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Authorized Distributor, Integrator, and Value-Added Reseller

EPIC-BDU7

Intel® Core™ i3/i5/i7 ULT Processor SoC

DDR3L 1600 SODIMM

2 Mini-PCIe Socket

4 USB 2.0, 2 USB 3.0, 6 COM

2 SATA, 1 mSATA

VGA, LVDS, DP

EPIC-BDU7 Rev. A Manual 2nd Ed.
August 27, 2015

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Packing List

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

- DVD-ROM for manual (in PDF format) and drivers
- EPIC-BDU7

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

China RoHS Requirements

产品中有毒有害物质或元素名称及含量

AAEON Main Board/ Daughter Board/ Backplane

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

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：此产品所标示之环保使用期限，系指在一般正常使用状况下。

China RoHS Requirements

Poisonous or Hazardous Substances or Elements in Products

AAEON Main Board/ Daughter Board/ Backplane

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

As one of AAEON's first products using Intel® 5th Generation Core™ Processor SoCs, the board is equipped with rich media playing features such as support for 4K resolution videos as well as independent displays.

With low-power consumption and compactness being the key aspects in 21st century computer designs, the board runs on 15WDP while providing an abundance of expansion, network, and I/O capabilities, making it one of the top contenders in applications in gaming, digital signage, and industrial automation.

1.2 Features

- Fifth Generation Intel® Core™ i3/i5/i7 ULT Processor SoC
- DDR3L 1600 SODIMM, up to 8GB
- VGA, LVDS1, DP, LVDS2 (Optional), eDP (Optional)
- Intel® WGI211AT/ WGI218LM x 1, RJ-45 x 2
- SATA 3 (6.0Gb/s) x 2, mSATA x 1
- USB 2.0 x 4, USB 3.0 x 2
- RS-232 x 4, RS-242/422/485 x 2
- Touch panel control chip supporting 4/5 wire touchscreen (Optional)
- DC 9V ~ 24V, AT/ATX

1.3 Specifications

System

Form Factor	EPIC Board
Processor	5th Generation Intel® Core™ i3/i5/i7 ULT Processor SoC
System Memory	DDR3L 1600 SODIMM, up to 8GB
Chipset	5th Generation Intel® Core™ i3/i5/i7 ULT Processor SoC
Ethernet	Intel® WGI211AT x 1/ WGI218LM x 1
BIOS	AMI BIOS
Wake On LAN	Yes
Watchdog Timer	1~255 sec support by AAEON Hi-Safe
H/W Status Monitoring	Supported by AAEON Hi-Safe
Expansion Interface	Full-size MiniCard #1 (Shared with mSATA) (Optional) Full-size MiniCard #1 SIM slot x 1 (Optional) Half-size MiniCard #2 PCI-104 x 1(optional) Touch panel controller and connector x 1 (optional) TPM x 1 (optional)

- Battery — Lithium RTC battery
- Power Requirement — DC 9~24V, AT/ATX
- Power Consumption (Typical) — 38W
- Board Size — 165mm x 115mm (6.5" x 4.53")
- Gross Weight — 0.4kg (0.88 lbs)
- Operating Temperature — 0 °C ~ 60 °C (32 °F ~ 140 °F)
- Storage Temperature — -40°C ~ 80°C (-40°F ~ 176°F)
- Operation Humidity — 0% ~ 90% Relative Humidity, Non-Condensing

Display

- Chipset — 5th Generation Intel® Core™ i3/i5/i7 ULT Processor SoC
- Resolution — CRT up to 1920 x 1200 @ 60Hz
  LCD up to 1920 x 1200 @ 60Hz
  Display Port up to 3840 x 2160 @ 60Hz
- LCD Interface — VGA, LVDS1, DP, LVDS2 (Optional), eDP (Optional)

I/O

- Storage — SATA 3 (6.0Gb/s) x 2, mSATA x 1 (Full-size, default)

- USB — USB 3.0 x 2
  USB 2.0 x 4
- Serial Port — RS-232 x 4
  RS-232/422/485 x 2 (Ring/+5V/+12V)
- Parallel Port — SPP/EPP/ECP x 1 (Optional) controlled by BIOS
- DI/O — 16-bit digital I/O interface co-lay with LPT Port controlled by BIOS (DI/O default)
- Audio — Realtek ALC 892
  2W Audio Amp
- Keyboard/ Mouse — PS/2 Keyboard & Mouse

Chapter

2

Quick Installation Guide

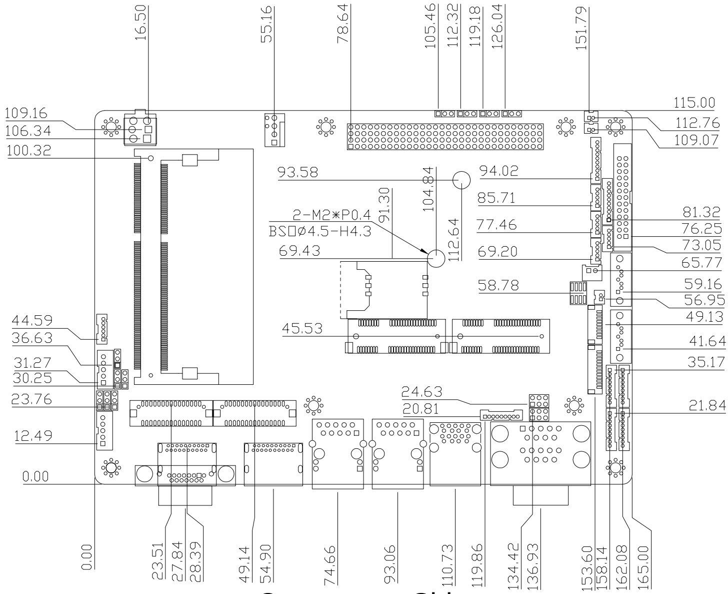
2.1 Safety Precautions

Always completely disconnect the power cord from your board whenever you are working on it. Do not make connections while the power is on, because a sudden rush of power can damage sensitive electronic components.

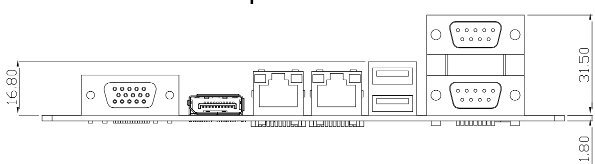
Always ground yourself to remove any static charge before touching the board. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis

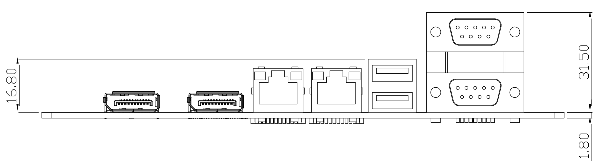
2.2 Dimensions

Component Side

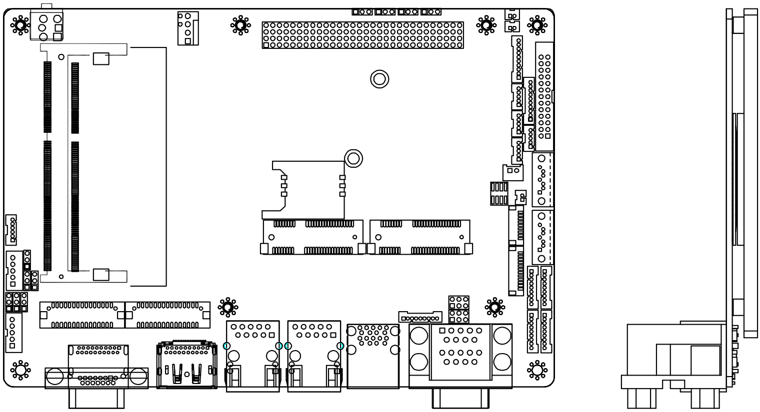


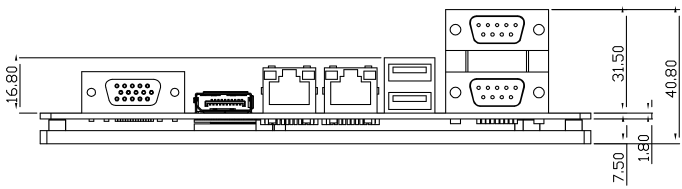
Component Side
Component Side

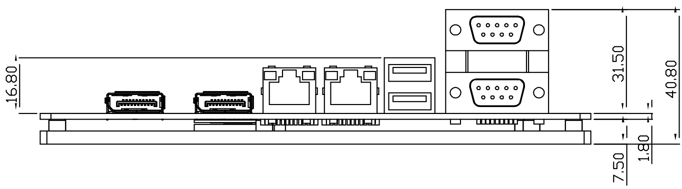




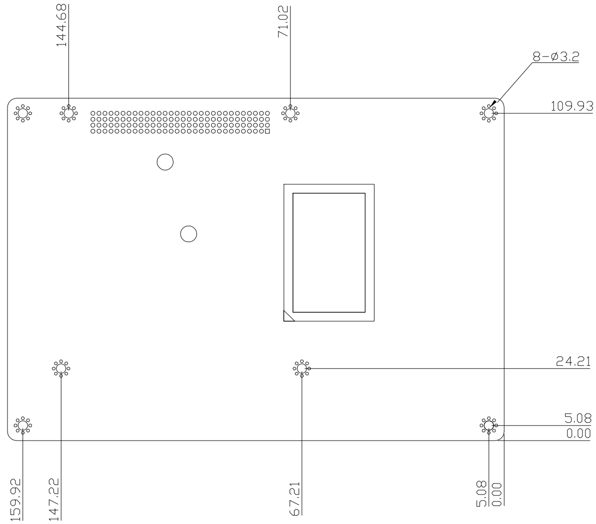
With Heat Spreader



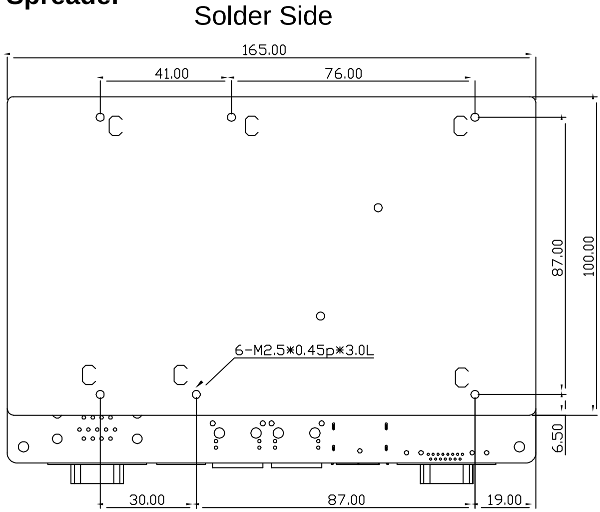




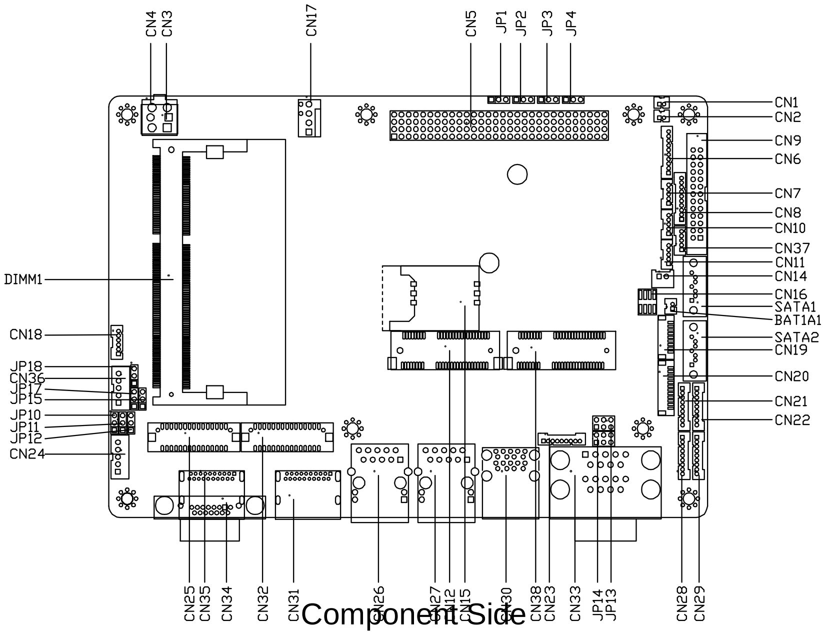
Solder Side



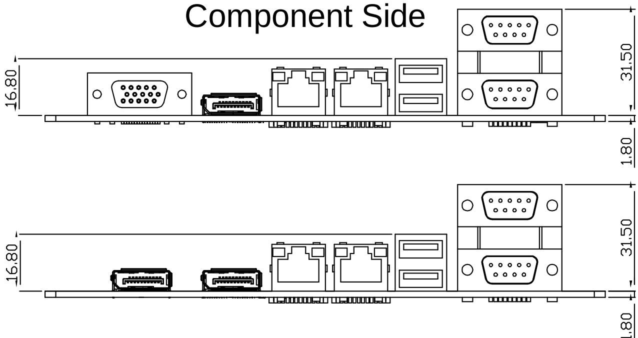
With Heat Spreader



2.3 Jumpers and Connectors



Component 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
JP1	PCI-104 I/O Voltage Selection
JP2	Clear CMOS Jumper
JP3	Touch Screen 4/5/8 Wire Mode Selection
JP4	AT/ATX Power Supply Mode Selection
JP10	LVDS Port1/eDP Backlight Inverter Voltage
JP11	LVDS Port1/eDP Operating Voltage Selection
JP12	LVDS Port1/eDP Backlight Lightness Control
JP13	COM2 (D-SUB) Ring/+12V/+5V Selection
JP14	COM3 (Wafer) Ring/+12V/+5V Selection
JP15	LVDS Port2 Backlight Lightness Control Mode
JP17	LVDS Port2 Backlight Inverter Voltage
JP18	LVDS Port2 Operating Voltage Selection

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:

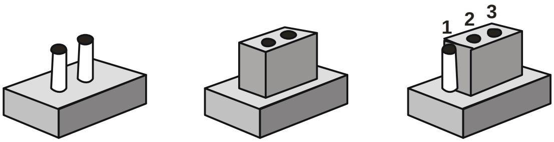
Label	Function
CN1	Stereo Audio RIGHT Channel
CN2	Stereo Audio LEFT Channel
CN3	Main Power Input (+12V ONLY)
CN4	Main Power Input (+9V to +24V)
CN5	PCI-104 Connector
CN6	High Definition Audio
CN7	USB 2.0 Port 4
CN8	Front Panel
CN9	LPT/Digital IO Port
CN10	USB 2.0 Port 3
CN11	USB 2.0 Port 5
CN12	Mini-Card (Half Size)
CN14	+5V Output for SATA HDD
CN15	UIM Socket
CN16	SPI Programming Header (Debug ONLY)
CN17	CPU FAN
CN18	PS/2 Keyboard/Mouse Combo Port
CN19	Touch Screen Connector
CN20	LPC Expansion Connector

CN21	COM Port 6 (RS232)
CN22	COM Port 5 (RS232)
CN23	COM Port 1 (RS232)
CN24	LVDS Port1/eDP Inverter / Backlight Connector
CN25	LVDS Port1/eDP
CN26	10M/100M/1G Ethernet Port 1
CN27	10M/100M/1G Ethernet Port 2
CN28	COM Port 4 (RS232)
CN29	COM Port 3 (RS232/485/422)
CN30	USB 2.0/3.0 Port 1 & 2
CN31	Display Port 2
CN32	LVDS Port 2
CN33A	COM Port 1 (RS232)
CN33B	COM Port 2 (RS232/485/422)
CN34	VGA Port
CN35	Display Port 1
CN36	LVDS Port 2 Inverter / Backlight Connector
CN37	USB 2.0 Port 6
CN38	Mini-Card (Full Size)
SATA1	SATA Port 1
SATA2	SATA Port 2
DIMM1	DDR3L SODIMM

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.



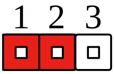
Open **Closed** **Closed 2-3**

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

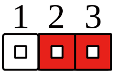
If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any change.

