

# EPIC-BT07

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EPIC Board

User's Manual 5<sup>th</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
● EPIC-BT07	1
● 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 product page on [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. 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	×	○	○	○	○	○

○: 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: 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。

## 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	X	○	○	○	○	○
Wires & Connectors for External Connections	X	○	○	○	○	○
<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>						

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# Chapter 1

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Product Specifications

## 1.1 Specifications

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### System

Form Factor	4" EPIC Board
CPU	Intel® Atom™/ Celeron® E3845/J1900/N2807
CPU Frequency	Up to 2.0 GHz
Chipset	Intel® Atom™/ Celeron® SOC
Memory Type	DDR3L 1333, SODIMM x 1
Max. Memory Capacity	Up to 8G
BIOS	AMI
Wake on LAN	Yes
Watchdog Timer	255 Levels
Power Requirement	+12V or 9-24V AT/ATX (default)
Power Supply Type	AT/ ATX
Power Consumption (Typical)	11.8W
Dimension (L x W)	4.53" x 6.50" (115mm x 165mm)
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
MTBF (Hours)	110,000
Certification	CE/FCC



## Display

VGA/LCD Controller	Intel® Atom™/ Celeron® SOC
Video Output	CRT, LVDS, HDMI
Backlight Inverter Supply	Max. 12V

## I/O

Ethernet	Intel® i211 Gigabit Ethernet, RJ-45 x 2
Audio	High Definition Audio Interface
USB Port	USB2.0 x 5 USB3.0 x 1
Serial Port	COM1, 4, 5, 6 : RS-232 x 4 COM2, 3 : RS-232/422/485 x 1 (Ring/ +5V/ +12V)
Parallel Port	SPP/EPP/ECP x 1
HDD Interface	SATA 2.0 x 1
FDD Interface	—
SSD	mSATA x 1 (Share with half-size Mini-Card by BOM)
Expansion Slot	Mini-Card x 1, Micro-SD x 1 (Only E3800 series) PCI-104 x 1 (optional) 16-bit DIO or LPT SMBus x 1 I2C x 1 (optional) PS/2 x 1

**I/O**

PWM LCD Support	—
DIO	16-bit
TPM	Optional
Touch	Optional

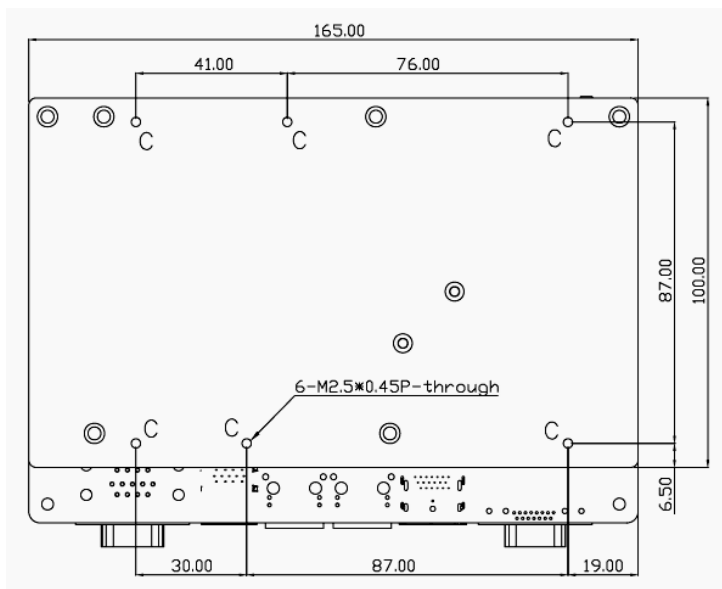
# Chapter 2

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Hardware Information

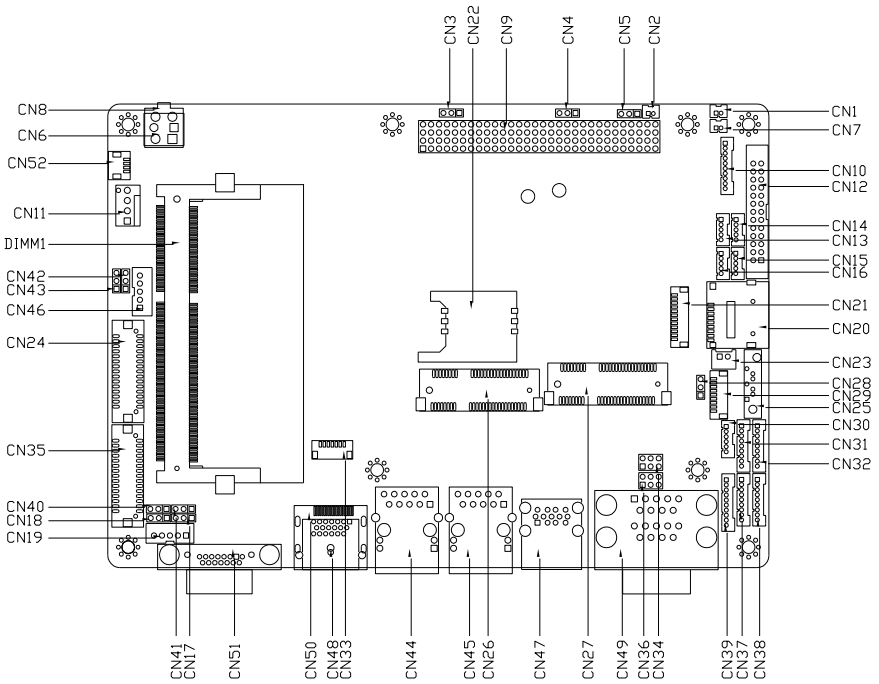


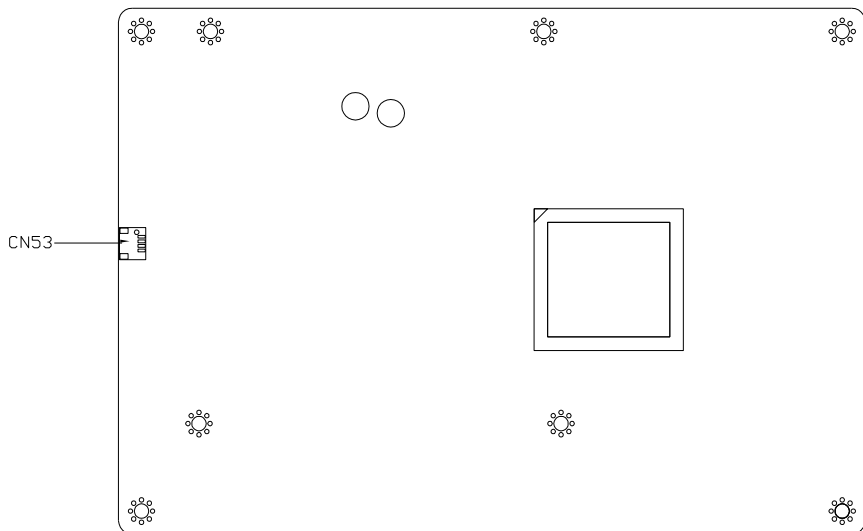
### Solder Side



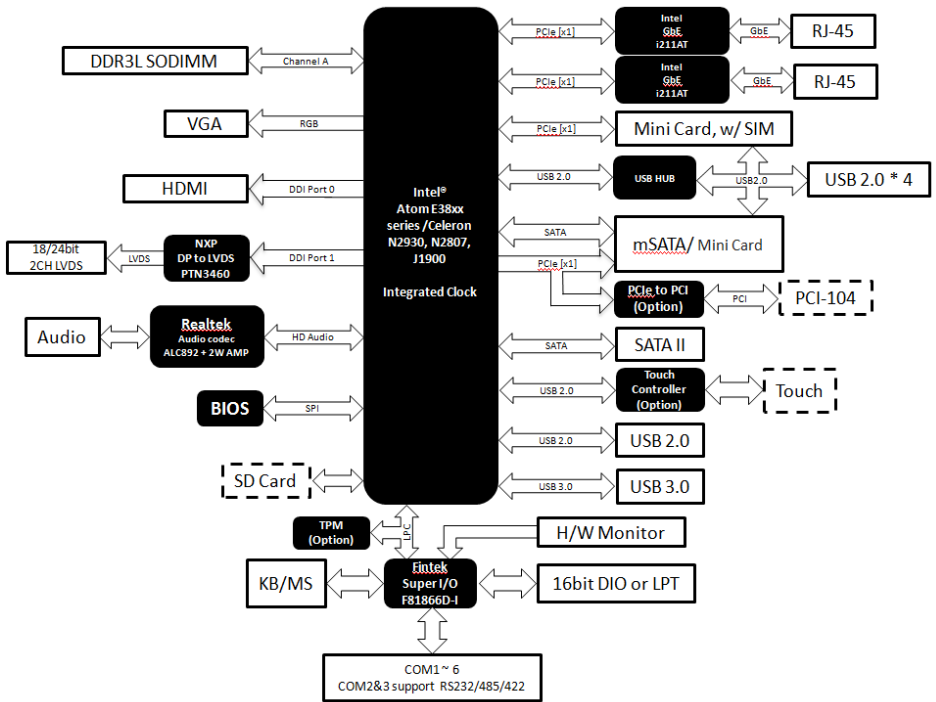
## 2.2 Jumpers and Connectors

### Component Side





## 2.3 Block Diagram





## 2.4 List of Jumpers

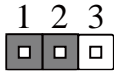
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The board features a number of jumpers which can be configured for your application. Please refer to the table below and following sections for all jumpers which can be configured.

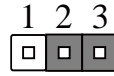
Label	Function
CN3	Auto Power Button Selection
CN4	PCI-104 VIO Voltage Selection
CN5	CMOS RTC Setting
CN17	LVDS/eDP Backlight Voltage Selection
CN18	LVDS/eDP Backlight Control Selection
CN28	Touch Screen 4/5/8-wire Mode Selection
CN34	COM2 RI/+5/+12V Selection
CN36	COM3 RI/+5/+12V Selection
CN40	eDP Operating Voltage Selection
CN41	LVDS/eDP Operating Voltage Selection
CN42	eDP Backlight Control Selection
CN43	eDP Backlight Voltage Selection

### 2.4.1 Auto Power Button Selection (CN3)

---



Disable

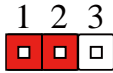


Enable (Default)

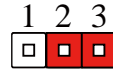
**Note:** When disabled, use CN39 (1-2) to power on the system.

### 2.4.2 PCI-104 VI/O Voltage Selection (CN4)

---



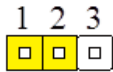
+5V



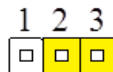
+3.3V (Default)

### 2.4.3 CMOS RTC Setting (CN5)

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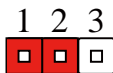
Normal (Default)



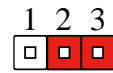
Clear CMOS

### 2.4.4 LVDS/eDP Backlight Voltage Selection (CN17)

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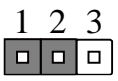


+12V

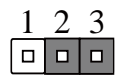


+5V (Default)

2.4.5 LVDS/eDP Backlight Control Selection (CN18)

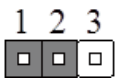


VR Mode (Default)

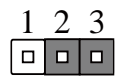


PWM Mode

2.4.6 Touchscreen 4/5/8-wire Mode Selection (CN28)

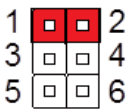


4/8 Wires Mode (Default)

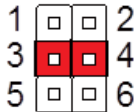


5 Wires Mode

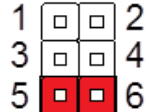
2.4.7 COM2 RI/+5/+12V Selection (CN34)



+12V

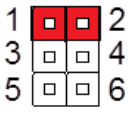


Ring (Default)

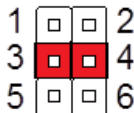


+5V

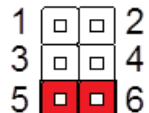
2.4.8 COM3 RI/+5/+12V Selection (CN36)



+12V



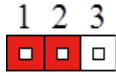
Ring (Default)



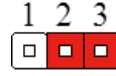
+5V

2.4.9 eDP Operating Voltage Selection (CN40)

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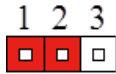
+5V



+3.3V (Default)

2.4.10 LVDS/eDP Operating Voltage Selection (CN41)

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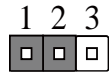
+5V



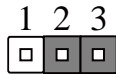
+3.3V (Default)

2.4.11 eDP Backlight Control Selection (CN42)

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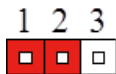
VR Mode (Default)



PWM Mode

2.4.12 eDP Backlight Voltage Selection (CN43)

---



+12V



+5V (Default)

## 2.5 List of Connectors

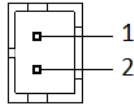
This section details the connectors featured on the board, which can be configured for your application. For a list of mating connectors and cables, please see Appendix C. For Electrical Specifications of I/O Ports, please see Appendix D. Please refer to the table below for a list of all connectors on this board which can be configured.

Label	Function
CN1	Stereo Audio RIGHT Channel
CN2	RTC Battery Connector
CN6	4-Pin Power In Connector
CN7	Stereo Audio LEFT Channel
CN8	2-Pin Power in Connector
CN9	PCI-104 Connector
CN10	Audio Connector
CN12	LPT/Digital IO Connector
CN13	USB 2.0 Port 2
CN14	USB 2.0 Port 3
CN15	USB 2.0 Port 5
CN16	USB 2.0 Port 4
CN19	LVDS/eDP Inverter / Backlight Connector
CN20	Micro SD Card Connector
CN21	LPC Expansion Connector
CN22	UIM Card Socket
CN23	+5V Output for SATA HDD
CN24	eDP Port
CN25	SATA Port1
CN26	Mini-Card Slot
CN27	Mini-Card / mSATA Slot

Label	Function
CN29	Touch Screen Connector
CN30	PS/2 Keyboard Mouse Connector
CN31	COM Port 6
CN32	COM Port 5
CN33	SPI Programming Port
CN35	LVDS/eDP Port
CN37	COM Port 4
CN38	COM Port 3
CN39	Front Panel Connector
CN44	10/100/1000 Mbps Ethernet Port 1
CN46	eDP Inverter / Backlight Connector
CN45	10/100/1000 Mbps Ethernet Port 2
CN47	USB Ports 0 & 1
CN48	DP Port
CN49	COM Port 1 & 2
CN50	HDMI Port
CN51	VGA Port
CN52	SMBUS Connector
DIMM1	DDR3L SODIMM

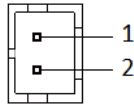
**Note:** CN50 HDMI Colay with CN24 Display Port is default display port.

### 2.5.1 Stereo Audio Right Channel (CN1)



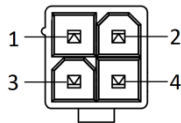
Pin	Pin Name	Signal Type	Signal Level
1	R+	OUT	
2	R-	OUT	

### 2.5.2 RTC Battery Connector (CN2)



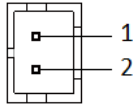
Pin	Pin Name	Signal Type	Signal Level
1	+3.3 V	PWR	3.3 V
2	GND	GND	

### 2.5.3 4-Pin Power-In Connector (CN6)



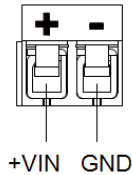
Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	GND	GND	
3	+VIN	PWR	+12V
4	+VIN	PWR	+12V

## 2.5.4 Stereo Audio Left Channel (CN7)



Pin	Pin Name	Signal Type	Signal Level
1	L+	OUT	
2	L-	OUT	

## 2.5.5 2-Pin Power in Connector (CN8)



Pin	Pin Name	Signal Type	Signal Level
1	+VIN	PWR	+9V to +24 V
2	GND	GND	

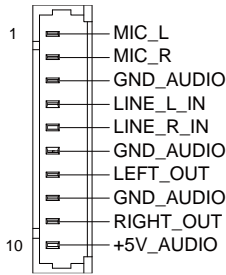
## 2.5.6 PCI-104 Connector (CN9)

	A	B	C	D
1	GND	+5V_SB	+5V	AD00
2	VI/O	AD02	AD01	+5V
3	AD05	GND	AD04	AD03
4	C/BE0#	AD07	GND	AD06
5	GND	AD09	AD08	GND
6	AD11	VI/O	AD10	M66EN
7	AD14	AD13	GND	AD12



	A	B	C	D
8	+3.3V	C/BE1#	AD15	+3.3V
9	SERR#	GND	PSON#	PAR
10	GND	PERR#	+3.3V	PME#
11	STOP#	+3.3V	LOCK#	GND
12	+3.3V	TRDY#	GND	DEVSEL#
13	FRAME#	GND	IRDY#	+3.3V
14	GND	AD16	+3.3V	C/BE2#
15	AD18	+3.3V	AD17	GND
16	AD21	AD20	GND	AD19
17	+3.3V	AD23	AD22	+3.3V
18	IDSEL0	GND	IDSEL1	IDSEL2
19	AD24	C/BE3#	VI/O	IDSEL3
20	GND	AD26	AD25	GND
21	AD29	+5V	AD28	AD27
22	+5V	AD30	GND	AD31
23	REQ0#	GND	REQ1#	VI/O
24	GND	REQ2#	+5V	GNT0#
25	GNT1#	VI/O	GNT2#	GND
26	+5V	CLK0	GND	CLK1
27	CLK2	+5V	CLK3	GND
28	GND	INTD#	+5V	RST#
29	+12V	INTA#	INTB#	INTC#
30	-12V	REQ3#	GNT3#	GND

## 2.5.7 Audio Connector (CN10)



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

## 2.5.8 LPT/ Digital I/O Connector (CN12)

---

LPT Mode:

Pin	Pin Name	Signal Type	Signal Level
1	STOBE#	I/O	
2	#AFD	I/O	
3	PPD0	I/O	
4	ERR#	I/O	
5	PPD1	I/O	
6	PINIT#	I/O	
7	PPD2	I/O	
8	SLIN#	I/O	
9	PPD3	I/O	
10	GND	GND	
11	PPD4	I/O	
12	GND	GND	
13	PPD5	I/O	
14	GND	GND	
15	PPD6	I/O	
16	GND	GND	
17	PPD7	I/O	
18	GND	GND	
19	ACK#	I/O	
20	GND	GND	
21	BUSY	I/O	
22	GND	GND	

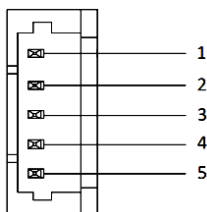
Pin	Pin Name	Signal Type	Signal Level
23	PE	I/O	
24	GND	GND	
25	SLCT	I/O	
26	PWR	PWR	+5V

### Digital I/O Mode:

Pin	Pin Name	Signal Type	Signal Level
1	GPIO15	I/O	+5 V
2	GPIO14	I/O	+5 V
3	GPIO0	I/O	+5 V
4	GPIO13	I/O	+5 V
5	GPIO1	I/O	+5 V
6	GPIO12	I/O	+5 V
7	GPIO2	I/O	+5 V
8	GPIO11	I/O	+5 V
9	GPIO3	I/O	+5 V
10	GND	GND	
11	GPIO4	I/O	+5 V
12	GND	GND	
13	GPIO5	I/O	+5 V
14	GND	GND	
15	GPIO6	I/O	+5 V
16	GND	GND	
17	GPIO7	I/O	+5 V
18	GND	GND	

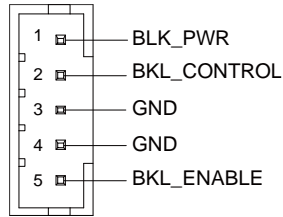
Pin	Pin Name	Signal Type	Signal Level
19	GPIO10	I/O	+5 V
20	GND	GND	
21	GPIO9	I/O	+5 V
22	GND	GND	
23	GPIO8	I/O	+5 V
24	GND	GND	
25	N.C		
26	PWR	PWR	+5V

### 2.5.9 USB 2.0 Port 2/3/4/5 (CN13/14/15/16)



Pin	Pin Name	Signal Type	Signal Level
1	+5VSB	PWR	+5V
2	USB2_D-	DIFF	
3	USB2_D+	DIFF	
4	GND	GND	
5	GND	GND	

## 2.5.10 LVDS/eDP Inverter / Backlight Connector (CN19)



### Notes:

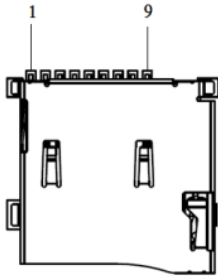
**BLK\_PWR** can be set to +12V or +5V by jumper CN17 (see section 2.4.4).

