

# GENE-QM77 Rev. A

---

3.5" Subcompact Board

User's Manual 5<sup>th</sup> Ed

## Copyright Notice

---

This document is copyrighted, 2018. All rights are reserved. The original manufacturer reserves the right to make improvements to the products described in this manual at any time without notice.

No part of this manual may be reproduced, copied, translated, or transmitted in any form or by any means without the prior written permission of the original manufacturer. Information provided in this manual is intended to be accurate and reliable. However, the original manufacturer assumes no responsibility for its use, or for any infringements upon the rights of third parties that may result from its use.

The material in this document is for product information only and is subject to change without notice. While reasonable efforts have been made in the preparation of this document to assure its accuracy, AAEMON assumes no liabilities resulting from errors or omissions in this document, or from the use of the information contained herein.

AAEMON reserves the right to make changes in the product design without notice to its users.

## Acknowledgement

---

All other products' name or trademarks are properties of their respective owners.

- Microsoft Windows is a registered trademark of Microsoft Corp.
- Intel, Pentium, Celeron, and Xeon are registered trademarks of Intel Corporation
- Core, Atom are trademarks of Intel Corporation
- ITE is a trademark of Integrated Technology Express, Inc.
- IBM, PC/AT, PS/2, and VGA are trademarks of International Business Machines Corporation.

All other product names or trademarks are properties of their respective owners.

## Packing List

---

Before setting up your product, please make sure the following items have been shipped:

Item	Quantity
● GENE-QM77 Rev. A	1
● Cooler	1
● Product CD/DVD with User's Manual (in pdf) and drivers	1

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

## About this Document

---

This User's Manual contains all the essential information, such as detailed descriptions and explanations on the product's hardware and software features (if any), its specifications, dimensions, jumper/connector settings/definitions, and driver installation instructions (if any), to facilitate users in setting up their product.

Users may refer to the [AAEON.com](http://AAEON.com) for the latest version of this document.

## Safety Precautions

---

Please read the following safety instructions carefully. It is advised that you keep this manual for future references

1. All cautions and warnings on the device should be noted.
2. Make sure the power source matches the power rating of the device.
3. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
4. Always completely disconnect the power before working on the system's hardware.
5. No connections should be made when the system is powered as a sudden rush of power may damage sensitive electronic components.
6. If the device is not to be used for a long time, disconnect it from the power supply to avoid damage by transient over-voltage.
7. Always disconnect this device from any AC supply before cleaning.
8. While cleaning, use a damp cloth instead of liquid or spray detergents.
9. Make sure the device is installed near a power outlet and is easily accessible.
10. Keep this device away from humidity.
11. Place the device on a solid surface during installation to prevent falls
12. Do not cover the openings on the device to ensure optimal heat dissipation.
13. Watch out for high temperatures when the system is running.
14. Do not touch the heat sink or heat spreader when the system is running
15. Never pour any liquid into the openings. This could cause fire or electric shock.
16. As most electronic components are sensitive to static electrical charge, be sure to ground yourself to prevent static charge when installing the internal components. Use a grounding wrist strap and contain all electronic components in any static-shielded containers.

17. If any of the following situations arises, please the contact our service personnel:
  - i. Damaged power cord or plug
  - ii. Liquid intrusion to the device
  - iii. Exposure to moisture
  - iv. Device is not working as expected or in a manner as described in this manual
  - v. The device is dropped or damaged
  - vi. Any obvious signs of damage displayed on the device
18. **DO NOT LEAVE THIS DEVICE IN AN UNCONTROLLED ENVIRONMENT WITH TEMPERATURES BEYOND THE DEVICE'S PERMITTED STORAGE TEMPERATURES (SEE CHAPTER 1) TO PREVENT DAMAGE.**

### **Warning!**



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.*

### **Attention:**

*Il y a un risque d'explosion si la batterie est remplacée de façon incorrecte. Ne la remplacer qu'avec le même modèle ou équivalent recommandé par le constructeur. Recycler les batteries usées en accord avec les instructions du fabricant et les directives gouvernementales de recyclage.*



## China RoHS Requirements (CN)

产品中有毒有害物质或元素名称及含量

AAEON Main Board/ Daughter Board/ Backplane

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷电路板 及其电子组件	○	○	○	○	○	○
外部信号 连接器及线材	○	○	○	○	○	○
<p>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。</p> <p>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。</p> <p>备注: 此产品所标示之环保使用期限, 系指在一般正常使用状况下。</p>						

## China RoHS Requirement (EN)

Poisonous or Hazardous Substances or Elements in Products

AAEON Main Board/ Daughter Board/ Backplane

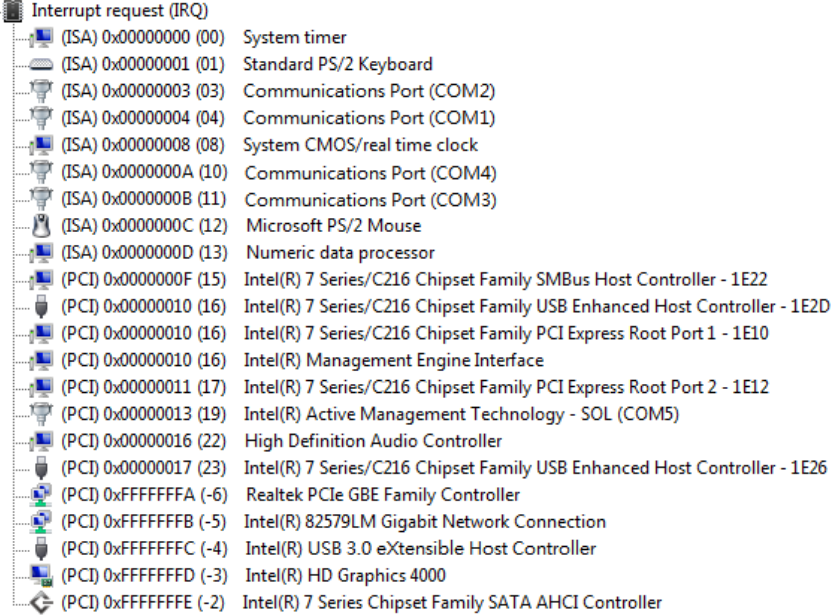
Component	Poisonous or Hazardous Substances or Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (Cr(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
PCB & Other Components	○	○	○	○	○	○
Wires & Connectors for External Connections	○	○	○	○	○	○
<p>O: The quantity of poisonous or hazardous substances or elements found in each of the component's parts is below the SJ/T 11363-2006-stipulated requirement.</p> <p>X: The quantity of poisonous or hazardous substances or elements found in at least one of the component's parts is beyond the SJ/T 11363-2006-stipulated requirement.</p> <p><b>Note:</b> The Environment Friendly Use Period as labeled on this product is applicable under normal usage only</p>						

# Table of Contents

---

<b>Chapter 1 - Product Specifications</b> .....	<b>1</b>
1.1 Specifications .....	2
<b>Chapter 2 – Hardware Information</b> .....	<b>5</b>
2.1 Dimensions .....	6
2.2 Jumpers and Connectors.....	8
2.3 List of Jumpers .....	10
2.3.1 LVDS Port 2 Operating VDD Selection (JP2).....	11
2.3.2 LVDS Port 1 Backlight Inverter VCC Selection (JP3) .....	11
2.3.3 LVDS Port 2 Backlight Inverter VCC Selection (JP4).....	11
2.3.4 LVDS Port 1 Operating VDD Selection (JP5).....	11
2.3.5 LVDS Port 1 Backlight Lightness Control Mode Selection (JP6)	11
2.3.6 LVDS Port 2 Backlight Lightness Control Mode Selection (JP7)	12
2.3.7 COM2 Pin8 Function Selection (JP8) .....	12
2.3.8 Front Panel Connector (JP9) .....	12
2.3.9 Touch Screen 4/5/8-Wire Selection (JP10) .....	13
2.3.10 Clear CMOS (JP11).....	13
2.3.11 AT/ATX Power Supply Mode Selection (JP12).....	13
2.4 List of Connectors.....	14
2.4.1 LVDS Port 1 Inverter/ Backlight Connector (CN1) .....	16
2.4.2 External +12V Input (CN2) .....	16
2.4.3 USB2.0 Port 7 and Port 8 (CN3).....	17
2.4.4 USB2.0 Port 5 and Port 6 (CN4) .....	17
2.4.5 USB2.0 Port 3 and Port 4 (CN5) .....	18
2.4.6 External +5VSB Input (CN6).....	19

2.4.7	LVDS Port 2 Inverter/ Backlight Connector (CN7) .....	19
2.4.8	Audio I/O Port Connector (CN8).....	20
2.4.9	LVDS Port 1 Connector (CN9).....	20
	* LVDS1 LCD_PWR can be set to +3.3V or +5V by JP5.....	22
2.4.10	LVDS Port 2 Connector (CN10) .....	22
	* LVDS2 LCD_PWR can be set to +3.3V or +5V by JP2.....	23
2.4.11	COM Port 2 Connector (CN11).....	24
2.4.12	LPT/ Digital I/O Port Connector (CN12).....	25
2.4.13	COM Port 3 Connector (CN13).....	28
2.4.14	LPC Port Connector (CN14).....	29
2.4.15	COM Port 4 Connector (CN15).....	30
2.4.16	UIM Card Module (CN16).....	31
2.4.17	PS/2 Keyboard/Mouse Combo Port Connector (CN17) .....	31
2.4.18	+5VSB Output w/SMBus (CN18).....	32
2.4.19	Touch Screen Connector (CN19).....	32
2.4.20	CPU FAN Connector (CN20).....	34
2.4.21	+5V Output for SATA HDD (CN22) .....	35
2.4.22	Realtek LAN (RJ-45) Port (CN23).....	35
2.4.23	Intel LAN (RJ-45) Port (CN24) .....	36
2.4.24	USB Port 1 and Port 2 (CN25) .....	36
2.4.25	VGA / DVI Ports (CN26).....	37
2.4.26	COM Port 1 (D-SUB 9) (CN27) .....	39
2.4.27	CFast Slot (CN28).....	40
2.4.28	DDR3 SODIMM Slot (CN29).....	41
2.4.29	MiniCard Slot (CN30) .....	41
2.4.30	SATA Port 1 (SATA1) .....	43
2.4.31	SATA Port 2 (SATA2).....	43
<b>Chapter 3 - AMI BIOS Setup .....</b>		<b>45</b>

