

# BOXER-6651

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Fanless Embedded Box PC

User's Manual 3<sup>rd</sup> Ed

## Copyright Notice

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## Packing List

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

Item	Quantity
● BOXER-6651	1
● Phoenix power connector	1
● Thermal pad	1
● Screw package	1
● Wallmount bracket	2
● Product 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

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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

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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. All cables and adapters supplied by AAEON are certified and in accordance with the material safety laws and regulations of the country of sale. Do not use any cables or adapters not supplied by AAEON to prevent system malfunction or fires.
3. Make sure the power source matches the power rating of the device.
4. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
5. Always completely disconnect the power before working on the system's hardware.
6. No connections should be made when the system is powered as a sudden rush of power may damage sensitive electronic components.
7. 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.
8. Always disconnect this device from any AC supply before cleaning.
9. While cleaning, use a damp cloth instead of liquid or spray detergents.
10. Make sure the device is installed near a power outlet and is easily accessible.
11. Keep this device away from humidity.
12. Place the device on a solid surface during installation to prevent falls
13. Do not cover the openings on the device to ensure optimal heat dissipation.
14. Watch out for high temperatures when the system is running.
15. Do not touch the heat sink or heat spreader when the system is running
16. Never pour any liquid into the openings. This could cause fire or electric shock.

17. 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.
18. 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
19. **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 Embedded Box PC/ Industrial System

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷电路板 及其电子组件	○	○	○	○	○	○
外部信号 连接器及线材	○	○	○	○	○	○
外壳	○	○	○	○	○	○
中央处理器 与内存	○	○	○	○	○	○
硬盘	○	○	○	○	○	○
电源	○	○	○	○	○	○

○：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。

## China RoHS Requirement (EN)

Poisonous or Hazardous Substances or Elements in Products  
 AAEON Embedded Box PC/ Industrial System

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	○	○	○	○	○	○
Chassis	○	○	○	○	○	○
CPU & RAM	○	○	○	○	○	○
Hard Disk	○	○	○	○	○	○
PSU	○	○	○	○	○	○

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.

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.

**Note: The Environment Friendly Use Period as labeled on this product is applicable under normal usage only**

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# Chapter 1

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Product Specifications

## 1.1 Specifications

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### System

● Processor		Intel® Atom™ E3845	
● System Memory		204-pin DDR3L 1333 MHz SODIMM x 1, up to 8 GB	
● Chipset		Intel® Atom™ E3845	
● Display	HDMI	-	
● Interface	DVI	DVI-D x 1	
	VGA	VGA x 1	
	CF-SATA	CFast x 1	
● Storage	CF-SATA	CFast x 1	
Device	HDD/SSD	2.5" SATA HDD/SSD slot x 1	
● Network	LAN	Gigabit Ethernet	
	Wireless	Optional	
● Front I/O	USB Host	USB 2.0 Type A x 2	
	LAN	—	
	Serial Port	RS-232 x 2	
	DIO	—	
	Audio	—	
	KB/MS	—	
	Others	Power Button	x 1
		SIM slot	x 1
		SMA Antenna holes	x 2
● Rear I/O	CFast slot	x 1	
	USB Host	USB 3.0 Type A x 1 USB 2.0 Type A x 3	
	LAN	RJ-45 x 2	



	<b>Serial Port</b>	RS-232 x 2 Isolated RS-232/422/485 x 2
	<b>DIO</b>	—
	<b>Audio</b>	Line-in x 1/ Line-out x 1
	<b>KB/MS</b>	—
	<b>Others</b>	Power Input x 1 VGA x 1 DVI-D x 1
● <b>Expansion</b>	<b>PCIe</b>	—
	<b>PCI</b>	—
	<b>MiniCard</b>	Half-size MiniCard (USB & PCIe) x 1 Full-size MiniCard (USB & PCIe) x 1
	<b>Mini PCI</b>	—
	<b>Others</b>	—
● <b>Indicator</b>	<b>Front</b>	System LED x 1 HDD LED x 1 LAN1 Tx LED x1 LAN1 Rx LED x1 LAN2 Tx LED x1 LAN2 Rx LED x1
	<b>Rear</b>	—
● <b>Power Requirement</b>		9 ~ 30 Vdc, ATX/AT
● <b>System Cooling</b>		Passive cooling
● <b>Mounting</b>		Wall-mount
● <b>Dimension (W x H x D)</b>		264.2 x 69.6 x 193.5 mm (10.4 x 2.7 x 7.6")
● <b>Gross Weight</b>		5 Kg
● <b>Net Weight</b>		3.5 Kg
● <b>Carton Size</b>		412 x 307 x 284 mm

● Certification	EMC	CE/FCC Class A
	Safety	—

## Environmental

- **Operating Temperature** -25°C ~ 65°C (With air flow, FAN speed 0.5 m/s)  
With industrial grade device (According to IEC68-2-14)
- **Storage Temperature** -20 ~ 70°C (-4 ~ 158°F)
- **Anti-Vibration** 5G<sub>rms</sub>/5~500 Hz/ operation- CFast  
5G<sub>rms</sub>/5~500 Hz/ operation- SSD  
1G<sub>rms</sub>/5~500 Hz/ operation- HDD
- **Anti-Shock** 50G pear acceleration(11 msec duration)- CFast  
50G pear acceleration(11 msec duration)- SSD  
20G pear acceleration(11 msec duration)- HDD

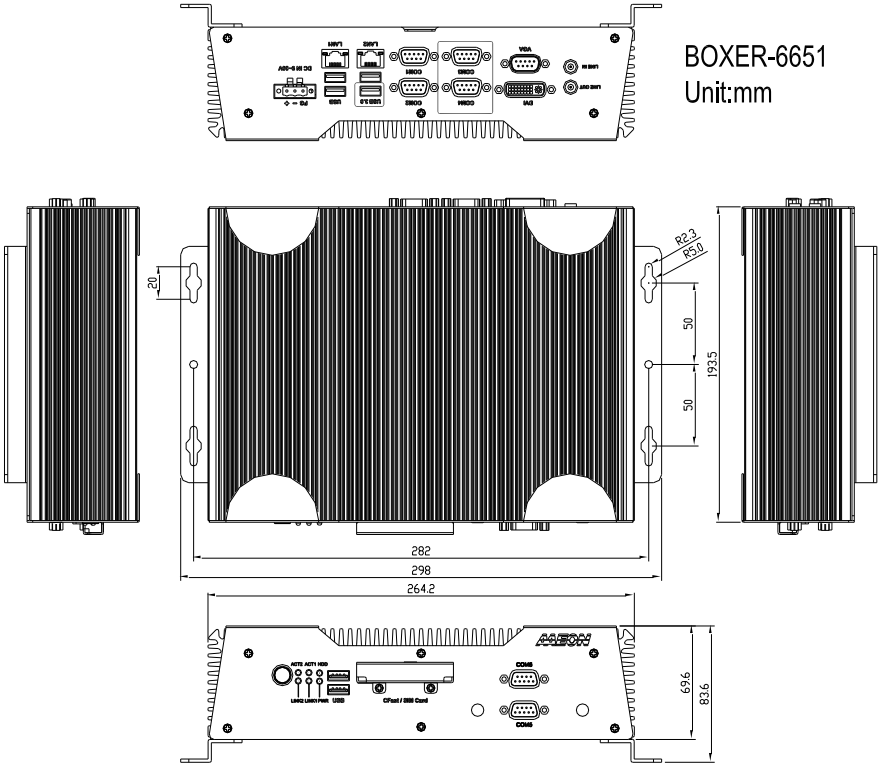
# Chapter 2

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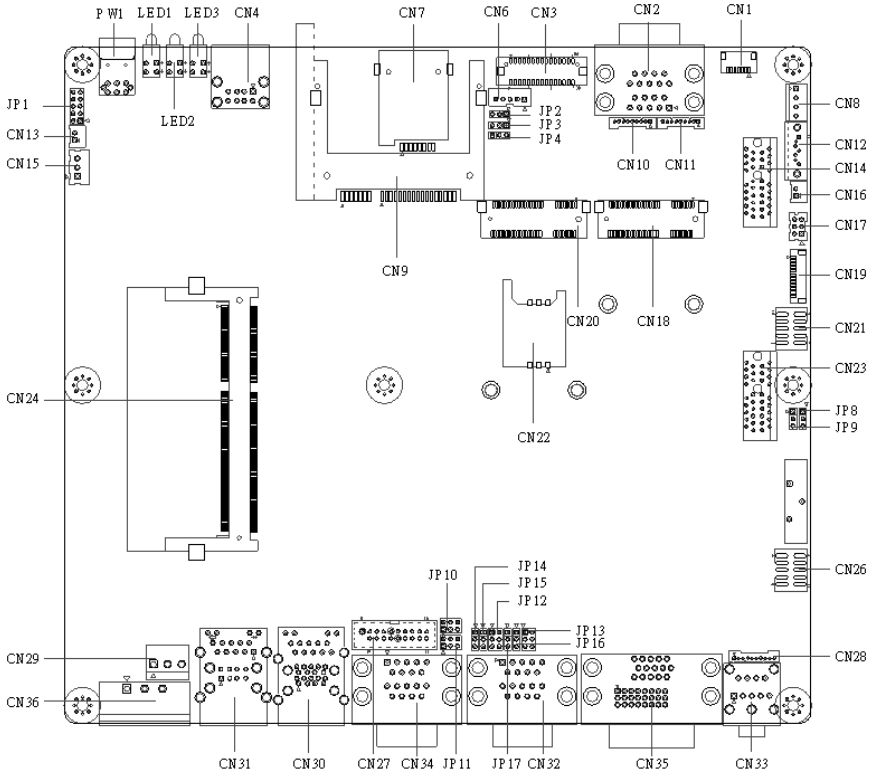
Hardware Information

## 2.1 Dimensions

BOXER-6651  
Unit:mm



## 2.2 Jumpers and Connectors



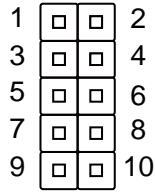
## 2.3 List of Jumpers

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

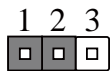
Label	Function
JP1	Front Panel Connector
JP2	LVDS Port Backlight Lightness Control Mode Selection
JP3	LVDS Port Backlight Inverter VCC Selection
JP4	LVDS Port Operating VDD Selection
JP8	Clear CMOS Jumper
JP9	Auto Power Button Enable/Disable Selection
JP10	COM1 Pin9 Function Selection
JP11	COM2 Pin9 Function Selection
JP12	COM4 Mode Selection
JP13	COM3 Mode Selection
JP14	COM4 RX/DCD Termination Selection
JP15	COM4 TX/DTR Termination Selection
JP16	COM3 TX/DTR Termination Selection
JP17	COM3 RX/DCD Termination Selection

### 2.3.1 Front Panel Connector (JP1)

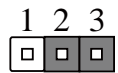


Pin	Pin Name	Pin	Pin Name
1	PWR_BTN-	2	PWR_BTN+
3	HDD_LED-	4	HDD_LED+
5	SPEAKER-	6	SPEAKER+
7	PWR_LED-	8	PWR_LED+
9	H/W RESET-	10	H/W RESET+

### 2.3.2 LVDS Port Backlight Brightness Control Mode Selection (JP2)

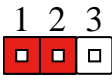


VR Mode (Default)

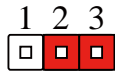


PWM Mode

### 2.3.3 LVDS Port Backlight Inverter VCC Selection (JP3)

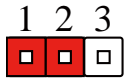


+12V

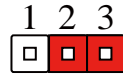


+5V (Default)

### 2.3.4 LVDS Port Operating VCC Selection (JP4)

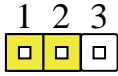


+5V

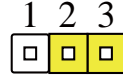


+3.3V (Default)

### 2.3.5 Clear CMOS Jumper (JP8)

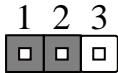


Normal (Default)



Clear CMOS

### 2.3.6 Auto Power Button Enable/ Disable Selection (JP9)



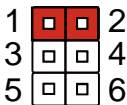
ATX Mode



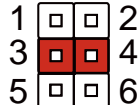
AT Mode

\* When disabled, use power button JP1 (1-2) to power on the system

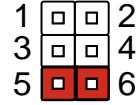
### 2.3.7 COM1 Pin9 Function Selection (JP10)



+12V



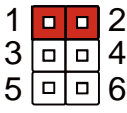
Ring(Default)



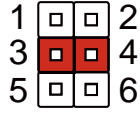
+5V



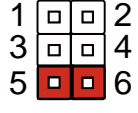
### 2.3.8 COM2 Pin9 Function Selection (JP11)



+12V

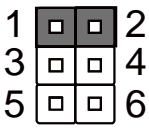


Ring(Default)

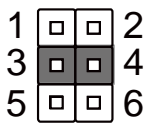


+5V

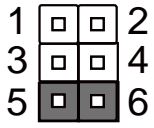
### 2.3.9 COM4 Mode Selection (JP12)



RS-422

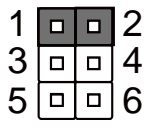


RS-232(Default)

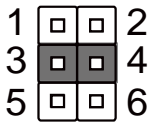


RS-485

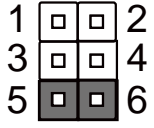
### 2.3.10 COM3 Mode Selection (JP13)



RS-422

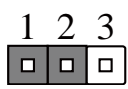


RS-232(Default)

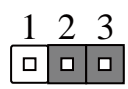


RS-485

### 2.3.11 COM4 RX/DCD Termination Selection (JP14)



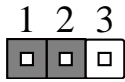
No Termination(Default)



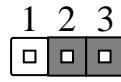
Termination With 120Ω

### 2.3.12 COM4 TX/DTR Termination Selection (JP15)

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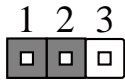
No Termination(Default)



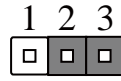
Termination With 120Ω

### 2.3.13 COM3 RX/DCD Termination Selection (JP16)

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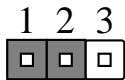
No Termination(Default)



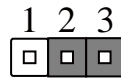
Termination With 120Ω

### 2.3.14 COM3 TX/DTR Termination Selection (JP17)

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No Termination(Default)



