

BOXER-6614

Embedded Controller

Intel® Quad Core N2930 1.83GHz Processor

Dual LAN, 3 USB2.0, 1 USB3.0, 4 COM

1 Full Size, 1 Half Size Mini Card

BOXER-6614 Manual 1st Ed.
December 24, 2014

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Packing List

Before you begin operating your PC, please make sure that the following materials are enclosed:

- 1 BOXER-6614 Embedded Controller
- 2 Wallmount Brackets
- 1 Screw Package
- 1 CD-ROM for manual (in PDF format) and drivers
- 1 Phoenix Power Connector
- 1 Thermal Pad (A1/A1M)

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

Safety & Warranty

1. Read these safety instructions carefully.
2. Keep this user's manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Do not use liquid or spray detergents for cleaning. Use a damp cloth.
4. For pluggable equipment, the power outlet must be installed near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a firm surface during installation. Dropping it or letting it fall could cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. **DO NOT COVER THE OPENINGS.**
8. Make sure the voltage of the power source is correct before connecting the equipment 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 equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient over-voltage.
12. Never pour any liquid into an opening. This could cause fire or electrical shock.
13. Never open the equipment. For safety reasons, only qualified service personnel should open the equipment.
14. If any of the following situations arises, get the equipment checked by service personnel:
 - a. The power cord or plug is damaged.
 - b. Liquid has penetrated into the equipment.
 - c. The equipment has been exposed to moisture.

- d. The equipment does not work well, or you cannot get it to work according to the user's manual.
 - e. The equipment has been dropped and damaged.
 - f. The equipment has obvious signs of breakage.
15. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE IS BELOW -20°C (-4°F) OR ABOVE 70°C (158°F). IT MAY DAMAGE THE EQUIPMENT.
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 devices.

FCC

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.

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。

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Chapter

1

General Information

1.1 Introduction

AAEON introduces the newest product in the Boxer series, BOXER-6614, which utilizes the Intel® Quad Core 1.83GHz SoC N2930: this embedded controller expands its graphics performance greatly with the newest generation of Celeron® processors.

In this era of information explosion, the advertising of consumer products will not be confined to the family television, but will also spread to high-traffic public areas, like department stores, the bus, transportation station, the supermarket etc. The advertising marketing industry will resort to every conceivable mean to transmit product information to consumers. System integrators will need a multifunction device to satisfy commercial needs for such public advertising.

The BOXER-6614 is a standalone high performance controller designed for long-life operation and with high reliability. It can replace traditional methods and become the mainstream controller for the multimedia entertainment market.

1.2 Features

- Intel® Quad Core 1.83GHz SoC N2930
- Intel® HD Integrated Graphics Engine
- USB3.0 x 1, USB2.0 x 3
- COM x 4
- Dual Gigabit Ethernet LAN
- VGA+HDMI Output, dual view/simultaneous display support
- SATA 3.0Gb/s
- Full size Mini Card with SIM slot x 1
- Half size Mini Card x 1 (Factory install only)
- Fanless System Design
- AAEON's Hi-Safe Support

1.3 Specifications

System

- CPU Intel® Quad Core 1.83GHz SoC N2930
- Memory DDR3L 1333 SODIMM x 1, Max. 8GB
- Display VGA x 1, HDMI x 1
- Ethernet Gigabit Ethernet, RJ-45 connector x 2
MiniCard wireless module (optional)
- Storage SATA 3.0Gb/s 2.5" HDD/SSD Bay x 1
CFast™ Slot x 1 (W/ cover protection)
- Expansion Full-size Mini Card Slot x 1
Half-size Mini Card x 1 (only for factory-install)
SIM Slot x 1
- Serial Port RS-232/422/485 x 2, RS-232 x 2,
- USB USB 3.0 x 1, USB 2.0 x 3
- System Control Power ON/OFF
- LED Indicator Power LED x 1, Hard disk active LED x 1, Link status x 2, Activate status x 2
- Power Supply 1) DC power input 12V (A1/A2)
2) DC 9-30V w/ 3-pin terminal block (A1M/A2M)
- OS Support Windows® 8.1 (32/64-bit)
Windows® 7(32/64-bit)
WES7/WES8
Linux Fedora Core

Mechanical and Environmental

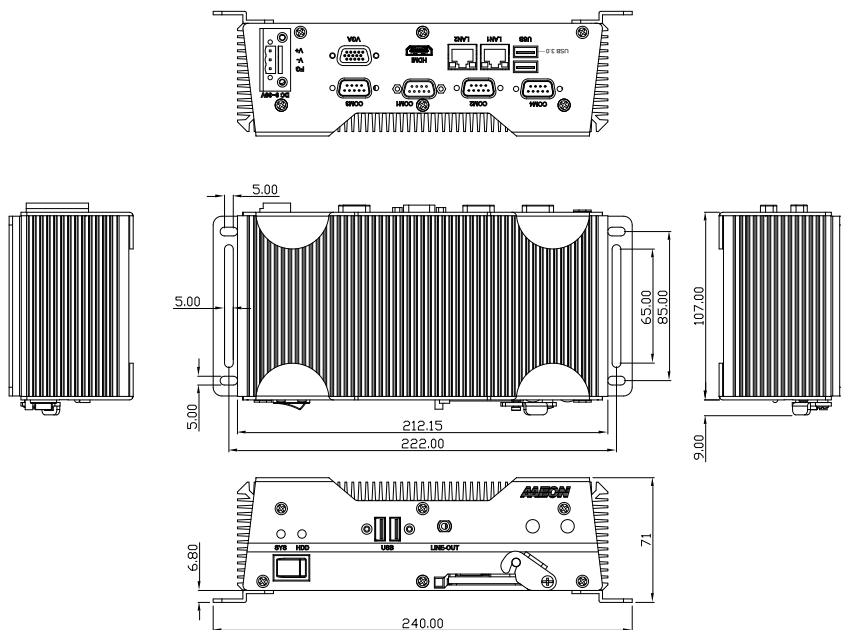
- Construction Metal Fe.
- Color Dark Gray
- Mounting Desktop mount/ Wallmount/ Din Rail
- Dimension 8.71"(W) x 3.32"(H) x 2.25"(D)
(221.15mm x 84.28mm x 107mm)
- Gross Weight 6.16 lb (2.8kg)
- Net Weight 4.4 lb (2.0kg)
- Operating
Temperature Ambient with Airflow
-4°F ~ 131°F (-20°C ~ 55°C) - CFast™
-4°F ~ 140°F (-20°C ~ 60°C) - HDD
With industrial grade device
(according to IEC68-2-14)
- Storage
Temperature -4°F ~ 158°F (-20°C ~ 70°C)
With industrial grade device
(according to IEC62-2-1, IEC68-2-2)
- Storage Humidity 95% @ 40°C, non-condensing
- Vibration 5 g rms/ 5~500Hz/ operation –
CFast™
1 g rms/ 5~500Hz/ operation – HDD
- Shock 50 G peak acceleration (11msec.
duration) – CFast™
20 G peak acceleration (11msec.
duration) – HDD
- EMC CE/FCC Class A

Chapter

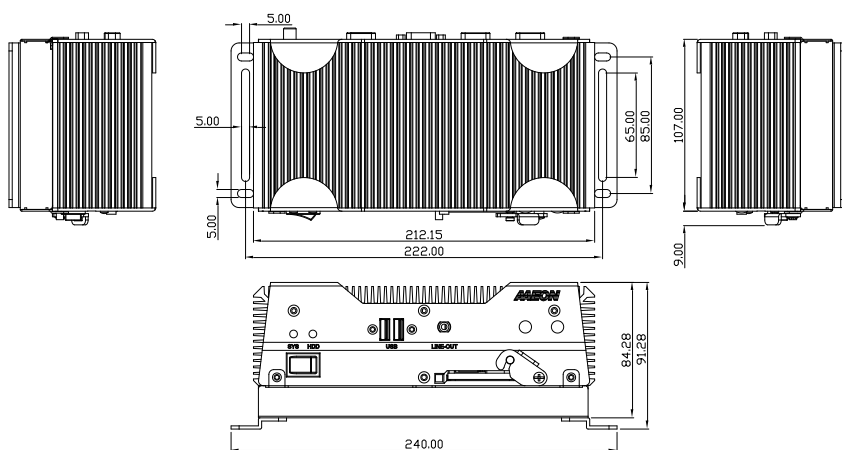
2

Hardware Installation

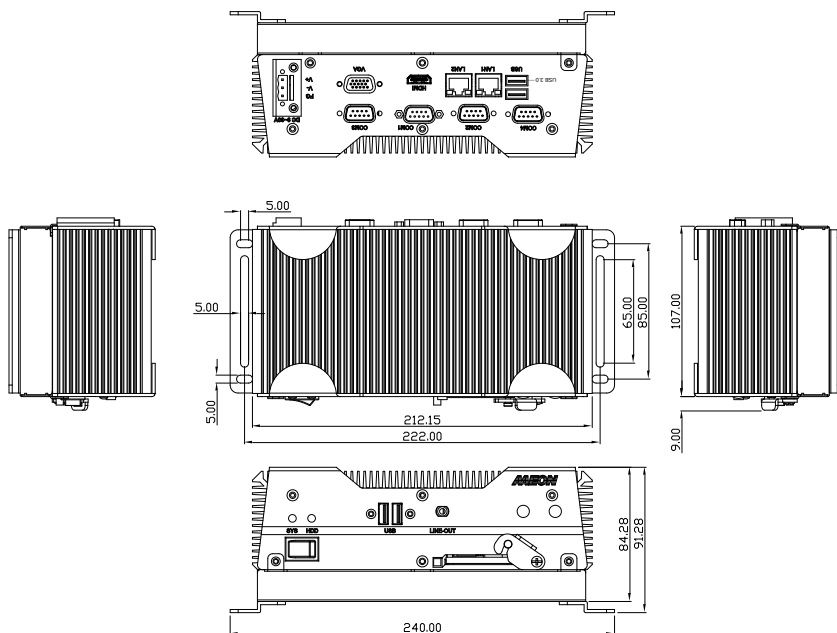
BOXER-6614-A1M



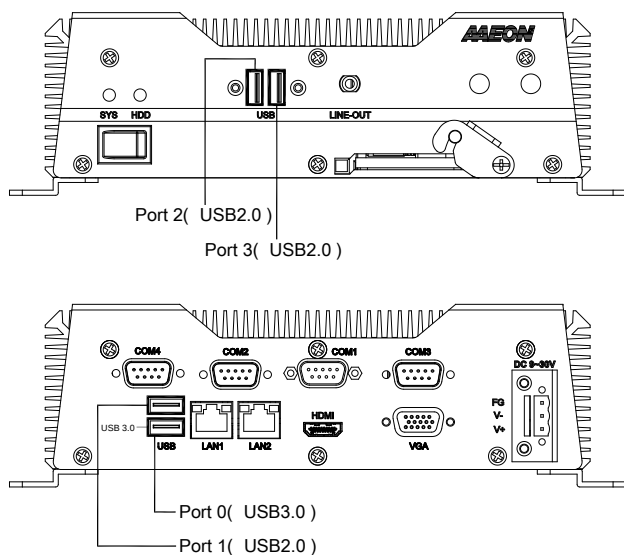
The rear panel of the HP DesignJet 500C printer features several ports and controls. On the left, there is a power switch labeled 'ON' and 'OFF', and a power cord connector labeled 'AC/2'. In the center, there is a 'VISA' port, a 'USB' port, and a 'BNC' port. On the right, there are two 'BNC' ports, a 'BNC' port, and a 'BNC' port. The text 'C12 6221' is printed on the right side of the panel.