3.1	System Test and Initialization .....	46
3.2	AMI BIOS Setup .....	47
<b>Chapter 4 – Drivers Installation.....</b>		<b>48</b>
4.1	Product CD/DVD .....	49
<b>Appendix A - Watchdog Timer Programming.....</b>		<b>52</b>
A.1	Watchdog Timer Registers .....	53
A.2	ITE8728F Watchdog Timer Initial Program .....	57
<b>Appendix B - I/O Information .....</b>		<b>62</b>
B.1	I/O Address Map .....	63
B.2	Memory Address Map .....	65
B.3	IRQ Mapping Chart.....	66
		
B.4	DMA Channel Assignments .....	66
<b>Appendix C – Mating Connectors .....</b>		<b>68</b>
C.1	List of Mating Connectors and Cables .....	69
<b>Appendix D – RAID &amp; AHCI Settings.....</b>		<b>71</b>

D.1	Setting RAID .....	72
D.2	Setting AHCI .....	79
<b>Appendix E – Electrical Specifications for I/O Ports.....</b>		<b>84</b>
E.1	Electrical Specifications for I/O Ports.....	85

# Chapter 1

---

Product Specifications

## 1.1 Specifications

---

### System

● Form Factor	3.5"
● Processor	Intel® 3rd Generation Core™i7/i5 Mobile processor
● System Memory	204-pin DDR3 1066/1333/1600 MHz SODIMM x 1, up to 8GB
● I/O Chipset	ITE IT8728F + Fintek F81216D
● Chipset	Intel® QM77/HM76
● Ethernet	Intel® 82579LM & Realtek RTL-8111E, 10/100/1000Base-TX, RJ-45 x 2
● BIOS	AMI BIOS-16MB SPI Flash
● Wake On LAN	Yes
● Watchdog Timer	Generates a time-out system reset
● H/W Status Monitoring	Supports power supply voltages and temperature monitoring
● Expansion Interface	Mini Card x 1, LPC
● Battery	Lithium Battery
● Power Requirement	+12V, AT/ATX
● Board Size	5.75" x 4" (146mm x 101.6mm)
● Gross Weight	0.88 lb (0.4Kg)



- **Operating Temperature** 32°F~140°F (0°C~60°C)
- **Storage Temperature** -40°F~176°F (-40°C~80°C)
- **Operating Humidity** 0% ~ 90% relative humidity, non-condensing

## Display

- **Chipset** Intel® QM77/HM76 integrated
- **Memory** Shared system memory up to 512MB
- **Resolution** Up to 2048x1536 for CRT  
Up to 1920 x 1200 for LCD, DVI
- **Display Combination** CRT/LCD, DVI/LCD simultaneous / dual view displays

## I/O

- **Storage** SATA 6.0Gb/s x 2 (RAID supported by QM77 chipset only)  
CFAST™ x 1
- **USB** USB3.0 x 2, USB2.0 x 6
- **Serial Port** RS-232 x 3  
RS-232/422/485 (auto flow) x 1
- **PS/2 Port** Keyboard x 1, Mouse x 1
- **DI/O** 8-bit Programmable
- **Audio** Line-in, Line-out, Mic-in

### \*Note on OS

For Linux, AAEON suggests the following:

- Kernel 2.6.39 version or later: Set default BIOS/SATA operating mode to IDE
- Use Ubuntu 12.04 version or later for better display performance