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

2.7 PCI-104 I/O Voltage Selection (JP1)

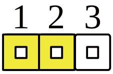


+5V

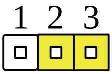


+3.3V (Default)

2.8 Clear CMOS Jumper (JP2)

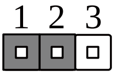


Normal (Default)

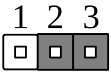


Clear CMOS

2.9 Touchscreen 4/5/8 Wire Mode Selection (JP3)

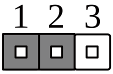


4/8 Wires Mode (Default)

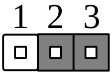


5 Wires Mode

2.10 AT/ATX Power Supply Mode Selection (JP4)



ATX Mode



AT Mode (Default)

2.11 LVDS2 Port1/eDP Backlight Inverter Voltage Selection (JP10)

+12V **+5V (Default)**

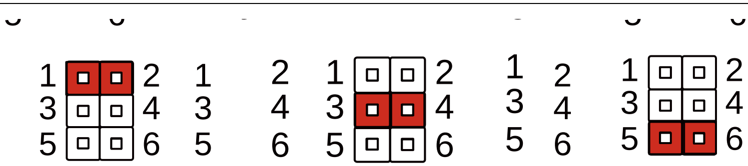
2.12 LVDS2 Port1/eDP Operating Voltage Selection (JP11)

+5V **+3.3V (Default)**

2.13 LVDS Port1/eDP Backlight Lightness Control Mode Selection (JP12)

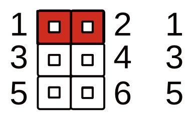
VR Mode **PWM Mode (Default)**

2.14 COM2 (D-SUB) Ring/+12V/+5V Selection (JP13)

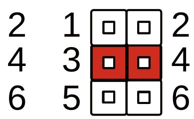


+12V **Ring (Default)** **+5V**

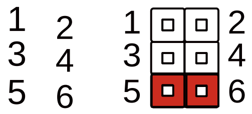
2.15 COM3 (Wafer) Ring/+12V/+5V Selection (JP14)



+12V

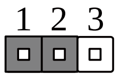


Ring (Default)

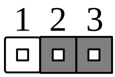


+5V

2.16 LVDS Port2 Backlight Lightness Control Mode Selection (JP15)

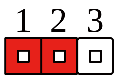


VR Mode

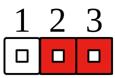


PWM Mode (Default)

2.17 LVDS Port2 Backlight Inverter Voltage Selection (JP17)

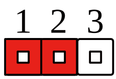


+12V

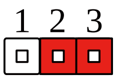


+5V (Default)

2.18 LVDS Port2 Operating Voltage Selection (JP18)

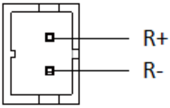


+5V



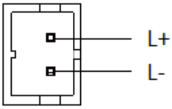
+3.3V (Default)

2.19 Stereo Audio Right Channel (CN1)



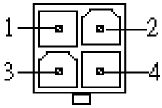
Pin	Pin Name	Signal Type	Signal Level
1	R+	OUT	
2	R-	OUT	

2.20 Stereo Audio Left Channel (CN2)



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

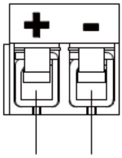
2.21 Main Power Input (+12V) (CN3)



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

4	+VIN	PWR	+12V

2.22 Main Power Input (+9V to +24V) (CN4)



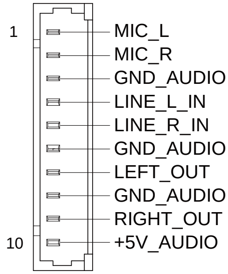
Pin	Pin Name	Signal Type	Signal Level
1	+VIN	PWR	+9V to +24V
2	GND	GND	

2.23 PCI-104 Connector (CN5)

	A	B	C	D
1	GND	+5V_SB	+5V	AD00
2	VI/O	AD02	AD01	+5V
3	AD05	GND	AD04	AD03
4	C/BE0#	AD07	GND	AD06
5	GND	AD09	AD08	GND
6	AD11	VI/O	AD10	M66EN
7	AD14	AD13	GND	AD12
8	+3.3V	C/BE1#	AD15	+3.3V
9	SERR#	GND	PSON#	PAR
10	GND	PERR#	+3.3V	PME#

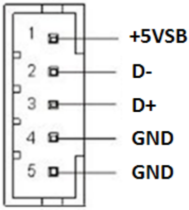
11	STOP#	+3.3V	LOCK#	GND
12	+3.3V	TRDY#	GND	DEVSEL#
13	FRAME#	GND	IRDY#	+3.3V
14	GND	AD16	+3.3V	C/BE2#
15	AD18	+3.3V	AD17	GND
16	AD21	AD20	GND	AD19
17	+3.3V	AD23	AD22	+3.3V
18	IDSEL0	GND	IDSEL1	IDSEL2
19	AD24	C/BE3#	VI/O	IDSEL3
20	GND	AD26	AD25	GND
21	AD29	+5V	AD28	AD27
22	+5V	AD30	GND	AD31
23	REQ0#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

2.24 High Definition Audio (CN6)



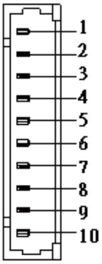
Pin	Pin Name	Signal Type	Signal Level
1	MIC_L	IN	
2	MIC_R	IN	
3	GND_AUDIO	GND	
4	LINE_L_IN	IN	
5	LINE_R_IN	IN	
6	GND_AUDIO	GND	
7	LEFT_OUT	OUT	
8	GND_AUDIO	GND	
9	RIGHT_OUT	OUT	
10	+5V_AUDIO	PWR	+5V

2.25 USB 2.0 Port 4 (CN7)



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

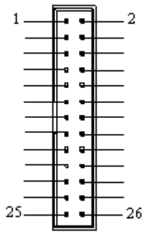
2.26 Front Panel (CN8)



Pin	Pin Name	Signal Type	Signal Level
1	PWR_BTN#	IN	
2	GND	GND	
3	+V5S	PWR	+5V

4	SPEAKER	IN	
5	+V3.3S	PWR	+3.3V
6	HDD_LED#	IN	
7	+V3.3S	PWR	+3.3V
8	GND	GND	
9	H/W RESET#	IN	
10	GND	GND	

2.27 LPT/ Digital IO Port (CN9)



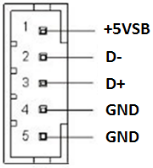
Pin	Pin Name	Signal Type	Signal Level
1	STOBE#	I/O	
2	#AFD	I/O	
3	PPD0	I/O	
4	ERR#	I/O	
5	PPD1	I/O	
6	PINIT#	I/O	
7	PPD2	I/O	
8	SLIN#	I/O	

9	PPD3	I/O	
10	GND	GND	
11	PPD4	I/O	
12	GND	GND	
13	PPD5	I/O	
14	GND	GND	
15	PPD6	I/O	
16	GND	GND	
17	PPD7	I/O	
18	GND	GND	
19	ACK#	I/O	
20	GND	GND	
21	BUSY	I/O	
22	GND	GND	
23	PE	I/O	
24	GND	GND	
25	SLCT	I/O	
26	PWR	PWR	+5V

Digital I/O Mode			
Pin	**Pin Name**	**Signal Type**	**Signal Level**
1	GPIO15	I/O	
2	GPIO14	I/O	

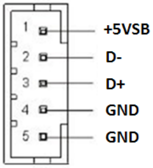
3	GPIO0	I/O	
4	GPIO13	I/O	
5	GPIO1	I/O	
6	GPIO12	I/O	
7	GPIO2	I/O	
8	GPIO11	I/O	
9	GPIO3	I/O	
10	GND	GND	
11	GPIO4	I/O	
12	GND	GND	
13	GPIO5	I/O	
14	GND	GND	
15	GPIO6	I/O	
16	GND	GND	
17	GPIO7	I/O	
18	GND	GND	
19	GPIO10	I/O	
20	GND	GND	
21	GPIO9	I/O	
22	GND	GND	
23	GPIO8	I/O	
24	GND	GND	
25	N.C		
26	PWR	PWR	+5V

2.28 USB 2.0 Port 3 (CN10)



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	

2.29 USB 2.0 Port 5 (CN11)



Pin	Pin Name	Signal Type	Signal Level
1	+5VSB	PWR	+5V
2	USB4_D-	DIFF	
3	USB4_D+	DIFF	
4	GND	GND	
5	GND	GND	

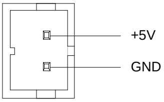
2.30 MiniCard (Half-size) (CN12)

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	

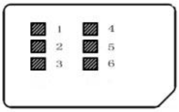
39	+3.3VSB	PWR	+3.3V
40	GND	GND	
41	+3.3VSB	PWR	+3.3V
42	NC		
43	GND	GND	
44	NC		
45	NC		
46	NC		
47	NC		
48	+1.5V	PWR	+1.5V
49	NC		
50	GND	GND	
51	NC		
52	+3.3VSB	PWR	+3.3V

2.31 +5V Output for SATA HDD (CN14)



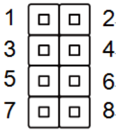
Pin	Pin Name	Signal Type	Signal Level
1	+5V	PWR	+5V
2	GND	GND	

2.32 UIM Socket (CN15)



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_DAT	I/O	

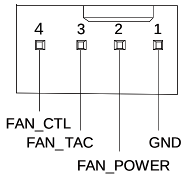
2.33 SPI Programming Header (Debug ONLY) (CN16)



Pin	Pin Name	Signal Type	Signal Level
1	+3.3V	PWR	+3.3V
2	GND	GND	
3	CS#	I/O	
4	CLK	I/O	
5	SO	I/O	
6	SI	I/O	

7	NC		
8	NC		

2.34 CPU Fan (CN17)



Pin	Pin Name	Signal type	Signal Level
1	GND	GND	
2	FAN_POWER	PWR	+12V
3	FAN_TAC	IN	
4	FAN_CTL	IN	

***** Pin 4 is optional. If used, smart fan will be supported

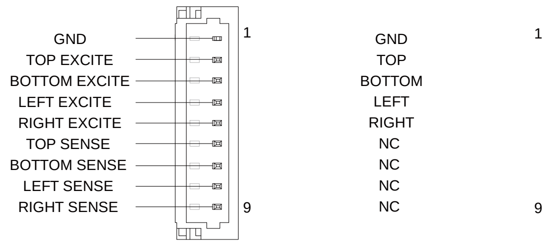
2.35 PS/2 Keyboard/Mouse Combo (CN18)

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

2.36 Touchscreen Connector (CN19)

8 Wires 4 Wires



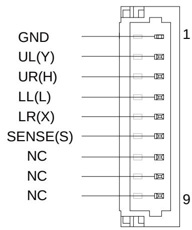
8 Wires			
Pin	**Pin Name**	**Signal Type**	**Signal Level**
1	GND	GND	
2	TOP EXCITE	IN	
3	BOTTOM EXCITE	IN	
4	LEFT EXCITE	IN	
5	RIGHT EXCITE	IN	
6	TOP SENSE	IN	
7	BOTTOM SENSE	IN	
8	LEFT SENSE	IN	

9	RIGHT SENSE	IN	

8 Wires 4 Wires 5 Wires

1
GND
TOP
BOTTOM
LEFT
RIGHT
NC
NC
NC
NC
9

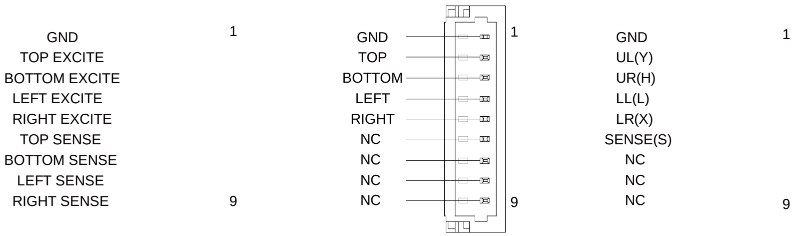
1
9



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

EPIC Board	EPIC-BDU7

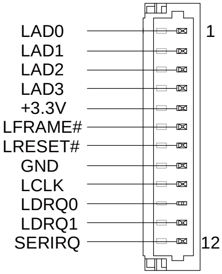
8 Wires   4 Wires   5 Wires



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

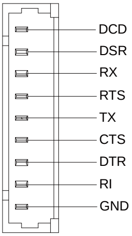
* Touchscreen mode can be set by JP3

2.37 LCP Expansion Connector (CN20)



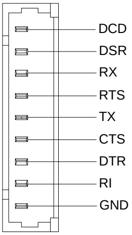
Pin	Pin Name	Signal Type	Signal Level
1	LAD0	I/O	+3.3V
2	LAD1	I/O	+3.3V
3	LAD2	I/O	+3.3V
4	LAD3	I/O	+3.3V
5	+3.3V	PWR	+3.3V
6	LFRAME#	IN	
7	LRESET#	OUT	+3.3V
8	GND	GND	
9	LCLK	OUT	

2.38 COM Port 6 (CN21)



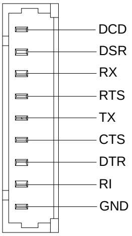
Pin	Pin Name	Signal Type	Signal Level
1	DCD	IN	
2	DSR	IN	
3	RX	IN	
4	RTS	OUT	±9V
5	TX	OUT	±9V
6	CTS	IN	
7	DTR	OUT	±9V
8	RI	IN	
9	GND	GND	

2.39 COM Port 5 (CN22)



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

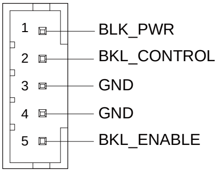
2.40 COM Port 1 (Optional) (CN23)



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

7	DTR	OUT	±9V
8	RI	IN	
9	GND	GND	

2.41 LVDS Port 1/eDP Inverter / Backlight Connector (CN24)



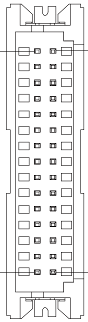
Pin	Pin Name	Signal Type	Signal Level
1	BKL_PWR	PWR	+5V / +12V
2	BKL_CONTROL	OUT	
3	GND	GND	
4	GND	GND	
5	BKL_ENABLE	OUT	+5V

* LVDS1/BKL_PWR can be set to +5V or +12V by JP10.

* LVDS1/BKL_CONTROL can be set by JP12.

* The driving current supports up to 2A

2.42 LVDS Port 1/eDP (CN25)



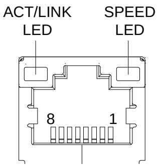
LVDS			
Pin	**Pin Name**	**Signal Type**	**Signal Level**
1	BKL_ENABLE	OUT	
2	BKL_CONTROL	OUT	
3	LCD_PWR	PWR	+3.3V/+5V
4	GND	GND	
5	LVDS_A_CLK-	DIFF	
6	LVDS_A_CLK+	DIFF	
7	LCD_PWR	PWR	+3.3V/+5V
8	GND	GND	
9	LVDS_DA0-	DIFF	
10	LVDS_DA0+	DIFF	
11	LVDS_DA1-	DIFF	

12	LVDS_DA1+	DIFF	
13	LVDS_DA2-	DIFF	
14	LVDS_DA2+	DIFF	
15	LVDS_DA3-	DIFF	
16	LVDS_DA3+	DIFF	
17	DDC_DATA	I/O	+3.3V
18	DDC_CLK	I/O	+3.3V
19	LVDS_DB0-	DIFF	
20	LVDS_DB0+	DIFF	
21	LVDS_DB1-	DIFF	
22	LVDS_DB1+	DIFF	
23	LVDS_DB2-	DIFF	
24	LVDS_DB2+	DIFF	
25	LVDS_DB3-	DIFF	
26	LVDS_DB3+	DIFF	
27	LCD_PWR	PWR	+3.3V/+5V
28	GND	GND	
29	LVDS_B_CLK-	DIFF	
30	LVDS_B_CLK+	DIFF	

eDP			
Pin	**Pin Name**	**Signal Type**	**Signal Level**
1	BKL_ENABLE	OUT	
2	BKL_CONTROL	OUT	
3	LCD_PWR	PWR	+3.3V/+5V
4	GND	GND	
5	eDP_DA3-	DIFF	
6	eDP_DA3+	DIFF	
7	LCD_PWR	PWR	+3.3V/+5V
8	GND	GND	
9	eDP_DA2-	DIFF	
10	eDP_DA2+	DIFF	
11	eDP_DA1-	DIFF	
12	eDP_DA1+	DIFF	
13	eDP_DA0-	DIFF	
14	eDP_DA0+	DIFF	
15	NC		
16	Hot Plug Detect #		
17	eDP_AUX-	DIFF	
18	eDP_AUX+	DIFF	
19	NC		

20	NC		
21	NC		
22	NC		
23	NC		
24	NC		
25	NC		
26	NC		
27	LCD_PWR	PWR	+3.3V/+5V
28	GND	GND	
29	NC		
30	NC		

2.43 10M/100M/1G Ethernet Port 1 (CN26)

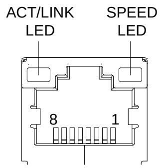


Pin	Pin Name	Signal Type	Signal Level
1	MDI0+	DIFF	
2	MDI0-	DIFF	
3	MDI1+	DIFF	

4	MDI2+	DIFF	
5	MDI2-	DIFF	
6	MDI1-	DIFF	
7	MDI3+	DIFF	
8	MDI3-	DIFF	

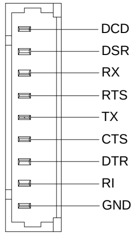
***** Standard IEEE 802.3 Ethernet interface for 1000BASE-T, 100BASE-TX, and 10BASE-T applications is provided for by Intel® LAN

