

# μCOM-BT

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SMARC Module

User's Manual 4<sup>th</sup> Ed

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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
● $\mu$ COM-BT	1
● M2.5 screw	4
● Product DVD with User's Manual (in pdf) and drivers	1

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

## About this Document

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

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

## Safety Precautions

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

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

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

### **Warning!**



This device complies with Part 15 FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received including interference that may cause undesired operation.

### **Caution:**

*There is a danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions and your local government's recycling or disposal directives.*

### **Attention:**

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



## China RoHS Requirements (CN)

产品中有毒有害物质或元素名称及含量

AAEON Main Board/ Daughter Board/ Backplane

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷电路板 及其电子组件	○	○	○	○	○	○
外部信号 连接器及线材	○	○	○	○	○	○
<p>○: 表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T 11363-2006 标准规定的限量要求以下。</p> <p>X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11363-2006 标准规定的限量要求。</p> <p>备注: 此产品所标示之环保使用期限, 系指在一般正常使用状况下。</p>						

## China RoHS Requirement (EN)

Poisonous or Hazardous Substances or Elements in Products

AAEON Main Board/ Daughter Board/ Backplane

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

# Table of Contents

---

<b>Chapter 1 - Product Specifications</b> .....	<b>1</b>
1.1 Specifications .....	2
<b>Chapter 2 – Hardware Information</b> .....	<b>4</b>
2.1 Dimensions, Jumpers and Connectors .....	5
2.2 List of Jumpers .....	9
2.2.1 AT/ATX Switch (SW1) .....	9
2.3 List of Connectors.....	10
2.3.1 Battery Connector (BAT1) .....	10
2.4 MXM 314 Pin Definitions .....	11
<b>Chapter 3 - AMI BIOS Setup</b> .....	<b>17</b>
3.1 System Test and Initialization .....	18
3.2 AMI BIOS Setup .....	19
3.3 Setup submenu: Main .....	20
3.4 Setup submenu: Advanced .....	21
3.4.1 Advanced: Power Management .....	22
3.4.1.1 Power Management: S5 RTC Wake Settings .....	24
3.4.2 Advanced: Digital IO .....	25
3.4.3 Advanced: H/W Monitor .....	26
3.4.4 Advanced: CPU Configuration .....	27
3.4.4.1 CPU Configuration: Socket 0 CPU Information .....	28
3.4.5 Advanced: IDE Configuration.....	29
3.4.6 Advanced: CSM Configuration .....	31
3.4.7 Advanced: USB Configuration.....	32
3.4.8 Advanced: LPSS & SCC Configuration .....	34
3.5 Setup submenu: Chipset.....	36
3.5.1 Chipset: Host Bridge.....	37

3.5.1.1	Host Bridge: IGD – LCD Control.....	38
3.5.2	Chipset: South Bridge .....	39
3.5.2.1	South Bridge: Azalia HD Audio.....	40
3.5.2.2	South Bridge: USB Configuration .....	42
3.5.2.3	South Bridge: PCI Express Configuration .....	44
3.6	Setup submenu: Security .....	45
3.7	Setup submenu: Boot.....	46
3.8	Setup submenu: Save & Exit .....	47
<b>Chapter 4</b>	<b>– Drivers Installation.....</b>	<b>48</b>
4.1	Product CD/DVD .....	49
<b>Appendix A</b>	<b>- Watchdog Timer Programming.....</b>	<b>52</b>
A.1	Watchdog Timer Initial Program .....	53
<b>Appendix B</b>	<b>- I/O Information .....</b>	<b>58</b>
B.1	I/O Address Map.....	59
B.2	Memory Address Map .....	61
B.3	IRQ Mapping Chart.....	62
<b>Appendix C</b>	<b>– Programming Digital I/O.....</b>	<b>74</b>
C.1	Digital I/O Sample Program.....	75
<b>Appendix D</b>	<b>– eMMC Settings.....</b>	<b>80</b>
D.1	eMMC Format for Windows® 7 or Later.....	81
D.2	Installing Windows® 7 on eMMC.....	81

# Chapter 1

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Product Specifications

## 1.1 Specifications

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### System

- **Form Factor** SMARC, 82 x 50 mm
- **Processor** Intel® Atom™ E3800 Series or Celeron® N2807 Processor SoC
- **System Memory** Onboard DDR3L 2 GB (optional 4 GB)
- **Chipset** Intel® Atom™ SoC
- **I/O Chipset** Intel® Atom™ SoC
- **Ethernet** Intel® I211AT, I210IT
- **BIOS** AMI BIOS, Legacy free BIOS
- **Wake On LAN** Yes
- **Watchdog Timer** ITE IT8528VG
- **H/W Status Monitoring** Supports CPU temperature monitoring
- **Expansion Interface** PCIe x 3  
I2C x 2, SM Bus x 1  
SPI x 2 (SPI0 reserved for boot device, SPI1 free for other use)  
UART x 1 for TX/RX/RTS#/CTS#  
UART x 1 for TX/RX only
- **Power Requirement** Standard: DC 3.3 ~ 5V
- **Board Size (L x W)** 82 x 50mm (3.23 x 1.97")
- **Gross Weight** 0.2 kg (0.44 lb)

- **Operating Temperature** Standard: 0 ~ 60°C (32 ~ 140°F)  
Optional: -40 ~ 80°C (-40 ~ 185°F)
- **Storage Temperature** -20 ~ 70°C (-4 ~ 158°F)
- **Operation Humidity** 0 ~ 90% relative humidity, non-condensing

## Display

- **Chipset** Intel® Atom™ SOC
- **Resolution** LCD: Up to 1920x1200 @ single 24-bit LVDS  
DDI: Up 2560 x 1600 (HDMI)
- **Display Combination** HDMI + LVDS (Simultaneous/ dual display)

## I/O

- **Storage** SATA 3.0 GB/s x 2
- **USB** USB 3.0 x 1  
USB 2.0 x 2 (3 for Linux)  
- USB1 for Client mode only on Linux  
- USB2 and USB3 for standard USB Host port
- **Serial Port** UART x 2 (one 4-wire TX/RX/RTS#/CTS#, one 2-wire TX/RX)
- **Audio** High Definition Audio x 1
- **GPI/O** Default 11-bit , up to 12 bit 1.8V (GPIO4 shared with High Definition Audio)

# Chapter 2

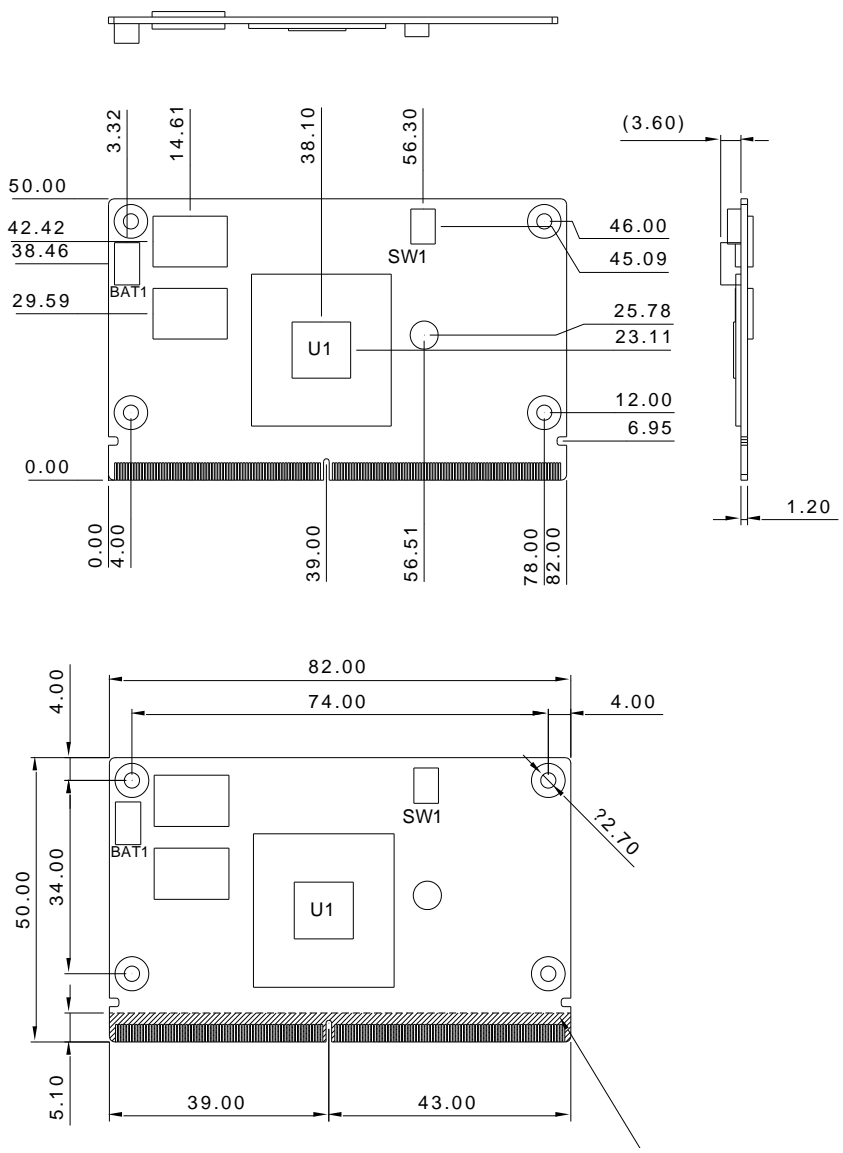
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Hardware Information

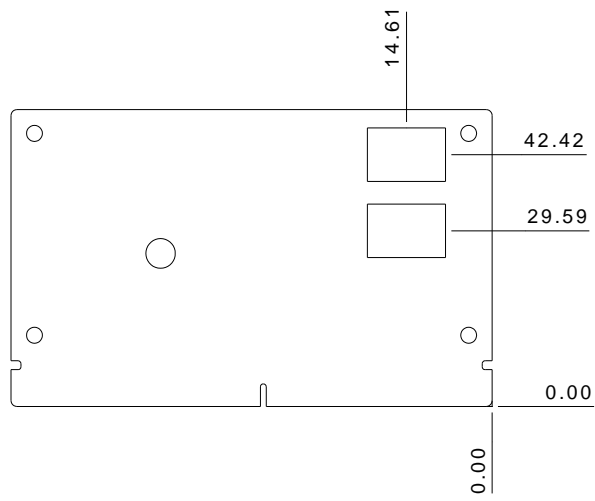


## 2.1 Dimensions, Jumpers and Connectors

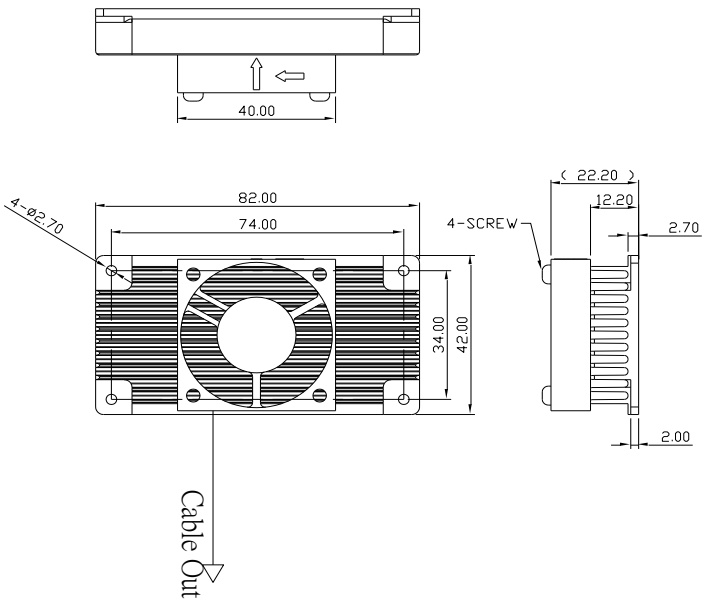
### Component Side



Solder Side

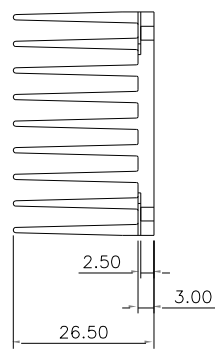
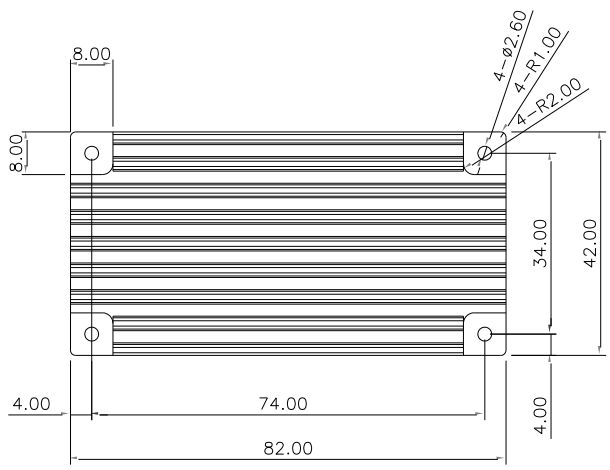
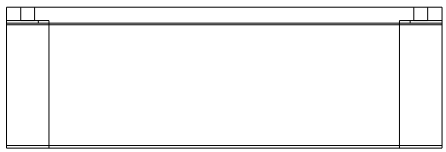