BOXER-6614-A2M

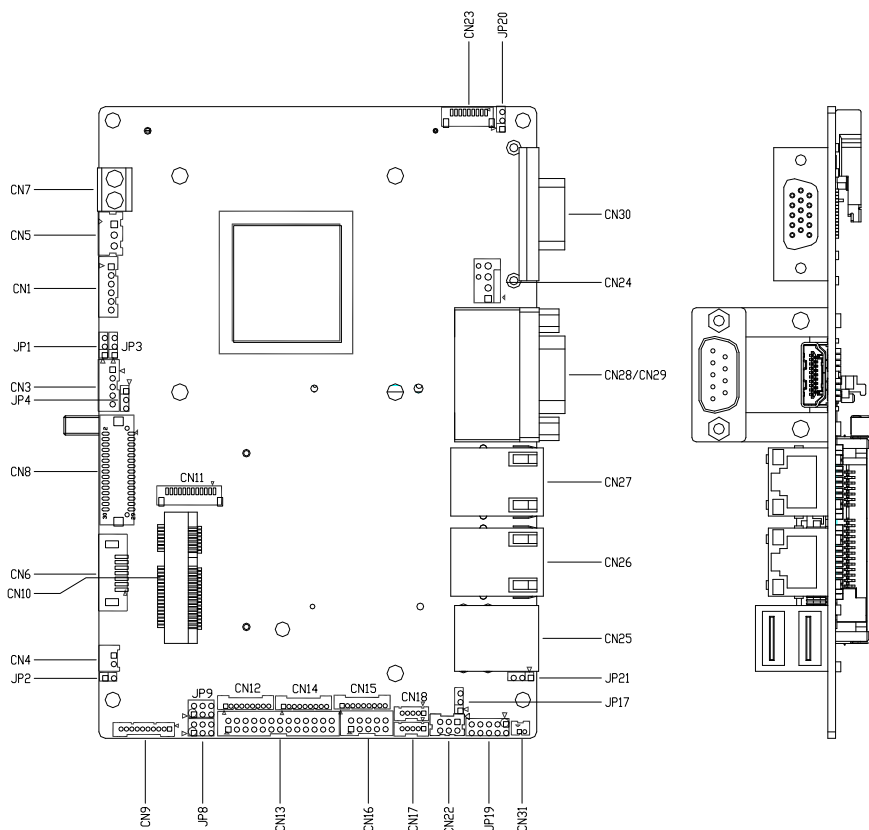


2.2 Allocation of USB Ports

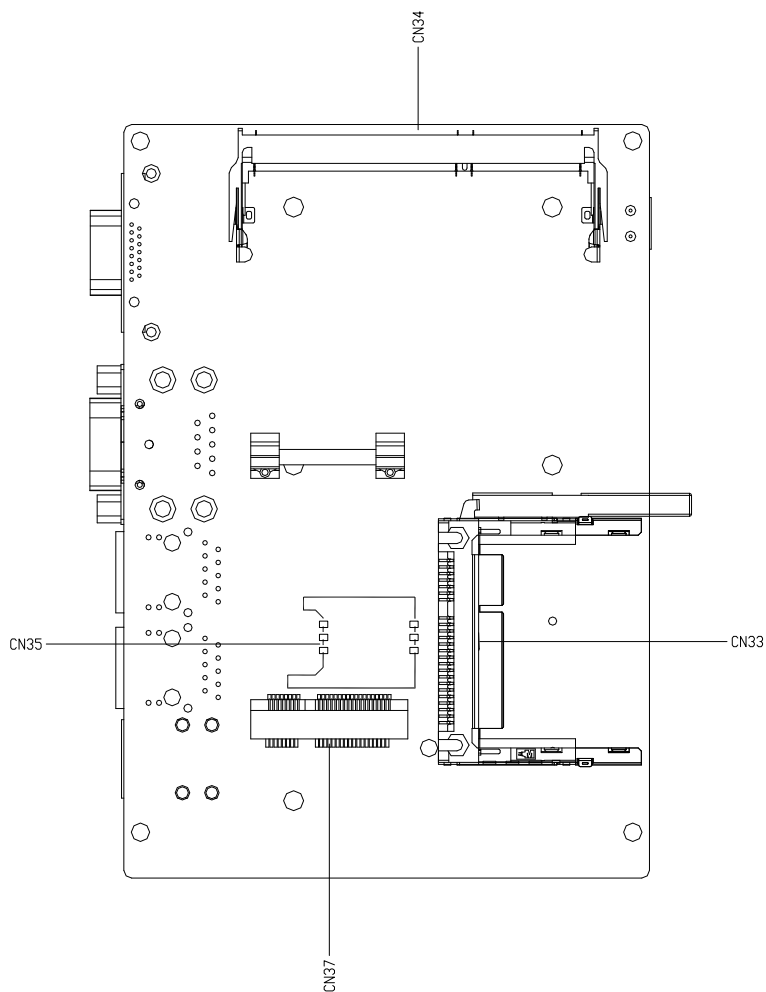


2.3 Connectors and Jumpers of The Main Board

Component Side



Solder Side



2.4 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
JP8	COM2 Pin8 Function Selection
JP9	COM3 Pin8 Function Selection
JP17	Auto Power Button Enable/Disable Selection
JP21	Clear CMOS Jumper

2.5 List of Connectors

The board has a number of connectors that allow you to configure your system to suit your application. The table below shows the function of each board's connectors:

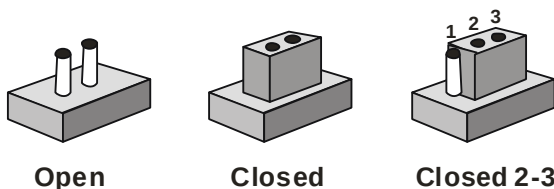
Label	Function
CN1	+5VSB Output w/SMBus
CN4	+5V Output for SATA HDD
CN6	SATA Port
CN7	External +12V Input
CN9	Audio I/O Port
CN10	Mini-Card Slot (Half-Mini Card)
CN11	LPC Port
CN12	COM Port 2 Connector
CN13	LPT Port
CN14	COM Port 3 Connector
CN15	COM Port 4 Connector
CN16	Digital IO Port
CN17	USB 2.0 Port 3
CN18	USB 2.0 Port 2
CN19	SPI Debug Port
CN22	PS/2 Keyboard/Mouse Combo Port
CN25	USB Ports 0 and 1
CN26	LAN (RJ-45) Port1
CN27	LAN (RJ-45) Port2
CN28	COM Port 1 Connector (D-SUB 9)
CN29	HDMI Port
CN30	VGA Port
CN31	Battery
CN33	CFast Slot

CN34	DDR3L SO-DIMM Slot
CN35	UIM Card Socket
CN37	Mini-Card Slot (Full-Mini Card)

2.6 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.

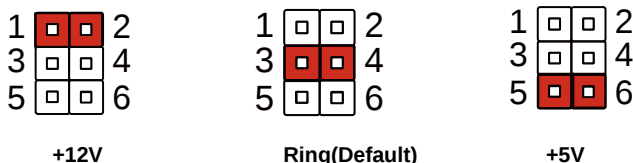


A pair of needle-nose pliers may be helpful when working with jumpers.

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.

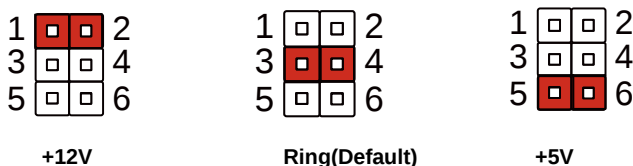
Generally, you simply need a standard cable to make most connections.

2.7 COM2 Pin8 Function Selection (JP8)



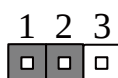
JP8	Function
1-2	+12V
3-4	Ring(Default)
5-6	+5V

2.8 COM3 Pin8 Function Selection (JP9)

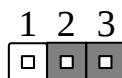


JP9	Function
1-2	+12V
3-4	Ring(Default)
5-6	+5V

2.9 Auto Power Button Enable/Disable Selection (JP17)



Disable

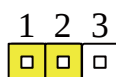


Enable (Default)

JP17	Function
1-2	Disable
2-3	Enable (Default)

Note 1: Disable Auto Power Button JP17(1-2) : Need to use power button JP19(1-2) to power on the system.

2.10 Clear CMOS Jumper (JP21)



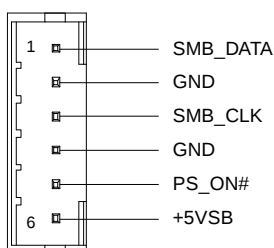
Normal (Default)



Clear CMOS

JP21	Function
1-2	Normal (Default)
2-3	Clear CMOS

2.11 +5VSB Output w/SMBus (CN1)

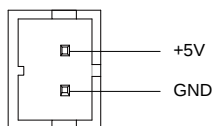


Pin	Pin Name	Signal Type	Signal Level
1	SMB_DATA	I/O	+3.3V
2	GND	GND	

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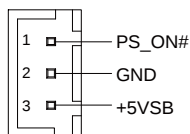
3	SMB_CLK	I/O	+3.3V
4	GND	GND	
5	PS_ON#	OUT	+3.3V
6	+5VSB	PWR	+5V

2.12 +5V Output for SATA HDD (CN4)



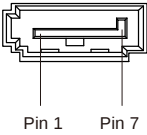
Pin	Pin Name	Signal Type	Signal Level
1	+5V	PWR	+5V
2	GND	GND	

2.13 External +5VSB Input (CN5)



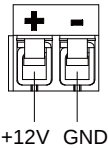
Pin	Pin Name	Signal Type	Signal Level
1	PS_ON#	OUT	+3.3V
2	GND	GND	
3	+5VSB	PWR	+5V

2.14 SATA Port1 (CN6)



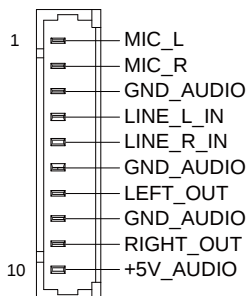
Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	SATA_TX+	DIFF	
3	SATA_TX-	DIFF	
4	GND	GND	
5	SATA_RX-	DIFF	
6	SATA_RX+	DIFF	
7	GND	GND	

2.15 External +12V Input (CN7)



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

2.16 Audio I/O Port (CN9)



Pin	Pin Name	Signal Type	Signal Level
1	MIC_L	IN	
2	MIC_R	IN	
3	GND_AUDIO	GND	
4	LINE_L_IN	IN	
5	LINE_R_IN	IN	
6	GND_AUDIO	GND	
7	LEFT_OUT	OUT	
8	GND_AUDIO	GND	
9	RIGHT_OUT	OUT	
10	+5V_AUDIO	PWR	+5V

2.17 Mini-Card Slot (Half-Mini Card) (CN10)

Pin	Pin Name	Signal Type	Signal Level
1	PCIE_WAKE#	IN	
2	+3.3VSB	PWR	+3.3V

3	NC		
4	GND	GND	
5	NC		
6	+1.5V	PWR	+1.5V
7	PCIE_CLK_REQ#	IN	
8	NC		
9	GND	GND	
10	NC		
11	PCIE_REF_CLK-	DIFF	
12	NC		
13	PCIE_REF_CLK+	DIFF	
14	NC		
15	GND	GND	
16	NC		
17	NC		
18	GND	GND	
19	NC		
20	W_DISABLE#	OUT	+3.3V
21	GND	GND	
22	PCIE_RST#	OUT	+3.3V
23	PCIE_RX-	DIFF	
24	+3.3VSB	PWR	+3.3V
25	PCIE_RX+	DIFF	
26	GND	GND	

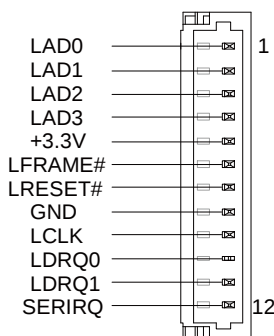
27	GND	GND	
28	+1.5V	PWR	+1.5V
29	GND	GND	
30	SMB_CLK	I/O	+3.3V
31	PCIE_TX-	DIFF	
32	SMB_DATA	I/O	+3.3V
33	PCIE_TX+	DIFF	
34	GND	GND	
35	GND	GND	
36	USB_D-	DIFF	
37	GND	GND	
38	USB_D+	DIFF	
39	+3.3VSB	PWR	+3.3V
40	GND	GND	
41	+3.3VSB	PWR	+3.3V
42	NC		
43	GND	GND	
44	NC		
45	NC		
46	NC		
47	NC		
48	+1.5V	PWR	+1.5V
49	NC		
50	GND	GND	

51	NC		
52	+3.3VSB	PWR	+3.3V

Note 1: CN10 can be selected for Mini-Card or mSATA by changing BOM.