Termination With 120Ω

## 2.4 List of Connectors

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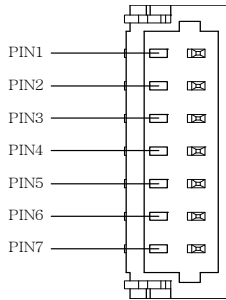
Please refer to the table below for all of the system's connectors that you can configure for your application

\* = Not available in cost down version

Label	Function
CN1	BIOS Debug Port
CN2	COM Port 5 and 6 (D-SUB 9)
CN3*	LVDS Port
CN4	USB 2.0 Port 4 and 5
CN6*	LVDS Port Inverter / Backlight Connector
CN7	UIM Card Socket (Push-Push type)
CN8	+5V/+12V Output for SATA HDD
CN9	CFast Slot
CN10*	COM Port 6 (Wafer Box, Optional)
CN11*	COM Port 5 (Wafer Box, Optional)
CN12	SATA Port
CN13	PSON# Output
CN14*	PCIEx1 Port1
CN15	+3.3V and +5V Output
CN16	+5V Output for SATA HDD
CN17*	PS/2 Keyboard/Mouse Combo Port
CN18	MiniCard Slot (Half-MiniCard)
CN19	LPC Port
CN20	MiniCard Slot (Full-MiniCard)
CN21*	Digital IO Port
CN22	UIM Card Socket (Optional)

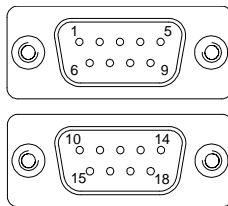
CN23*	PCIEx1 Port2
CN24	DDR3L SO-DIMM Slot
CN26*	USB 2.0 Port 6 and 7
CN27*	USB 3.0 Ports 0 (Wafer Box, Optional)
CN28*	Audio I/O Port
CN29*	External Power Input (Optional)
CN30	LAN (RJ-45) + USB3.0+ USB2.0
CN31	LAN (RJ-45) + Dual USB2.0
CN32	COM Port 3 and 4 (D-SUB 9)
CN33	PHONE Jack for LINE IN/OUT
CN34	COM Port 1 and 2 (D-SUB 9)
CN35	VGA+DVI-D Port
CN36	External Power Input
LED2	LAN1 LED
LED3	PWR LED/HDD LED
LED5	LAN2 LED

## 2.4.1 BIOS Debug Port (CN1)



Pin	Pin Name	Signal Type	Signal level
1	SPI_MISO	OUT	
2	GND	GND	
3	SPI_CLK	IN	
4	+3.3VSB	PWR	+3.3V
5	SPI_MOSI	IN	
6	SPI_CS	IN	
7	NC		

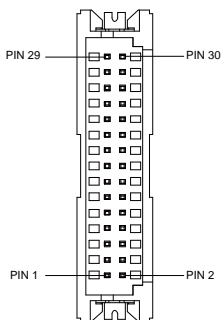
## 2.4.2 COM Port 5 and 6 (D-SUB 9) (CN2)



Pin	Pin Name	Signal Type	Signal level
1	DCD3	IN	
2	RX3	IN	

3	TX3	OUT	±9V
4	DTR3	OUT	±9V
5	GND	GND	
6	DSR3	IN	
7	RTS3	OUT	±9V
8	CTS3	IN	
9	RI3	IN	
10	DCD4	IN	
11	RX4	IN	
12	TX4	OUT	±9V
13	DTR4	OUT	±9V
14	GND	GND	
15	DSR4	IN	
16	RTS4	OUT	±9V
17	CTS4	IN	
18	RI4	IN	

### 2.4.3 LVDS Port (CN3)

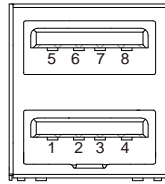


\* LVDS LCD\_PWR can be set to +3.3V or +5V by JP4

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	

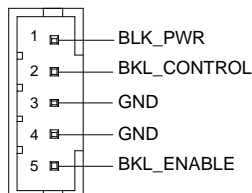
Pin	Pin Name	Signal Type	Signal level
27	LCD_PWR	PWR	+3.3V/+5V
28	GND	GND	
29	LVDS_B_CLK-	DIFF	
30	LVDS_B_CLK+	DIFF	

#### 2.4.4 USB 2.0 Port 4 and 5 (CN4)



Pin	Pin Name	Signal Type	Signal level
1	+5VSB	PWR	+5V
2	USB4_D-	DIFF	
3	USB4_D+	DIFF	
4	GND	GND	
5	+5VSB	PWR	+5V
6	USB5_D-	DIFF	
7	USB5_D+	DIFF	
8	GND	GND	

#### 2.4.5 LVDS Port Inverter/ Backlight Connector (CN6)





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	+3.3V

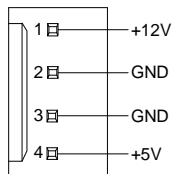
\*LVDS BKL\_PWR can be set to +5V or +12V by JP3.

\*LVDS BKL\_CONTROL can be set by JP2.

## 2.4.6 UIM Card Socket (Push-Push Type) (CN7)

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	

## 2.4.7 +5V/+12V Output for SATA HDD (CN8)



Pin	Pin Name	Signal Type	Signal level
1	+12V	PWR	+12V

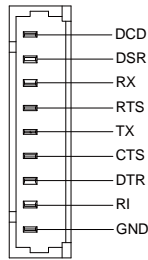
2	GND	GND	
3	GND	GND	
4	+5V	PWR	+5V

## 2.4.8 CFast Slot (CN9)

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		

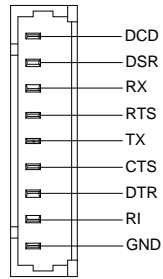
## 2.4.9 COM Port 6 (Wafer Box, Optional) (CN10)



Pin	Pin Name	Signal Type	Signal level
1	DCD6	IN	
2	DSR6	IN	
3	RX6	IN	
4	RTS6	OUT	±9V
5	TX6	OUT	±9V
6	CTS6	IN	
7	DTR6	OUT	±9V
8	RI6	IN	
9	GND	GND	

\*Signals for CN10 and CN2 are the same

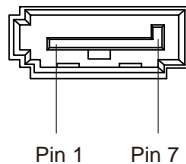
## 2.4.10 COM Port 5 (Wafer Box, Optional) (CN11)



Pin	Pin Name	Signal Type	Signal level
1	DCD5	IN	
2	DSR5	IN	
3	RX5	IN	
4	RTS5	OUT	±9V
5	TX5	OUT	±9V
6	CTS5	IN	
7	DTR5	OUT	±9V
8	RI5	IN	
9	GND	GND	

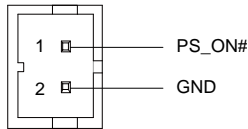
\*Signals for CN11 and CN2 are the same.

## 2.4.11 SATA Port (CN12)



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	

### 2.4.12 PS\_ON# Output (CN13)

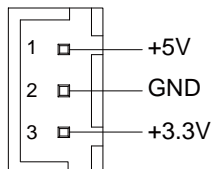


Pin	Pin Name	Signal Type	Signal level
1	PS_ON#	OUT	+5V
2	GND	GND	

### 2.4.13 PCIE x 1 Port 1 (CN14)

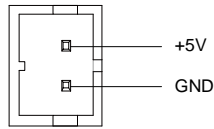
Standard specification

### 2.4.14 +3.3V and +5V Output (CN15)



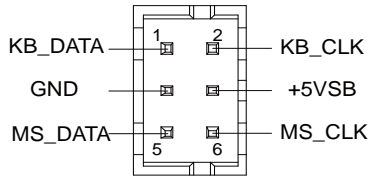
Pin	Pin Name	Signal Type	Signal level
1	+5V	PWR	+5V
2	GND	GND	
3	+3.3V	PWR	+3.3V

#### 2.4.15 +5V Output for SATA HDD (CN16)



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

#### 2.4.16 PS/2 Keyboard/ Mouse Combo Port (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

## 2.4.17 MiniCard Slot (Half-MiniCard) (CN18)

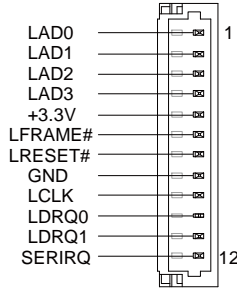
Pin	Pin Name	Signal Type	Signal level
1	PCIE_WAKE#	IN	
2	+3.3VSB	PWR	+3.3V
3	NC		
4	GND	GND	
5	NC		
6	+1.5V	PWR	+1.5V
7	PCIE_CLK_REQ#	IN	
8	NC	PWR	
9	GND	GND	
10	NC	I/O	
11	PCIE_REF_CLK-	DIFF	
12	NC	IN	
13	PCIE_REF_CLK+	DIFF	
14	NC		
15	GND	GND	
16	NC	PWR	
17	NC		
18	GND	GND	
19	NC		
20	W_DISABLE#	OUT	+3.3V
21	GND	GND	
22	PCIE_RST#	OUT	+3.3V
23	PCIE_RX-	DIFF	
24	+3.3VSB	PWR	+3.3V

Pin	Pin Name	Signal Type	Signal level
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	



Pin	Pin Name	Signal Type	Signal level
51	NC		
52	+3.3VSB	PWR	+3.3V

### 2.4.18 LPC Port (CN19)



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

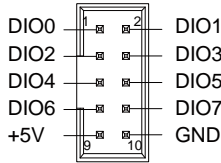
## 2.4.19 MiniCard Slot (Full-MiniCard) (CN20)

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

Pin	Pin Name	Signal Type	Signal level
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	

Pin	Pin Name	Signal Type	Signal level
51	NC		
52	+3.3VSB	PWR	+3.3V

### 2.4.20 Digital I/O Port (CN21)



Pin	Pin Name	Signal Type	Signal level
1	DIO0	I/O	+5V
2	DIO1	I/O	+5V
3	DIO2	I/O	+5V
4	DIO3	I/O	+5V
5	DIO4	I/O	+5V
6	DIO5	I/O	+5V
7	DIO6	I/O	+5V
8	DIO7	I/O	+5V
9	+5V	PWR	+5V
10	GND	GND	

### 2.4.21 UIM Card Socket (CN22)

Same Signals as CN7

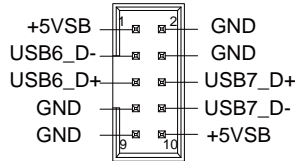
### 2.4.22 PCIe1 Port 2 (CN23)

Standard specifications

### 2.4.23 DDR3L SODIMM Slot (CN24)

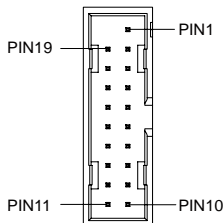
Standard specifications

### 2.4.24 USB 2.0 Port 6 and 7 (CN26)



Pin	Pin Name	Signal Type	Signal level
1	+5VSB	PWR	+5V
2	GND	GND	
3	USB6_D-	DIFF	
4	GND	GND	
5	USB6_D+	DIFF	
6	USB7_D+	DIFF	
7	GND	GND	
8	USB7_D-	DIFF	
9	GND	GND	
10	+5VSB	PWR	+5V

### 2.4.25 USB 3.0 Port 0 (Wafer Box, Optional) (CN27)

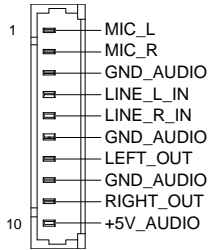


Pin	Pin Name	Signal Type	Signal level
1	+5VSB	PWR	+5V
2	USB0_SSRX-	DIFF	
3	USB0_SSRX+	DIFF	
4	GND	GND	
5	USB0_SSTX-	DIFF	
6	USB0_SSTX+	DIFF	
7	GND	GND	
8	USB0_D-	DIFF	
9	USB0_D+	DIFF	
10	NC		
11	NC		
12	NC		
13	NC		
14	NC		
15	NC		
16	NC		
17	NC		
18	NC		
19	NC		

\* CN27 USB3.0 function can be enabled from CN30 by BIOS setting.

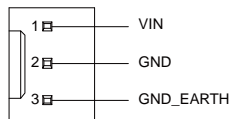
\* If CN27 function is enabled, there will be no USB 3.0 signals from CN30.

## 2.4.26 Audio I/O Port (CN28)



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

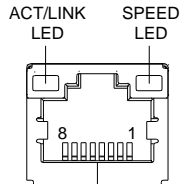
## 2.4.27 External Power Input (CN29)



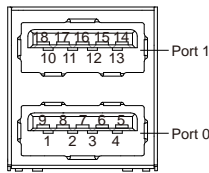
Pin	Pin Name	Signal Type	Signal level
1	VIN	PWR	+9V~+30V
2	GND	GND	
3	GND_EARTH	GND	

\*Signals for CN29 and CN36 are the same.

## 2.4.28 LAN (RJ-45) + USB 3.0 + USB 2.0 (CN30)



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	



Pin	Pin Name	Signal Type	Signal level
U1	+5VSB	PWR	+5V
U2	USB0_D-	DIFF	
U3	USB0_D+	DIFF	
U4	GND	GND	
U5	USB0_SSRX-	DIFF	
U6	USB0_SSRX+	DIFF	



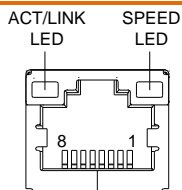
U7	GND	GND	
U8	USB0_SSTX-	DIFF	
U9	USB0_SSTX+	DIFF	
U10	+5VSB	PWR	+5V
U11	USB1_D-	DIFF	
U12	USB1_D+	DIFF	
U13	GND	GND	
U14	NC		
U15	NC		
U16	GND	GND	
U17	NC		
U18	NC		

\*Only Port0 supports USB3.0.

\*CN30 USB3.0 function can be enabled from CN27 by BIOS setting.

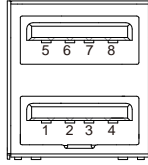
\*If CN30 USB3.0 function is enabled, there will be no USB 3.0 signals from CN27.

