### AEC-6637

Fanless Embedded Controller

Intel<sup>®</sup> 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.

#### Embedded Controller

- 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.
- 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.

#### **Embedded Controller**

#### A E C - 6 6 3 7

#### 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**

	有毒有害物质或元素					
部件名称	铅	汞	镉	六价铬	多溴联苯	多溴二苯醚
	(Pb)	(Hg)	(Cd)	(Cr(VI))	(PBB)	(PBDE)
印刷电路板					0	0
及其电子组件	^	0	0	0	0	0
外部信号	~				0	0
连接器及线材	^	0	0		0	0
外壳	×	0	0	0	0	0
中央处理器	~				0	0
与内存	^	0	0		0	0
硬盘	×	0	0	0	0	0
电源	×	0	0	0	0	0
0. 表示该有责有害	物质左	<u> </u>	新右杓属	おきし	今景均左	•

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

# General Information

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#### **1.1 Introduction**

The newest Boxer series AEC-6637 has been introduced by AAEON and it utilizes  $Intel^{\ensuremath{\mathbb{R}}}$  Core<sup>TM</sup> i7/ i5 Mobile processor. This condensed Embedded Controller is a fanless controller with the latest  $Intel^{\ensuremath{\mathbb{R}}}$  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<sup>®</sup> 3rd Generation Core<sup>™</sup> i7-3610QE, Core<sup>™</sup> i5-3610Mel Processor
- Intel<sup>®</sup> QM77 Chipset
- Intel<sup>®</sup> 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**

		Intel <sup>®</sup> Core™ i7-3610QE 2.3GHz
CPU		Intel <sup>®</sup> Core™ i5-3610ME 2.7GHz
		processor
Chipset		Intel <sup>®</sup> QM77
System Mem	ory	DDR3 1066/1333/1600 SDRAM SODIMM x 1, Max. 8 GB
Display Interface	VGA	DB-15 x 1
Storage	SSD	Onboard CFast™ x 1
Device	HDD	2.5" SATA 6.0Gb/s Hard Disk Drive Bay x 1
Notwork	LAN	Gigabit Ethernet
Network	Wireless	Optional by Mini Card
	USB Host	USB2.0 x 2
Front I/O	Audio	1
	Others	Power ON/OFF Switch x 1, antenna hole x 2
	USB Host	USB3.0 x 2
	LAN	RJ-45 x 2
Rear I/O	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

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#### Embedded Controller

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 Tem	perature	-4°F ~158°F (-20°C~70°C)		
Anti-Vibration		5 g rms/5~500 Hz/ random operation (CFast <sup>TM</sup> ); 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 <sup>®</sup> XP Embedded, Windows <sup>®</sup> XP, Windows <sup>®</sup> 7, Ubuntu 11.10 – Kernel 3.0.0.12-generic		



# 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.



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)

1	2	3	1	2	3

+12V	+5V

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

#### 2.7 LVDS Port 1 Operating VDD Selection (JP5)

1 2 3		
+5V	+3.3V	
JP5	Function	
<b>JP5</b> 1-2	Function +5V	

# 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)

1 • • 2	1 • • 2	1 2
3 • • 4	3 • • 4	3 4
5 • • 6	5 • • 6	5 6
+12V	Ring	+5V

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

#### 2.10 Front Panel Connector (JP9)

1		2
3		4
5		6
7		8
9		10

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)

1	2	3	1	2	3

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)

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

#### 2.13 AT/ATX Power Supply Mode Selection (JP12)

1 2 3	1 2 3 <b>D D</b> 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)



+12V GND

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

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

5	2	
+5VSB1_	82	- GND
USB7_D-	ø	– GND
USB7_D+	œ.	USB8_D+
GND 🚽 🔤	8	USB8_D-
GND 🚽 🔊	國 10	- +5VSB

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)

+5VSB -	<sup>2</sup> GND
USB5_D-	፼— GND
USB5_D+	⊯ USB6_D+
GND 🚽 🖉	ISB6_D-
GND 🚽 👳	≊ +5VSB
	V

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

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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	

Embedded Controller		A E C - 6 6 3 7	
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	

Embed	ded	Control	ler

A E C - 6 6 3 7

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	ТХ	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



#### Embedded Controller

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	
Embedded Controller		A E C - 6 6 3 7	
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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	

A E C - 6 6 3 7

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	ТХ	OUT	±9V
6	CTS	IN	
7	DTR	OUT	±9V
8	RI	IN	
9	GND	GND	

## 2.25 LPC Port Connector (CN14)



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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)

DCD DSR RX RX RTS TX
DTR RI GND

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

Embedded Controller		A E C	-6637	
4	RTS	OUT	±9V	
5	ТХ	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)



Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	TOP EXCITE	IN	
3	BOTTOM EXCITE	IN	
4	LEFT EXCITE	IN	
5	<b>RIGHT EXCITE</b>	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	

	Emb	bedde	d Co	ntrol	ler
--	-----	-------	------	-------	-----

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		

Embedded Controller		A E C - 6 6 3 7	
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	

A E C - 6 6 3 7

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	

E	m	be	e d	d	е	d	С	ο	n	t	r	ο	I	le	1	ſ

AEC-6637

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	ТХ	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