Note 2: You can choose the function either from mSATA or from CFast on the motherboard.

2.18 LPC Port (CN11)

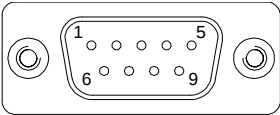


Pin	Pin Name	Signal Type	Signal Level
1	LAD0	I/O	+3.3V
2	LAD1	I/O	+3.3V
3	LAD2	I/O	+3.3V
4	LAD3	I/O	+3.3V
5	+3.3V	PWR	+3.3V
6	LFRAME#	IN	
7	LRESET#	OUT	+3.3V
8	GND	GND	

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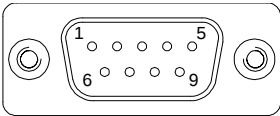
9	LCLK	OUT	
10	LDRQ0	IN	
11	LDRQ1	IN	
12	SERIRQ	I/O	+3.3V

2.19 COM Port 2 Connector (CN12 of mainboard)



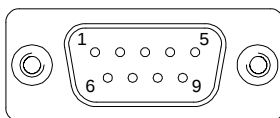
Pin	Pin Name	Signal Type	Signal Level
1	DCD	IN	
2	RX	IN	
3	TX	OUT	± 9V
4	DTR	OUT	± 9V
5	GND	GND	
6	DSR	IN	
7	RTS	OUT	± 9V
8	CTS	IN	
9	RI	IN	

RS-422



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

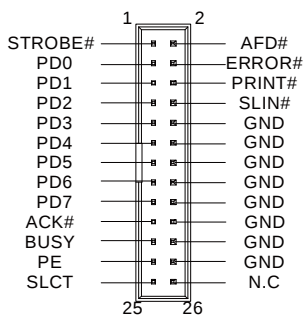
RS-485



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

Note: COM 2 can be configured into RS-232/422/485 through BIOS settings. Default is RS-232

2.20 LPT Port (CN13)

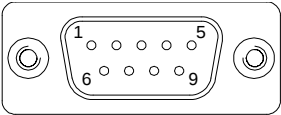


Pin	Pin Name	Signal Type	Signal Level
1	STROBE#	IN	
2	AFD#	I/O	
3	PD0	I/O	
4	ERROR#	IN	
5	PD1	I/O	
6	PRINT#	I/O	
7	PD2	I/O	
8	SLIN#	I/O	
9	PD3	I/O	
10	GND	GND	
11	PD4	I/O	
12	GND	GND	
13	PD5	I/O	
14	GND	GND	
15	PD6	I/O	

Embedded Controller	BOXER-6614
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16	GND	GND
17	PD7	I/O
18	GND	GND
19	ACK#	IN
20	GND	GND
21	BUSY	IN
22	GND	GND
23	PE	IN
24	GND	GND
25	SLCT	IN
26	NC	

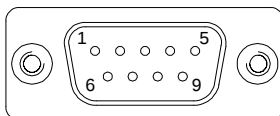
2.21 COM Port 3 Connector (CN14 of mainboard)



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	

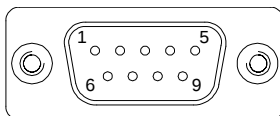
7	RTS	OUT	$\pm 9V$
8	CTS	IN	
9	RI	IN	

RS-422



Pin	Pin Name	Signal Type	Signal Level
1	RS422_TX-	OUT	$\pm 5V$
2	RS422_TX+	OUT	$\pm 5V$
3	RS422_RX+	IN	
4	RS422_RX-	IN	
5	GND	GND	
9	NC/+5V/+12V	PWR	+5V/+12V

RS-485

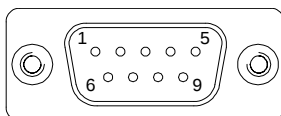


Pin	Pin Name	Signal Type	Signal Level
1	RS485_D-	I/O	$\pm 5V$
2	RS485_D+	I/O	$\pm 5V$
5	GND	GND	

9	NC/+5V/+12V	PWR	+5V/+12V
---	-------------	-----	----------

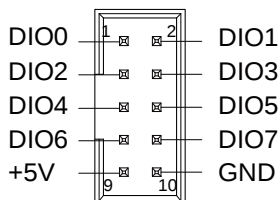
Note: COM 3 can be configured into RS-232/422/485 through BIOS settings. Default is RS-232

2.22 COM Port 4 (CN15 of mainboard)



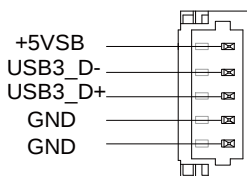
Pin	Pin Name	Signal Type	Signal Level
1	DCD	IN	
2	RX	IN	
3	TX	OUT	± 9V
4	DTR	OUT	± 9V
5	GND	GND	
6	DSR	IN	
7	RTS	OUT	± 9V
8	CTS	IN	
9	RI	IN	

2.23 Digital IO Port (CN16)



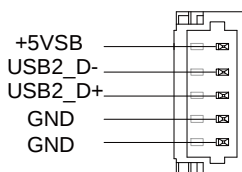
Pin	Pin Name	Signal Type	Signal Level
1	DIO0	I/O	+5V
2	DIO1	I/O	+5V
3	DIO2	I/O	+5V
4	DIO3	I/O	+5V
5	DIO4	I/O	+5V
6	DIO5	I/O	+5V
7	DIO6	I/O	+5V
8	DIO7	I/O	+5V
9	+5V	PWR	+5V
10	GND	GND	

2.24 USB 2.0 Port 3 (CN17)



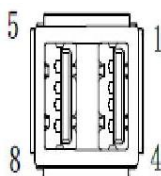
Pin	Pin Name	Signal Type	Signal Level
1	+5VSB	PWR	
2	USB3_D-	DIFF	
3	USB3_D+	DIFF	
4	GND	GND	
5	GND	GND	

2.25 USB 2.0 Port 2 (CN18)



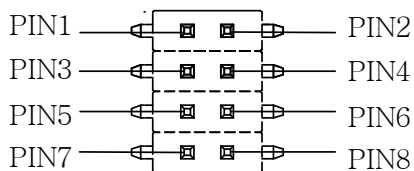
Pin	Pin Name	Signal Type	Signal Level
1	+5VSB	PWR	+5V
2	USB2_D-	DIFF	
3	USB2_D+	DIFF	
4	GND	GND	
5	GND	GND	

2.26 USB Port 2 and 3 (CN17/18)



Pin	Pin Name	Signal Type	Signal Level
1	+5VSB	PWR	+5V
2	USB0_D-	DIFF	
3	USB0_D+	DIFF	
4	GND	GND	
5	+5VSB	PWR	+5V
6	USB0_D-	DIFF	
7	USB0_D+	DIFF	
8	GND	GND	

2.27 BIOS Debug Port (CN19)

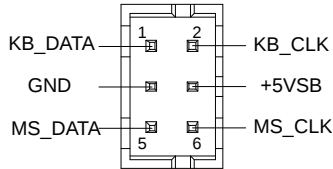


Pin	Pin Name	Signal Type	Signal Level
1	+3.3VSB	PWR	+3.3V
2	GND	GND	
3	SPI_CS	IN	
4	SPI_CLK	IN	
5	SPI_MISO	OUT	
6	SPI_MOSI	IN	
7	NC		

8

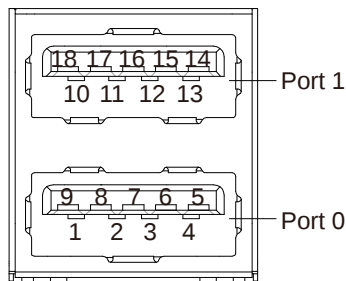
NC

2.28 PS/2 Keyboard/Mouse Combo Port (CN22)



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

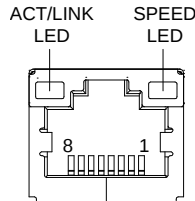
2.29 USB Ports 0 and 1 (CN25)



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

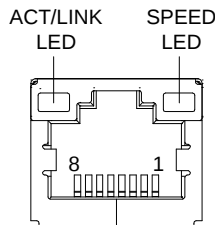
Note: Only Port0 supports USB3.0.

2.30 LAN (RJ-45) Port1 (CN26)



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

2.31 LAN (RJ-45) Port2 (CN27)

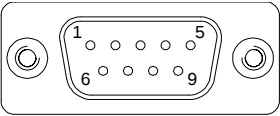


Pin	Pin Name	Signal Type	Signal Level
1	MDI0+	DIFF	

Embedded Controller	BOXER-6614
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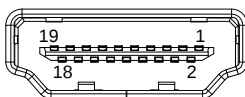
2	MDI0-	DIFF
3	MDI1+	DIFF
4	MDI2+	DIFF
5	MDI2-	DIFF
6	MDI1-	DIFF
7	MDI3+	DIFF
8	MDI3-	DIFF

2.32 COM Port 1 (D-SUB 9) (CN28)



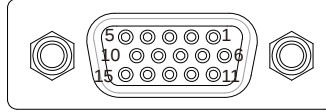
Pin	Pin Name	Signal Type	Signal Level
1	DCD	IN	
2	RX	IN	
3	TX	OUT	± 9V
4	DTR	OUT	± 9V
5	GND	GND	
6	DSR	IN	
7	RTS	OUT	± 9V
8	CTS	IN	
9	RI	IN	

2.33 HDMI Port (CN29)



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

2.34 VGA Port (CN30)



Pin	Pin Name	Signal Type	Signal Level
1	RED	OUT	
2	GREEN	OUT	
3	BLUE	OUT	
4	NC		
5	GND	GND	
6	RED_GND_RTN	GND	
7	GREEN_GND_RTN	GND	
8	BLUE_GND_RTN	GND	
9	+5V	PWR	+5V
10	CRT_PLUG#		
11	NC		
12	DDC_DATA	I/O	+5V
13	HSYNC	OUT	
14	VSYNC	OUT	
15	DDC_CLK	I/O	+5V

2.35 Battery (CN31)

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

2.36 CFast Slot (CN33)

Pin	Pin Name	Signal Type	Signal Level
S1	GND	GND	
S2	SATA_TX+	DIFF	
S3	SATA_TX-	DIFF	
S4	GND	GND	
S5	SATA_RX-	DIFF	
S6	SATA_RX+	DIFF	
S7	GND	GND	
PC1	NC		
PC2	GND	GND	
PC3	NC		
PC4	NC		
PC5	NC		
PC6	NC		
PC7	GND	GND	
PC8	NC		
PC9	NC		
PC10	NC		

PC11	NC		
PC12	NC		
PC13	+3.3V	PWR	+3.3V
PC14	+3.3V	PWR	+3.3V
PC15	GND	GND	
PC16	GND	GND	
PC17	NC		

2.37 DDR3L SO-DIMM Slot (CN34)

Standard specification

2.38 UIM Card Socket (CN35)

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

2.39 Mini-Card Slot (Full-Mini Card) (CN37)

Pin	Pin Name	Signal Type	Signal Level
1	PCIE_WAKE#	IN	
2	+3.3VSB	PWR	+3.3V

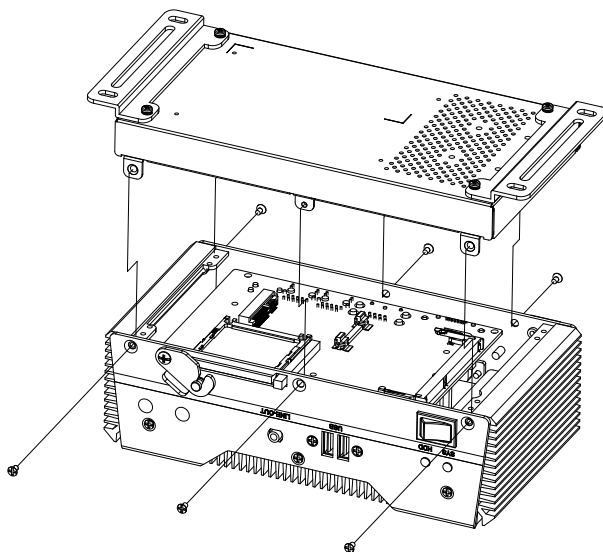
3	NC		
4	GND	GND	
5	NC		
6	+1.5V	PWR	+1.5V
7	PCIE_CLK_REQ#	IN	
8	UIM_PWR	PWR	
9	GND	GND	
10	UIM_DATA	I/O	
11	PCIE_REF_CLK-	DIFF	
12	UIM_CLK	IN	
13	PCIE_REF_CLK+	DIFF	
14	UIM_RST	IN	
15	GND	GND	
16	UIM_VPP	PWR	
17	NC		
18	GND	GND	
19	NC		
20	W_DISABLE#	OUT	+3.3V
21	GND	GND	
22	PCIE_RST#	OUT	+3.3V
23	PCIE_RX-	DIFF	
24	+3.3VSB	PWR	+3.3V
25	PCIE_RX+	DIFF	
26	GND	GND	

