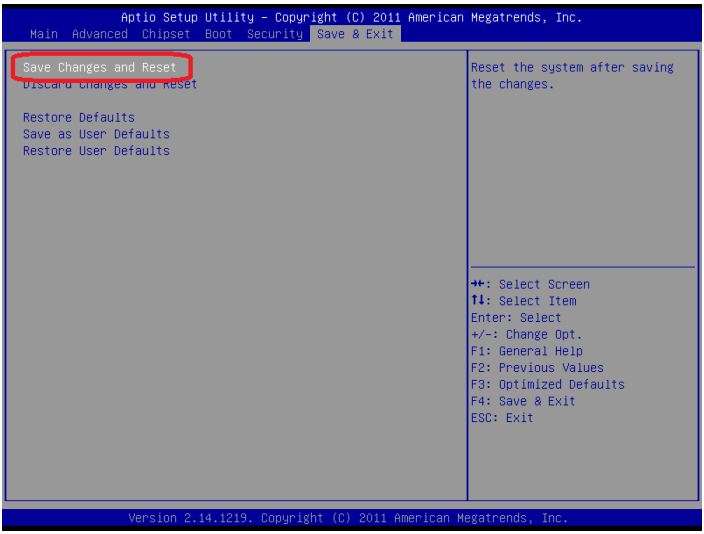
Step 3: Configure SATA Controller to RAID mode in **BIOS SETUP Menu: Advanced -> SATA Configuration -> SATA Mode -> RAID Mode**



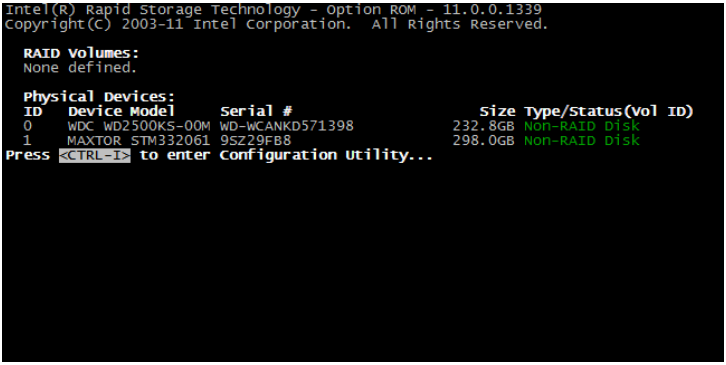
Step 4: Configure DVD/CD-ROM drive as the first boot device.



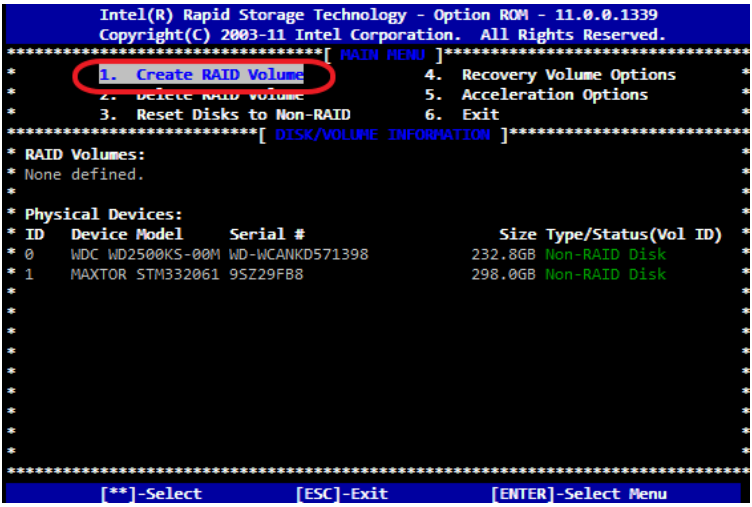
Step 5: Save changes and exit BIOS SETUP