Embe	dded	Control	ler

A E C - 6 6 3 7

PC15	GND	GND
PC16	GND	GND
PC17	NC	

### 2.39 DDR3 SODIMM Slot (CN29)

Standard specification

### 2.40 Mini Card Slot (CN30)

1         PCIE_WAKE#         IN           2         +3.3VSB         PWR         +3.3V           3         NC	Pin	Pin Name	Signal Type	Signal Level
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	1	PCIE_WAKE#	IN	
3         NC           4         GND         GND           5         NC	2	+3.3VSB	PWR	+3.3V
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	3	NC		
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	4	GND	GND	
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	5	NC		
7PCIE_CLK_REQ#IN8UIM_PWRPWR9GNDGND10UIM_DATAI/O11PCIE_REF_CLK-DIFF12UIM_CLKIN13PCIE_REF_CLK+DIFF14UIM_RSTIN15GNDGND	6	+1.5V	PWR	+1.5V
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	7	PCIE_CLK_REQ#	IN	
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	8	UIM_PWR	PWR	
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	9	GND	GND	
11         PCIE_REF_CLK-         DIFF           12         UIM_CLK         IN           13         PCIE_REF_CLK+         DIFF           14         UIM_RST         IN           15         GND         GND	10	UIM_DATA	I/O	
12         UIM_CLK         IN           13         PCIE_REF_CLK+         DIFF           14         UIM_RST         IN           15         GND         GND	11	PCIE_REF_CLK-	DIFF	
13         PCIE_REF_CLK+         DIFF           14         UIM_RST         IN           15         GND         GND	12	UIM_CLK	IN	
14         UIM_RST         IN           15         GND         GND	13	PCIE_REF_CLK+	DIFF	
15 GND GND	14	UIM_RST	IN	
	15	GND	GND	
16 UIM_VPP PWR	16	UIM_VPP	PWR	

NC		
GND	GND	
NC		
W_DISABLE#	OUT	+3.3V
GND	GND	
PCIE_RST#	OUT	+3.3V
PCIE_RX-	DIFF	
+3.3VSB	PWR	+3.3V
PCIE_RX+	DIFF	
GND	GND	
GND	GND	
+1.5V	PWR	+1.5V
GND	GND	
SMB_CLK	I/O	+3.3V
PCIE_TX-	DIFF	
SMB_DATA	I/O	+3.3V
PCIE_TX+	DIFF	
GND	GND	
GND	GND	
USB_D-	DIFF	
GND	GND	
USB_D+	DIFF	
+3.3VSB	PWR	+3.3V
GND	GND	
	NC           GND           NC           W_DISABLE#           GND           PCIE_RST#           PCIE_RX-           +3.3VSB           PCIE_RX+           GND           GND           GND           GND           GND           GND           GND           SMB_CLK           PCIE_TX-           SMB_DATA           PCIE_TX+           GND           USB_D-           GND           USB_D-           GND           USB_D+           +3.3VSB           GND	NCGNDGNDNCW_DISABLE#OUTGNDGNDPCIE_RST#OUTPCIE_RX-DIFF+3.3VSBPWRPCIE_RX+DIFFGNDGNDGNDGNDGNDGNDSMB_CLKI/OPCIE_TX-DIFFSMB_DATAI/OPCIE_TX+DIFFGNDGNDQNDGNDSMB_DATAI/OPCIE_TX+DIFFGNDGNDUSB_D-DIFFGNDGNDUSB_D+DIFF+3.3VSBPWRGNDGNDGNDGNDGNDGNDUSB_D+DIFFH3.3VSBPWRGNDGNDGNDGNDGNDGNDGNDGND

A E C - 6 6 3 7

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	

GND

7

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



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





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



Step 6: Fasten the two screws of the CFast  ${}^{\rm T\!M}$  bracket and finish the installation



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



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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



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



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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.

# <u>Setup Menu</u> Setup submenu: Main

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc. Main Advanced Chipset Boot Security Save & Exit		
BIOS Information AEC-6637 RX.X(6637AMXX) (MM/DD/Y	YYY)	Set the Date. Use Tab to switch between Date elements.
BIDS Vendor Core Version Compliancy System Date System Time Access Level	American Megatrends 4.6.5.3 UEFI 2.3; PI 1.2 [Wed 08/15/2012] [01:03:20] Administrator	
		<pre>++: Select Screen ++: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
Version 2.15.1226. Copyright (C) 2012 American Megatrends, Inc.		

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

Aptio Setup Utility – Copyright (C) 2012 American Main Advanced Chipset Boot Security Save & Exit	Megatrends, Inc.
<ul> <li>ACPI Settings</li> <li>CPU Configuration</li> <li>SATA Configuration</li> <li>AMT Configuration</li> <li>USB Configuration</li> <li>H/W Monitor</li> <li>Super IO Configuration</li> </ul>	System ACPI Parameters. ++: Select Screen 11: 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 M	egatrends, Inc.

## 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		

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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	

Chapter 3 AMI BIOS Setup 3-6

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

### **RTC Wake Settings**

Aptio Setup Utility - Advanced	Copyright (C) 2012 American	Megatrends, Inc.
Hake system with Fixed Time Hake up day Hake up hour Hake up minute Hake up second	[Enabled] 0 0 0 0	Enable or disable System wake on alarm event. When enabled, System will wake on the hr::min::sec specified
Wake system with Dynamic Time Wake up minute increase	[Disabled] 1	tt: Calact Screen
		H: Select Schen H: Select Trem Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.15.1226. Cc	pyright (C) 2012 American Mu	egatrends, Inc.