27	GND	GND	
28	+1.5V	PWR	+1.5V
29	GND	GND	
30	SMB_CLK	I/O	+3.3V
31	PCIE_TX-	DIFF	
32	SMB_DATA	I/O	+3.3V
33	PCIE_TX+	DIFF	
34	GND	GND	
35	GND	GND	
36	USB_D-	DIFF	
37	GND	GND	
38	USB_D+	DIFF	
39	+3.3VSB	PWR	+3.3V
40	GND	GND	
41	+3.3VSB	PWR	+3.3V
42	NC		
43	GND	GND	
44	NC		
45	NC		
46	NC		
47	NC		
48	+1.5V	PWR	+1.5V
49	NC		
50	GND	GND	

51	NC		
52	+3.3VSB	PWR	+3.3V

2.40 Hard Disk Drive Installation (A2/A2M)

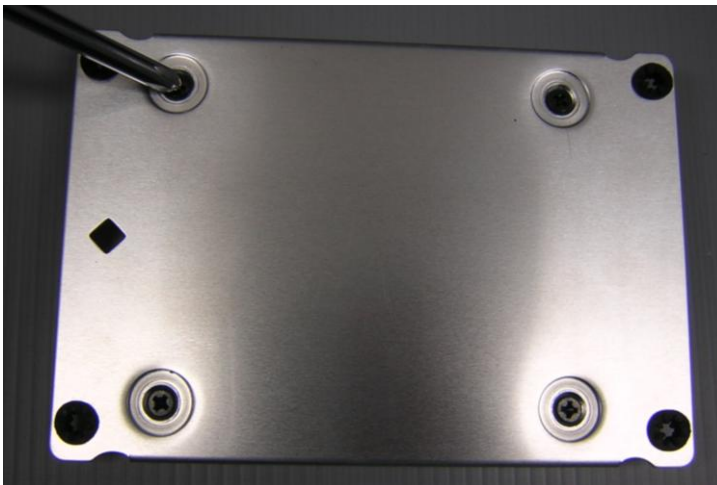
Step 1: Remove the baseplate as instructed below



Step 2: Place the HDD on the bracket plate



Step 3: Tighten the screws at the back to secure the HDD

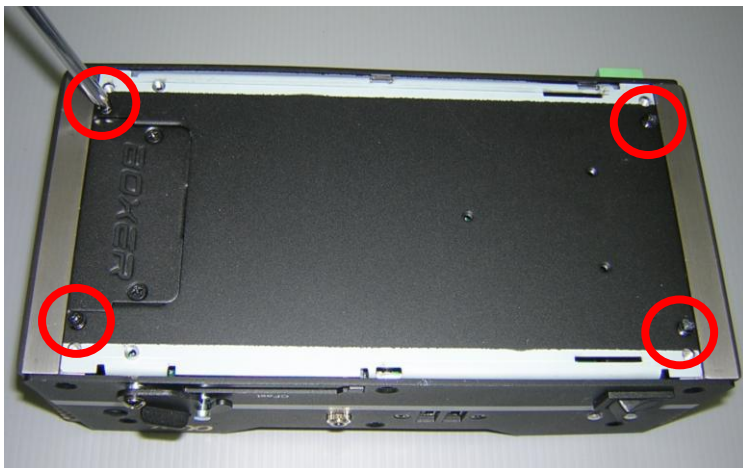


Step 4: Connect the SATA and power cables to the HDD, attach the HDD assembly to the baseplate.

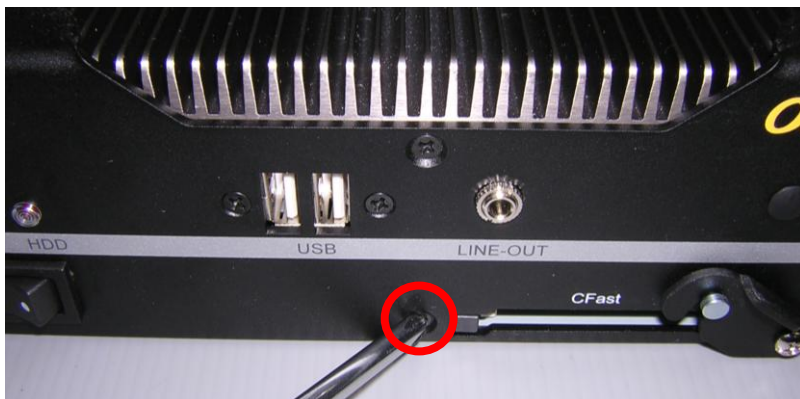


2.41 RAM Installation (A1/A1M)

Step 1: Remove the screws on the baseplate



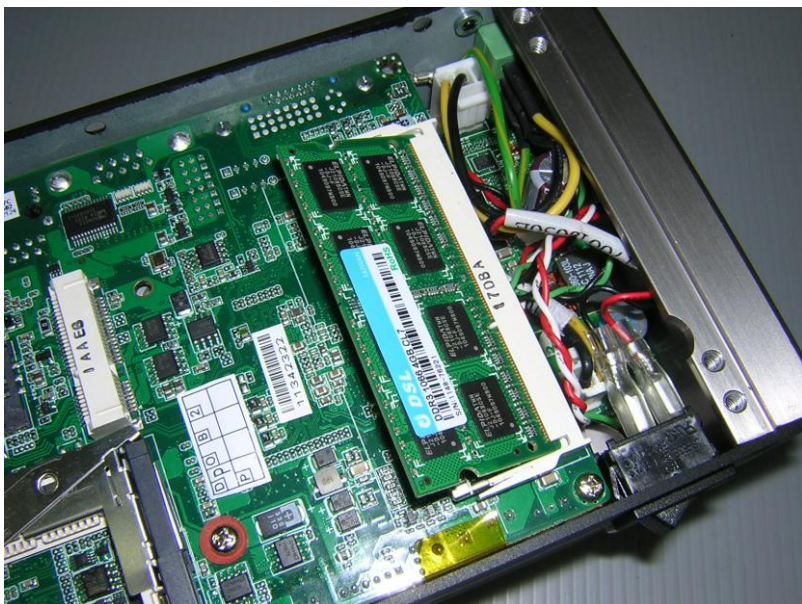
Step 2: Remove the screw on the front panel as shown below



Step 3: Remove the screw on the rear panel as shown below



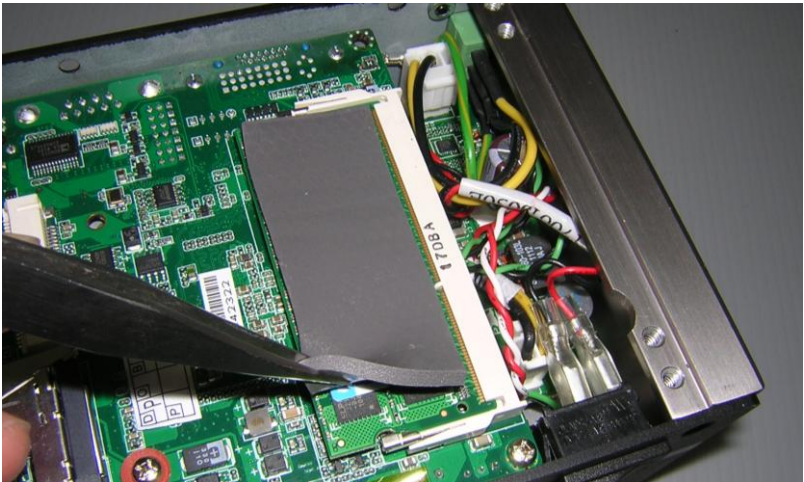
Step 4: Remove the baseplate, insert the RAM into the RAM slot



Step 5: Push down to secure the RAM



Step 6: Place a thermal pad over the RAM



Step 7: Close and secure the baseplate



Step 8: Close and secure the front panel as shown below

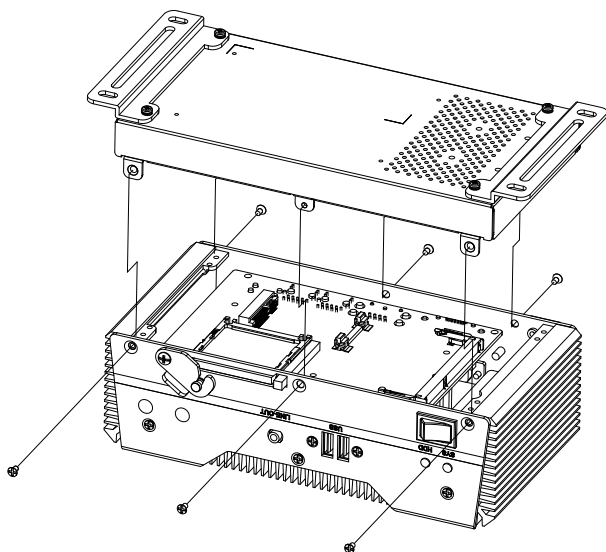


Step 9: Close and secure the rear panel as shown below



2.42 RAM Installation (A2/A2M)

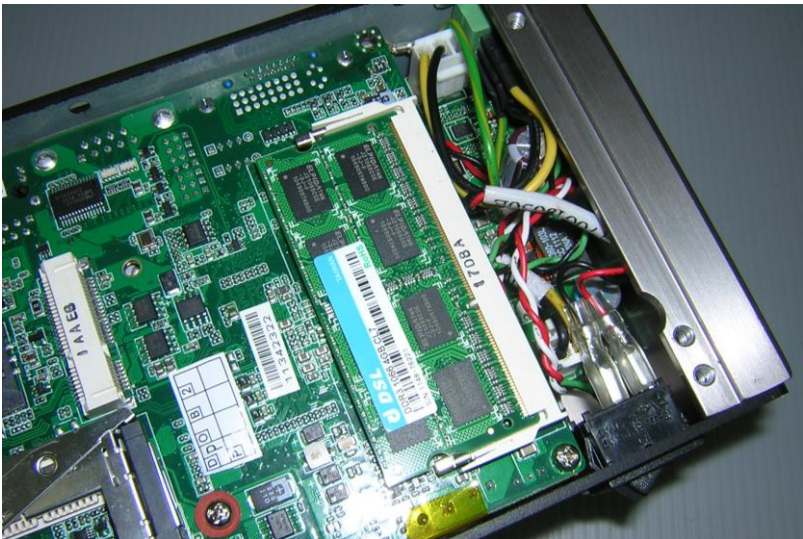
Step 1: Remove the baseplate as instructed below



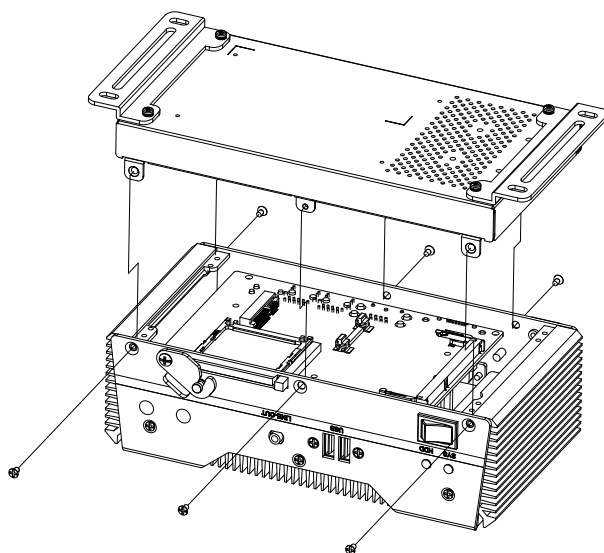
Step 2: Insert the RAM into the RAM slot