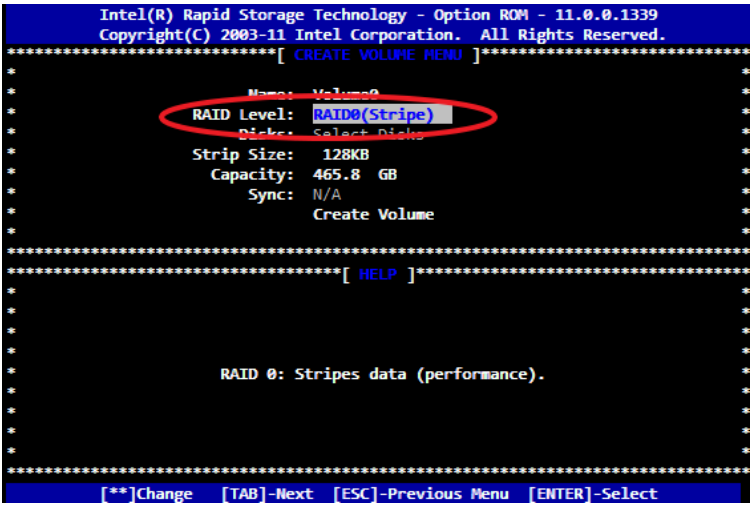
Step 6: Press **CTRL-I** to enter RAID Configuration Utility



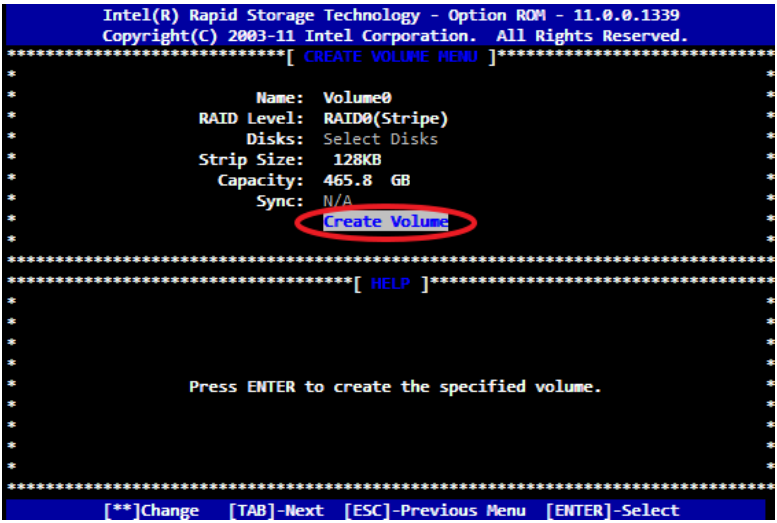
Step 7: Choose **"1. Create RAID Volume"**

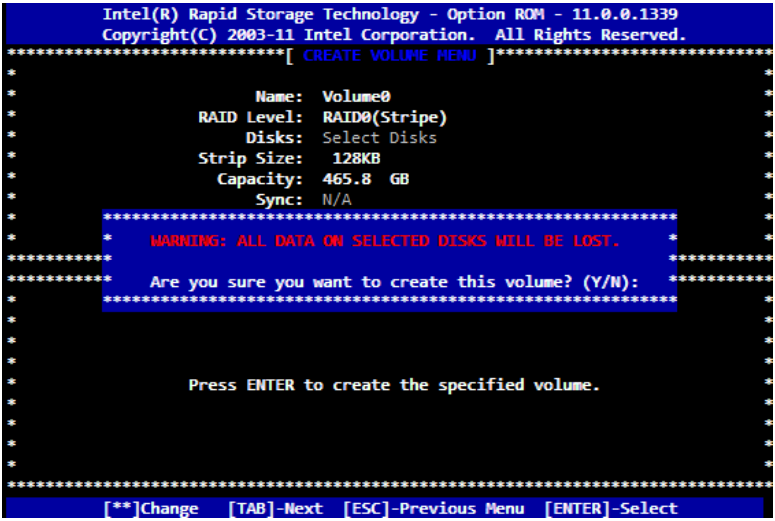


Step 8 – Configure RAID parameters for the system



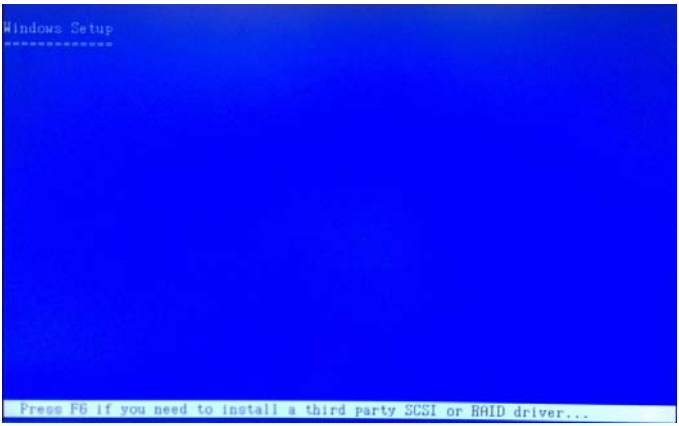
Step 9 – Choose **"Create Volume"** and confirmed in next warning message.