# Options summary: (default setting)

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

Aptio Setup Utility Advanced	– Copyright (C) 2012	American Megatrends, Inc.
Intel(R) Core(TM) 17-3610QE CPU @ CPU Signature Microcode Patch Max CPU Speed Min CPU Speed CPU Speed Processor Cores Intel HT Technology Intel VT-x Technology Intel VX-x Technology 64-bit	2.30GHz 30Ga9 12 2300 MHz 1200 MHz 2300 MHz 4 Supported Supported Supported Supported	<ul> <li>Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology). When Disabled only one thread per enabled core is enabled.</li> </ul>
L1 Data Cache L1 Code Cache L2 Cache L3 Cache Hyper-threading Active Processor Cores Limit CPUID Maximum Execute Disable Bit Intel Virtualization Technology EIST Turbo Mode	32 kB x 4 32 kB x 4 256 kB x 4 6144 kB [Enabled] [A11] [Disabled] [Enabled] [Enabled] [Enabled] [Enabled]	++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

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		

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Execute Disable Bit	Disabled	
	Enabled	
En/Disable XD bit for s	supporting OS	
Intel Virtualization	Disabled	
Technology	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**

Aptio Setup Utility - Advanced	- Copyright (C) 2012 Americar	n Megatrends, Inc.
Aptio Setup Utility - Advanced SATA Controller(s) SATA Mode Selection Serial ATA Port 1 Port 1 Hot Plug Serial ATA Port 2 Port 2 Hot Plug CFast Slot Slot Hot Plug MiniCard Slot Slot	- Copyright (C) 2012 American [Enabled] [AHCI] Empty [Enabled] [Disabled] Empty [Enabled] [Disabled] Empty [Enabled] [Disabled] Empty [Enabled] [Disabled] Empty [Enabled]	Megatrends, Inc.
Hot Plug	[Disabled]	11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

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

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

#### **AMT Configuration**

Aptio Advanced	Setup Utility – Copyright (C) 2012 American	n Megatrends, Inc.
Intel AMT Un-Configure ME	[Enabled] [Disabled]	Enable/Disable Intel (R) 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 ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Vers	ion 2.15.1226. Copyright (C) 2012 American M	Megatrends, Inc.

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

Aptio Setup Utility - ( Advanced	Copyright (C) 2012 American	Megatrends, Inc.
USB Configuration		Enables Legacy USB support.
USB Devices: 1 Drive, 1 Keyboard, 1 Mouse, 3	1 Point	support if no USB devices are connected. DISABLE option will
Legacy USB Support	[Enabled]	only for EFI applications.
Mass Storage Devices:	[2:140.204]	
USB Device Modelname	[Auto]	
		†∔: Select Item Enter: Select
		+/−: Change Opt. F1: General Help
		F2: Previous Values F3: Optimized Defaults
		ESC: Exit
Version 2.15.1226. Co	nuright (C) 2012 American Mu	egatrends. Inc.

Legacy USB Support	Enabled	
	Disabled	
	Auto	

Enables BIOS Support for Legacy USB Support. When enabled,			
USB can be functional	USB can be functional in legacy environment like DOS. AUTO option		
disables legacy suppo	rt if no USB devices	are connected. DISABLE	
option will keep USB c	levices available only	for EFI application	
USB3.0 Support	Enabled		
	Disabled		
Enables BIOS Suppor	t for USB3.0 (XHCI).	When disabled, PCH	
USB3.0 controller will also be disabled.			
Device Name	Auto		
(Emulation Type)	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 Utili Advanced	ty – Copyright (C) 2012 Amer	rican Megatrends, Inc.
Pc Health Status		
CPU Temperature PCH Temperature System Temperature CPU_VCORE VCC_DIMM 12V SV 3.3V SVSB VBAT	: +51 C : +39 C : +28 C : +0.876 V : +1.512 V : +11.633 V : +5.110 V : +3.296 V : +5.020 V : +3.024 V	<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
Version 2.15.122		

#### **Super IO Configuration**

Aptio Setup Utility – Advanced	Copyright (C) 2012 American	Megatrends, Inc.
Super IO Configuration		Set Parameters of Serial Port
Super IO Chip ▶ Serial Port 1 Configuration ▶ Serial Port 2 Configuration	IT8728	I (COMM)
Restore AC Power Loss EuP Power Control	[Power Off] [Disabled]	
Second Super IO Chip ▶ Serial Port 3 Configuration ▶ Serial Port 4 Configuration	Fintek F81216	
		<pre>++: Select Screen 1↓: Select Item Enter: Select</pre>
		+/−: Change Opt. F1: General Help F2: Previous Values
		F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.15.1226. Co	pyright (C) 2012 American M	egatrends, Inc.