The maximum driving current is 1.5A.

**BKL\_CONTROL** can be set to VR Mode or PWM Mode by jumper CN18 (see section 2.4.5)

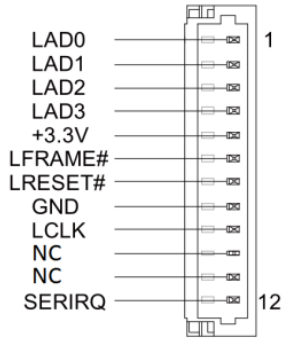
Pin	Pin Name	Signal Type	Signal Level
1	BKL_PWR	PWR	+5V / +12V
2	BKL_CONTROL	OUT	
3	GND	GND	
4	GND	GND	
5	BKL_ENABLE	OUT	+3.3V

## 2.5.11 MicroSD Card Connector (CN20)



Pin	Pin Name	Signal Type	Signal Level
1	SDIO_D2	I/O	
2	SDIO_D3	I/O	
3	SDIO_CMD	I/O	
4	+3.3V	PWR	+3.3V
5	SDIO_CLK	I/O	
6	GND	GND	
7	SDIO_D0	I/O	
8	SDIO_D1	I/O	
9	SDIO_CD#	I/O	

## 2.5.12 LPC Expansion Connector (CN21)



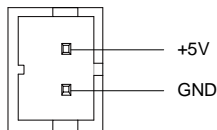
Pin	Pin Name	Signal Type	Signal Level
1	LAD0	I/O	+3.3V
2	LAD1	I/O	+3.3V
3	LAD2	I/O	+3.3V
4	LAD3	I/O	+3.3V
5	+3.3V	PWR	+3.3V
6	LFRAME#	IN	
7	LRESET#	OUT	+3.3V
8	GND	GND	
9	LCLK	OUT	
10	NC		
11	NC		
12	SERIRQ	I/O	+3.3V



### 2.5.13 UIM Socket (CN22)

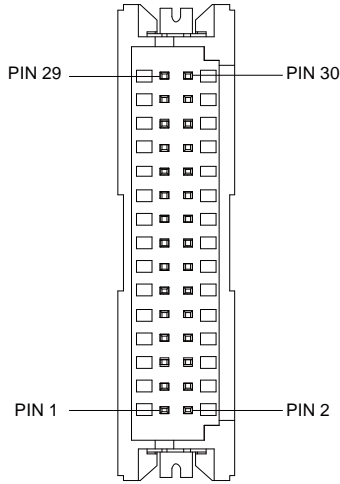
Pin	Pin Name	Signal Type	Signal Level
1	UIM_PWR	PWR	
2	UIM_RST	IN	
3	UIM_CLK	IN	
4	GND	GND	
5	UIM_VPP	PWR	
6	UIM_DATA	I/O	

### 2.5.14 +5V Output for SATA HDD (CN23)



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

## 2.5.15 eDP (CN24)



### Notes:

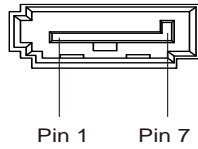
LVDS LCD\_PWR can be set to +3.3V or +5V by CN40 (see section 2.4.9).

The max driving current is 2A.

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	eDP_DA3-	DIFF	
6	eDP_DA3+	DIFF	
7	LCD_PWR	PWR	+3.3V/+5V
8	GND	GND	

Pin	Pin Name	Signal Type	Signal Level
9	eDP_DA2-	DIFF	
10	eDP_DA2+	DIFF	
11	eDP_DA1-	DIFF	
12	eDP_DA1+	DIFF	
13	eDP_DA0-	DIFF	
14	eDP_DA0+	DIFF	
15	NC		
16	Hot Plug Detect #		
17	eDP_AUX-	DIFF	
18	eDP_AUX+	DIFF	
19	NC		
20	NC		
21	NC		
22	NC		
23	NC		
24	NC		
25	NC		
26	NC		
27	LCD_PWR	PWR	+3.3V/+5V
28	GND	GND	
29	NC		
30	NC		

### 2.5.16 SATA Port1 (CN25)



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	

### 2.5.17 MiniCard Slot (CN26)

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		
9	GND	GND	
10	UIM_DAT		

Pin	Pin Name	Signal Type	Signal Level
11	PCIE_REF_CLK-	DIFF	
12	UIM_CLK		
13	PCIE_REF_CLK+	DIFF	
14	UIM_RST		
15	GND	GND	
16	UIM_VPP		
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	

Pin	Pin Name	Signal Type	Signal Level
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

### 2.5.18 MiniCard/ mSATA Slot (CN27)

**Note:** CN27 can be selected for MiniCard or mSATA by changing BOM

Pin	Pin Name	Signal Type	Signal Level
1	PCIE_WAKE#	IN	
2	+3.3VSB	PWR	+3.3V
3	NC		
4	GND	GND	

Pin	Pin Name	Signal Type	Signal Level
5	NC		
6	+1.5V	PWR	+1.5V
7	PCIE_CLK_REQ#	IN	
8	NC		
9	GND	GND	
10	NC		
11	PCIE_REF_CLK-	DIFF	
12	NC		
13	PCIE_REF_CLK+	DIFF	
14	NC		
15	GND	GND	
16	NC		
17	NC		
18	GND	GND	
19	NC		
20	W_DISABLE#	OUT	+3.3V
21	GND	GND	
22	PCIE_RST#	OUT	+3.3V
23	SATA_RX+	DIFF	
24	+3.3V	PWR	+3.3V
25	SATA_RX-	DIFF	
26	GND	GND	
27	GND	GND	
28	+1.5V	PWR	+1.5V
29	GND	GND	
30	SMB_CLK	I/O	+3.3V

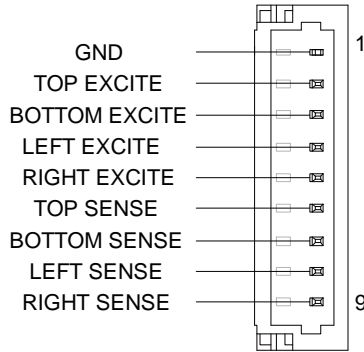
Pin	Pin Name	Signal Type	Signal Level
31	SATA_TX-	DIFF	
32	SMB_DATA	I/O	+3.3V
33	SATA_TX+	DIFF	
34	GND	GND	
35	GND	GND	
36	USB_D-	DIFF	
37	GND	GND	
38	USB_D+	DIFF	
39	+3.3V	PWR	+3.3V
40	GND	GND	
41	+3.3V	PWR	+3.3V
42	NC		
43	GND	GND	
44	NC		
45	NC		
46	NC		
47	NC		
48	+1.5V	PWR	+1.5V
49	NC		
50	GND	GND	
51	NC		
52	+3.3V	PWR	+3.3V



## 2.5.19 Touchscreen Connector (CN29)

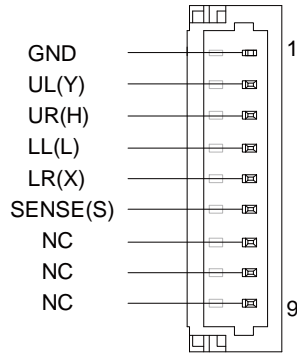
**Note:** Touchscreen mode can be set by jumper CN28 (see section 2.4.6).

### 8 Wires



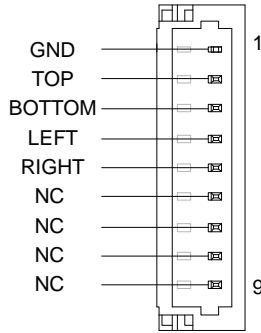
Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	TOP EXCITE	IN	
3	BOTTOM EXCITE	IN	
4	LEFT EXCITE	IN	
5	RIGHT EXCITE	IN	
6	TOP SENSE	IN	
7	BOTTOM SENSE	IN	
8	LEFT SENSE	IN	
9	RIGHT SENSE	IN	

### 5 Wires



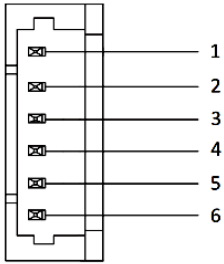
Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	UL(Y)	IN	
3	UR(H)	IN	
4	LL(L)	IN	
5	LR(X)	IN	
6	SENSE(S)	IN	
7	NC		
8	NC		
9	NC		

## 4 Wires



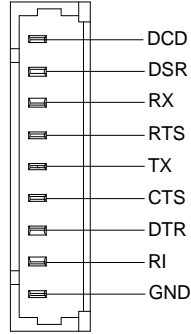
Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	TOP	IN	
3	BOTTOM	IN	
4	LEFT	IN	
5	RIGHT	IN	
6	NC		
7	NC		
8	NC		
9	NC		

### 2.5.20 PS/2 Keyboard Mouse Connector (CN30)



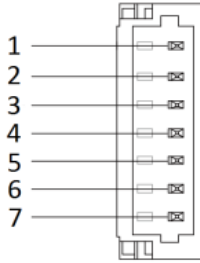
Pin	Pin Name	Signal Type	Signal Level
1	KB_DATA	I/O	+5V
2	KB_CLK	I/O	+5V
3	GND	GND	
4	+5VSB	PWR	+5V
5	MS_DATA	I/O	+5V
6	MS_CLK	I/O	+5V

## 2.5.21 COM Port 4/5/6 (CN31/32/37)



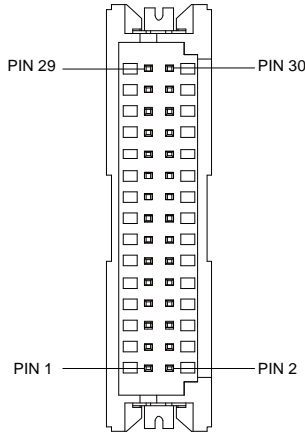
Pin	Pin Name	Signal Type	Signal Level
1	DCD	IN	
2	DSR	IN	
3	RX	IN	
4	RTS	OUT	±9V
5	TX	OUT	±9V
6	CTS	IN	
7	DTR	OUT	±9V
8	RI	IN	
9	GND	GND	

## 2.5.22 SPI Programming Port (CN33)



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		

## 2.5.23 LVDS/eDP Port (CN35)



### Notes:

LVDS LCD\_PWR can be set to +3.3V or +5V by jumper CN41 (see section 2.4.10)  
The max driving current is 2A.

### LVDS Settings:

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	

Pin	Pin Name	Signal Type	Signal Level
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	



## eDP Settings:

**Note:** eDP may not work on DDI0. Pre-testing eDP is recommended

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	eDP_DA3-	DIFF	
6	eDP_DA3+	DIFF	
7	LCD_PWR	PWR	+3.3V/+5V
8	GND	GND	
9	eDP_DA2-	DIFF	
10	eDP_DA2+	DIFF	
11	eDP_DA1-	DIFF	
12	eDP_DA1+	DIFF	
13	eDP_DA0-	DIFF	
14	eDP_DA0+	DIFF	
15	NC		
16	Hot Plug Detect #		
17	eDP_AUX-	DIFF	
18	eDP_AUX+	DIFF	
19	NC		
20	NC		
21	NC		
22	NC		
23	NC		

Pin	Pin Name	Signal Type	Signal Level
24	NC		
25	NC		
26	NC		
27	LCD_PWR	PWR	+3.3V/+5V
28	GND	GND	
29	NC		
30	NC		

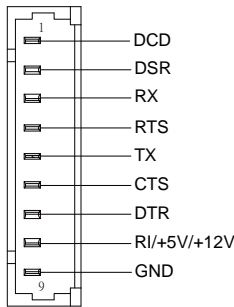
## 2.5.24 COM Port 3 (CN38)

### Notes:

COM3 RS-232/422/485 can be set by BIOS settings. Default is RS-232. See Section 3.4.8.3.

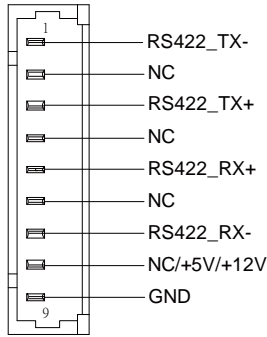
Function for Pin 8 can be set by CN36 (See Section 2.4.8)

### RS-232 Settings



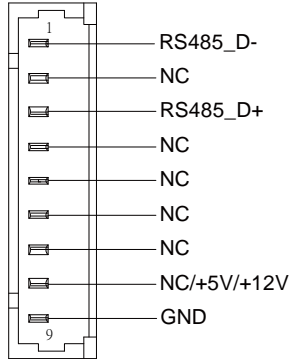
Pin	Pin Name	Signal Type	Signal Level
1	DCD	IN	
2	DSR	IN	
3	RX	IN	
4	RTS	OUT	±6V
5	TX	OUT	±6V
6	CTS	IN	
7	DTR	OUT	±6V
8	RI/+5V/+12V	IN/ PWR	+5V/+12V
9	GND	GND	

## RS-422 Settings



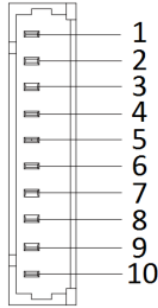
Pin	Pin Name	Signal Type	Signal Level
1	RS422_TX-	OUT	±5V
2	NC		
3	RS422_TX+	OUT	±5V
4	NC		
5	RS422_RX+	IN	
6	NC		
7	RS422_RX-	IN	
8	NC/+5V/+12V	PWR	+5V/+12V
9	GND	GND	

## RS-485 Settings



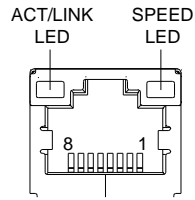
Pin	Pin Name	Signal Type	Signal Level
1	RS485_D-	I/O	±5V
2	NC		
3	RS485_D+	I/O	±5V
4	NC		
5	NC		
6	NC		
7	NC		
8	NC/+5V/+12V	PWR	+5V/+12V
9	GND	GND	

## 2.5.25 Front Panel Connector (CN39)



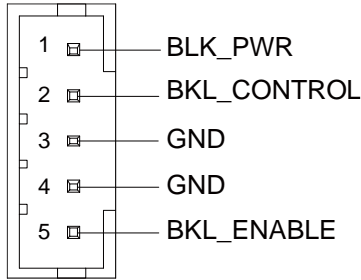
Pin	Pin Name	Signal Type	Signal Level
1	PWR_BTN#	IN	
2	GND	GND	
3	+5V	PWR	+5V
4	FP_SPKR	IN	
5	+3.3V	PWR	+3.3V
6	HDD_LED#	IN	
7	+3.3V	PWR	+3.3V
8	GND	GND	
9	HWRST#	IN	
10	GND	GND	

## 2.5.26 10/100/1000 Mbps Ethernet Port 1/2 (CN44/45)



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	

## 2.5.27 eDP Inverter/Backlight (CN46)



### Notes:

BLK\_PWR can be set to +12V or +5V by CN43. (See Section 2.4.12)

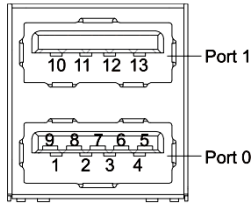
The max driving current is 1.5A.

BKL\_CONTROL can be set to VR Mode or PWM Mode by CN42. (See Section 2.4.11)

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



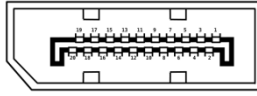
## 2.5.28 USB Port 0 & 1 (CN47)



**Note:** Only Port 0 supports USB 3.0.

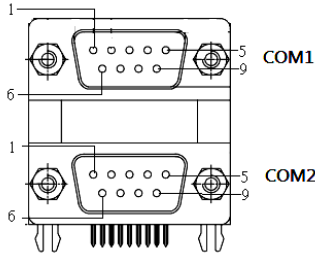
Pin	Pin Name	Signal Type	Signal Level
1	+5VSB	PWR	+5 V
2	USB0_D-	DIFF	
3	USB0_D+	DIFF	
4	GND	GND	
5	USB0_SSRX-	DIFF	
6	USB0_SSRX+	DIFF	
7	GND	GND	
8	USB0_SSTX-	DIFF	
9	USB0_SSTX+	DIFF	
10	+5VSB	PWR	+5 V
11	USB1_D-	DIFF	
12	USB1_D+	DIFF	
13	GND	GND	

## 2.5.29 DP Port (CN48)



Pin	Pin Name	Signal Type	Signal Level
1	DP_D0+	DIFF	
2	GND	GND	
3	DP_D0-	DIFF	
4	DP_D1+	DIFF	
5	GND	GND	
6	DP_D1-	DIFF	
7	DP_D2+	DIFF	
8	GND	GND	
9	DP_D2-	DIFF	
10	DP_D3+	DIFF	
11	GND	GND	
12	DP_D3-	DIFF	
13	GND	GND	
14	GND	GND	
15	DP_AUX+	DIFF	
16	GND	GND	
17	DP_AUX-	DIFF	
18	HPLG_DETECT	IN	
19	GND	GND	
20	+3.3V	I/O	+3.3 V

## 2.5.30 COM Port 1 & 2 (CN49)



### Notes:

COM2 RS-232/422/485 can be set by BIOS setting. Default is RS-232. See Section 3.4.8.2.

Function for Pin 9 can be set by jumper CN34 (see section 2.4.7).