2.44 10M/100M/1G Ethernet Port 2 (CN27)



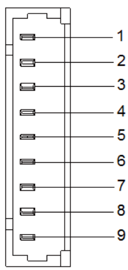
Pin	Pin Name	Signal Type	Signal Level
1	MDI0+	DIFF	
2	MDI0-	DIFF	
3	MDI1+	DIFF	
4	MDI2+	DIFF	
5	MDI2-	DIFF	
6	MDI1-	DIFF	
7	MDI3+	DIFF	
8	MDI3-	DIFF	

2.45 COM Port 4 (CN28)



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

2.46 COM Port 3 (RS-232/422/485) (CN29)



RS-232			
Pin	**Pin Name**	**Signal Type**	**Signal Level**
1	DCD	IN	
2	DSR	IN	
3	RX	IN	
4	RTS	OUT	±6V
5	TX	OUT	±6V
6	CTS	IN	
7	DTR	OUT	±6V
8	RI/+5V/+12V	IN/ PWR	+5V/+12V
9	GND	GND	

RS-422			
Pin	**Pin Name**	**Signal Type**	**Signal Level**
1	RS422_TX-	OUT	±5V
2	NC		
3	RS422_TX+	IN	
4	NC		
5	RS422_RX+	OUT	±5V
6	NC		

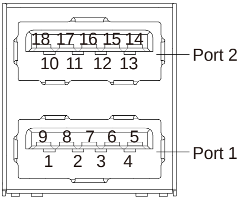
7	RS422_RX-	IN	
8	NC/+5V/+12V	PWR	+5V/+12V
9	GND	GND	

RS-485			
Pin	**Pin Name**	**Signal Type**	**Signal Level**
1	RS485_D-	I/O	±5V
2	NC		
3	RS485_D+	I/O	±5V
4	NC		
5	NC		
6	NC		
7	NC		
8	NC/+5V/+12V	PWR	+5V/+12V
9	GND	GND	

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

* Function for Pin 8 can be set by JP14

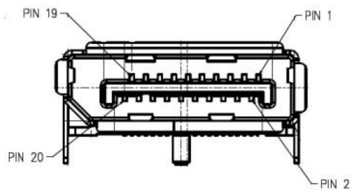
2.47 USB 2.0/3.0 Port 1 & 2 (CN30)



Pin	Pin Name	Signal Type	Signal Level
1	+5VSB	PWR	+5V
2	USB1_D-	DIFF	
3	USB1_D+	DIFF	
4	GND	GND	
5	USB1_SSRX−	DIFF	
6	USB1_SSRX+	DIFF	
7	GND	GND	
8	USB1_SSTX−	DIFF	
9	USB1_SSTX+	DIFF	
10	+5VSB	PWR	+5V
11	USB2_D-	DIFF	
12	USB2_D+	DIFF	
13	GND	GND	
14	USB2_SSRX−	DIFF	
15	USB2_SSRX+	DIFF	
16	GND	GND	

17	USB2_SSTX−	DIFF	
18	USB2_SSTX+	DIFF	

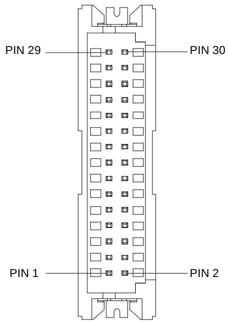
2.48 Display Port 2 (CN31)



Pin	Pin Name	Signal Type	Signal Level
1	Lane0+	I/O	
2	GND	GND	
3	Lane0-	I/O	
4	Lane1+	I/O	
5	GND	GND	
6	Lane1-	I/O	
7	Lane2+	I/O	
8	GND	GND	
9	Lane2-	I/O	
10	Lane3+	I/O	
11	GND	GND	
12	Lane3-	I/O	
13	GND	GND	
14	GND	GND	

15	AUX+	I/O	
16	GND	GND	
17	AUX-	I/O	
18	Hot Plug Detect		
19	Return PWR (GND)	GND	
20	DP_PWR	PWR	+3.3V

2.49 LVDS Port 2 (CN32)



Pin	Pin Name	Signal Type	Signal Level
1	BKL_ENABLE	OUT	
2	BKL_CONTROL	OUT	
3	LCD_PWR	PWR	+3.3V/+5V
4	GND	GND	
5	LVDS_C_CLK-	DIFF	
6	LVDS_C_CLK+	DIFF	
7	LCD_PWR	PWR	+3.3V/+5V

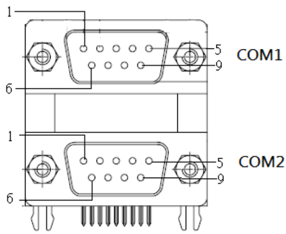
8	GND	GND	
9	LVDS_DC0-	DIFF	
10	LVDS_DC0+	DIFF	
11	LVDS_DC1-	DIFF	
12	LVDS_DC1+	DIFF	
13	LVDS_DC2-	DIFF	
14	LVDS_DC2+	DIFF	
15	LVDS_DC3-	DIFF	
16	LVDS_DC3+	DIFF	
17	DDC_DATA	I/O	+3.3V
18	DDC_CLK	I/O	+3.3V
19	LVDS_DD0-	DIFF	
20	LVDS_DD0+	DIFF	
21	LVDS_DD1-	DIFF	
22	LVDS_DD1+	DIFF	
23	LVDS_DD2-	DIFF	
24	LVDS_DD2+	DIFF	
25	LVDS_DD3-	DIFF	
26	LVDS_DD3+	DIFF	
27	LCD_PWR	PWR	+3.3V/+5V

28	GND	GND
29	LVDS_D_CLK-	DIFF
30	LVDS_D_CLK+	DIFF

* LVDS2 LCD_PWR can be set to +3.3V or +5V by JP18

* The max. driving current is 2A

2.50 COM Port 1 & 2 (CN33)



COM1/COM2 (RS-232)			
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_+5V_+12V	IN/PWR	+5V/+12V

COM2 (RS-422)			
Pin	**Pin Name**	**Signal Type**	**Signal Level**
1	422TXD-	OUT	
2	422TXD+	OUT	
3	422RXD+	IN	
4	422RXD-	IN	422RXD-
5	NC		
6	NC		
7	NC		
8	NC		
9	NC/+5V/+12V	PWR	+5V/+12V

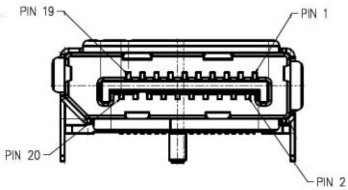
COM2 (RS-485)			
Pin	**Pin Name**	**Signal Type**	**Signal Level**
1	485D-	I/O	
2	485D+	I/O	
3	NC		
4	NC		
5	NC		
6	NC		
7	NC		

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

2.51 VGA Port (CN34)

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

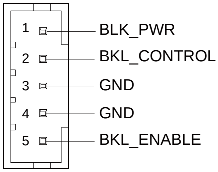
2.52 Display Port 1 (CN35)



Pin	Pin Name	Signal Type	Signal Level
1	Lane0+	I/O	
2	GND	GND	
3	Lane0-	I/O	
4	Lane1+	I/O	
5	GND	GND	
6	Lane1-	I/O	
7	Lane2+	I/O	
8	GND	GND	
9	Lane2-	I/O	
10	Lane3+	I/O	
11	GND	GND	
12	Lane3-	I/O	
13	GND	GND	
14	GND	GND	
15	AUX+	I/O	
16	GND	GND	
17	AUX-	I/O	

18	Hot Plug Detect		
19	Return PWR (GND)	GND	
20	DP_PWR	PWR	+3.3V

2.53 LVDS Port 2 Inverter / Backlight Connector (CN36)



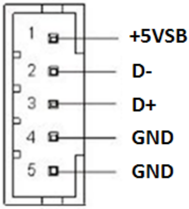
Pin	Pin Name	Signal Type	Signal Level
1	BKL_PWR	PWR	+5V / +12V
2	BKL_CONTROL	OUT	
3	GND	GND	
4	GND	GND	
5	BKL_ENABLE	OUT	+5V

***** LVDS2/BKL_PWR can be set to +5V or +12V by JP17

***** LVDS2/BKL_CONTROL can be set by JP15

***** The driving current supports up to 2A

2.54 USB 2.0 Port 6 (CN37)



Pin	Pin Name	Signal Type	Signal Level
1	+5VSB	PWR	+5V
2	USB5_D-	DIFF	
3	USB5_D+	DIFF	
4	GND	GND	
5	GND	GND	

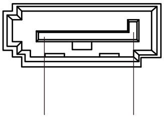
2.55 MiniCard (Full-size) (CN38)

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	

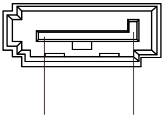
34	GND	GND	
35	GND	GND	
36	USB_D-	DIFF	
37	GND	GND	
38	USB_D+	DIFF	
39	+3.3VSB	PWR	+3.3V
40	GND	GND	
41	+3.3VSB	PWR	+3.3V
42	NC		
43	GND	GND	
44	NC		
45	NC		
46	NC		
47	NC		
48	+1.5V	PWR	+1.5V
49	NC		
50	GND	GND	
51	NC		
52	+3.3VSB	PWR	+3.3V

2.56 SATA Port 1 (SATA1)



Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	SATA_TX0+	DIFF	
3	SATA_TX0-	DIFF	
4	GND	GND	
5	SATA_RX0-	DIFF	
6	SATA_RX0+	DIFF	
7	GND	GND	

2.57 SATA Port 2 (SATA2)



Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	SATA_TX1+	DIFF	
3	SATA_TX1-	DIFF	
4	GND	GND	
5	SATA_RX1-	DIFF	

6	SATA_RX1+	DIFF
7	GND	GND

2.58 DDR3L SODIMM (DIMM1)

Standard Specification

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 EPIC-BDU7 CMOS memory has an integral lithium battery backup for data retention. However, you will need to replace the complete unit when it finally 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 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.

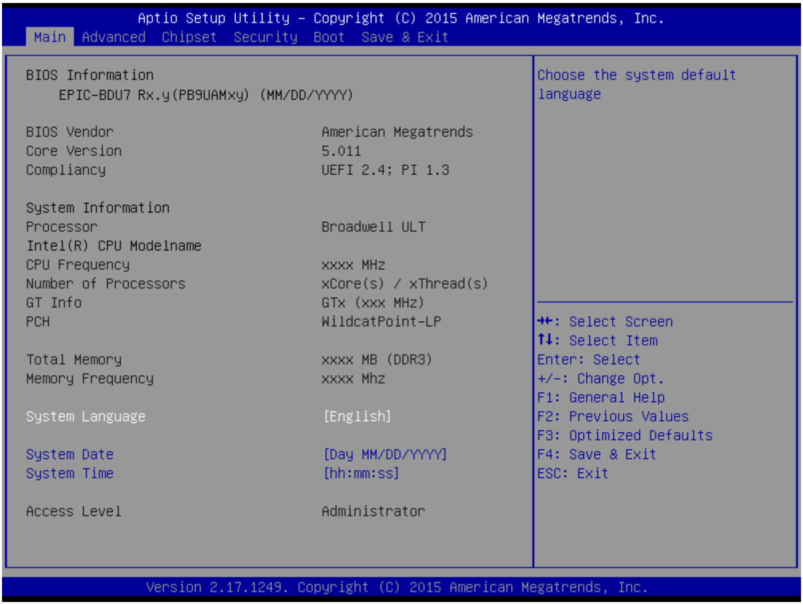
Security

Set setup administrator password.

Save & Exit

Exit system setup after saving the changes.

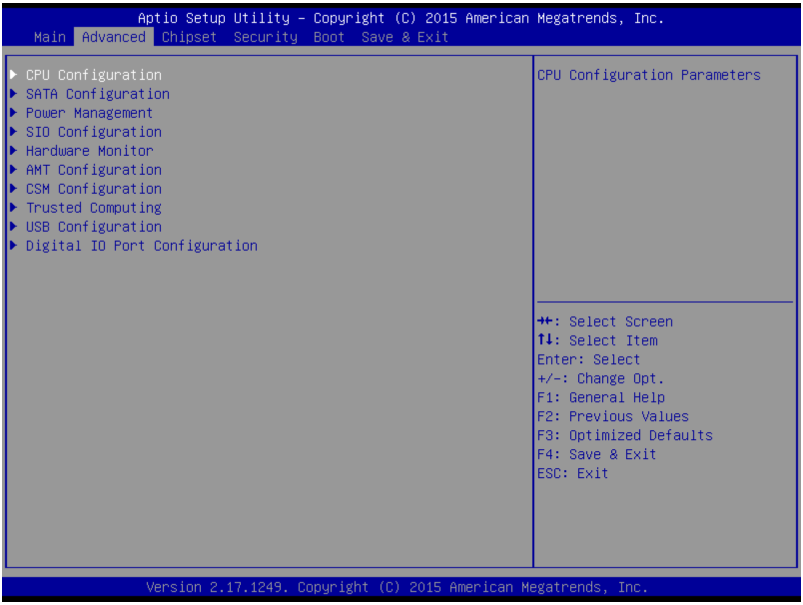
Setup submenu: Main



Options summary: (***default setting***)

System Language	English	
Only English support in this BIOS		
System Date	Day MM:DD:YYYY	
Change the month, year and century. The ‘Day’ is changed automatically.		
System Time	HH : MM : SS	
Change the clock of the system.		

Setup submenu: Advanced

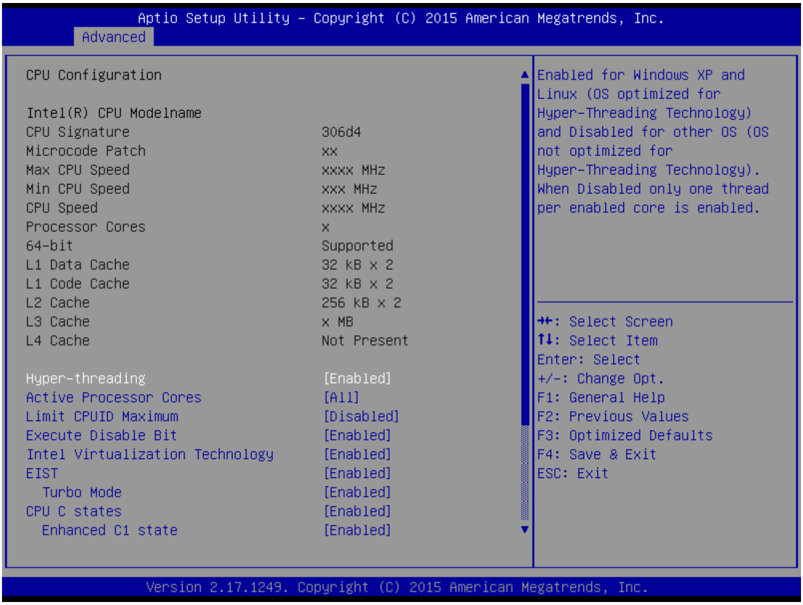


Options summary: (***default setting***)

CPU Configuration		
CPU Configuration Parameters		
SATA Configuration		
SATA Controller/ Serial ATA Port Parameters		
Power Management		
System ACPI/Power Mode/Wake Event Configuration		
SIO Configuration		
Super IO Configuration Parameters		
Hardware Monitor		
Monitor hardware status		

AMT Configuration		
AMT Configuration Settings		
CSM Configuration		
CSM Configuration Parameters		
Trusted Computing		
Trusted Computing Settings		
USB Configuration		
USB Configuration Parameters		
Digital IO Port Configuration		
DIO configuration		

CPU Configuration



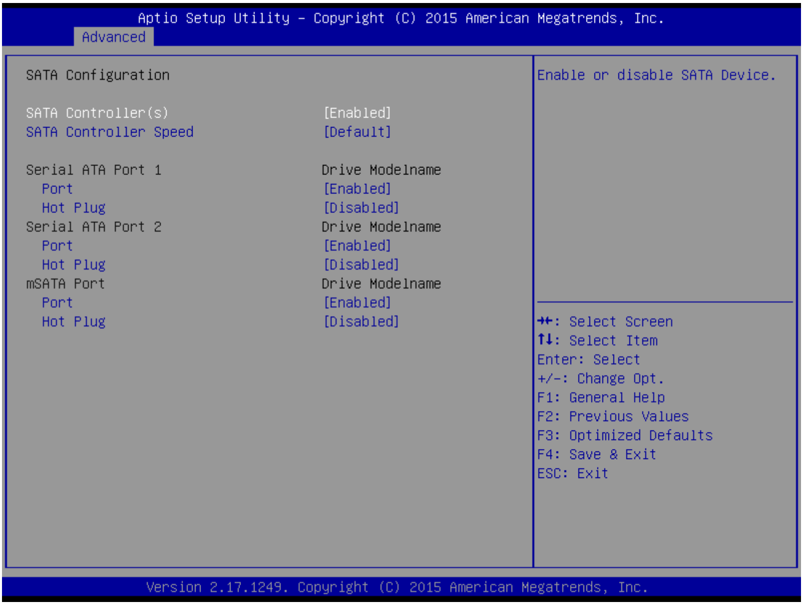
Options summary: (***default setting***)