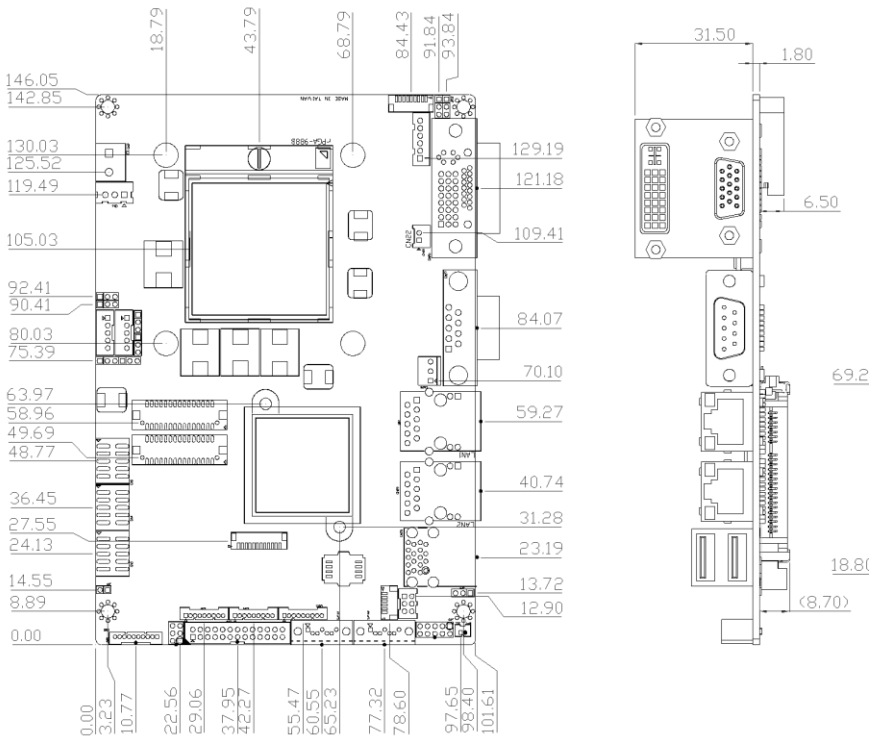
# Chapter 2

---

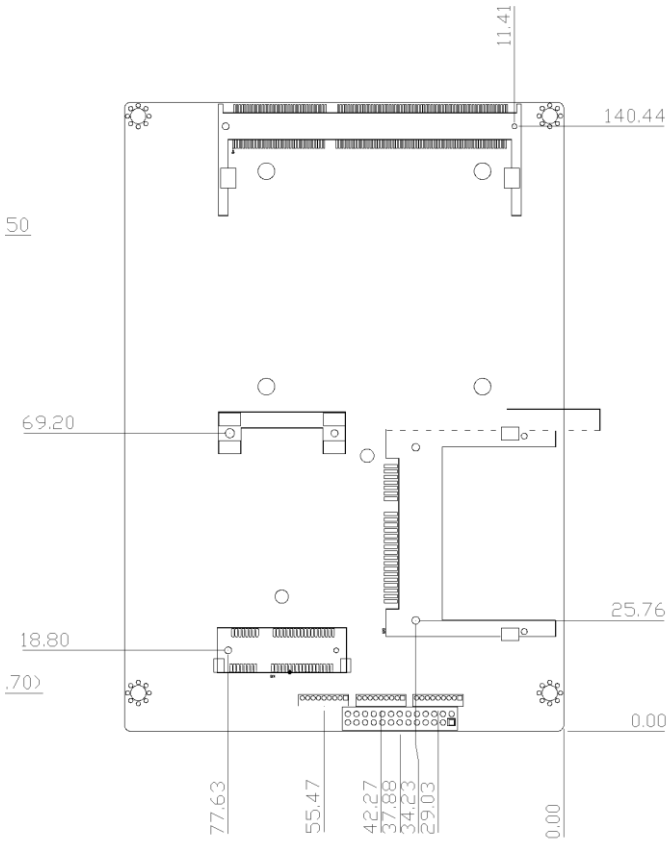
Hardware Information

## 2.1 Dimensions

### Component side

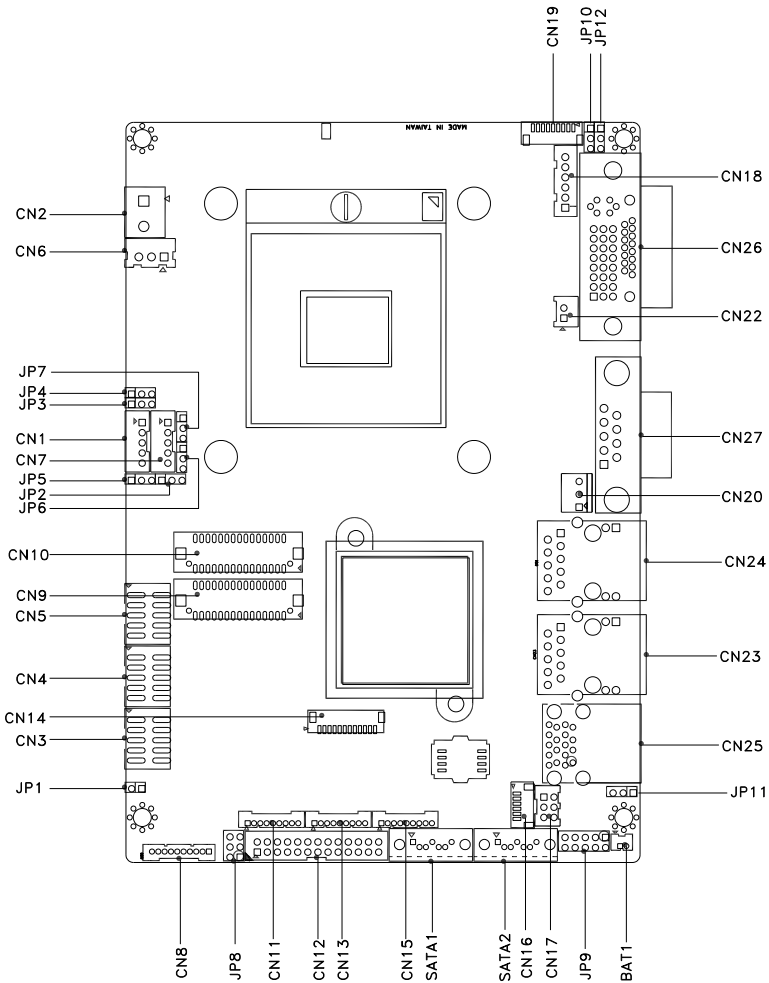


Solder side

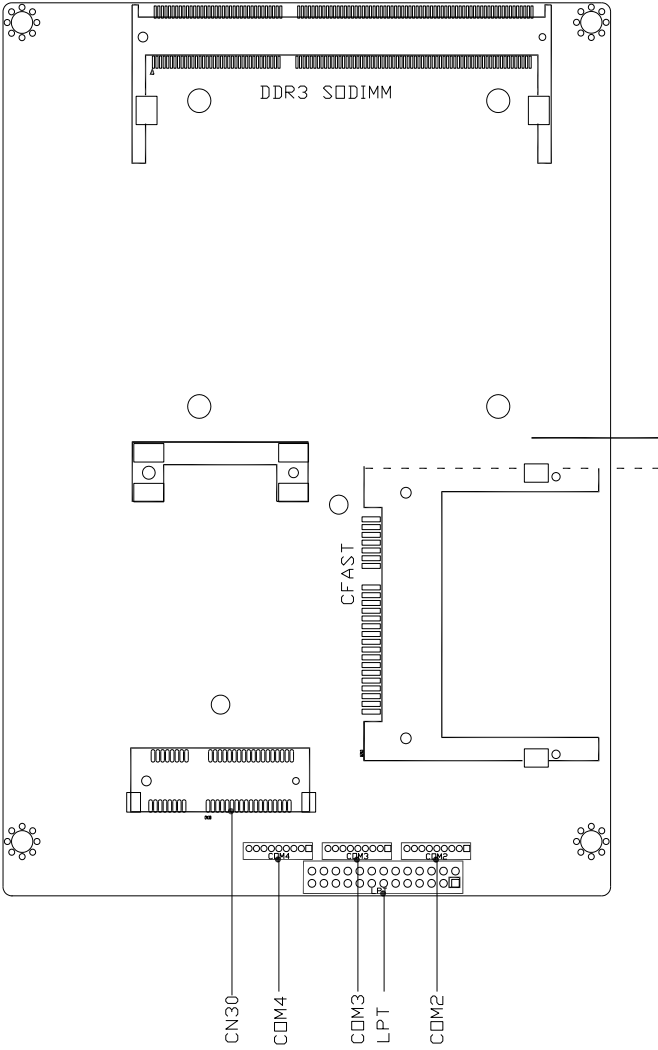


## 2.2 Jumpers and Connectors

### Component side



## Solder side



## 2.3 List of Jumpers

---

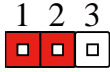
Please refer to the table below for all of the board's jumpers that you can configure for your application

Label	Function
JP2	LVDS Port 2 Operating VDD Selection
JP3	LVDS Port 1 Backlight Inverter VCC Selection
JP4	LVDS Port 2 Backlight Inverter VCC Selection
JP5	LVDS Port 1 Operating VDD Selection
JP6	LVDS Port 1 Backlight Lightness Control Mode Selection
JP7	LVDS Port 2 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

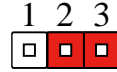


### 2.3.1 LVDS Port 2 Operating VDD Selection (JP2)

---



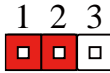
+5V



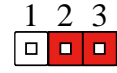
+3.3V (Default)

### 2.3.2 LVDS Port 1 Backlight Inverter VCC Selection (JP3)

---



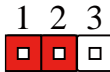
+12V



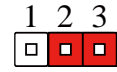
+5V (Default)

### 2.3.3 LVDS Port 2 Backlight Inverter VCC Selection (JP4)

---



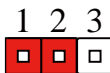
+12V



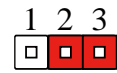
+5V (Default)

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

---



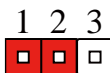
+5V



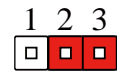
+3.3V (Default)

### 2.3.5 LVDS Port 1 Backlight Lightness Control Mode Selection (JP6)

---



VR Mode (default)

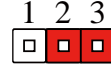


PWM Mode

### 2.3.6 LVDS Port 2 Backlight Lightness Control Mode Selection (JP7)

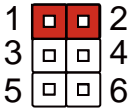


VR Mode (default)

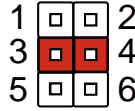


PWM Mode

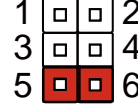
### 2.3.7 COM2 Pin8 Function Selection (JP8)



+12V

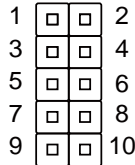


Ring(Default)



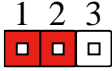
+5V

### 2.3.8 Front Panel Connector (JP9)

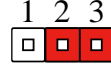


Pin	Signal
1	PWR_BTN-
2	PWR_BTN+
3	HDD_LED-
4	HDD_LED+
5	SPEAKER-
6	SPEAKER+
7	PWR_LED-
8	PWR_LED+
9	H/W RESET-

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

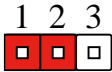


4/8-wire mode (default)

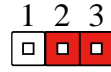


5-wire mode

### 2.3.10 Clear CMOS (JP11)

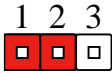


Normal (default)

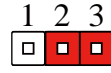


Clear CMOS

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



AT Mode (default)



ATX Mode

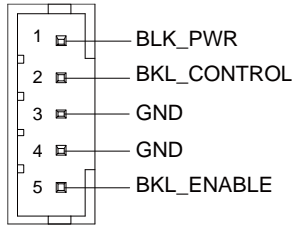
## 2.4 List of Connectors

Please refer to the table below for all of the board's connectors that you can configure for your application

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
CN7	LVDS Port 2 Inverter / Backlight Connector
CN8	Audio I/O Port
CN9	LVDS Port 1
CN10	LVDS Port 2
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 / DVI Ports (depend on hardware configuration)
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

## 2.4.1 LVDS Port 1 Inverter/ Backlight Connector (CN1)

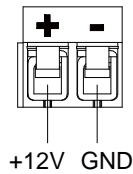


Pin	Pin Name	Signal Type	Signal Level
1	BKL_PWR	PWR	+5V / +12V
2	BKL_CONTROL	OUT	
3	GND	GND	
4	GND	GND	
5	BKL_ENABLE	OUT	+5V

\* LVDS1 BKL\_PWR can be set to +5V or +12V by JP3.

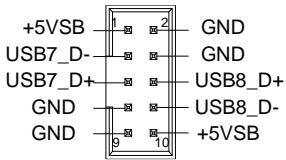
\* LVDS1 BKL\_CONTROL can be set by JP6.

## 2.4.2 External +12V Input (CN2)



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

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

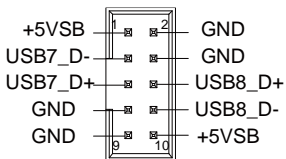


\* LVDS LCD\_PWR can be set to 3.3V or +5V by JP1

\* LVDS VDD power can be set by JP4

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

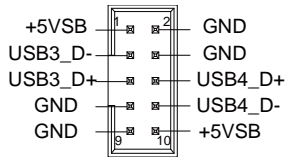
### 2.4.4 USB2.0 Port 5 and Port 6 (CN4)



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

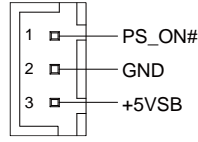
### 2.4.5 USB2.0 Port 3 and Port 4 (CN5)



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

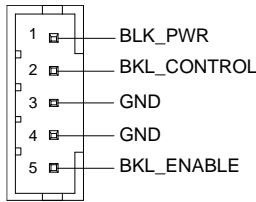


## 2.4.6 External +5VSB Input (CN6)



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

## 2.4.7 LVDS Port 2 Inverter/ Backlight Connector (CN7)

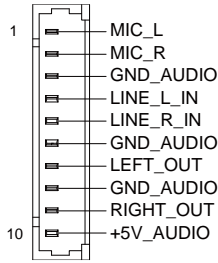


Pin	Pin Name	Signal Type	Signal Level
1	BKL_PWR	PWR	+5V / +12V
2	BKL_CONTROL	OUT	
3	GND	GND	
4	GND	GND	
5	BKL_ENABLE	OUT	+5V

\* LVDS2 BKL\_PWR can be set to +5V or +12V by JP4.

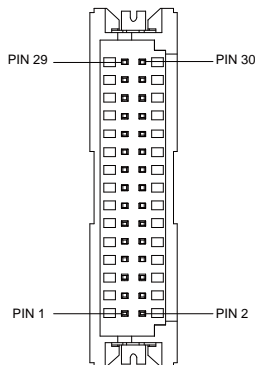
\* LVDS2 BKL\_CTL can be set by JP7.

## 2.4.8 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

## 2.4.9 LVDS Port 1 Connector (CN9)

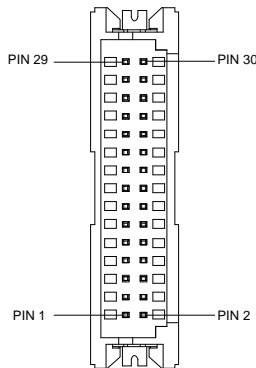


Pin	Pin Name	Signal Type	Signal Level
1	BKL_ENABLE	OUT	
2	BKL_CONTROL	OUT	
3	LCD_PWR	PWR	+3.3V/+5V
4	GND	GND	
5	LVDS_A_CLK-	DIFF	
6	LVDS_A_CLK+	DIFF	
7	LCD_PWR	PWR	+3.3V/+5V
8	GND	GND	
9	LVDS_DA0-	DIFF	
10	LVDS_DA0+	DIFF	
11	LVDS_DA1-	DIFF	
12	LVDS_DA1+	DIFF	
13	LVDS_DA2-	DIFF	
14	LVDS_DA2+	DIFF	
15	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	

\* LVDS1 LCD\_PWR can be set to +3.3V or +5V by JP5.

## 2.4.10 LVDS Port 2 Connector (CN10)

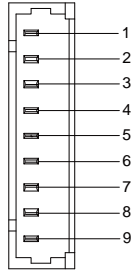


Pin	Pin Name	Signal Type	Signal Level
1	BKL_ENABLE	OUT	
2	BKL_CONTROL	OUT	
3	LCD_PWR	PWR	+3.3V/+5V
4	GND	GND	
5	LVDS_A_CLK-	DIFF	
6	LVDS_A_CLK+	DIFF	
7	LCD_PWR	PWR	+3.3V/+5V
8	GND	GND	
9	LVDS_DA0-	DIFF	
10	LVDS_DA0+	DIFF	
11	LVDS_DA1-	DIFF	

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	

\* LVDS2 LCD\_PWR can be set to +3.3V or +5V by JP2.

## 2.4.11 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	

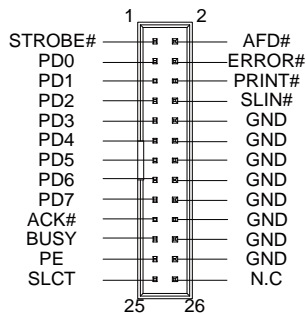
## RS-485

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	

\* COM2 RS-232/422/485 can be set by BIOS setting. Default is RS-232.