### COM1 RS-232 Settings

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

## COM2 RS-232 Settings

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

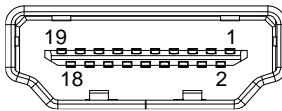
## COM2 RS-422 Settings

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

## COM2 RS-485 Settings

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

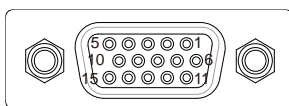
### 2.5.31 HDMI Port (CN50)



Pin	Pin Name	Signal Type	Signal Level
1	TMDS_DAT2+	DIFF	
2	GND	GND	
3	TMDS_DAT2-	DIFF	
4	TMDS_DAT1+	DIFF	
5	GND	GND	
6	TMDS_DAT1-	DIFF	
7	TMDS_DAT0+	DIFF	
8	GND	GND	

Pin	Pin Name	Signal Type	Signal Level
9	TMDS_DAT0-	DIFF	
10	TMDS_CLK+	DIFF	
11	GND	GND	
12	TMDS_CLK-	DIFF	
13	NC		
14	NC		
15	DDC_CLK	I/O	+5V
16	DDC_DATA	I/O	+5V
17	GND	GND	
18	+5V	I/O	+5V
19	HPLG_DETECT	IN	

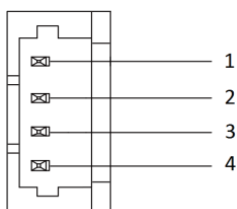
### 2.5.32 VGA Port (CN51)



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	

Pin	Pin Name	Signal Type	Signal Level
9	+5V	PWR	+5V
10	CRT_PLUG#		
11	NC		
12	DDC_DATA	I/O	+5V
13	HSYNC	OUT	
14	VSYNC	OUT	
15	DDC_CLK	I/O	+5V

### 2.5.33 SMBus Connector (CN52)



Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	+5V
2	SMB_DATA	I/O	
3	SMB_CLK	I/O	
4	+5V	PWR	

### 2.5.34 DDR3L SODIMM (DIMM1)

Standard Specification

# Chapter 3

---

AMI BIOS Setup



## 3.1 System Test and Initialization

---

The system uses certain routines to perform testing and initialization during the boot up sequence. If an error, fatal or non-fatal, is encountered, the system will output a few short beeps or an error message. 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 output, and the BIOS setup program will need to be run to set the configuration information in memory.

There are three situations in which the CMOS settings will need to be set or changed:

- Starting the system for the first time
- The system hardware has been changed
- The CMOS memory has lost power and the configuration information is erased

The system's CMOS memory uses a backup battery for data retention. The battery must be replaced when it runs down.

## 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.

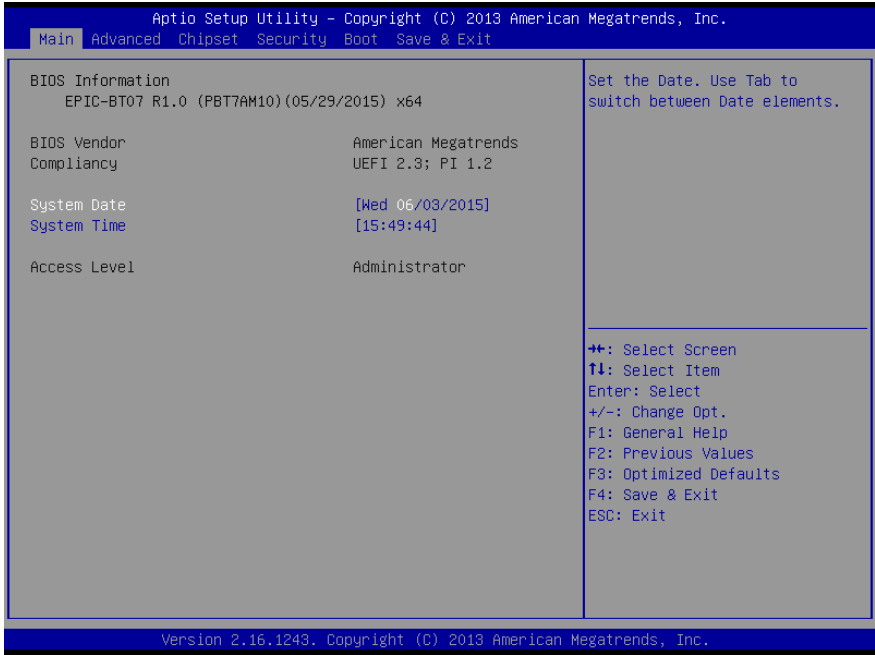
**Chipset** – For hosting bridge parameters.

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

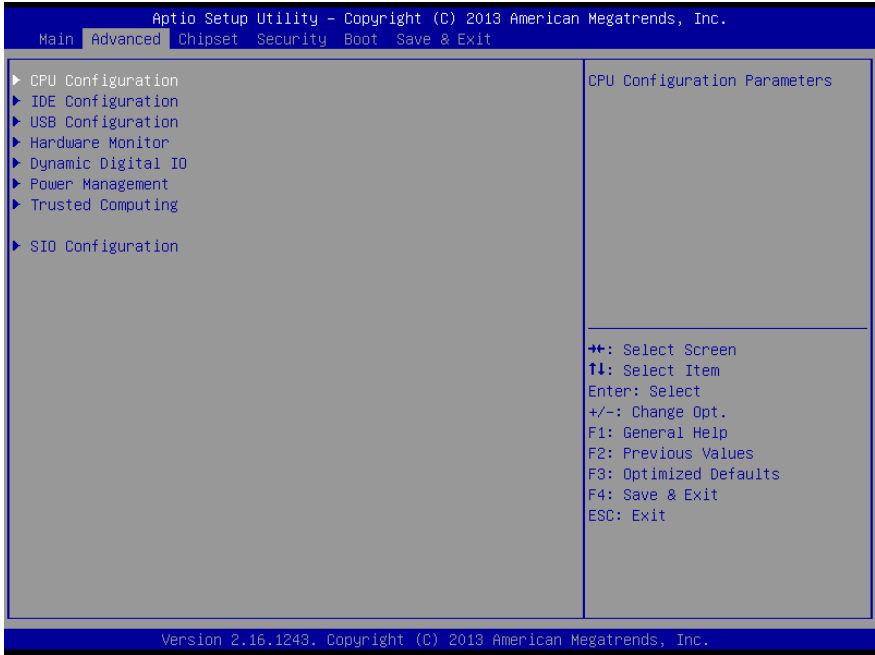
**Boot** – Enable/ disable Quiet Boot option.

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

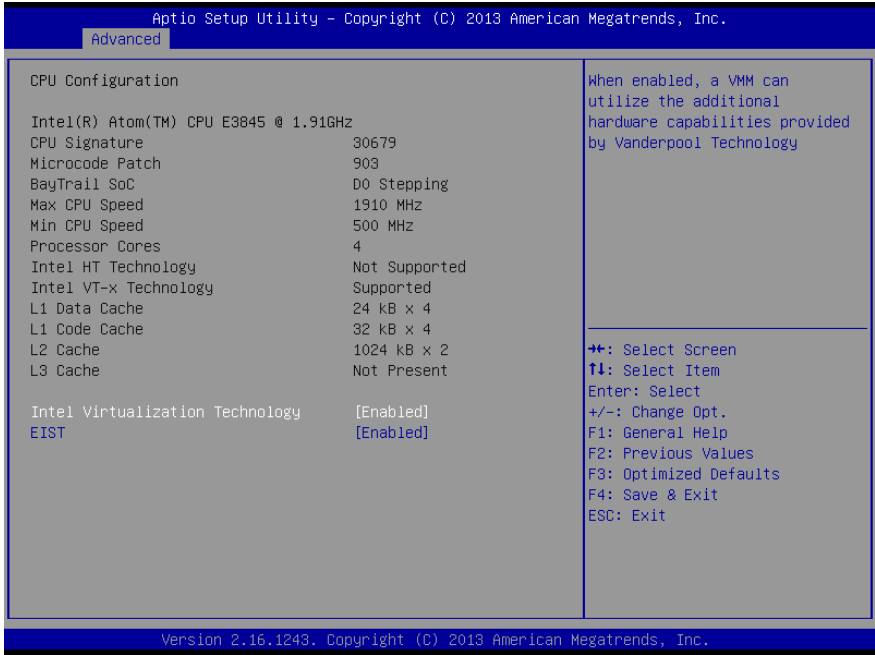
### 3.3 Setup submenu: Main



### 3.4 Setup submenu: Advanced

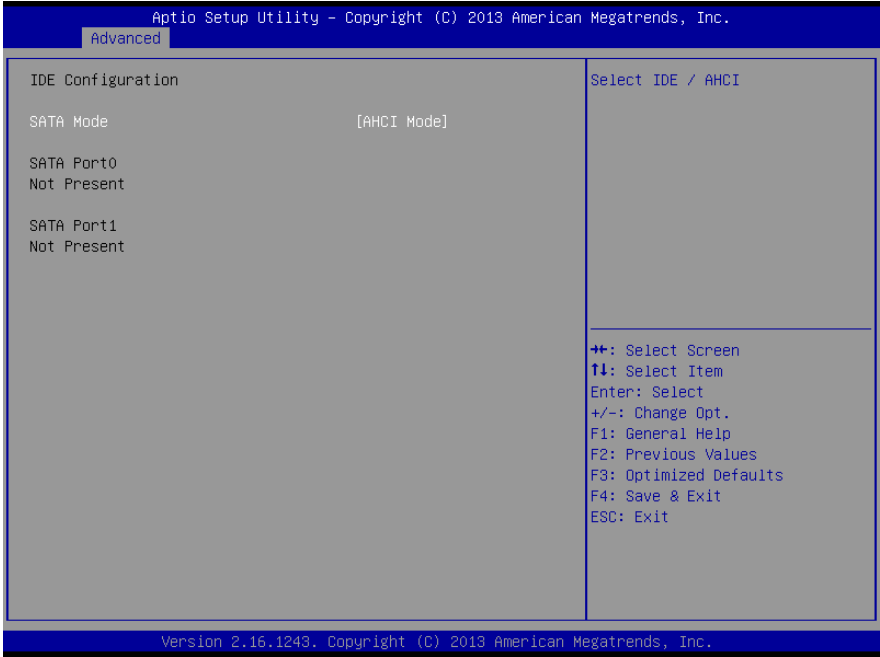


### 3.4.1 Advanced: CPU Configuration



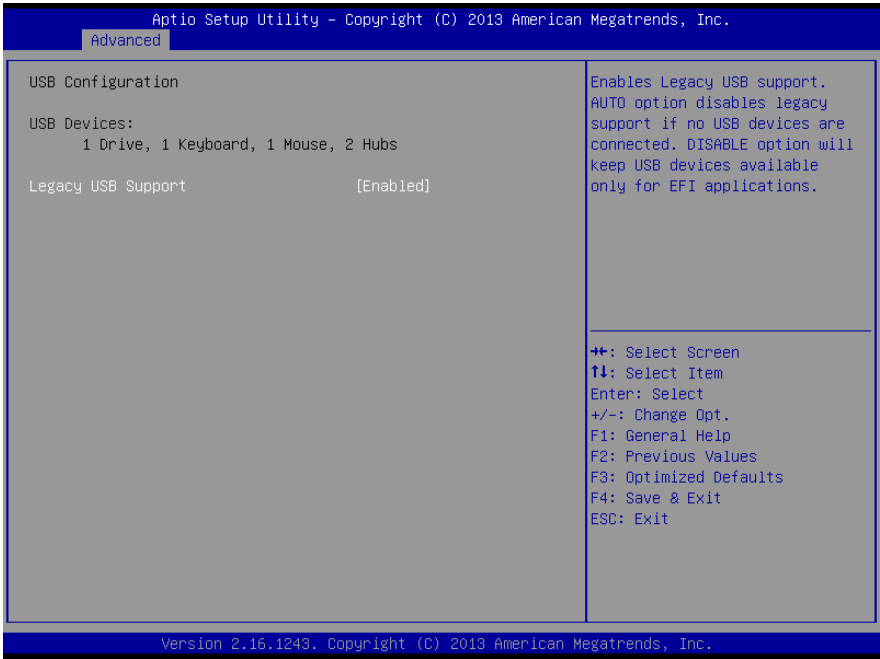
Options Summary		
Intel Virtualization Technology	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable Intel Virtualization Technology		
EIST	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable EIST		

### 3.4.2 Advanced: IDE Configuration



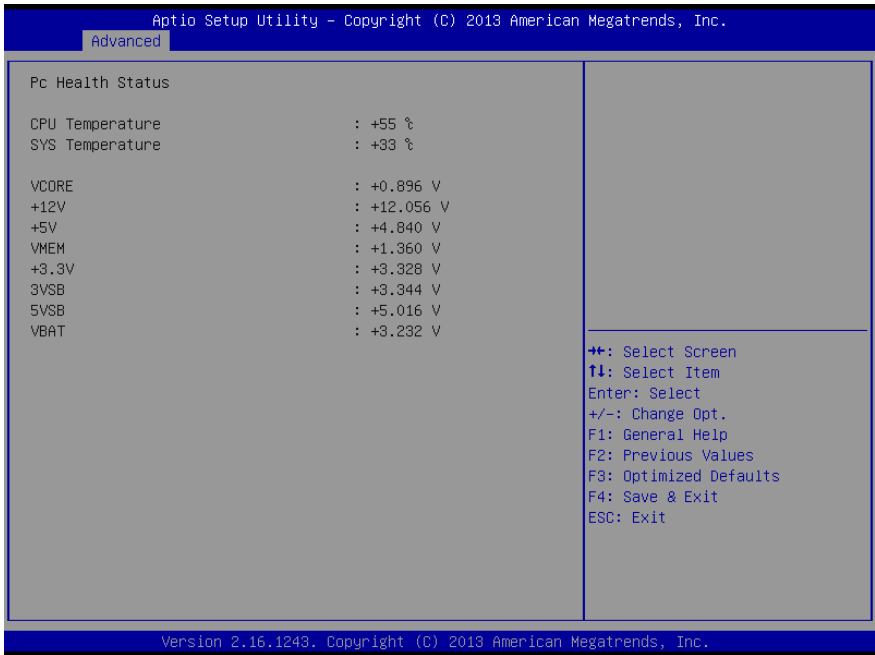
Options Summary		
SATA Mode	IDE Mode	Optimal Default, Failsafe Default
	AHCI Mode	

### 3.4.3 Advanced: USB Configuration



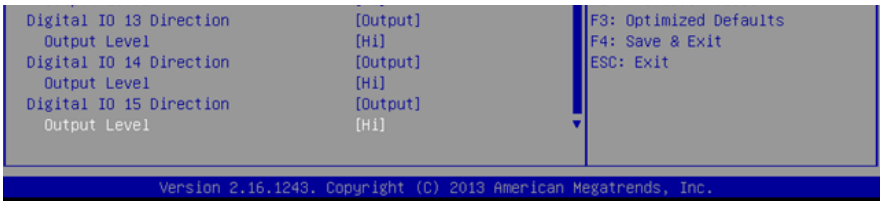
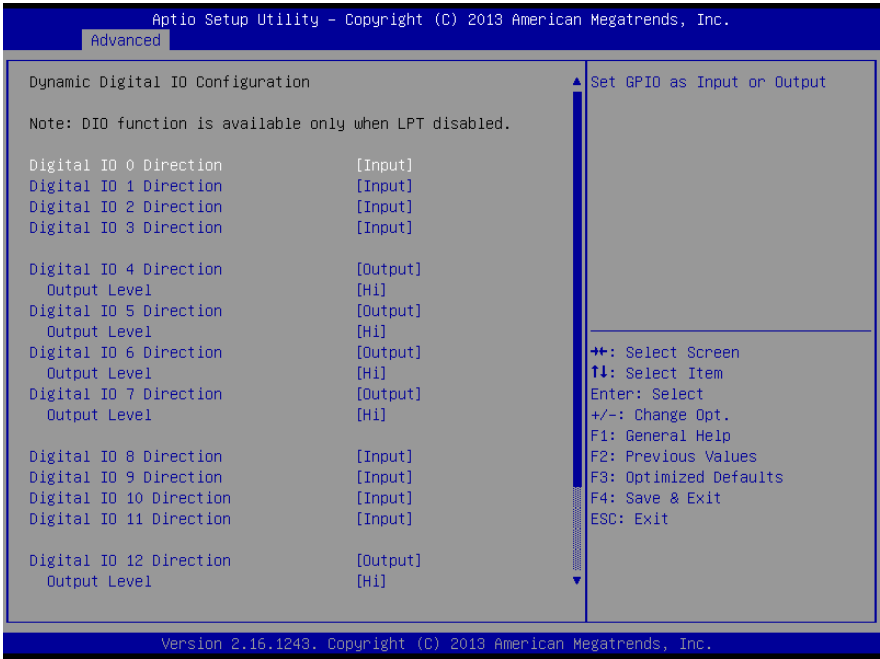
Options Summary		
Legacy USB Support	Enabled	Optimal Default, Failsafe Default
	Disabled	
	Auto	
<p>Enables BIOS Support for Legacy USB Support. When enabled, USB can be functional in legacy environment like DOS.</p> <p>AUTO option disables legacy support if no USB devices are connected</p>		

### 3.4.4 Advanced: Hardware Monitor





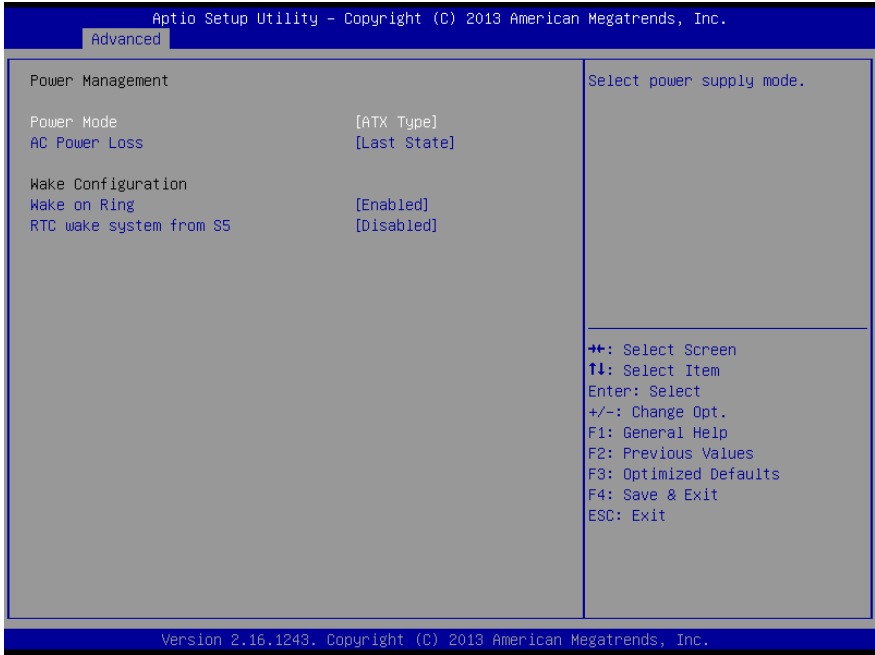
### 3.4.5 Advanced: Dynamic Digital I/O



Options Summary		
Digital GPIO [3:0] Direction	Input	Optimal Default, Failsafe Default
	Output	
Set GPIO as Input or Output		
Digital GPIO [7:4] Direction	Input	Optimal Default, Failsafe Default
	Output	
Set GPIO as Input or Output		