## 2.4.29 LAN (RJ-45) + Dual USB 2.0 (CN31)



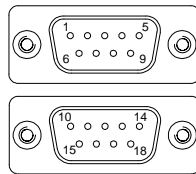
Pin	Pin Name	Signal Type	Signal Level
1	MDI0+	DIFF	
2	MDI0-	DIFF	
3	MDI1+	DIFF	
4	MDI2+	DIFF	
5	MDI2-	DIFF	

6	MDI1-	DIFF
7	MDI3+	DIFF
8	MDI3-	DIFF



Pin	Pin Name	Signal Type	Signal level
U1	+5VSB	PWR	+5V
U2	USB2_D-	DIFF	
U3	USB2_D+	DIFF	
U4	GND	GND	
U5	+5VSB	PWR	+5V
U6	USB3_D-	DIFF	
U7	USB3_D+	DIFF	
U8	GND	GND	

### 2.4.30 COM Port 3 and 4 (D-SUB 9) (CN32)



#### RS232

Pin	Pin Name	Signal Type	Signal level
1	DCD3	IN	
2	RX3	IN	

3	TX3	OUT	±5V
4	DTR3	OUT	±5V
5	GND	GND	
6	DSR3	IN	
7	RTS3	OUT	±5V
8	CTS3	IN	
9	RI3	IN	
10	DCD4	IN	
11	RX4	IN	
12	TX4	OUT	±5V
13	DTR4	OUT	±5V
14	GND	GND	
15	DSR4	IN	
16	RTS4	OUT	±5V
17	CTS4	IN	
18	RI4	IN	

## RS422

Pin	Pin Name	Signal Type	Signal level
1	RS422_TX3-	OUT	±5V
2	RS422_TX3+	OUT	±5V
3	RS422_RX3-	IN	
4	RS422_RX3+	IN	
5	GND	GND	
6	NC		
7	NC		
8	NC		

9	NC		
10	RS422_TX4-	OUT	±5V
11	RS422_TX4+	OUT	±5V
12	RS422_RX4-	IN	
13	RS422_RX4+	IN	
14	GND	GND	
15	NC		
16	NC		
17	NC		
18	NC		

## RS485

Pin	Pin Name	Signal Type	Signal level
1	RS485_D3-	I/O	±5V
2	RS485_D3+	I/O	±5V
3	NC		
4	NC		
5	GND	GND	
6	NC		
7	NC		
8	NC		
9	NC		
10	RS485_D4-	I/O	±5V
11	RS485_D4+	I/O	±5V
12	NC		
13	NC		
14	GND	GND	

15	NC
16	NC
17	NC
18	NC

\*COM3 RS-232/422/485 can be set by JP13.

\*COM4 RS-232/422/485 can be set by JP12.

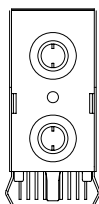
\*When JP13 is set to RS485, BIOS needs to set to RS485 Driver Mode in the Serial Port 3 Configuration.

\*When JP12 is set to RS485, BIOS needs to set to RS485 Driver Mode in Serial Port 4 Configuration.

\*When JP13 is set to RS232/422, BIOS needs to set to RS232/422 Driver Mode in Serial Port 3 Configuration.

\*When JP12 set to RS232/422, BIOS needs to set to RS232/422 Driver Mode in Serial Port 4 Configuration.

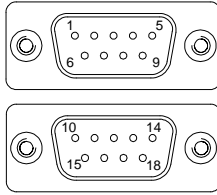
### 2.4.31 Phone Jack for Line in/Out (CN33)



Pin	Pin Name	Signal Type	Signal level
1	RIGHT_OUT	OUT	
2	GND_AUDIO	GND	
3	LOUT Jack Detect		
4	LEFT_OUT	OUT	
5	GND_AUDIO	GND	

21	LINE_R_IN	IN
22	GND_AUDIO	GND
23	LIN Jack Detect	
24	LINE_L_IN	IN

### 2.4.32 COM Port 1 and 2 (D-SUB 9) (CN34)



Pin	Pin Name	Signal Type	Signal level
1	DCD1	IN	
2	RX1	IN	
3	TX1	OUT	±9V
4	DTR1	OUT	±9V
5	GND	GND	
6	DSR1	IN	
7	RTS1	OUT	±9V
8	CTS1	IN	
9	RI1/+5V/+12V	IN/ PWR	+5V/+12V
10	DCD2	IN	
11	RX2	IN	
12	TX2	OUT	±9V
13	DTR2	OUT	±9V
14	GND	GND	
15	DSR2	IN	

16	RTS2	OUT	±9V
17	CTS2	IN	
18	RI2/+5V/+12V	IN/ PWR	+5V/+12V

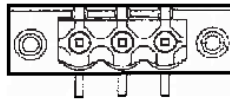
\* Function for Pin 9 of COM Port 1 can be set by JP10.

\* Function for Pin 9 of COM Port 2 can be set by JP11.

### 2.4.33 VGA + DVI-D Port (CN35)

Standard specification

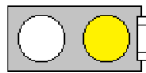
### 2.4.34 External Power Input (CN36)



PIN1 PIN2 PIN3

Pin	Pin Name	Signal Type	Signal level
1	VIN	PWR	+9V~+30V
2	GND	GND	
3	GND_EARTH	GND	

### 2.4.35 LAN1 LED (LED2)



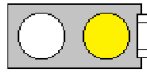
Pin	Pin Name	Signal Type	Signal level
1	+3.3V	PWR	+3.3V
2	L AN1_LINK_ACT#		
3	LAN1_1000#		
4	LAN1_100#		

### 2.4.36 PWR LED/HDD LED (LED3)



Pin	Pin Name	Signal Type	Signal level
1	+5V	PWR	+5V
2	HDD_LED-		
3	+5V	PWR	+5V
4	PWR_LED-		

### 2.4.37 LAN2 LED (LED5)

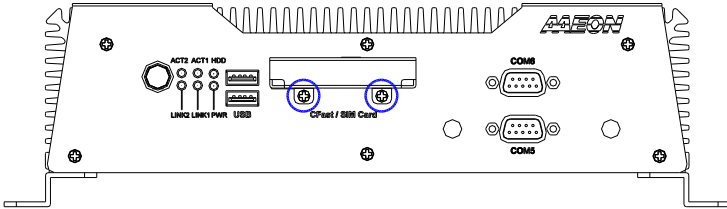


Pin	Pin Name	Signal Type	Signal level
1	+3.3V	PWR	+3.3V
2	LAN2_LINK_ACT#		
3	LAN2_1000#		
4	LAN2_100#		

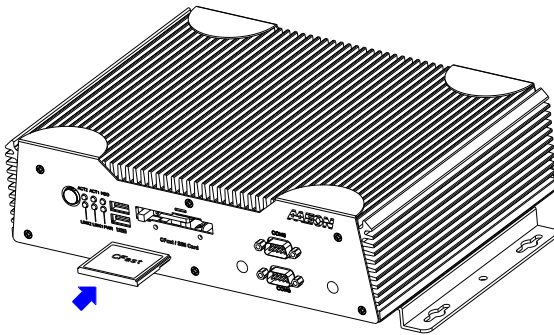


## 2.5 Inserting CFast Card

1. Remove the highlighted screws to remove slot cover

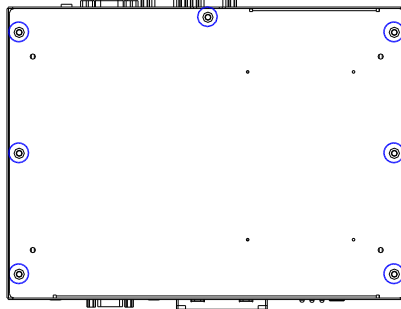
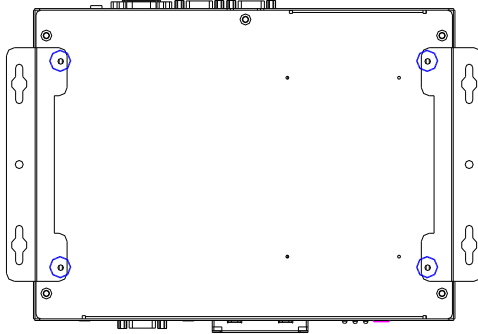
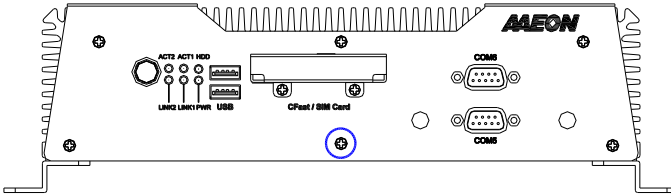


2. Insert the CFast card into the slot

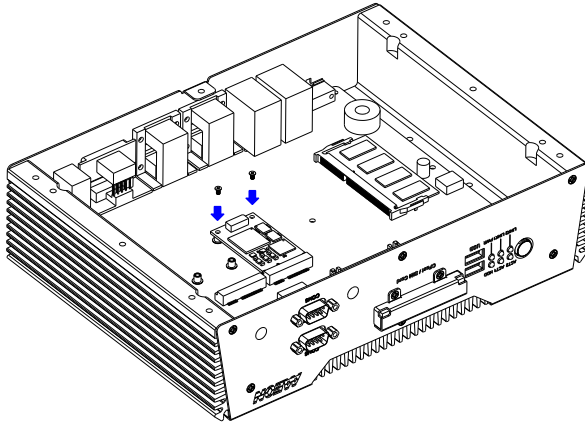


## 2.6 Installing MiniCard

1. Remove the highlighted screws to access the system's interior

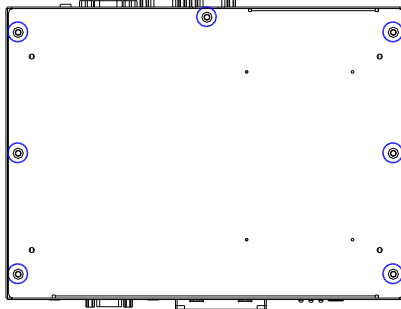
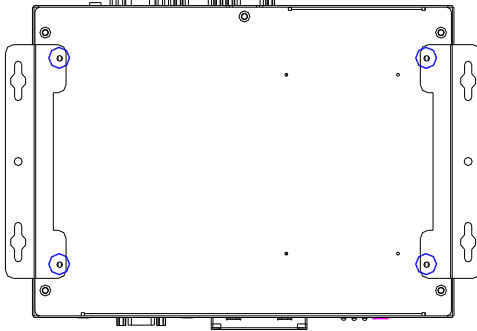
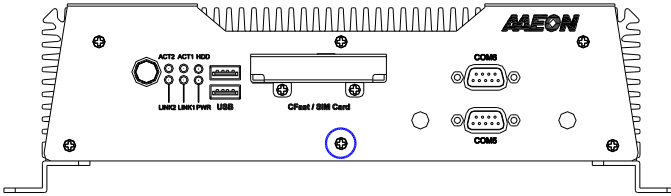


2. Remove the highlighted screws and slot in the MiniCard to the MiniCard slot.  
Tighten screws to secure the MiniCard

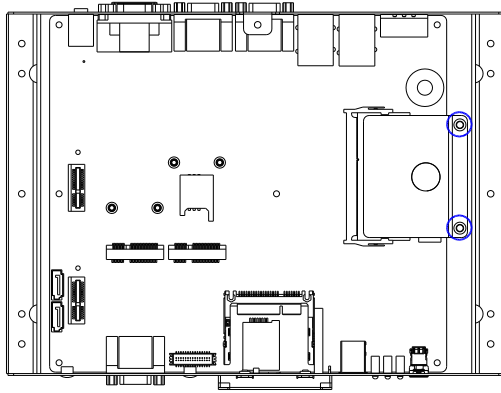


## 2.7 Installing RAM

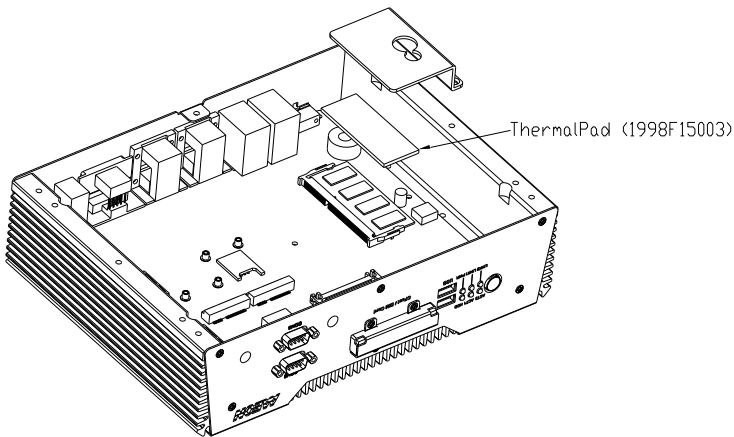
1. Remove the highlighted screws to access the system's interior



2. Remove the highlighted screws to remove RAM cover



3. Insert the RAM and place a thermal pad (1998F15003) on top of it. Secure the RAM cover to complete installation



# Chapter 3

---

AMI BIOS Setup

## 3.1 System Test and Initialization

---

The system 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



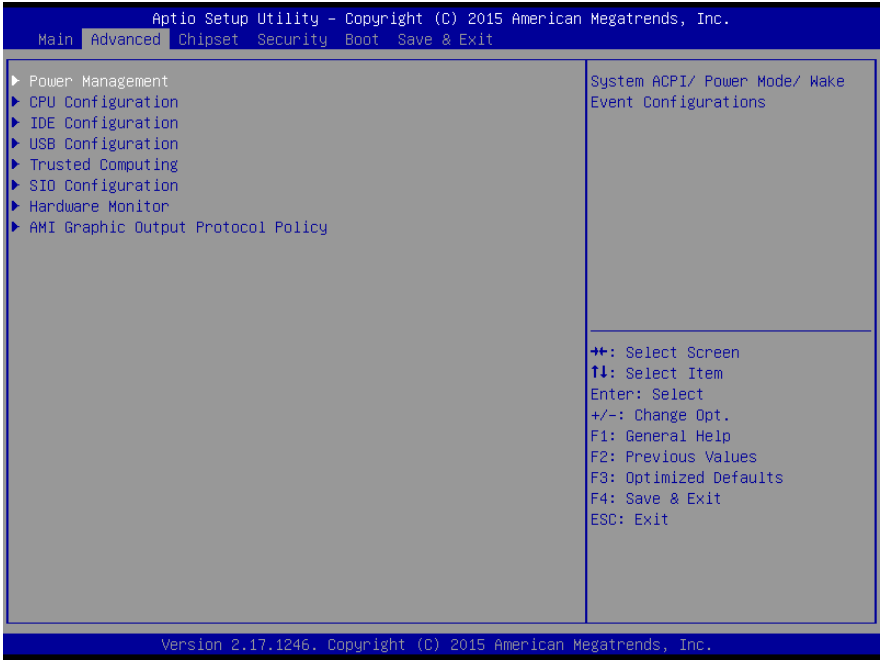
### 3.3 Setup Submenu: Main



Options summary: **(default setting)**

System Language	English	
Only English support in this BIOS		
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.		

