BOXER-6404

Intel® Celeron®/ Atom™ Processor

LAN, HDMI, USB, COM

Distributed by:
TEXIM EUROPE
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BOXER-6404 Manual 1st Ed.
September 8, 2015

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Packing List

Before you begin operating your PC, please make sure that the following materials have been shipped:

- 1 BOXER-6404 Embedded Box PC
- 1 Power Adapter
- 1 DVD-ROM for manual (in PDF format) and Drivers

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

Safety & Warranty

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

1. Disconnect this device from any AC supply before cleaning.
2. While cleaning, use a damp cloth instead of liquid or spray detergents.
3. For any pluggable equipment, the power outlet must be installed near the device and easily accessible.
4. Keep this device away from humidity.
5. Place this device on a solid surface during installation. Dropping it or letting it fall could cause damage.
6. The openings on the device's enclosure are for dissipating heat. DO NOT COVER THE OPENINGS.
7. Watch out for high temperatures that may occur during system operation.
8. Make sure the voltage of the power source is correct before connecting the device to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the device should be noted.
11. 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.
12. Never pour any liquid into the openings. This could cause fire or electric shock.

13. 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 devices.

14. 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**

15. DO NOT LEAVE THIS DEVICE IN AN UNCONTROLLED ENVIRONMENT WHERE THE STORAGE TEMPERATURE IS BELOW -30° C (-22°F) OR ABOVE 80° C (176° F) TO PREVENT DAMAGE.

FCC

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

Caution:

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

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
产品中有毒有害物质或元素名称及含量
AAEON Boxer/ Industrial System

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

O：表示该有毒有害物质在该部件所有均质材料中的含量均在 **SJ/T 11363-2006** 标准规定的限量要求以下。

X：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 **SJ/T 11363-2006** 标准规定的限量要求。

备注：
一、此产品所标示之环保使用期限，系指在一般正常使用状况下。
二、上述部件物质中央处理器、内存、硬盘、电源为选购品。

China RoHS Requirements

Poisonous or Hazardous Substances or Elements in Products

AAEON Embedded Box PC/ Industrial System

Component	Poisonous or Hazardous Substances or Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (Cr(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
PCB & Other Components	X	O	O	O	O	O
Wires & Connectors for External Connections	X	O	O	O	O	O
Chassis	X	O	O	O	O	O
CPU & RAM	X	O	O	O	O	O
Hard Disk	X	O	O	O	O	O
PSU	X	O	O	O	O	O

O：The quantity of poisonous or hazardous substances or elements found in each of the component's parts is below the SJ/T 11363-2006-stipulated requirement.

X: The quantity of poisonous or hazardous substances or elements found in at least one of the component's parts is beyond the SJ/T 11363-2006-stipulated requirement.

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

Contents

Chapter 1 General Information

1.1 Introduction 1-2
1.2 Features 1-3
1.3 Specifications 1-4

Chapter 2 Quick Installation Guide

2.1 Product Overview 2-2
2.2 Setting Jumpers 2-3
2.3 List of Jumpers 2-4
2.3.1 Clear CMOS (JP12 pin 1,3,5) 2-5
2.3.2 Auto Power Button Enable/ Disable Selection (JP12 pin 2,4,6) 2-5
2.3.3 Push Power Button with Orange LED (SW1) 2-5
2.4 List of Connectors 2-7
2.4.1 COM Port RS-232 (CN1) 2-9
2.4.2 +12 V Input (CN2) 2-9
2.4.3 LAN (RJ-45) Port 1,2,3,4 (JP3,4,5,6) 2-10
2.4.4 +5 V Output for SATA HDD (CN7) 2-10
2.4.5 SATA Port (CN8) 2-11
2.4.6 DDR3L SO-DIMM Slot (CN9) 2-11
2.4.7 C-FAST Card Connector (CN11) 2-11
2.4.8 MiniCard Slot (CN13) (USB Port2 Only) 2-13
2.4.9 Battery (CN14) 2-15
2.4.10 USB 3.0 Port 0 (CN17) 2-15
2.4.11 USB 2.0 Port 1,3 (CN18,19) 2-16

2.4.12 HDMI Port 1,2 (CN20,21) 2-17
2.4.13 LPC Port (CN22) 2-18
2.4.14 SPI Programming Header (CN23) 2-19

Chapter 3 AMI BIOS Setup

3.1 System Test and Initialization. 3-2
3.2 AMI BIOS Setup 3-3

Chapter 4 Driver Installation

4.1 Installation 4-3

Appendix A Programming The Watchdog Timer

A.1 Watchdog Timer Registers A-2
A.2 Watchdog Sample Program.....A-3

Appendix B I/O Information

B.1 I/O Address Map B-2
B.2 Memory Address Map B-4
B.3 IRQ Mapping Chart B-5

Appendix C Electrical Specifications for I/O Ports

C.1 Electrical Specifications for I/O Ports C-2

Chapter

1

General Information

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1.1 Introduction

AAEON introduces the slim BOXER-64 series embedded box PCs, with the Intel® Celeron®/ Atom™ processors: this box PC expands its graphics performance greatly with the newest generation of Celeron®/ Atom™ processors.

So far, there is no other boxer PC can be so small and slim like the BOXER-64 series, not even PICO-ITX system. With this tiny form factor, customers can fit it almost anywhere, and it provides quite a lot of I/O ports for basic applications. BOXER-6404 adopts a reliable fanless design for most rugged environment. It also provides wireless communication features for users wishing to build up a network connection at any locations.

The BOXER-6404 is a standalone high performance PC designed for extended operation and with high reliability. It can replace traditional methods and become the mainstream boxer PC for diversified markets.

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1.2 Features

- Slim Design
- 4 LAN, 2 HDMI
- Supports Wide Operating Temperature

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1.3 Specifications

● CPU		Intel® Atom™ N2807/ Celeron® J1900
● Chipset		-
● System Memory		204-pin DDR3L 1333 MHz SODIMM x 1, up to 8 GB, (J1900) 204-pin DDR3L 1333 MHz SODIMM x 1, up to 4 GB, (N2807)
● Display Interface	HDMI	HDMI x 2
● Storage Device	CF-SATA	CFast™ x 1
● Network	LAN	Gigabit Ethernet
	Wireless	Optional
● Front I/O	USB Host	USB 2.0 x 2, USB 3.0 x 1
	LAN	—
	Serial Port	—
	DIO	—
	Audio	—
	KB/MS	—
	Others	Power On/Off button x 1, HDMI x 2
● Rear I/O	USB Host	—
	LAN	RJ-45 x 4
	Serial Port	RS-232 x 1
	DIO	—

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	Audio	—
	KB/MS	—
	Others	—
● Expansion	PCIe	—
	PCI	—
	MiniCard	Half MiniCard x 1 (USB Only)
	Mini PCI	—
	Others	—
● Indicator	Front	—
	Rear	—
● Power Requirement		12 V DC-in with lockable connector ATX mode (optional AT by jumper/ BIOS setting)
● System Cooling		Passive cooling
● Mounting		Wall-mount
● Operating Temperature		-20~ 50°C with 0.5 m/s Air Flow (J1900) -20 ~ 60°C with 0.5 m/s Air Flow (N2807)
● Storage Temperature		-30 ~ 80°C (-22 ~ 176°F)
● Anti-Vibration		5 Grms/ 5~500 Hz/ operation (CFast)
● Anti-Shock		50 G peak acceleration (11 msec. duration) – (CFast)
● Certification	EMC	CE/FCC Class A
	Safety	—

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● Dimension (W x H x D)	166 x 106.6 x 30 mm (6.5 x 4.2 x 1.2")
● OS Support	Windows® Embedded Standard 8 32/64-bit, Windows® Embedded Standard 7 32/64-bit, Windows® 8.1 32/64-bit Windows® 7 32/64-bit Linux by Fedora kernel 2.6.3 up