Cooler (μCOM-BT-FAN01, to be used with heat spreader)

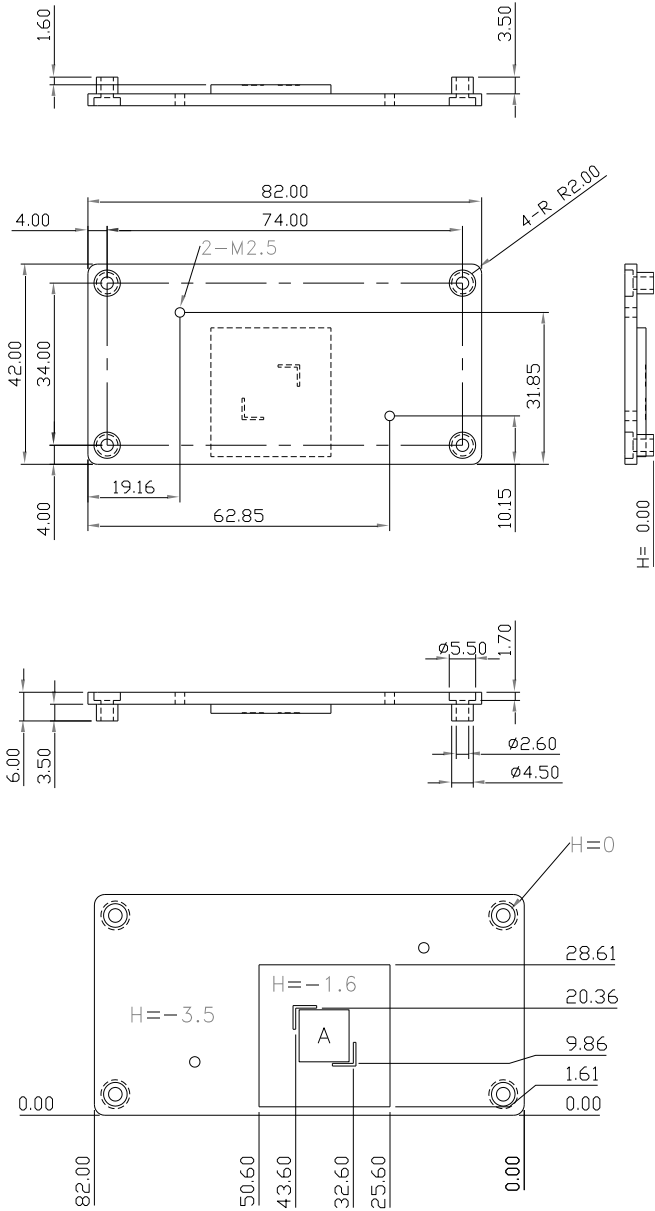


Note: Cooler is recommended for the E3845 SKU

### Heat Sink (uCOM-BT-HSK01, to be used with heat spreader)



# Heat Spreader (uCOM-BT-HSP01)



## 2.2 List of Jumpers

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

Label	Function
SW1	Boot Mode Selection

### 2.2.1 AT/ATX Switch (SW1)



RTC normal mode(Default)



Clear RTC



ATX(Default)



AT

## 2.3 List of Connectors

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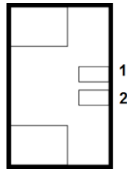
Please refer to the table below for all of the board's jumpers that you can configure for your application

Label	Function
BAT1A	RTC Battery Connector

---

### 2.3.1 Battery Connector (BAT1)

---



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

---

## 2.4 MXM 314 Pin Definitions

Pin	Signal	Pin	Signal
P1	NC	S1	NC
P2	GND	S2	NC
P3	CSI1_CK+	S3	GND
P4	CSI1_CK-	S4	NC
P5	NC	S5	CAM_I2C_CLK
P6	NC	S6	NC
P7	CSI1_D0+	S7	CAM_I2C_DATA
P8	CSI1_D0+	S8	CSI0_CK+
P9	GND	S9	CSI0_CK-
P10	CSI1_D1+	S10	GND
P11	CSI1_D1-	S11	CSI0_D0+
P12	GND	S12	CSI0_D0+
P13	CSI1_D2+	S13	GND
P14	CSI1_D2-	S14	NC
P15	GND	S15	NC
P16	CSI1_D3+	S16	GND
P17	CSI1_D3-	S17	PM_SLP_S3#
P18	GND	S18	PM_SLP_S4#
P19	GBE_MDI3-	S19	NC
P20	GBE_MDI3+	S20	NC
P21	GBE_LINK100#	S21	NC
P22	GBE_LINK1000#	S22	NC
P23	GBE_MDI2-	S23	NC
P24	GBE_MDI2+	S24	NC
P25	GBE_LINK_ACT#	S25	GND

P26	GBE_MDI1-	S26	NC
P27	GBE_MDI1+	S27	NC
P28	NC	S28	NC
P29	GBE_MDI0-	S29	NC
P30	GBE_MDI0+	S30	NC
P31	NC	S31	NC
P32	GND	S32	NC
P33	SDIO_WP	S33	NC
P34	SDIO_CMD	S34	GND
P35	SDIO_CD#	S35	NC
P36	SDIO_CK	S36	NC
P37	SDIO_PWR_EN	S37	NC
P38	GND	S38	CB_MCLK
P39	SDIO_D0	S39	I2S0_LRCK
P40	SDIO_D1	S40	I2S0_SDOOUT
P41	SDIO_D2	S41	I2S0_SDIN
P42	SDIO_D3	S42	I2S0_CK
P43	NC	S43	NC
P44	NC	S44	NC
P45	NC	S45	NC
P46	NC	S46	NC
P47	GND	S47	GND
P48	SATA_TX+	S48	I2C_GP_CLK
P49	SATA_TX-	S49	I2C_GP_DAT
P50	GND	S50	HDA_SYNC
P51	SATA_RX+	S51	HDA_SDO
P52	SATA_RX-	S52	HDA_SDI
P53	GND	S53	HDA_CK
P54	SPI1_CS0#	S54	SATA_ACT#



P55	NC	S55	NC
P56	SPI1_CK	S56	NC
P57	SPI1_DIN	S57	NC
P58	SPI1_DO	S58	NC
P59	GND	S59	NC
P60	USB0+	S60	NC
P61	USB0-	S61	GND
P62	USB0_EN_OC#	S62	USB3_TX0_P
P63	USB0_VBUS_DET	S63	USB3_TX0_N
P64	USB0_OTG_ID	S64	GND
P65	USB1+	S65	USB3_RX0_P
P66	USB1-	S66	USB3_RX0_N
P67	USB1_EN_OC#	S67	GND
P68	GND	S68	NC
P69	USB2+	S69	NC
P70	USB2-	S70	GND
P71	USB2_EN_OC#	S71	SATA_TXP1
P72	PCIE_C_PRSN#	S72	SATA_TXN1
P73	PCIE_B_PRSN#	S73	GND
P74	PCIE_A_PRSN#	S74	SATA_RXP1
		S75	SATA_RXN1
<b>Key</b>	<b>Key</b>	<b>Key</b>	<b>Key</b>
P75	PCIE_A_RST	S76	PCIE_B_RST
P76	PCIE_C_CK_REQ#	S77	PCIE_C_RST
P77	PCIE_B_CK_REQ#	S78	PCIE_C_RX+
P78	PCIE_A_CK_REQ#	S79	PCIE_C_RX-
P79	GND	S80	GND
P80	PCIE_C_REFCK+	S81	PCIE_C_TX+
P81	PCIE_C_REFCK-	S82	PCIE_C_TX-

P82	GND	S83	GND
P83	PCIE_A_REFCK+	S84	PCIE_B_REFCK+
P84	PCIE_A_REFCK-	S85	PCIE_B_REFCK-
P85	GND	S86	GND
P86	PCIE_A_RX+	S87	PCIE_B_RX+
P87	PCIE_A_RX-	S88	PCIE_B_RX-
P88	GND	S89	GND
P89	PCIE_A_TX+	S90	PCIE_B_TX+
P90	PCIE_A_TX-	S91	PCIE_B_TX-
P91	GND	S92	GND
P92	HDMI_D2+	S93	NC
P93	HDMI_D2-	S94	NC
P94	GND	S95	NC
P95	HDMI_D1+	S96	NC
P96	HDMI_D1-	S97	NC
P97	GND	S98	NC
P98	HDMI_D0+	S99	NC
P99	HDMI_D0-	S100	NC
P100	GND	S101	GND
P101	HDMI_CK+	S102	NC
P102	HDMI_CK-	S103	NC
P103	GND	S104	NC
P104	HDMI_HPD	S105	NC
P105	HDMI_CTRL_CK	S106	NC
P106	HDMI_CTRL_DAT	S107	NC
P107	NC	S108	NC
P108	GPIO0	S109	NC
P109	GPIO1	S110	GND
P110	GPIO2	S111	NC

P111	GPIO3	S112	NC
P112	HDA_RST#	S113	NC
P113	GPIO5 / PWM_OUT	S114	NC
P114	GPIO6 / TACHIN	S115	NC
P115	GPIO7	S116	NC
P116	GPIO8	S117	NC
P117	GPIO9	S118	NC
P118	GPIO10	S119	GND
P119	GPIO11	S120	NC
P120	GND	S121	NC
P121	I2C_PM_CK	S122	NC
P122	I2C_PM_DAT	S123	NC
P123	BOOT_SELO#	S124	GND
P124	BOOT_SEL1#	S125	LVDS0+
P125	BOOT_SEL2#	S126	LVDS0-
P126	RESET_OUT	S127	LCD_BKLT_EN
P127	RESET_IN#	S128	LVDS1+
P128	POWER_BTN#	S129	LVDS1-
P129	SERO_TX	S130	GND
P130	SERO_RX	S131	LVDS2+
P131	SERO_RTS#	S132	LVDS2-
P132	SERO_CTS#	S133	LCD_VDD_EN
P133	GND	S134	LVDS_CK+
P134	SER1_TX	S135	LVDS_CK-
P135	SER1_RX	S136	GND
P136	NC	S137	LVDS3+
P137	NC	S138	LVDS3-
P138	NC	S139	I2C_LCD_CK
P139	NC	S140	I2C_LCD_DAT

P140	NC	S141	LCD_BKLT_PWM
P141	NC	S142	NC
P142	GND	S143	GND
P143	NC	S144	NC
P144	NC	S145	WDT_TIME_OUT#
P145	NC	S146	PCIE_WAKE#
P146	NC	S147	VDD_RTC
P147	VDD_IN	S148	LID#
P148	VDD_IN	S149	SLEEP#
P149	VDD_IN	S150	VIN_PWR_BAD#
P150	VDD_IN	S151	CHARGING#
P151	VDD_IN	S152	CHARGER_PRSENT#
P152	VDD_IN	S153	CARRIER_STBY#
P153	VDD_IN	S154	CARRIER_PWR_ON
P154	VDD_IN	S155	FORCE_RECOV#
P155	VDD_IN	S156	BATLOW#
P156	VDD_IN	S157	NC
		S158	VDD_IO_SEL#

# Chapter 3

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AMI BIOS Setup

## 3.1 System Test and Initialization

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

The system configuration verification routines check the current system configuration against the values stored in the CMOS memory. If they do not match, an error message will be outputted, in which case you will need to run the BIOS setup program to set the configuration information in memory.

There are three situations in which you will need to change the CMOS settings:

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

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

## 3.2 AMI BIOS Setup

---

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

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

The function for each interface can be found below.