\* Pin 8 function can be set by JP8.

## 2.4.12LPT/ Digital I/O Port Connector (CN12)

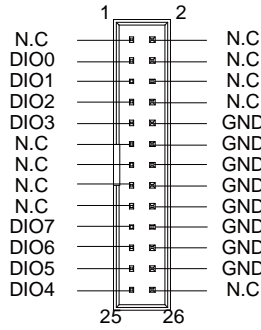


\* LPT / Digital IO can be set by BIOS setting. Default is LPT Function

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	



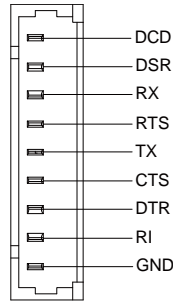
### DIO Mode

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		

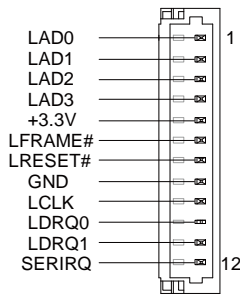
GPIO Port # / Pin Name	Location (Pin #)	I/O Port Access Address
Port 1/DIO0	3	Bit 0 of 0xA06
Port 2/DIO1	5	Bit 1 of 0xA06
Port 3/DIO2	7	Bit 2 of 0xA06
Port 4/DIO3	9	Bit 3 of 0xA06
Port 5/DIO4	25	Bit 0 of 0xA07
Port 6/DIO5	23	Bit 1 of 0xA07
Port 7/DIO6	21	Bit 2 of 0xA07
Port 8/DIO7	19	Bit 3 of 0xA07

### 2.4.13 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	

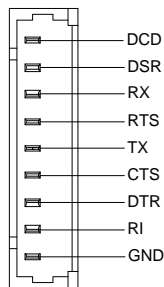
## 2.4.14LPC Port Connector (CN14)



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

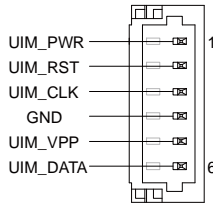
#### 2.4.15COM Port 4 Connector (CN15)



Pin	Pin Name	Signal Type	Signal Level
1	DCD	IN	
2	DSR	IN	
3	RX	IN	
4	RTS	OUT	±9V
5	TX	OUT	±9V

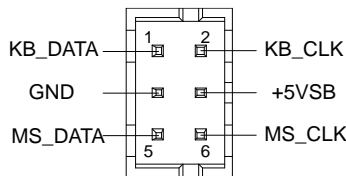
6	CTS	IN	
7	DTR	OUT	±9V
8	RI	IN	
9	GND	GND	

### 2.4.16 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	

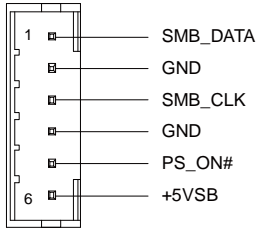
### 2.4.17 PS/2 Keyboard/Mouse Combo Port Connector (CN17)



Pin	Pin Name	Signal Type	Signal Level
1	KB_DATA	I/O	+5V
2	KB_CLK	I/O	+5V

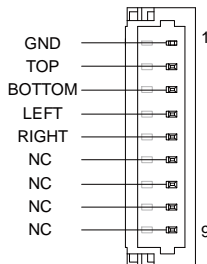
3	GND	GND	
4	+5VSB	PWR	+5V
5	MS_DATA	I/O	+5V
6	MS_CLK	I/O	+5V

### 2.4.18+5VSB Output w/SMBus (CN18)



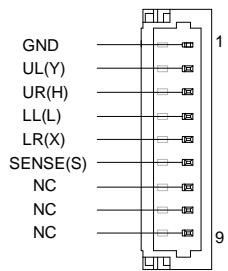
Pin	Pin Name	Signal Type	Signal Level
1	SMB_DATA	I/O	+3.3V
2	GND	GND	
3	SMB_CLK	I/O	+3.3V
4	GND	GND	
5	PS_ON#	OUT	+3.3V
6	+5VSB	PWR	+5V

### 2.4.19 Touch Screen Connector (CN19)



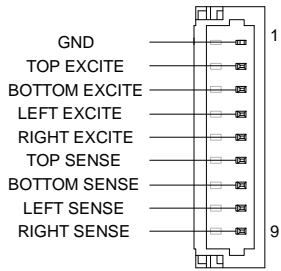
\* Touch mode can be set by JP10

4-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	



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		

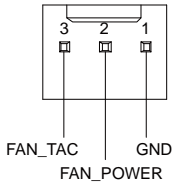
8	NC
9	NC



**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	

**2.4.20 CPU FAN Connector (CN20)**

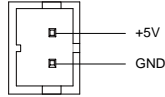


Pin	Pin Name	Signal Type	Signal Level
-----	----------	-------------	--------------



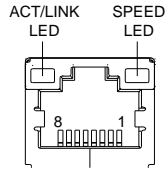
1	GND	GND	
2	FAN_POWER	PWR	+5V
3	FAN_TAC	IN	

## 2.4.21+5V Output for SATA HDD (CN22)



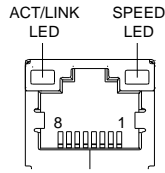
Pin	Pin Name	Signal Type	Signal Level
1	+5V	PWR	+5V
2	GND	GND	

## 2.4.22 Realtek LAN (RJ-45) Port (CN23)



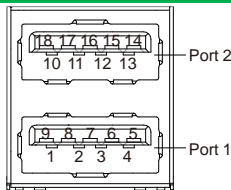
Pin	Pin Name	Signal Type	Signal Level
1	MDI0+	DIFF	
2	MDI0-	DIFF	
3	MDI1+	DIFF	
4	MDI2+	DIFF	
5	MDI2-	DIFF	
6	MDI1-	DIFF	
7	MDI3+	DIFF	
8	MDI3-	DIFF	

### 2.4.23 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	

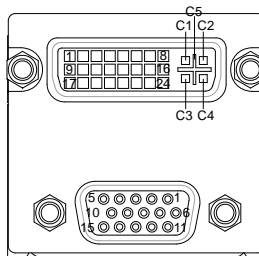
### 2.4.24 USB Port 1 and Port 2 (CN25)



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	

### 2.4.25 VGA / DVI Ports (CN26)



#### VGA

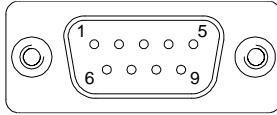
Pin	Pin Name	Signal Type	Signal Level
1	RED	OUT	
2	GREEN	OUT	
3	BLUE	OUT	
4	NC		
5	GND	GND	

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

DVI			
Pin	Pin Name	Signal Type	Signal Level
1	TMDS_DAT2+	DIFF	
2	TMDS_DAT2-	DIFF	
3	GND	GND	
4	VGA_DDC_CLK	I/O	
5	VGA_DDC_DATA	I/O	
6	DVI_DDC_CLK	I/O	+5V
7	DVI_DDC_DATA	I/O	+5V
8	VSYNC	OUT	
9	TMDS_DAT1-	DIFF	
10	TMDS_DAT1+	DIFF	
11	GND	GND	
12	TMDS_DAT3-	DIFF	
13	TMDS_DAT3+	DIFF	
14	+5V	PWR	+5V

15	GND	GND
16	HPLG_DETECT	IN
17	TMDS_DAT0-	DIFF

### 2.4.26 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	

## 2.4.27 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		

## 2.4.28 DDR3 SODIMM Slot (CN29)

Standard specification

## 2.4.29 MiniCard Slot (CN30)

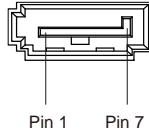
Pin	Pin Name	Signal Type	Signal Level
1	PCIE_WAKE#	IN	
2	+3.3VSB	PWR	+3.3V
3	NC		
4	GND	GND	
5	NC		
6	+1.5V	PWR	+1.5V
7	PCIE_CLK_REQ#	IN	
8	UIM_PWR	PWR	
9	GND	GND	
10	UIM_DATA	I/O	
11	PCIE_REF_CLK-	DIFF	
12	UIM_CLK	IN	
13	PCIE_REF_CLK+	DIFF	
14	UIM_RST	IN	
15	GND	GND	
16	UIM_VPP	PWR	
17	NC		
18	GND	GND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



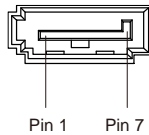
49	NC		
50	GND	GND	
51	NC		
52	+3.3VSB	PWR	+3.3V

### 2.4.30 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	

### 2.4.31 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

# Chapter 3

---

AMI BIOS Setup

## 3.1 System Test and Initialization

---

The board uses certain routines to perform testing and initialization. If an error, fatal or non-fatal, is encountered, a few short beeps or an error message will be outputted. The board can usually continue the boot up sequence with non-fatal errors.

The system configuration verification routines check the current system configuration against the values stored in the CMOS memory. If they do not match, an error message will be outputted, in which case you will 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:

- You are starting your system for the first time
- You have changed your system's hardware
- The CMOS memory has lost power and the configuration information is erased

The system's CMOS memory uses a backup battery for data retention, which is to be replaced once emptied.

## 3.2 AMI BIOS Setup

---

The AMI BIOS ROM has a pre-installed Setup program that allows users to modify basic system configurations, which is stored in the battery-backed CMOS RAM and BIOS NVRAM so that the information is retained when the power is turned off.

To enter BIOS Setup, press <Del> or <F2> immediately while your computer is powering up.

The function for each interface can be found below.

**Main** – Date and time can be set here. Press <Tab> to switch between date elements

**Advanced** – Enable/ Disable boot option for legacy network devices

**Chipset** – For hosting bridge parameters

**Boot** – Enable/ Disable quiet Boot Option

**Security** – The setup administrator password can be set here

**Save & Exit** – Save your changes and exit the program

# Chapter 4

---

Drivers Installation

## 4.1 Product CD/DVD

---

The GENE-QM77 Rev. A comes with a product DVD that contains all the drivers and utilities you need to setup your product. Insert the DVD and follow the steps in the autorun program to install the drivers.

In case the program does not start, follow the sequence below to install the drivers.