Step 3: Push down to secure the RAM



Step 4: Close the baseplate as instructed below



2.43 CFast™ Installation (A1/A1M/A2/A2M)

Step 1: Insert a CFast™ Card into the CFast™ slot

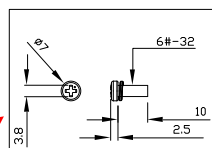
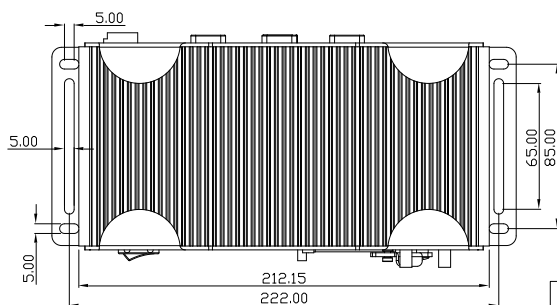
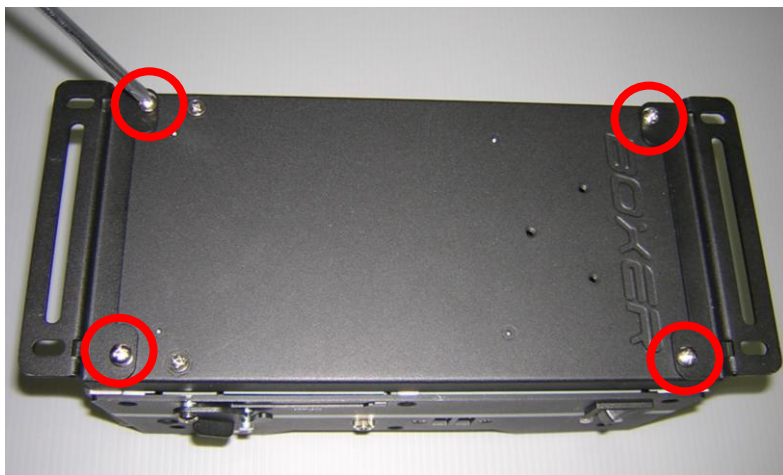


Step 2: Lower the arm to secure the CFast™ Card



2.44 Wallmount Installation

Step 1: Attach the brackets



We suggest using this screw.

Chapter

3

AMI BIOS Setup

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 against the values stored in the CMOS memory. If they do not match, the program outputs an error message. You will then 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:

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

The BOXER-6614 CMOS memory has an integral lithium battery backup for data retention. However, you will need to replace the complete unit when it runs down.

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 so that it retains the Setup information when the power is turned off.

Entering Setup

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

Main

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

Advanced

Advanced BIOS Features Setup including TPM, ACPI, etc.

Chipset

Host bridge parameters.

Boot

Enables/disable quiet boot option.

Security

Set setup administrator password.

Save&Exit

Exit system setup after saving the changes.

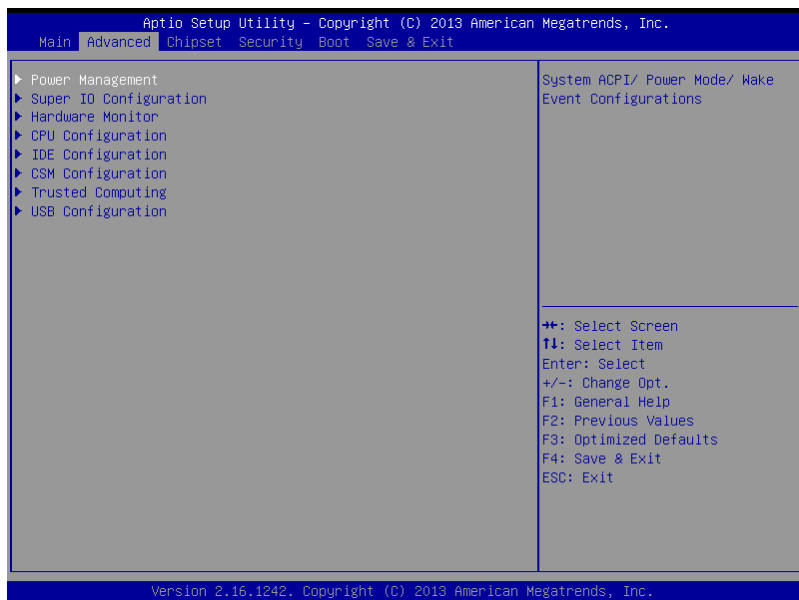
BIOS Setup Menu

Main

Press '*Delete*' Key to enter Setup

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.	
Main Advanced Chipset Security Boot Save & Exit	
BIOS Information BOXER-6614 R1.0(B614AM10) (11/25/2014)	
BIOS Vendor Core Version Compliance Project Version Build Date and Time	American Megatrends 5.009 UEFI 2.3; PI 1.2 GBTSC 1.0 x64 05/30/2014 11:11:39
System Language	[English]
System Date	[Sun 01/01/2012]
System Time	[19:39:31]
Access Level	Administrator
Choose the system default language	
** : Select Screen F1 : Select Item Enter : Select +/- : Change Opt. F1 : General Help F2 : Previous Values F3 : Optimized Defaults F4 : Save & Exit ESC : Exit	
Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.	

Advanced



Advanced -> Power Management

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

Advanced

Power Management		Select power supply mode.
Power Mode		
Power Mode	[ATX Type]	
Restore AC Power Loss	[Last State]	
ERP Function	[Disabled]	
ACPI Settings		
Enable ACPI Auto Configuration	[Disabled]	
Enable Hibernation	[Enabled]	
ACPI Sleep State	[S3 (Suspend to RAM)]	
Lock Legacy Resources	[Disabled]	
Wake Configuration		
Wake on Ring	[Enabled]	
Wake on LAN	[Enabled]	
► S5 RTC Wake Settings		
		++: Select Screen T1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

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Options summary:

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

Enables or Disables BIOS ACPI Auto Configuration		
Enable Hibernation	Enable	Optimal Default, Failsafe Default
	Disable	
Enables or Disables System ability to Hibernates (OS/S4 Sleep State). This option may be not effective with some OS		
Lock Legacy Resources	Enable	
	Disable	Optimal Default, Failsafe Default
Enables or Disables Lock of Legacy Resources		
Wake on Ring	Enable	Optimal Default, Failsafe Default
	Disable	
Enabled/Disabled wake from Ring		
Wake on LAN	Enable	Optimal Default, Failsafe Default
	Disable	
Enabled/Disabled wake from LAN		

Advanced -> Power Management -> S5 RTC Wake Settings

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

Advanced

Wake system with Fixed Time	[Disabled]	Enable or disable System wake on alarm event. When enabled, System will wake on the hr::min::sec specified
Wake system with Dynamic Time	[Disabled]	

++: Select Screen
 f1: Select Item
 Enter: Select
 +/-: Change Opt.
 F1: General Help
 F2: Previous Values
 F3: Optimized Defaults
 F4: Save & Exit
 ESC: Exit

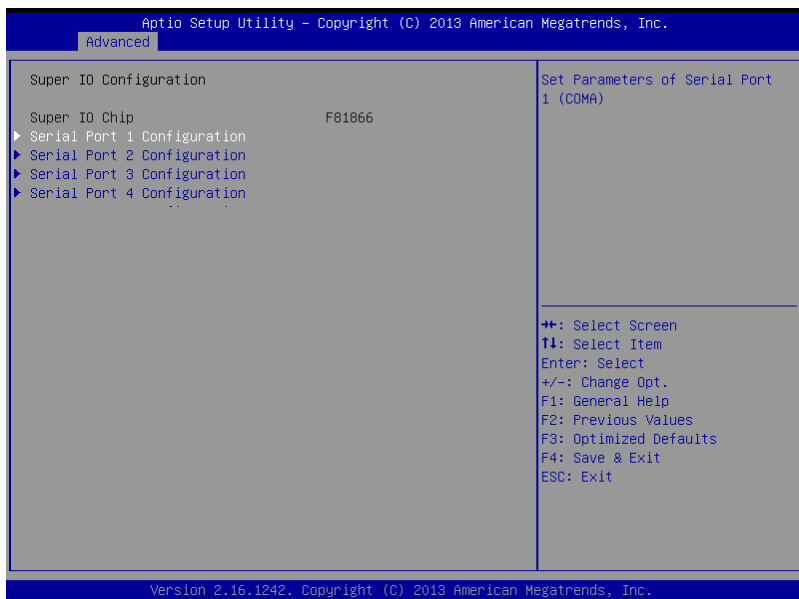
Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.

Options summary:

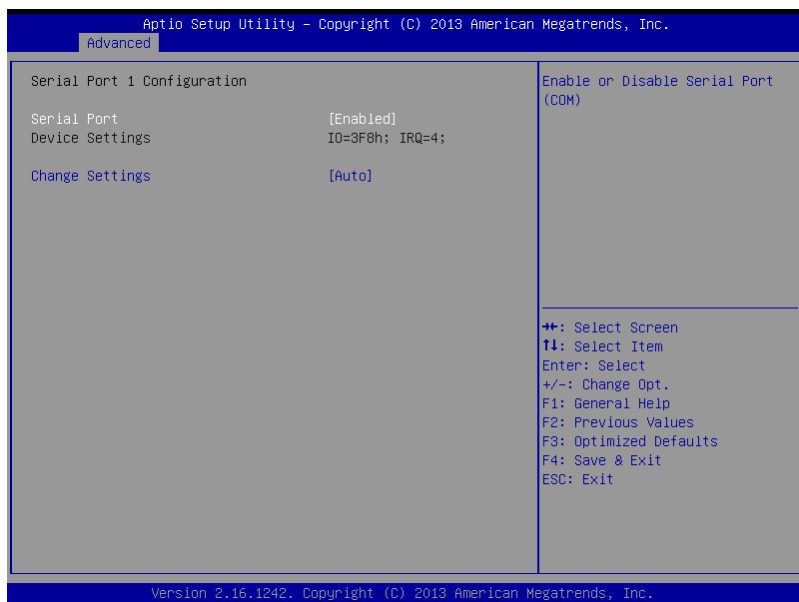
Wake system with Fixed Time		Enable	
		Disable	Optimal Default, Failsafe Default
	Wake up hour	0	
	Wake up minute	0	
	Wake up second	0	
Wake system with Dynamic Time		Enable	
		Disable	Optimal Default, Failsafe Default
	Wake up minute increase	0	

Select RTC wake mode

Advanced -> Super IO Configuration



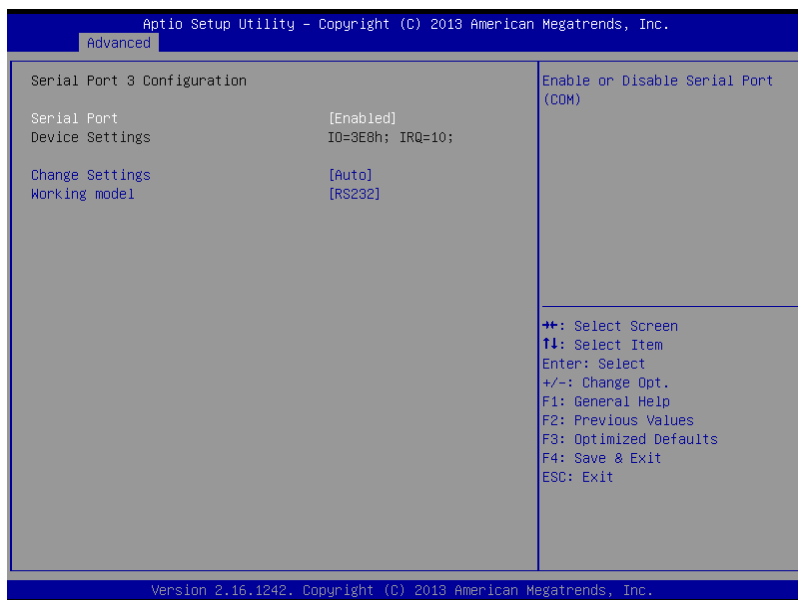
Advanced -> Super IO Configuration Serial Port 1 Configuration