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Chapter

2

Quick Installation Guide

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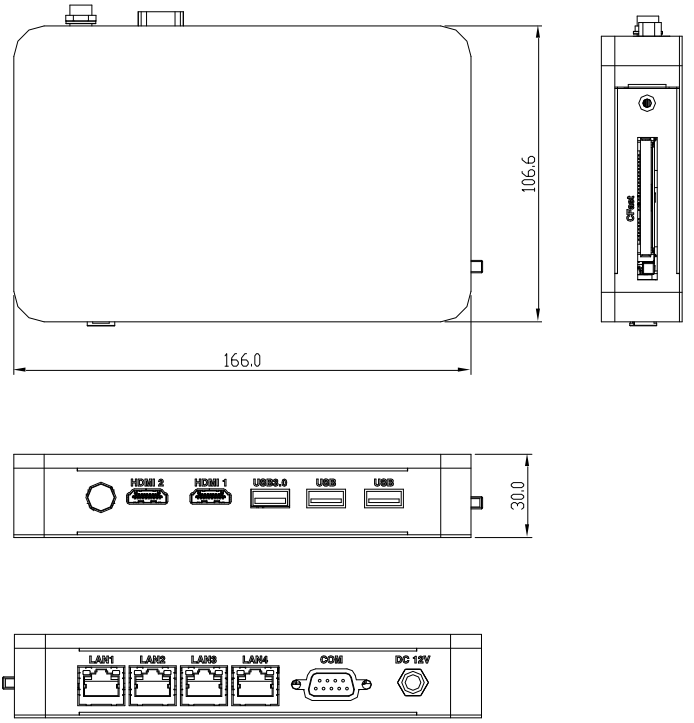
2.1 Product Overview

Units in mm



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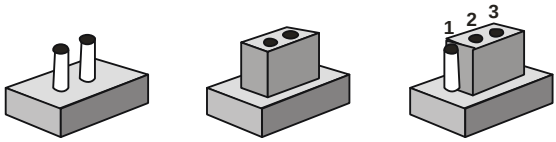
2.2 Setting Jumpers

You configure your card to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” a jumper you connect the pins with the clip.

To “open” a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2 and 3. In this case you would connect either pins 1 and 2 or 2 and 3.



Open **Closed** **Closed 2-3**

A pair of needle-nose pliers may be helpful when working with jumpers.

If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any change.

In general, you simply need a standard cable to make most connections.

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2.3 List of Jumpers

The board has a number of jumpers that allow you to configure your system to suit your application.

The table below shows the function of each of the board's jumpers:

Label	Function
JP12 (1,3,5)	Clear CMOS Jumper
JP12 (2,4,6)	Auto Power Button Enable/ Disable Selection
SW1	Push Power Button with Orange LED

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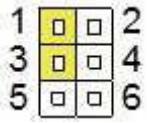
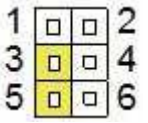
2.3.1 Clear CMOS (JP12 pin 1, 3, 5)

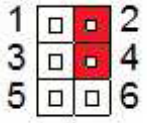


Normal (Default)

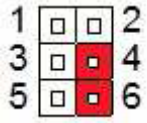


Clear CMOS

2.3.2 Auto Power Button Enable/ Disable Selection (JP12 pin 2, 4, 6)

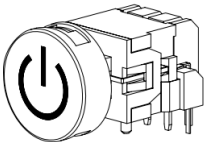


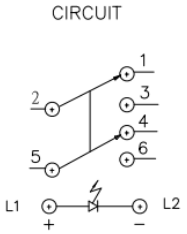
Enable



Disable (Default)

2.3.3 Push Power Button with Orange LED (SW1)





Pin	Pin Name	Signal Type	Signal Level
L1	+V5S	IN	+5V
L2	GND	GND	GND
1	NC		

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2	PWRBTN#	OUT	
3	GND	GND	GND
4	NC		
5	NC		
6	NC		

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2.4 List of Connectors

The board has a number of connectors that provides access to external devices such as storage devices, power units, expansion ports, etc.

The table below shows the function of each of the board's connectors:

Label	Function
CN1	COM port RS-232
CN2	+12 V Input
CN3	LAN (RJ-45) Port
CN4	LAN (RJ-45) Port
CN5	LAN (RJ-45) Port
CN6	LAN (RJ-45) Port
CN7	+5V Output for SATA HDD
CN8	SATA Port
CN9	DDR3L SO-DIMM Slot
CN11	C-FAST CARD Connector
CN13	MiniCard Slot (USB2.0 port 2 ONLY)
CN14	Battery
CN17	USB3.0 port 0
CN18	USB2.0 port 3
CN19	USB2.0 port 1
CN20	HDMI1 Port
CN21	HDMI 2 Port

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CN22	LPC Expansion Connector
CN23	SPI Programming Header

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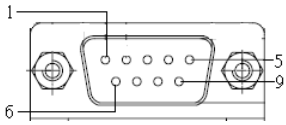
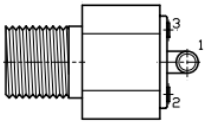
2.4.1 COM Port RS-232 (CN1)



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

2.4.2 +12 V Input (CN2)



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

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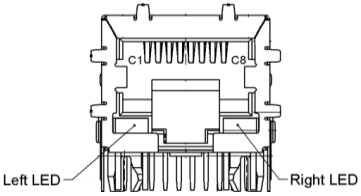
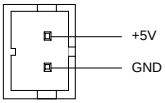
2.4.3 LAN (RJ-45) Port 1,2,3,4 (JP3,4,5,6)



Pin	Pin Name	Signal Type	Signal Level
C1	MDI0+	DIFF	
C2	MDI0-	DIFF	
C3	MDI1+	DIFF	
C4	MDI2+	DIFF	
C5	MDI2-	DIFF	
C6	MDI1-	DIFF	
C7	MDI3+	DIFF	
C8	MDI3-	DIFF	

2.4.4 +5 V Output for SATA HDD (CN7)



Pin	Pin Name	Signal Type	Signal Level
1	+V5S	PWR	+5V
2	GND	GND	

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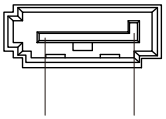
2.4.5 SATA Port (CN8)



Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	SATA_TXP1	DIFF	
3	SATA_TXN1	DIFF	
4	GND	GND	
5	SATA_RXN1	DIFF	
6	SATA_RXP1	DIFF	
7	GND	GND	

2.4.6 DDR3L SO-DIMM Slot (CN9)

Standard Specification

2.4.7 C-FAST Card Connector (CN11)

Pin	Pin Name	Signal Type	Signal Level
S1	GND	GND	
S2	SATA_TXP0	DIFF	
S3	SATA_TXN0	DIFF	
S4	GND	GND	

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S5	SATA_RXN0	DIFF	
S6	SATA_RXP0	DIFF	
S7	GND	GND	
P1	NC		
P2	GND	GND	
P3	NC		
P4	NC		
P5	NC		
P6	NC		
P7	GND	GND	
P8	CFD_LED#	OUT	+3.3 V
P9	NC		
P10	NC		
P11	NC		
P12	NC		
P13	+V3.3S	PWR	+3.3 V
P14	+V3.3S	PWR	+3.3 V
P15	GND	GND	
P16	GND	GND	
P17	NC		

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2.4.8 MiniCard Slot (CN13) (USB Port2 Only)

Pin	Pin Name	Signal Type	Signal Level
1	WAKE_PCIE0#_3P3	IN	
2	+V3.3A	PWR	+3.3 V
3	NC		
4	GND	GND	
5	NC		
6	+V1.5S	PWR	+1.5 V
7	NC	IN	
8	NC	PWR	
9	GND	GND	
10	NC	I/O	
11	NC	DIFF	
12	NC	IN	
13	NC	DIFF	
14	NC	IN	
15	GND	GND	
16	NC	PWR	
17	NC		
18	GND	GND	
19	NC		
20	WL_DISABLED0#	OUT	+3.3 V
21	GND	GND	