Hyper-threading	Disabled	
	Enabled	
Enable for Windows XP		
Active Processor Cores	***All***	
	1~4	
All for Windows XP		
Limit CPUID Maximum	***Disabled***	
	Enabled	
Disabled for Windows XP		

Execute Disable Bit	Disabled	
	Enabled	
En/Disable XD bit for supporting OS		
Intel Virtualization Technology	Disabled	
	Enabled	
Wen enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology		
EIST	Disabled	
	Enabled	
Enable/Disable Intel SpeedStep		
Turbo Mode	Disabled	
	Enabled	
Enabled for Windows XP		
CPU C States	Disabled	
	Enabled	
Enable/Disable CPU C States		
Enhanced C1 state	Disabled	
	Enabled	
Enabled for Windows XP		
CPU C3 Report	Disabled	
	Enabled	
Enable/Disable CPU C3 report to OS		
CPU C6 report	Disabled	
	Enabled	

Enable/Disable CPU C6 report to OS		
CPU C7 report	Disabled	
	CPU C7	
	CPU C7s	
Enable/Disable CPU C7 report to OS		
ACPI CTDP BIOS	***Disabled***	
	Enabled	
Enable/Disable ACPI CTDP BIOS support		
Configurable TDP	TDP NOMINAL	
	TDP DOWN	
	TDP UP	
	Disabled	
Allow reconfiguration of TDP levels base on current power and thermal delivery capabilities of the system		
Config TDP LOCK	***Disabled***	
	Enabled	
Lock the Config TDP Control register		
Intel TXT (LT) Support	***Disabled***	
	Enabled	
Enable/Disable Intel(R) TXT (LT) Support		

SATA Configuration

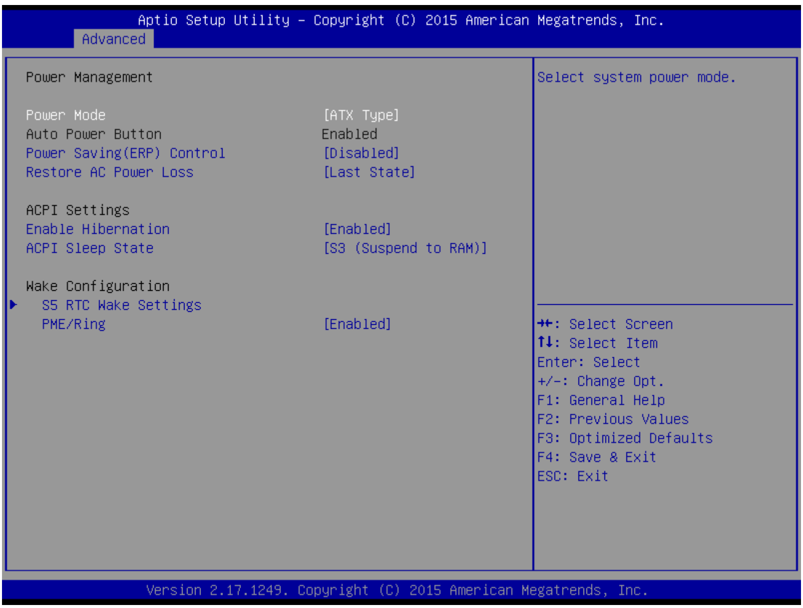


Options summary: (***default setting***)

SATA Controller(s)	Disabled	
	Enabled	
En/Disable SATA Device		
SATA Controller Speed	***Default***	
	Gen1	
	Gen2	
	Gen3	
Indicates the maximum speed the SATA controller can support		
SATA Port1/Port2/mSATA	***Enabled***	

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

Power Management

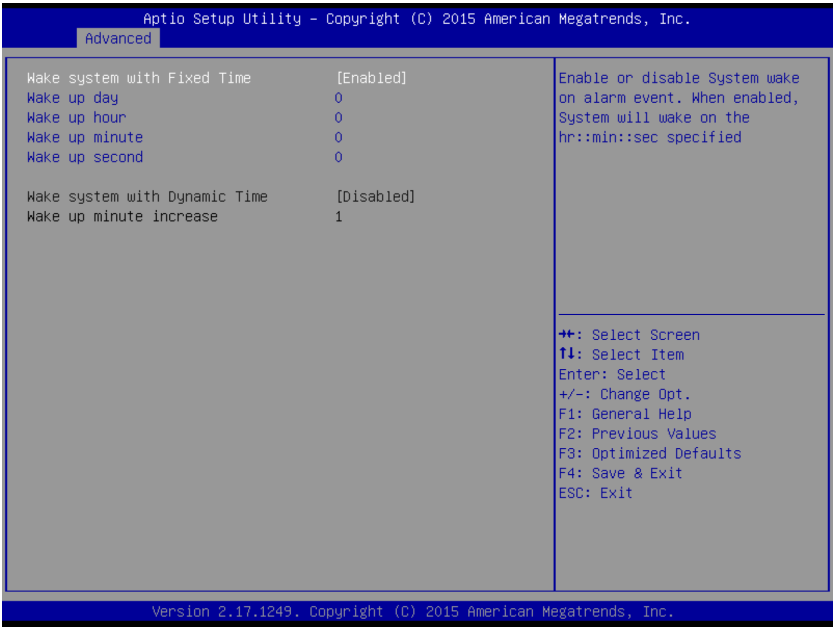


Options summary: (***default setting***)

Power Mode	***ATX Type***	
	AT Type	

Select system power mode		
Power Saving (ERP) Control	***Disabled***	
	Enabled	
Configure power mode for power saving function		
Restore AC Power Loss	Power Off	
	Power on	
	Late State	
Select AC power state when power is re-applied after a power failure		
Enable Hibernation	***Enabled***	
	Disabled	
Enabled or disabled system ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.		
ACPI Sleep State	Suspend Disabled	
	S3 only(Suspend to RAM)	
Select highest ACPI sleep state the System will enter when the Suspend button is pressed		
S5 RTC Wake Settings		
Enable system to wake from S5 using RTC alarm.		
PME/Ring	***Enabled***	
	Disabled	
Use RI or PME to wake system from sleep state		

RTC Wake Settings

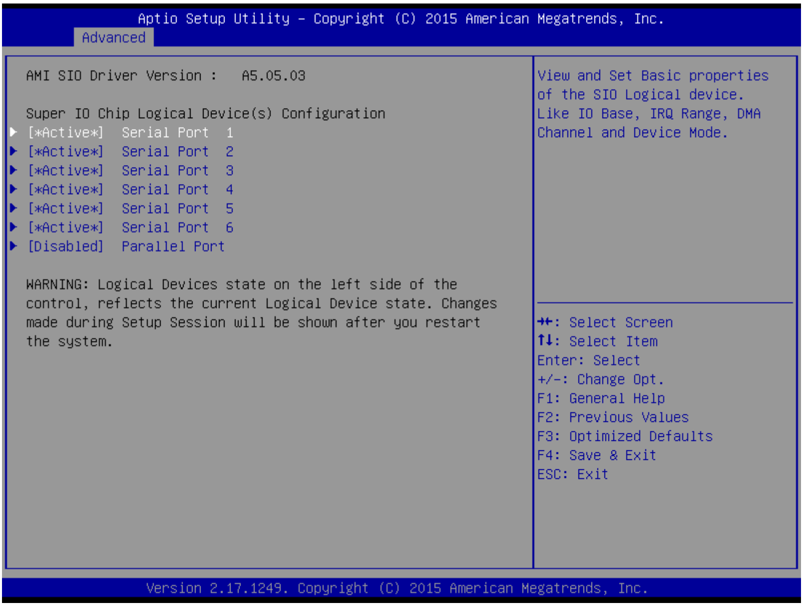


Options summary: (***default setting***)

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

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

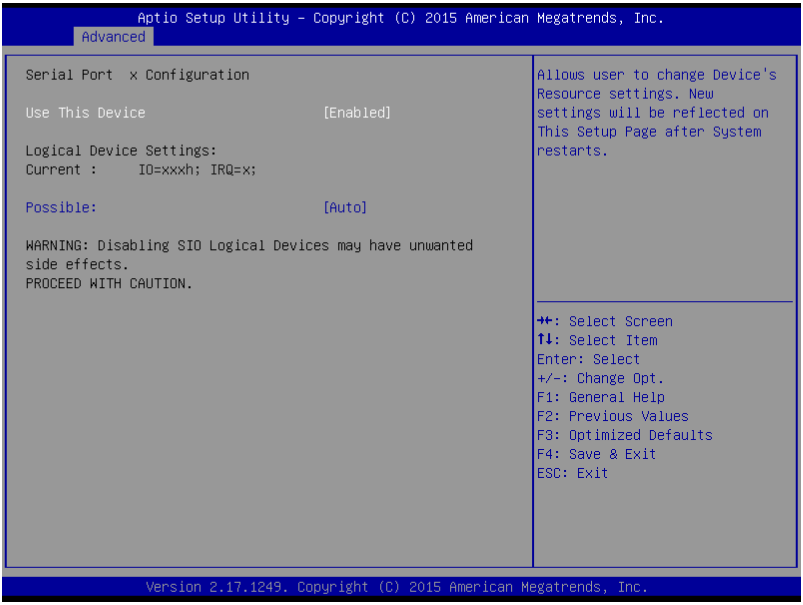
SIO Configuration



Options summary: (***default setting***)

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

Serial Port 1/2/3/4/5/6 Configuration



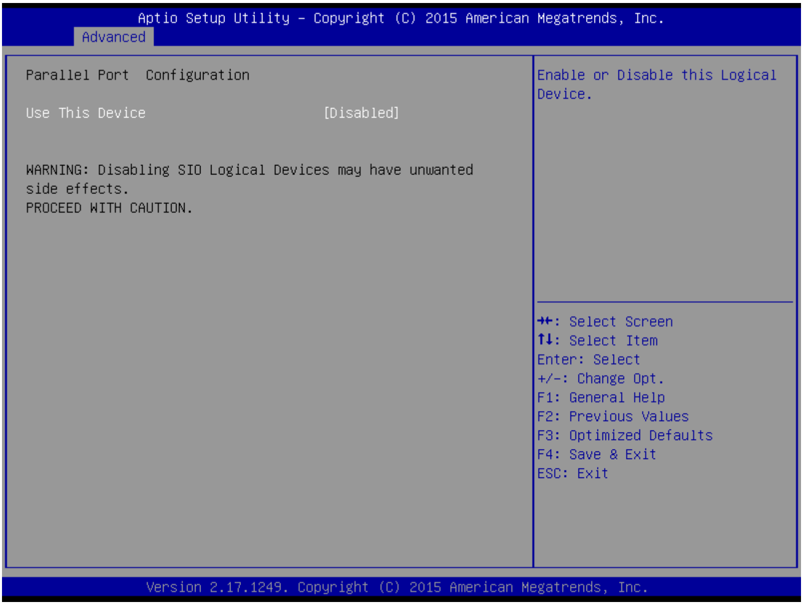
Options summary: (***default setting***)

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

Possible (COM2)	***Auto***	
	IO=2F8h; IRQ=3; DMA;	
	IO=3F8h; IRQ=3,4,5,7,9,10,11,12; DMA;	
	IO=2F8h; IRQ=3,4,5,7,9,10,11,12; DMA;	
	IO=3E8h; IRQ=3,4,5,7,9,10,11,12; DMA;	
	IO=2E8h; IRQ=3,4,5,7,9,10,11,12; DMA;	
Possible (COM3)	***Auto***	
	IO=3E8h; IRQ=7; DMA	
	IO=3E8h; IRQ=3,4,5,6,7,10,11,12; DMA	
	IO=2E8h; IRQ=3,4,5,6,7,10,11,12; DMA	
	IO=2F0h; IRQ=3,4,5,6,7,10,11,12; DMA	
	IO=2E0h; IRQ=3,4,5,6,7,10,11,12; DMA	
Possible (COM4)	***Auto***	
	IO=2E8h; IRQ=7; DMA	
	IO=3E8h; IRQ=3,4,5,6,7,10,11,12; DMA	
	IO=2E8h; IRQ=3,4,5,6,7,10,11,12; DMA	
	IO=2F0h; IRQ=3,4,5,6,7,10,11,12; DMA	
	IO=2E0h; IRQ=3,4,5,6,7,10,11,12; DMA	
Possible (COM5)	***Auto***	
	IO=2D0h; IRQ=7; DMA	
	IO=3E8h; IRQ=3,4,5,6,7,10,11,12; DMA	
	IO=2E8h; IRQ=3,4,5,6,7,10,11,12; DMA	
	IO=2D0h; IRQ=3,4,5,6,7,10,11,12; DMA	
	IO=2C0h; IRQ=3,4,5,6,7,10,11,12; DMA	

Possible (COM6)	***Auto***	
	IO=2C0h; IRQ=7; DMA	
	IO=3E8h; IRQ=3,4,5,6,7,10,11,12; DMA	
	IO=2E8h; IRQ=3,4,5,6,7,10,11,12; DMA	
	IO=2D0h; IRQ=3,4,5,6,7,10,11,12; DMA	
	IO=2C0h; IRQ=3,4,5,6,7,10,11,12; DMA	
Select a resource setting for Super IO device.		
Mode	***RS232***	
	RS422	
	RS485	
Configure COM operated as RS232, RS422 or RS485. Only COM2 and COM3 support this function.		

Parallel Port Configuration

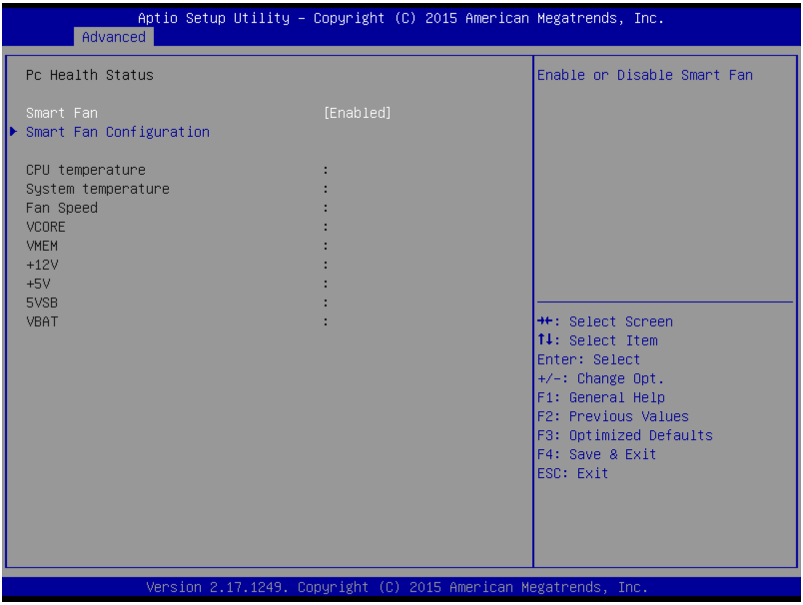


Options summary: (***default setting***)

<table>
<tr><td colspan="2" rowspan="2">Parallel Port</td><td>Disabled</td><td rowspan="2"></td></tr>
<tr><td>Enabled</td></tr>
<tr><td colspan="4">En/Disable specified this Logical Device
Note: LPT and DIO feature share the same interface CN9 on the board. When LPT disabled, the interface works in DIO mode and vice versa.</td></tr>
<tr><td rowspan="4">Possible</td><td></td><td>Auto</td><td rowspan="4"></td></tr>
<tr><td>STD Printer</td><td>IO=378h; IRQ=5;</td></tr>
<tr><td>SPP</td><td>IO=378h; IRQ=5,6,7,9,10,11,12;</td></tr>
<tr><td>EPP and SPP</td><td>IO=278h; IRQ=5,6,7,9,10,11,12;</td></tr>
</table>

		IO=3BCh; IRQ=5,6,7,9,10,11,12;	
	ECP ECP and EPP	IO=378h; IO=778h; IRQ=5; DMA=3;	
		IO=378h; IO=778h; IRQ=5,6,7,9,10,11,12; DMA=1,3;	
		IO=278h; IO=678h; IRQ=5,6,7,9,10,11,12; DMA=1,3;	
		IO=3BCh; IO=7BCh; IRQ=5,6,7,9,10,11,12; DMA=1,3;	
Select a resource setting for Super IO device.			
Mode		***STD Print Mode***	
		SPP Mode	
		EPP-1.9 and SPP Mode	
		EPP-1.7 and SPP Mode	
		ECP Mode	
		ECP and EPP 1.9 Mode	
		ECP and EPP 1.7 Mode	
Change Parallel Port mode.			