### Step 1 – Install Chipset Driver

1. Open the **Step 1 - Chipset** folder followed by **SetupChipset.exe**
2. Follow the instructions
3. Drivers will be installed automatically

### Step 2 – Install Graphics Driver

\* If you are using Windows XP, install **dotnetfx35.exe** prior to installing the drivers

1. Open the **Step 2 - VGA** folder and select your OS
2. Open the **Setup.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

### Step 3 – Install LAN Driver (Realtek LAN chip)

1. Click on the **Step 3 – LAN (Realtek)** folder and select your OS
2. Open the **Setup.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

#### Step 4 – Install LAN Driver (Intel LAN chip)

1. Click on the **Step 4 – LAN (Intel)** folder and select your OS
2. Open the **Setup.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

#### Step 5 – Install Audio Driver

1. Open the **Step 5 - Audio** folder and select your OS
2. Open the **.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

#### Step 6 – Install ME Driver

1. Open the **Step 6 – ME SW** folder and select your OS
2. Open the **Setup.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

#### Step 7 – Install RAID & AHDI Driver

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

#### Step 8 – Install TPM Driver

1. Open the **Step 8 – TPM** folder and select your OS
2. Open the **Setup.exe** file in the folder
3. Follow the instructions



4. Drivers will be installed automatically

### Step 9 – Install Touch Driver

1. Open the **Step 9 – Touch** folder and select your OS
2. Open the **Setup.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

### Step 10 – Install USB 3.0 Driver (Windows 7 only)

1. Open the **Step 10 – USB3.0** folder followed by **Setup.exe**
2. Follow the instructions
3. Drivers will be installed automatically

# Appendix A

---

## Watchdog Timer Programming

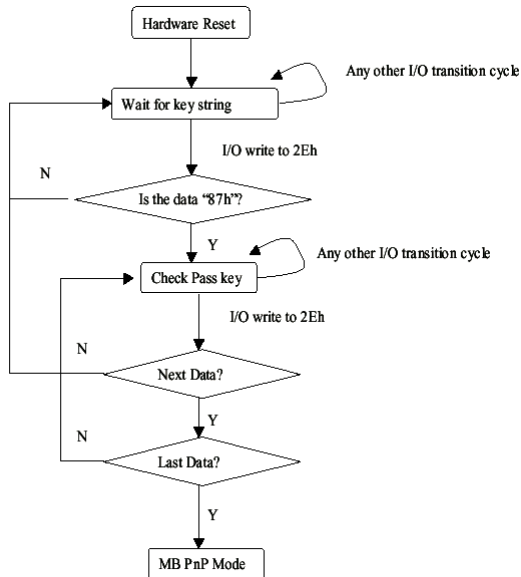
## A.1 Watchdog Timer Registers

GENE-QM77 rev. A 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.

	<b>Address Port</b>	<b>Data Port</b>
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

<b>LDN</b>	<b>Index</b>	<b>R/W</b>	<b>Reset</b>	<b>Configuration Register or Action</b>
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.

<b>Bit</b>	<b>Description</b>
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 <sup>Note</sup> for WDT

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

## 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

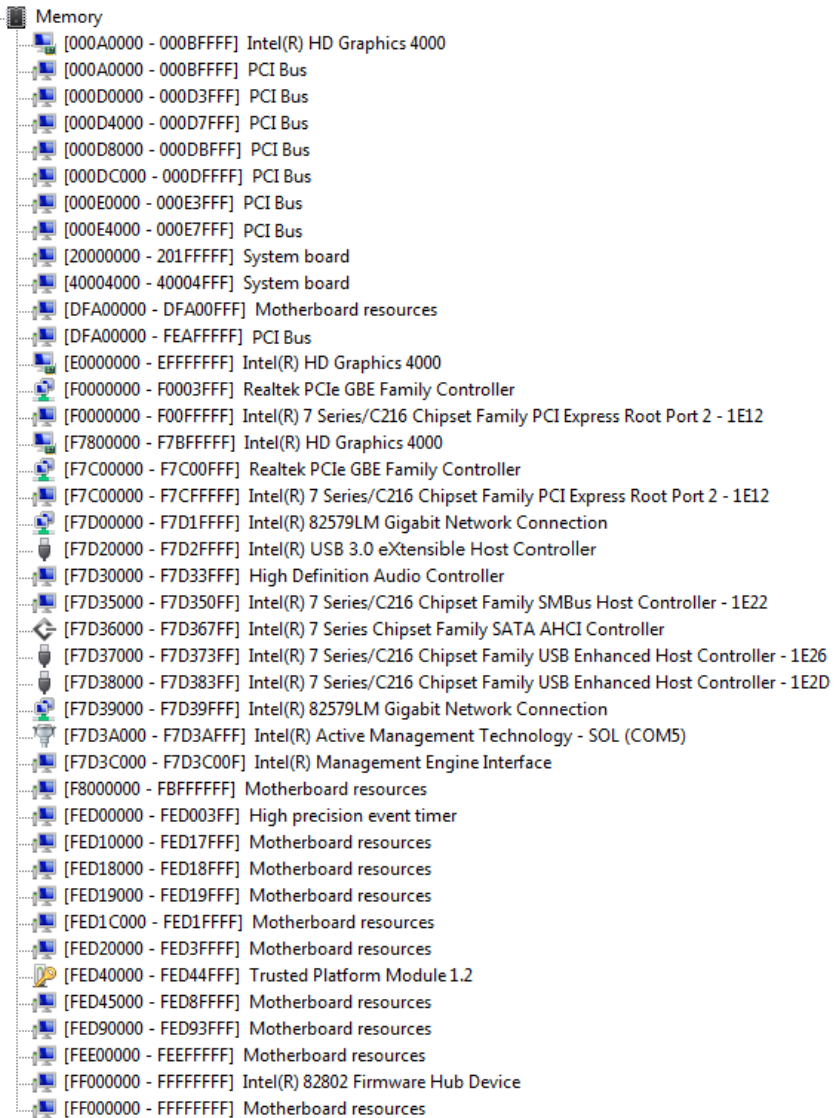
---

I/O Information



	[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



The image shows a screenshot of a memory address map. On the left side, there is a vertical green bar with the text "3.5" Subcompact Board" and "GENE-QM77 Rev. A". The main content is a list of memory addresses and their corresponding hardware components. Each entry consists of a small icon, a memory address range in brackets, and the component name. The components include Intel(R) HD Graphics 4000, PCI Bus, System board, Motherboard resources, Intel(R) HD Graphics 4000, Realtek PCIe GBE Family Controller, Intel(R) 7 Series/C216 Chipset Family PCI Express Root Port 2 - 1E12, Intel(R) HD Graphics 4000, Realtek PCIe GBE Family Controller, Intel(R) 7 Series/C216 Chipset Family PCI Express Root Port 2 - 1E12, Intel(R) 82579LM Gigabit Network Connection, Intel(R) USB 3.0 eXtensible Host Controller, High Definition Audio Controller, Intel(R) 7 Series/C216 Chipset Family SMBus Host Controller - 1E22, Intel(R) 7 Series Chipset Family SATA AHCI Controller, Intel(R) 7 Series/C216 Chipset Family USB Enhanced Host Controller - 1E26, Intel(R) 7 Series/C216 Chipset Family USB Enhanced Host Controller - 1E2D, Intel(R) 82579LM Gigabit Network Connection, Intel(R) Active Management Technology - SOL (COM5), Intel(R) Management Engine Interface, Motherboard resources, High precision event timer, Motherboard resources, Motherboard resources, Motherboard resources, Motherboard resources, Motherboard resources, Motherboard resources, Trusted Platform Module 1.2, Motherboard resources, Motherboard resources, Motherboard resources, Intel(R) 82802 Firmware Hub Device, and Motherboard resources.

Memory Address Range	Component
[000A0000 - 000BFFFF]	Intel(R) HD Graphics 4000
[000A0000 - 000BFFFF]	PCI Bus
[000D0000 - 000D3FFF]	PCI Bus
[000D4000 - 000D7FFF]	PCI Bus
[000D8000 - 000DBFFF]	PCI Bus
[000DC000 - 000DFFFF]	PCI Bus
[000E0000 - 000E3FFF]	PCI Bus
[000E4000 - 000E7FFF]	PCI Bus
[20000000 - 201FFFFFF]	System board
[40004000 - 40004FFF]	System board
[DFA00000 - DFA00FFF]	Motherboard resources
[DFA00000 - FEAFFFFF]	PCI Bus
[E0000000 - EFFFFFFF]	Intel(R) HD Graphics 4000
[F0000000 - F0003FFF]	Realtek PCIe GBE Family Controller
[F0000000 - F00FFFFFF]	Intel(R) 7 Series/C216 Chipset Family PCI Express Root Port 2 - 1E12
[F7800000 - F7BFFFFF]	Intel(R) HD Graphics 4000
[F7C00000 - F7C00FFF]	Realtek PCIe GBE Family Controller
[F7C00000 - F7CFFFFFF]	Intel(R) 7 Series/C216 Chipset Family PCI Express Root Port 2 - 1E12
[F7D00000 - F7D1FFFF]	Intel(R) 82579LM Gigabit Network Connection
[F7D20000 - F7D2FFFF]	Intel(R) USB 3.0 eXtensible Host Controller
[F7D30000 - F7D33FFF]	High Definition Audio Controller
[F7D35000 - F7D350FF]	Intel(R) 7 Series/C216 Chipset Family SMBus Host Controller - 1E22
[F7D36000 - F7D367FF]	Intel(R) 7 Series Chipset Family SATA AHCI Controller
[F7D37000 - F7D373FF]	Intel(R) 7 Series/C216 Chipset Family USB Enhanced Host Controller - 1E26
[F7D38000 - F7D383FF]	Intel(R) 7 Series/C216 Chipset Family USB Enhanced Host Controller - 1E2D
[F7D39000 - F7D39FFF]	Intel(R) 82579LM Gigabit Network Connection
[F7D3A000 - F7D3AFFF]	Intel(R) Active Management Technology - SOL (COM5)
[F7D3C000 - F7D3C00F]	Intel(R) Management Engine Interface
[F8000000 - FBFFFFFF]	Motherboard resources
[FED00000 - FED003FF]	High precision event timer
[FED10000 - FED17FFF]	Motherboard resources
[FED18000 - FED18FFF]	Motherboard resources
[FED19000 - FED19FFF]	Motherboard resources
[FED1C000 - FED1FFFF]	Motherboard resources
[FED20000 - FED3FFFF]	Motherboard resources
[FED40000 - FED44FFF]	Trusted Platform Module 1.2
[FED45000 - FED8FFFF]	Motherboard resources
[FED90000 - FED93FFF]	Motherboard resources
[FEE00000 - FEEFFFFFF]	Motherboard resources
[FF000000 - FFFFFFFF]	Intel(R) 82802 Firmware Hub Device
[FF000000 - FFFFFFFF]	Motherboard resources