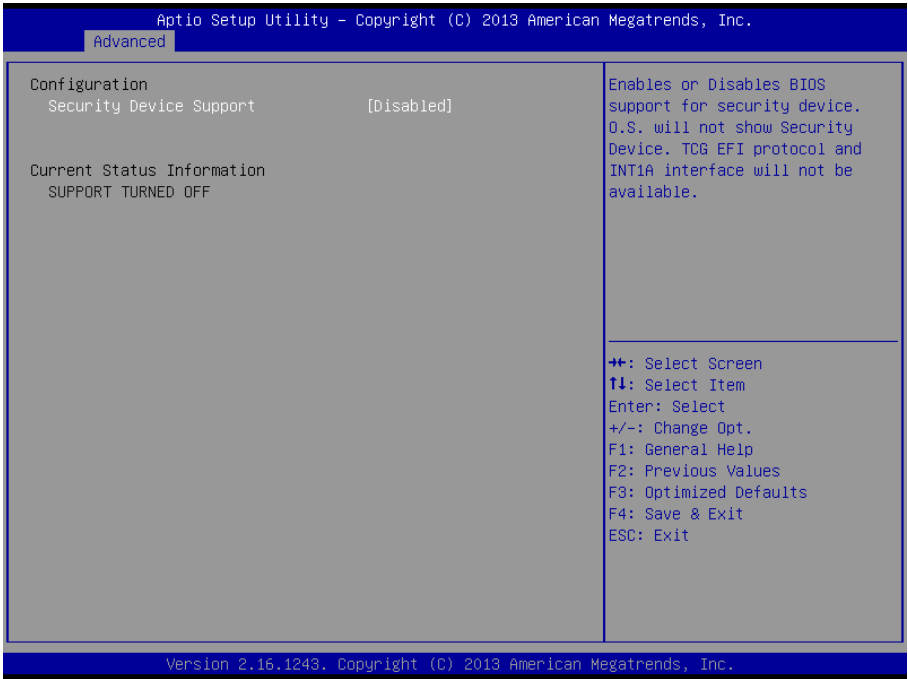
Options Summary		
Output Level	Low	Optimal Default, Failsafe Default
	Hi	
Digital GPIO [11:8] Direction	Input	Optimal Default, Failsafe Default
	Output	
Set GPIO as Input or Output		
Digital GPIO [15:12] Direction	Input	Optimal Default, Failsafe Default
	Output	
Set GPIO as Input or Output		
Output Level	Low	Optimal Default, Failsafe Default
	Hi	

### 3.4.6 Advanced: Power Management



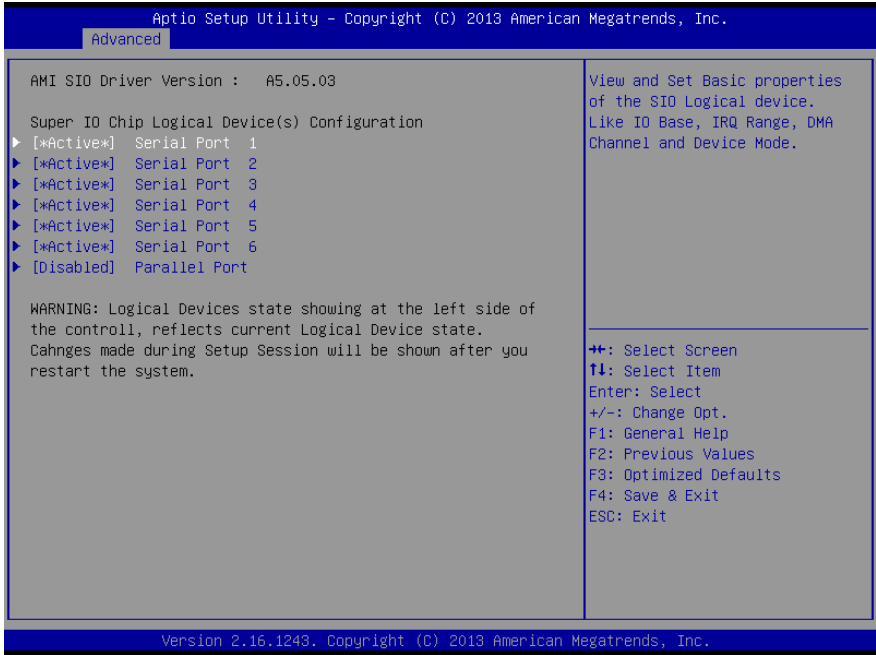
Options Summary		
Power Mode	ATX Type	Optimal Default, Failsafe Default
	AT Type	
Select power supply mode.		
AC Power Loss	Last State	Optimal Default, Failsafe Default
	Power On	
	Power Off	
Select power state when power is re-applied after a power failure.		
Wake on Ring	Enable	Optimal Default, Failsafe Default
	Disable	
Enable or disable System wake on Ring.		
RTC wake system from S5	Disabled	Optimal Default, Failsafe Default
	Fixed Time	
	Dynamic Time	
Enable or disable System wake on alarm event. When enabled, System will wake on the hr::min::sec specified		

### 3.4.7 Advanced: Trusted Computing

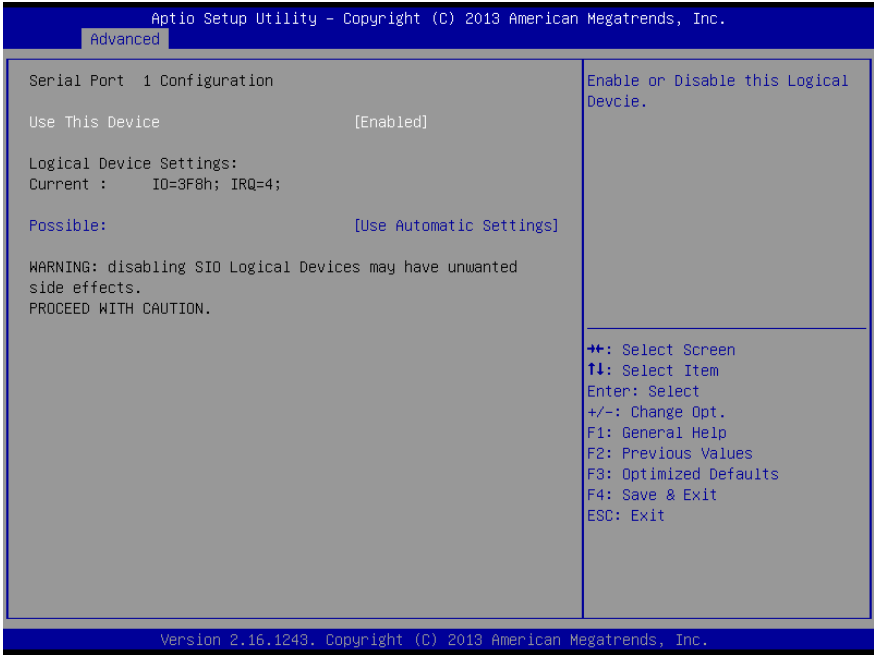


Options Summary		
Security Device Support	Disable	Optimal Default, Failsafe Default
	Enable	
Enable or Disable BIOS support for security device.		

### 3.4.8 Advanced: SIO Configuration

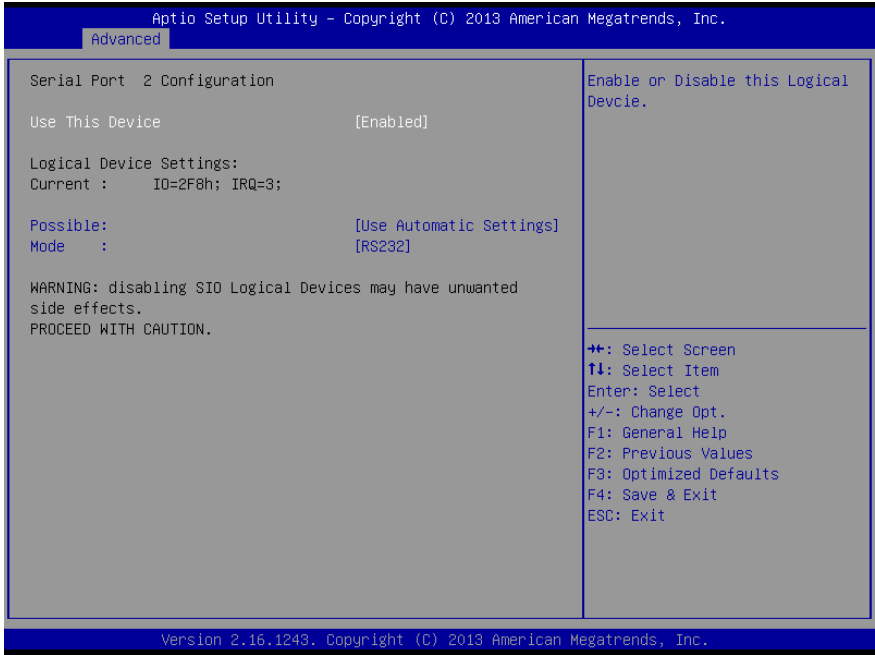


### 3.4.8.1 SIO Configuration: Serial Port 1 Configuration



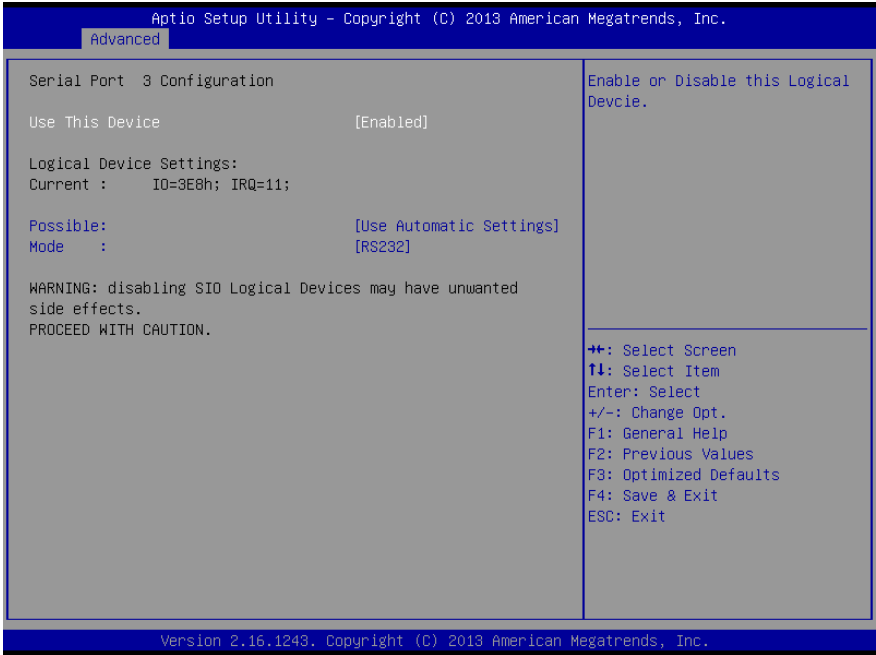
Options Summary		
Use This Device	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enable or Disable Serial Port (COM)		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=3F8; IRQ=4;	
	IO=2F8; IRQ=3;	
Select an optimal setting for IO device		

### 3.4.8.2 SIO Configuration: Serial Port 2 Configuration



Options Summary		
Use This Device	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enable or Disable Serial Port (COM)		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=2F8; IRQ=3;	
	IO=3F8; IRQ=4;	
Select an optimal setting for IO device		
Mode:	RS232	Optimal Default, Failsafe Default
	RS422	
	RS485	

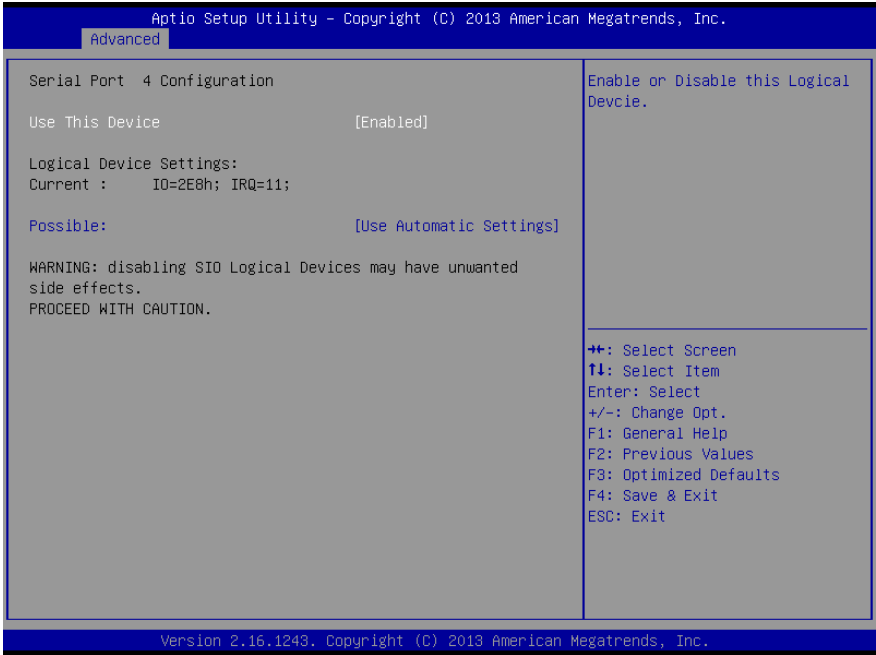
### 3.4.8.3 SIO Configuration: Serial Port 3 Configuration



Options Summary		
Use This Device	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enable or Disable Serial Port (COM)		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=3E8; IRQ=11;	
	IO=2E8; IRQ=11;	
Select an optimal setting for IO device		
Mode:	RS232	Optimal Default, Failsafe Default
	RS422	
	RS485	

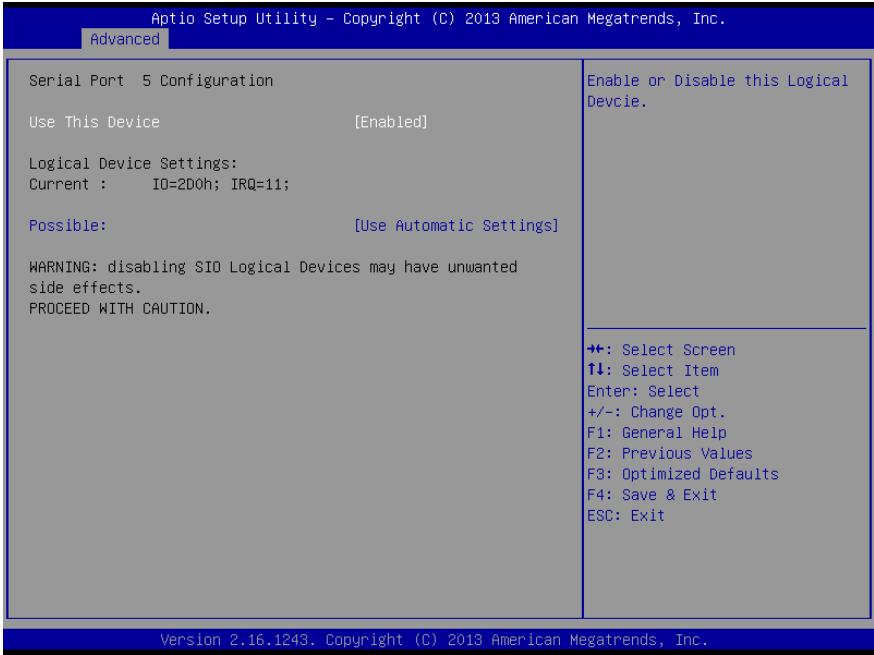


### 3.4.8.4 SIO Configuration: Serial Port 4 Configuration



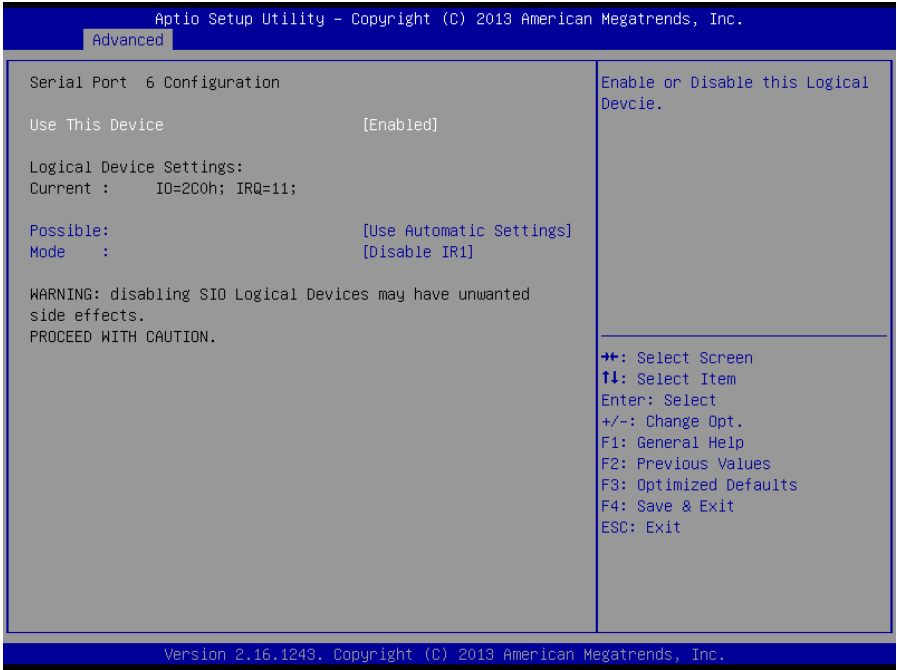
Options Summary		
Use This Device	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enable or Disable Serial Port (COM)		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=2E8; IRQ=11;	
	IO=3E8; IRQ=11;	
Select an optimal setting for IO device		

### 3.4.8.5 SIO Configuration: Serial Port 5 Configuration



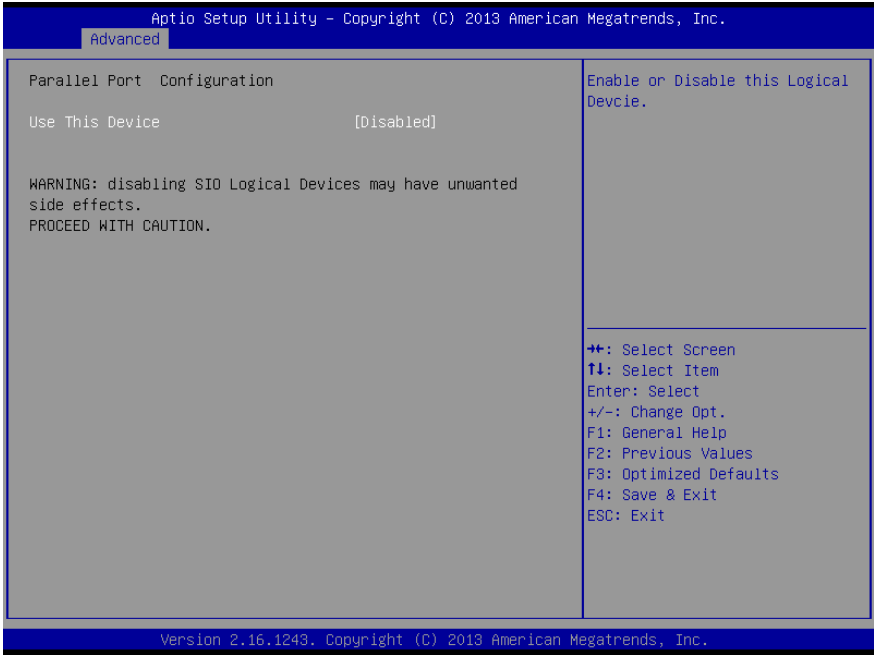
Options Summary		
Use This Device	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enable or Disable Serial Port (COM)		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=2D0; IRQ=11;	
	IO=2C0; IRQ=11;	
Select an optimal setting for IO device		