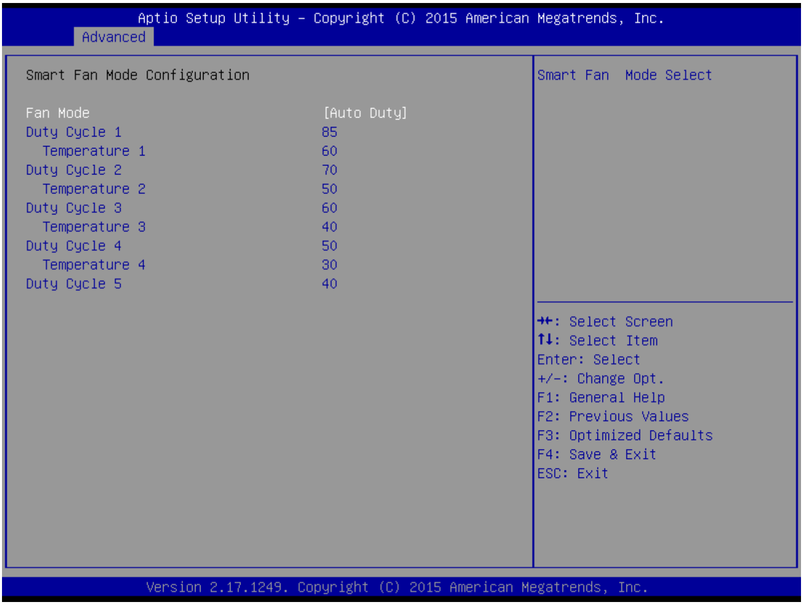
Hardware Monitor



Options summary: (***default setting***)

Smart Fan	Disabled	
	Enabled	
En/Disable specified Smart Fan.		

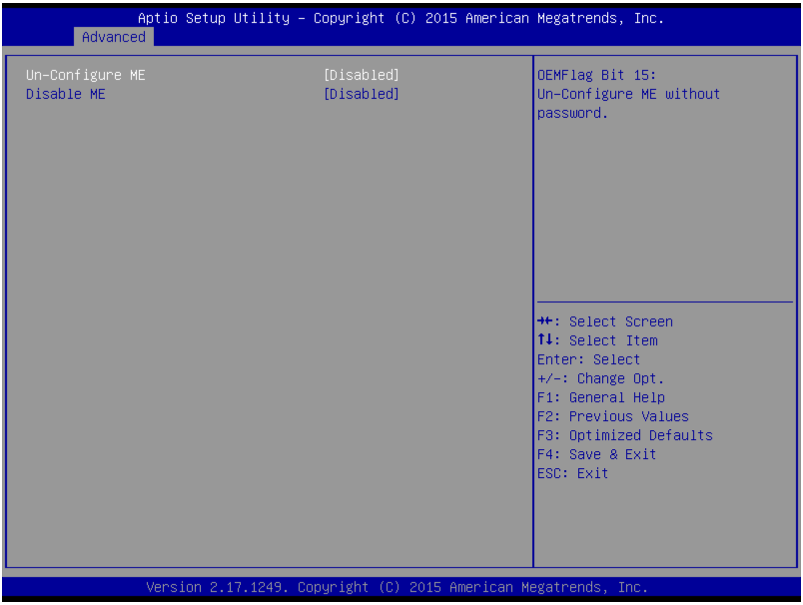
Smart Fan Configuration



Options summary: (***default setting***)

Fan Mode	Manual Duty	
	Auto Duty	
Smart Fan Mode Select		

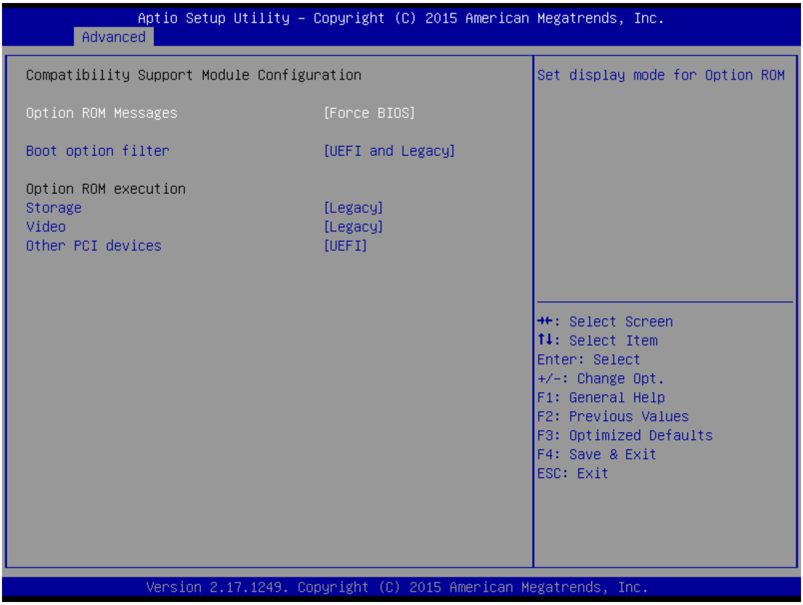
AMT Configuration



Options summary: (***default setting***)

Un-Configure ME	***Disabled***	
	Enabled	
Un-configure ME without password.		
Disable ME	***Disabled***	
	Enabled	
Set ME to soft Temporary Disabled.		

CSM Configuration

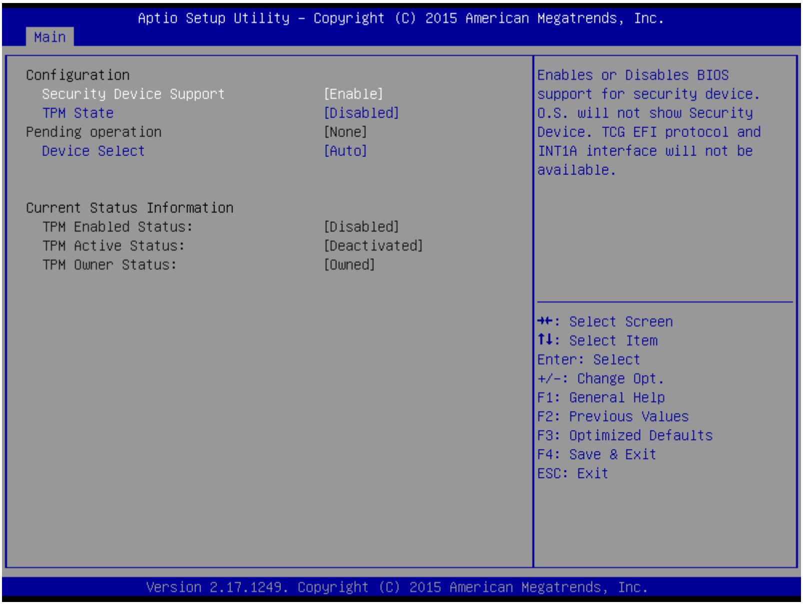


Options summary: (***default setting***)

Option ROM Messages	***Force BIOS***	
	Keep Current	
Set display mode for Option ROM		
Boot option filter	***UEFI and Legacy***	
	Legacy only	
	UEFI only	
Legacy/UEFI ROMs priority		
Storage/Video	Do not launch	
	UEFI	

	Legacy	
Controls the execution of UEFI and Legacy Storage OpROM		
Other PCI devices	Do not launch	
	UEFI	
	Legacy	
Determines OpROM execution policy for devices other than Network, Storage, or Video		

Trusted Computing

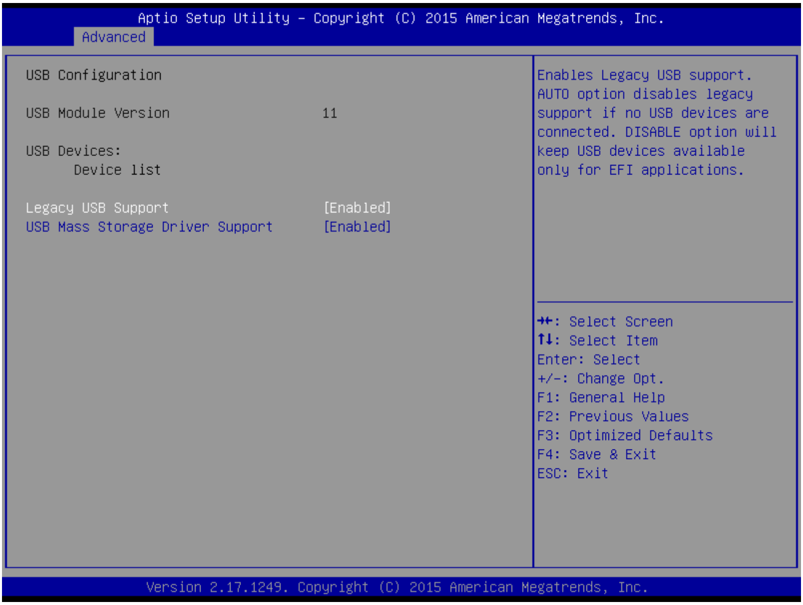


Options summary: (***default setting***)

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

Device Select	***Auto***	
	TPM 1.2	
	TPM 2.0	
Set Auto option for Device Select		

USB Configuration

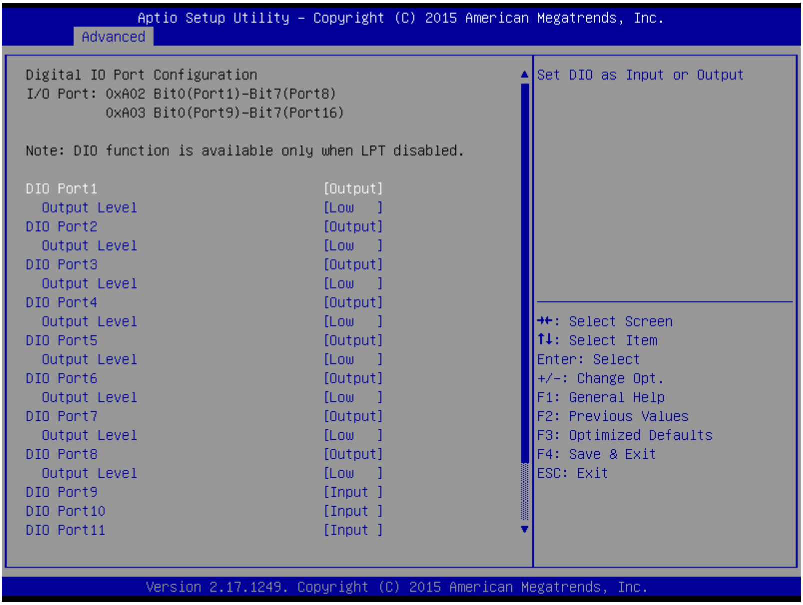


Options summary: (***default setting***)

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

Enable/Disable USB Mass Storage Driver Support

Digital IO Port Configuration

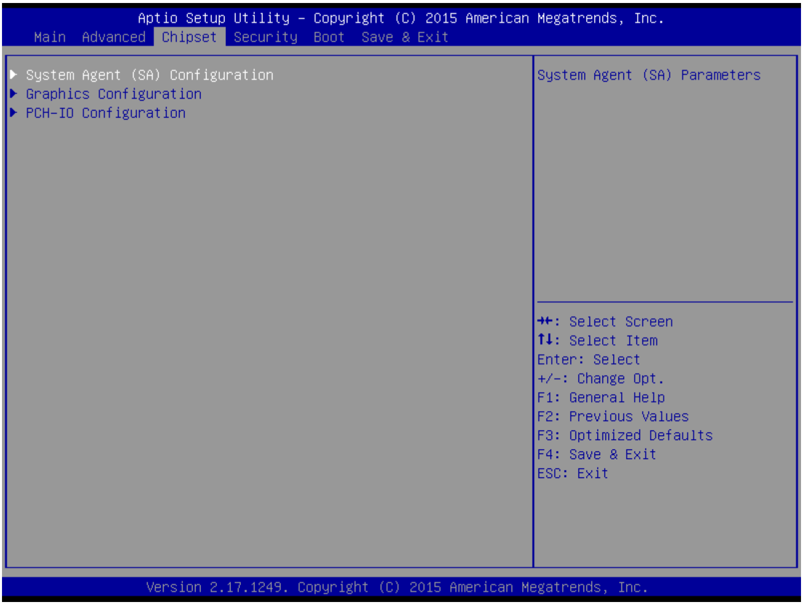


Options summary: (***default setting***)

DIO Port 1/2/3/4/5/6/7/8	Input	
	Output	
Set DIO Port 1/2/3/4/5/6/7/8 as Input or Output		
DIO Port 9/10/11/12/13/14/15/16	***Input***	
	Output	
Set DIO Port 9/10/11/12/13/14/15/16 as Input or Output		
Output Level	Hi	
	Low	

Set GPIO Level when used as Output

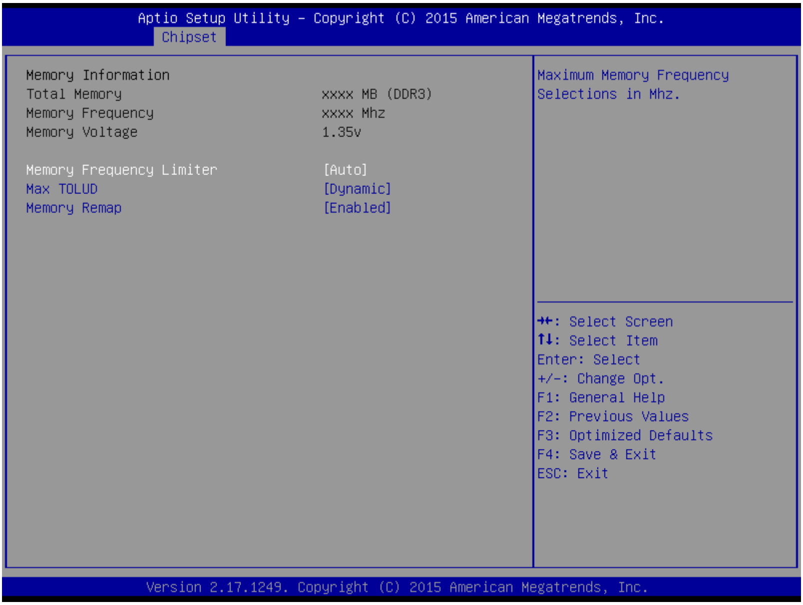
Setup submenu: Chipset



Options summary: (***default setting***)

System Agent (SA) Configuration		
System Agent (SA) Parameters		
Graphics Configuration		
Configure Graphics Settings.		
PCH-IO Configuration		
Configure PCH Parameters		

System Agent (SA) Configuration

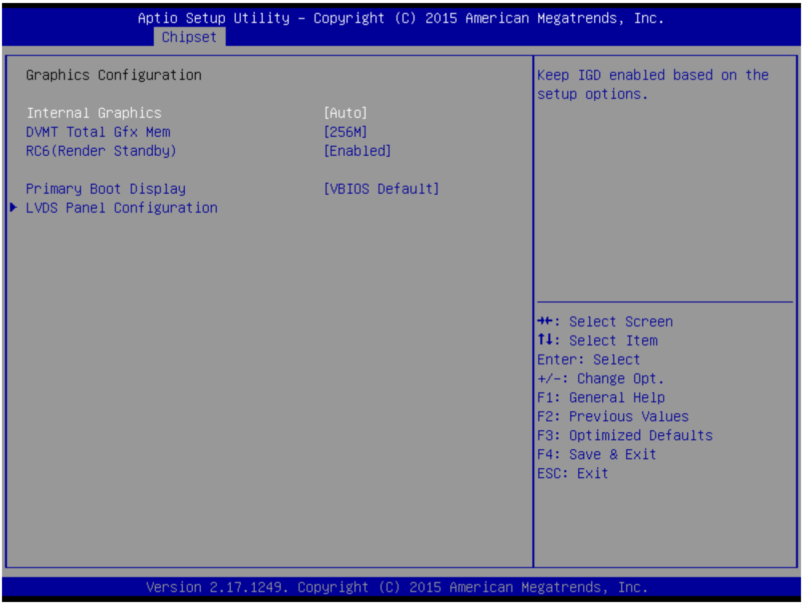


Options summary: (***default setting***)

Memory Frequency Limiter	***Auto***	
	1333	
	1600	
Maximum Memory Frequency Selections in Mhz.		
Max TOLUD	***Dynamic***	
	1 GB	
	1.25 GB	
	1.5 GB	
	1.75 GB	

	2 GB	
	2.25 GB	
	2.5 GB	
	2.75 GB	
	3 GB	
	3.25 GB	
Maximum Value of TOLOUD. Dynamic assignment would adjust TOLUD automatically base on largest MMIO length of installed graphic controller.		
Memory Remap	***Enabled***	
	Disabled	
Enabled/Disabled Memory Remap above 4G.		