## B.3 IRQ Mapping Chart

Interrupt request (IRQ)	
 (ISA) 0x00000000 (00)	System timer
 (ISA) 0x00000001 (01)	Standard PS/2 Keyboard
 (ISA) 0x00000003 (03)	Communications Port (COM2)
 (ISA) 0x00000004 (04)	Communications Port (COM1)
 (ISA) 0x00000008 (08)	System CMOS/real time clock
 (ISA) 0x0000000A (10)	Communications Port (COM4)
 (ISA) 0x0000000B (11)	Communications Port (COM3)
 (ISA) 0x0000000C (12)	Microsoft PS/2 Mouse
 (ISA) 0x0000000D (13)	Numeric data processor
 (PCI) 0x0000000F (15)	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
 (PCI) 0x00000010 (16)	Intel(R) 7 Series/C216 Chipset Family PCI Express Root Port 1 - 1E10
 (PCI) 0x00000010 (16)	Intel(R) Management Engine Interface
 (PCI) 0x00000011 (17)	Intel(R) 7 Series/C216 Chipset Family PCI Express Root Port 2 - 1E12
 (PCI) 0x00000013 (19)	Intel(R) Active Management Technology - SOL (COM5)
 (PCI) 0x00000016 (22)	High Definition Audio Controller
 (PCI) 0x00000017 (23)	Intel(R) 7 Series/C216 Chipset Family USB Enhanced Host Controller - 1E26
 (PCI) 0xFFFFF7FA (-6)	Realtek PCIe GBE Family Controller
 (PCI) 0xFFFFF7FB (-5)	Intel(R) 82579LM Gigabit Network Connection
 (PCI) 0xFFFFF7FC (-4)	Intel(R) USB 3.0 eXtensible Host Controller
 (PCI) 0xFFFFF7FD (-3)	Intel(R) HD Graphics 4000
 (PCI) 0xFFFFF7FE (-2)	Intel(R) 7 Series Chipset Family SATA AHCI Controller



## B.4 DMA Channel Assignments

---



Direct memory access (DMA)



4 Direct memory access controller

# Appendix C

---

Mating Connectors

## C.1 List of Mating Connectors and Cables

Connector Label	Function	Mating Connector		Available Cable	Cable P/N
		Vendor	Model no		
CN1	LVDS#1 Inverter Connector	JST	PHR-5	N/A	N/A
CN2	+12V Vin Connector	N/A	N/A	Power Cable	1702002010
CN3	USB Port #7, #8 Connector	Molex	51110-1050	USB Cable	1709100201
CN4	USB Port #5, #6 Connector	Molex	51110-1050	USB Cable	1709100201
CN5	USB Port #3, #4 Connector	Molex	51110-1050	USB Cable	1709100201
CN6	External +5VSB Power Input and PS_ON#	JST	XHP-3	ATX Cable	170220020B
CN7	LVDS#2 Inverter Connector	JST	PHR-5	N/A	N/A
CN8	Audio Connector	Molex	51021-1000	Audio Cable	1709100254
CN9	LVDS#1 Connector	HIROSE	DF13-30DS-1.25C	N/A	N/A
CN10	LVDS#2 Connector	HIROSE	DF13-30DS-1.25C	N/A	N/A
CN11	COM Port 2 Connector	Molex	51021-0900	Serial Port Cable	1701090150
CN12	LPT / Digital IO Port	Molex	51110-2650	Parallel Port Cable	1701260200
CN13	COM Port 3 Connector	Molex	51021-0900	Serial Port Cable	1701090150
CN14	LPC Port	JST	SHR-12V-S-B	AAEON LPC Cable	1703120130

CN15	COM Port 4 Connector	Molex	51021-0900	Serial Port Cable	1701090150
CN16	UIM Connector	Molex	51021-0600	N/A	N/A
CN17	P/S2 KB/MS Connector	JST	PHDR-06VS	P/S2 KB/MS Cable	1700060152
CN18	External AUX Power and PS_ON#	JST	PHR-6	N/A	N/A
CN19	Touch Screen Connector	JST	SHR-9V-S-B	N/A	N/A
CN20	CPU Fan Connector	Molex	22-01-2035	N/A	N/A
CN22	+5Vout Connector	JST	PHR-2	2 Pins For HDD Power	1702150155
BAT1	External RTC Connector	Molex	51021-0200	Battery Cable	175011901C

# Appendix D

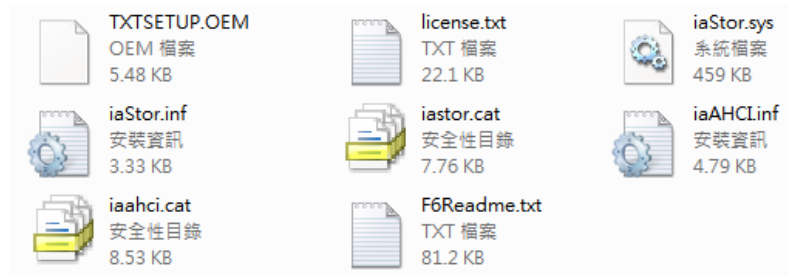
---

RAID & AHCI Settings

## D.1 Setting RAID

OS installation to SETUP RAID Mode

Step 1: Extract the **f6fly-x86.zip** from "Driver CD -> Step7-RAID&AHCI\WinXP\_32" and copy below files to diskette.

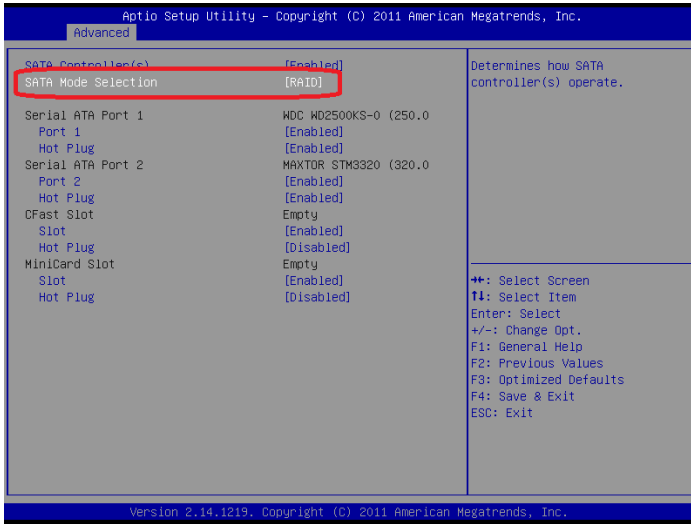


Step 2: Connect the USB Floppy drive to the board and insert the diskette from previous step.

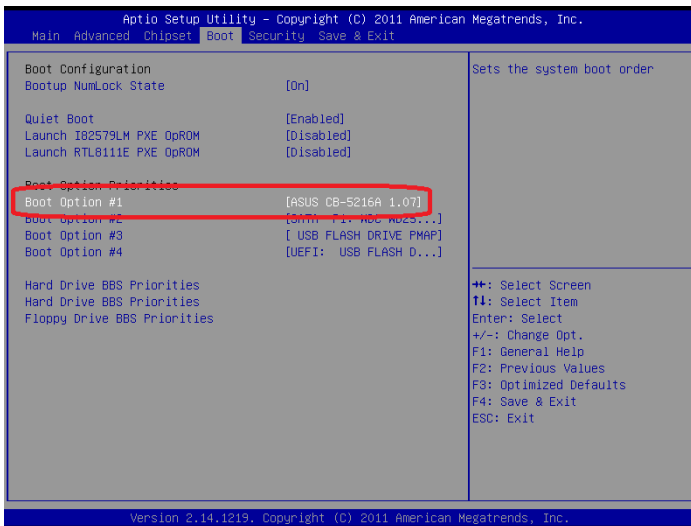


Step 3: Configure SATA Controller to RAID mode in BIOS SETUP Menu: Advanced ->

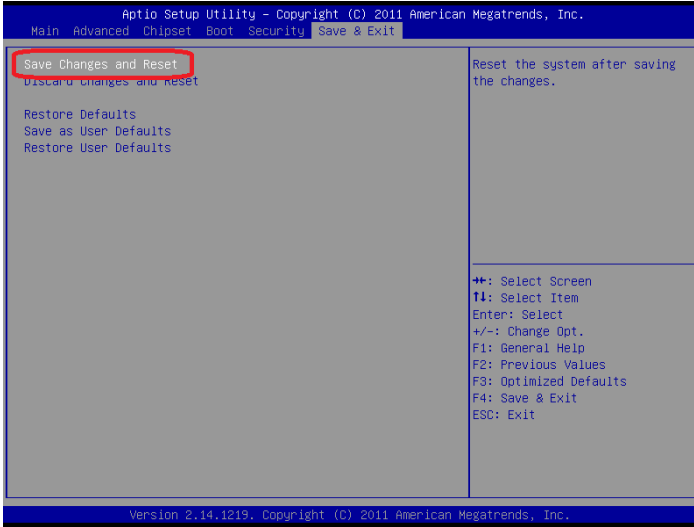
SATA Configuration -> SATA Mode -> RAID Mode



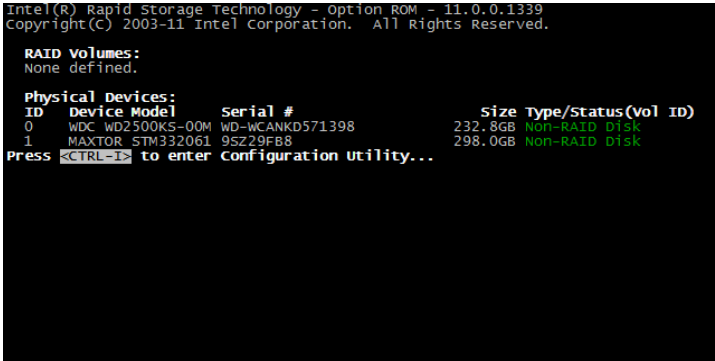
Step 4: Configure DVD/CD-ROM drive as the first boot device.