### 3.4 Setup Submenu: Advanced

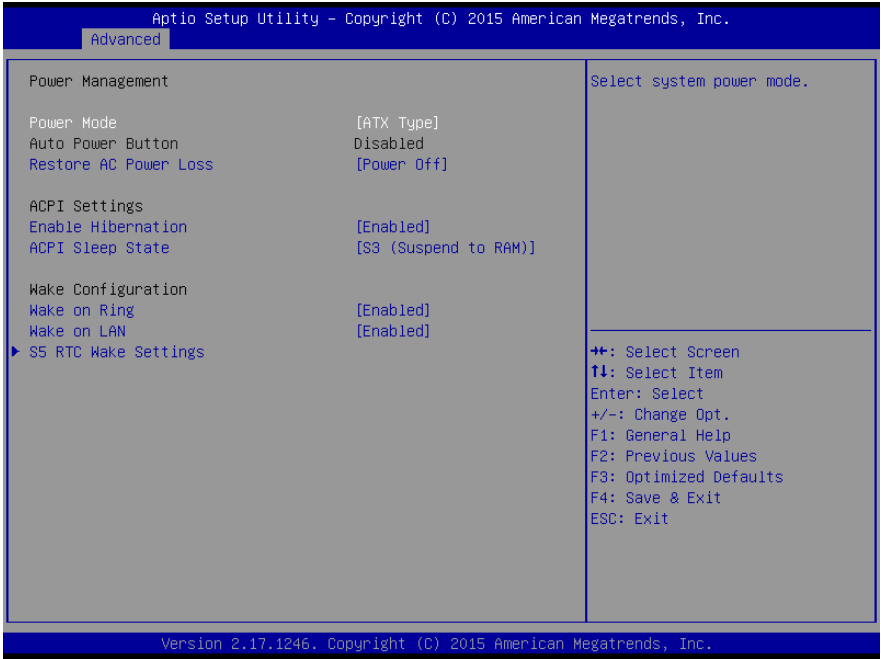


Options summary: (default setting)

Power Management		
System ACPI/Power Mode/Wake Event Configuration		
CPU Configuration		
CPU Configuration Parameters		
IDE Configuration		
IDE Device Options Settings		
USB Configuration		
USB Configuration Parameters		
Trusted Computing		
Trusted Computing Settings		

SIO Configuration		
Super IO Configuration Parameters		
Hardware Monitor		
Monitor hardware status		
AMI Graphic Output Protocol Policy		
User Select Monitor Output by Graphic Output Protocol		

### 3.4.1 Advanced: Power Management

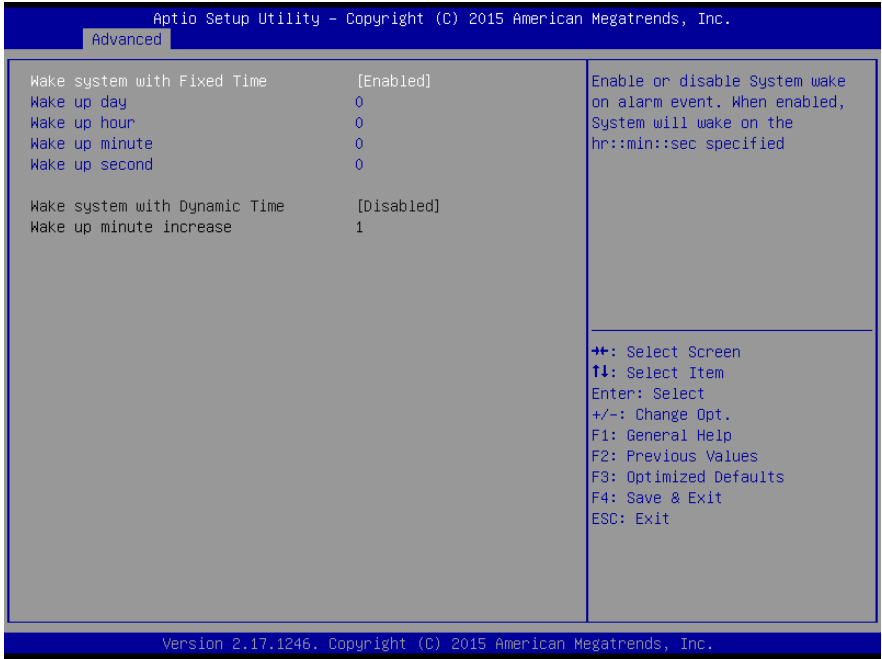


Options summary: (default setting)

Power Mode	ATX Type	
	AT Type	
Select system power mode		
Restore AC Power Loss	Power Off	
	Power on	
	Late State	
Select AC power state when power is re-applied after a power failure		
Enable Hibernation	Enabled	
	Disabled	
Enabled or disabled hibernate (OS/S4 Sleep State).		

ACPI Sleep State	Suspend Disabled	
	<b>S3 only(Suspend to RAM)</b>	
Select the ACPI state used for System Suspend		
Wake on Ring	<b>Enabled</b>	
	Disabled	
Enabled or disabled wake on ring function.		
Wake on LAN	<b>Enabled</b>	
	Disabled	
Enabled or disabled wake from LAN.		
S5 RTC Wake Settings		
Enable system to wake from S5 using RTC alarm.		

### 3.4.1.1 Power Management: RTC Wake Settings



Options summary: (default setting)

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

Wake up second	0-59	
Wake system with Dynamic	<b>Disabled</b>	
Time	Enabled	
Enable or disable System wake on alarm event. Wake up time is current time + Increase minutes.		
Wake up minute increase	1-5	

### 3.4.2 Advanced: CPU Configuration



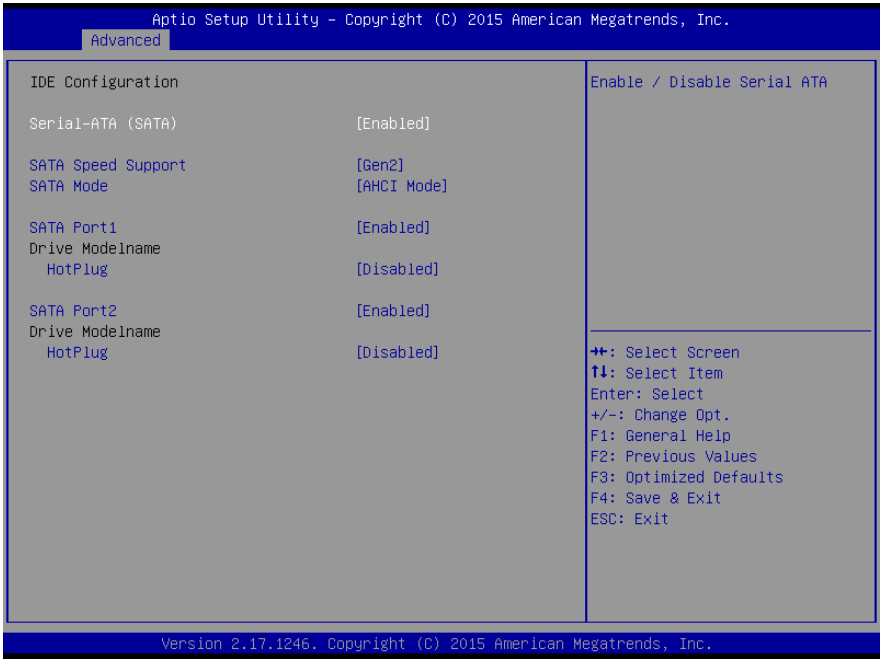
Options summary: (default setting)

Limit CPUID Maximum	Disabled	
	Enabled	
Disabled for Windows XP		
Execute Disable Bit	Disabled	
	Enabled	
En/Disable XD bit for supporting OS		
CPU C State Report	Disabled	
	Enabled	
Report C State support for ACPI OS		
Max CPU C-State	C7	



	C6	
	C1	
This option controls Max C state that the processor will support		

### 3.4.3 Advanced: IDE Configuration

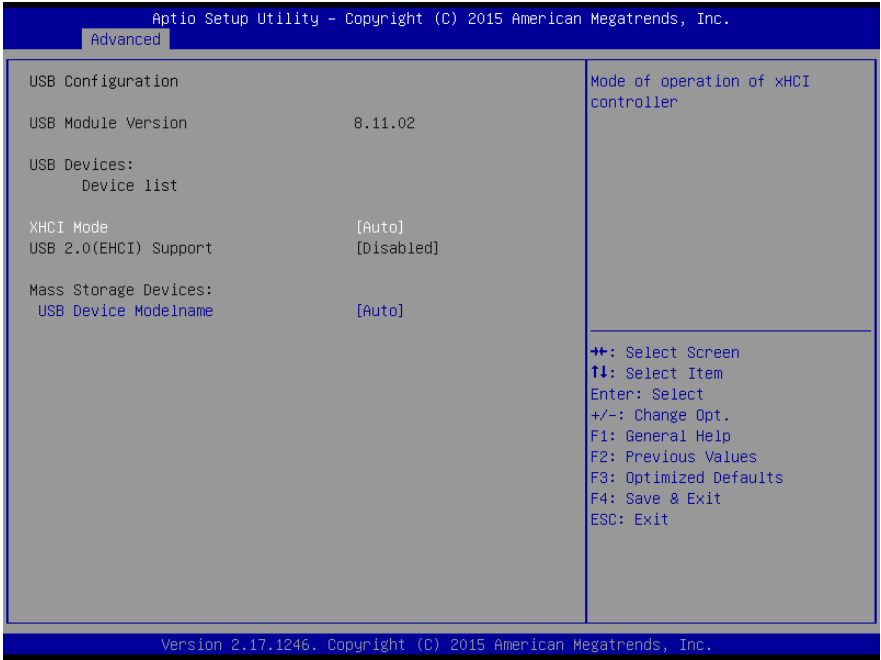


Options summary: (default setting)

Serial-ATA (SATA)	Disabled	
	Enabled	
En/Disable SATA controller		
SATA Speed Support	Gen2	
	Gen1	
SATA Speed Support Gen1 or Gen2		
SATA Mode	AHCI Mode	
	IDE Mode	
Select IDE/AHCI mode		
SATA Port1/Port2	Enabled	

	Disabled	
Enabled/Disabled SATA Port1/Port2		
HotPlug	Disabled	
	Enabled	
Enabled/Disabled SATA Port1/Port2 HotPlug function		

### 3.4.4 Advanced: USB Configuration



Options summary: (default setting)

XHCI Mode	Enabled	
	Disabled	
	<b>Auto</b>	
	Smart Auto	

Mode of operation of xHCI controller:

Disabled - USB 3.0 ports behave as USB 2.0 ports.

Enabled - USB 3.0 ports behave as USB 3.0 ports.

Auto - USB 3.0 ports function as USB 2.0 ports until the OS USB 3.0 driver loads, at which point they function as USB 3.0. If the machine is rebooted, the ports revert back to USB 2.0 until the OS driver loads again.

Smart Auto - Same as Auto, except during a reboot the ports aren't downgraded to USB 2.0.

USB 2.0(EHCI) Support	Enabled	
	Disabled	

Control the USB EHCI (USB 2.0) functions. This item active when xHCI controller disabled because all ports are routed to xHCI controller when xHCI enabled.