Graphics Configuration

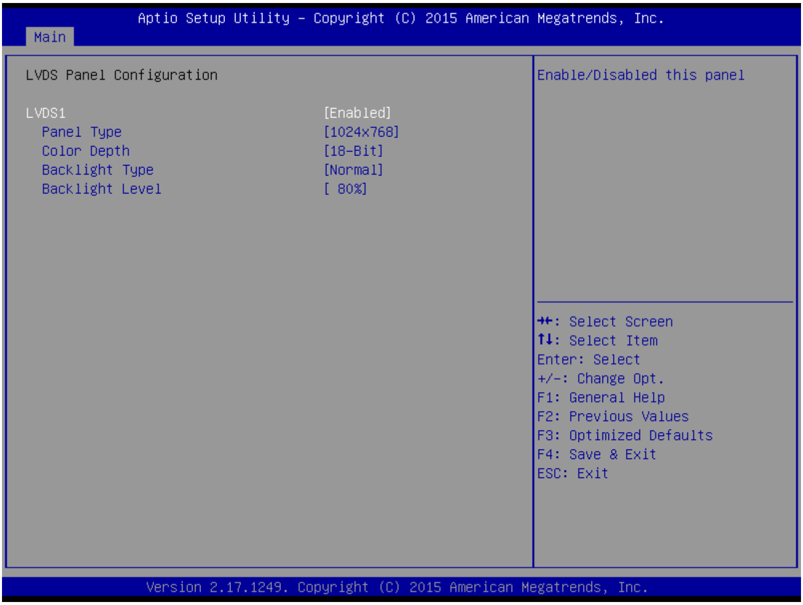


Options summary: (***default setting***)

Internal Graphics	***Auto***	
	Disabled	
	Enabled	
Keep IGD enabled based on the setup option.		
DVMT Total Gfx Mem	128M	
	256M	
	MAX	
Select DVMT5.0 Total Graphic Memory size used by the internal Graphic Device.		

RC6(Render Standby)	Disabled	
	Enabled	
Check to enable render standby support.		
Primary Boot Display	***VBIOS Default***	
	CRT	
	LVDS1	
	DisplayPort	
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		

LVDS Panel Configuration



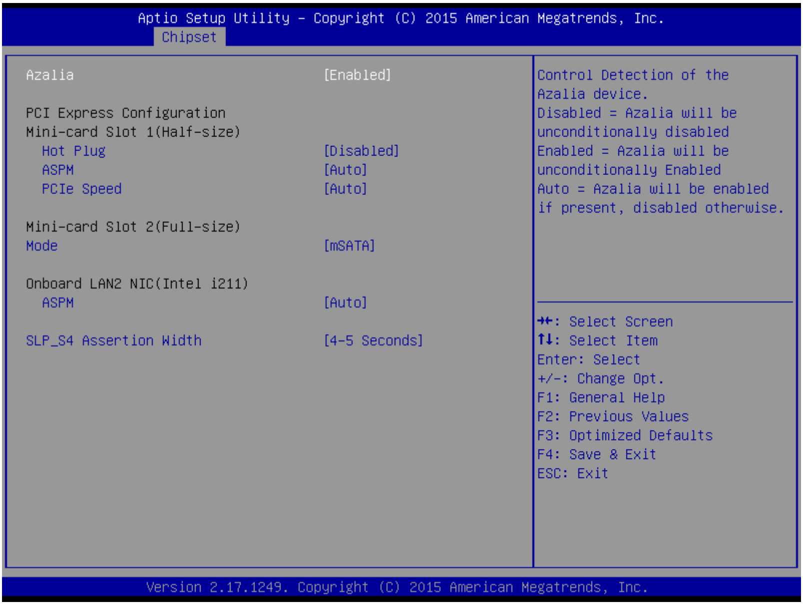
Options summary: (***default setting***)

LVDS1	Disabled	
	Enabled	
Enable or Disable LVDS interface		
Panel Type	640x480	
	800x480	
	800x600	
	1024x600	
	1024x768	
	1280x768	

	1280x1024	
	1366x768	
	1440x900	
	1600x1200	
	1920x1080	
	1920x1200	
Select panel resolution.		
Color Depth	***18-Bit***	
	24-Bit	
	36-Bit	
	48-Bit	
Select color depth of the panel		
Backlight Type	Inverted	
	Normal	
Select Backlight control type. Inverted: Brightest for low PWM duty cycle and low voltage. Normal: Brightest for high PWM duty cycle and high voltage.		
Backlight Level	0%	
	10%	
	20%	
	30%	
	40%	
	50%	
	60%	

	70%	
	80%	
	90%	
	100%	
Select Backlight Level		

PCH-IO Configuration

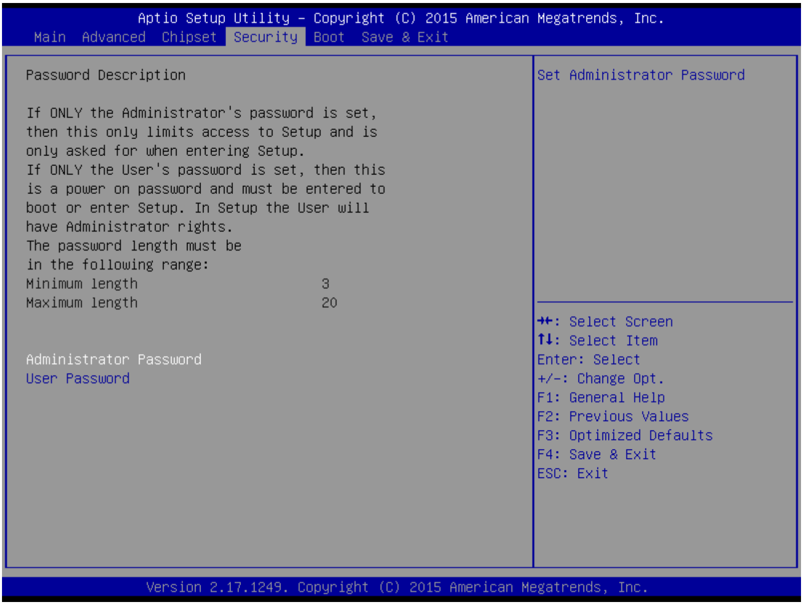


Options summary: (***default setting***)

Azalia	Disabled	
	Enabled	
Enable or disabled Azalia device for audio function.		
Hot Plug for Mini-card Slot 1(Half-size) Mini-card Slot 2(Full-size)	***Disabled***	
	Enabled	
Enabled/Disabled PCIe Hot Plug feature for the port.		
PCIe Speed for Mini-card Slot 1(Half-size)	***Auto***	
	Gen1	

Mini-card Slot 2(Full-size)	Gen2	
Select PCI Express port speed.		
ASPM for Mini-card Slot 1(Half-size) Mini-card Slot 2(Full-size) Onboard LAN2 NIC	Disabled	
	L0s	
	L1	
	L0sL1	
	Auto	
Set the ASPM Level: Force L0s-Force all links to L0s State AUTO-BIOS auto configure DISABLE-Disables ASPM		
Mini-card Slot 2(Full-size) Mode	***mSATA***	
	PCI Express	
Configure slot 2 function to PCIe or mSATA.		
SLP_S4 Assertion Width	Disabled	
	1-2 Seconds	
	2-3 Seconds	
	3-4 Seconds	
	4-5 Seconds	
Select a minimum assertion width of the SLP_S4# signal		

Setup submenu: Security



Options summary: (***default setting***)

Administrator Password/ User Password	***Not set***	

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.

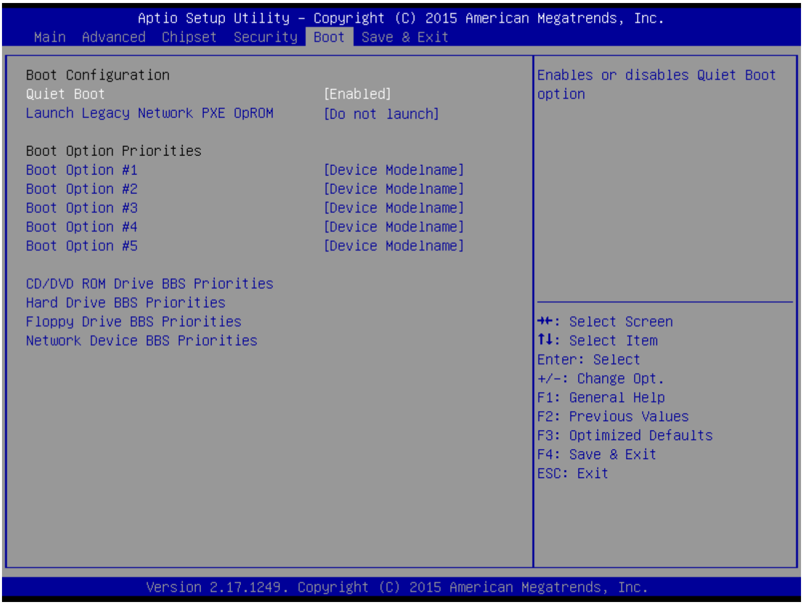
Install the Password:

Press Enter on this item, 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.

Setup submenu: Boot

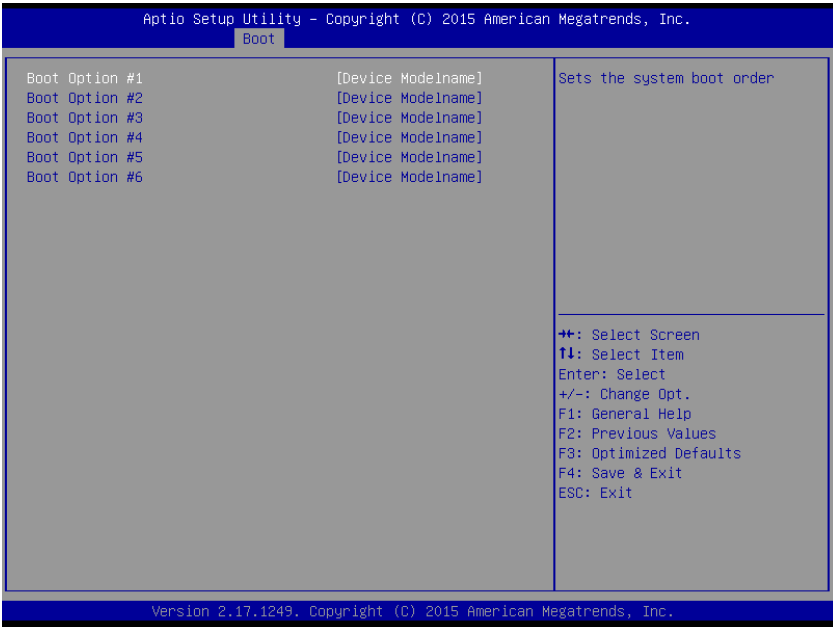


Options summary: (***default setting***)

Quiet Boot	Disabled	
	Enabled	
En/Disable showing boot logo.		
Launch Network PXE OpROM	***Do not launch***	
	UEFI	
	Legacy	
En/Disable network OpROM for PXE boot		
Boot Option #X/ XXXX Drive BBS Priorities		

The order of boot priorities.

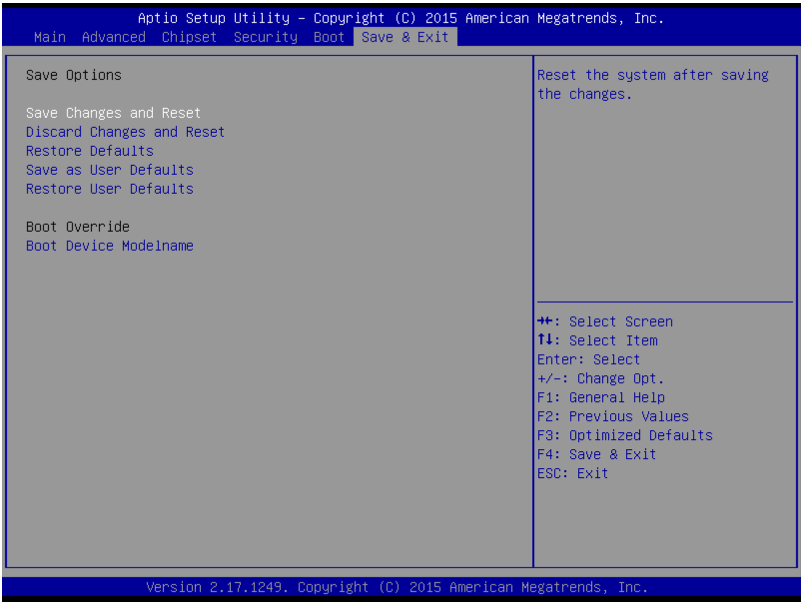
BBS Priorities



Options summary: (***default setting***)

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

Setup submenu: Exit



Options summary: (***default setting***)

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

Select the boot device for this boot.		
Restore User Defaults		
Restore the User Defaults to all the setup options		

Chapter 4

Driver Installation

The EPIC-BDU7 comes with a driver disk that contains all drivers and utilities you need to setup your product.

Insert the disk 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 Audio Driver

Step 4 – Install LAN Driver

Step 5 – Install ME SW Driver

Step 6 – Install Intel RST Driver

Step 7 – Install USB 3.0 (Windows 7 only)

Step 8 – Install Infineon TPM Driver (Optional)

Step 9 – Install PenMount Touch 6000 Series Driver (Optional)

Step 10 – Install Serial Port Driver (Optional)

***** Also included in the disk is **Microsoft.NET framework 4.5**, users may use this file, or go online for the latest version, when necessary.

Please read instructions below for further detailed installations.

4.1 Installation

Insert the EPIC-BDU7 driver disk into the disk drive and install the drivers from Step 1 to Step 10 in order.

Step 1 – Install Chipset Driver

1. Open the ***STEP1 - CHIPSET*** folder followed by ***SetupChipset.exe***
2. Follow the instructions
3. Drivers will be installed automatically

*** Note:** There is a known issue in Windows® 8.1 whereby running Direct3D graphic tools such as BurnIn Test will cause the system to freeze. Microsoft has provided the KB2979265 hotfix to address to this issue. In order to install this hotfix without dependency issues, it is advised that users update their systems with Windows® Update first before installing the hotfix.