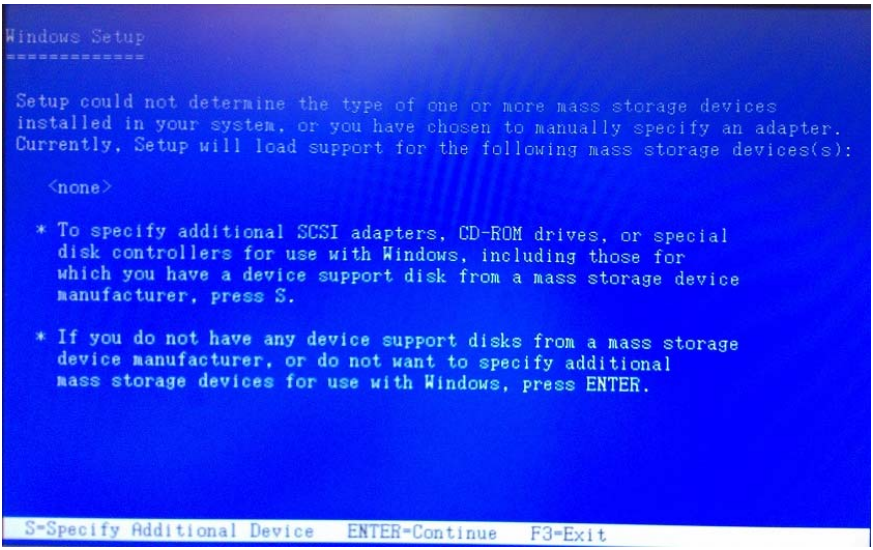


Step 10 – Exit RAID Configuration Utility and Reboot to DVD/CD-ROM device to install OS

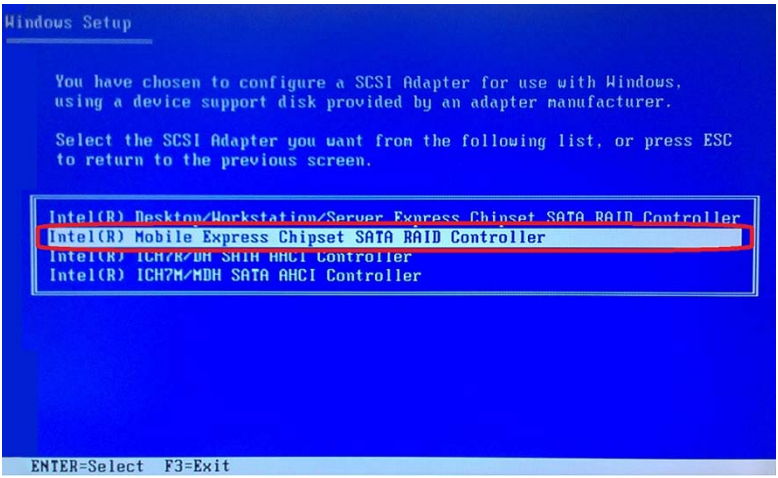
Step 11 – Press **"F6"** to install RAID driver



Step 12 – Press **"S"** to install RAID driver

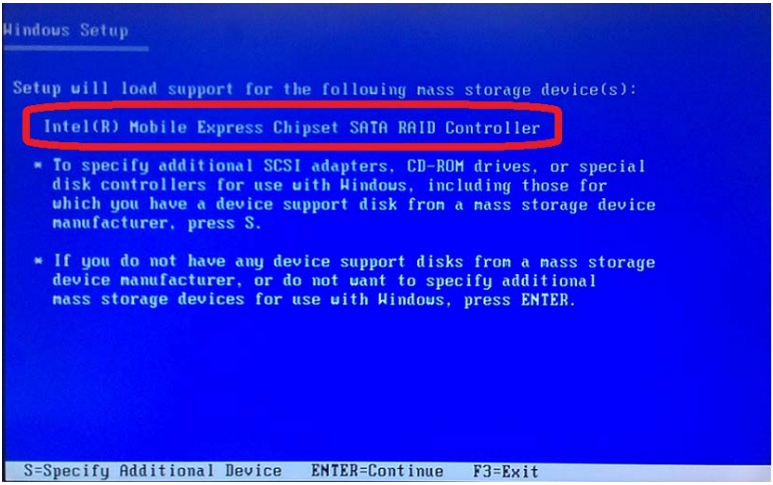


Step 13 – Choose **"Intel(R) Mobile Express Chipset SATA RAID Controller"**



Step 14 – It will show the model you selected and then press **"ENTER"**.