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22	BUF_PLT_RST#	OUT	+3.3 V
23	NC	DIFF	
24	+V3.3A	PWR	+3.3 V
25	NC	DIFF	
26	GND	GND	
27	GND	GND	
28	+V1.5S	PWR	+1.5 V
29	GND	GND	
30	SMB_CLK_3P3_FA	I/O	+3.3 V
31	NC	DIFF	
32	SMB_DATA_3P3_FA	I/O	+3.3 V
33	NC	DIFF	
34	GND	GND	
35	GND	GND	
36	USB_DN2	DIFF	
37	GND	GND	
38	USB_DP2	DIFF	
39	+V3.3A	PWR	+3.3 V
40	GND	GND	
41	+V3.3A	PWR	+3.3 V
42	NC		
43	NC		
44	NC		
45	NC		

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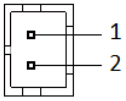
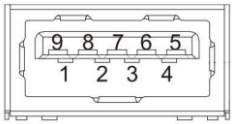
46	NC		
47	NC		
48	+V1.5S	PWR	+1.5 V
49	NC		
50	GND	GND	
51	NC		
52	+V3.3A	PWR	+3.3 V

2.4.9 Battery (CN14)



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

2.4.10 USB 3.0 Port 0 (CN17)



Pin	Pin Name	Signal Type	Signal Level
1	+5VSB	PWR	+5 V
2	USB0_D-	DIFF	

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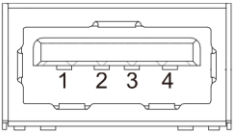
3	USB0_D+	DIFF
4	GND	GND
5	USB0_SSRX−	DIFF
6	USB0_SSRX+	DIFF
7	GND	GND
8	USB0_SSTX-	DIFF
9	USB0_SSTX+	DIFF

2.4.11 USB 2.0 Port 1, 3 (CN18,19)

Standard USB Connector



Pin	Pin Name	Signal Type	Signal Level
1	+5VSB	PWR	+5 V
2	USB1_D-	DIFF	
3	USB1_D+	DIFF	
4	GND	GND	

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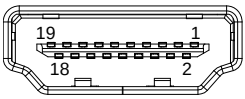
2.4.12 HDMI Port 1, 2 (CN20,21)



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	
9	TMDS_DAT0-	DIFF	
10	TMDS_CLK+	DIFF	
11	GND	GND	
12	TMDS_CLK-	DIFF	
13	NC		
14	NC		
15	DDC_CLK	I/O	+5 V

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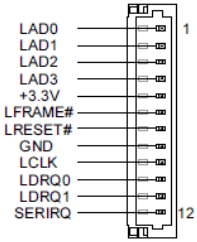
16	DDC_DATA	I/O	+5 V
17	GND	GND	
18	+5V	I/O	+5 V
19	HPLG_DETECT	IN	

2.4.13 LPC Port (CN22)



Pin	Pin Name	Signal Type	Signal Level
1	LAD0	I/O	+3.3 V
2	LAD1	I/O	+3.3 V
3	LAD2	I/O	+3.3 V
4	LAD3	I/O	+3.3 V
5	+V3.3S	PWR	+3.3 V
6	LFRAME#	IN	
7	LRESET#	OUT	+3.3 V
8	GND	GND	
9	LCLK	OUT	

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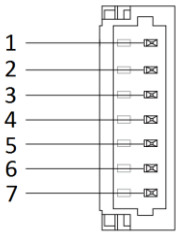
10	LDRQ0	IN	
11	LDRQ1	IN	
12	SERIRQ	I/O	+3.3 V

2.4.14 SPI Programming Header (CN23)



Pin	Pin Name	Signal Type	Signal Level
1	SPI_SO_F	OUT	
2	GND	GND	
3	SPI_CLK_F	IN	
4	+V3.3A_SPI	PWR	+3.3 V
5	SPI_SI_F	IN	
6	SPI_CS0#_F	IN	
7	NC		

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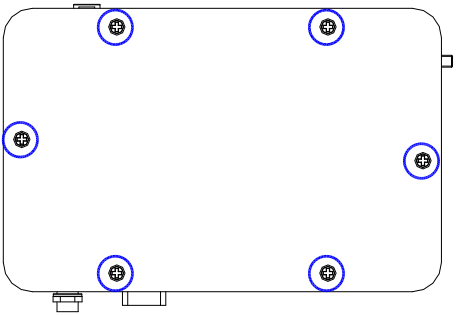
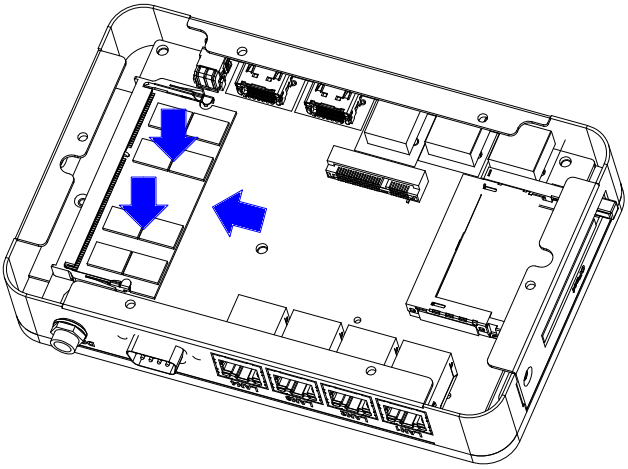
2.5 Installing DRAM

1. Remove the screws as shown below



2. Slot in the RAM diagonally into the slot, push down to secure.



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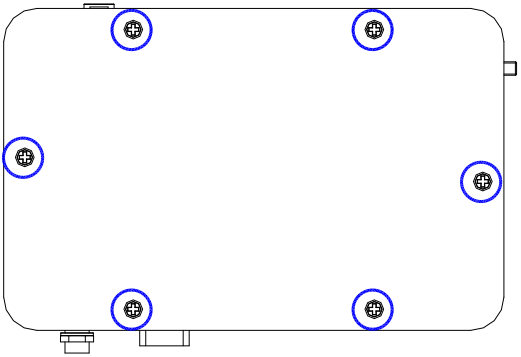
3. Re-tighten the screws



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Chapter

3

AMI BIOS Setup

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3.1 System Test and Initialization

These routines test and initialize board hardware. If the routines encounter an error during the tests, you will either hear a few short beeps or see an error message on the screen. There are two kinds of errors: fatal and non-fatal. The system can usually continue the boot up sequence with non-fatal errors.

System configuration verification

These routines check the current system configuration stored in the CMOS memory and BIOS NVRAM. If system configuration is not found or system configuration data error is detected, system will load optimized default and re-boot with this default system configuration automatically.

There are four situations in which you will need to setup system configuration:

1. You are starting your system for the first time
2. You have changed the hardware attached to your system
3. The system configuration is reset by Clear-CMOS jumper
4. The CMOS memory has lost power and the configuration information has been erased.

The BOXER-6404 CMOS memory has an integral lithium battery backup for data retention. However, you will need to replace the complete unit when it finally runs out.

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3.2 AMI BIOS Setup

AMI BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed CMOS RAM and BIOS NVRAM so that it retains the Setup information when the power is turned off.

Entering Setup

Power on the computer and press <Del>or <F2> immediately. This will allow you to enter Setup.

Main

Set the date, use tab to switch between date elements.

Advanced

Enable disable boot option for legacy network devices.

Chipset

Host bridge parameters.

Boot

Enables/disable quiet boot option.

Security

Set setup administrator password.

Save & Exit

Exit system setup after saving the changes.