## 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"

```

Intel(R) Rapid Storage Technology - Option ROM - 11.0.0.1339
Copyright(C) 2003-11 Intel Corporation. All Rights Reserved.
*****[ MAIN MENU ]*****
* 1. Create RAID Volume          4. Recovery Volume Options
* 2. Delete RAID Volume        5. Acceleration Options
* 3. Reset Disks to Non-RAID    6. Exit
*****[ DISK/VOLUME INFORMATION ]*****
* RAID Volumes:
* None defined.
* Physical Devices:
* ID Device Model Serial # Size Type/Status(Vol ID)
* 0 WDC WD2500KS-00M WD-WCANKD571398 232.8GB Non-RAID Disk
* 1 MAXTOR STM332061 95Z29FB8 298.0GB Non-RAID Disk
*****
[**]-Select [ESC]-Exit [ENTER]-Select Menu

```

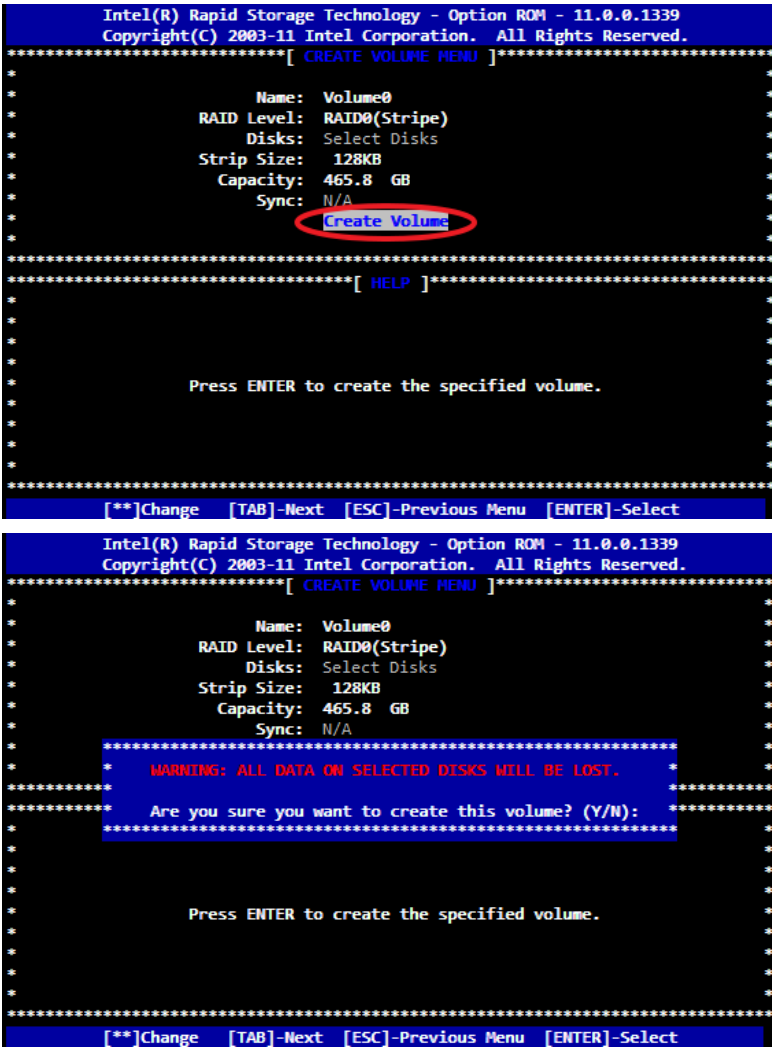
## Step 8 – Configure RAID parameters for the system

```

Intel(R) Rapid Storage Technology - Option ROM - 11.0.0.1339
Copyright(C) 2003-11 Intel Corporation. All Rights Reserved.
*****[ CREATE VOLUME MENU ]*****
* Name: Volume0
* RAID Level: RAID0(Stripe)
* Disks: Select Disk
* Strip Size: 128KB
* Capacity: 465.8 GB
* Sync: N/A
* Create Volume
*****
*****[ HELP ]*****
*
* RAID 0: Stripes data (performance).
*
*****
[**]Change [TAB]-Next [ESC]-Previous Menu [ENTER]-Select

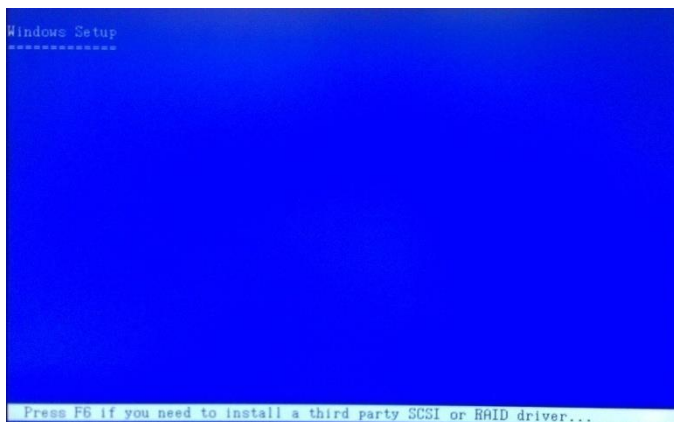
```

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

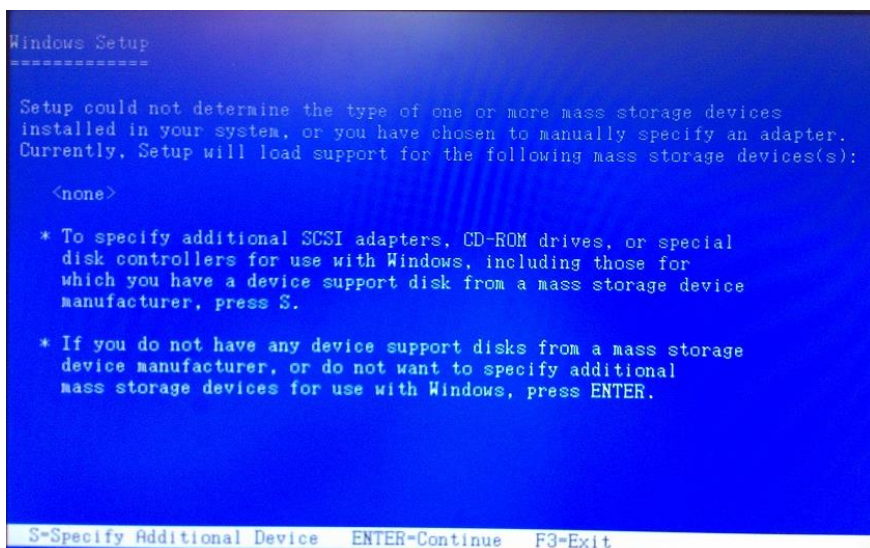


Step 10 – Exit RAID Configuration Utility and Reboot to DVD/CD-ROM device to install OS

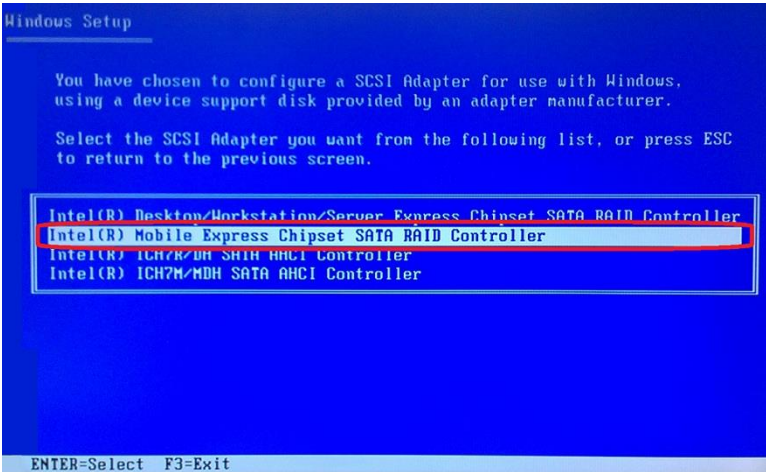
Step 11 – Press **"F6"** to install RAID driver



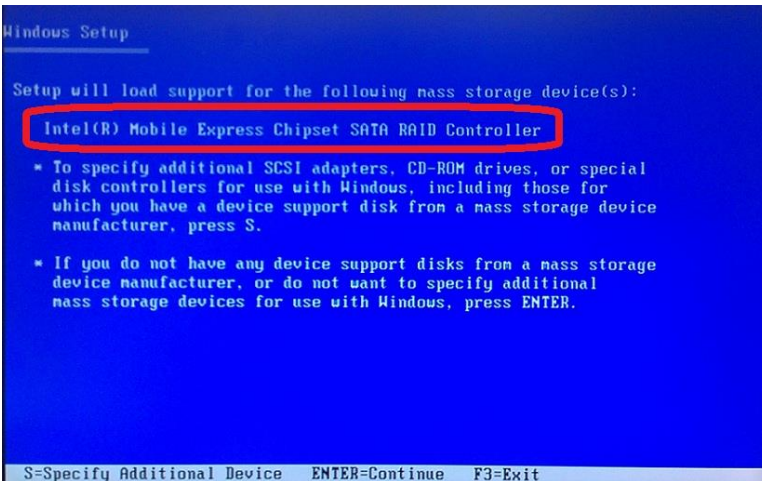
Step 12 – Press **"S"** to install RAID driver



## Step 13 – Choose “Intel(R) Mobile Express Chipset SATA RAID Controller”



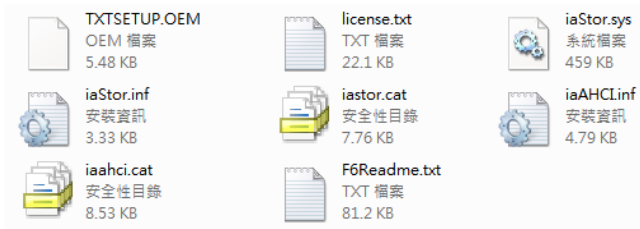
Step 14 – It will show the model you selected and then press “ENTER”. Windows Setup will continue to install OS.