### 3.4.8.6 SIO Configuration: Serial Port 6 Configuration



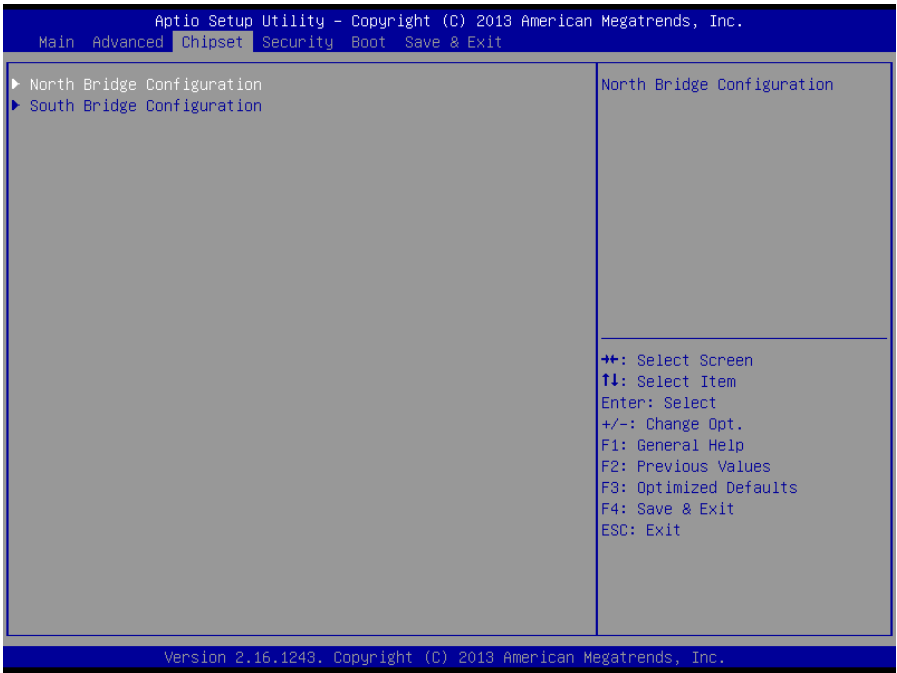
Options Summary		
Use This Device	Disabled	Optimal Default, Failsafe Default
	Enabled	
En/Disable Serial Port (COM)		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=2C0; IRQ=11;	
	IO=2E8; IRQ=11;	
Select an optimal setting for IO device		
Mode:	Disable IR1	Optimal Default, Failsafe Default
	Enable IR1 (pulse 1.6uS)	
	Enable IR1 (pulse 3/16 bit time)	
Set the Serial Mode		

### 3.4.9 Advanced: Parallel Port Configuration

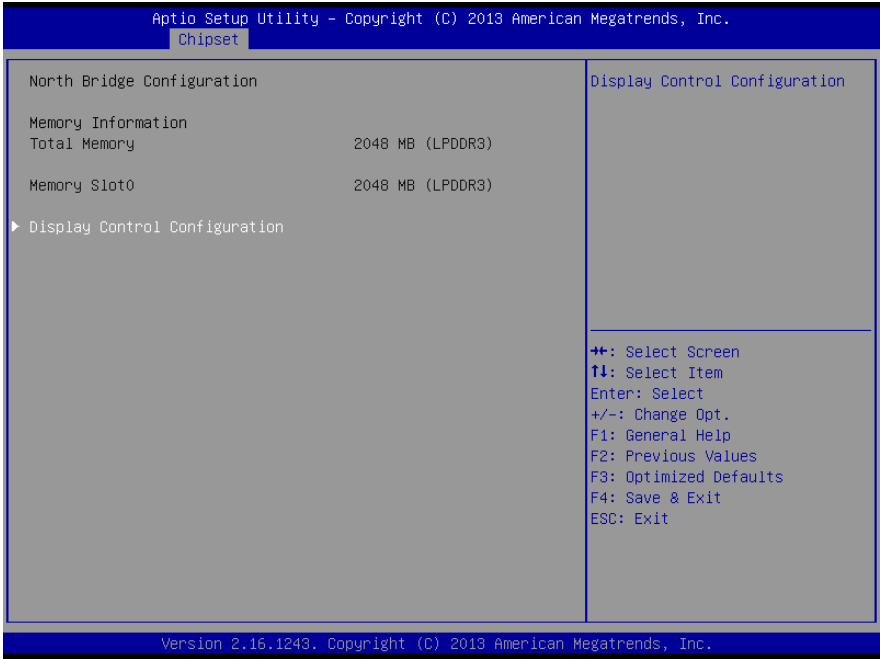


Options Summary		
Use This Device	Disabled	Optimal Default, Failsafe Default
	Enabled	
En/Disable Parallel Port		

### 3.5 Setup submenu: Chipset



### 3.5.1 Chipset: North Bridge



### 3.5.2.1 Chipset: Display Control Configuration

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.

Chipset

Display Control Configuration		Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.  ++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
DVMT Pre-Allocated	[64M]	
DVMT Total Gfx Mem	[256MB]	
Primary IGFX Boot Display	[VBIOS Default]	
LVDS	[Enabled]	
LVDS Panel Type	[1024x768,60Hz]	
Color Depth	[24bit]	
Panel Mode	[Dual channel]	
Data enable polarity	[Active low]	
LVDS Backlight Level	[ 80%]	
LVDS Backlight Type	[Normal]	

Version 2.16.1243. Copyright (C) 2013 American Megatrends, Inc.

Options Summary																	
<b>DVMT Pre-Allocated</b>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="padding: 2px 5px;">64M</td></tr> <tr><td style="padding: 2px 5px;">96M</td></tr> <tr><td style="padding: 2px 5px;">128M</td></tr> <tr><td style="padding: 2px 5px;">160M</td></tr> <tr><td style="padding: 2px 5px;">192M</td></tr> <tr><td style="padding: 2px 5px;">224M</td></tr> <tr><td style="padding: 2px 5px;">256M</td></tr> <tr><td style="padding: 2px 5px;">288M</td></tr> <tr><td style="padding: 2px 5px;">320M</td></tr> <tr><td style="padding: 2px 5px;">352M</td></tr> <tr><td style="padding: 2px 5px;">384M</td></tr> <tr><td style="padding: 2px 5px;">416M</td></tr> <tr><td style="padding: 2px 5px;">448M</td></tr> <tr><td style="padding: 2px 5px;">480M</td></tr> <tr><td style="padding: 2px 5px;">512M</td></tr> </table>	64M	96M	128M	160M	192M	224M	256M	288M	320M	352M	384M	416M	448M	480M	512M	Optimal Default, Failsafe Default
64M																	
96M																	
128M																	
160M																	
192M																	
224M																	
256M																	
288M																	
320M																	
352M																	
384M																	
416M																	
448M																	
480M																	
512M																	

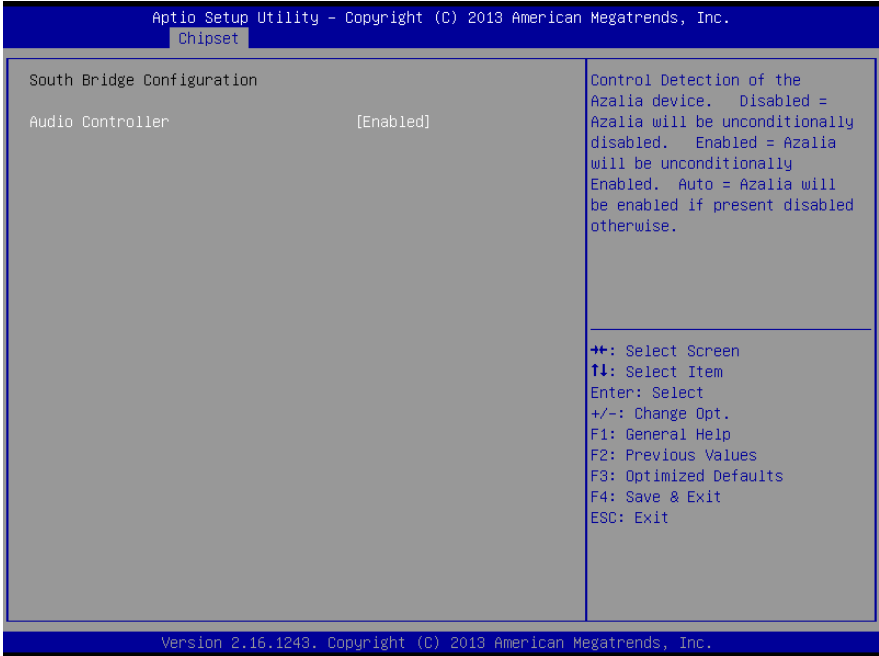
Options Summary		
DVMT Total Gfx Mem	128MB	Optimal Default, Failsafe Default
	256MB	
	Max	
DVMT Total Gfx Mem	128MB	Optimal Default, Failsafe Default
	256MB	
	Max	
LVDS	Enable	Optimal Default, Failsafe Default
	Disable	
LVDS Panel Type	640x480, 60Hz	Optimal Default, Failsafe Default
	800x480, 60Hz	
	800x600,60Hz	
	1024x600,60Hz	
	1024x768,60Hz	
	1280x768,60Hz	
	1280x1024,60Hz	
	1366x768,60Hz	
	1440x900,60Hz	
	1600x1200,60Hz	
	1920x1080,60Hz	
	1920x1200,60Hz	
Color Depth	24bit	Optimal Default, Failsafe Default
	18bit	
Panel Mode	Single Channel	Optimal Default, Failsafe Default
	Dual Channel	
Data enable polarity	Active Low	Optimal Default, Failsafe Default
	Active High	
LVDS Backlight Level	100%	Default
	90%	
	80%	
	70%	
	60%	
	50%	
	40%	
	30%	
	20%	
	10%	
0%		



**Options Summary**

LVDS Backlight Control	Normal	Default
	Inverted	

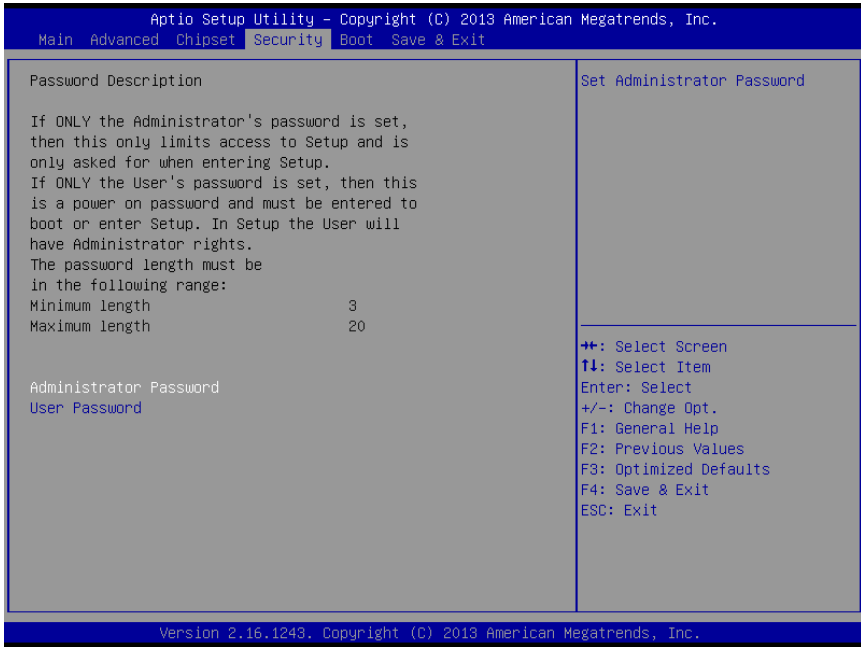
**3.5.3 Chipset: South Bridge**



**Options Summary**

Audio Controller	Disabled	Optimal Default, Failsafe Default
	Enabled	

## 3.6 Setup submenu: Security



### Change User/Administrator Password

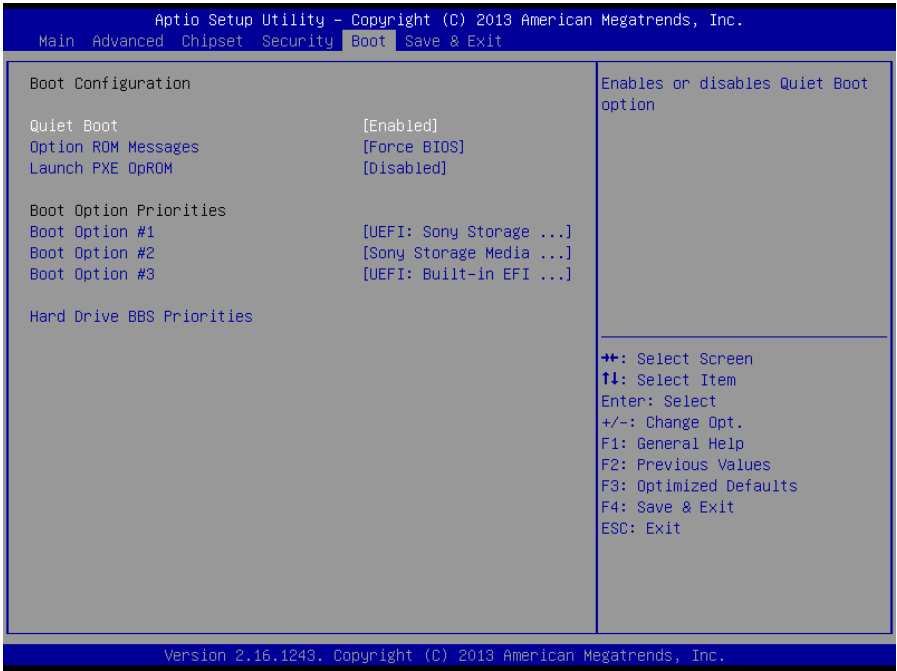
You can set an Administrator Password or User Password. An Administrator Password must be set before you can set a User Password. The password will be required during boot up, or when the user enters the Setup utility. A User Password does not provide access to many of the features in the Setup utility.

Select the password you wish to set, and press Enter. In the dialog box, enter your password (must be between 3 and 20 letters or numbers). Press Enter and retype your password to confirm. Press Enter again to set the password.

### Removing the Password

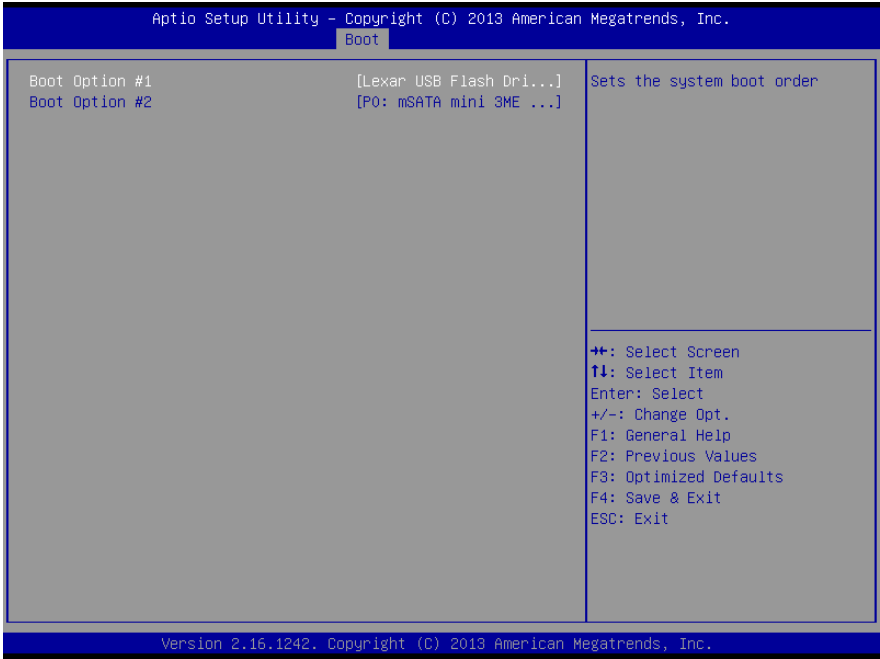
Select the password you want to remove and enter the current password. At the next dialog box press Enter to disable password protection.

### 3.7 Setup submenu: Boot

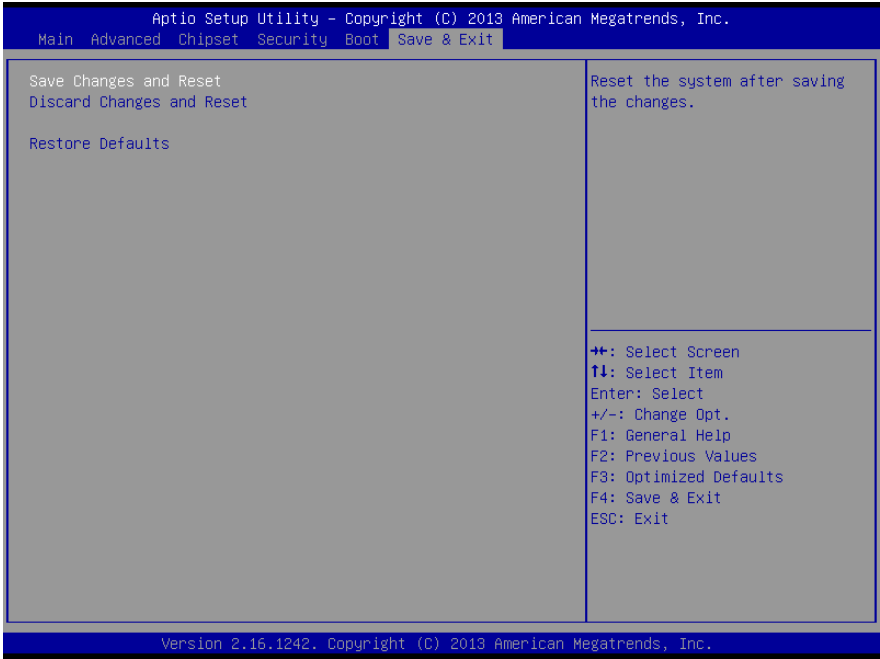


Options Summary		
Quiet Boot	Disabled	Default
	Enabled	
En/Disable showing boot logo.		
Option ROM Messages	Force BIOS	Default
	Keep Current	
Set display mode for Option ROM		
Launch PXE OpROM	Disabled	Default
	Enabled	
En/Disable Legacy Boot Option		

### 3.7.1 Boot: BBS Priorities



### 3.8 Setup submenu: Save & Exit



# Chapter 4

---

Drivers Installation

## 4.1 Product CD/DVD

---

The EPIC-BT07 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.

Drivers are also available for download from the product page on the AAEON website. If the program does not start, follow the instructions below to install the drivers.