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

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

**Chipset** – For hosting bridge parameters

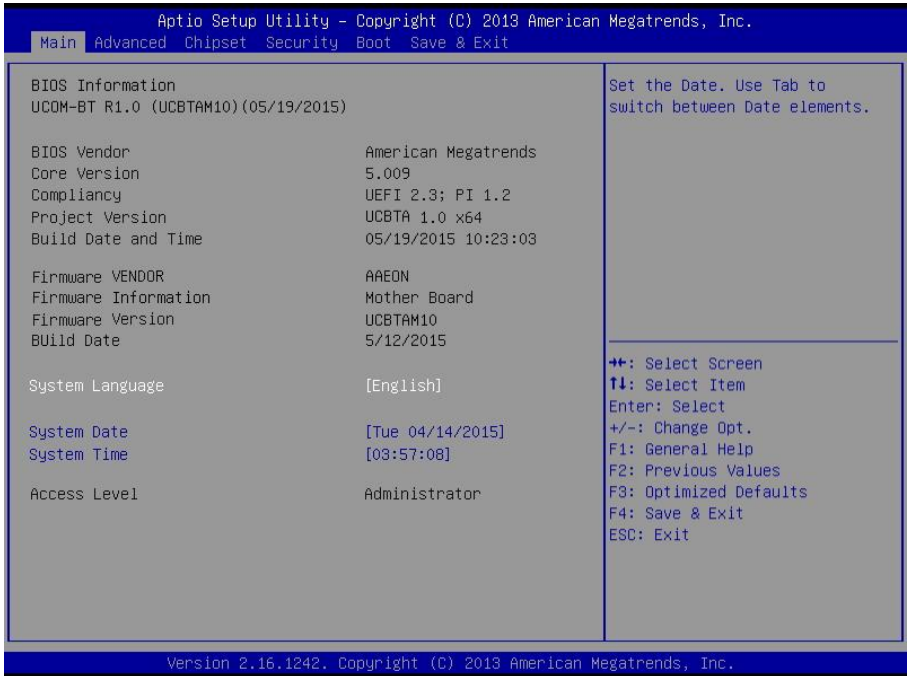
**Boot** – Enable/ Disable quiet Boot Option

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

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

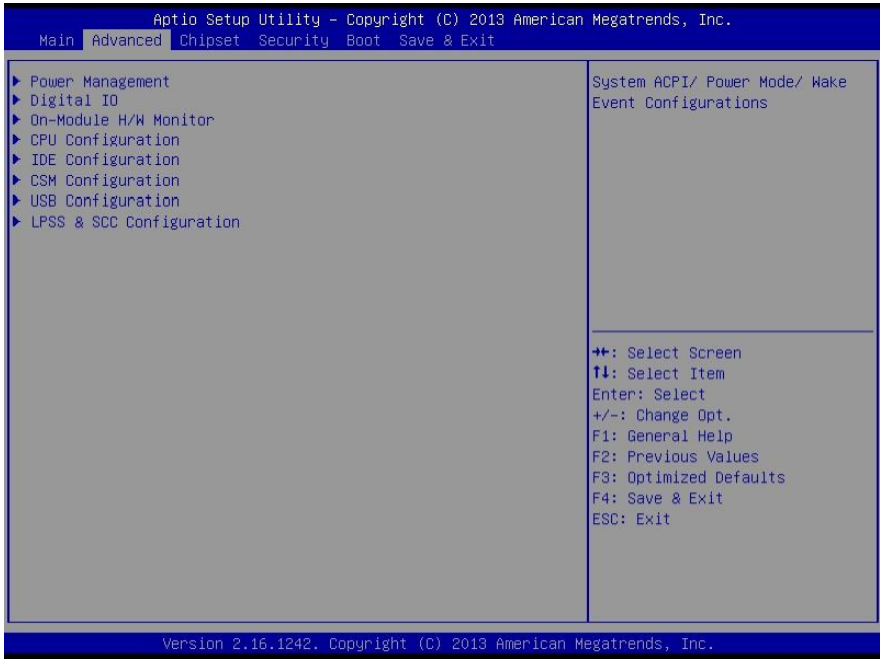
### 3.3 Setup submenu: Main

Press **Delete** to enter Setup

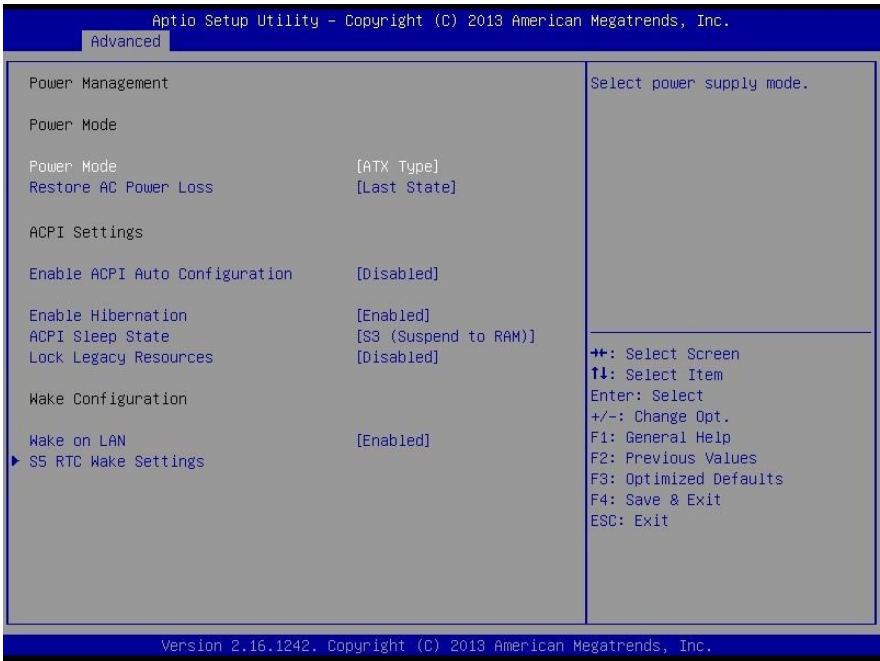




### 3.4 Setup submenu: Advanced



### 3.4.1 Advanced: Power Management

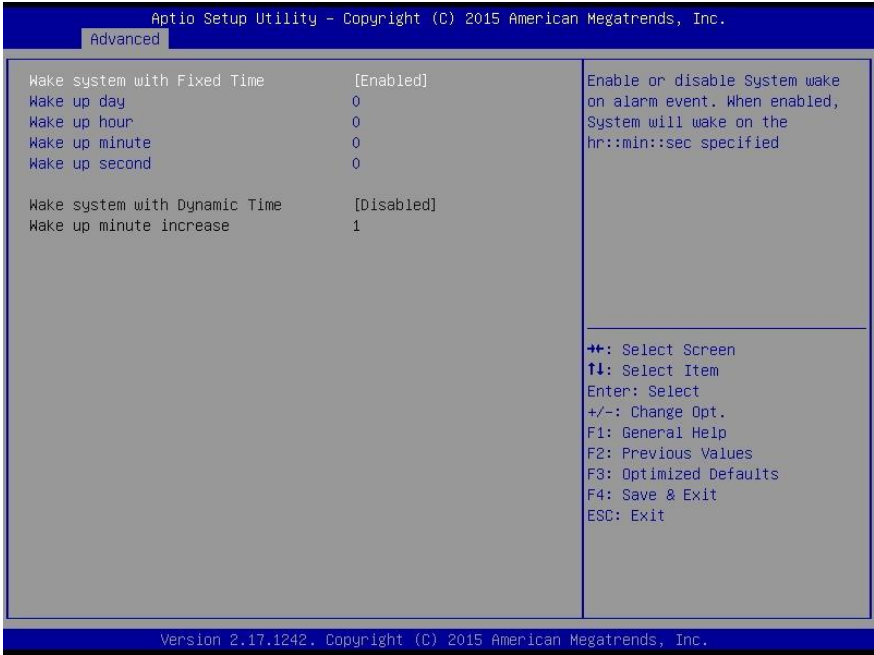


Options summary:

Power Mode	ATX Type	Optimal Default, Failsafe Default
	AT Type	
Select power supply mode		
Restore AC Power Loss	Power Off	Optimal Default, Failsafe Default
	Power On	
	Last State	
Select AC power state when power is re-applied after a power failure		
Enable ACPI Auto Configuration	Enable	Optimal Default, Failsafe Default
	Disable	
Enables or Disables BIOS ACPI Auto Configuration		

Enable Hibernation	Enable	Optimal Default, Failsafe Default
	Disable	
Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS		
ACPI Sleep State	Suspend Disabled	Optimal Default, Failsafe Default
	S3 only(Suspend to RAM)	
Select highest ACPI sleep state the System will enter when the Suspend button is pressed		
Lock Legacy Resources	Enable	Optimal Default, Failsafe Default
	Disable	
Enables or Disables Lock of Legacy Resources		
Wake on LAN	Enable	Optimal Default, Failsafe Default
	Disable	
Enabled/Disabled wake from LAN		
S5 RTC Wake Settings		
Enable system to wake from S5 using RTC alarm.		

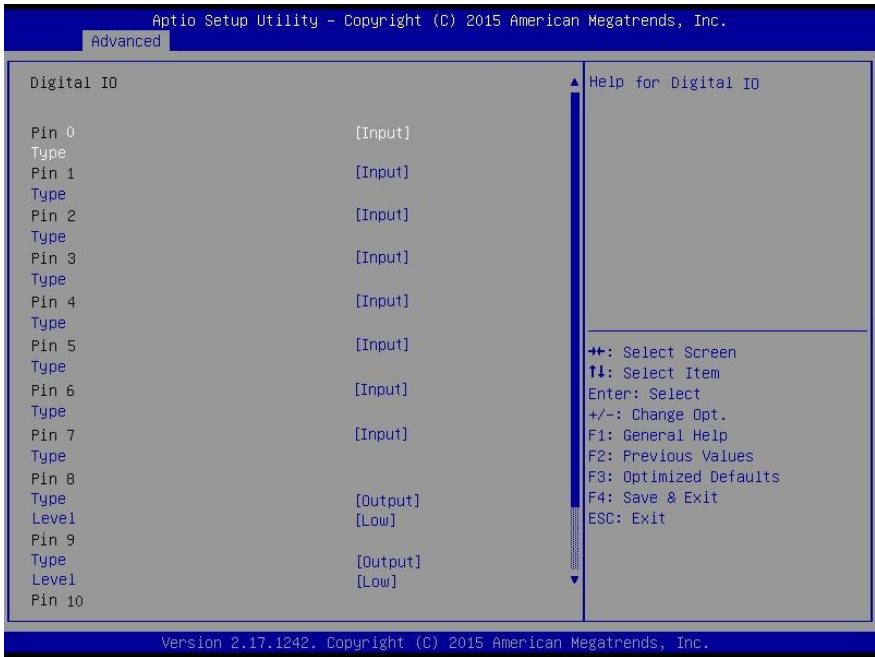
### 3.4.1.1 Power Management: S5 RTC Wake Settings



Options summary:

Wake system with Fixed Time	Enable	
	Disable	Optimal Default, Failsafe Default
Enable or disable System wake on alarm event. Wake up time is setting by following settings.		
Wake up day	0-31	
Select 0 for daily system wake up 1-31 for which day of the month that you would like the system to wake up		
Wake up hour	0-23	
Wake up minute	0-59	
Wake up second	0-59	
Wake system with Dynamic Time	Enable	
	Disable	Optimal Default, Failsafe Default
Enable or disable System wake on alarm event. Wake up time is current time + Increase minutes.		
Wake up minute increase	1-15	

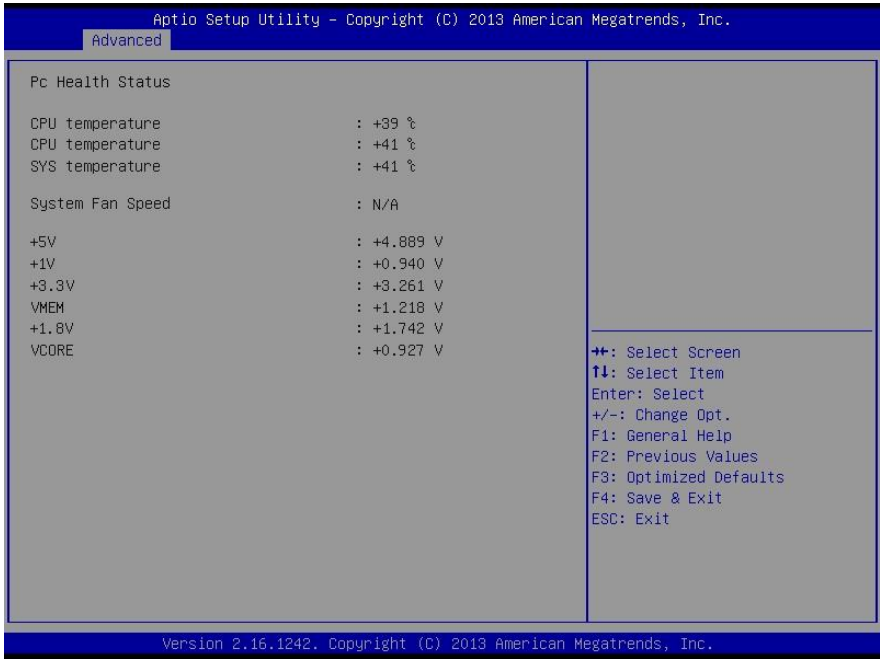
### 3.4.2 Advanced: Digital IO



Options summary:

Pin 1/2/3/4/5/6/7	Input	Optimal Default, Failsafe Default
	Output	
Set DIO Port 1/2/3/4/5/6/7 as Input or Output		
Pin 8/9/10/11	Input	Optimal Default, Failsafe Default
	Output	
Set DIO Port 1/2/3/4/5/6/7 as Input or Output		
Output Level	Hi	Optimal Default, Failsafe Default
	Low	
Set GPIO Level when used as Output		

### 3.4.3 Advanced: H/W Monitor



Note: The two CPU temperature sensors are located by the edge of the CPU and the back of the MCB respectively.