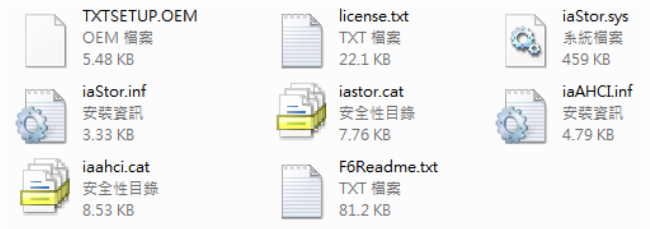
Windows Setup will continue to install OS.



C.2 Setting AHCI

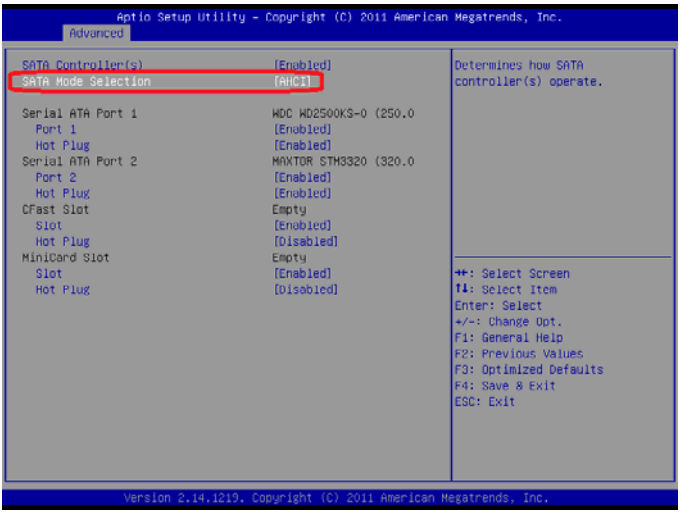
OS installation to SETUP AHCI Mode

Step 1: Copy below files from “Driver CD -> Step7-RAID&AHCI\ WinXP_32” to diskette.

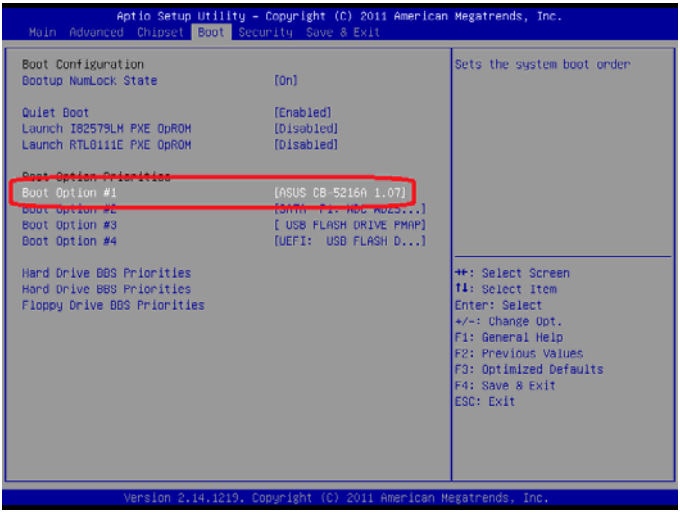


Step 2: Connect the USB Floppy drive to the board and insert the diskette from previous step.