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Setup Menu

Setup submenu: Main

Press “Delete” to enter Setup

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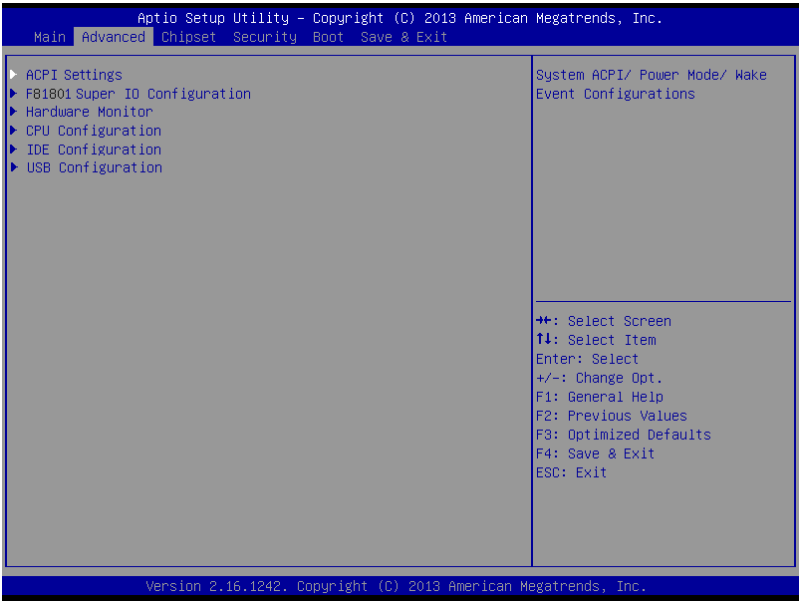
Setup submenu: Advanced



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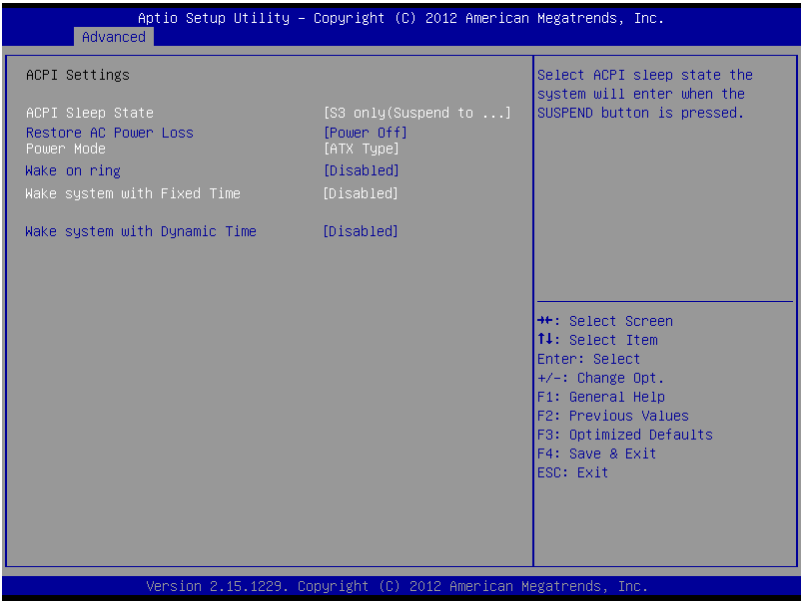
Advanced -> ACPI Settings



Options summary:

ACPI Sleep State	Suspend Disabled	
	S3 (Suspend to RAM)	Optimal Default, Failsafe Default
Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.		
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		

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Power Mode	ATX Type	Optimal Default, Failsafe Default
	AT Type	
Select power supply mode		
Wake on Ring	Disabled	Optimal Default, Failsafe Default
	Enabled	
En/Disabled wake from ring		
Wake system with Fixed Time	***Disabled***	
	Enabled	
Enable or disable System wake on alarm event. Wake up time is setting by following settings.		
Wake up day	0-31	
Select 0 for daily system wake up		
Wake up hour	0-23	
Wake up minute	0-59	
Wake up second	0-59	
Wake system with Dynamic Time	***Disabled***	
	Enabled	

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Enable or disable System wake on alarm event. Wake up time is current time + Increase minutes.		
Wake up minute increase	1-5	

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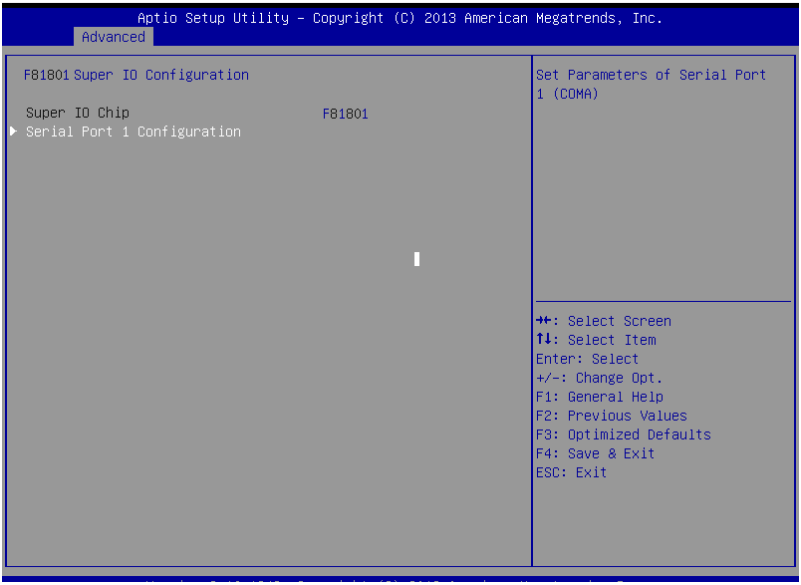
Advanced -> F81801 Super IO Configuration



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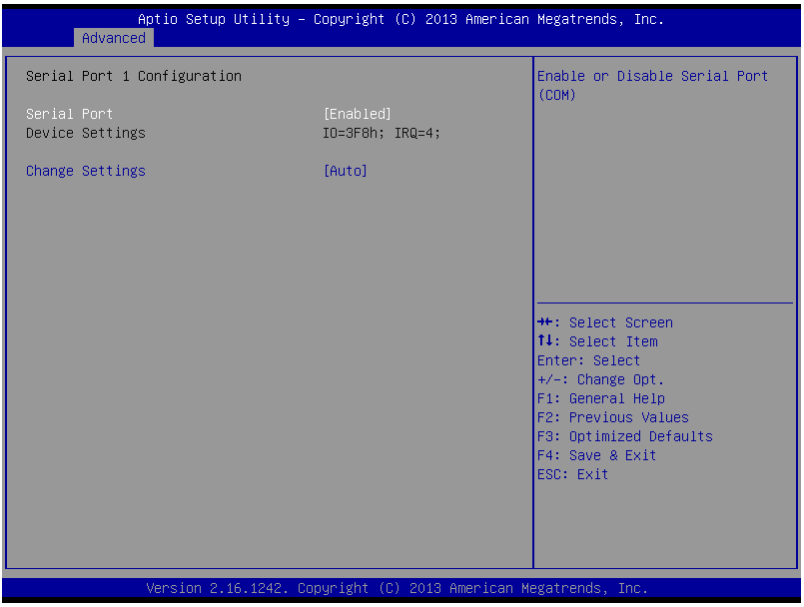
Advanced -> Super IO Configuration Serial Port 1 Configuration



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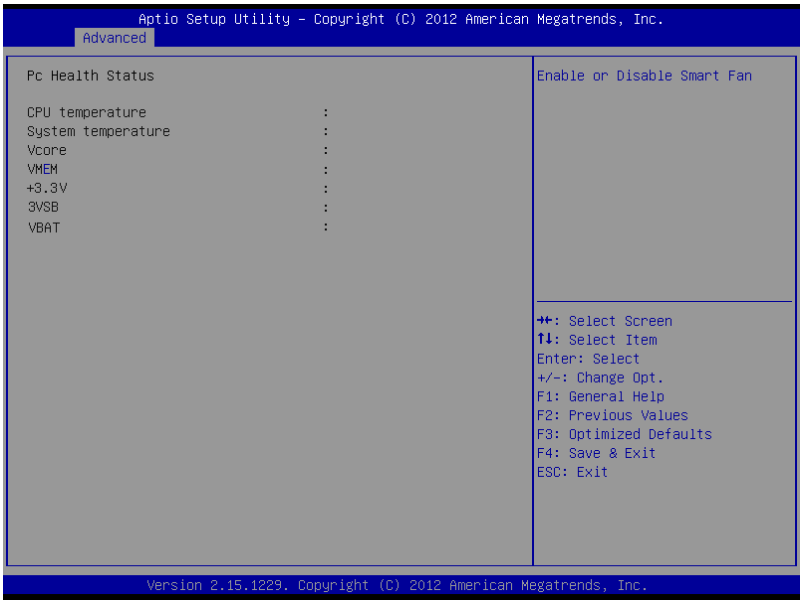
Advanced -> H/W Monitor