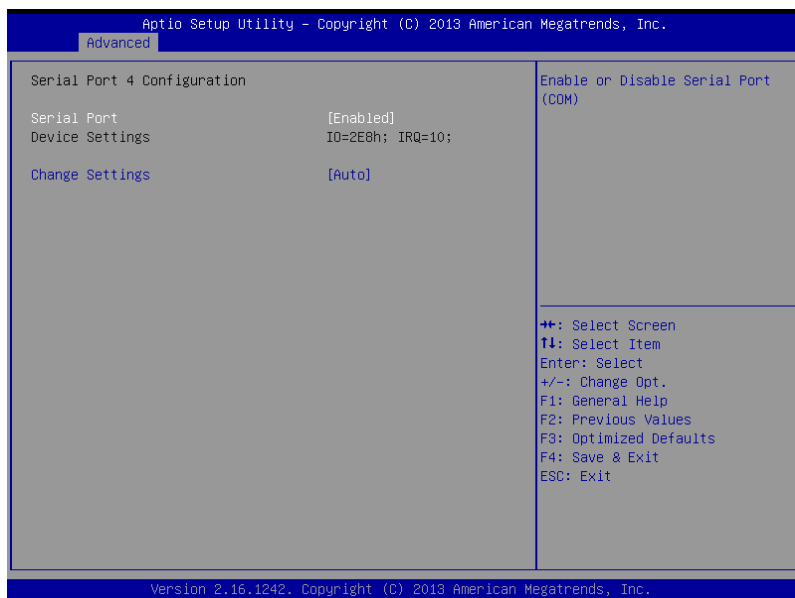
Advanced -> Super IO Configuration Serial Port 2 Configuration

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.		
Advanced		
Serial Port 2 Configuration		Enable or Disable Serial Port (COM)
Serial Port	[Enabled]	
Device Settings	IO=2F8h; IRQ=3;	
Change Settings	[Auto]	
Working model	[RS232]	
		++: Select Screen F1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.		

Advanced -> Super IO Configuration Serial Port 3 Configuration



Advanced -> Super IO Configuration Serial Port 4 Configuration



Options summary:

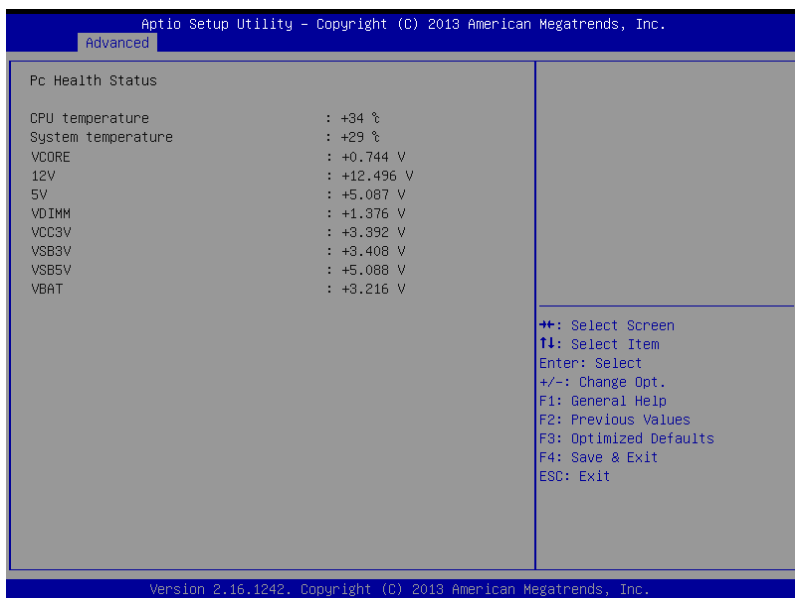
Serial Port	Disabled	
	Enabled	Default
Allows BIOS to En/Disable correspond serial port.		
Change Settings (Serial Port 1)	Auto	Default
	IO=3F8h; IRQ=4;	
	IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12;	
	IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12;	

	IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12;	
	IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;	
Allows BIOS to Select Serial Port resource.		
Change Settings (Serial Port 2)	Auto	Default
	IO=2F8h; IRQ=3;	
	IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12;	
	IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12;	
	IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12;	
	IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;	
Working model	RS232	Default
	RS422	
	RS485	
Select Working model		
Change Settings (Serial Port 3)	Auto	Default
	IO=3E8h; IRQ=7;	
	IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12;	

	IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;	
	IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12;	
	IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;	
Working model	RS232	Default
	RS422	
	RS485	
Select Working model		
Change Settings (Serial Port 4)	Auto	Default
	IO=2E8h; IRQ=7;	
	IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12;	
	IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12;	
	IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12;	
	IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;	
Allows BIOS to Select Serial Port resource.		
Smart Fan Function	Enable	
	Disable	Optimal Default, Failsafe Default

Enable or Disable Smart Fan

Advanced -> H/W Monitor



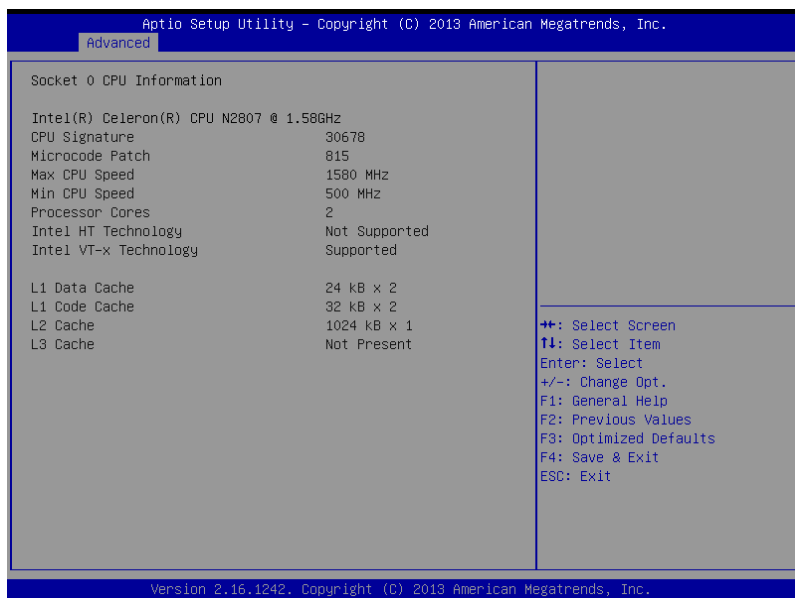
Advanced -> H/W Monitor



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		

Advanced -> CPU Configuration Socket 0 CPU Information



Advanced -> SATA Configuration

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Advanced

IDE Configuration		Enable / Disable Serial ATA
Serial-ATA (SATA)	[Enabled]	
SATA Speed Support	[Gen2]	
SATA ODD Port	[No ODD]	
SATA Mode	[AHCI Mode]	
Serial-ATA Port 0	[Enabled]	
SATA Port0 HotPlug	[Disabled]	
Serial-ATA Port 1	[Enabled]	
SATA Port1 HotPlug	[Disabled]	
SATA Port0	Not Present	
SATA Port1	Not Present	
		++: Select Screen T1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

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Options summary:

SATA Mode	IDE	Default
	AHCI	
IDE: Configure SATA controllers as legacy IDE		
AHCI: Configure SATA controllers to operate in AHCI mode		
En/Disable SATA Port		

Advanced -> CSM Configuration

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.		
Advanced		
Compatibility Support Module Configuration		Enable/Disable CSM Support.
CSM Support	[Enabled]	
CSM16 Module Version	07.71	
Boot option filter	[UEFI and Legacy]	
Option ROM execution order		
Storage	[UEFI only]	
Video	[Legacy first]	
Other PCI devices	[UEFI first]	
		++: Select Screen T1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.		

Advanced -> Trusted Computing

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.		
Advanced		
Configuration		
Security Device Support	[Disabled]	Enables or Disables BIOS support for security device. U.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
Current Status Information	SUPPORT TURNED OFF	
		++: Select Screen t1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.		

Advanced -> USB Configuration

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

Advanced

USB Configuration USB Module Version 8.11.01 USB Devices: 1 Drive, 1 Keyboard, 1 Mouse, 1 Hub Legacy USB Support [Enabled] USB Mass Storage Driver Support [Enabled]	Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.
---	---

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

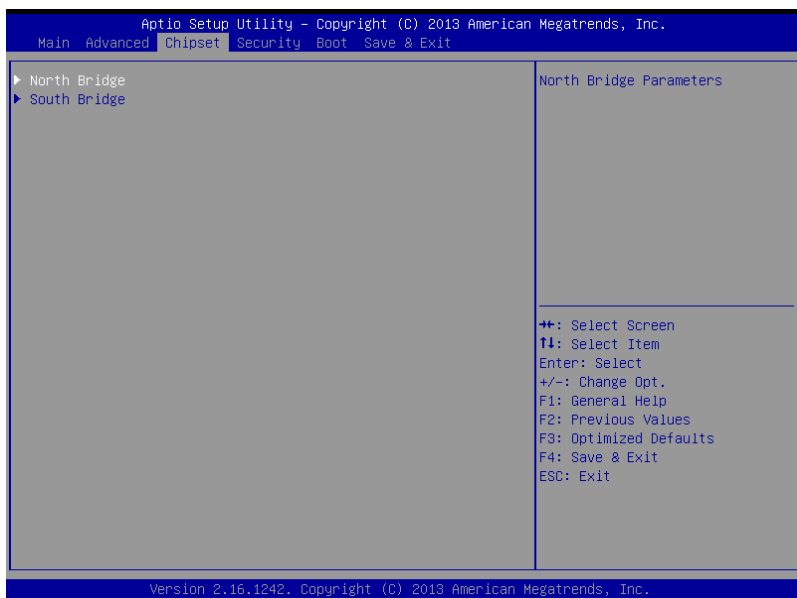
Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.

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 Type)	Auto	Optimal Default, Failsafe Default
	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)		

Chipset

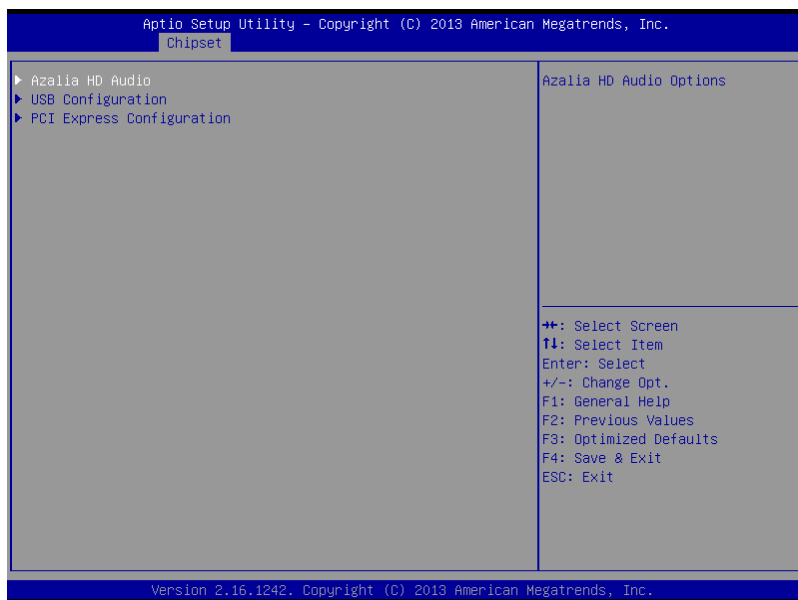


Chipset -> Host Bridge

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.		
Chipset		
Primary Boot Display	[VBIOS Default]	Select the Video Device which will be activated during POST. This has no effect if external graphics present. Secondary boot display selection will appear based on your selection. VGA modes will be supported only on primary display
Memory Information		
Total Memory	4096 MB (LPDDR3)	++: Select Screen f1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Memory Slot0	4096 MB (LPDDR3)	