Options summary: (*default setting*)

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

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

#### **Serial Port 1 Configuration**

Aptio Setup Utility Advanced	– Copyright (C) 2012 America	n Megatrends, Inc.
Serial Port 1 Configuration		Enable or Disable Serial Port
Serial Port Device Settings	[Enabled] IO=3F8h; IRQ=4;	
Change Settings	[Auto]	
		↔: Select Screen ↑↓: Select Item
		Enter: Select +/-: Change Opt. F1: General Help
		F2: Previous Values F3: Optimized Defaults E4: Source & Exit
		ESC: Exit
Version 2.15.1226.	Copyright (C) 2012 American	Megatrends, Inc.

Serial Port	Disabled	
	Enabled	
En/Disable specified s	erial 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**

Aptio Setup Utility - Advanced	Copyright (C) 2012 American	Megatrends, Inc.
Serial Port 2 Configuration		Enable or Disable Serial Port
Serial Port Device Settings	[Enabled] IO=2F8h; IRQ=3;	(com)
Change Settings Device Type	[Auto] [RS232]	
		++: Select Screen fl: Select Item
		+/−: Change Opt. F1: General Help
		F2: Previous Values F3: Optimized Defaults F4: Save & Exit
		ESC: Exit
Version 2.15.1226. Co	opyright (C) 2012 American M	egatrends, Inc.

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**

Serial Port 3 Configuration       Enable or Disab         Serial Port       [Enabled]         Device Settings       IO=3E8h; IRQ=11;         Change Settings       [Auto]         ++: Select Scree       11: Select Item Enter: Select         II: Select Item       Fil: General Hell	s, Inc.
Serial Port [Enabled] Device Settings ID=3E8h; IRQ=11; Change Settings [Auto] ++: Select Scre 11: Select Item Enter: Select +/-: Change Opt F1: General Hel	Disable Serial Port
Change Settings [Auto] ++: Select Scree 11: Select Item Enter: Select +/-: Change Opt F1: General Hel	
++: Select Scre 11: Select Item Enter: Select +/-: Change Opt F1: General Hel	
++: Select Scre 11: Select Item Enter: Select +/-: Change Opt F1: General Hel	
++: Select Scre 14: Select Item Enter: Select +/-: Change Opt F1: General Hel	
Enter: Select +/-: Change Opt F1: General Hel	t Screen t Item
F1: General Hel	lect ge Opt.
F2: Previous va	al Help ous Values
F3: Optimized D F4: Save & Exit	ized Defaults & Exit
ESC: Exit	
Version 2 15 1226 Conuright (C) 2012 American Magatempter Inc	Inc

Serial Port	Disabled	
	Enabled	
En/Disable specified s	erial 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**

Aptio Setup Utility - Advanced	Copyright (C) 2012 American	n Megatrends, Inc.
Serial Port 4 Configuration		Enable or Disable Serial Port
Serial Port Device Settings	[Enabled] IO=2E8h; IRQ=10;	
Change Settings	[Auto]	
		++: Select Screen fl: Select Item
		Enter: Select +/-: Change Opt.
		F1: General Help F2: Previous Values F3: Optimized Defaults
		F4: Save & Exit ESC: Exit
Version 2.15.1226. C	opyright (C) 2012 American M	Megatrends, Inc.

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

	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

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc. Main Advanced <mark>Chipset</mark> Boot Security Save & Exit		
<ul> <li>Doboard Device</li> <li>PCH-IO Configuration</li> <li>Memory Configuration</li> <li>Graphics Configuration</li> </ul>	Onboard Device Parameters	
	++: Select Screen 14: 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 M	egatrends, Inc.	

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#### Options summary: (default setting)

Onboard Device			
Configure Onboard De	evices		
PCI-IO Configuration			
South Bridge Paramet	South Bridge Parameters		
Memory			
Configuration			
Memory Parameters			
Graphic			
Configuration			
Graphic Parameters			

#### **Onboard Device**

Aptio Setup Utility Chipset	) – Copyright (C) 2012 (	American Megatrends, Inc.
Onboard Device Configuration Onboard HD Audio Intel LAN Controller Realtek LAN Controller	(Auto) [Enabled] [Enabled]	Control Detection of the Onboard HD Audio device. Disabled = Device will be unconditionally disabled Enabled = Device will be unconditionally Enabled Auto = Device will be enabled if present, disabled otherwise. ++: Select Screen 11: 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 Am	erican Megatrends, Inc.

#### Options summary: (default setting)

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

#### **PCH-IO Configuration**

Aptio Setup U Chipset	tility – Copyright (C) 2012 Americ	an Megatrends, Inc.
PCH-IO Configuration		Select the power type used on
Power Mode		the system
PCI Express Configuration PCIe MiniCard Slot PCIe Speed	[Enabled] [Auto]	++: Select Screen 14: Select Item
		HTTEP: 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.