### 3.4.4 Advanced: CPU Configuration



Options summary:

Intel Virtualization	Disabled	Optimal Default, Failsafe Default
Technology	Enabled	
When enabled, a VMM can utilize the additional hardware capabilities provided by Vander pool Technology		

### 3.4.4.1 CPU Configuration: Socket 0 CPU Information

The screenshot displays the Aptio Setup Utility interface. At the top, it reads 'Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.' Below this is a 'Main' menu. The primary content area is titled 'Socket 0 CPU Information' and lists the following specifications:

Intel(R) Atom(TM) CPU E3845 @ 1.91GHz	
CPU Signature	30679
Microcode Patch	901
Max CPU Speed	1910 MHz
Min CPU Speed	500 MHz
Processor Cores	4
Intel HT Technology	Not Supported
Intel VT-x Technology	Supported
L1 Data Cache	24 KB x 4
L1 Code Cache	32 KB x 4
L2 Cache	1024 KB x 2
L3 Cache	Not Present

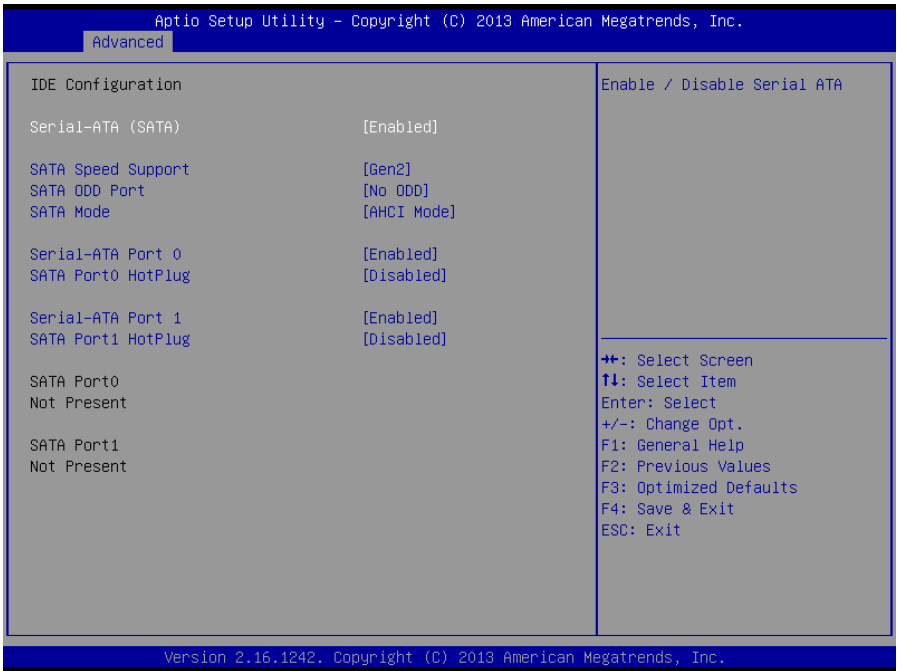
To the right of the CPU information, a list of navigation keys is provided:

- +: Select Screen
- ↑↓: Select Item
- Enter: Select
- +/-: Change Opt.
- F1: General Help
- F2: Previous Values
- F3: Optimized Defaults
- F4: Save & Exit
- ESC: Exit

At the bottom of the utility, it states 'Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.'



### 3.4.5 Advanced: IDE Configuration

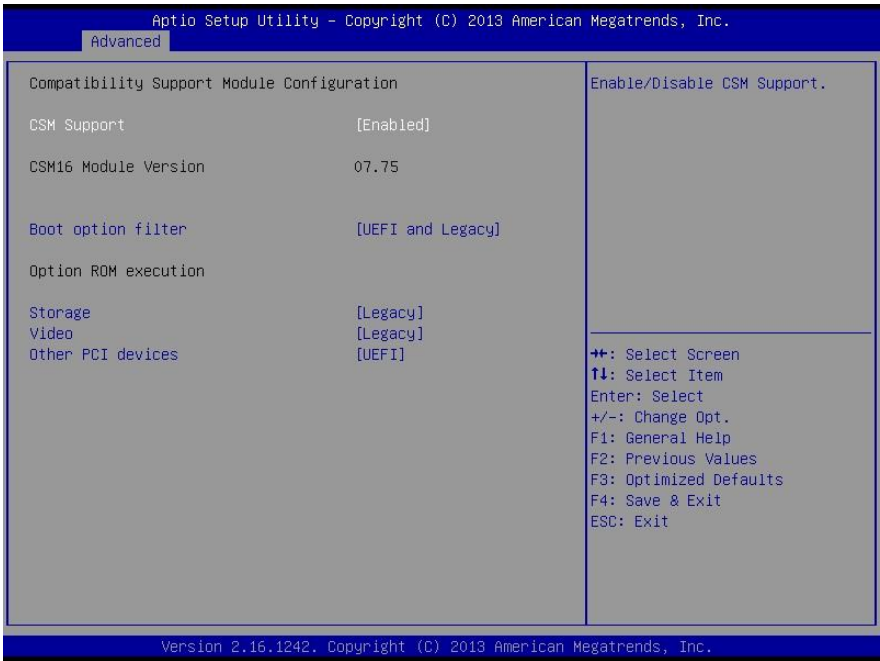


Options summary:

Serial-ATA(SATA)	Enabled	Default
	Disable	
SATA Speed Support	Gen1	
	Gen2	Default
SATA ODD Port	Port0 ODD	
	Port1 ODD	
	No ODD	Default
SATA Mode	IDE	
	AHCI	Default

IDE: Configure SATA controllers as legacy IDE		
AHCI: Configure SATA controllers to operate in AHCI mode		
Serial-ATA Port0/1	Enabled	Default
	Disable	
SATA Port0/1 HotPlug	Enabled	
	Disable	Default

### 3.4.6 Advanced: CSM Configuration



Options summary:

CSM Support	Enabled	Default
	Disable	
Boot option filter	UEFI and Legacy	Default
	Legacy	
	UEFI	
Storage & Video	Do not launch	Default
	UEFI	
	Legacy	
Other PCI devices	UEFI	Default
	Legacy	

### 3.4.7 Advanced: USB Configuration

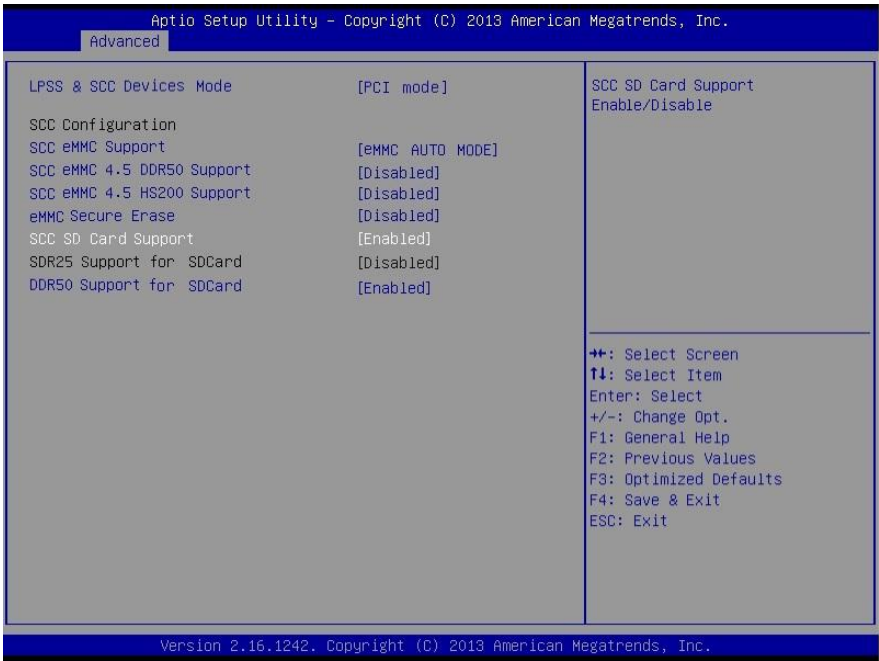


Options summary:

Legacy USB Support	Enabled	Optimal Default, Failsafe Default
	Disabled	
	Auto	
Enables BIOS Support for Legacy USB Support. When enabled, USB can be functional in legacy environment like DOS.		
AUTO option disables legacy support if no USB devices are connected		
USB Mass Storage Driver Support	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enable/Disable USB Mass Storage Driver Support		
Device Name (Emulation)	Auto	Optimal Default, Failsafe Default

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

### 3.4.8 Advanced: LPSS & SCC Configuration

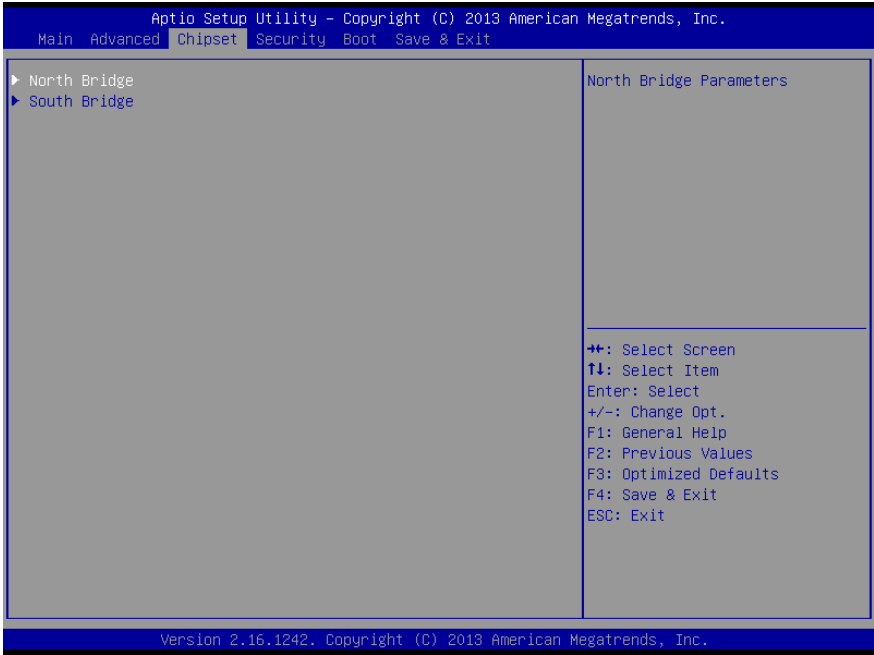


Options summary:

LPSS & SCC Devices Mode	ACPI mode	Default
	PCI mode	
LPSS & SCC Devices Mode Settings		
SCC eMMC Support	Enabled eMMC 4.5 Support	Default
	Enabled eMMC 4.41 Support	
	eMMC AUTO MODE	
	Disabled	

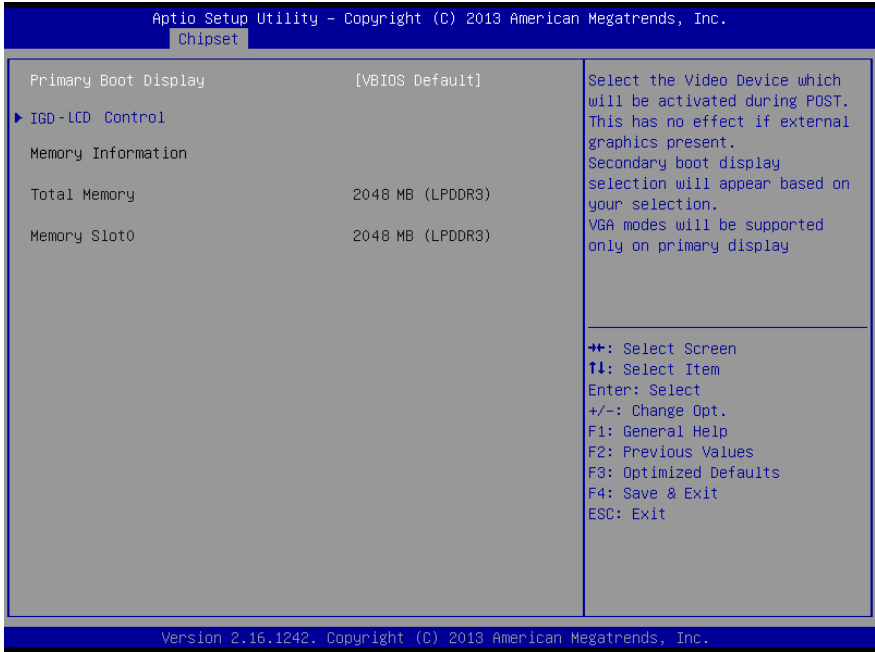
SCC eMMC Support Enable/Disable		
SCC eMMC 4.5 DDR50 Support	Enabled	Default
	Disabled	
SCC eMMC 4.5 DDR50 Support Enable/Disable		
SCC eMMC 4.5 HS200 Support	Enabled	Default
	Disabled	
SCC eMMC 4.5 HS200 Enable/Disable		
eMMC Secure Erase	Enabled	Default
	Disabled	
Enable/Disable eMMC Secure Erase. When enabled, all the data on eMMC will be erased.		
SCC SD Card Support	Enabled	Default
	Disable	
SCC SD Card Support Enable/Disable		
DDR50 Support for SDCard	Enabled	Default
	Disable	
Per chipset spec, there is chance that SD card can't be recognized properly when set to high speed. (DDR50) The issue doesn't occur at low speed setting.		