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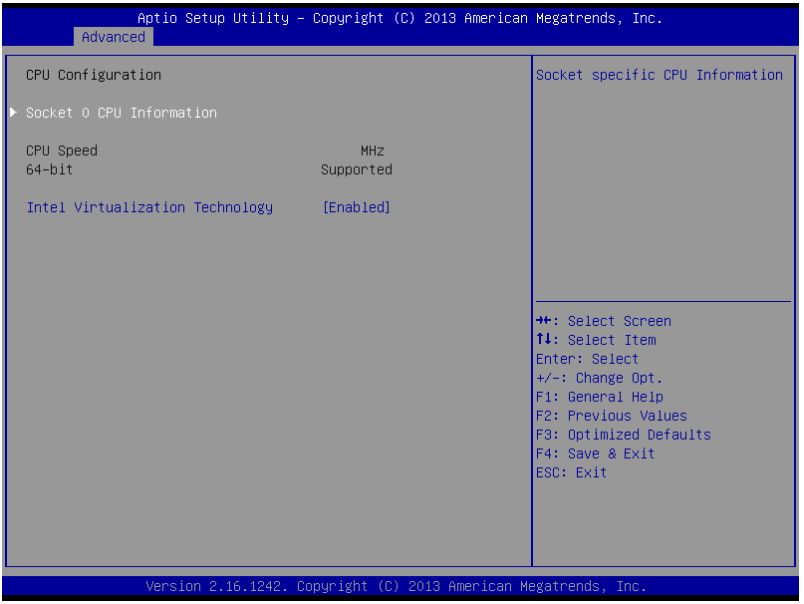
Advanced -> CPU Configuration



Options summary:

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

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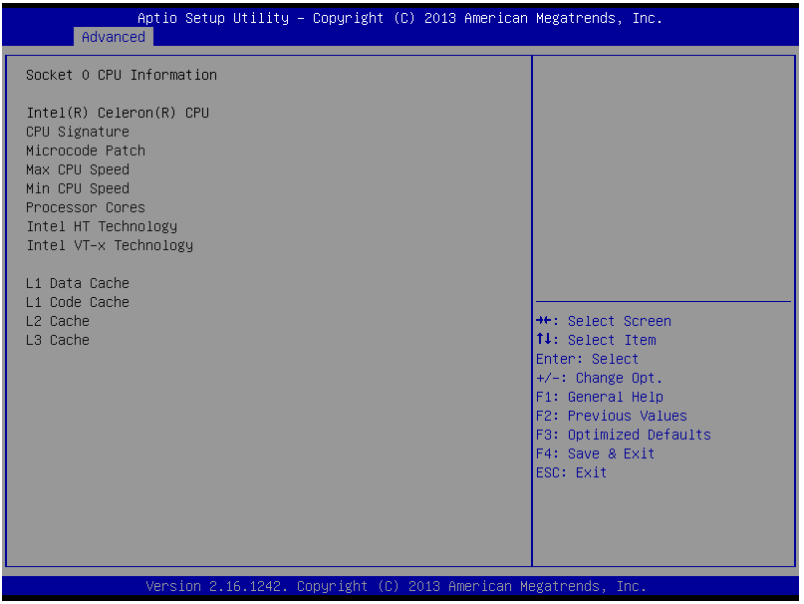
Advanced -> CPU Configuration Socket 0 CPU Information



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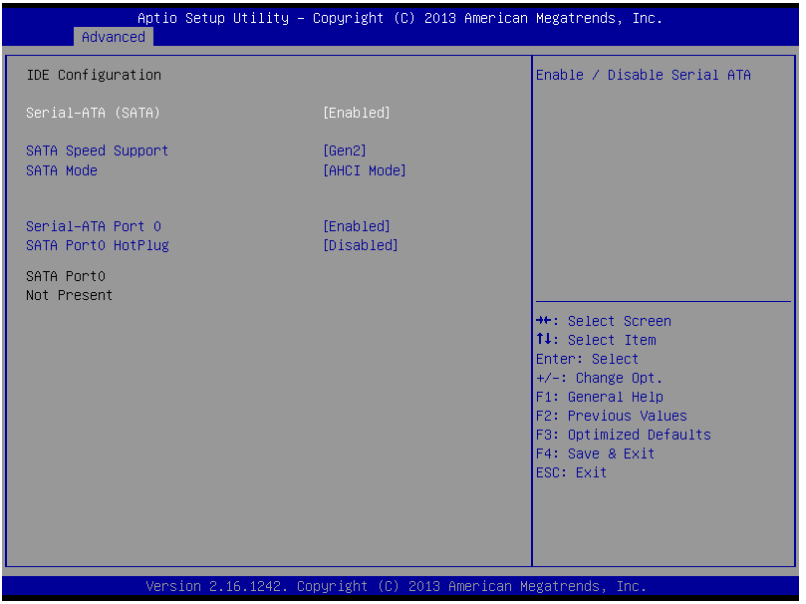
Advanced -> SATA Configuration



Options summary:

Serial-ATA (SATA)	Enabled	Default
	Disabled	
En/Disable SATA		
SATA Speed Support	Gen1	
	Gen2	Default
SATA Speed Support Gen1 or Gen2		
SATA Mode	IDE	
	AHCI	Default

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IDE: Configure SATA controllers as legacy IDE AHCI: Configure SATA controllers to operate in AHCI mode		
Serial-ATA Port 0	Enabled	Default
	Disabled	
En/Disable SATA Port		
SATA Port1 HotPlug	Enabled	
	Disabled	Default
En/Disable SATA Port Hotplug		

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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		
Device Name (Emulation	Auto	Optimal Default, Failsafe Default

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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)		

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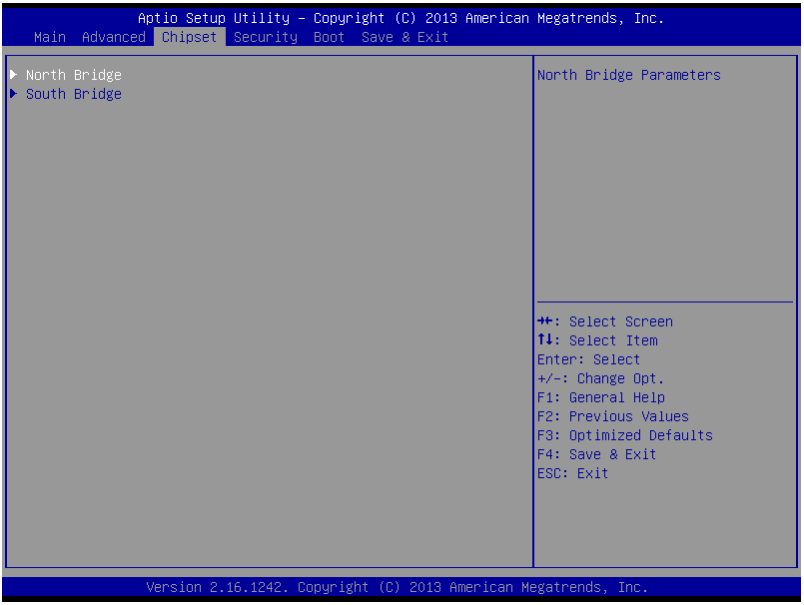
Chipset