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#### Options summary: (default setting)

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

#### **Memory Configuration**

Aptio Setup Utility - Chipset	Copyright (C) 2012 American	n Megatrends, Inc.
Memory Timing Information Memory Frequency CAS Latency (tCL) CAS to RAS (tRCDmin) Row Precharge (tRFmin) Active to Precharge (tRFmin) Write Recovery (tRFCmin) Refresh Recovery (tRFCmin) Row Active to Row Active (tRRDmin) Internal Write to Read Command (tW Internal Read to Precharge Command Four Activate Window (tFAWmin)	1333 Mhz 9 9 24 10 107 4 5 5 20	Maximum Memory Frequency Selections in Mhz.
Memory Timing Configuration Memory Frequency Limiter tCL tRCD tRP tRAS tRR tRFC tRRD tRTD tATR tRTP tFAW	[1938] 9 9 24 10 107 4 5 5 5 20	++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

#### Options summary: (default setting)

DIMM Profile	Default DIMM profile	
	XMP Profile 1	
	XMP Profile 2	
Select DIMM timing p	rofile that should be us	ed
Memory Frequency	Auto	
Limiter	1067	
	1333	
	1600	
Maximum Memory Fr	equency 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 T	DLUD. Dynamic assign	ment would adjust
TOLUD automatically	based on largest MMI	O length of install

graphic controller.

#### **Graphic Configuration**

Aptio Setup Chipset	Utility – Copyright (C) 2012 Ame	rican Megatrends, Inc.
Graphics Configuration IGfx Frequency	350 MHz	Select the GTT Size
GTT Size Aperture Size DVMT Pre-Allocated DVMT Total Gfx Mem	[2MB] [256MB] [64M] [256M]	++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.1	5.1226. Copyright (C) 2012 Ameri	can Megatrends, Inc.

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 Grap	hics Device.	
DVMT Total Gfx	x 128MB	
Mem	256MB	
	Max	
Select DVMT 5.0 To	tal Graphic Memory siz	e used by the Internal
Graphics Device.		

#### Setup submenu: Boot

Main       Advanced       Chipset       Boot       Security       Save & Exit         Boot       Configuration       [Enabled]       Enables or disables Quiet Boot         Quiet Boot       [Enabled]       [Disabled]       option         Launch 182579LM PXE OpROM       [Disabled]       Enables or disables Quiet Boot         Boot Option Priorities       [Device Modelname]       option         Boot Option #2       [Device Modelname]       option         Boot Option #3       [Device Modelname]       option         Boot Option #4       [Device Modelname]       etc.         Boot Option #5       [Device Modelname]       etc.         CD/DVD ROM Drive BBS Priorities       Hard Drive BBS Priorities       etc.         Hard Drive BBS Priorities       Fiselect Screen       fiselect Item         Network Device BBS Priorities       Fiselect Item       Enter: Select         V-: Change Opt.       Fiselect Defaults       Fiselect Defaults         F4: Save & Exit       ESC: Exit       ESC: Exit	Aptio Setup Utili	ty – Copyright (C) 2012 Ameri	ican Megatrends, Inc.
Boot Configuration       [Enabled]         Quiet Boot       [Enabled]         Launch 182579LM PXE OpROM       [Disabled]         Boot Option Priorities       [Device Modelname]         Boot Option #1       [Device Modelname]         Boot Option #2       [Device Modelname]         Boot Option #3       [Device Modelname]         Boot Option #4       [Device Modelname]         Boot Option #5       [Device Modelname]         Boot Option #6       [Device Modelname]         Boot Option #5       [Device Modelname]         Boot Option #6       [Device Modelname]         Boot Option #6       [Device Modelname]         Boot Optive BBS Priorities       #1: Select Itm         Hard Drive BBS Priorities       [Select Itm         Network Device BBS Priorities       [Select Itm         Pi: Previous Values       F3: Optimized Defaults         F4: Save & Exit       ESC: Exit	Main Advanced Chipset Boot	Security Save & Exit	
Boot Option Priorities         Boot Option #1       [Device Modelname]         Boot Option #2       [Device Modelname]         Boot Option #3       [Device Modelname]         Boot Option #4       [Device Modelname]         Boot Option #5       [Device Modelname]         CD/DVD ROM Drive BBS Priorities       ++: Select Screen         Hand Drive BBS Priorities       ++: Select Item         Floppy Drive BBS Priorities       +-: Change Opt.         F1: General Help       F2: Previous Values         F2: Previous Values       F3: Optimized Defaults         F4: Save & Exit       ESC: Exit	Boot Configuration Quiet Boot Launch I82579LM PXE OpROM Launch RTL8111E PXE OpROM	[Enabled] [Disabled] [Disabled]	Enables or disables Quiet Boot option
CD/DVD ROM Drive BBS Priorities Hand Drive BBS Priorities Floppy Drive BBS Priorities Network Device BBS Priorities +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit	Boot Option Priorities Boot Option #1 Boot Option #2 Boot Option #3 Boot Option #4 Boot Option #5	[Device Modelname] [Device Modelname] [Device Modelname] [Device Modelname] [Device Modelname]	
	CD/DVD ROM Drive BBS Priorities Hand Drive BBS Priorities Floppy Drive BBS Priorities Network Device BBS Priorities		++: Select Screen 14: 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.	Version 2.15.122	6. Copyright (C) 2012 America	an Megatrends, Inc.

#### Options summary: (default setting)

Quiet Boot	Disabled	
	Enabled	
En/Disable showing be	oot logo.	
Launch I82579LM/	Disabled	
RTL8111E PXE	Enabled	
OpROM		
En/Disable PXE boot f	for I82579LM/RTL8111	E LAN
Boot Option #X/		
XXXX Drive BBS		
Priorities		
The order of boot prior	rities.	