### 3.5 Setup submenu: Chipset



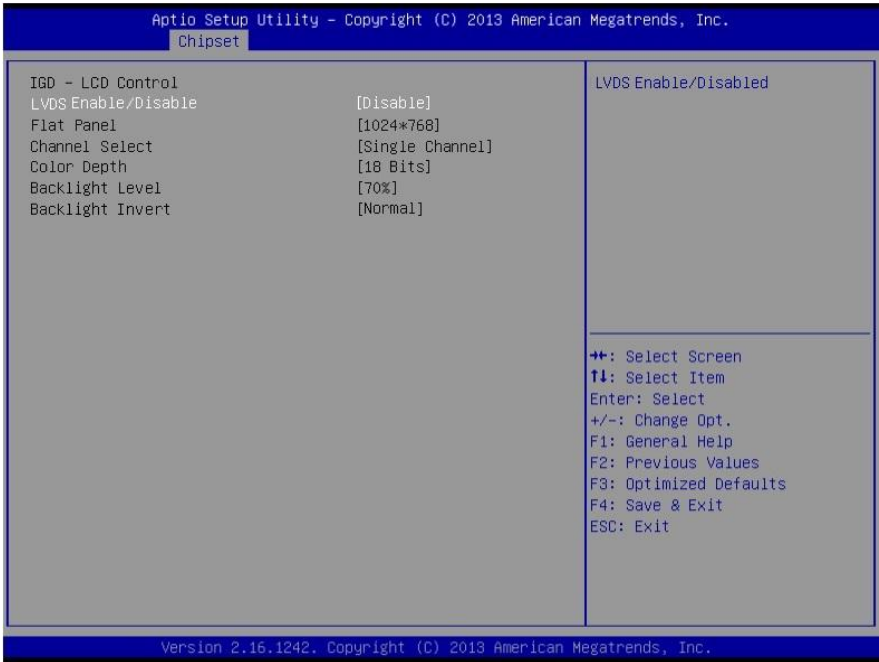


### 3.5.1 Chipset: Host Bridge

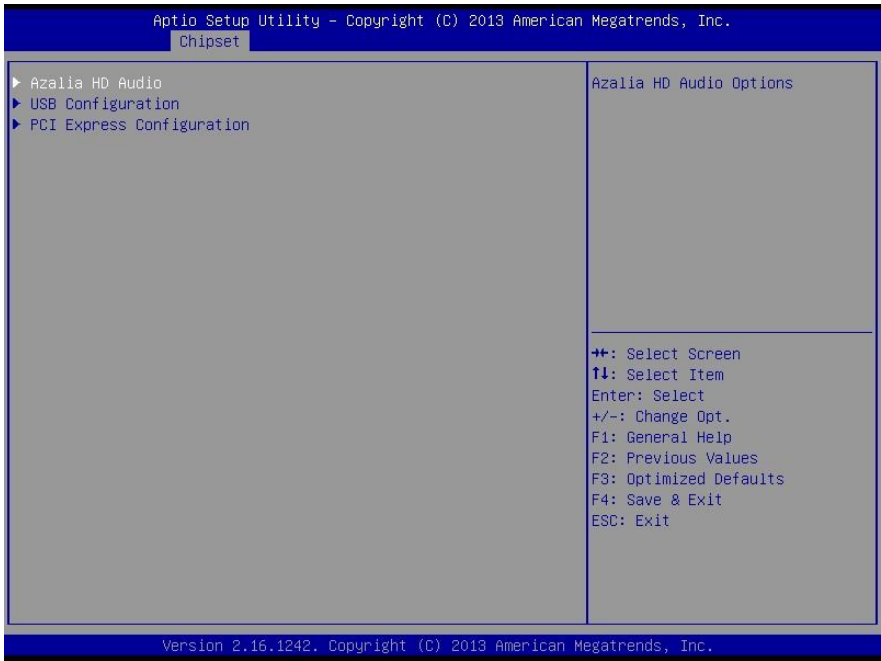


Primary Boot Display	VBIOS Default	Default
	CRT	
	DP/HDMI	

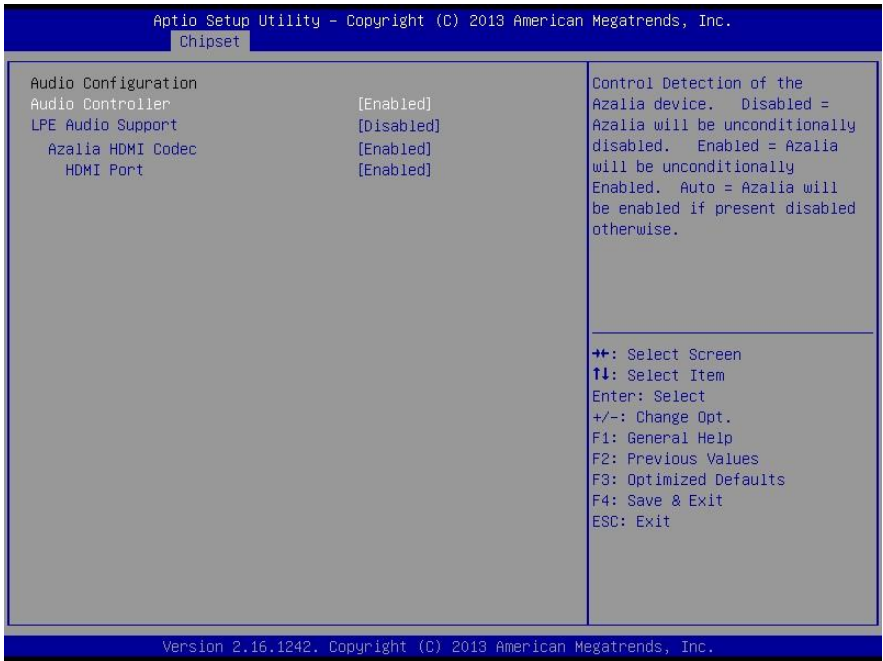
### 3.5.1.1 Host Bridge: IGD – LCD Control



## 3.5.2 Chipset: South Bridge



### 3.5.2.1 South Bridge: Azalia HD Audio

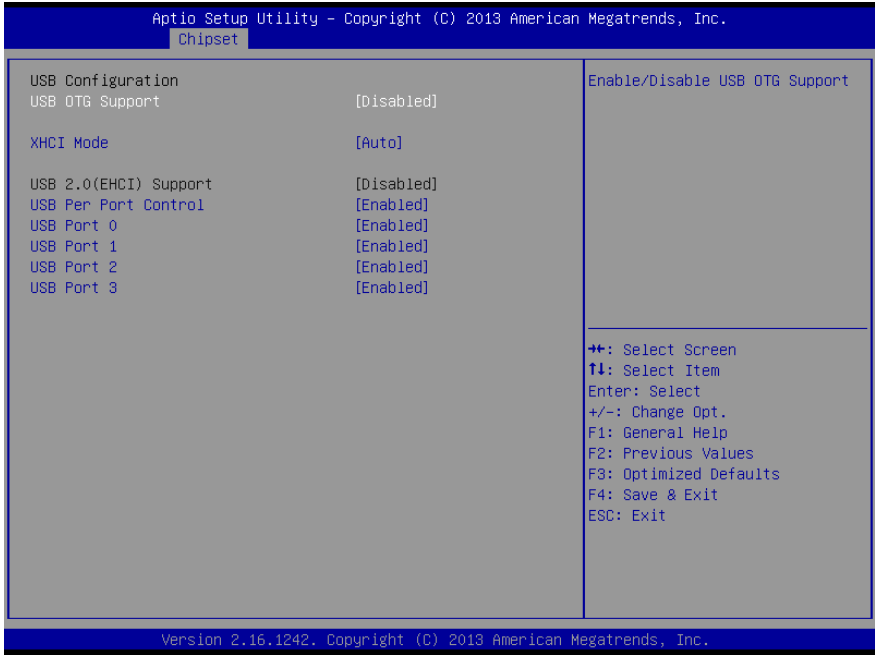


Options summary:

Audio Controller	Disabled	Default
	Enabled	
Control Detection of the Azalia device.		
Disabled = Azalia will be unconditionally disabled.		
Enabled = Azalia will be unconditionally Enabled.		
Auto = Azalia will be enabled if present disabled otherwise.		
LPE Audio Support	Disabled	Default
	LPE Audio PCI mode	

	LPE Audio ACPI mode	
Select LPE Audio ACPI mode or PCI mode		
Azalia HDMI codec	Disabled	Default
	Enabled	
Enable/Disable internal HDMI codec for Azalia		
HDMI Port	Disabled	Default
	Enabled	
Enable/Disable HDMI Port		

### 3.5.2.2 South Bridge: USB Configuration



Options summary:

USB OTG Support	PCI mode	Default
	Disabled	
USB OTG Support not available		
XHCI Mode	Enabled	Default
	Disabled	
	Auto	
	Smart Auto	
Mode of operation of XHCI controller		
USB Per Port Control	Enabled	Default
	Disabled	

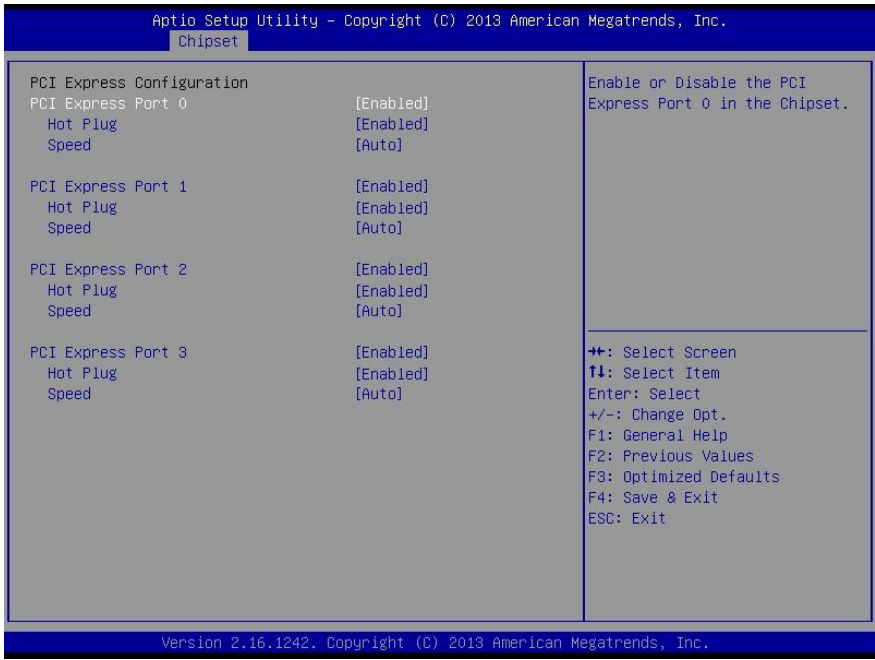
Control each of the USB ports (0~3).

Enable: Enable USB per port

Disable: Use USB port X settings

USB Port0/1/2/3	Enabled	Default
	Disabled	
Enable/Disable USB Port0/1/2/3		

### 3.5.2.3 South Bridge: PCI Express Configuration



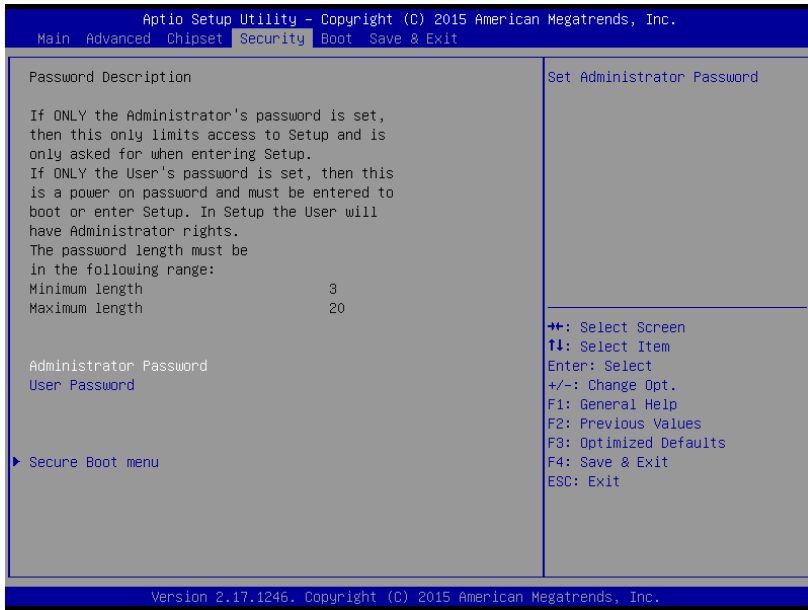
Options summary:

PCI Express Root Port	Disabled	Optimal Default, Failsafe Default
0/1/2/3	Enabled	
Enabling/Disabling the PCI Express root ports		
Hot Plug	Disabled	Default
	Enabled	
Enabling/Disabling the PCI Express Hot Plug		
Speed	Auto	Default
	Gen2	
	Gen1	
Configure PCIe Port Speed		

Note: PCIe Port 0 is used for LAN



## 3.6 Setup submenu: Security



### Change User/Administrator Password

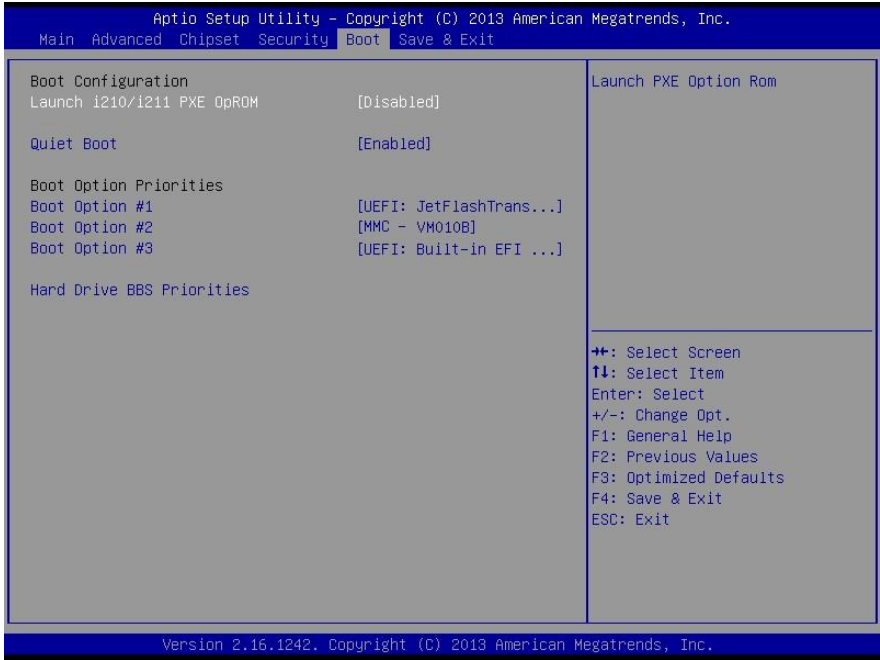
You can set a User Password once an Administrator Password is set. The password will be required during boot up, or when the user enters the Setup utility. Please Note that a User Password does not provide access to many of the features in the Setup utility.