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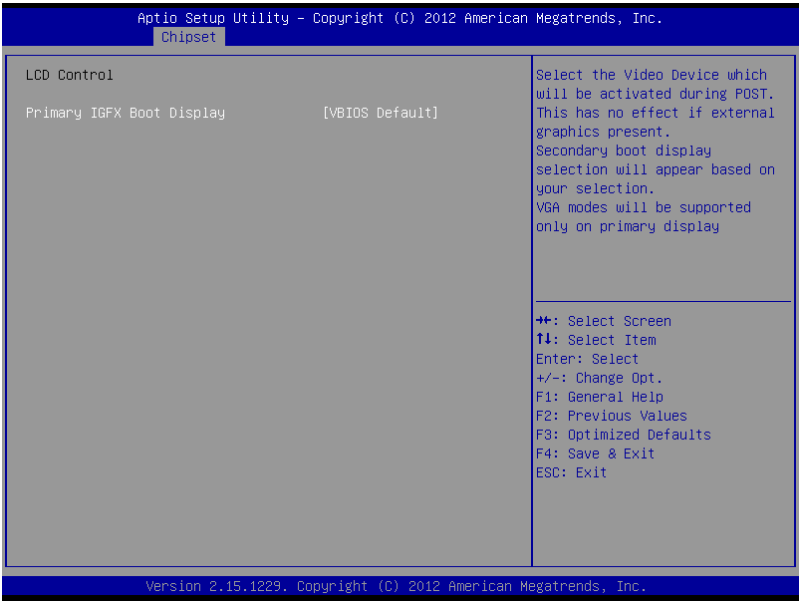
Chipset -> Host Bridge



Options summary:

Primary IGFX Boot Display	VBIOS Default	Optimal Default, Failsafe Default
	HDMI1	
	HDMI2	
Select the Video device		

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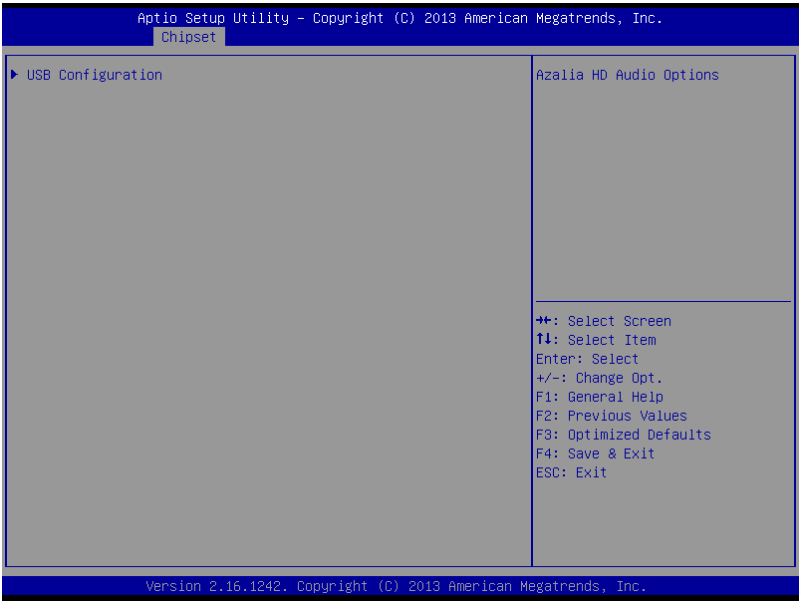
Chipset -> South Bridge



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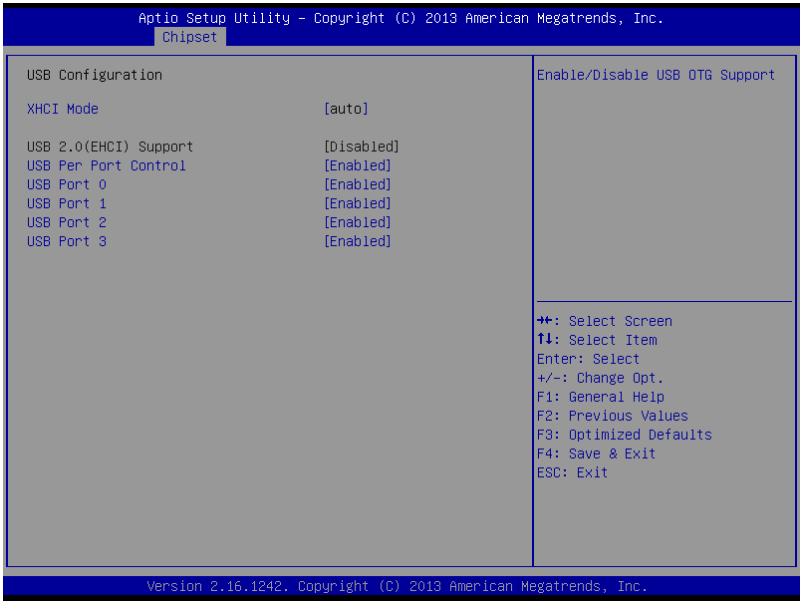
Chipset -> South Bridge -> USB Configuration (Default Setting)



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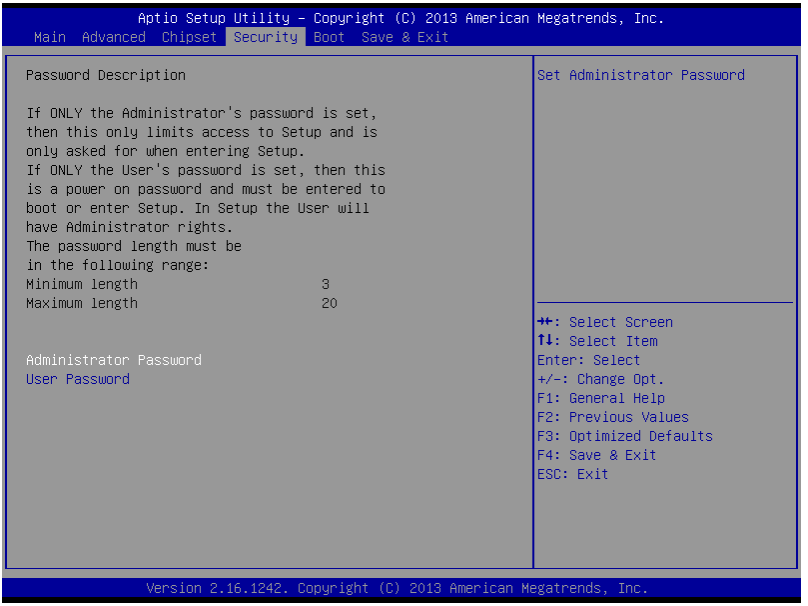
Security



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

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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.

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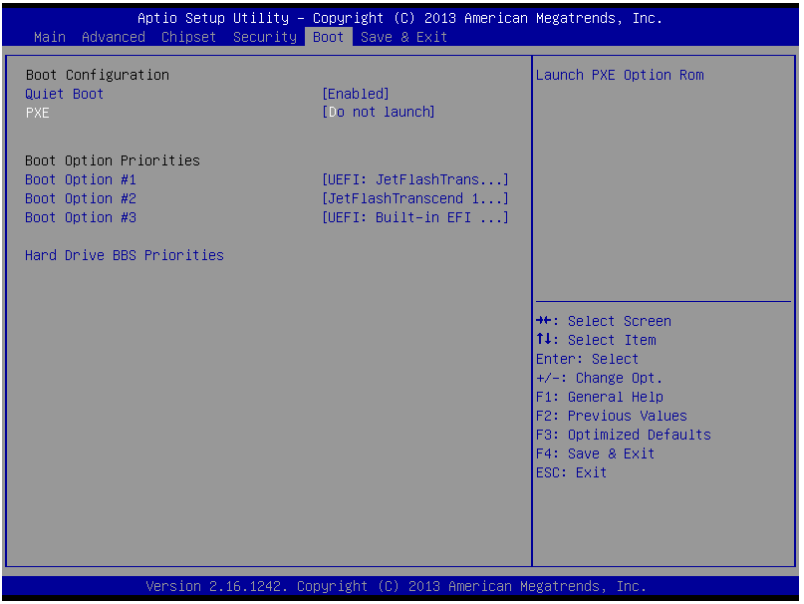
Boot