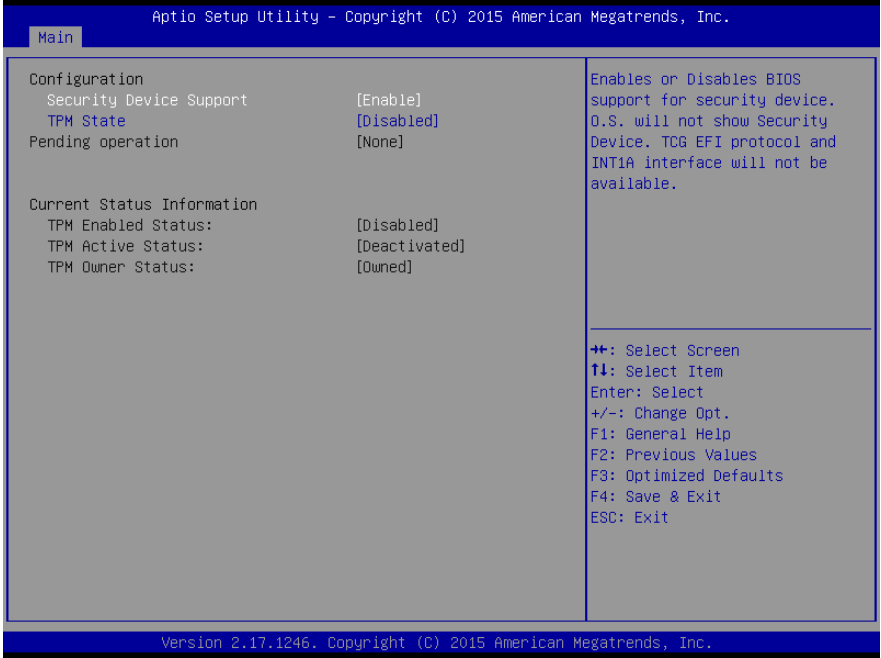
Legacy USB Support	Enabled	
	Disabled	
	Auto	

Enables BIOS Support for Legacy USB Support. When enabled, USB can be functional in legacy environment like DOS. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI application

Device Name (Emulation Type)	Auto	
	Floppy	
	Forced FDD	
	Hard Disk	
	CD-ROM	

If Auto. USB devices less than 530MB will be emulated as Floppy and remaining as Floppy and remaining as hard drive. Forced FDD option can be used to force a HDD formatted drive to boot as FDD(Ex. ZIP drive)

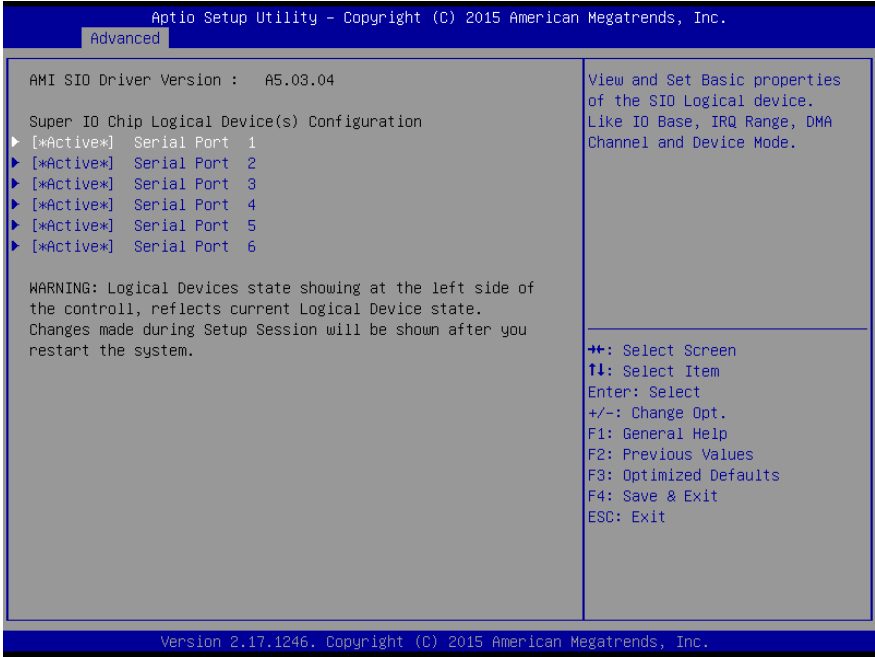
### 3.4.5 Advanced: Trusted Computing



Options summary: (default setting)

Security Device Support	Disabled	
	Enabled	
En/Disable TPM support.		
TPM State	Disabled	
	Enabled	
En/Disable TPM functionality.		
Pending TPM Operation	None	
	TPM Clear	
Select one-time TPM operation. Item value returns to 'None' after next POST.		

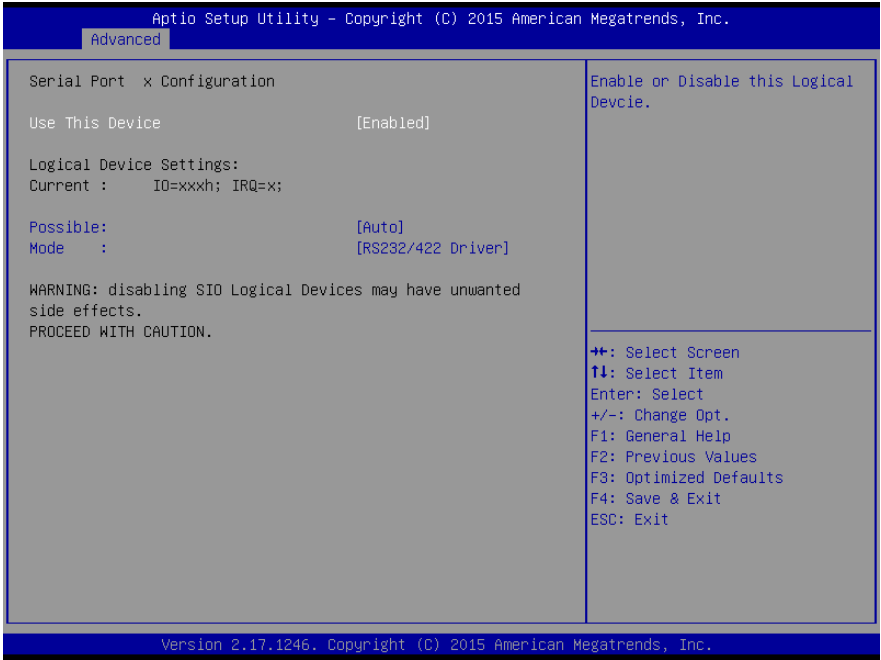
### 3.4.6 Advanced: SIO Configuration



Options summary: (default setting)

Serial Port 1/2/3/4/5/6		
Configuration		
Set Parameters of Serial Port 1/2/3/4/5/6		

### 3.4.6.1 SIO Configuration: Serial Port 1/2/3/4/5/6 Configuration



Options summary: (default setting)

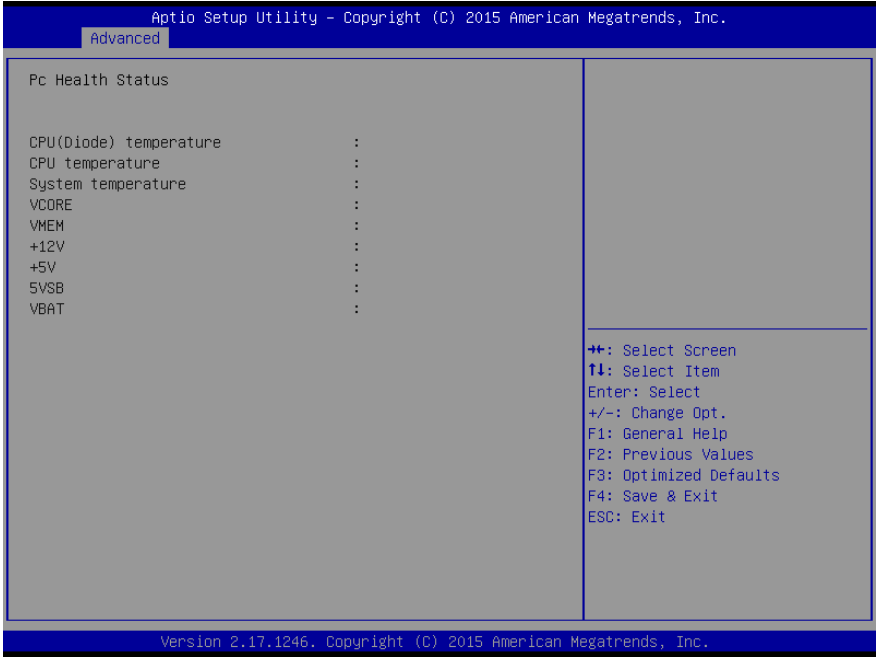
Use This Device	Disabled	
	<b>Enabled</b>	
En/Disable specified serial port.		
Change Settings (COM1)	<b>Auto</b>	
	IO=3F8h; IRQ=4;	
	IO=3F8h; IRQ=3,4,5,7,9,10,11,12;	
	IO=2F8h; IRQ=3,4,5,7,9,10,11,12;	
	IO=3E8h; IRQ=3,4,5,7,9,10,11,12;	
	IO=2E8h; IRQ=3,4,5,7,9,10,11,12;	
Change Settings	<b>Auto</b>	



(COM2)	IO=2F8h; IRQ=3;	
	IO=3F8h; IRQ=3,4,5,7,9,10,11,12;	
	IO=2F8h; IRQ=3,4,5,7,9,10,11,12;	
	IO=3E8h; IRQ=3,4,5,7,9,10,11,12;	
	IO=2E8h; IRQ=3,4,5,7,9,10,11,12;	
Change Settings (COM3)	<b>Auto</b>	
IO=3E8h; IRQ=7;		
IO=3E8h; IRQ=3,4,5,7,10,11,12;		
IO=2E8h; IRQ=3,4,5,7,10,11,12;		
IO=2F0h; IRQ=3,4,5,7,10,11,12;		
IO=2E0h; IRQ=3,4,5,7,10,11,12;		
Change Settings (COM4)	<b>Auto</b>	
IO=2E8h; IRQ=7;		
IO=3E8h; IRQ=3,4,5,7,10,11,12;		
IO=2E8h; IRQ=3,4,5,7,10,11,12;		
IO=2F0h; IRQ=3,4,5,7,10,11,12;		
IO=2E0h; IRQ=3,4,5,7,10,11,12;		
Change Settings (COM5)	<b>Auto</b>	
IO=2D0h; IRQ=7;		
IO=3E8h; IRQ=3,4,5,7,10,11,12;		
IO=2E8h; IRQ=3,4,5,7,10,11,12;		
IO=2D0h; IRQ=3,4,5,7,10,11,12;		
IO=2C0h; IRQ=3,4,5,7,10,11,12;		
Change Settings (COM6)	<b>Auto</b>	
IO=2C0h; IRQ=7;		
IO=3E8h; IRQ=3,4,5,7,10,11,12;		
	IO=2E8h; IRQ=3,4,5,7,10,11,12;	

	IO=2D0h; IRQ=3,4,5,7,10,11,12;	
	IO=2C0h; IRQ=3,4,5,7,10,11,12;	
Select a resource setting for Super IO device.		
Mode	<b>RS232/422 Driver</b>	
	RS485	
Configure COM operated as RS232, RS422 or RS485. Only COM3 and COM4 support this function.		

### 3.4.7 Advanced: Hardware Monitor



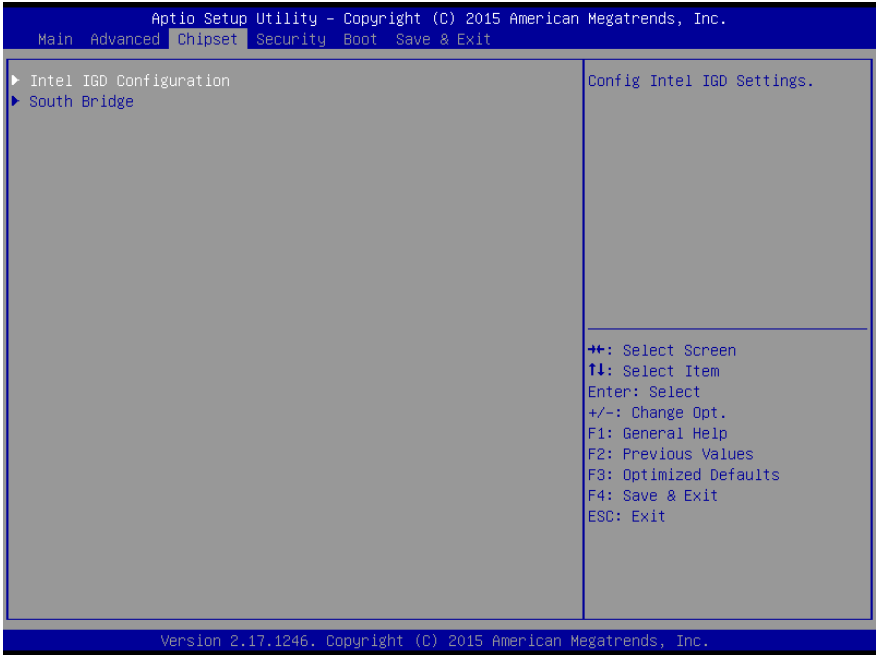
### 3.4.8 Advanced: AMI Graphic Output Protocol Policy



Options summary: (default setting)

Output Select	CRT1	
	DVI1	
Output interface		

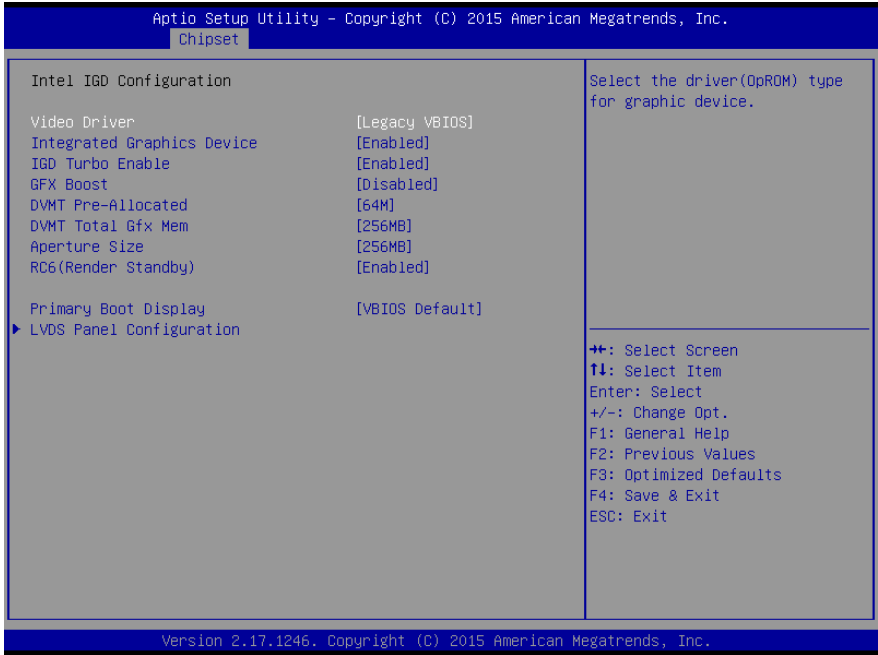
### 3.5 Setup submenu: Chipset



Options summary: **(default setting)**

Intel IGD Configuration		
Config Intel IGD Settings.		
South Bridge		
South Bridge Parameters		

### 3.5.1 Chipset: Intel IGD Configuration

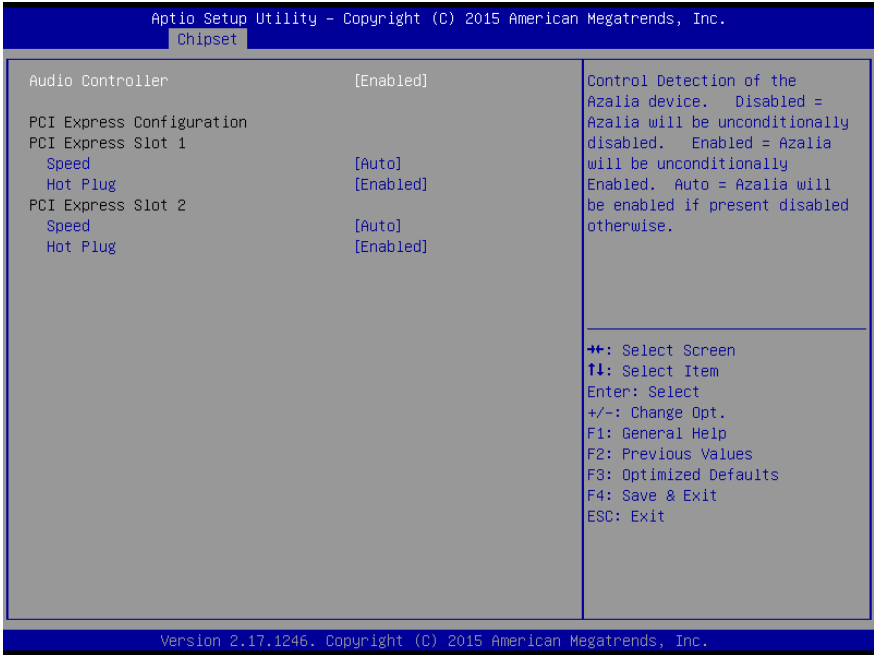


Options summary: (default setting)

Video Driver	Do not launch	
	UEFI GOP	
	<b>Legacy VBIOS</b>	
Select the driver (OpROM) type for graphic device.		
Integrated Graphics Device	<b>Enabled</b>	
	Disabled	
Enabled/Disabled internal graphics device (IGD).		
IGD Turbo Enable	<b>Enabled</b>	
	Disabled	
Enabled/Disabled internal graphics device (IGD) Turbo mode.		