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

### Removing the Password

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

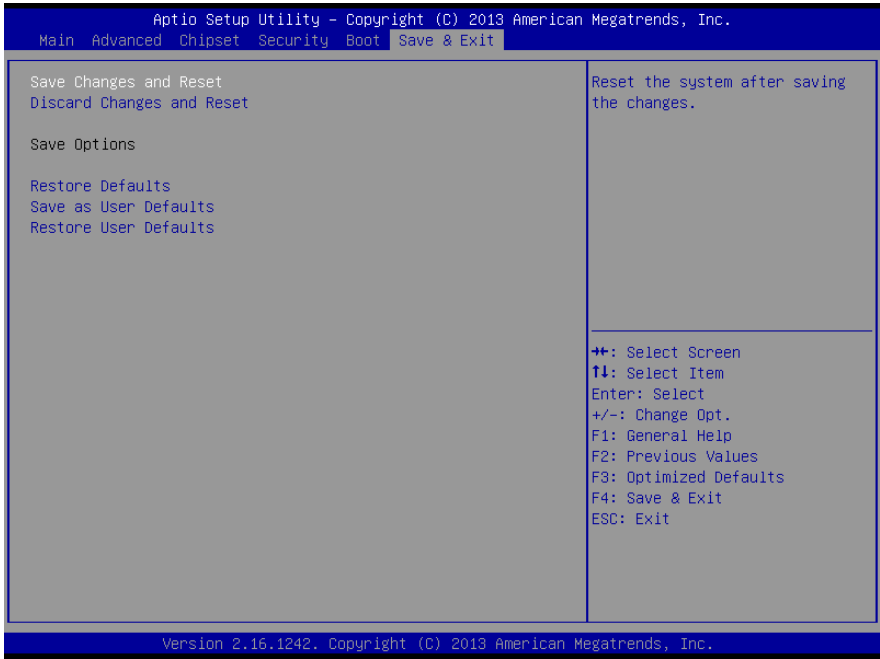
### 3.7 Setup submenu: Boot



Options summary:

Quiet Boot	Disabled	Default
	Enabled	
En/Disable showing boot logo.		
Launch i210/i211 PXE OpROM	Disabled	Default
	Enabled	
En/Disable PXE boot for i210/i211 LAN		

### 3.8 Setup submenu: Save & Exit



# Chapter 4

---

Drivers Installation

## 4.1 Product CD/DVD

---

The  $\mu$ COM-BT comes with a product DVD that contains all the drivers and utilities you need to setup your product. Insert the DVD and follow the steps in the autorun program to install the drivers.

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

### Step 1 – Install Chipset Driver

1. Open the *Step1 - Chipset* folder followed by *SetupChipset.exe*
2. Follow the instructions
3. 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 - LAN* folder and select your OS
2. Open the *.exe* file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

### Step 4 – Install Audio Driver

1. Open the *STEP4 - Audio* folder followed by *win7\_8-32\_64\_R273.exe*

2. Follow the instructions
3. Drivers will be installed automatically

#### Step 5 – Install TXE Driver (Windows 8 only)

1. Open the *STEP5 - TXE* folder followed by *SetupTXE.exe*
2. Follow the instructions
3. Drivers will be installed automatically

#### Step 6 – Install Intel Sideband Fabric Device Driver (Windows 8 only)

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

#### Step 7 – Install Atom I/O Driver

1. Open the *STEP7 – Atom\_E3800\_IO* folder and select your OS
2. Open the *.msi* file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

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

1. Open the *STEP8 – MBI (Optional)* folder followed by *Setup.exe*
2. Follow the instructions
3. Drivers will be installed automatically

#### Step 9 – Install USB 3.0 Driver (Windows 7 only)

1. Open the *STEP9 – USB3.0* folder followed by *Setup.exe*

2. Follow the instructions
3. Drivers will be installed automatically

# Appendix A

---

## Watchdog Timer Programming



## A.1 Watchdog Timer Initial Program

Table 1 : Embedded BRAM relative register table

	Default Value	Note
Index	0x284(Note1)	BRAM Index Register
Data	0x285(Note2)	BRAM Data Register
Logical Device Number	0xA8(Note3)	Watch dog Logical Device Number
Function and Device Number	0x00(Note4)	Watch dog Function/Device Number

Table 2 : Watchdog relative register table

	Option Register	BitNum	Value	Note
Timer Counter	0x00(Note5)		(Note10)	Time of watchdog timer (0~255)
Counting Unit	0x01(Note6)	0(Note7)	0(Note11)	Select time unit. 0: second 1: minute
Watchdog RST pulse width	0x01(Note8)	[3:2](Note9)	0(Note12)	0: 20ms 1: 60ms 2: 100ms 3: 250ms

```
*****
// Embedded BRAM relative definition (Please reference to Table 1)
#define byte EcBRAMIndex //This parameter is represented from Note1
#define byte EcBRAMData //This parameter is represented from Note2
#define byte BRAMLDNReg //This parameter is represented from Note3
#define byte BRAMFnDataReg //This parameter is represented from Note4
#define void EcBRAMWriteByte(byte Offset, byte Value);
#define byte EcBRAMReadByte(byte Offset);
#define void IOWriteByte(byte Offset, byte Value);
#define byte IOReadByte(byte Offset);
// Watch Dog relative definition (Please reference to Table 2)
#define byte TimerReg //This parameter is represented from Note5
#define byte TimerVal // This parameter is represented from Note10
#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 Note11
#define byte RSTReg //This parameter is represented from Note8
#define byte RSTBit //This parameter is represented from Note9
#define byte RSTVal //This parameter is represented from Note12
*****
```

```
*****
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(1);
}

// Procedure : AaeonWDTConfig
VOID AaeonWDTConfig (){
    // Disable WDT counting
    WDTEnableDisable(0);
    // WDT relative parameter setting
    WDTParameterSetting();
}

VOID WDTEnableDisable(byte Value){
    ECBRAMWriteByte(TimerReg , Value);
}

VOID WDTParameterSetting(){
    Byte TempByte;

    // Watchdog Timer counter setting
    ECBRAMWriteByte(TimerReg , TimerVal);
    // WDT counting unit setting
    TempByte = ECBRAMReadByte(UnitReg);
    TempByte |= (UnitVal << UnitBit);
    ECBRAMWriteByte(UnitReg , TempByte);
    // WDT RST pulse width setting
    TempByte = ECBRAMReadByte(RSTReg);
    TempByte |= (RSTVal << RSTBit);
    ECBRAMWriteByte(RSTReg , TempByte);
}
*****
```

```

*****
VOID  ECBRAMWriteByte(byte OPReg, byte OPBit, byte Value){
    IOWriteByte(EcBRAMIndex, 0x10);
    IOWriteByte(EcBRAMData, BRAMLDNReg);
    IOWriteByte(EcBRAMIndex, 0x11);
    IOWriteByte(EcBRAMData, BRAMFnDataReg);

    IOWriteByte(EcBRAMIndex, 0x13 + OPReg);
    IOWriteByte(EcBRAMData, Value);

    IOWriteByte(EcBRAMIndex, 0x12);
    IOWriteByte(EcBRAMData, 0x30);          //Write start
}

Byte  ECBRAMReadByte(byte OPReg){
    IOWriteByte(EcBRAMIndex, 0x10);
    IOWriteByte(EcBRAMData, BRAMLDNReg);
    IOWriteByte(EcBRAMIndex, 0x11);
    IOWriteByte(EcBRAMData, BRAMFnDataReg);

    IOWriteByte(EcBRAMIndex, 0x12);
    IOWriteByte(EcBRAMData, 0x10);        //Read start

    IOWriteByte(EcBRAMIndex, 0x13 + OPReg);
    Return    IORReadByte(EcBRAMData, Value);
}
*****

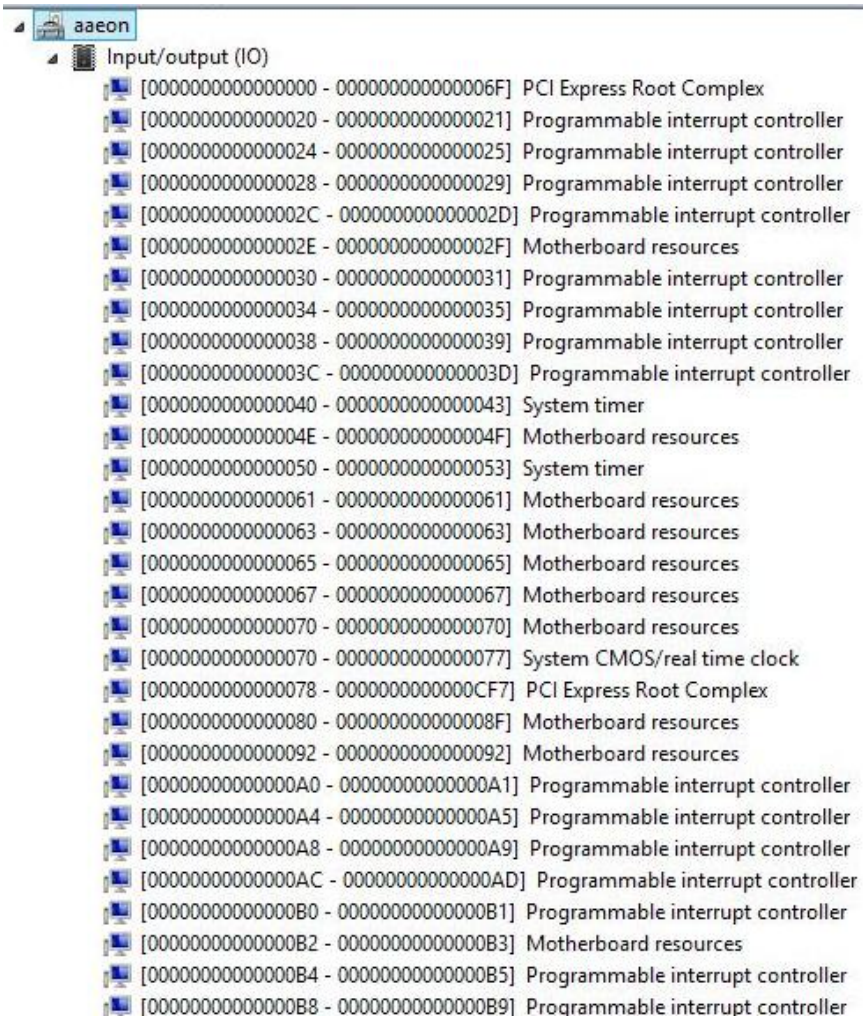
```