#### **BBS** Priorities

Boot Option #1       [Device Modelname]         Boot Option #2       [Device Modelname]         Boot Option #3       [Device Modelname]         Boot Option #4       [Device Modelname]         Boot Option #5       [Device Modelname]         Boot Option #6       [Device Modelname]         Boot Option #6       [Device Modelname]         Herror Science       [Device Modelname]         Boot Option #6       [Device Modelname]         Herror Science       [Device Modelname]         Herror Science	Aptio Setup Utilit Boot	y – Copyright (C) 2012 Ameri	can Megatrends, Inc.
<pre>#: Select Screen fl: Select Item Enter: Select + √-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>	Boot Option #1 Boot Option #2 Boot Option #3 Boot Option #4 Boot Option #5 Boot Option #6	[Device Modelname] [Device Modelname] [Device Modelname] [Device Modelname] [Device Modelname] [Device Modelname]	Sets the system boot order
			<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>

#### Options summary: (default setting)

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

#### Setup submenu: Security

Aptio Setup Ut Main Advanced Chipset Bo	ility – Copyright (C) 2012 Ameria ot Security Save & Exit	can Megatrends, Inc.
Password Description If ONLY the Administrator's then this only limits access only asked for when entering If ONLY the User's password is a power on password and n boot or enter Setup. In Setu have Administrator rights. The password length must be	password is set, to Setup and is Setup. Is set, then this ust be entered to p the User will	Set Administrator Password
Administrator Password	3 20	++: Select Screen 11: 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 America	n Megatrends, Inc.

Administrator	Not set	
Password/		
User 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. *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

Aptio Setup Utility — Copyright (C) 2012 American Main Advanced Chipset Boot Security <mark>Save &amp; Exit</mark>	Megatrends, Inc.
Save Changes and Reset Discard Changes and Reset	Reset the system after saving the changes.
Restore Defaults Save as User Defaults Restore User Defaults	
	++: Select Screen 11: Select Trem
	Here 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 Me	egatrends, Inc.

Save Changes and		
Reset		
Reset the system after sa	aving the changes	
Discard Changes and		
Reset		
Reset system setup witho	out saving any chan	ges
Restore Defaults		
Restore/Load Default valu	ues 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

### Driver Installation

Chapter 4 Driver Installation 4-1

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 <sup>®</sup> 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.

<u>Note 2:</u> If the OS is Windows<sup>®</sup> 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<sup>®</sup> 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

- 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

Appendix A Programming the Watchdog Timer A-1

#### 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 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 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 ter	00H	WatchDog Timer Configuration Regis-
07H	73H	R/W Regi	00H ster	WatchDog Timer Time-out Value

#### 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)

Description				
WDT is reset upon a CIR interrupt				
WDT is reset upon a KBC (mouse) interrupt				
WDT is reset upon a KBC (keyboard) interrupt				
WDT is reset upon a read or a write to the Game Port base address				
Reserved				
Force Time-out. This bit is self-clearing				
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 <sup>Note</sup> 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

Appendix B I/O Information B-1

# B.1 I/O Address Map

Input/output (IO)
[00000000 - 0000001F] Direct memory access controller
1 [00000000 - 00000CF7] PCI Bus
[00000010 - 0000001F] Motherboard resources
[00000020 - 00000021] Programmable interrupt controller
[00000022 - 0000003F] Motherboard resources
[00000024 - 00000025] Programmable interrupt controller
📲 [0000002C - 0000002D] Programmable interrupt controller
📲 [00000030 - 00000031] Programmable interrupt controller
📲 [0000003C - 0000003D] Programmable interrupt controller
[00000064 - 00000064] Standard PS/2 Keyboard
[00000067 - 00000067] Motherboard resources
[000000/0 - 000000/0] Motherboard resources
[000000/0 - 000000//] System CMOS/real time clock
I recorded a constant in the second s
[00000080 - 0000080] Motherboard resources
[00000081 - 0000080] Notherboard resources
[00000081 - 00000091] Direct memory access controller
[00000084 - 00000080] Motherboard resources
[0000008] Wotherboard resources
[00000090 - 00000097] Motherboard resources
100000032 - 00000052   Michelboard resources 100000093 - 0000009E1 Direct memory access controller
[00000000] Direct memory access controller
I [000000A2 - 00000A2] Programmable interrupt controller
I [0000004 - 0000005] Programmable interrupt controller
100000048 - 000000491 Programmable interrupt controller
I [000000AC - 000000AD] Programmable interrupt controller
In the research of the second