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. Drivers will be installed automatically

Step 3 – Install Audio Driver

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

Step 4 – Install LAN Driver

1. Open the ***STEP4 - LAN*** folder and select your OS
2. Open the ***Setup.exe*** file in the OS folder
3. Follow the instructions
4. Drivers will be installed automatically

Step 5 – Install ME SW Driver

1. Open the ***STEP5 - ME SW*** folder and select your OS
2. Open the ***MEISetup.exe*** file in the OS folder (For Windows® 7, please install KMDF update first)
3. Follow the instructions
4. Drivers will be installed automatically

Step 6 – Install Intel RST Driver

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

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

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

Step 8 – Install Infineon TPM Driver (Optional)

1. Open the ***STEP8 – Infineon TPM*** folder followed by ***Setup.exe***
2. Follow the instructions
3. Drivers will be installed automatically

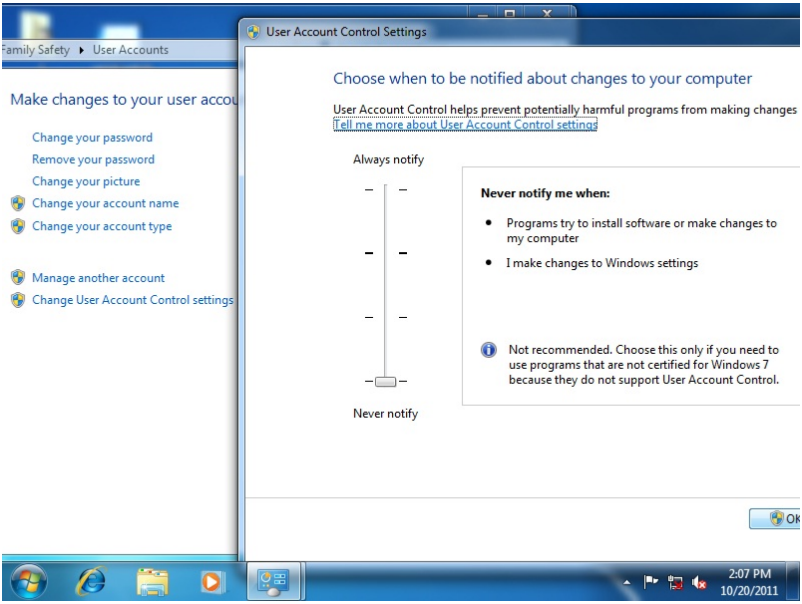
Step 9 – Install PenMount Touch 6000 Series Driver (Optional)

1. Open the ***STEP9 – PenMount Touch 6000 Series*** folder followed by ***Setup.exe***
2. Follow the instructions
3. Drivers will be installed automatically

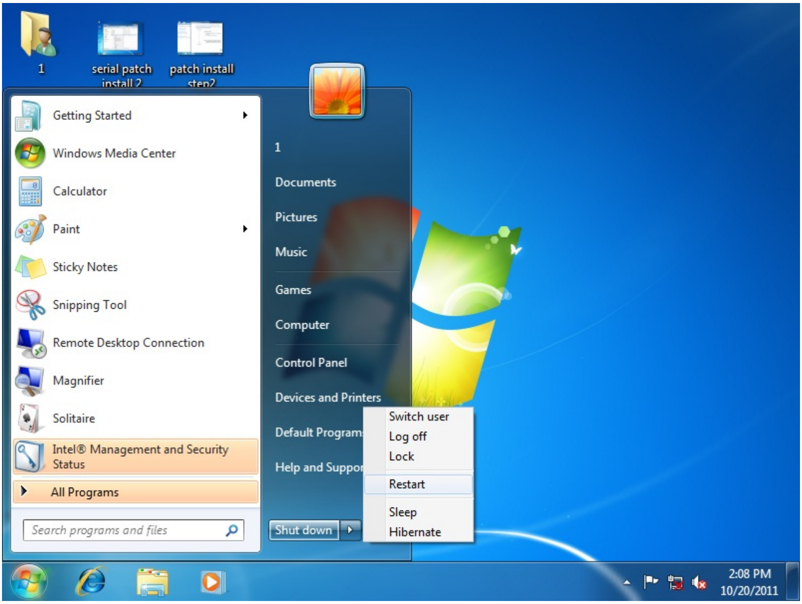
Step 10 – Install Serial Port Driver (Optional)

For Windows 7:

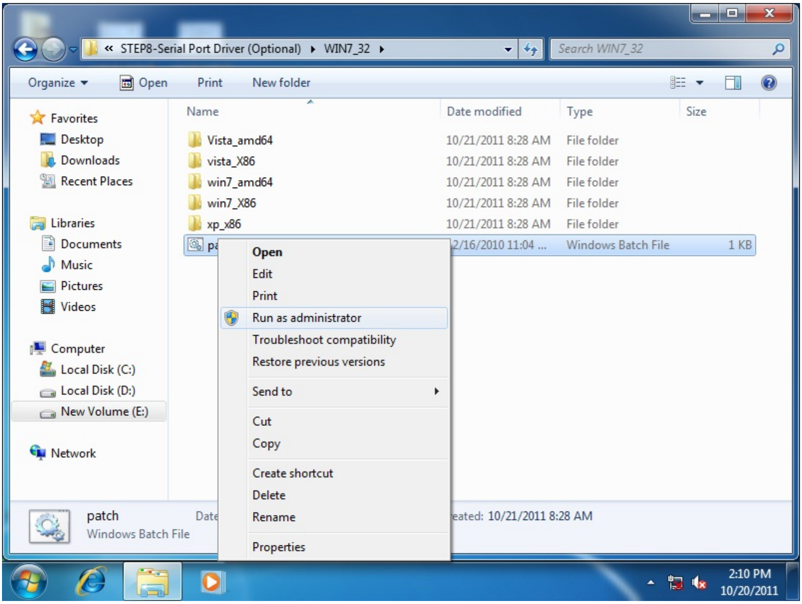
1. Change User Account Control settings to **Never notify**


Family Safety ▸ User Accounts
Make changes to your user accou
Change your password
Remove your password
Change your picture
Change your account name
Change your account type
Manage another account
Change User Account Control settings
User Account Control Settings
Choose when to be notified about changes to your computer
User Account Control helps prevent potentially harmful programs from making changes
Tell me more about User Account Control settings
Always notify
Never notify me when:
Programs try to install software or make changes to my computer
I make changes to Windows settings
Not recommended. Choose this only if you need to use programs that are not certified for Windows 7 because they do not support User Account Control.
Never notify
OK
2:07 PM
10/20/2011

2. Reboot and log in as administrator

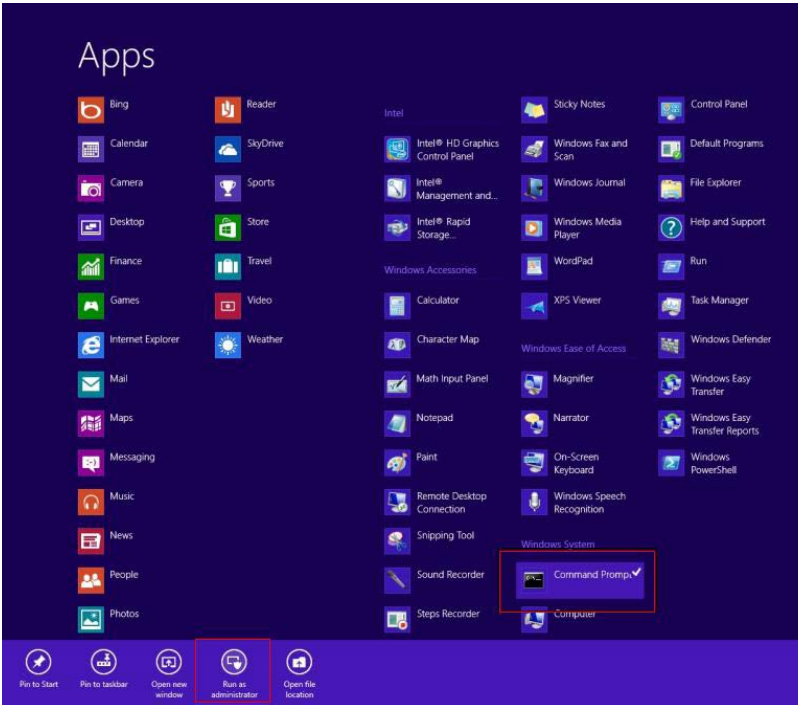


3. Run patch.bat as administrator



For Windows 8/ Windows 10:

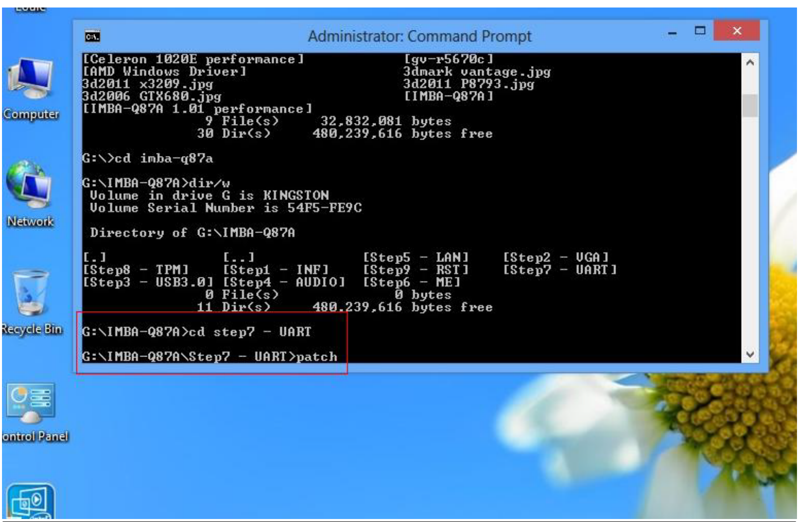
1. Open the Apps Screen, right click on the **Command Prompt** tile and select **Run as Administrator**



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

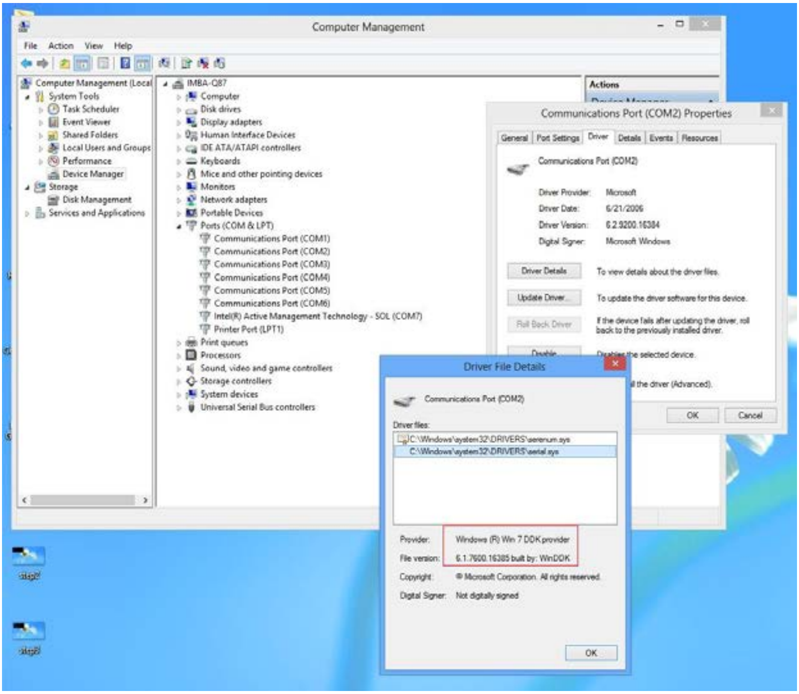
3. You are now at the directory containing the installation file. Next, go to the folder in which the file resides by entering **cd <folder>** eg: if the file is in a folder named abc, enter cd <abc>.

4. You are now at the folder where the file is located. Enter the **patch.bat** to open and install the drivers. If your file is in a subfolder, enter the cd <folder> command again to access the subfolder (screenshot below is for reference only).



5. Reboot after installation completes.

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



Appendix A

Programming the Watchdog Timer

A.1 Watchdog Timer Registers

Table 1 : Watch dog relative IO address		
	Default Value	**Note**
I/O Base Address	**0xA10**	I/O Base address for Watchdog operation. This address is assigned by SIO LDN7, register 0x60-0x61.

Table 2 : Watchdog relative register table				
Register	**Offset**	**BitNum**	**Value**	**Note**
Watchdog WDTRST# Enable	**0x00**	**7**	**1**	Enable/Disable time out output via WDTRST# 0: Disable 1: Enable
Pulse Width	**0x05**	**0:1**	**01**	Width of Pulse signal 00: 1ms (do not use) 01: 25ms 10: 125ms 11: 5s ***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)