GFX Boost	<b>Enabled</b>	
	Disabled	
Enabled/Disabled GFX Boost.		
DVMT Pre-Allocated	<b>64MB</b>	
	32MB~512MB	
Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.		
DVMT Total Gfx Mem	128MB	
	<b>256MB</b>	
	Max	
Select DVMT 5.0 Total Graphic Memory size used by the IGD.		
Aperture Size	128MB	
	<b>256MB</b>	
	512MB	
Select the Aperture Size		
RC6 (Render Standby)	<b>Enabled</b>	
	Disabled	
Enabled/Disabled render standby support.		
Primary Boot Display	<b>VBIOS Default</b>	
	CRT	
	DVI	
Select Primary boot display device		
Secondary Boot Display	<b>Disabled</b>	
	CRT	
	DVI	
Select Primary boot display device		

### 3.5.2 South Bridge

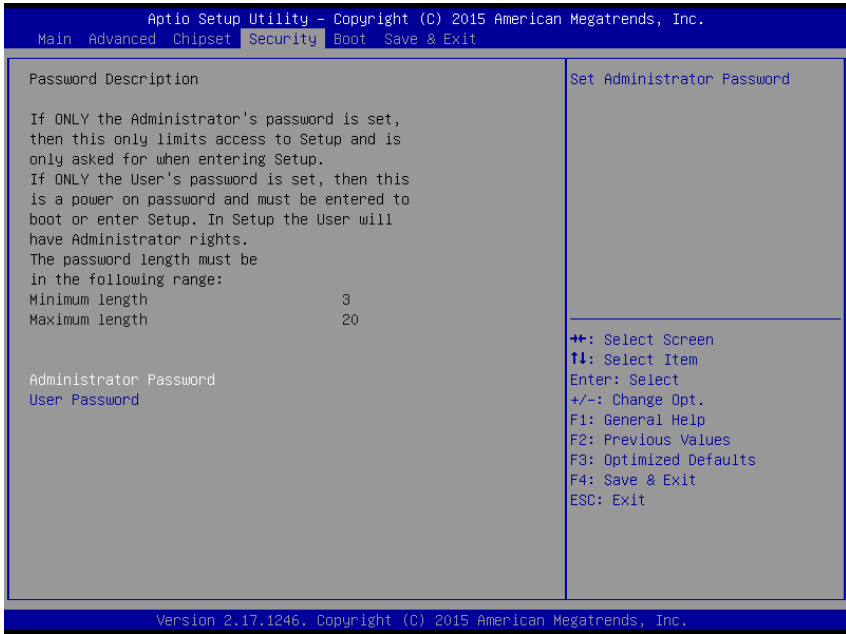


Options summary: (default setting)

Audio Controller	Disabled	
	<b>Enabled</b>	
Enable or disabled Azalia device for audio function.		
PCI Express Slot 1/2 Speed	<b>Auto</b>	
	Gen 2	
	Gen 1	
Configure PCIe Port Speed		
PCI Express Slot 1/2 Hot Plug	<b>Enabled</b>	
	Disabled	
Enabled/Disabled PCIe Hot Plug feature for the port.		



## 3.6 Security



Options summary: (*default setting*)

Administrator Password/	<i>Not set</i>	
User Password		

### Change User/Administrator Password

You can set a User Password once an Administrator Password is set. The password will be required during boot up, or when the user enters the Setup utility. Please Note that a User Password does not provide access to many of the features in the Setup utility.

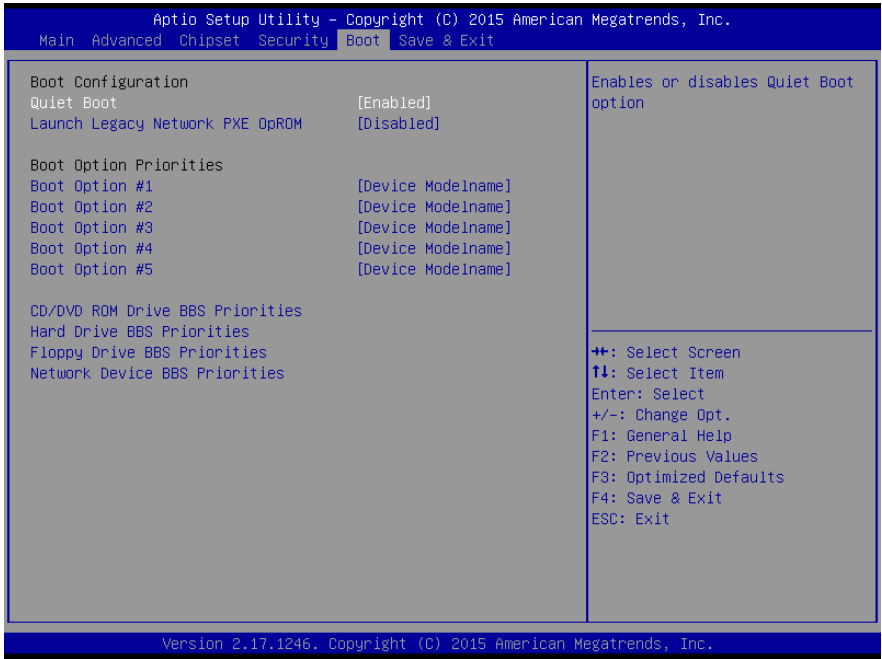
Select the password you wish to set, press Enter to open a dialog box to enter your password (you can enter no more than six letters or numbers). Press Enter to confirm your entry, after which you will be prompted to retype your password for a final

confirmation. Press Enter again after you have retyped it correctly.

## Removing the Password

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

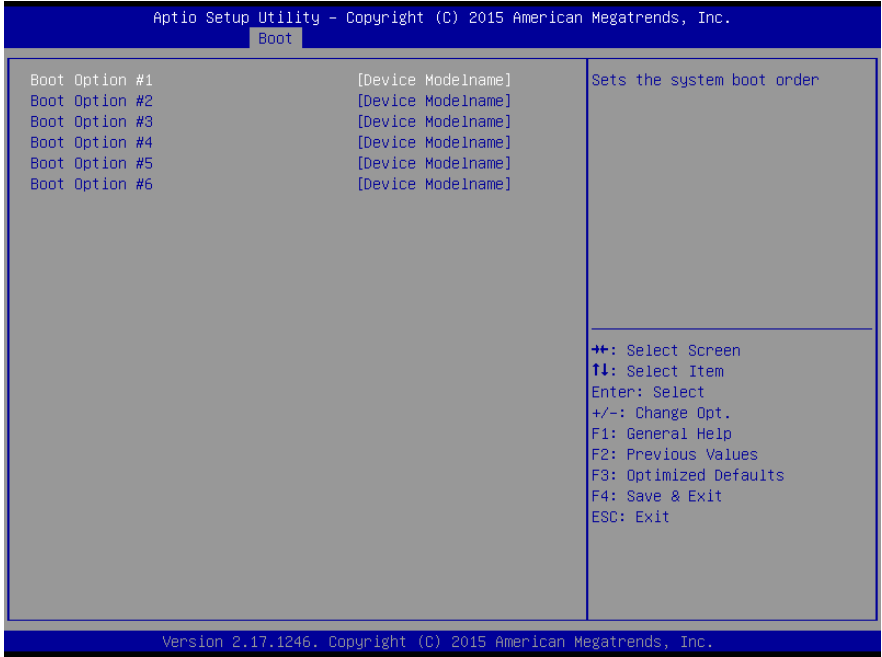
### 3.7 Setup submenu: Boot



Options summary: (default setting)

Quiet Boot	Disabled	
	Enabled	
En/Disable showing boot logo.		
Launch Legacy Network PXE OpROM	Disabled	
	Enabled	
En/Disable network OpROM for legacy PXE boot		
Boot Option #X/ XXXX Drive BBS Priorities		
The order of boot priorities.		

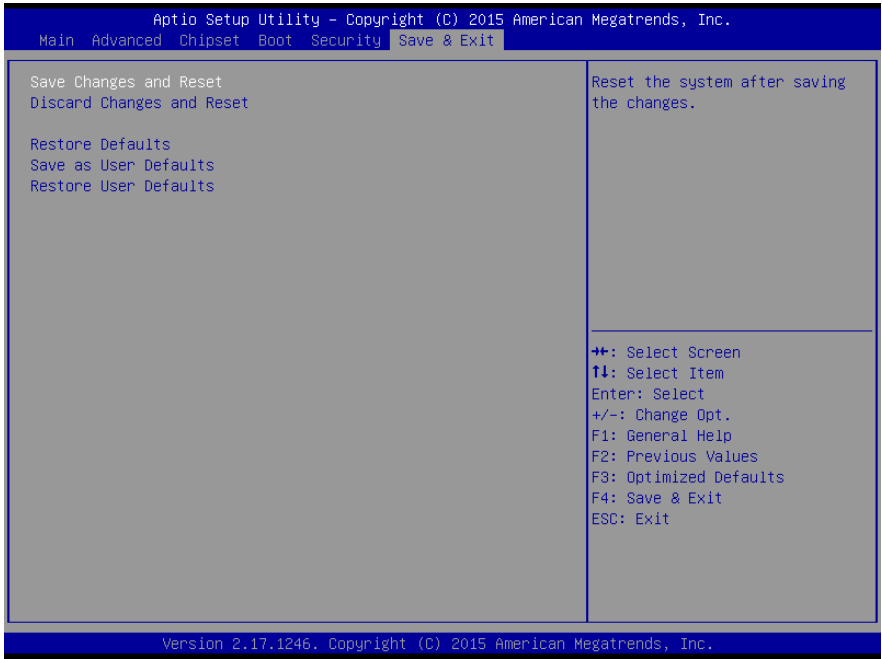
### 3.7.1 Boot: BBS Priorities



Options summary: (default setting)

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

### 3.8 Setup submenu: Save & Exit



Options summary: **(default setting)**

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

# Chapter 4

---

Drivers Installation

## 4.1 Product CD/DVD

---

The BOXER-6651 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 **STEP1 - Chipset** folder and select your OS
2. Open the **SetupChipset.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

### Step 2 – Install Graphic Driver

1. Open the **STEP2 - Graphics** 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

1. Open the **STEP3 - LAN** folder and select your OS
2. Open the **.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

#### Step 4 – Install Audio Driver

1. Open the **STEP4 - 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 5 – Install TXE Driver (Windows 8/10 only)

1. Open the **STEP5 - TXE** 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 TPM Driver

1. Open the **STEP6 - TPM** folder followed by **Setup.msi**
2. Follow the instructions
3. Drivers will be installed automatically

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

1. Open the **STEP7 – USB3.0** folder followed by **Setup.exe**
2. Follow the instructions
3. Drivers will be installed automatically

#### Step 8 – Install MBI Driver (Windows 8/10 only, Optional)

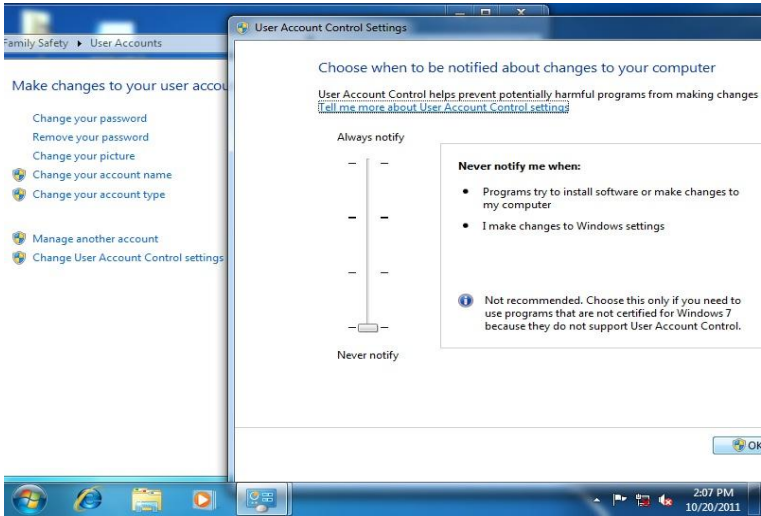
1. Open the **STEP8 - TPM** folder and select your OS
2. Open the **Setup.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically



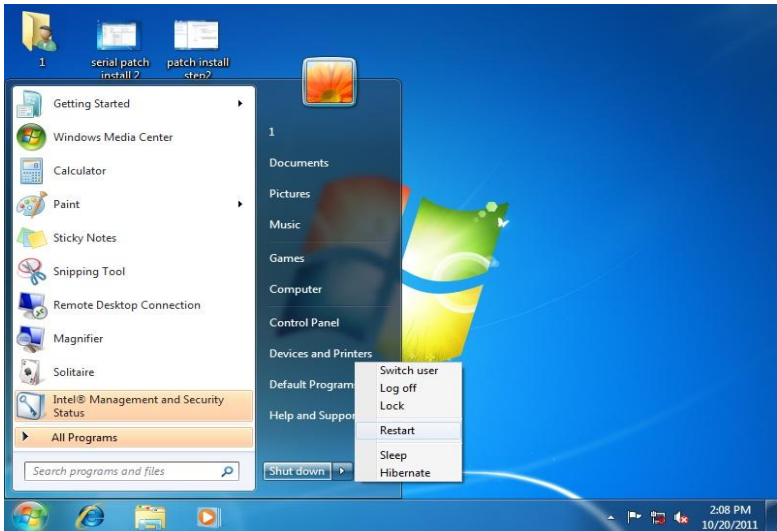
## Step 9 – Install Serial Port Driver (Optional)

For Windows 7:

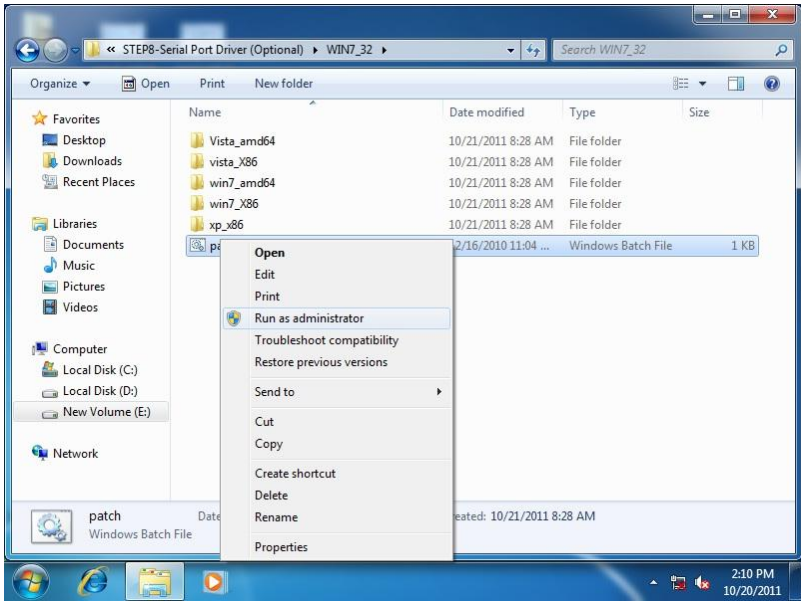
1. Change User Account Control settings to **Never notify**



2. Reboot and log in as administrator

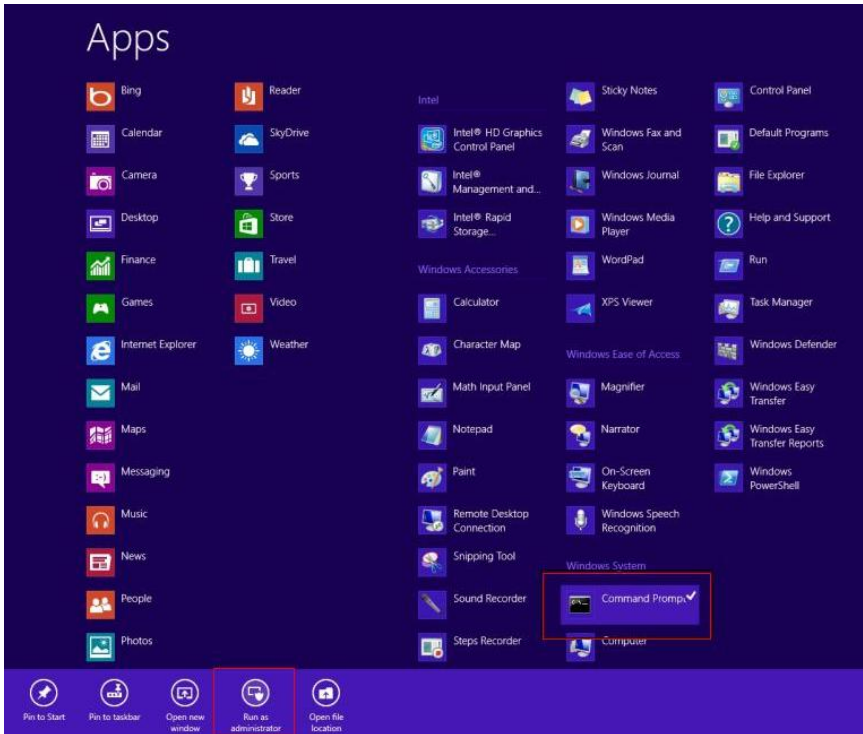


3. Run patch.bat as administrator



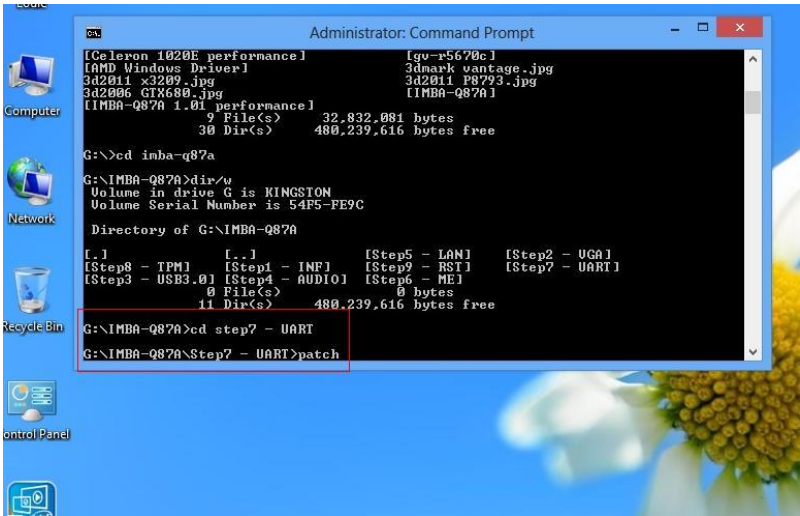
## For Windows 8:

1. Open the Apps Screen, right click on the **Command Prompt** tile and select **Run as Administrator**

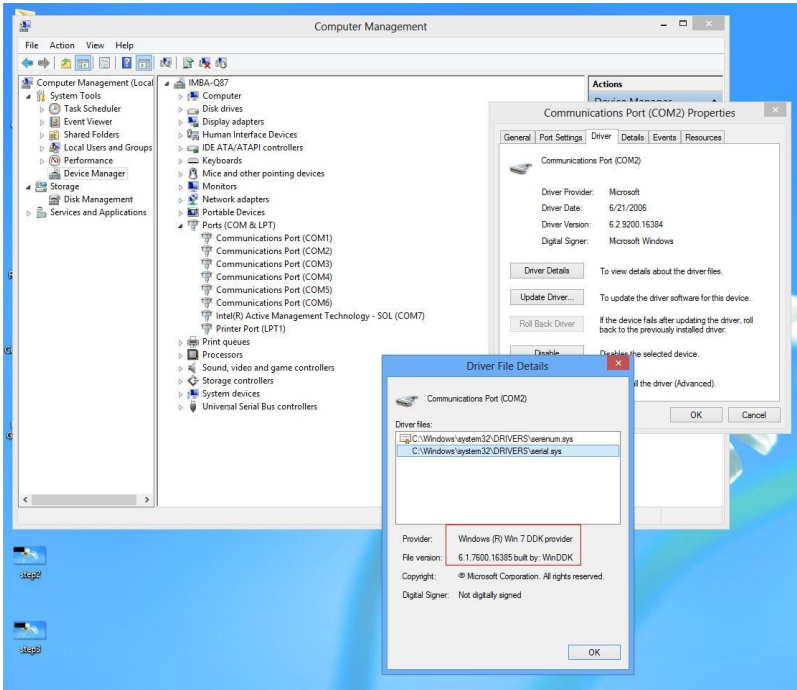


2. To install the driver (patch.bat), you will first have to locate the file in command prompt. To do that, first go to the directory which contains the file by entering **<drive letter>**: eg. if the driver is in D drive, enter **D:**
3. You are now at the directory containing the installation file. Next, go to the folder in which the file resides by entering **cd <folder>** eg: if the file is in a folder named abc, enter **cd <abc>**.
4. You are now at the folder where the file is located. Enter the **patch.bat** to open and install the drivers. If your file is in a subfolder, enter the **cd**

<folder> command again to access the subfolder (screenshot below is for reference only).

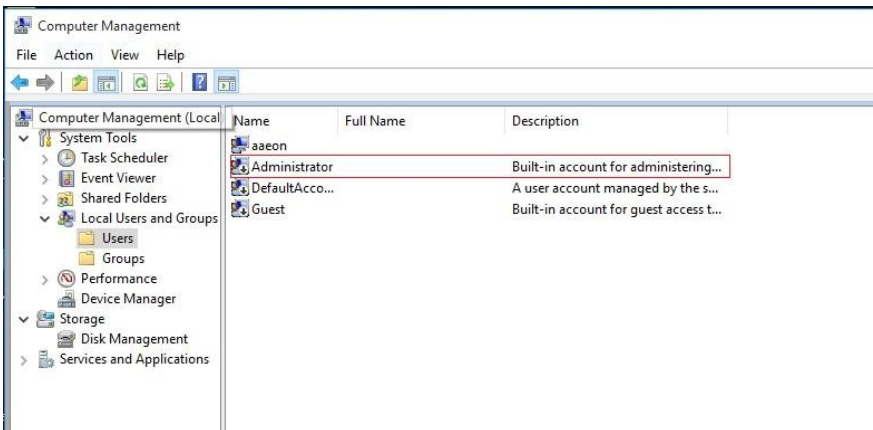


5. Reboot after installation completes.
6. To confirm the installation, go to Device Manager, expand the Ports (COM & LPT) tree and double click on any of the COM ports to open its properties. Go to the Driver tab, select Driver Details and click on **serial.sys**, you should see its provider as **Windows (R) Win 7 DDK Provider**.

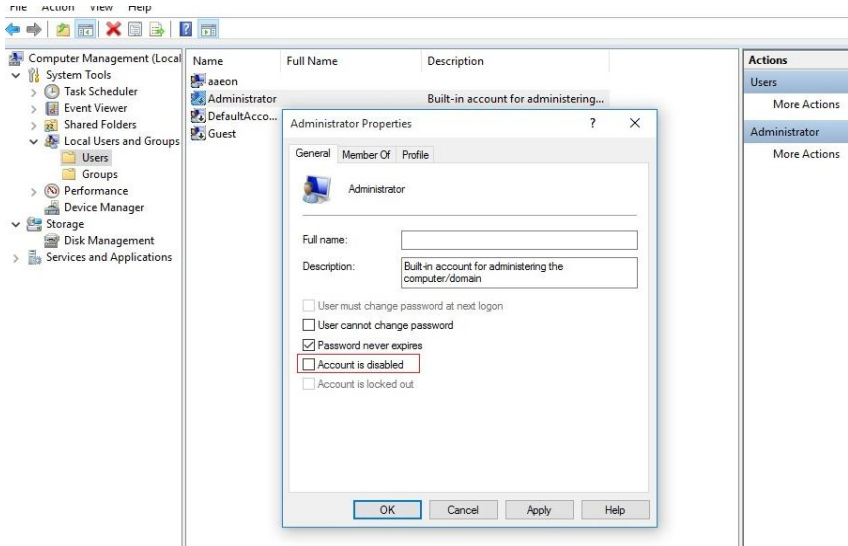


For Windows 10:

1. You will need administrator rights to install the drivers. To get it, first go to **Computer Management in Control Panel** and double-click on **Administrator**



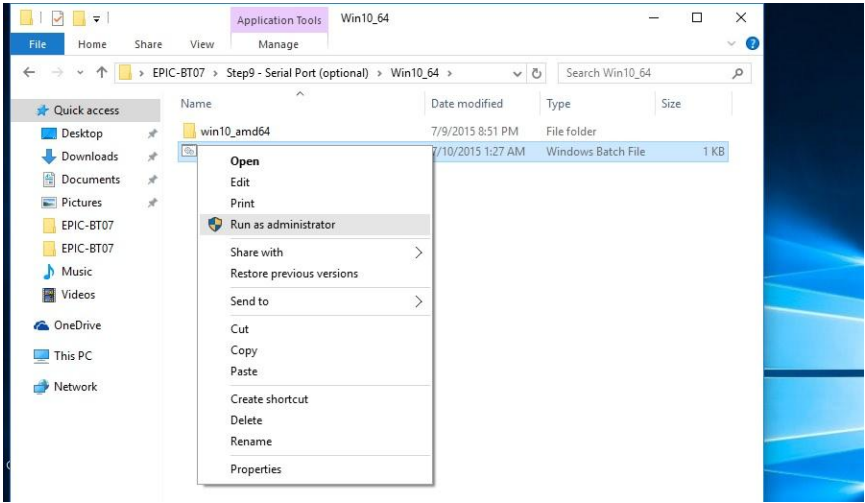
- In the dialog box, **uncheck** the **Account is disabled** option to enable administrator account.



- Restart and sign in as the administrator (not password-protected by default)



4. Go back to the Windows 10 Serial Port drivers directory and run `patch.bat` as administrator.



# Appendix A

---

## Watchdog Timer Programming



## A.1 Watchdog Timer Initial Program

Table 1 : Watch dog relative IO address

	Default Value	Note
I/O Base Address	0xA10	I/O Base address for Watchdog operation. This address is assigned by SIO LDN7, register 0x60-0x61.