Appendix B I/O Information B-2

# A E C - 6 6 3 7

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

# B.2 Memory Address Map

1		Мe	mory
			[000A0000 - 000BFFFF] Intel(R) HD Graphics 4000
			[000A0000 - 000BFFFF] PCI Bus
		,	[000D0000 - 000D3FFF] PCI Bus
	<b>j</b> l	Ļ	[000D4000 - 000D7FFF] PCI Bus
	<b>j</b> l	Ļ	[000D8000 - 000DBFFF] PCI Bus
		Ţ	[000DC000 - 000DFFFF] PCI Bus
			[000E0000 - 000E3FFF] PCI Bus
			[000E4000 - 000E7FFF] PCI Bus
		ļ	[20000000 - 201FFFFF] System board
		Ļ	[40004000 - 40004FFF] System board
		Ļ	[DFA00000 - DFA00FFF] Motherboard resources
		Ļ	[DFA00000 - FEAFFFFF] PCI Bus
			[E0000000 - EFFFFFF] Intel(R) HD Graphics 4000
	[	2	[F0000000 - F0003FFF] Realtek PCIe GBE Family Controller
	]	ļ	[F0000000 - F00FFFFF] Intel(R) 7 Series/C216 Chipset Family PCI Express Root Port 2 - 1E12
	ļ		[F7800000 - F7BFFFFF] Intel(R) HD Graphics 4000
		7	[F7C00000 - F7C00FFF] Realtek PCIe GBE Family Controller
	<b>j</b> l	Ļ	[F7C00000 - F7CFFFFF] Intel(R) 7 Series/C216 Chipset Family PCI Express Root Port 2 - 1E12
		7	[F7D00000 - F7D1FFFF] Intel(R) 82579LM Gigabit Network Connection
	(	ļ	[F7D20000 - F7D2FFFF] Intel(R) USB 3.0 eXtensible Host Controller
		ļ	[F7D30000 - F7D33FFF] High Definition Audio Controller
		Ļ	[F7D35000 - F7D350FF] Intel(R) 7 Series/C216 Chipset Family SMBus Host Controller - 1E22
	- <	\$	[F7D36000 - F7D367FF] Intel(R) 7 Series Chipset Family SATA AHCI Controller
	(	ļ,	[F7D37000 - F7D373FF] Intel(R) 7 Series/C216 Chipset Family USB Enhanced Host Controller - 1E26
	(	ļ.	[F7D38000 - F7D383FF] Intel(R) 7 Series/C216 Chipset Family USB Enhanced Host Controller - 1E2D
	[	2	[F7D39000 - F7D39FFF] Intel(R) 82579LM Gigabit Network Connection
	۴	7	[F7D3A000 - F7D3AFFF] Intel(R) Active Management Technology - SOL (COM5)
		Ļ	[F7D3C000 - F7D3C00F] Intel(R) Management Engine Interface
	]	Ļ	[F8000000 - FBFFFFFF] Motherboard resources
	]		[FED00000 - FED003FF] High precision event timer
	]	ļ	[FED10000 - FED17FFF] Motherboard resources
	]		[FED18000 - FED18FFF] Motherboard resources
	]	-	[FED19000 - FED19FFF] Motherboard resources
	]	-	[FED1C000 - FED1FFFF] Motherboard resources
	]	ļ	[FED20000 - FED3FFFF] Motherboard resources
	····[]	P	[FED40000 - FED44FFF] Trusted Platform Module 1.2
	]	-	[FED45000 - FED8FFFF] Motherboard resources
	[l	-	[FED90000 - FED93FFF] Motherboard resources
	]	ļ	[FEE00000 - FEEFFFFF] Motherboard resources
	]	Ţ	[FF000000 - FFFFFFF] Intel(R) 82802 Firmware Hub Device
	<b>j</b> l		[FF000000 - FFFFFFF] Motherboard resources

# **B.3 IRQ Mapping Chart**

Interrupt request (IRQ)	
	System timer
	Standard PS/2 Keyboard
	Communications Port (COM2)
(ISA) 0x00000004 (04)	Communications Port (COM1)
	System CMOS/real time clock
	Communications Port (COM4)
	Communications Port (COM3)
(ISA) 0x000000C (12)	Microsoft PS/2 Mouse
	Numeric data processor
	Intel(R) 7 Series/C216 Chipset Family SMBus Host Controller - 1E22
🟺 (PCI) 0x00000010 (16)	Intel(R) 7 Series/C216 Chipset Family USB Enhanced Host Controller - 1E2D
	Intel(R) 7 Series/C216 Chipset Family PCI Express Root Port 1 - 1E10
	Intel(R) Management Engine Interface
	Intel(R) 7 Series/C216 Chipset Family PCI Express Root Port 2 - 1E12
	Intel(R) Active Management Technology - SOL (COM5)
	High Definition Audio Controller
🟺 (PCI) 0x00000017 (23)	Intel(R) 7 Series/C216 Chipset Family USB Enhanced Host Controller - 1E26
PCI) 0xFFFFFFFA (-6)	Realtek PCIe GBE Family Controller
	Intel(R) 82579LM Gigabit Network Connection
PCI) 0xFFFFFFFC (-4)	Intel(R) USB 3.0 eXtensible Host Controller
	Intel(R) HD Graphics 4000
(PCI) 0xFFFFFFFF (-2)	Intel(R) 7 Series Chipset Family SATA AHCI Controller

# **B.4 DMA Channel Assignments**

Direct memory access (DMA)
 4 Direct memory access controller



# 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.

	TXTSETUP.OEM OEM 檔案 5.48 KB		license.txt TXT 檔案 22.1 KB	0	iaStor.sys 系統檔案 459 KB
	iaStor.inf 安裝資訊 3.33 KB	3	iastor.cat 安全性目錄 7.76 KB		iaAHCLinf 安裝資訊 4.79 KB
3	iaahci.cat 安全性目錄 8.53 KB		F6Readme.txt TXT 檔案 81.2 KB		