Options summary:

Quiet Boot	Disabled	
	Enabled	Default
En/Disable showing boot logo.		
PXE	Do not launch	Default
	Enabled	
En/Disable PXE boot		

* Only LAN1 and LAN2 supports PXE

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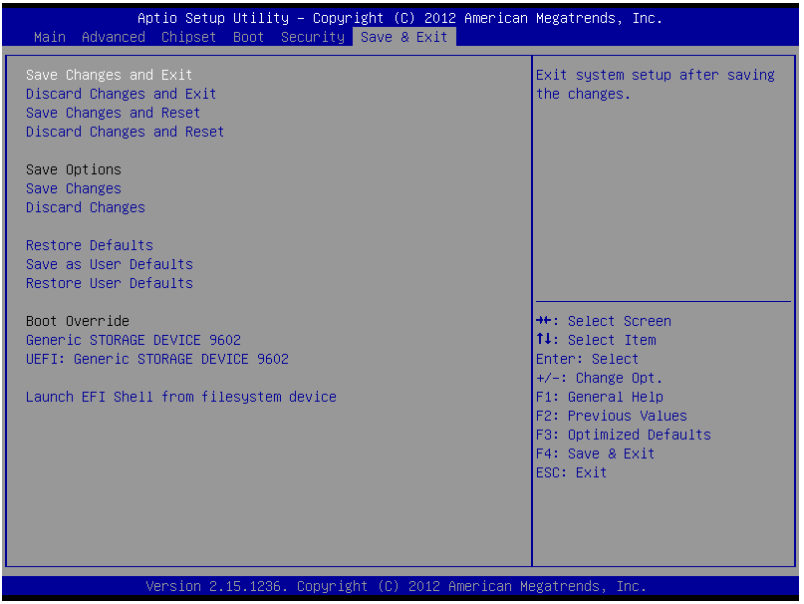
Save & Exit



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Chapter

4

Driver Installation

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The BOXER-6404 comes with a DVD-ROM that contains all the drivers and utilities you need to setup your product.

Insert the DVD and the installation guide will start automatically. If it doesn't, please follow the sequence below to install the drivers.

Follow the sequence below to install the drivers:

Step 1 – Install Chipset Driver

Step 2 – Install VGA Driver

Step 3 – Install LAN Driver

Step 4 – Install TXE Driver (Windows 8.1 only)

Step 5 – Install USB 3.0 Driver (Windows 7 only)

Step 6 – Install MBI Driver

Please refer to the instructions below for further details.

4.1 Installation

Insert the driver disk into the disk drive. And install the drivers from Step 1 to Step 6 in order.

Step 1 – Install Chipset Driver

1. Open the ***Step1 - Chipset*** folder and open the ***SetupChipset.exe*** file
2. Follow the instructions
3. Drivers will be installed automatically

Step 2 – Install VGA Driver

1. Open the ***Step2 - VGA*** folder and select your OS
2. Open the ***Setup.exe*** file in the folder
3. Follow the instructions
4. Driver 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. Driver will be installed automatically

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Step 4 – Install TXE Driver (Windows 8.1 only)

1. Open the ***Step4 - TXE*** folder and open the ***SetupTXE.exe*** file
2. Follow the instructions
3. Driver will be installed automatically

Step 5 – Install USB 3.0 Driver (Windows 7 only)

1. Open the ***Step5 - USB3.0*** folder and open the ***Setup.exe*** file
2. Follow the instructions
3. Driver will be installed automatically

Step 6 – Install MBI Driver

1. Open the ***Step6 - MBI*** folder and open the ***Setup.exe*** file
2. Follow the instructions
3. Driver will be installed automatically

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Appendix

A

Programming the Watchdog Timer

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A.1 Watchdog Timer Registers

Table 1 : Watch dog relative IO address		
	Default Value	**Note**
I/O Base Address	**0xA00**	I/O Base address for Watchdog operation. This address is assigned by SIO LDN7, register 0x60-0x61.

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

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A.2 WatchDog Sample Program

```
*************************************************************************
// WDT I/O operation relative definition (Please reference to Table 1)
#define  WDTAddr       0xA00   // WDT I/O base address
Void   WDTWriteByte(byte Register, byte Value);
byte   WDTReadByte(byte Register);
Void   WDTSetReg(byte Register, byte Bit, byte Val);
// Watch Dog relative definition (Please reference to Table 2)
#define  DevReg        0x00   // Device configuration register
     #define  WDTRstBit   0x80   // Watchdog WDTRST# (Bit7)
     #define  WDTRstVal   0x80   // Enabled WDTRST#
#define  TimerReg      0x05   // Timer register
     #define  PSWidthBit    0x00     // WDTRST# Pulse width (Bit0:1)
     #define  PSWidthVal    0x01     // 25ms for WDTRST# pulse
     #define  PolarityBit   0x02     // WDTRST# Signal polarity (Bit2)
     #define  PolarityVal   0x00     // Low active for WDTRST#
     #define  UnitBit       0x03     // Unit for timer (Bit3)
     #define  ModeBit       0x04     // WDTRST# mode (Bit4)
     #define  ModeVal       0x01     // 0:level 1: pulse
     #define  EnableBit     0x05     // WDT timer enable (Bit5)
     #define  EnableVal     0x01     // 1: enable
     #define  StatusBit     0x06     // WDT timer status (Bit6)
#define  CounterReg   0x06   // Timer counter register
*************************************************************************

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

       // Procedure : AaeonWDTEnable
       // This procudure will enable the WDT counting.
       AaeonWDTEnable();
```


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```
}
*****************************************************************************

*****************************************************************************
// Procedure : AaeonWDTEnable
VOID   AaeonWDTEnable (){
       WDTEnableDisable(1);
}

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

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

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

```
        // Watchdog WDTRST# Enable
        WDTSetBit(DevReg, WDTRstBit, WDTRstVal);
}

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

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

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

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

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

*****************************************************************************
```

Appendix

B

I/O Information

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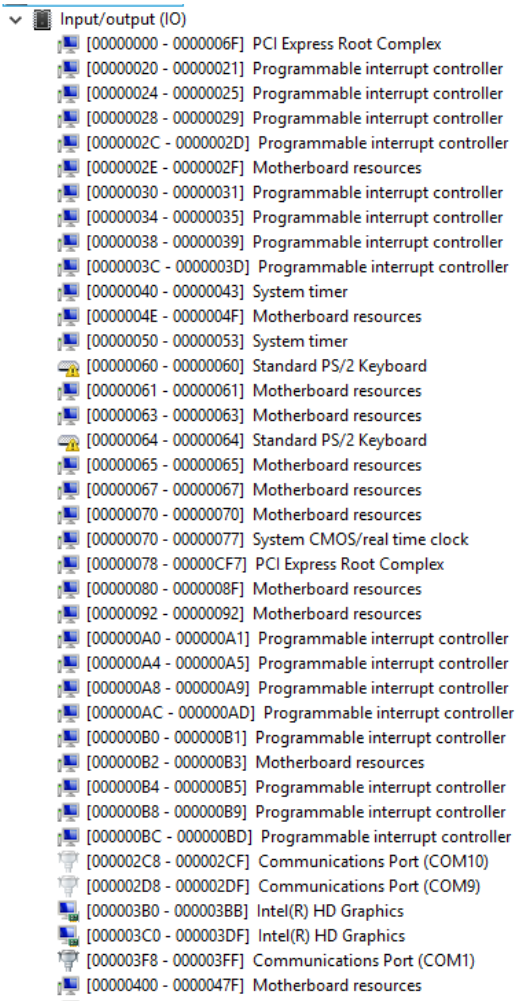
B.1 I/O Address Map