### Step 1 – Install Chipset Drivers

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

### Step 2 – Install Graphics 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 – Network** 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 xHCI Driver (Windows 7 only)

1. Open the **STEP4 – TXE** folder followed by **Setup.exe**
2. Follow the instructions
3. Drivers will be installed automatically

#### Step 5 – Install Intel Sideband Fabric Device Drivers (Windows 8.1/ 10 only)

1. Open the **STEP5 - Intel Sideband Fabric Device** folder followed by **Setup.exe**
2. Follow the instructions
3. Drivers will be installed automatically

#### Step 6 – Install TPM Drivers

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

#### Step 7 – Install Audio Driver

1. Open the **STEP7 – Audio** folder and select your OS
2. Open the **.exe** file
3. Follow the instructions
4. Drivers will be installed automatically

#### Step 8 – Install Touch Driver

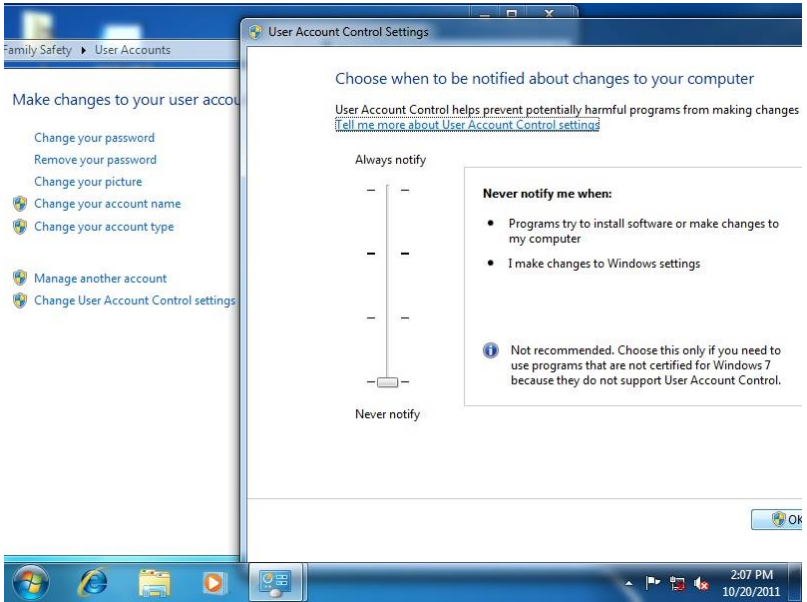
1. Open the **STEP8 – Touch** folder and select your OS
2. Open the **Setup.exe** file
3. Follow the instructions
4. Drivers will be installed automatically



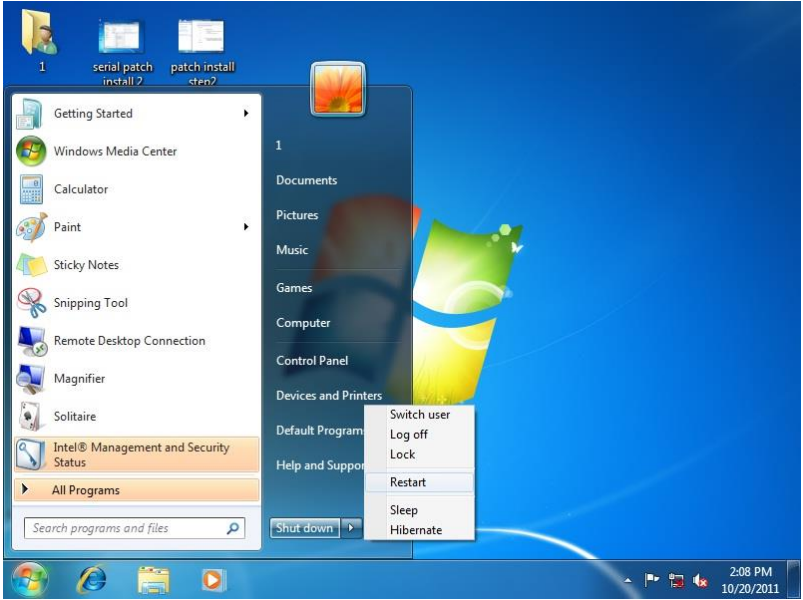
## Step 9 – Serial Port Drivers (Optional)

For Windows 7:

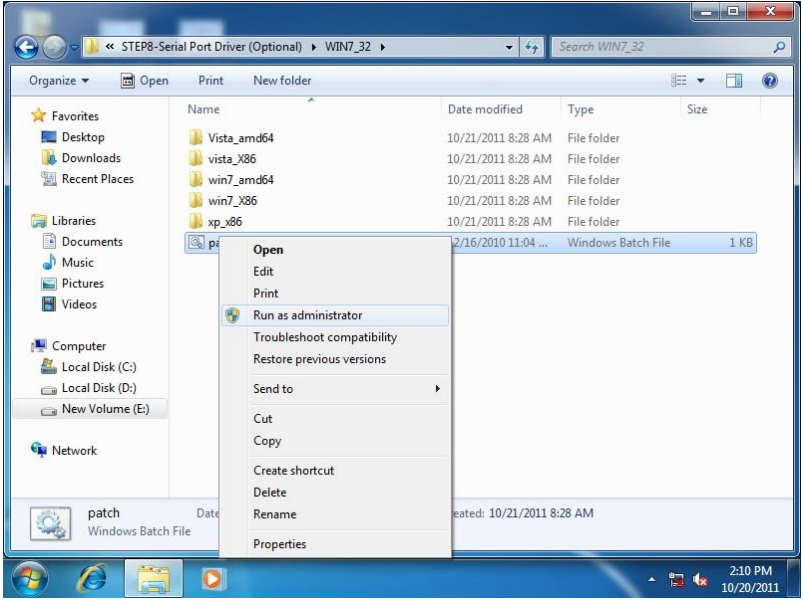
1. Change User Account Control settings to **Never notify**



2. Reboot and log in as administrator

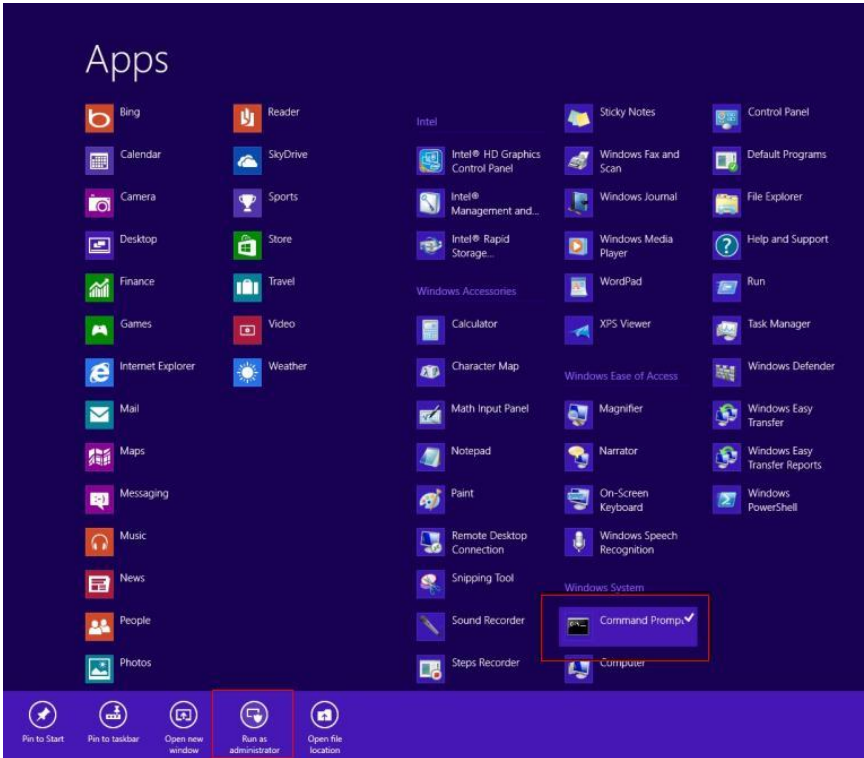


3. Run patch.bat as administrator



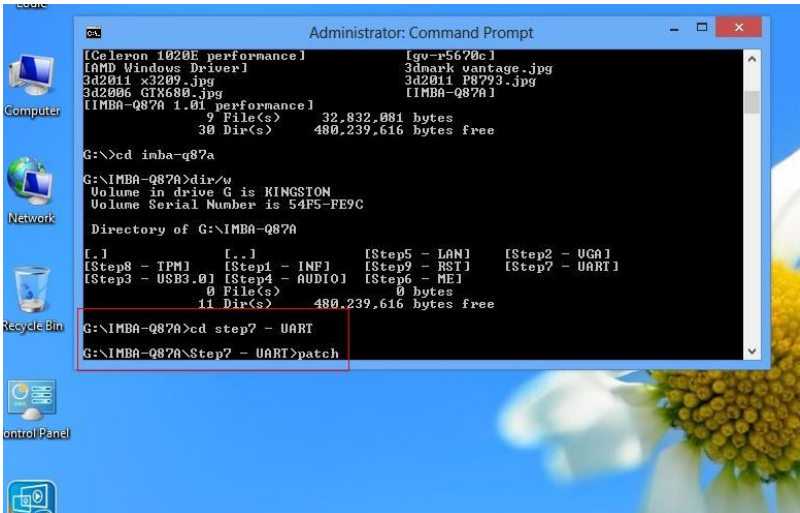
## For Windows 8:

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



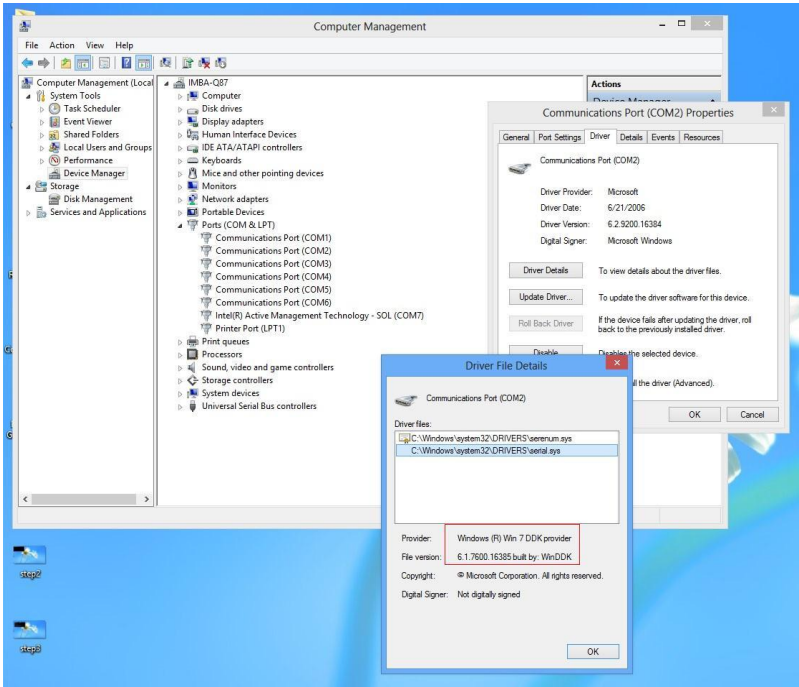
2. To install the driver (patch.bat), you will first have to locate the file in command prompt. To do that, first go to the directory which contains the file by entering **<drive letter>**: eg. if the driver is in D drive, enter **D:**
3. You are now at the directory containing the installation file. 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).



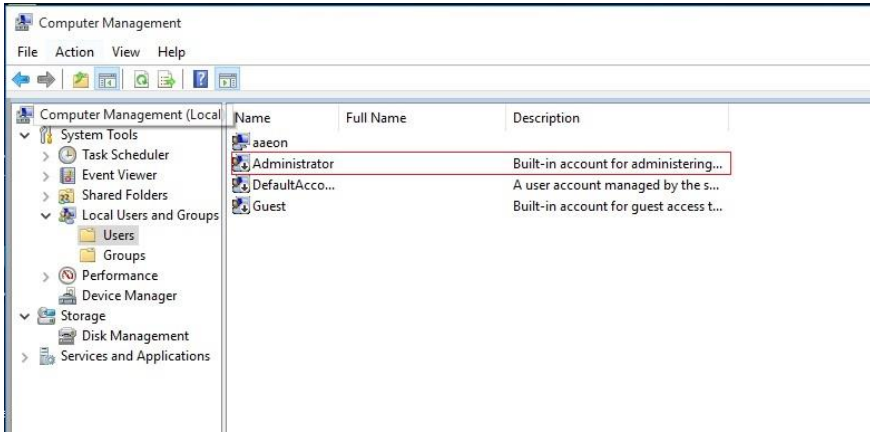
5. Reboot after installation completes.

- To confirm the installation, go to Device Manager, expand the Ports (COM & LPT) tree and double click on any of the COM ports Port 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**.

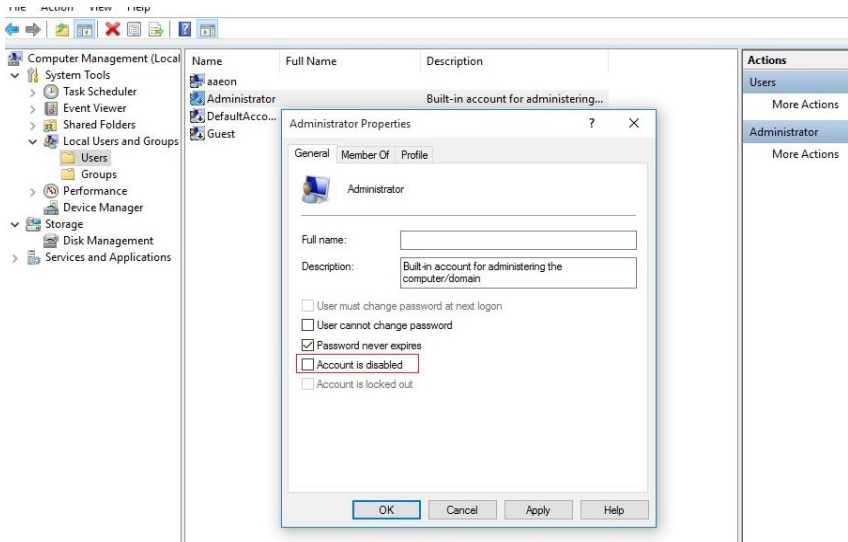


## For Windows 10:

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**



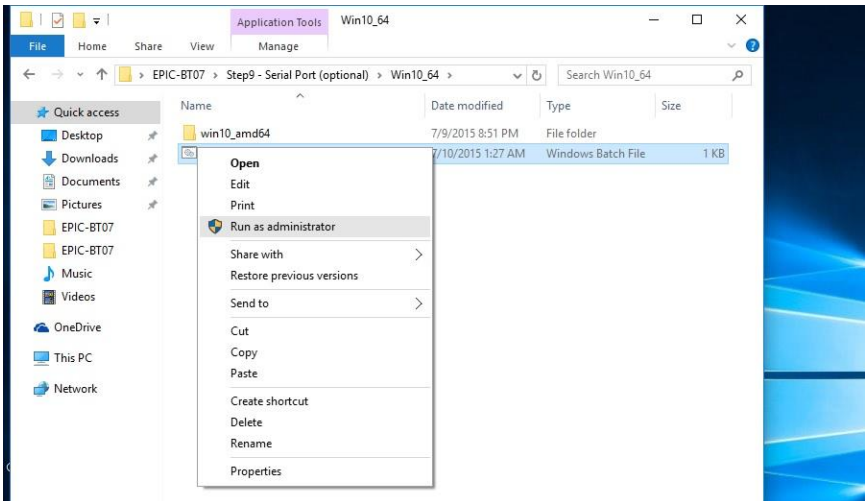
2. In the dialog box, **uncheck** the **Account is disabled** option to enable administrator account.



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



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





### Step 8 – Install Atom E3800 I/O Driver

1. Open the **STEP8 –Atom E3800 I/O** folder and select your OS
2. Open the **.exe** file
3. Follow the instructions
4. Drivers will be installed automatically

# Appendix A

---

## Watchdog Timer Programming

## A.1 Watchdog Timer Initial Program

**Table 1 : SuperIO relative register table**

	Default Value	Note
Index	0x2E(Note1)	SIO MB PnP Mode Index Register 0x2E or 0x4E
Data	0x2F(Note2)	SIO MB PnP Mode Data Register 0x2F or 0x4F

**Table 2 : Watchdog relative register table**

	LDN	Register	BitNum	Value	Note
Timer Counter	0x07(Note3)	0xF6(Note4)		(Note24)	Time of watchdog timer (0~255) This register is byte access
Counting Unit	0x07(Note5)	0xF5(Note6)	3(Note7)	0(Note8)	Select time unit. 0: second 1: minute
Watchdog Enable	0x07(Note9)	0xF5(Note10)	5(Note11)	1(Note12)	0: Disable 1: Enable
Timeout Status	0x07(Note13)	0xF5(Note14)	6(Note15)	1	1: Clear timeout status
Output Mode	0x07(Note16)	0xF5(Note17)	4(Note18)	1(Note19)	Select WDTRST# output mode 0: level 1: pulse
WDTRST output	0x07(Note20)	0xFA(Note21)	0(Note22)	1(Note23)	Enable/Disable time out output via WDTRST# 0: Disable 1: Enable

```
*****
// SuperIO relative definition (Please reference to Table 1)
#define byte SIOIndex //This parameter is represented from Note1
#define byte SIOData //This parameter is represented from Note2
#define void IOWriteByte(byte IOPort, byte Value);
#define byte IOReadByte(byte IOPort);
// Watch Dog relative definition (Please reference to Table 2)
#define byte TimerLDN //This parameter is represented from Note3
#define byte TimerReg //This parameter is represented from Note4
#define byte TimerVal // This parameter is represented from Note24
#define byte UnitLDN //This parameter is represented from Note5
#define byte UnitReg //This parameter is represented from Note6
#define byte UnitBit //This parameter is represented from Note7
#define byte UnitVal //This parameter is represented from Note8
#define byte EnableLDN //This parameter is represented from Note9
#define byte EnableReg //This parameter is represented from Note10
#define byte EnableBit //This parameter is represented from Note11
#define byte EnableVal //This parameter is represented from Note12
#define byte StatusLDN // This parameter is represented from Note13
#define byte StatusReg // This parameter is represented from Note14
#define byte StatusBit // This parameter is represented from Note15
#define byte ModeLDN // This parameter is represented from Note16
#define byte ModeReg // This parameter is represented from Note17
#define byte ModeBit // This parameter is represented from Note18
#define byte ModeVal // This parameter is represented from Note19
#define byte WDTRstLDN // This parameter is represented from Note20
#define byte WDTRstReg // This parameter is represented from Note21
#define byte WDTRstBit // This parameter is represented from Note22
#define byte WDTRstVal // This parameter is represented from Note23
*****
```