## D.2 Setting AHCI

OS installation to SETUP AHCI Mode

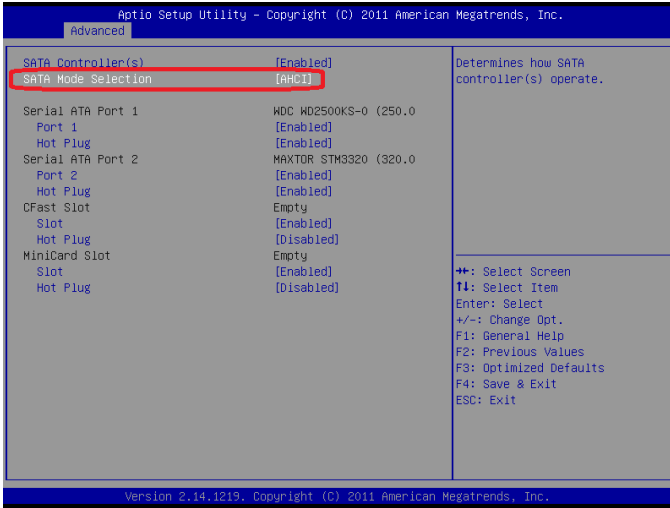
Step 1: Extract the **f6fly-x86.zip** from "Driver CD -> Step7 - RAID&AHCI\WinXP\_32" and copy below files to diskette.



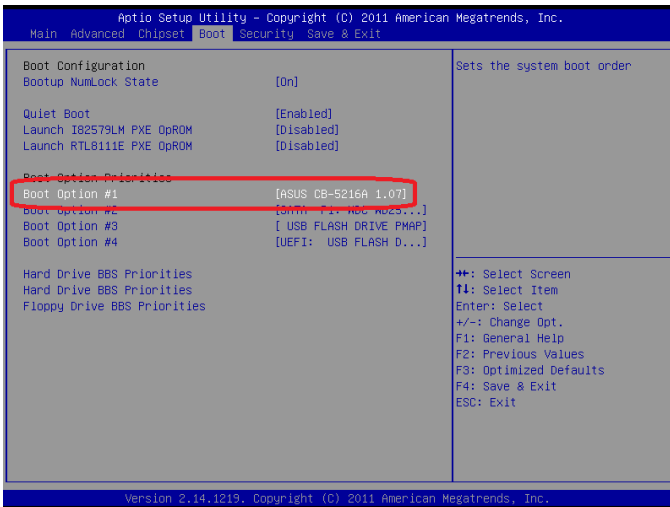
Step 2: Connect the USB Floppy drive to the board and insert the diskette from previous step.



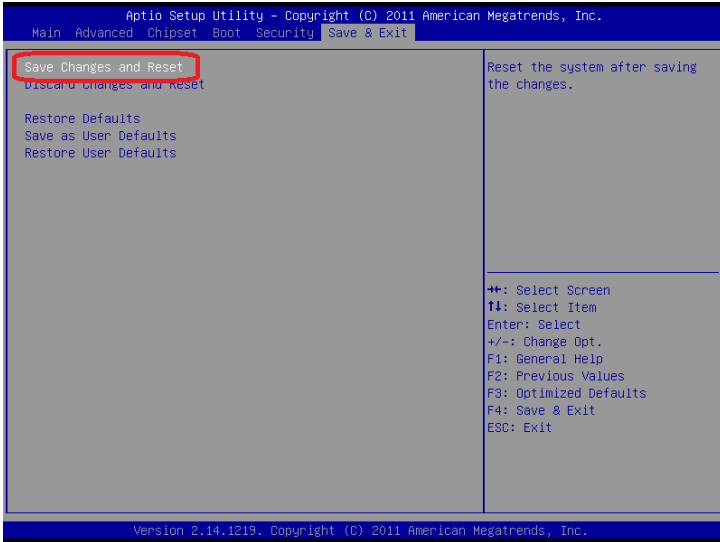
Step 3: Configure SATA Controller to RAID mode in BIOS SETUP Menu: Advanced -> SATA Configuration -> SATA Mode -> AHCI Mode



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

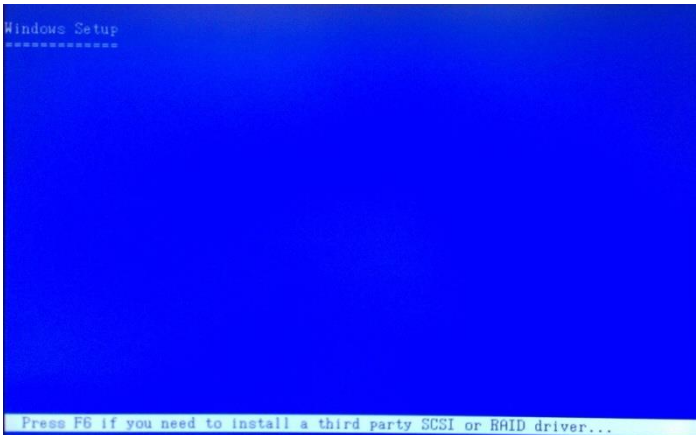


## Step 5: Save changes and exit BIOS SETUP

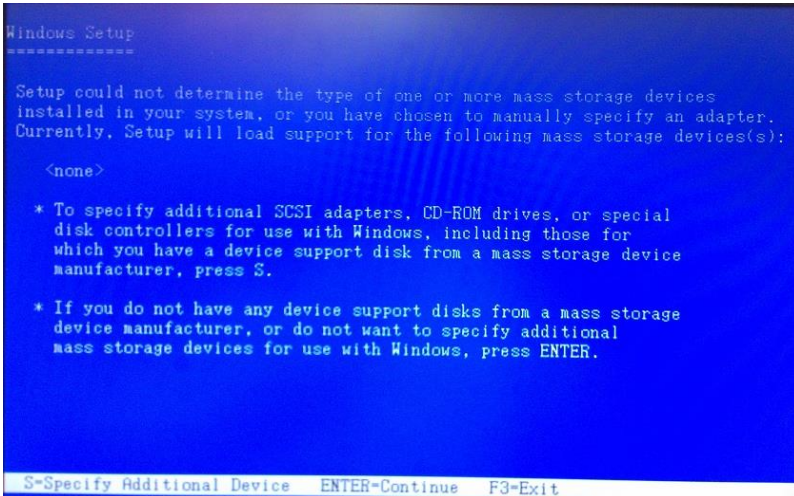


## Step 6 – Boot to DVD/CD-ROM device to install OS

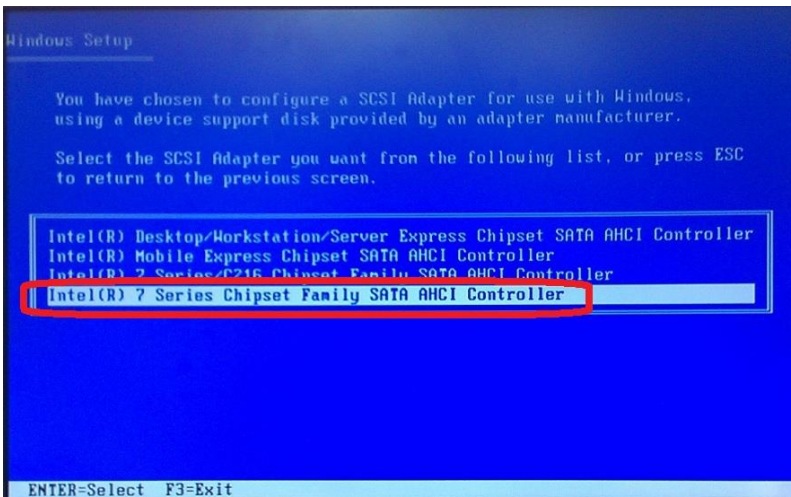
## Step 7 – Press "F6" to install AHCI driver



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

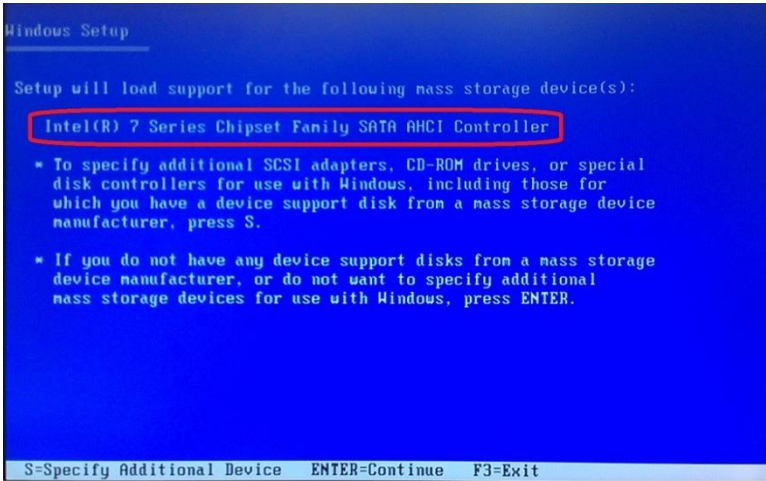


## Step 9 – Choose "Intel(R) 7 Series Chipset Family SATA AHCI Controller"





Step 10 – It will show the model you selected and then press **"ENTER"**. Windows Setup will continue to install OS.



# Appendix E

---

Electrical Specifications for I/O Ports

## E.1 Electrical Specifications for I/O Ports

I/O	Reference	Signal Name	Rate Output
LVDS Port 1 Inverter / Backlight Connector	CN1	VDD	+5V/2A or +12V/2A
LVDS Port 2 Inverter / Backlight Connector	CN7	VDD	+5V/2A or +12V/2A
USB 2.0 Ports 7 and 8	CN3	+5V	
USB 2.0 Ports 5 and 6	CN4	+5V	+5V/0.5A (per channel)
USB 2.0 Ports 3 and 4	CN5	+5V	
USB Ports 1 and 2	CN25	VCC	+5V/1A (per channel)
Audio I/O Port	CN8	+5V	+5V/1A
LVDS Port 1	CN9	VCC	+3.3V/1A or +5V/1A
LVDS Port 2	CN10	VCC	+3.3V/1A or +5V/1A
COM Port 2	CN11	+5V/+12V	+5V/1A or +12V/1A
Digital IO Port	CN12	D0~D7	+5V/(Open drain)
PS/2 Keyboard/Mouse Combo Port	CN17	+5V	+5V/1A

CPU FAN	CN20	VDD	+12V/0.5A
+5V Output for SATA HDD	CN22	+5V	+5V/1A
VGA / DVI Ports (depend on hardware configuration)	CN26	VGA: +5V DVI : +5V	+5V/1A (reserved) +5V/0.5A
CFast Slot	CN28	+3.3V	+3.3V/0.5A
Mini Card Slot	CN30	+3.3VSB +1.5V	+3.3V/1.1A +1.5V/0.375A
LPC Port	CN14	+3.3VCC	+3.3V/0.5A