# Appendix B
























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I/O Information

## B.1 I/O Address Map

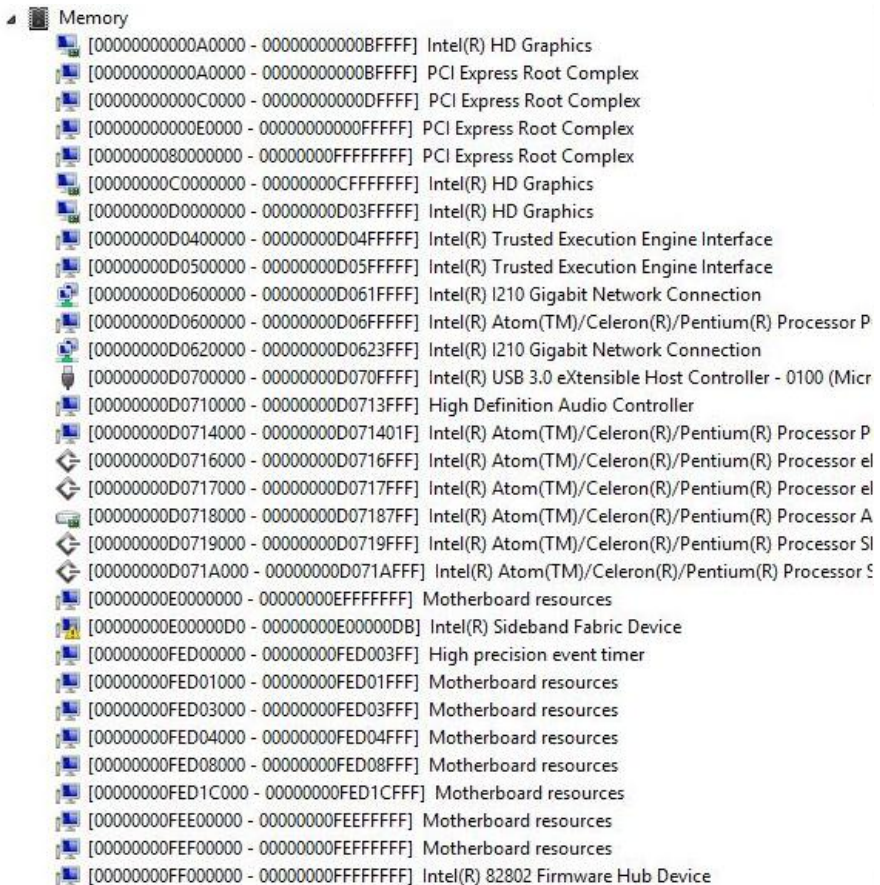


Address Range	Resource Name
[0000000000000000 - 000000000000006F]	PCI Express Root Complex
[0000000000000020 - 0000000000000021]	Programmable interrupt controller
[0000000000000024 - 0000000000000025]	Programmable interrupt controller
[0000000000000028 - 0000000000000029]	Programmable interrupt controller
[000000000000002C - 000000000000002D]	Programmable interrupt controller
[000000000000002E - 000000000000002F]	Motherboard resources
[0000000000000030 - 0000000000000031]	Programmable interrupt controller
[0000000000000034 - 0000000000000035]	Programmable interrupt controller
[0000000000000038 - 0000000000000039]	Programmable interrupt controller
[000000000000003C - 000000000000003D]	Programmable interrupt controller
[0000000000000040 - 0000000000000043]	System timer
[000000000000004E - 000000000000004F]	Motherboard resources
[0000000000000050 - 0000000000000053]	System timer
[0000000000000061 - 0000000000000061]	Motherboard resources
[0000000000000063 - 0000000000000063]	Motherboard resources
[0000000000000065 - 0000000000000065]	Motherboard resources
[0000000000000067 - 0000000000000067]	Motherboard resources
[0000000000000070 - 0000000000000070]	Motherboard resources
[0000000000000070 - 0000000000000077]	System CMOS/real time clock
[0000000000000078 - 000000000000CF7]	PCI Express Root Complex
[0000000000000080 - 000000000000008F]	Motherboard resources
[0000000000000092 - 0000000000000092]	Motherboard resources
[00000000000000A0 - 00000000000000A1]	Programmable interrupt controller
[00000000000000A4 - 00000000000000A5]	Programmable interrupt controller
[00000000000000A8 - 00000000000000A9]	Programmable interrupt controller
[00000000000000AC - 00000000000000AD]	Programmable interrupt controller
[00000000000000B0 - 00000000000000B1]	Programmable interrupt controller
[00000000000000B2 - 00000000000000B3]	Motherboard resources
[00000000000000B4 - 00000000000000B5]	Programmable interrupt controller
[00000000000000B8 - 00000000000000B9]	Programmable interrupt controller

	[00000000000000BC - 00000000000000BD] Programmable interrupt controller
	[000000000000002C8 - 000000000000002CF] Communications Port (COM2)
	[000000000000002D8 - 000000000000002DF] Communications Port (COM1)
	[000000000000003B0 - 000000000000003BB] Intel(R) HD Graphics
	[000000000000003C0 - 000000000000003DF] Intel(R) HD Graphics
	[00000000000000400 - 0000000000000047F] Motherboard resources
	[000000000000004D0 - 000000000000004D1] Programmable interrupt controller
	[00000000000000500 - 000000000000005FE] Motherboard resources
	[00000000000000600 - 0000000000000061F] Motherboard resources
	[00000000000000680 - 0000000000000069F] Motherboard resources
	[00000000000000D00 - 00000000000000FFF] PCI Express Root Complex
	[000000000000D000 - 000000000000DFFF] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Process
	[000000000000E000 - 000000000000E01F] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Process
	[000000000000E020 - 000000000000E03F] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Process
	[000000000000E040 - 000000000000E043] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Process
	[000000000000E050 - 000000000000E057] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Process
	[000000000000E060 - 000000000000E063] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Process
	[000000000000E070 - 000000000000E077] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Process
	[000000000000E080 - 000000000000E087] Intel(R) HD Graphics
	 Interrupt request (IRQ)
	 Memory



































## B.2 Memory Address Map


































































Address Range	Device Name
[0000000000A0000 - 0000000000BFFFFF]	Intel(R) HD Graphics
[0000000000A0000 - 0000000000BFFFFF]	PCI Express Root Complex
[0000000000C0000 - 0000000000DFFFFF]	PCI Express Root Complex
[0000000000E0000 - 0000000000FFFFFF]	PCI Express Root Complex
[0000000080000000 - 00000000FFFFFFF]	PCI Express Root Complex
[00000000C0000000 - 00000000CFFFFFFF]	Intel(R) HD Graphics
[00000000D0000000 - 00000000D03FFFFF]	Intel(R) HD Graphics
[00000000D0400000 - 00000000D04FFFFF]	Intel(R) Trusted Execution Engine Interface
[00000000D0500000 - 00000000D05FFFFF]	Intel(R) Trusted Execution Engine Interface
[00000000D0600000 - 00000000D061FFFFF]	Intel(R) I210 Gigabit Network Connection
[00000000D0600000 - 00000000D06FFFFF]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor P
[00000000D0620000 - 00000000D0623FFF]	Intel(R) I210 Gigabit Network Connection
[00000000D0700000 - 00000000D070FFFFF]	Intel(R) USB 3.0 eXtensible Host Controller - 0100 (Micr
[00000000D0710000 - 00000000D0713FFF]	High Definition Audio Controller
[00000000D0714000 - 00000000D071401F]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor P
[00000000D0716000 - 00000000D0716FFF]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor el
[00000000D0717000 - 00000000D0717FFF]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor el
[00000000D0718000 - 00000000D07187FF]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor A
[00000000D0719000 - 00000000D0719FFF]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor SI
[00000000D071A000 - 00000000D071AFFF]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor S
[00000000E0000000 - 00000000EFFFFFFF]	Motherboard resources
[00000000E00000D0 - 00000000E00000DB]	Intel(R) Sideband Fabric Device
[00000000FED00000 - 00000000FED003FF]	High precision event timer
[00000000FED01000 - 00000000FED01FFF]	Motherboard resources
[00000000FED03000 - 00000000FED03FFF]	Motherboard resources
[00000000FED04000 - 00000000FED04FFF]	Motherboard resources
[00000000FED08000 - 00000000FED08FFF]	Motherboard resources
[00000000FED1C000 - 00000000FED1CFFF]	Motherboard resources
[00000000FEE00000 - 00000000FEEFFFFFFF]	Motherboard resources
[00000000FEF00000 - 00000000FEFFFFFFF]	Motherboard resources
[00000000FF000000 - 00000000FFFFFFFFF]	Intel(R) 82802 Firmware Hub Device

































## B.3 IRQ Mapping Chart

































Interrupt request (IRQ)	
(ISA) 0x00000000 (00)	System timer
(ISA) 0x00000008 (08)	High precision event timer
(ISA) 0x0000000A (10)	Communications Port (COM2)
(ISA) 0x0000000B (11)	Communications Port (COM1)
(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
(ISA) 0x00000062 (98)	Microsoft ACPI-Compliant System
(ISA) 0x00000063 (99)	Microsoft ACPI-Compliant System
(ISA) 0x00000064 (100)	Microsoft ACPI-Compliant System
(ISA) 0x00000065 (101)	Microsoft ACPI-Compliant System
(ISA) 0x00000066 (102)	Microsoft ACPI-Compliant System
(ISA) 0x00000067 (103)	Microsoft ACPI-Compliant System
(ISA) 0x00000068 (104)	Microsoft ACPI-Compliant System
(ISA) 0x00000069 (105)	Microsoft ACPI-Compliant System
(ISA) 0x0000006A (106)	Microsoft ACPI-Compliant System
(ISA) 0x0000006B (107)	Microsoft ACPI-Compliant System

































 (ISA) 0x0000006C (108)	Microsoft ACPI-Compliant System
 (ISA) 0x0000006D (109)	Microsoft ACPI-Compliant System
 (ISA) 0x0000006E (110)	Microsoft ACPI-Compliant System
 (ISA) 0x0000006F (111)	Microsoft ACPI-Compliant System
 (ISA) 0x00000070 (112)	Microsoft ACPI-Compliant System
 (ISA) 0x00000071 (113)	Microsoft ACPI-Compliant System
 (ISA) 0x00000072 (114)	Microsoft ACPI-Compliant System
 (ISA) 0x00000073 (115)	Microsoft ACPI-Compliant System
 (ISA) 0x00000074 (116)	Microsoft ACPI-Compliant System
 (ISA) 0x00000075 (117)	Microsoft ACPI-Compliant System
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 (ISA) 0x00000079 (121)	Microsoft ACPI-Compliant System
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 (ISA) 0x0000007B (123)	Microsoft ACPI-Compliant System
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 (ISA) 0x0000007E (126)	Microsoft ACPI-Compliant System
 (ISA) 0x0000007F (127)	Microsoft ACPI-Compliant System
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 (ISA) 0x0000008B (139)	Microsoft ACPI-Compliant System

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 (ISA) 0x0000008E (142)	Microsoft ACPI-Compliant System
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 (ISA) 0x0000009C (156)	Microsoft ACPI-Compliant System
 (ISA) 0x0000009D (157)	Microsoft ACPI-Compliant System
 (ISA) 0x0000009E (158)	Microsoft ACPI-Compliant System
 (ISA) 0x0000009F (159)	Microsoft ACPI-Compliant System
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 (ISA) 0x000000A1 (161)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A2 (162)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A3 (163)	Microsoft ACPI-Compliant System
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 (ISA) 0x000000A6 (166)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A7 (167)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A8 (168)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A9 (169)	Microsoft ACPI-Compliant System
 (ISA) 0x000000AA (170)	Microsoft ACPI-Compliant System
 (ISA) 0x000000AB (171)	Microsoft ACPI-Compliant System

































 (ISA) 0x000000AC (172)	Microsoft ACPI-Compliant System
 (ISA) 0x000000AD (173)	Microsoft ACPI-Compliant System
 (ISA) 0x000000AE (174)	Microsoft ACPI-Compliant System
 (ISA) 0x000000AF (175)	Microsoft ACPI-Compliant System
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 (ISA) 0x000000B7 (183)	Microsoft ACPI-Compliant System
 (ISA) 0x000000B8 (184)	Microsoft ACPI-Compliant System
 (ISA) 0x000000B9 (185)	Microsoft ACPI-Compliant System
 (ISA) 0x000000BA (186)	Microsoft ACPI-Compliant System
 (ISA) 0x000000BB (187)	Microsoft ACPI-Compliant System
 (ISA) 0x000000BC (188)	Microsoft ACPI-Compliant System
 (ISA) 0x000000BD (189)	Microsoft ACPI-Compliant System
 (ISA) 0x000000BE (190)	Microsoft ACPI-Compliant System
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 (ISA) 0x00000109 (265)	Microsoft ACPI-Compliant System
 (ISA) 0x0000010A (266)	Microsoft ACPI-Compliant System
 (ISA) 0x0000010B (267)	Microsoft ACPI-Compliant System

































 (ISA) 0x0000010C (268)	Microsoft ACPI-Compliant System
 (ISA) 0x0000010D (269)	Microsoft ACPI-Compliant System
 (ISA) 0x0000010E (270)	Microsoft ACPI-Compliant System
 (ISA) 0x0000010F (271)	Microsoft ACPI-Compliant System
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 (ISA) 0x00000112 (274)	Microsoft ACPI-Compliant System
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 (ISA) 0x0000011B (283)	Microsoft ACPI-Compliant System
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 (ISA) 0x00000128 (296)	Microsoft ACPI-Compliant System
 (ISA) 0x00000129 (297)	Microsoft ACPI-Compliant System
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 (ISA) 0x0000012B (299)	Microsoft ACPI-Compliant System

































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 (ISA) 0x0000012D (301)	Microsoft ACPI-Compliant System
 (ISA) 0x0000012E (302)	Microsoft ACPI-Compliant System
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 (ISA) 0x0000013E (318)	Microsoft ACPI-Compliant System
 (ISA) 0x0000013F (319)	Microsoft ACPI-Compliant System
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 (ISA) 0x00000149 (329)	Microsoft ACPI-Compliant System
 (ISA) 0x0000014A (330)	Microsoft ACPI-Compliant System
 (ISA) 0x0000014B (331)	Microsoft ACPI-Compliant System

































 (ISA) 0x0000014C (332)	Microsoft ACPI-Compliant System
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 (ISA) 0x0000014E (334)	Microsoft ACPI-Compliant System
 (ISA) 0x0000014F (335)	Microsoft ACPI-Compliant System
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 (ISA) 0x00000169 (361)	Microsoft ACPI-Compliant System
 (ISA) 0x0000016A (362)	Microsoft ACPI-Compliant System
 (ISA) 0x0000016B (363)	Microsoft ACPI-Compliant System










