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

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

```

*****
// Procedure : AaeonWDTEnable
VOID AaeonWDTEnable (){
    WDTEnableDisable(EnableLDN, EnableReg, EnableBit, 1);
}

// Procedure : AaeonWDTConfig
VOID AaeonWDTConfig (){
    // Disable WDT counting
    WDTEnableDisable(EnableLDN, EnableReg, EnableBit, 0);
    // Clear Watchdog Timeout Status
    WDTClearTimeoutStatus();
    // WDT relative parameter setting
    WDTParameterSetting();
}

VOID WDTEnableDisable(byte LDN, byte Register, byte BitNum, byte Value){
    SIOBitSet(LDN, Register, BitNum, Value);
}

VOID WDTParameterSetting(){
    // Watchdog Timer counter setting
    SIOByteSet(TimerLDN, TimerReg, TimerVal);
    // WDT counting unit setting
    SIOBitSet(UnitLDN, UnitReg, UnitBit, UnitVal);
    // WDT output mode setting, level / pulse
    SIOBitSet(ModelLDN, ModeReg, ModeBit, ModeVal);
    // Watchdog timeout output via WDTRST#
    SIOBitSet(WDTRstLDN, WDTRstReg, WDTRstBit, WDTRstVal);
}

VOID WDTClearTimeoutStatus(){
    SIOBitSet(StatusLDN, StatusReg, StatusBit, 1);
}
*****

```

```

*****
VOID  SIOEnterMBPnPMode(){
    IOWriteByte(SIOIndex, 0x87);
    IOWriteByte(SIOIndex, 0x87);
}

VOID  SIOExitMBPnPMode(){
    IOWriteByte(SIOIndex, 0xAA);
}

VOID  SIOSelectLDN(byte LDN){
    IOWriteByte(SIOIndex, 0x07); // SIO LDN Register Offset = 0x07
    IOWriteByte(SIOData, LDN);
}

VOID  SIOBitSet(byte LDN, byte Register, byte BitNum, byte Value){
    Byte TmpValue;

    SIOEnterMBPnPMode();
    SIOSelectLDN(byte LDN);
    IOWriteByte(SIOIndex, Register);
    TmpValue = IOReadByte(SIOData);
    TmpValue &= ~(1 << BitNum);
    TmpValue |= (Value << BitNum);
    IOWriteByte(SIOData, TmpValue);
    SIOExitMBPnPMode();
}

VOID  SIOByteSet(byte LDN, byte Register, byte Value){
    SIOEnterMBPnPMode();
    SIOSelectLDN(LDN);
    IOWriteByte(SIOIndex, Register);
    IOWriteByte(SIOData, Value);
    SIOExitMBPnPMode();
}
*****

```

# Appendix B







































---

I/O Information



## B.1 I/O Address Map

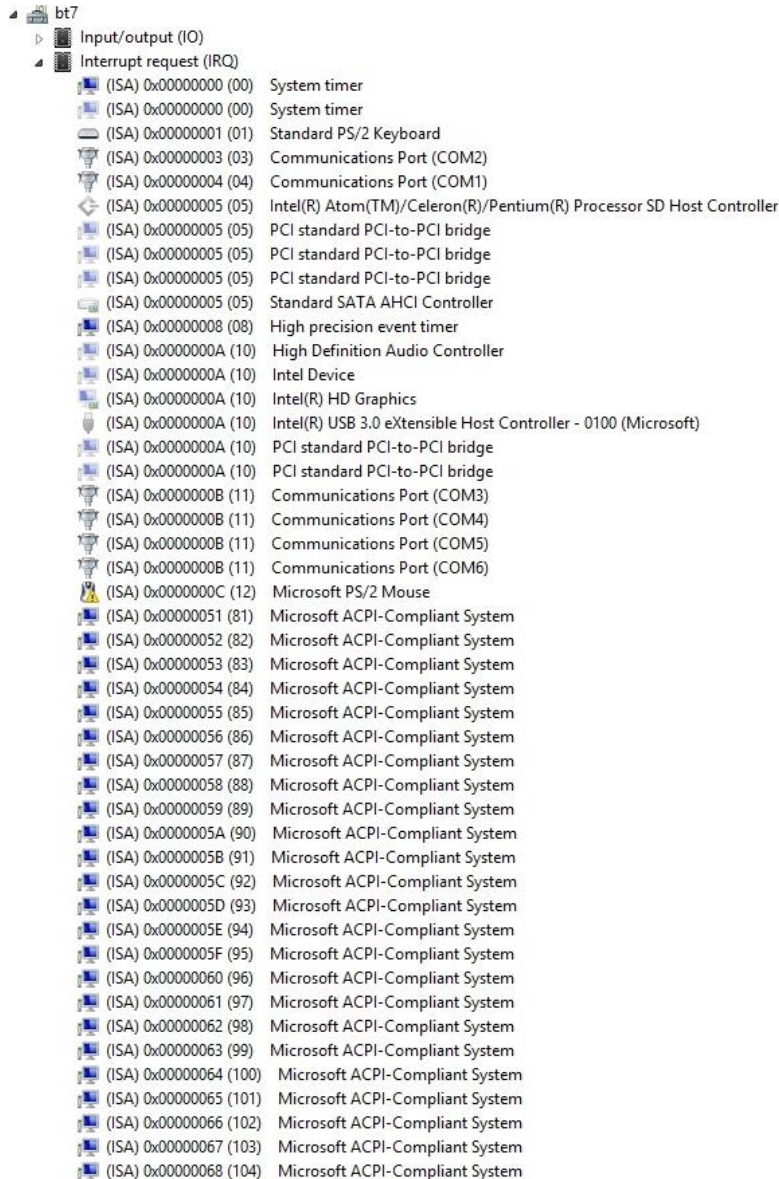
Input/output (IO)	
[0000000000000000 - 000000000000006F]	PCI Express Root Complex
[0000000000000020 - 0000000000000021]	Programmable interrupt controller
[0000000000000020 - 0000000000000021]	Programmable interrupt controller
[0000000000000024 - 0000000000000025]	Programmable interrupt controller
[0000000000000024 - 0000000000000025]	Programmable interrupt controller
[0000000000000028 - 0000000000000029]	Programmable interrupt controller
[0000000000000028 - 0000000000000029]	Programmable interrupt controller
[000000000000002C - 000000000000002D]	Programmable interrupt controller
[000000000000002C - 000000000000002D]	Programmable interrupt controller
[000000000000002E - 000000000000002F]	Motherboard resources
[0000000000000030 - 0000000000000031]	Programmable interrupt controller
[0000000000000030 - 0000000000000031]	Programmable interrupt controller
[0000000000000034 - 0000000000000035]	Programmable interrupt controller
[0000000000000034 - 0000000000000035]	Programmable interrupt controller
[0000000000000038 - 0000000000000039]	Programmable interrupt controller
[0000000000000038 - 0000000000000039]	Programmable interrupt controller
[000000000000003C - 000000000000003D]	Programmable interrupt controller
[000000000000003C - 000000000000003D]	Programmable interrupt controller
[0000000000000040 - 0000000000000043]	System timer
[0000000000000040 - 0000000000000043]	System timer
[000000000000004E - 000000000000004F]	Motherboard resources
[0000000000000050 - 0000000000000053]	System timer
[0000000000000050 - 0000000000000053]	System timer
[0000000000000060 - 0000000000000060]	Standard PS/2 Keyboard
[0000000000000061 - 0000000000000061]	Motherboard resources
[0000000000000063 - 0000000000000063]	Motherboard resources
[0000000000000064 - 0000000000000064]	Standard PS/2 Keyboard
[0000000000000065 - 0000000000000065]	Motherboard resources
[0000000000000067 - 0000000000000067]	Motherboard resources
[0000000000000070 - 0000000000000070]	Motherboard resources
[0000000000000070 - 0000000000000070]	Motherboard resources
[0000000000000070 - 0000000000000077]	System CMOS/real time clock
[0000000000000078 - 00000000000000CF7]	PCI Express Root Complex
[0000000000000080 - 000000000000008F]	Motherboard resources
[0000000000000092 - 0000000000000092]	Motherboard resources
[00000000000000A0 - 00000000000000A1]	Programmable interrupt controller
[00000000000000A0 - 00000000000000A1]	Programmable interrupt controller
[00000000000000A4 - 00000000000000A5]	Programmable interrupt controller
[00000000000000A4 - 00000000000000A5]	Programmable interrupt controller
[00000000000000A8 - 00000000000000A9]	Programmable interrupt controller
[00000000000000A8 - 00000000000000A9]	Programmable interrupt controller
[00000000000000AC - 00000000000000AD]	Programmable interrupt controller
[00000000000000AC - 00000000000000AD]	Programmable interrupt controller
[00000000000000B0 - 00000000000000B1]	Programmable interrupt controller
[00000000000000B0 - 00000000000000B1]	Programmable interrupt controller
[00000000000000B2 - 00000000000000B3]	Motherboard resources
[00000000000000B4 - 00000000000000B5]	Programmable interrupt controller
[00000000000000B4 - 00000000000000B5]	Programmable interrupt controller
[00000000000000B8 - 00000000000000B9]	Programmable interrupt controller

	[00000000000000B8 - 00000000000000B9]	Programmable interrupt controller
	[00000000000000BC - 00000000000000BD]	Programmable interrupt controller
	[00000000000000C0 - 00000000000000C7]	Communications Port (COM6)
	[00000000000002D0 - 00000000000002D7]	Communications Port (COM5)
	[00000000000002E8 - 00000000000002EF]	Communications Port (COM4)
	[00000000000002F8 - 00000000000002FF]	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
	[00000000000004D0 - 00000000000004D1]	Programmable interrupt controller
	[0000000000000500 - 00000000000005FE]	Motherboard resources
	[0000000000000600 - 000000000000061F]	Motherboard resources
	[0000000000000680 - 000000000000069F]	Motherboard resources
	[0000000000000A00 - 0000000000000A0F]	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 2 - 0F4A
	[000000000000C000 - 000000000000CFFF]	PCI standard PCI-to-PCI bridge
	[000000000000D000 - 000000000000DFFF]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 1 - 0F48
	[000000000000D000 - 000000000000DFFF]	PCI standard PCI-to-PCI bridge
	[000000000000E000 - 000000000000E01F]	Intel Device
	[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
	[000000000000E020 - 000000000000E03F]	Standard SATA AHCI Controller
	[000000000000E040 - 000000000000E043]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
	[000000000000E040 - 000000000000E043]	Standard SATA AHCI Controller
	[000000000000E050 - 000000000000E057]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
	[000000000000E050 - 000000000000E057]	Standard SATA AHCI Controller
	[000000000000E060 - 000000000000E063]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
	[000000000000E060 - 000000000000E063]	Standard SATA AHCI Controller
	[000000000000E070 - 000000000000E077]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
	[000000000000E070 - 000000000000E077]	Standard SATA AHCI Controller
	[000000000000E080 - 000000000000E087]	Intel(R) HD Graphics
	[000000000000E080 - 000000000000E087]	Intel(R) HD Graphics


















































## B.2 Memory Address Map
















































Memory Address Range	Device Name
[000000000000A0000 - 00000000000BFFFFF]	Intel(R) HD Graphics
[00000000000A0000 - 00000000000BFFFFF]	PCI Express Root Complex
[00000000000C00000 - 00000000000DFFFFF]	PCI Express Root Complex
[00000000000E00000 - 00000000000FFFFF]	PCI Express Root Complex
[0000000800000000 - 0000000D0818FFE]	PCI Express Root Complex
[00000000C00000000 - 00000000CFFFFFFF]	Intel(R) HD Graphics
[00000000C00000000 - 00000000CFFFFFFF]	Intel(R) HD Graphics
[00000000D00000000 - 00000000D03FFFFFFF]	Intel(R) HD Graphics
[00000000D00000000 - 00000000D03FFFFFFF]	Intel(R) HD Graphics
[00000000D04000000 - 00000000D04FFFFFFF]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Trusted Execution Engine Interface - 0F18
[00000000D04000000 - 00000000D04FFFFFFF]	PCI standard PCI-to-PCI bridge
[00000000D05000000 - 00000000D05FFFFFFF]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Trusted Execution Engine Interface - 0F18
[00000000D05000000 - 00000000D05FFFFFFF]	PCI standard PCI-to-PCI bridge
[00000000D06000000 - 00000000D06FFFFFFF]	Intel(R) USB 3.0 eXtensible Host Controller - 0100 (Microsoft)
[00000000D06000000 - 00000000D061FFFFF]	Intel(R) I211 Gigabit Network Connection
[00000000D06000000 - 00000000D06FFFFFFF]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 2 - 0F4A
[00000000D06100000 - 00000000D0613FFF]	High Definition Audio Controller
[00000000D06140000 - 00000000D061401F]	Intel Device
[00000000D06180000 - 00000000D06187FF]	Standard SATA AHCI Controller
[00000000D06200000 - 00000000D0623FFF]	Intel(R) I211 Gigabit Network Connection
[00000000D07000000 - 00000000D071FFFFF]	Intel(R) I211 Gigabit Network Connection #2
[00000000D07000000 - 00000000D07FFFFFFF]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 1 - 0F48
[00000000D07200000 - 00000000D0723FFF]	Intel(R) I211 Gigabit Network Connection #2
[00000000D08000000 - 00000000D080FFFFF]	Intel(R) USB 3.0 eXtensible Host Controller - 0100 (Microsoft)
[00000000D08100000 - 00000000D0813FFF]	High Definition Audio Controller
[00000000D08140000 - 00000000D081401F]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Platform Control Unit - SMBus Port - 0F12
[00000000D08180000 - 00000000D08187FF]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
[00000000D08190000 - 00000000D0819FFF]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor SD Host Controller
[00000000D081A0000 - 00000000D081AFFF]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor SD Host Controller
[00000000E00000000 - 00000000EFFFFFFF]	Motherboard resources
[00000000E00000D00 - 00000000E00000DB]	Intel(R) Sideband Fabric Device
[00000000FED000000 - 00000000FED003FF]	High precision event timer
[00000000FED010000 - 00000000FED01FFF]	Motherboard resources
[00000000FED030000 - 00000000FED03FFF]	Motherboard resources
[00000000FED040000 - 00000000FED04FFF]	Motherboard resources
[00000000FED080000 - 00000000FED08FFF]	Motherboard resources
[00000000FED1C0000 - 00000000FED1CFFF]	Motherboard resources
[00000000FED400000 - 00000000FED44FFF]	Trusted Platform Module 1.2
[00000000FEE000000 - 00000000FEEFFFFFFF]	Motherboard resources
[00000000FEF000000 - 00000000FEFFFFFFF]	Motherboard resources
[00000000FFF000000 - 00000000FFFFFFFFF]	Intel(R) 82802 Firmware Hub Device
[00000000FFF000000 - 00000000FFFFFFFFF]	Intel(R) 82802 Firmware Hub Device
















































## B.3 IRQ Mapping Chart




















































ISA Address	IRQ	Device Name
(ISA) 0x00000000	(00)	System timer
(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) 0x00000005	(05)	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor SD Host Controller
(ISA) 0x00000005	(05)	PCI standard PCI-to-PCI bridge
(ISA) 0x00000005	(05)	PCI standard PCI-to-PCI bridge
(ISA) 0x00000005	(05)	PCI standard PCI-to-PCI bridge
(ISA) 0x00000005	(05)	Standard SATA AHCI Controller
(ISA) 0x00000008	(08)	High precision event timer
(ISA) 0x0000000A	(10)	High Definition Audio Controller
(ISA) 0x0000000A	(10)	Intel Device
(ISA) 0x0000000A	(10)	Intel(R) HD Graphics
(ISA) 0x0000000A	(10)	Intel(R) USB 3.0 eXtensible Host Controller - 0100 (Microsoft)
(ISA) 0x0000000A	(10)	PCI standard PCI-to-PCI bridge
(ISA) 0x0000000A	(10)	PCI standard PCI-to-PCI bridge
(ISA) 0x0000000B	(11)	Communications Port (COM3)
(ISA) 0x0000000B	(11)	Communications Port (COM4)
(ISA) 0x0000000B	(11)	Communications Port (COM5)
(ISA) 0x0000000B	(11)	Communications Port (COM6)
(ISA) 0x0000000C	(12)	Microsoft PS/2 Mouse
(ISA) 0x00000051	(81)	Microsoft ACPI-Compliant System
(ISA) 0x00000052	(82)	Microsoft ACPI-Compliant System
(ISA) 0x00000053	(83)	Microsoft ACPI-Compliant System
(ISA) 0x00000054	(84)	Microsoft ACPI-Compliant System
(ISA) 0x00000055	(85)	Microsoft ACPI-Compliant System
(ISA) 0x00000056	(86)	Microsoft ACPI-Compliant System
(ISA) 0x00000057	(87)	Microsoft ACPI-Compliant System
(ISA) 0x00000058	(88)	Microsoft ACPI-Compliant System
(ISA) 0x00000059	(89)	Microsoft ACPI-Compliant System
(ISA) 0x0000005A	(90)	Microsoft ACPI-Compliant System
(ISA) 0x0000005B	(91)	Microsoft ACPI-Compliant System
(ISA) 0x0000005C	(92)	Microsoft ACPI-Compliant System
(ISA) 0x0000005D	(93)	Microsoft ACPI-Compliant System
(ISA) 0x0000005E	(94)	Microsoft ACPI-Compliant System
(ISA) 0x0000005F	(95)	Microsoft ACPI-Compliant System
(ISA) 0x00000060	(96)	Microsoft ACPI-Compliant System
(ISA) 0x00000061	(97)	Microsoft ACPI-Compliant System
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(ISA) 0x00000067	(103)	Microsoft ACPI-Compliant System
(ISA) 0x00000068	(104)	Microsoft ACPI-Compliant System


















































 (ISA) 0x0000069 (105)	Microsoft ACPI-Compliant System
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 (ISA) 0x000006B (107)	Microsoft ACPI-Compliant System
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
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
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(ISA) 0x0000013B (315)	Microsoft ACPI-Compliant System
























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	(PCI) 0x0000000A (10)	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Trusted Execution Engine Interface - 0F18
	(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) 0x00000013 (19)	PCI standard PCI-to-PCI bridge
	(PCI) 0x00000016 (22)	High Definition Audio Controller
	(PCI) 0xFFFFFFFF (-15)	Intel(R) I211 Gigabit Network Connection
	(PCI) 0xFFFFFFFF (-14)	Intel(R) I211 Gigabit Network Connection
	(PCI) 0xFFFFFFFF (-13)	Intel(R) I211 Gigabit Network Connection
	(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 #2
	(PCI) 0xFFFFFFFF (-8)	Intel(R) I211 Gigabit Network Connection #2
	(PCI) 0xFFFFFFFF (-7)	Intel(R) I211 Gigabit Network Connection #2
	(PCI) 0xFFFFFFFF (-6)	Intel(R) I211 Gigabit Network Connection #2
	(PCI) 0xFFFFFFFF (-5)	Intel(R) I211 Gigabit Network Connection #2
	(PCI) 0xFFFFFFFF (-4)	Intel(R) I211 Gigabit Network Connection #2
	(PCI) 0xFFFFFFFF (-3)	Intel(R) USB 3.0 eXtensible Host Controller - 0100 (Microsoft)
	(PCI) 0xFFFFFFFF (-2)	Intel(R) HD Graphics