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

Aptio Setup Utilit Advanced	y – Copyright (C) 2011 Americ	an Megatrends, Inc.
SATA Controller(r) SATA Node Selection	(Foshled) (RAID)	Determines how SATA controller(s) operate.
Serial ATA Port 1 Port 1 Hot Plug Serial ATA Port 2 Port 2 Hot Plug CFast Slot Slot Hot Plug MiniCard Slot Slot Hot Plug	HDC HD2500KS-0 (250.0 (Enabled) (Enabled) MAXTOR STH5320 (320.0 (Enabled) Enabled) (Enabled) (Disabled) (Disabled) (Disabled) (Disabled) (Disabled)	++: Select Screen 14: Select Item Enter: Select +/-: Change Opt, F1: General Hein F2: Previous Values F3: Optimized Defaults F3: Optimized Defaults F3: Optimized Defaults F3: Save & Exit ESD: Exit
Version 2.14.1219	. Copyright (C) 2011 American	Megatrends, Inc.

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

	Intel(R) Rapid Storag	ge Technology - Option ROM - 11.0.0.1339	
	Copyright(C) 2003-11	Intel Corporation. All Rights Reserved.	
********	]******	CREATE VOLUME MENU ]************************************	******
*			*
*	Marros		*
*	RAID Level:	RAID0(Stripe)	*
*	Dieker	Select Dicks	*
*	Strip Size:	: 128KB	*
*	Capacity:	: 465.8 GB	*
*	Sync:	N/A	*
*	-	Create Volume	*
*			*
********	*****************	***************************************	******
********	*****************	******[ HELP ]************************************	******
*			*
*			*
*			*
*			*
*	RATD Ø:	Stripes data (performance).	*
*			*
*			*
*			*
*			*
*********	*********	******	******
	[**]Change [TAB]-Net	ext [ESC]-Previous Menu [ENTER]-Select	

Step 9 - Choose "Create Volume" and confirmed in next warning

message. Intel(R) Rapid Storage Technology - Option ROM - 11.0.0.1339 Copyright(C) 2003-11 Intel Corporation. All Rights Reserved. Name: Volume0 RAID Level: RAID0(Stripe) Disks: Select Disks Strip Size: 128KB Capacity: 465.8 GB Sync: N/A Create Volume Press ENTER to create the specified volume. \*\*\*\*\*\*\*\*\*\* [\*\*]Change [TAB]-Next [ESC]-Previous Menu [ENTER]-Select Appendix C RAID & AHCI Settings C-5



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"

Hindows Setup	
You have chosen to configure a SCSI Adapter for use with Hindows, using a device support disk provided by an adapter manufacturer. Select the SCSI Adapter you want from the following list, or press ESC	
to return to the previous screen.	
Intel(R) Neston/Horkstation/Server Express Chippet SATA RAID Controller Intel(R) Mobile Express Chipset SATA RAID Controller	
Intel(R) ICH7M/MDH SATA AHCI Controller	
ENTER-Select F3=Exit	

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

Windows Setup will continue to install OS.

Hindows Setup	
Setup will load support for the following mass storage device(s): Intel(R) Mobile Express Chipset SATA RAID Controller	
<ul> <li>To specify additional SCSI adapters, CD-ROM drives, or special disk controllers for use with Hindows, including those for which you have a device support disk from a mass storage device manufacturer, press S.</li> </ul>	
<ul> <li>If you do not have any device support disks from a mass storage device manufacturer, or do not uant to specify additional mass storage devices for use with Hindows, press ENTER.</li> </ul>	
S=Specify Additional Device ENTER=Continue F3=Exit	

# 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

Aptio S Advanced	etup Utility – Copyright (C) 2011 American	Megatrends, Inc.
SATA Controller(s) SATA Mode Selection	[Enabled] [AHCI]	Determines how SATA controller(s) operate.
Serial ATA Port 1 Port 1 Hot Plug Serial ATA Port 2 Port 2 Hot Plug CFast Slot Slot Hot Plug Minicard Slot Slot Hot Plug	WDC WD2500K3-0 (250.0 [Enubled] [Enubled] MMXTOR STM3320 (320.0 [Enubled] Enubled] Enubled] [Enubled] [Disabled] [Disabled] [Disabled] [Disabled]	++: Select Screen 14: Select item Enter: Select +/-: Change Oot. Fi: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Versio	n 2.14.1219. Copyright (C) 2011 American N	egatrends, Inc.

Appendix C RAID & AHCI Settings C-9

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



Step 5: Save changes and exit BIOS SETUP



Appendix C RAID & AHCI Settings C-10

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

Step 7 - Press "F6" to install AHCI driver

Windows Setup	
Press F6 if you need to in	nstall a third party SCSI or BAID driver

Step 8 - Press "S" to install AHCI driver



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

#### Controller"

Windows Setup
You have chosen to configure a SCSI Adapter for use with Windows, using a device support disk provided by an adapter manufacturer.
Select the SCSI Adapter you want from the following list, or press ESC to return to the previous screen.
Intel(R) Desktop/Horkstation/Server Express Chipset SATA AHCI Controller Intel(R) Mobile Express Chipset SATA AHCI Controller Intel(R) 2 Series/C216 Chipset Family SATA AHCI Controller Intel(R) 7 Series Chipset Family SATA AHCI Controller
ENTER=Select F3=Exit

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

Windows Setup will continue to install OS.