 (ISA) 0x0000016C (364)	Microsoft ACPI-Compliant System
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 (ISA) 0x0000016E (366)	Microsoft ACPI-Compliant System
 (ISA) 0x0000016F (367)	Microsoft ACPI-Compliant System
 (ISA) 0x00000170 (368)	Microsoft ACPI-Compliant System
 (ISA) 0x00000171 (369)	Microsoft ACPI-Compliant System
 (ISA) 0x00000172 (370)	Microsoft ACPI-Compliant System
 (ISA) 0x00000173 (371)	Microsoft ACPI-Compliant System
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 (ISA) 0x00000175 (373)	Microsoft ACPI-Compliant System
 (ISA) 0x00000176 (374)	Microsoft ACPI-Compliant System
 (ISA) 0x00000177 (375)	Microsoft ACPI-Compliant System
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 (ISA) 0x0000017C (380)	Microsoft ACPI-Compliant System
 (ISA) 0x0000017D (381)	Microsoft ACPI-Compliant System
 (ISA) 0x0000017E (382)	Microsoft ACPI-Compliant System
 (ISA) 0x0000017F (383)	Microsoft ACPI-Compliant System
 (ISA) 0x00000180 (384)	Microsoft ACPI-Compliant System
 (ISA) 0x00000181 (385)	Microsoft ACPI-Compliant System
 (ISA) 0x00000182 (386)	Microsoft ACPI-Compliant System
 (ISA) 0x00000183 (387)	Microsoft ACPI-Compliant System
 (ISA) 0x00000184 (388)	Microsoft ACPI-Compliant System
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 (ISA) 0x00000186 (390)	Microsoft ACPI-Compliant System
 (ISA) 0x00000187 (391)	Microsoft ACPI-Compliant System
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 (ISA) 0x0000018E (398)	Microsoft ACPI-Compliant System
 (ISA) 0x0000018F (399)	Microsoft ACPI-Compliant System
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 (ISA) 0x0000019B (411)	Microsoft ACPI-Compliant System
 (ISA) 0x0000019C (412)	Microsoft ACPI-Compliant System
 (ISA) 0x0000019D (413)	Microsoft ACPI-Compliant System
 (ISA) 0x0000019E (414)	Microsoft ACPI-Compliant System
 (ISA) 0x0000019F (415)	Microsoft ACPI-Compliant System
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 (ISA) 0x000001A5 (421)	Microsoft ACPI-Compliant System
 (ISA) 0x000001A6 (422)	Microsoft ACPI-Compliant System
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 (ISA) 0x000001A8 (424)	Microsoft ACPI-Compliant System
 (ISA) 0x000001A9 (425)	Microsoft ACPI-Compliant System
 (ISA) 0x000001AA (426)	Microsoft ACPI-Compliant System
 (ISA) 0x000001AB (427)	Microsoft ACPI-Compliant System

 (ISA) 0x000001AC (428)	Microsoft ACPI-Compliant System
 (ISA) 0x000001AD (429)	Microsoft ACPI-Compliant System
 (ISA) 0x000001AE (430)	Microsoft ACPI-Compliant System
 (ISA) 0x000001AF (431)	Microsoft ACPI-Compliant System
 (ISA) 0x000001B0 (432)	Microsoft ACPI-Compliant System
 (ISA) 0x000001B1 (433)	Microsoft ACPI-Compliant System
 (ISA) 0x000001B2 (434)	Microsoft ACPI-Compliant System
 (ISA) 0x000001B3 (435)	Microsoft ACPI-Compliant System
 (ISA) 0x000001B4 (436)	Microsoft ACPI-Compliant System
 (ISA) 0x000001B5 (437)	Microsoft ACPI-Compliant System
 (ISA) 0x000001B6 (438)	Microsoft ACPI-Compliant System
 (ISA) 0x000001B7 (439)	Microsoft ACPI-Compliant System
 (ISA) 0x000001B8 (440)	Microsoft ACPI-Compliant System
 (ISA) 0x000001B9 (441)	Microsoft ACPI-Compliant System
 (ISA) 0x000001BA (442)	Microsoft ACPI-Compliant System
 (ISA) 0x000001BB (443)	Microsoft ACPI-Compliant System
 (ISA) 0x000001BC (444)	Microsoft ACPI-Compliant System
 (ISA) 0x000001BD (445)	Microsoft ACPI-Compliant System
 (ISA) 0x000001BE (446)	Microsoft ACPI-Compliant System
 (ISA) 0x000001BF (447)	Microsoft ACPI-Compliant System
 (ISA) 0x000001C0 (448)	Microsoft ACPI-Compliant System
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 (ISA) 0x000001C8 (456)	Microsoft ACPI-Compliant System
 (ISA) 0x000001C9 (457)	Microsoft ACPI-Compliant System
 (ISA) 0x000001CA (458)	Microsoft ACPI-Compliant System
 (ISA) 0x000001CB (459)	Microsoft ACPI-Compliant System

 (ISA) 0x000001CC (460)	Microsoft ACPI-Compliant System
 (ISA) 0x000001CD (461)	Microsoft ACPI-Compliant System
 (ISA) 0x000001CE (462)	Microsoft ACPI-Compliant System
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 (ISA) 0x000001D7 (471)	Microsoft ACPI-Compliant System
 (ISA) 0x000001D8 (472)	Microsoft ACPI-Compliant System
 (ISA) 0x000001D9 (473)	Microsoft ACPI-Compliant System
 (ISA) 0x000001DA (474)	Microsoft ACPI-Compliant System
 (ISA) 0x000001DB (475)	Microsoft ACPI-Compliant System
 (ISA) 0x000001DC (476)	Microsoft ACPI-Compliant System
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 (ISA) 0x000001DE (478)	Microsoft ACPI-Compliant System
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 (ISA) 0x000001E9 (489)	Microsoft ACPI-Compliant System
 (ISA) 0x000001EA (490)	Microsoft ACPI-Compliant System
 (ISA) 0x000001EB (491)	Microsoft ACPI-Compliant System

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	(ISA) 0x000001F7 (503)	Microsoft ACPI-Compliant System
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	(ISA) 0x000001F9 (505)	Microsoft ACPI-Compliant System
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	(ISA) 0x000001FB (507)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FC (508)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FD (509)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FE (510)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FF (511)	Microsoft ACPI-Compliant System
	(PCI) 0x00000003 (03)	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Platform Control
	(PCI) 0x00000010 (16)	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Roo
	(PCI) 0x00000011 (17)	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Roo
	(PCI) 0x00000012 (18)	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor SD Host Controlle
	(PCI) 0x00000012 (18)	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Roo
	(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 - Roo
	(PCI) 0x00000016 (22)	High Definition Audio Controller
	(PCI) 0x00000017 (23)	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor eMMC Host Cont
	(PCI) 0xFFFFFFF6 (-10)	Intel(R) Trusted Execution Engine Interface
	(PCI) 0xFFFFFFF7 (-9)	Intel(R) USB 3.0 eXtensible Host Controller - 0100 (Microsoft)
	(PCI) 0xFFFFFFF8 (-8)	Intel(R) HD Graphics
	(PCI) 0xFFFFFFF9 (-7)	Intel(R) I210 Gigabit Network Connection
	(PCI) 0xFFFFFFFA (-6)	Intel(R) I210 Gigabit Network Connection
	(PCI) 0xFFFFFFFB (-5)	Intel(R) I210 Gigabit Network Connection
	(PCI) 0xFFFFFFFC (-4)	Intel(R) I210 Gigabit Network Connection
	(PCI) 0xFFFFFFFD (-3)	Intel(R) I210 Gigabit Network Connection
	(PCI) 0xFFFFFFF0 (-2)	Intel(R) I210 Gigabit Network Connection
	Memory	

# Appendix C

---

Programming Digital I/O

## C.1 Digital I/O Sample Program

---

```
*****
```

```
BASE: 0xFED0C000h
```

```
Pin 0: BASE+4D0h+08h
```

```
Pin 1: BASE +4F0h+08h
```

```
Pin 2: BASE +530h+08h
```

```
Pin 3: BASE +4E0h+08h
```

```
Pin 5: BASE +0A0h+08h
```

```
Pin 6: BASE +0B0h+08h
```

```
Pin 7: BASE +510h+08h
```

```
Pin 8: BASE +500h+08h
```

```
Pin 9: BASE +520h+08h
```

```
Pin 10: BASE +050h+08h
```

```
Pin 11: BASE +030h+08h
```

```
SAMPLE CODE
```

```
//For Pin0
```

```
#define PAD_VAL_REG 0x8
```

```
DWORD dwBaseAddr = 0xFED0C4D0; // Depend on which pin
```

```
HRESULT DioPinGetDirection( BOOL* pbInput )
```

```
{ //bit = 1 if input, bit = 0 if output
```

```
    HRESULT hr = S_FALSE;
```

```
    BOOL bRet = FALSE;
```

```
    DWORD dwData = 0x00000000;
```

```
bRet = read_mem_dword(dwBaseAddr + PAD_VAL_REG, &dwData);
```

```
if( bRet )  
{  
    if(( dwData & 0x00000002) == 0x00000002)  
        *pbInput = TRUE;  
    else  
        *pbInput = FALSE;  
  
    hr = S_OK;  
}
```

```
return hr;
```

```
}
```

```
HRESULT DioPinSetDirection( BOOL bInput )
```

```
{ //bit = 1 if input, bit = 0 if output
```

```
if( !hInst )
```

```
return S_FALSE;
```

```
HRESULT hr = S_FALSE;
```

```
BOOL bRet = FALSE;
```

```
DWORD dwData = 0x00000000;
```

```
bRet = read_mem_dword(dwBaseAddr + PAD_VAL_REG, &dwData);
```



```
if( bRet )
{
    if(bInput)
        dwData = dwData | 0x00000002;
    else
        dwData = dwData & ~0x00000002;

    bRet = write_mem_dword(dwBaseAddr + PAD_VAL_REG, &dwData);

    if(bRet)
        hr = S_OK;
}

return hr;
}

HRESULT DioPinGetData( BOOL* pbHigh )
{
    if( !hInst )
        return S_FALSE;

    HRESULT hr = S_FALSE;
    BOOL bRet = FALSE;
    DWORD dwData = 0x00000000;

    bRet = read_mem_dword(dwBaseAddr + PAD_VAL_REG, &dwData);

    if( bRet )
```

```
{
    if((dwData & 0x00000001) == 0x00000001)
        *pbHigh = TRUE;
    else
        *pbHigh = FALSE;

    hr = S_OK;
}

return hr;
}

HRESULT DioPinSetData( BOOL bHigh )
{
    if( !hInst )
        return S_FALSE;

    HRESULT hr = S_FALSE;
    BOOL bRet = FALSE;
    DWORD dwData = 0x00000000;

    bRet = read_mem_dword(dwBaseAddr + PAD_VAL_REG, &dwData);

    if( bRet )
    {
        if((dwData & 0x00000002) != 0x00000002)
        {
            if(bHigh)
```

```
        dwData = dwData | 0x00000001;
    else
        dwData = dwData & ~0x00000001;
    }

    bRet = write_mem_dword(dwBaseAddr + PAD_VAL_REG,
&dwData);

    if(bRet)
        hr = S_OK;
    }

    return hr;
}
*****
*
```

# Appendix D

---

eMMC Settings

## D.1 eMMC Formot for Windows® 7 or Later

---

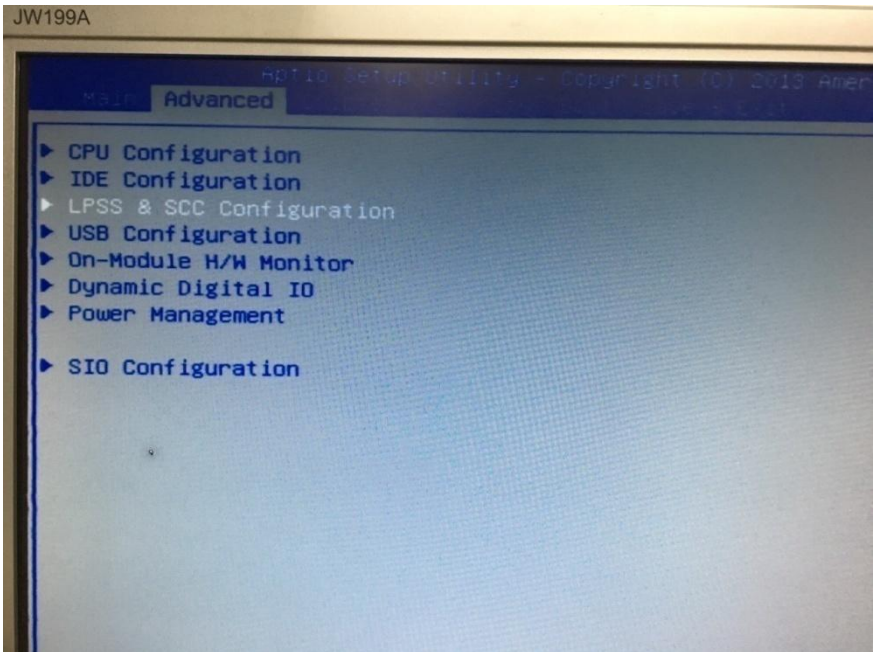
Both the NanoCOM-BT/BT4 and uCOM-BT have the option for eMMC storage. In order to properly install Microsoft Windows® 7 or later on eMMC, please format your eMMC to FAT32

## D.2 Installing Windows® 7 on eMMC

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While Windows® 7 doesn't support eMMC natively, some changes in the BIOS are required so that the EMMC can be detected by the system.

1. Go to BIOS/Advanced/ LPSS & SCC Configuration



2. Change the Device Mode to PCI Mode