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Chipset -> South Bridge



Chipset -> South Bridge -> Azallia HD Audio

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

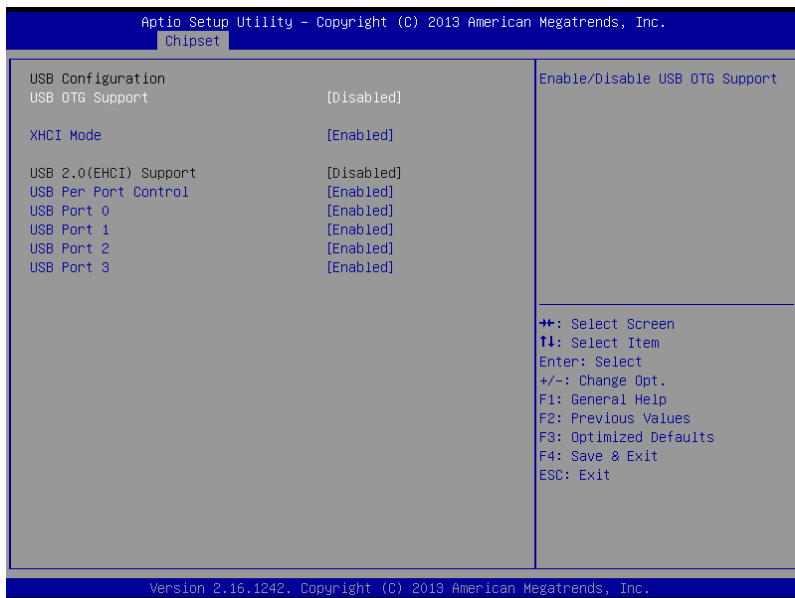
Chipset

Audio Configuration		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.
Audio Controller	[Enabled]	
Azalia HDMI Codec	[Enabled]	
HDMI Port	[Enabled]	
		++: Select Screen t1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

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Azalia HD Audio	Disabled	Optimal Default, Failsafe Default
	HD Audio	
Enabling/Disabling HD Audio controller.		

Chipset -> South Bridge -> USB Configuration



Chipset -> South Bridge -> PCI Express Configuration

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

Chipset

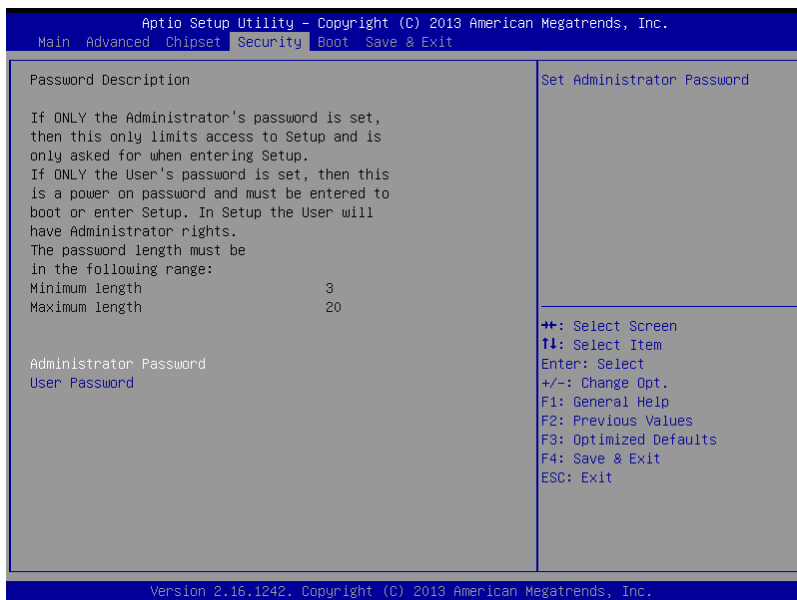
PCI Express Configuration PCI Express Port 0 [Enabled] Hot Plug [Disabled] Speed [Auto]		Enable or Disable the PCI Express Port 0 in the Chipset.
PCI Express Port 1 [Enabled] Hot Plug [Disabled] Speed [Auto]		
PCI Express Port 2 [Enabled] Hot Plug [Disabled] Speed [Auto]		
PCI Express Port 3 [Enabled] Hot Plug [Disabled] Speed [Auto]		++: Select Screen !: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

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Options summary:

PCI Express Root Port 0	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enabling/Disabling PCI Express root ports		
PCI Express Root Port x	Disabled Enabled	Optimal Default, Failsafe Default
	Auto	
Enabling/Disabling PCI Express root ports		

Security



Setup submenu: Security

Change User/Supervisor Password

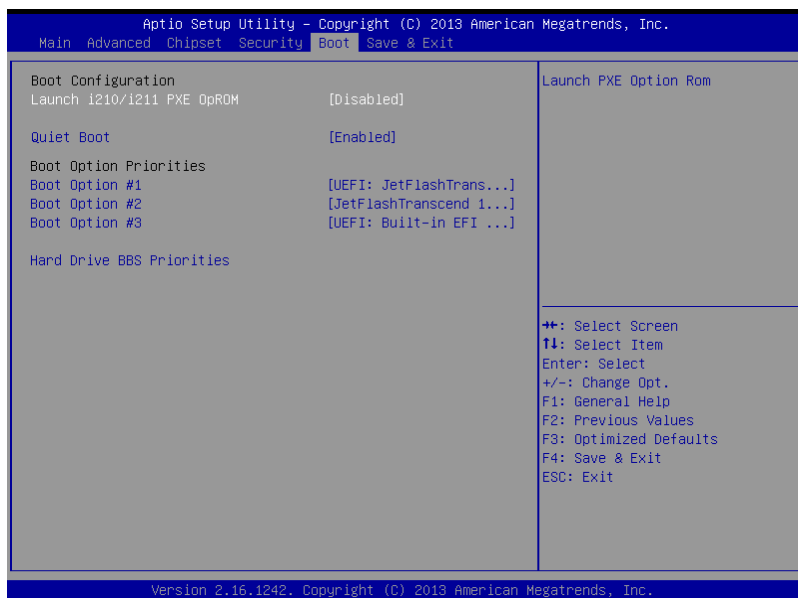
You can install a Supervisor password, and if you install a supervisor password, you can then install a user password. A user password does not provide access to many of the features in the Setup utility.

If you highlight these items and press Enter, a dialog box appears which lets you enter a password. You can enter no more than six letters or numbers. Press Enter after you have typed in the password. A second dialog box asks you to retype the password for confirmation. Press Enter after you have retyped it correctly. The password is required at boot time, or when the user enters the Setup utility.

Removing the Password

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

Boot

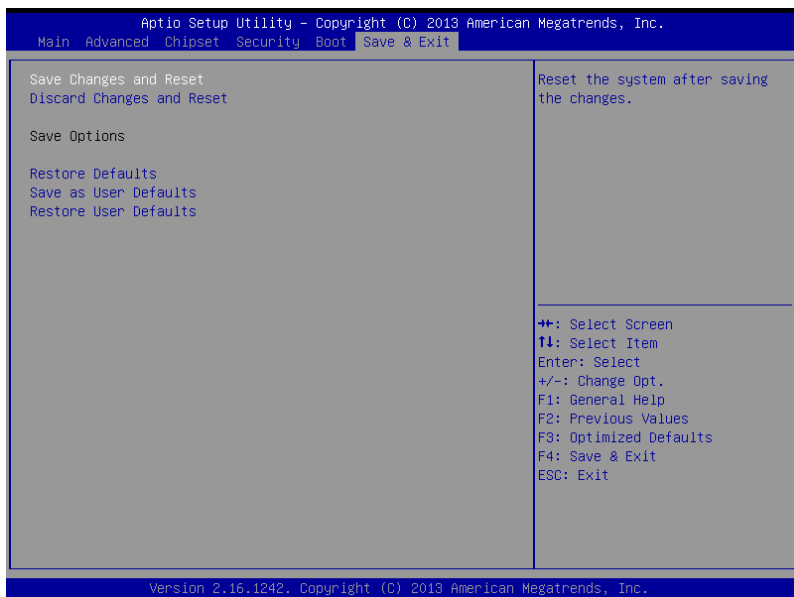


Options summary:

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

En/Disable PXE boot for 8111E LAN

Exit



Chapter

4

Driver Installation

The BOXER-6614 comes with a DVD-ROM that contains all drivers and utilities that meet your needs.

Follow the sequence below to install the drivers:

Step 1 – Install Chipset Driver

Step 2 – Install Graphics Driver

Step 3 – Install LAN Driver

Step 4 – Install Audio Driver

Step 5 – Install TXE Driver

Step 6 – Install TPM Driver

Step 7 – Install MBI Driver

Step 8 – Install Serial Port Driver (Optional)

Step 9 – Install USB3.0 Driver

4.1 Installation:

Insert the BOXER-6614 DVD-ROM into the DVD-ROM Drive. And install the drivers from Step 1 to Step 9 in order.

Step 1 – Install Chipset Driver

1. Click on the **Step1 - Chipset** folder and double click on the **SetupChipset.exe** file
2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

Step 2 – Install Graphics Driver

1. Click on the **Step2 - Graphic** folder and select the OS your system is
2. Double click on the **Setup.exe** file located in each OS folder
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

Step 3 – Install LAN Driver

1. Click on the **Step3 - LAN** folder and select the OS folder your system is
2. Double click on the **.exe** file located in each OS folder
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

Step 4 – Install Audio Driver

1. Click on the **Step4 - Audio** folder and double click on the

Win7_8-32_64_R273.exe file

2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

Step 5 – Install TXE Driver

1. Click on the **Step5 - TXE** folder and double click on the **SetupTXE.exe** file
2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

Step 6 – Install TPM Driver

1. Click on the **Step7 - TPM** folder and double click on the **Atmel TPM Driver Installer 3.0.3.15.exe** file
2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

Step 7 – Install MBI Driver

1. Click on the **Step8 - MBI** folder and double click on the **Setup.exe** file
2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

Step 8 – Install Serial Port Driver (Optional)

1. Click on the **Step10 - Serial Port Driver (Optional)** folder and select the OS folder your system is
2. Double click on the **patch.exe** file located in each OS

folder

3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

Step 9 – Install USB3.0 Driver

1. Click on the **Step9 - USB3.0** folder and double click on the **Setup.exe** file

Follow the instructions that the window shows

Appendix

A

Programming the Watchdog Timer

A.1 Watchdog Timer Registers

Table 1 : Watch dog relative IO address

I/O Base	Default Value	Note
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 than 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)

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 procedure will enable the WDT counting.
WDTSetBit(TimerReg, PSWidthBit, PSWidthVal);
// Watchdog WDTRST# Enable
WDTSetBit(DevReg, WDTRstBit, WDTRstVal);
}
VOID WDTClearTimeoutStatus(){
WDTSetBit(TimerReg, StatusBit, 1);
}

```