Table 2 : Watchdog relative register table

Register	Offset	BitNum	Value	Note
Watchdog WDTRST# Enable	0x00	7	1	Enable/Disable time out output via WDTRST# 0: Disable 1: Enable
Pulse Width	0x05	0:1	01	Width of Pulse signal 00: 1ms (do not use) 01: 25ms 10: 125ms 11: 5s <i>Pulse width is must longer then 16ms.</i>
Signal Polarity	0x05	2	0	0: low active 1: high active <i>Must set this bit to 0</i>
Counting Unit	0x05	3	0	Select time unit. 0: second 1: minute
Output Signal Type	0x05	4	1	0: Level 1: Pulse <i>Must set this bit to 1</i>
Watchdog Timer Enable	0x05	5	1	0: Disable 1: Enable
Timeout Status	0x05	6	1	1: timeout occurred. Write a 1 to clear timeout status
Timer Counter	0x06			Time of watchdog timer (0~255)

## A.2 Watchdog Sample Program

```
*****
// WDT I/O operation relative definition (Please reference to Table 1)
#define WDTAddr    0x510 // WDT I/O base address
Void  WDTWriteByte(byte Register, byte Value);
byte  WDTReadByte(byte Register);
Void  WDTSetReg(byte Register, byte Bit, byte Val);
// Watch Dog relative definition (Please reference to Table 2)
#define DevReg     0x00 // Device configuration register
    #define WDRstBit  0x80 // Watchdog WDTRST# (Bit7)
    #define WDRstVal  0x80 // Enabled WDTRST#
#define TimerReg   0x05 // Timer register
    #define PSWidthBit 0x00 // WDTRST# Pulse width (Bit0:1)
    #define PSWidthVal 0x01 // 25ms for WDTRST# pulse
    #define PolarityBit 0x02 // WDTRST# Signal polarity (Bit2)
    #define PolarityVal 0x00 // Low active for WDTRST#
    #define UnitBit    0x03 // Unit for timer (Bit3)
    #define ModeBit    0x04 // WDTRST# mode (Bit4)
    #define ModeVal    0x01 // 0:level 1: pulse
    #define EnableBit  0x05 // WDT timer enable (Bit5)
    #define EnableVal  0x01 // 1: enable
    #define StatusBit  0x06 // WDT timer status (Bit6)
#define CounterReg 0x06 // Timer counter register
*****

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

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

*****
// Procedure : AaeonWDTEnable
```

```

VOID AaeonWDTEnable (){
    WDTEnableDisable(1);
}

// Procedure : AaeonWDTConfig
VOID AaeonWDTConfig (byte Counter, BOOLEAN Unit){
    // Disable WDT counting
    WDTEnableDisable(0);
    // Clear Watchdog Timeout Status
    WDTClearTimeoutStatus();
    // WDT relative parameter setting
    WDTParameterSetting(Timer, Unit);
}

VOID WDTEnableDisable(byte Value){
    If (Value == 1)
        WDTSetBit(TimerReg, EnableBit, 1);
    else
        WDTSetBit(TimerReg, EnableBit, 0);
}

VOID WDTParameterSetting(byte Counter, BOOLEAN Unit){
    // Watchdog Timer counter setting
    WDTWriteByte(CounterReg, Counter);
    // WDT counting unit setting
    WDTSetBit(TimerReg, UnitBit, Unit);
    // WDT output mode set to pulse
    WDTSetBit(TimerReg, ModeBit, ModeVal);
    // WDT output mode set to active low
    WDTSetBit(TimerReg, PolarityBit, PolarityVal);
    // WDT output pulse width is 25ms
    WDTSetBit(TimerReg, PSWidthBit, PSWidthVal);
    // Watchdog WDTRST# Enable
    WDTSetBit(DevReg, WDTRstBit, WDTRstVal);
}

VOID WDTClearTimeoutStatus(){
    WDTSetBit(TimerReg, StatusBit, 1);
}

*****
*****

```

```
VOID  WDTWriteByte(byte Register, byte Value){
    IOWriteByte(WDTAddr+Register, Value);
}

byte  WDTReadByte(byte Register){
    return IOReadByte(WDTAddr+Register);
}

VOID  WDTSetBit(byte Register, byte Bit, byte Val){
    byte TmpValue;

    TmpValue = WDTReadByte(Register);
    TmpValue &= ~(1 << Bit);
    TmpValue |= Val << Bit;
    WDTWriteByte(Register, TmpValue);
}
```

```
*****
```

# Appendix B

---

I/O Information


































## B.1 I/O Address Map

Input/output (I/O)	
[0000000000000000 - 000000000000006F]	PCI Express Root Complex
[0000000000000020 - 000000000000021]	Programmable interrupt controller
[0000000000000024 - 0000000000000025]	Programmable interrupt controller
[0000000000000028 - 0000000000000029]	Programmable interrupt controller
[000000000000002C - 000000000000002D]	Programmable interrupt controller
[000000000000002E - 000000000000002F]	Motherboard resources
[0000000000000030 - 0000000000000031]	Programmable interrupt controller
[0000000000000034 - 0000000000000035]	Programmable interrupt controller
[0000000000000038 - 0000000000000039]	Programmable interrupt controller
[000000000000003C - 000000000000003D]	Programmable interrupt controller
[0000000000000040 - 0000000000000043]	System timer
[000000000000004E - 000000000000004F]	Motherboard resources
[0000000000000050 - 0000000000000053]	System timer
[0000000000000061 - 0000000000000061]	Motherboard resources
[0000000000000063 - 0000000000000063]	Motherboard resources
[0000000000000065 - 0000000000000065]	Motherboard resources
[0000000000000067 - 0000000000000067]	Motherboard resources
[0000000000000070 - 0000000000000070]	Motherboard resources
[0000000000000070 - 0000000000000077]	System CMOS/real time clock
[0000000000000078 - 00000000000000CF]	PCI Express Root Complex
[0000000000000080 - 000000000000008F]	Motherboard resources
[0000000000000092 - 0000000000000092]	Motherboard resources
[00000000000000A0 - 00000000000000A1]	Programmable interrupt controller
[00000000000000A4 - 00000000000000A5]	Programmable interrupt controller
[00000000000000A8 - 00000000000000A9]	Programmable interrupt controller
[00000000000000AC - 00000000000000AD]	Programmable interrupt controller
[00000000000000B0 - 00000000000000B1]	Programmable interrupt controller
[00000000000000B2 - 00000000000000B3]	Motherboard resources
[00000000000000B4 - 00000000000000B5]	Programmable interrupt controller
[00000000000000B8 - 00000000000000B9]	Programmable interrupt controller
[00000000000000BC - 00000000000000BD]	Programmable interrupt controller
[00000000000000C0 - 00000000000000C7]	Communications Port (COM6)
[00000000000000D0 - 00000000000000D7]	Communications Port (COM5)
[00000000000000E8 - 00000000000000EF]	Communications Port (COM4)
[00000000000000F8 - 00000000000000FF]	Communications Port (COM2)
[00000000000003B0 - 00000000000003BB]	Intel(R) HD Graphics
[00000000000003C0 - 00000000000003DF]	Intel(R) HD Graphics
[00000000000003E8 - 00000000000003EF]	Communications Port (COM3)
[00000000000003F8 - 00000000000003FF]	Communications Port (COM1)
[0000000000000400 - 000000000000047F]	Motherboard resources
[00000000000004D0 - 00000000000004D1]	Programmable interrupt controller
[0000000000000500 - 00000000000005FE]	Motherboard resources
[0000000000000680 - 000000000000069F]	Motherboard resources
[0000000000000A00 - 0000000000000A0F]	Motherboard resources
[0000000000000A00 - 0000000000000A3F]	Motherboard resources
[0000000000000A10 - 0000000000000A1F]	Motherboard resources
[0000000000000A20 - 0000000000000A2F]	Motherboard resources
[0000000000000D00 - 000000000000FFFF]	PCI Express Root Complex
[000000000000C000 - 000000000000CFFF]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 3 - 0F4C
[000000000000D000 - 000000000000DFFF]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 1 - 0F48
[000000000000E000 - 000000000000E01F]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Platform Control Unit - SMBus Port - 0F12
[000000000000E020 - 000000000000E03F]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
[000000000000E040 - 000000000000E043]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
[000000000000E050 - 000000000000E057]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
[000000000000E060 - 000000000000E063]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
[000000000000E070 - 000000000000E077]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
[000000000000E080 - 000000000000E087]	Intel(R) HD Graphics

## B.2 Memory Address Map

Memory	
[00000000000A0000 - 000000000008FFFF]	Intel(R) HD Graphics
[00000000000A0000 - 000000000008FFFF]	PCI Express Root Complex
[00000000000C0000 - 000000000000FFFF]	PCI Express Root Complex
[00000000000E0000 - 000000000000FFFF]	PCI Express Root Complex
[000000000008000000 - 0000000008FFFFFF]	Intel(R) HD Graphics
[000000000008000000 - 000000000903FFFF]	PCI Express Root Complex
[000000000009000000 - 000000000903FFFF]	Intel(R) HD Graphics
[000000000009040000 - 000000000904FFFF]	Intel(R) Trusted Execution Engine Interface
[000000000009050000 - 000000000905FFFF]	Intel(R) Trusted Execution Engine Interface
[000000000009060000 - 0000000009061FFFF]	Intel(R) i211 Gigabit Network Connection #2
[000000000009060000 - 000000000906FFFF]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 3 - 0F4C
[0000000000090620000 - 00000000090623FFF]	Intel(R) i211 Gigabit Network Connection #2
[000000000009070000 - 0000000009071FFFF]	Intel(R) i211 Gigabit Network Connection
[000000000009070000 - 000000000907FFFF]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 1 - 0F48
[0000000000090720000 - 00000000090723FFF]	Intel(R) i211 Gigabit Network Connection
[000000000009080000 - 0000000009080FFFF]	Intel(R) USB 3.0 eXtensible Host Controller - 0100 (Microsoft)
[0000000000090810000 - 00000000090813FFF]	High Definition Audio Controller
[0000000000090814000 - 0000000009081401F]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Platform Control Unit - SMBus Port - 0F12
[0000000000090816000 - 000000000908167FF]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
[000000000E0000000 - 00000000FFFFFF]	Motherboard resources
[000000000E0000000 - 000000000E00000DB]	Intel(R) Sideband Fabric Device
[000000000FED00000 - 000000000FED003FF]	High precision event timer
[000000000FED01000 - 000000000FED01FFF]	Motherboard resources
[000000000FED03000 - 000000000FED03FFF]	Motherboard resources
[000000000FED04000 - 000000000FED04FFF]	Motherboard resources
[000000000FED08000 - 000000000FED08FFF]	Motherboard resources
[000000000FED1C000 - 000000000FED1CFFF]	Motherboard resources
[000000000FED40000 - 000000000FED44FFF]	Trusted Platform Module 1.2
[000000000FEE00000 - 000000000FEEFFFFF]	Motherboard resources
[000000000FEF00000 - 000000000FEFfffff]	Motherboard resources

## B.3 IRQ Mapping Chart

Interrupt request (IRQ)	
 (ISA) 0x00000000 (00)	System timer
 (ISA) 0x00000003 (03)	Communications Port (COM2)
 (ISA) 0x00000004 (04)	Communications Port (COM1)
 (ISA) 0x00000007 (07)	Communications Port (COM3)
 (ISA) 0x00000007 (07)	Communications Port (COM4)
 (ISA) 0x00000007 (07)	Communications Port (COM5)
 (ISA) 0x00000007 (07)	Communications Port (COM6)
 (ISA) 0x00000008 (08)	High precision event timer
 (PCI) 0x0000000B (11)	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Platform Control Unit - SMBus Port - 0F12
 (PCI) 0x00000010 (16)	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 1 - 0F48
 (PCI) 0x00000011 (17)	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 2 - 0F4A
 (PCI) 0x00000012 (18)	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 3 - 0F4C
 (PCI) 0x00000013 (19)	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
 (PCI) 0x00000013 (19)	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 4 - 0F4E
 (PCI) 0x00000016 (22)	High Definition Audio Controller
 (PCI) 0xFFFFFFFF (-19)	Intel(R) Trusted Execution Engine Interface
 (PCI) 0xFFFFFFFF (-18)	Intel(R) I211 Gigabit Network Connection #2
 (PCI) 0xFFFFFFFF (-17)	Intel(R) I211 Gigabit Network Connection #2
 (PCI) 0xFFFFFFFF (-16)	Intel(R) I211 Gigabit Network Connection #2
 (PCI) 0xFFFFFFFF (-15)	Intel(R) I211 Gigabit Network Connection #2
 (PCI) 0xFFFFFFFF (-14)	Intel(R) I211 Gigabit Network Connection #2
 (PCI) 0xFFFFFFFF (-13)	Intel(R) I211 Gigabit Network Connection #2
 (PCI) 0xFFFFFFFF (-12)	Intel(R) I211 Gigabit Network Connection
 (PCI) 0xFFFFFFFF (-11)	Intel(R) I211 Gigabit Network Connection
 (PCI) 0xFFFFFFFF (-10)	Intel(R) I211 Gigabit Network Connection
 (PCI) 0xFFFFFFFF (-9)	Intel(R) I211 Gigabit Network Connection
 (PCI) 0xFFFFFFFF (-8)	Intel(R) I211 Gigabit Network Connection
 (PCI) 0xFFFFFFFF (-7)	Intel(R) I211 Gigabit Network Connection
 (PCI) 0xFFFFFFFF (-6)	Intel(R) USB 3.0 eXtensible Host Controller - 0100 (Microsoft)
 (PCI) 0xFFFFFFFF (-5)	Intel(R) HD Graphics
 (PCI) 0xFFFFFFFF (-4)	PCI standard PCI-to-PCI bridge
 (PCI) 0xFFFFFFFF (-3)	PCI standard PCI-to-PCI bridge
 (PCI) 0xFFFFFFFF (-2)	PCI standard PCI-to-PCI bridge