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[000004D0 - 000004D1] Programmable interrupt controller
[00000500 - 000005FE] Motherboard resources
[00000600 - 0000061F] Motherboard resources
[00000680 - 0000069F] Motherboard resources
[00000A00 - 00000A0F] Motherboard resources
[00000A10 - 00000A1F] Motherboard resources
[00000D00 - 0000FFFF] PCI Express Root Complex
[0000B000 - 0000BFFF] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 4 - 0F4E
[0000C000 - 0000CFFF] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 3 - 0F4C
[0000D000 - 0000DFFF] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 2 - 0F4A
[0000E000 - 0000EFFF] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 1 - 0F48
[0000F000 - 0000F01F] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Platform Control Unit - SMBus Port - 0F12
[0000F080 - 0000F087] Intel(R) HD Graphics

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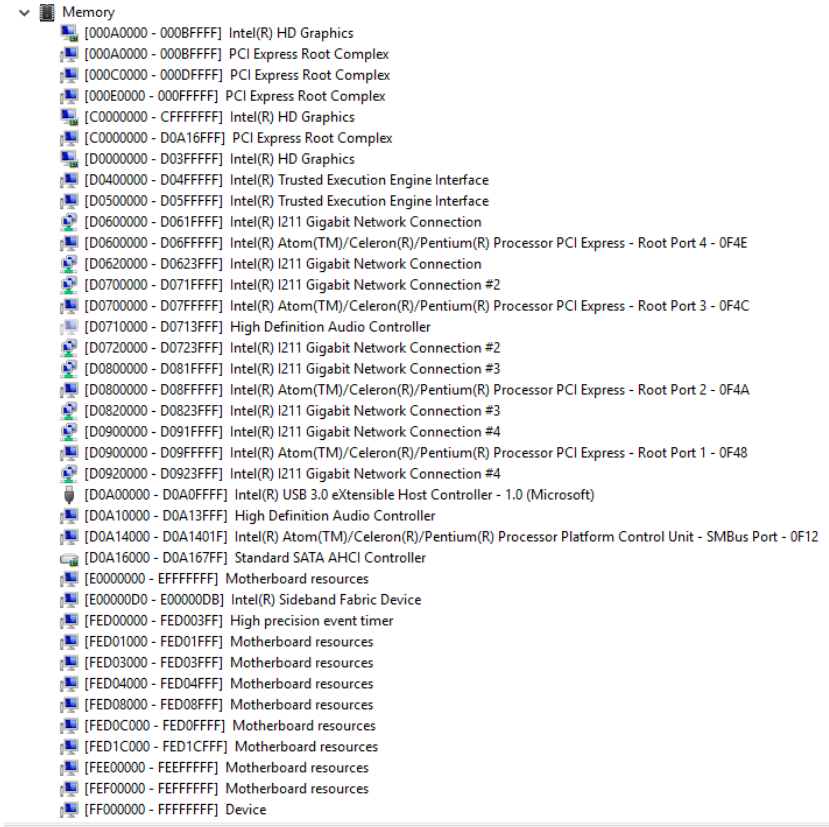
B.2 Memory Address Map



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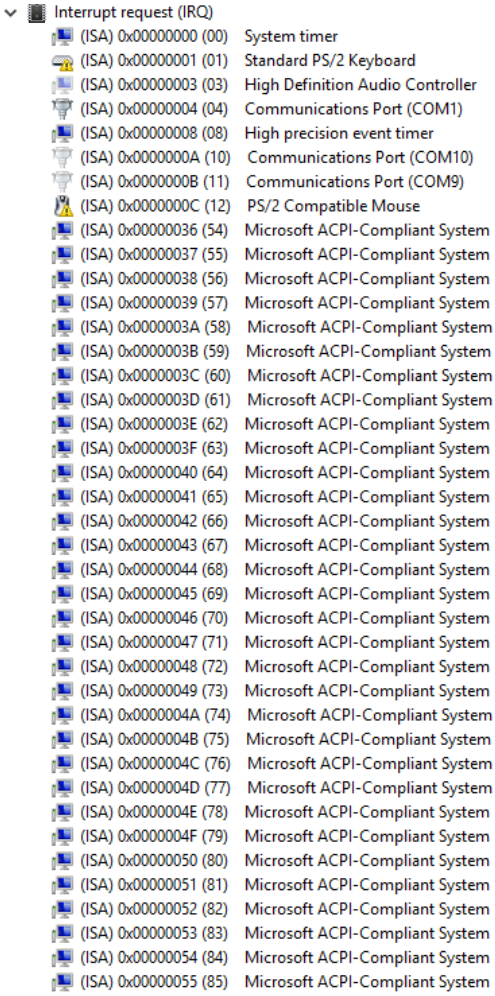
B.3 IRQ Mapping Chart



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(PCI) 0x0000000A (10) Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Platform Control Unit - SMBus Port - 0F12
(PCI) 0x00000016 (22) High Definition Audio Controller
(PCI) 0xFFFFFFEB (-21) Intel(R) Trusted Execution Engine Interface
(PCI) 0xFFFFFFEC (-20) Intel(R) I211 Gigabit Network Connection #4
(PCI) 0xFFFFFFED (-19) Intel(R) I211 Gigabit Network Connection #3
(PCI) 0xFFFFFFEE (-18) Intel(R) I211 Gigabit Network Connection #2
(PCI) 0xFFFFFFEF (-17) Intel(R) I211 Gigabit Network Connection #2
(PCI) 0xFFFFFFF0 (-16) Intel(R) I211 Gigabit Network Connection #2
(PCI) 0xFFFFFFF1 (-15) Intel(R) I211 Gigabit Network Connection #2
(PCI) 0xFFFFFFF2 (-14) Intel(R) I211 Gigabit Network Connection #3
(PCI) 0xFFFFFFF3 (-13) Intel(R) I211 Gigabit Network Connection #3
(PCI) 0xFFFFFFF4 (-12) Intel(R) I211 Gigabit Network Connection #3
(PCI) 0xFFFFFFF5 (-11) Intel(R) I211 Gigabit Network Connection #4
(PCI) 0xFFFFFFF6 (-10) Intel(R) I211 Gigabit Network Connection #4
(PCI) 0xFFFFFFF7 (-9) Intel(R) I211 Gigabit Network Connection #4
(PCI) 0xFFFFFFF8 (-8) Intel(R) USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)
(PCI) 0xFFFFFFF9 (-7) Intel(R) HD Graphics
(PCI) 0xFFFFFFFA (-6) Intel(R) I211 Gigabit Network Connection
(PCI) 0xFFFFFFFB (-5) Intel(R) I211 Gigabit Network Connection
(PCI) 0xFFFFFFFC (-4) Intel(R) I211 Gigabit Network Connection
(PCI) 0xFFFFFFFD (-3) Intel(R) I211 Gigabit Network Connection
(PCI) 0xFFFFFFFE (-2) Standard SATA AHCI Controller

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Appendix

C

Electrical Specifications for I/O Ports

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C.1 Electrical Specifications for I/O Ports

I/O	Reference	Signal Name	Rate output
COM Port	CN1	+5 V/ +12 V	+5 V/ 1 A or +12 V/ 1 A
+5 V Output for SATA HDD	CN7	+5 V	+5 V/ 1 A
CFast Slot	CN11	+3.3 V	+3.3 V/ 0.5 A
MiniCard Slot (USB 2.0 Port2 Only)	CN13	+3.3 VSB +1.5 V	+3.3 V/ 1.1 A +1.5 V/ 0.375 A
USB 3.0 Port 0	CN17	+5 VSB	+5V/ 1A
USB 2.0 Port 3	CN18	+5 VSB	+5 V/ 0.5A
USB 2.0 Port 1	CN19	+5 VSB	+5 V/ 0.5A
HDMI Port	CN20, CN21	+5 V	+5 V/ 1A

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