```

VOID WDTWriteByte(byte Register, byte Value){
IOWriteByte(WDTAddr+Register, Value);
}
byte WDTReadByte(byte Register){
return IOReadByte(WDTAddr+Register);
}
VOID WDTSetBit(byte Register, byte Bit, byte Val){

```

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

Appendix

B

I/O Information

B.1 I/O Address Map

Input/output (IO)	
[0000000000000000 - 000000000000006F]	PCI bus
[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 - 000000000000007F]	PCI bus
[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
[000000000000002E8 - 000000000000002EF]	Communications Port (COM4)
[000000000000002F8 - 000000000000002FF]	Communications Port (COM2)
[00000000000000378 - 0000000000000037F]	Printer Port (LPT1)
[000000000000003B0 - 000000000000003BF]	Intel(R) Atom(TM) Processor E3800 Series/Intel(R) Celeron(R) Processor N2920/1900
[000000000000003C0 - 000000000000003DF]	Intel(R) Atom(TM) Processor E3800 Series/Intel(R) Celeron(R) Processor N2920/1900
[000000000000003E8 - 000000000000003EF]	Communications Port (COM3)
[000000000000003F8 - 000000000000003FF]	Communications Port (COM1)
[00000000000000400 - 0000000000000047F]	Motherboard resources
[000000000000004D0 - 000000000000004D1]	Programmable interrupt controller
[00000000000000500 - 000000000000005FE]	Motherboard resources
[00000000000000600 - 0000000000000061F]	Motherboard resources
[00000000000000680 - 0000000000000069F]	Motherboard resources
[00000000000000A00 - 00000000000000A0F]	Motherboard resources
[00000000000000A10 - 00000000000000A1F]	Motherboard resources
[00000000000000A20 - 00000000000000A2F]	Motherboard resources
[00000000000000D00 - 00000000000000FFF]	PCI bus

[000000000000D000 - 000000000000DFFF]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 2 - 0F4A
[000000000000E000 - 000000000000EFFF]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 1 - 0F48
[000000000000F000 - 000000000000F01F]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Platform Control Unit - SMBus Port
[000000000000F020 - 000000000000F03F]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
[000000000000F040 - 000000000000F043]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
[000000000000F050 - 000000000000F057]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
[000000000000F060 - 000000000000F063]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
[000000000000F070 - 000000000000F077]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
[000000000000F080 - 000000000000F087]	Intel(R) Atom(TM) Processor E3800 Series/Intel(R) Celeron(R) Processor N2920/J1900

B.2 Memory Address Map

Memory	
[000000000000A000 - 000000000000BFFF]	Intel(R) Atom(TM) Processor E3800 Series/Intel(R) Celeron(R) Processor N2920/J1900
[000000000000A000 - 000000000000BFFF]	PCI bus
[000000000000C000 - 000000000000DFFF]	PCI bus
[000000000000E000 - 000000000000FFFF]	PCI bus
[000000000000C0000000 - 000000000000CFFFFFFF]	Intel(R) Atom(TM) Processor E3800 Series/Intel(R) Celeron(R) Processor N2920/J1900
[000000000000C0000000 - 000000000000D816FFFF]	PCI bus
[000000000000D0000000 - 000000000000D03FFFFF]	Intel(R) Atom(TM) Processor E3800 Series/Intel(R) Celeron(R) Processor N2920/J1900
[000000000000D0400000 - 000000000000D04FFFFF]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Trusted Execution Engine Interface -
[000000000000D0500000 - 000000000000D05FFFFF]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Trusted Execution Engine Interface -
[000000000000D0600000 - 000000000000D061FFFF]	Intel(R) I211 Gigabit Network Connection
[000000000000D0600000 - 000000000000D06FFFFF]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 2 - 0F4A
[000000000000D0620000 - 000000000000D0623FFF]	Intel(R) I211 Gigabit Network Connection
[000000000000D0700000 - 000000000000D071FFFF]	Intel(R) I211 Gigabit Network Connection #2
[000000000000D0700000 - 000000000000D07FFFFF]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 1 - 0F48
[000000000000D0720000 - 000000000000D0723FFF]	Intel(R) I211 Gigabit Network Connection #2
[000000000000D0800000 - 000000000000D080FFFF]	Intel(R) USB 3.0 eXtensible Host Controller
[000000000000D0810000 - 000000000000D0813FFF]	High Definition Audio Controller
[000000000000D0814000 - 000000000000D081401F]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Platform Control Unit - SMBus Port
[000000000000D0816000 - 000000000000D08167FF]	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
[000000000000E0000000 - 000000000000EFFFFFFF]	Motherboard resources
[000000000000FED00000 - 000000000000FED003FF]	High precision event timer
[000000000000FED01000 - 000000000000FED01FFF]	Motherboard resources
[000000000000FED03000 - 000000000000FED03FFF]	Motherboard resources
[000000000000FED04000 - 000000000000FED04FFF]	Motherboard resources
[000000000000FED08000 - 000000000000FED08FFF]	Motherboard resources
[000000000000FED0C000 - 000000000000FED0FFFF]	Motherboard resources
[000000000000FED1C000 - 000000000000FED1CFFF]	Motherboard resources
[000000000000FEE00000 - 000000000000FEEFFFFFFF]	Motherboard resources
[000000000000FEF00000 - 000000000000FEFFFFFFF]	Motherboard resources
[000000000000FFF00000 - 000000000000FFFFFFFF]	Intel(R) 82802 Firmware Hub Device

B.3 IRQ Mapping Chart

Interrupt request (IRQ)	
(ISA) 0x00000000 (00)	System timer
(ISA) 0x00000003 (03)	Communications Port (COM2)
(ISA) 0x00000004 (04)	Communications Port (COM1)
(ISA) 0x00000008 (08)	High precision event timer
(ISA) 0x0000000A (10)	Communications Port (COM3)
(ISA) 0x0000000A (10)	Communications Port (COM4)
(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
(ISA) 0x00000076 (118)	Microsoft ACPI-Compliant System
(ISA) 0x00000077 (119)	Microsoft ACPI-Compliant System
(ISA) 0x00000078 (120)	Microsoft ACPI-Compliant System
(ISA) 0x00000079 (121)	Microsoft ACPI-Compliant System
(ISA) 0x0000007A (122)	Microsoft ACPI-Compliant System
(ISA) 0x0000007B (123)	Microsoft ACPI-Compliant System
(ISA) 0x0000007C (124)	Microsoft ACPI-Compliant System
(ISA) 0x0000007D (125)	Microsoft ACPI-Compliant System

	(ISA) 0x0000007E (126)	Microsoft ACPI-Compliant System
	(ISA) 0x0000007F (127)	Microsoft ACPI-Compliant System
	(ISA) 0x00000080 (128)	Microsoft ACPI-Compliant System
	(ISA) 0x00000081 (129)	Microsoft ACPI-Compliant System
	(ISA) 0x00000082 (130)	Microsoft ACPI-Compliant System
	(ISA) 0x00000083 (131)	Microsoft ACPI-Compliant System
	(ISA) 0x00000084 (132)	Microsoft ACPI-Compliant System
	(ISA) 0x00000085 (133)	Microsoft ACPI-Compliant System
	(ISA) 0x00000086 (134)	Microsoft ACPI-Compliant System
	(ISA) 0x00000087 (135)	Microsoft ACPI-Compliant System
	(ISA) 0x00000088 (136)	Microsoft ACPI-Compliant System
	(ISA) 0x00000089 (137)	Microsoft ACPI-Compliant System
	(ISA) 0x0000008A (138)	Microsoft ACPI-Compliant System
	(ISA) 0x0000008B (139)	Microsoft ACPI-Compliant System
	(ISA) 0x0000008C (140)	Microsoft ACPI-Compliant System
	(ISA) 0x0000008D (141)	Microsoft ACPI-Compliant System
	(ISA) 0x0000008E (142)	Microsoft ACPI-Compliant System
	(ISA) 0x0000008F (143)	Microsoft ACPI-Compliant System
	(ISA) 0x00000090 (144)	Microsoft ACPI-Compliant System
	(ISA) 0x00000091 (145)	Microsoft ACPI-Compliant System
	(ISA) 0x00000092 (146)	Microsoft ACPI-Compliant System
	(ISA) 0x00000093 (147)	Microsoft ACPI-Compliant System
	(ISA) 0x00000094 (148)	Microsoft ACPI-Compliant System
	(ISA) 0x00000095 (149)	Microsoft ACPI-Compliant System
	(ISA) 0x00000096 (150)	Microsoft ACPI-Compliant System
	(ISA) 0x00000097 (151)	Microsoft ACPI-Compliant System
	(ISA) 0x00000098 (152)	Microsoft ACPI-Compliant System
	(ISA) 0x00000099 (153)	Microsoft ACPI-Compliant System
	(ISA) 0x0000009A (154)	Microsoft ACPI-Compliant System
	(ISA) 0x0000009B (155)	Microsoft ACPI-Compliant System
	(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
	(ISA) 0x000000A0 (160)	Microsoft ACPI-Compliant System
	(ISA) 0x000000A1 (161)	Microsoft ACPI-Compliant System
	(ISA) 0x000000A2 (162)	Microsoft ACPI-Compliant System
	(ISA) 0x000000A3 (163)	Microsoft ACPI-Compliant System
	(ISA) 0x000000A4 (164)	Microsoft ACPI-Compliant System
	(ISA) 0x000000A5 (165)	Microsoft ACPI-Compliant System
	(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
	(ISA) 0x000000B0 (176)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B1 (177)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B2 (178)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B3 (179)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B4 (180)	Microsoft ACPI-Compliant System

	(ISA) 0x000000B5 (181)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B6 (182)	Microsoft ACPI-Compliant System
	(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
	(PCI) 0x00000008 (11)	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Platform Control Unit - SMBus Port - 0F12
	(PCI) 0x00000010 (16)	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 1 - 0F48
	(PCI) 0x00000011 (17)	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 2 - 0F4A
	(PCI) 0x00000013 (19)	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
	(PCI) 0x00000016 (22)	High Definition Audio Controller
	(PCI) 0xFFFFFFF1 (-15)	Intel(R) I211 Gigabit Network Connection
	(PCI) 0xFFFFFFF2 (-14)	Intel(R) I211 Gigabit Network Connection
	(PCI) 0xFFFFFFF3 (-13)	Intel(R) I211 Gigabit Network Connection
	(PCI) 0xFFFFFFF4 (-12)	Intel(R) I211 Gigabit Network Connection
	(PCI) 0xFFFFFFF5 (-11)	Intel(R) I211 Gigabit Network Connection
	(PCI) 0xFFFFFFF6 (-10)	Intel(R) I211 Gigabit Network Connection
	(PCI) 0xFFFFFFF7 (-9)	Intel(R) I211 Gigabit Network Connection #2
	(PCI) 0xFFFFFFF8 (-8)	Intel(R) I211 Gigabit Network Connection #2
	(PCI) 0xFFFFFFF9 (-7)	Intel(R) I211 Gigabit Network Connection #2
	(PCI) 0xFFFFFFFA (-6)	Intel(R) I211 Gigabit Network Connection #2
	(PCI) 0xFFFFFFF8 (-5)	Intel(R) I211 Gigabit Network Connection #2
	(PCI) 0xFFFFFFFC (-4)	Intel(R) I211 Gigabit Network Connection #2
	(PCI) 0xFFFFFFFD (-3)	Intel(R) USB 3.0 eXtensible Host Controller
	(PCI) 0xFFFFFFF0 (-2)	Intel(R) Atom(TM) Processor E3800 Series/Intel(R) Celeron(R) Processor N2920/J1900

B.4 DMA Channel Assignments

-  Direct memory access (DMA)
-  3 Printer Port (LPT1)

TEXIM EUROPE

Partner in Electronic Components & Supply Chain Solutions



The Netherlands

Elektrostraat 17
NL-7483 PG Haaksbergen
Tel: +31 (0)53 573 33 33
Fax: +31 (0)53 573 33 30
nl@texim-europe.com



Denmark

Sdr. Jagtvej 12
DK-2970 Hørsholm
Tel: +45 88 20 26 30
Fax: +45 88 20 26 39
nordic@texim-europe.com



Belgium

Gentsesteenweg 1154-C22
Chaussée de Gand 1154-C22
B-1082 Brussel / Bruxelles
Tel: +32 (0)2 462 01 00
Fax: +32 (0)2 462 01 25
belgium@texim-europe.com



United Kingdom

St. Mary's House, Church Lane
Carlton Le Moorland
Lincoln LN5 9HS
Tel: +44 (0)1522 789 555
Fax: +44 (0)845 299 22 26
uk@texim-europe.com



Germany

Bahnhofstrasse 92
D-25451 Quickborn
Tel: +49 (0)4106 627 07-0
Fax: +49 (0)4106 627 07-20
germany@texim-europe.com



Germany

Martin-Kollar-Strasse 9
D-81829 München
Tel: +49 (0)89 436 086-0
Fax: +49 (0)89 436 086-19
germany@texim-europe.com



Austria

Warwitzstrasse 9
A-5020 Salzburg
Tel: +43 (0)662 216026
Fax: +43 (0)662 216026-66
austria@texim-europe.com

Texim Europe B.V.

Elektrostraat 17
NL-7483 PG Haaksbergen
Tel: +31 (0)53 573 33 33
info@texim-europe.com
www.texim-europe.com