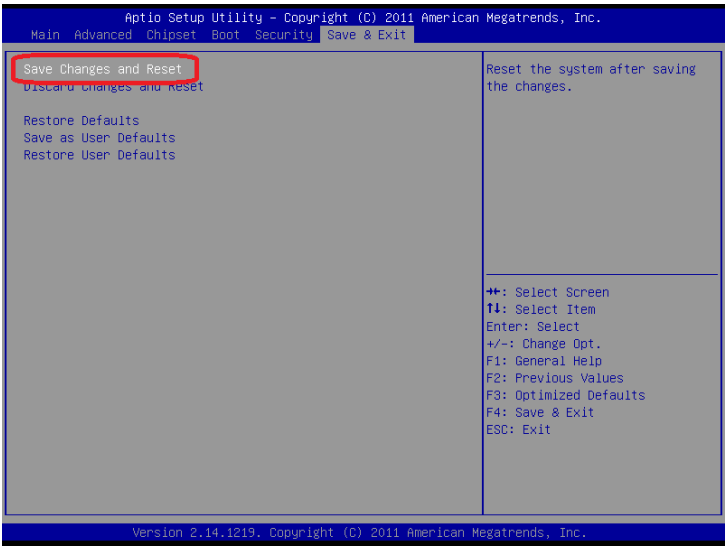
Step 3: Configure SATA Controller to RAID mode in **BIOS SETUP Menu: Advanced -> SATA Configuration -> SATA Mode -> AHCI Mode**



Step 4: Configure DVD/CD-ROM drive as the first boot device.



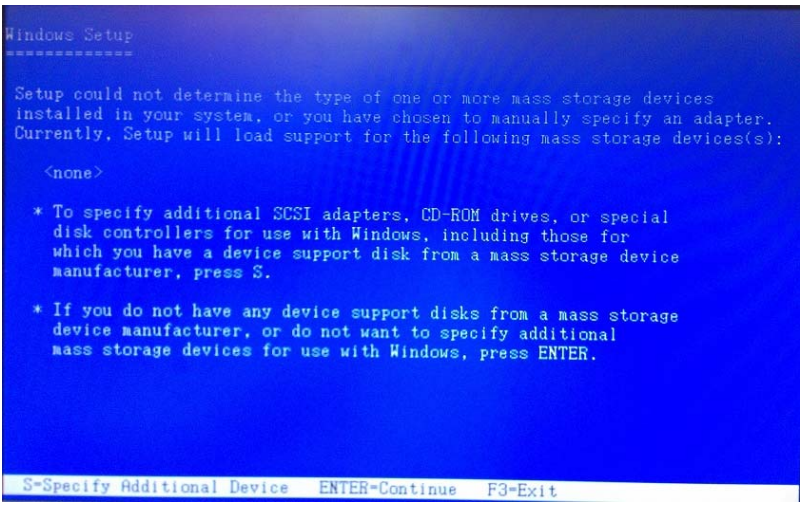
Step 5: Save changes and exit BIOS SETUP



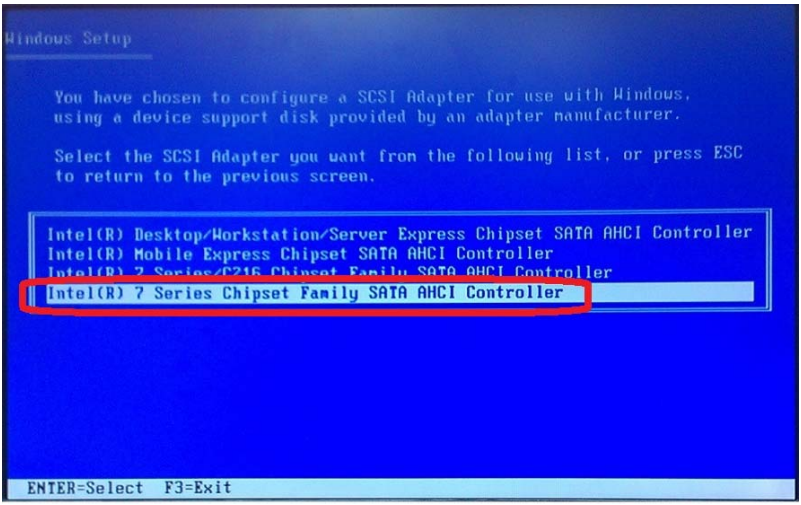
Step 6 – Boot to DVD/CD-ROM device to install OS

Step 7 – Press **"F6"** to install AHCI driver

Step 8 – Press **"S"** to install AHCI driver



Step 9 – Choose **"Intel(R) 7 Series Chipset Family SATA AHCI Controller"**



Step 10 – It will show the model you selected and then press **"ENTER"**.

Windows Setup will continue to install OS.