# Appendix C

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Mating Connectors

## C.1 List of Mating Connectors and Cables

Connector Label	Function	Mating Connector		Available Cable	Cable P/N
		Vendor	Model no		
CN1	Stereo Audio RIGHT Channel	PINREX	712-71-02TW01	N/A	N/A
CN6	4-Pin Power In Connector	CATCH	1121-700-04S	ATX 2x2 Power Cable	N/A
CN7	Stereo Audio LEFT Channel	PINREX	712-71-02TW01	N/A	N/A
CN8	2-Pin Power in Connector	DINKLE	DT-126VP-S2016002P	Power Cable	170204010R
CN10	Audio Connector	PINREX	712-71-10TW01	Audio Cable	1709100254
CN12	LPT/Digital IO Connector	PINREX	520-90-26GB00	Parallel Port Cable	1701260200
CN13	USB 2.0 Port 2	PINREX	712-71-05TW01	USB Wafer Cable	1700050207
CN14	USB 2.0 Port 3	PINREX	712-71-05TW01	USB Wafer Cable	1700050207
CN15	USB 2.0 Port 5	PINREX	712-71-05TW01	USB Wafer Cable	1700050207
CN16	USB 2.0 Port 4	PINREX	712-71-05TW01	USB Wafer Cable	1700050207
CN21	LPC Expansion Connector	PINREX	710-73-12TW01	AAEON LPC Cable	1703120130

Connector Label	Function	Mating Connector		Available Cable	Cable P/N
		Vendor	Model no		
CN23	+5V Output for SATA HDD	PINREX	721-81-02TW00	2 Pins For SATA Power	1702150155
CN25	SATA Port1	PINREX	770-83-07SB39	SATA Cable	1709070500
CN29	Touch Screen Connector	PINREX	710-73-09TW01	N/A	N/A
CN30	PS/2 Keyboard Mouse Connector	PINREX	712-41-065W00	KB/MS Cable	1700060155
CN31	COM Port 6	PINREX	712-71-09TW01	UART Wafer Cable	1701090150
CN32	COM Port 5	PINREX	712-71-09TW01	UART Wafer Cable	1701090150
CN37	COM Port 4	PINREX	712-71-09TW01	UART Wafer Cable	1701090150
CN38	COM Port 3	PINREX	712-71-09TW01	UART Wafer Cable	1701090150

# Appendix D

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Electrical Specifications for I/O Ports



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

I/O	Reference	Signal Name	Rate Output
Audio I/O Port	CN10	+5V	+5V/1A
COM Port 2	CN49	+5V/+12V	+5V/1A or +12V/1A
COM Port 3	CN38	+5V/+12V	+5V/1A or +12V/1A
DP Port	CN48	+3.3V	+3.3V/1A
Digital IO Port	CN12	+5V	+5V/1A
LVDS/eDP Inverter / Backlight Connector	CN19	+5V/+12V	+5V/1.5A or +12V/1.5A
eDP Inverter/ Backlight Connector	CN46	+5V/+12V	+5V/1.5A or +12V/1.5A
HDMI Port	CN50	+5V	+5V/1A
LVDS Port / eDP	CN35	+3.3V/+5V	+3.3V/2A or +5V/2A
eDP	CN24	+3.3V/+5V	+3.3V/2A or +5V/2A
Mini-Card Slot	CN26	+3.3VSB +1.5V	+3.3V/1.1A +1.5V/0.375A
Mini-Card Slot	CN27	+3.3VSB +1.5V	+3.3V/1.1A +1.5V/0.375A
PS/2 Keyboard/ Mouse Combo Port	CN30	+5VSB	+5V/1A
+5V Output for SATA HDD	CN23	+5V	+5V/1A

I/O	Reference	Signal Name	Rate Output
USB Ports 0 & 1	CN47	+5VSB	+5V/0.5A (USB 2.0)
			+5V/0.9A (USB 3.0)
USB 2.0 Port 2	CN13	+5VSB	+5V/0.5A
USB 2.0 Port 3	CN14	+5VSB	+5V/0.5A
USB 2.0 Port 5	CN15	+5VSB	+5V/0.5A
USB 2.0 Port 4	CN16	+5VSB	+5V/0.5A
VGA Port	CN51	+5V	+5V/1A (reserved)

# Appendix E

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Digital I/O Ports

## E.1 DI/O Programming

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EPIC-BT07 utilizes FINTEK F81866D chipset as its Digital I/O controller. Below are the procedures to complete its configuration. AAEON initial DI/O program is also attached for developing customized program for your application.

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.

## E.2 Digital I/O Register

**Table 1 : SuperIO relative register table**

	Default Value	Note
Index	0x2E(Note1)	SIO MB PnP Mode Index Register 0x2E or 0x4E
Data	0x2F(Note2)	SIO MB PnP Mode Data Register 0x2F or 0x4F

**Table 2 : Digital Input relative register table**

	LDN	Register	BitNum	Value	Note
DIO-0 Pin Status	0x06(Note3)	0x82(Note4)	0(Note5)		GPIO80
DIO-1 Pin Status	0x06(Note6)	0x82(Note7)	1(Note8)		GPIO81
DIO-2 Pin Status	0x06(Note9)	0x82(Note10)	2(Note11)		GPIO82
DIO-3 Pin Status	0x06(Note12)	0x82(Note13)	3(Note14)		GPIO93
DIO-4 Pin Status	0x06(Note15)	0x82(Note16)	4(Note17)		GPIO84
DIO-5 Pin Status	0x06(Note18)	0x82(Note19)	5(Note20)		GPIO85
DIO-6 Pin Status	0x06(Note21)	0x82(Note22)	6(Note23)		GPIO86
DIO-7 Pin Status	0x06(Note24)	0x82(Note25)	7(Note26)		GPIO87

**Table 3 : Digital Output relative register table**

	LDN	Register	BitNum	Value	Note
DIO-0 Output Data	0x06(Note27)	0x81(Note28)	0(Note29)	(Note30)	GPIO80
DIO-1 Output Data	0x06(Note31)	0x81(Note32)	1(Note33)	(Note34)	GPIO81
DIO-2 Output Data	0x06(Note35)	0x81(Note36)	2(Note37)	(Note38)	GPIO82
DIO-3 Output Data	0x06(Note39)	0x81(Note40)	3(Note41)	(Note42)	GPIO83
DIO-4 Output Data	0x06(Note43)	0x81(Note44)	4(Note45)	(Note46)	GPIO84
DIO-5 Output Data	0x06(Note47)	0x81(Note48)	5(Note49)	(Note50)	GPIO85
DIO-6 Output Data	0x06(Note51)	0x81(Note52)	6(Note53)	(Note54)	GPIO86
DIO-7 Output Data	0x06(Note55)	0x81(Note56)	7(Note57)	(Note58)	GPIO87

Table 4 : Digital Output relative register table

	LDN	Register	BitNum	Value	Note
DIO-0 Output Data	0x06(Note27)	0x81(Note28)	0(Note29)	(Note30)	GPIO80
DIO-1 Output Data	0x06(Note31)	0x81(Note32)	1(Note33)	(Note34)	GPIO81
DIO-2 Output Data	0x06(Note35)	0x81(Note36)	2(Note37)	(Note38)	GPIO82
DIO-3 Output Data	0x06(Note39)	0x81(Note40)	3(Note41)	(Note42)	GPIO83
DIO-4 Output Data	0x06(Note43)	0x81(Note44)	4(Note45)	(Note46)	GPIO84
DIO-5 Output Data	0x06(Note47)	0x81(Note48)	5(Note49)	(Note50)	GPIO85
DIO-6 Output Data	0x06(Note51)	0x81(Note52)	6(Note53)	(Note54)	GPIO86
DIO-7 Output Data	0x06(Note55)	0x81(Note56)	7(Note57)	(Note58)	GPIO87

Table 5 : Digital Output relative register table

	LDN	Register	BitNum	Value	Note
DIO-8 Output Data	0x06(Note83)	0x89(Note84)	0(Note85)	(Note86)	GPIO70
DIO-9 Output Data	0x06(Note87)	0x89(Note88)	1(Note89)	(Note90)	GPIO71
DIO-10 Output Data	0x06(Note91)	0x89(Note92)	2(Note93)	(Note94)	GPIO72
DIO-11 Output Data	0x06(Note95)	0x89(Note96)	3(Note97)	(Note98)	GPIO73
DIO-12 Output Data	0x06(Note96)	0x89(Note100)	4(Note101)	(Note102)	GPIO74
DIO-13 Output Data	0x06(Note103)	0x89(Note104)	5(Note105)	(Note106)	GPIO75
DIO-14 Output Data	0x06(Note107)	0x89(Note108)	6(Note109)	(Note110)	GPIO76
DIO-15 Output Data	0x06(Note111)	0x89(Note112)	7(Note113)	(Note114)	GPIO77

## E.3 Digital I/O Sample Program

---

```
*****
// SuperIO relative definition (Please reference to Table 1)
#define byte SIOIndex //This parameter is represented from Note1
#define byte SIOData //This parameter is represented from Note2
#define void IOWriteByte(byte IOPort, byte Value);
#define byte IOReadByte(byte IOPort);
// Digital Input Status relative definition (Please reference to Table 2)
#define byte DInput1LDN // This parameter is represented from Note3
#define byte DInput1Reg // This parameter is represented from Note4
#define byte DInput1Bit // This parameter is represented from Note5
#define byte DInput2LDN // This parameter is represented from Note6
#define byte DInput2Reg // This parameter is represented from Note7
#define byte DInput2Bit // This parameter is represented from Note8
#define byte DInput3LDN // This parameter is represented from Note9
#define byte DInput3Reg // This parameter is represented from Note10
#define byte DInput3Bit // This parameter is represented from Note11
#define byte DInput4LDN // This parameter is represented from Note12
#define byte DInput4Reg // This parameter is represented from Note13
#define byte DInput4Bit // This parameter is represented from Note14
#define byte DInput5LDN // This parameter is represented from Note15
#define byte DInput5Reg // This parameter is represented from Note16
#define byte DInput5Bit // This parameter is represented from Note17
#define byte DInput6LDN // This parameter is represented from Note18
#define byte DInput6Reg // This parameter is represented from Note19
#define byte DInput6Bit // This parameter is represented from Note20
#define byte DInput7LDN // This parameter is represented from Note21
#define byte DInput7Reg // This parameter is represented from Note22
#define byte DInput7Bit // This parameter is represented from Note23
#define byte DInput8LDN // This parameter is represented from Note24
#define byte DInput8Reg // This parameter is represented from Note25
#define byte DInput8Bit // This parameter is represented from Note26
*****
```

```
*****
// Digital Output control relative definition (Please reference to Table 3)
#define byte DOutput1LDN // This parameter is represented from Note27
#define byte DOutput1Reg // This parameter is represented from Note28
#define byte DOutput1Bit // This parameter is represented from Note29
#define byte DOutput1Val // This parameter is represented from Note30
#define byte DOutput2LDN // This parameter is represented from Note31
#define byte DOutput2Reg // This parameter is represented from Note32
#define byte DOutput2Bit // This parameter is represented from Note33
#define byte DOutput2Val // This parameter is represented from Note34
#define byte DOutput3LDN // This parameter is represented from Note35
#define byte DOutput3Reg // This parameter is represented from Note36
#define byte DOutput3Bit // This parameter is represented from Note37
#define byte DOutput3Val // This parameter is represented from Note38
#define byte DOutput4LDN // This parameter is represented from Note39
#define byte DOutput4Reg // This parameter is represented from Note40
#define byte DOutput4Bit // This parameter is represented from Note41
#define byte DOutput4Val // This parameter is represented from Note42
#define byte DOutput5LDN // This parameter is represented from Note43
#define byte DOutput5Reg // This parameter is represented from Note44
#define byte DOutput5Bit // This parameter is represented from Note45
#define byte DOutput5Val // This parameter is represented from Note46
#define byte DOutput6LDN // This parameter is represented from Note47
#define byte DOutput6Reg // This parameter is represented from Note48
#define byte DOutput6Bit // This parameter is represented from Note49
#define byte DOutput6Val // This parameter is represented from Note50
#define byte DOutput7LDN // This parameter is represented from Note51
#define byte DOutput7Reg // This parameter is represented from Note52
#define byte DOutput7Bit // This parameter is represented from Note53
#define byte DOutput7Val // This parameter is represented from Note54
#define byte DOutput8LDN // This parameter is represented from Note55
#define byte DOutput8Reg // This parameter is represented from Note56
#define byte DOutput8Bit // This parameter is represented from Note57
#define byte DOutput8Val // This parameter is represented from Note58
*****
```



```
*****
// Digital Input Status relative definition (Please reference to Table 4)
#define byte DInput9LDN // This parameter is represented from Note59
#define byte DInput9Reg // This parameter is represented from Note60
#define byte DInput9Bit // This parameter is represented from Note61
#define byte DInput10LDN // This parameter is represented from Note62
#define byte DInput10Reg // This parameter is represented from Note63
#define byte DInput10Bit // This parameter is represented from Note64
#define byte DInput11LDN // This parameter is represented from Note65
#define byte DInput11Reg // This parameter is represented from Note66
#define byte DInput11Bit // This parameter is represented from Note67
#define byte DInput12LDN // This parameter is represented from Note68
#define byte DInput12Reg // This parameter is represented from Note69
#define byte DInput12Bit // This parameter is represented from Note70
#define byte DInput13LDN // This parameter is represented from Note71
#define byte DInput13Reg // This parameter is represented from Note72
#define byte DInput13Bit // This parameter is represented from Note73
#define byte DInput14LDN // This parameter is represented from Note74
#define byte DInput14Reg // This parameter is represented from Note75
#define byte DInput14Bit // This parameter is represented from Note76
#define byte DInput15LDN // This parameter is represented from Note77
#define byte DInput15Reg // This parameter is represented from Note78
#define byte DInput15Bit // This parameter is represented from Note79
#define byte DInput16LDN // This parameter is represented from Note80
#define byte DInput16Reg // This parameter is represented from Note81
#define byte DInput16Bit // This parameter is represented from Note82
*****
```

```
*****
// Digital Output control relative definition (Please reference to Table 5)
#define byte DOutput9LDN // This parameter is represented from Note83
#define byte DOutput9Reg // This parameter is represented from Note84
#define byte DOutput9Bit // This parameter is represented from Note85
#define byte DOutput9Val // This parameter is represented from Note86
#define byte DOutput10LDN // This parameter is represented from Note87
#define byte DOutput10Reg // This parameter is represented from Note88
#define byte DOutput10Bit // This parameter is represented from Note89
#define byte DOutput10Val // This parameter is represented from Note90
#define byte DOutput11LDN // This parameter is represented from Note91
#define byte DOutput11Reg // This parameter is represented from Note92
#define byte DOutput11Bit // This parameter is represented from Note93
#define byte DOutput11Val // This parameter is represented from Note94
#define byte DOutput12LDN // This parameter is represented from Note95
#define byte DOutput12Reg // This parameter is represented from Note96
#define byte DOutput12Bit // This parameter is represented from Note97
#define byte DOutput12Val // This parameter is represented from Note98
#define byte DOutput13LDN // This parameter is represented from Note99
#define byte DOutput13Reg // This parameter is represented from Note100
#define byte DOutput13Bit // This parameter is represented from Note101
#define byte DOutput13Val // This parameter is represented from Note102
#define byte DOutput14LDN // This parameter is represented from Note103
#define byte DOutput14Reg // This parameter is represented from Note104
#define byte DOutput14Bit // This parameter is represented from Note105
#define byte DOutput14Val // This parameter is represented from Note106
#define byte DOutput15LDN // This parameter is represented from Note107
#define byte DOutput15Reg // This parameter is represented from Note108
#define byte DOutput15Bit // This parameter is represented from Note109
#define byte DOutput15Val // This parameter is represented from Note110
#define byte DOutput16LDN // This parameter is represented from Note111
#define byte DOutput16Reg // This parameter is represented from Note112
#define byte DOutput16Bit // This parameter is represented from Note113
#define byte DOutput16Val // This parameter is represented from Note114
*****
```

```
*****
VOID Main(){
    Boolean PinStatus ;

    // Procedure : AaeonReadPinStatus
    // Input :
    //     Example, Read Digital I/O Pin 3 status
    // Output :
    //     InputStatus :
    //         0: Digital I/O Pin level is low
    //         1: Digital I/O Pin level is High
    PinStatus = AaeonReadPinStatus(DInput3LDN, DInput3Reg, DInput3Bit);

    // Procedure : AaeonSetOutputLevel
    // Input :
    //     Example, Set Digital I/O Pin 6 level
    AaeonSetOutputLevel(DOutput6LDN, DOutput6Reg, DOutput6Bit,
DOutput6Val);
}
*****
```

```
*****
Boolean  AaeonReadPinStatus(byte LDN, byte Register, byte BitNum){
    Boolean PinStatus ;

    PinStatus = SIOBitRead(LDN, Register, BitNum);
    Return PinStatus ;
}
VOID  AaeonSetOutputLevel(byte LDN, byte Register, byte BitNum, byte Value){
    ConfigToOutputMode(LDN, Register, BitNum);
    SIOBitSet(LDN, Register, BitNum, Value);
}
*****
```

```

*****
VOID  SIOEnterMBPnPMode0{
    IOWriteByte(SIOIndex, 0x87);
    IOWriteByte(SIOIndex, 0x87);
}

VOID  SIOExitMBPnPMode0{
    IOWriteByte(SIOIndex, 0xAA);
}

VOID  SIOSelectLDN(byte LDN){
    IOWriteByte(SIOIndex, 0x07); // SIO LDN Register Offset = 0x07
    IOWriteByte(SIOData, LDN);
}

VOID  SIOBitSet(byte LDN, byte Register, byte BitNum, byte Value){
    Byte TmpValue;

    SIOEnterMBPnPMode();
    SIOSelectLDN(byte LDN);
    IOWriteByte(SIOIndex, Register);
    TmpValue = IOReadByte(SIOData);
    TmpValue &= ~(1 << BitNum);
    TmpValue |= (Value << BitNum);
    IOWriteByte(SIOData, TmpValue);
    SIOExitMBPnPMode();
}

VOID  SIOByteSet(byte LDN, byte Register, byte Value){
    SIOEnterMBPnPMode();
    SIOSelectLDN(LDN);
    IOWriteByte(SIOIndex, Register);
    IOWriteByte(SIOData, Value);
    SIOExitMBPnPMode();
}
*****

```

```
*****
Boolean  SIOBitRead(byte LDN, byte Register, byte BitNum){
    Byte TmpValue;

    SIOEnterMBPnPMode();
    SIOSelectLDN(LDN);
    IOWriteByte(SIOIndex, Register);
    TmpValue = IOReadByte(SIOData);
    TmpValue &= (1 << BitNum);
    SIOExitMBPnPMode();
    If(TmpValue == 0)
        Return 0;
    Return 1;
}
VOID  ConfigToOutputMode(byte LDN, byte Register, byte BitNum){
    Byte TmpValue, OutputEnableReg;

    OutputEnableReg = Register-1;
    SIOEnterMBPnPMode();
    SIOSelectLDN(LDN);
    IOWriteByte(SIOIndex, OutputEnableReg);
    TmpValue = IOReadByte(SIOData);
    TmpValue |= (1 << BitNum);
    IOWriteByte(SIOData, OutputEnableReg);
    SIOExitMBPnPMode();
}
*****
```