A.2 WatchDog Sample Program

```
******************************************************************************
// WDT I/O operation relative definition (Please reference to Table 1)
#define   WDTAddr        0x510   // WDT I/O base address
Void   WDTWriteByte(byte Register, byte Value);
byte   WDTReadByte(byte Register);
Void   WDTSetReg(byte Register, byte Bit, byte Val);
// Watch Dog relative definition (Please reference to Table 2)
#define   DevReg         0x00   // Device configuration register
     #define   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();
}
******************************************************************************

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

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

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

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

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

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

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

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

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

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

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

Appendix B

I/O Information

B.1 I/O Address Map

Input/output (IO)

[0000000000000000 - 000000000000001F] Direct memory access controller
[0000000000000000 - 0000000000000CF7] PCI Express Root Complex
[0000000000000020 - 0000000000000021] Programmable interrupt controller
[0000000000000024 - 0000000000000025] Programmable interrupt controller
[0000000000000028 - 0000000000000029] Programmable interrupt controller
[000000000000002C - 000000000000002D] Programmable interrupt controller
[000000000000002E - 000000000000002F] Motherboard resources
[0000000000000030 - 0000000000000031] Programmable interrupt controller
[0000000000000034 - 0000000000000035] Programmable interrupt controller
[0000000000000038 - 0000000000000039] Programmable interrupt controller
[000000000000003C - 000000000000003D] Programmable interrupt controller
[0000000000000040 - 0000000000000043] System timer
[000000000000004E - 000000000000004F] Motherboard resources
[0000000000000050 - 0000000000000053] System timer
[0000000000000060 - 0000000000000060] Standard PS/2 Keyboard
[0000000000000061 - 0000000000000061] Motherboard resources
[0000000000000063 - 0000000000000063] Motherboard resources
[0000000000000064 - 0000000000000064] Standard PS/2 Keyboard
[0000000000000065 - 0000000000000065] Motherboard resources
[0000000000000067 - 0000000000000067] Motherboard resources
[0000000000000070 - 0000000000000070] Motherboard resources
[0000000000000070 - 0000000000000077] System CMOS/real time clock
[0000000000000080 - 0000000000000080] Motherboard resources
[0000000000000081 - 0000000000000091] Direct memory access controller
[0000000000000092 - 0000000000000092] Motherboard resources
[0000000000000093 - 000000000000009F] Direct memory access controller
[00000000000000A0 - 00000000000000A1] Programmable interrupt controller
[00000000000000A4 - 00000000000000A5] Programmable interrupt controller
[00000000000000A8 - 00000000000000A9] Programmable interrupt controller
[00000000000000AC - 00000000000000AD] Programmable interrupt controller
[00000000000000B0 - 00000000000000B1] Programmable interrupt controller

[00000000000000B2 - 00000000000000B3] Motherboard resources
[00000000000000B4 - 00000000000000B5] Programmable interrupt controller
[00000000000000B8 - 00000000000000B9] Programmable interrupt controller
[00000000000000BC - 00000000000000BD] Programmable interrupt controller
[00000000000000C0 - 00000000000000DF] Direct memory access controller
[00000000000002E0 - 00000000000002E7] Communications Port (COM6)
[00000000000002E8 - 00000000000002EF] Communications Port (COM4)
[00000000000002F0 - 00000000000002F7] Communications Port (COM5)
[00000000000002F8 - 00000000000002FF] Communications Port (COM2)
[00000000000003B0 - 00000000000003BB] Intel(R) HD Graphics 6000
[00000000000003C0 - 00000000000003DF] Intel(R) HD Graphics 6000
[00000000000003E8 - 00000000000003EF] Communications Port (COM3)
[00000000000003F8 - 00000000000003FF] Communications Port (COM1)
[00000000000004D0 - 00000000000004D1] Programmable interrupt controller
[0000000000000680 - 000000000000069F] Motherboard resources
[0000000000000A00 - 0000000000000A0F] Motherboard resources
[0000000000000A10 - 0000000000000A1F] Motherboard resources
[0000000000000A20 - 0000000000000A2F] Motherboard resources
[0000000000000D00 - 000000000000FFFF] PCI Express Root Complex
[000000000000164E - 000000000000164F] Motherboard resources
[0000000000001800 - 00000000000018FE] Motherboard resources
[0000000000001854 - 0000000000001857] Motherboard resources
[0000000000003000 - 0000000000003FFF] Mobile 5th Generation Intel(R) Core(TM) PCI Express
[0000000000004000 - 000000000000403F] Intel(R) HD Graphics 6000
[0000000000004040 - 000000000000405F] Mobile 5th Generation Intel(R) Core(TM) SMBus Cont
[0000000000004060 - 000000000000407F] Intel(R) 9 Series Chipset Family SATA AHCI Controller
[00000000000040A0 - 00000000000040A3] Intel(R) 9 Series Chipset Family SATA AHCI Controlle
[00000000000040B0 - 00000000000040B7] Intel(R) 9 Series Chipset Family SATA AHCI Controlle
[00000000000040C0 - 00000000000040C3] Intel(R) 9 Series Chipset Family SATA AHCI Controlle
[00000000000040D0 - 00000000000040D7] Intel(R) 9 Series Chipset Family SATA AHCI Controlle
[000000000000FFFF - 000000000000FFFF] Motherboard resources
[000000000000FFFF - 000000000000FFFF] Motherboard resources
[000000000000FFFF - 000000000000FFFF] Motherboard resources

Interrupt request (IRQ)

B.2 Memory Address Map

Memory

[00000000000A0000 - 00000000000BFFFF] Intel(R) HD Graphics 6000
[00000000000A0000 - 00000000000BFFFF] PCI Express Root Complex
[000000007E000000 - 00000000FEAFFFFF] PCI Express Root Complex
[0000000080000000 - 000000008000FFFF] Motherboard resources
[0000000080010000 - 000000008001FFFF] Motherboard resources
[0000000081000000 - 0000000081FFFFFF] Intel(R) HD Graphics 6000
[0000000082000000 - 00000000827FFFFF] Intel(R) I211 Gigabit Network Connection
[0000000082000000 - 00000000828FFFFF] Mobile 5th Generation Intel(R) Core(TM) PCI Express
[0000000082800000 - 0000000082803FFF] Intel(R) I211 Gigabit Network Connection
[0000000082900000 - 000000008291FFFF] Intel(R) Ethernet Connection I218-LM
[0000000082920000 - 000000008292FFFF] Intel(R) USB 3.0 eXtensible Host Controller - 0100 (Mi
[0000000082930000 - 0000000082933FFF] High Definition Audio Controller
[0000000082934000 - 0000000082937FFF] Mobile 5th Generation Intel(R) Core(TM) and Intel(R)
[0000000082938000 - 00000000829380FF] Mobile 5th Generation Intel(R) Core(TM) SMBus Con
[0000000082939000 - 00000000829397FF] Intel(R) 9 Series Chipset Family SATA AHCI Controlle
[000000008293A000 - 000000008293A3FF] Mobile 5th Generation Intel(R) Core(TM) USB EHCI (
[000000008293B000 - 000000008293BFFF] Intel(R) Ethernet Connection I218-LM
[000000008293E000 - 000000008293E01F] Intel(R) Management Engine Interface
[0000000090000000 - 000000009FFFFFFF] Intel(R) HD Graphics 6000
[00000000F8000000 - 00000000FBFFFFFF] Motherboard resources
[00000000FED00000 - 00000000FED003FF] High precision event timer
[00000000FED10000 - 00000000FED17FFF] Motherboard resources
[00000000FED18000 - 00000000FED18FFF] Motherboard resources
[00000000FED19000 - 00000000FED19FFF] Motherboard resources
[00000000FED1C000 - 00000000FED1FFFF] Motherboard resources
[00000000FED20000 - 00000000FED3FFFF] Motherboard resources
[00000000FED40000 - 00000000FED44FFF] Trusted Platform Module 1.2
[00000000FED45000 - 00000000FED8FFFF] Motherboard resources
[00000000FED90000 - 00000000FED93FFF] Motherboard resources
[00000000FEE00000 - 00000000FEEFFFFF] Motherboard resources
[00000000FF000000 - 00000000FFFFFFFF] Intel(R) 82802 Firmware Hub Device
[00000000FF000000 - 00000000FFFFFFFF] Intel(R) 82802 Firmware Hub Device
[00000000FF000000 - 00000000FFFFFFFF] Motherboard resources

B.3 IRQ Mapping Chart

Interrupt request (IRQ)

(ISA) 0x00000000 (00)	System timer
(ISA) 0x00000001 (01)	Standard PS/2 Keyboard
(ISA) 0x00000003 (03)	Communications Port (COM2)
(ISA) 0x00000004 (04)	Communications Port (COM1)
(ISA) 0x00000007 (07)	Communications Port (COM3)
(ISA) 0x00000007 (07)	Communications Port (COM4)
(ISA) 0x00000007 (07)	Communications Port (COM5)
(ISA) 0x00000007 (07)	Communications Port (COM6)
(ISA) 0x00000008 (08)	System CMOS/real time clock
(ISA) 0x0000000B (11)	Mobile 5th Generation Intel(R) Core(TM) and Intel(R) Core(TM) M Audi
(ISA) 0x0000000C (12)	Microsoft PS/2 Mouse
(ISA) 0x00000051 (81)	Microsoft ACPI-Compliant System
(ISA) 0x00000052 (82)	Microsoft ACPI-Compliant System
(ISA) 0x00000053 (83)	Microsoft ACPI-Compliant System
(ISA) 0x00000054 (84)	Microsoft ACPI-Compliant System
(ISA) 0x00000055 (85)	Microsoft ACPI-Compliant System
(ISA) 0x00000056 (86)	Microsoft ACPI-Compliant System
(ISA) 0x00000057 (87)	Microsoft ACPI-Compliant System
(ISA) 0x00000058 (88)	Microsoft ACPI-Compliant System
(ISA) 0x00000059 (89)	Microsoft ACPI-Compliant System
(ISA) 0x0000005A (90)	Microsoft ACPI-Compliant System
(ISA) 0x0000005B (91)	Microsoft ACPI-Compliant System
(ISA) 0x0000005C (92)	Microsoft ACPI-Compliant System
(ISA) 0x0000005D (93)	Microsoft ACPI-Compliant System
(ISA) 0x0000005E (94)	Microsoft ACPI-Compliant System
(ISA) 0x0000005F (95)	Microsoft ACPI-Compliant System
(ISA) 0x00000060 (96)	Microsoft ACPI-Compliant System
(ISA) 0x00000061 (97)	Microsoft ACPI-Compliant System
(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
(ISA) 0x000000BF (191)	Microsoft ACPI-Compliant System
(ISA) 0x00000100 (256)	Microsoft ACPI-Compliant System
(ISA) 0x00000101 (257)	Microsoft ACPI-Compliant System
(ISA) 0x00000102 (258)	Microsoft ACPI-Compliant System
(ISA) 0x00000103 (259)	Microsoft ACPI-Compliant System
(ISA) 0x00000104 (260)	Microsoft ACPI-Compliant System

(ISA) 0x00000105 (261) Microsoft ACPI-Compliant System
(ISA) 0x00000106 (262) Microsoft ACPI-Compliant System
(ISA) 0x00000107 (263) Microsoft ACPI-Compliant System
(ISA) 0x00000108 (264) Microsoft ACPI-Compliant System
(ISA) 0x00000109 (265) Microsoft ACPI-Compliant System
(ISA) 0x0000010A (266) Microsoft ACPI-Compliant System
(ISA) 0x0000010B (267) Microsoft ACPI-Compliant System
(ISA) 0x0000010C (268) Microsoft ACPI-Compliant System
(ISA) 0x0000010D (269) Microsoft ACPI-Compliant System
(ISA) 0x0000010E (270) Microsoft ACPI-Compliant System
(ISA) 0x0000010F (271) Microsoft ACPI-Compliant System
(ISA) 0x00000110 (272) Microsoft ACPI-Compliant System
(ISA) 0x00000111 (273) Microsoft ACPI-Compliant System
(ISA) 0x00000112 (274) Microsoft ACPI-Compliant System
(ISA) 0x00000113 (275) Microsoft ACPI-Compliant System
(ISA) 0x00000114 (276) Microsoft ACPI-Compliant System
(ISA) 0x00000115 (277) Microsoft ACPI-Compliant System
(ISA) 0x00000116 (278) Microsoft ACPI-Compliant System
(ISA) 0x00000117 (279) Microsoft ACPI-Compliant System
(ISA) 0x00000118 (280) Microsoft ACPI-Compliant System
(ISA) 0x00000119 (281) Microsoft ACPI-Compliant System
(ISA) 0x0000011A (282) Microsoft ACPI-Compliant System
(ISA) 0x0000011B (283) Microsoft ACPI-Compliant System
(ISA) 0x0000011C (284) Microsoft ACPI-Compliant System
(ISA) 0x0000011D (285) Microsoft ACPI-Compliant System
(ISA) 0x0000011E (286) Microsoft ACPI-Compliant System
(ISA) 0x0000011F (287) Microsoft ACPI-Compliant System
(ISA) 0x00000120 (288) Microsoft ACPI-Compliant System
(ISA) 0x00000121 (289) Microsoft ACPI-Compliant System
(ISA) 0x00000122 (290) Microsoft ACPI-Compliant System
(ISA) 0x00000123 (291) Microsoft ACPI-Compliant System
(ISA) 0x00000124 (292) Microsoft ACPI-Compliant System

(ISA) 0x00000125 (293)	Microsoft ACPI-Compliant System
(ISA) 0x00000126 (294)	Microsoft ACPI-Compliant System
(ISA) 0x00000127 (295)	Microsoft ACPI-Compliant System
(ISA) 0x00000128 (296)	Microsoft ACPI-Compliant System
(ISA) 0x00000129 (297)	Microsoft ACPI-Compliant System
(ISA) 0x0000012A (298)	Microsoft ACPI-Compliant System
(ISA) 0x0000012B (299)	Microsoft ACPI-Compliant System
(ISA) 0x0000012C (300)	Microsoft ACPI-Compliant System
(ISA) 0x0000012D (301)	Microsoft ACPI-Compliant System
(ISA) 0x0000012E (302)	Microsoft ACPI-Compliant System
(ISA) 0x0000012F (303)	Microsoft ACPI-Compliant System
(ISA) 0x00000130 (304)	Microsoft ACPI-Compliant System
(ISA) 0x00000131 (305)	Microsoft ACPI-Compliant System
(ISA) 0x00000132 (306)	Microsoft ACPI-Compliant System
(ISA) 0x00000133 (307)	Microsoft ACPI-Compliant System
(ISA) 0x00000134 (308)	Microsoft ACPI-Compliant System
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(ISA) 0x00000138 (312)	Microsoft ACPI-Compliant System
(ISA) 0x00000139 (313)	Microsoft ACPI-Compliant System
(ISA) 0x0000013A (314)	Microsoft ACPI-Compliant System
(ISA) 0x0000013B (315)	Microsoft ACPI-Compliant System
(ISA) 0x0000013C (316)	Microsoft ACPI-Compliant System
(ISA) 0x0000013D (317)	Microsoft ACPI-Compliant System
(ISA) 0x0000013E (318)	Microsoft ACPI-Compliant System
(ISA) 0x0000013F (319)	Microsoft ACPI-Compliant System
(ISA) 0x00000140 (320)	Microsoft ACPI-Compliant System
(ISA) 0x00000141 (321)	Microsoft ACPI-Compliant System
(ISA) 0x00000142 (322)	Microsoft ACPI-Compliant System
(ISA) 0x00000143 (323)	Microsoft ACPI-Compliant System
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(ISA) 0x00000145 (325)	Microsoft ACPI-Compliant System
(ISA) 0x00000146 (326)	Microsoft ACPI-Compliant System
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(ISA) 0x0000014A (330)	Microsoft ACPI-Compliant System
(ISA) 0x0000014B (331)	Microsoft ACPI-Compliant System
(ISA) 0x0000014C (332)	Microsoft ACPI-Compliant System
(ISA) 0x0000014D (333)	Microsoft ACPI-Compliant System
(ISA) 0x0000014E (334)	Microsoft ACPI-Compliant System
(ISA) 0x0000014F (335)	Microsoft ACPI-Compliant System
(ISA) 0x00000150 (336)	Microsoft ACPI-Compliant System
(ISA) 0x00000151 (337)	Microsoft ACPI-Compliant System
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(ISA) 0x00000159 (345)	Microsoft ACPI-Compliant System
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(ISA) 0x0000015C (348)	Microsoft ACPI-Compliant System
(ISA) 0x0000015D (349)	Microsoft ACPI-Compliant System
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(ISA) 0x00000160 (352)	Microsoft ACPI-Compliant System
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(ISA) 0x00000162 (354)	Microsoft ACPI-Compliant System
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(ISA) 0x00000166 (358)	Microsoft ACPI-Compliant System
(ISA) 0x00000167 (359)	Microsoft ACPI-Compliant System
(ISA) 0x00000168 (360)	Microsoft ACPI-Compliant System
(ISA) 0x00000169 (361)	Microsoft ACPI-Compliant System
(ISA) 0x0000016A (362)	Microsoft ACPI-Compliant System
(ISA) 0x0000016B (363)	Microsoft ACPI-Compliant System
(ISA) 0x0000016C (364)	Microsoft ACPI-Compliant System
(ISA) 0x0000016D (365)	Microsoft ACPI-Compliant System
(ISA) 0x0000016E (366)	Microsoft ACPI-Compliant System
(ISA) 0x0000016F (367)	Microsoft ACPI-Compliant System
(ISA) 0x00000170 (368)	Microsoft ACPI-Compliant System
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(ISA) 0x00000176 (374)	Microsoft ACPI-Compliant System
(ISA) 0x00000177 (375)	Microsoft ACPI-Compliant System
(ISA) 0x00000178 (376)	Microsoft ACPI-Compliant System
(ISA) 0x00000179 (377)	Microsoft ACPI-Compliant System
(ISA) 0x0000017A (378)	Microsoft ACPI-Compliant System
(ISA) 0x0000017B (379)	Microsoft ACPI-Compliant System
(ISA) 0x0000017C (380)	Microsoft ACPI-Compliant System
(ISA) 0x0000017D (381)	Microsoft ACPI-Compliant System
(ISA) 0x0000017E (382)	Microsoft ACPI-Compliant System
(ISA) 0x0000017F (383)	Microsoft ACPI-Compliant System
(ISA) 0x00000180 (384)	Microsoft ACPI-Compliant System
(ISA) 0x00000181 (385)	Microsoft ACPI-Compliant System
(ISA) 0x00000182 (386)	Microsoft ACPI-Compliant System
(ISA) 0x00000183 (387)	Microsoft ACPI-Compliant System
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(ISA) 0x00000185 (389)	Microsoft ACPI-Compliant System
(ISA) 0x00000186 (390)	Microsoft ACPI-Compliant System
(ISA) 0x00000187 (391)	Microsoft ACPI-Compliant System
(ISA) 0x00000188 (392)	Microsoft ACPI-Compliant System
(ISA) 0x00000189 (393)	Microsoft ACPI-Compliant System
(ISA) 0x0000018A (394)	Microsoft ACPI-Compliant System
(ISA) 0x0000018B (395)	Microsoft ACPI-Compliant System
(ISA) 0x0000018C (396)	Microsoft ACPI-Compliant System
(ISA) 0x0000018D (397)	Microsoft ACPI-Compliant System
(ISA) 0x0000018E (398)	Microsoft ACPI-Compliant System
(ISA) 0x0000018F (399)	Microsoft ACPI-Compliant System
(ISA) 0x00000190 (400)	Microsoft ACPI-Compliant System
(ISA) 0x00000191 (401)	Microsoft ACPI-Compliant System
(ISA) 0x00000192 (402)	Microsoft ACPI-Compliant System
(ISA) 0x00000193 (403)	Microsoft ACPI-Compliant System
(ISA) 0x00000194 (404)	Microsoft ACPI-Compliant System
(ISA) 0x00000195 (405)	Microsoft ACPI-Compliant System
(ISA) 0x00000196 (406)	Microsoft ACPI-Compliant System
(ISA) 0x00000197 (407)	Microsoft ACPI-Compliant System
(ISA) 0x00000198 (408)	Microsoft ACPI-Compliant System
(ISA) 0x00000199 (409)	Microsoft ACPI-Compliant System
(ISA) 0x0000019A (410)	Microsoft ACPI-Compliant System
(ISA) 0x0000019B (411)	Microsoft ACPI-Compliant System
(ISA) 0x0000019C (412)	Microsoft ACPI-Compliant System
(ISA) 0x0000019D (413)	Microsoft ACPI-Compliant System
(ISA) 0x0000019E (414)	Microsoft ACPI-Compliant System
(ISA) 0x0000019F (415)	Microsoft ACPI-Compliant System
(ISA) 0x000001A0 (416)	Microsoft ACPI-Compliant System
(ISA) 0x000001A1 (417)	Microsoft ACPI-Compliant System
(ISA) 0x000001A2 (418)	Microsoft ACPI-Compliant System
(ISA) 0x000001A3 (419)	Microsoft ACPI-Compliant System
(ISA) 0x000001A4 (420)	Microsoft ACPI-Compliant System

(ISA) 0x000001A5 (421)	Microsoft ACPI-Compliant System
(ISA) 0x000001A6 (422)	Microsoft ACPI-Compliant System
(ISA) 0x000001A7 (423)	Microsoft ACPI-Compliant System
(ISA) 0x000001A8 (424)	Microsoft ACPI-Compliant System
(ISA) 0x000001A9 (425)	Microsoft ACPI-Compliant System
(ISA) 0x000001AA (426)	Microsoft ACPI-Compliant System
(ISA) 0x000001AB (427)	Microsoft ACPI-Compliant System
(ISA) 0x000001AC (428)	Microsoft ACPI-Compliant System
(ISA) 0x000001AD (429)	Microsoft ACPI-Compliant System
(ISA) 0x000001AE (430)	Microsoft ACPI-Compliant System
(ISA) 0x000001AF (431)	Microsoft ACPI-Compliant System
(ISA) 0x000001B0 (432)	Microsoft ACPI-Compliant System
(ISA) 0x000001B1 (433)	Microsoft ACPI-Compliant System
(ISA) 0x000001B2 (434)	Microsoft ACPI-Compliant System
(ISA) 0x000001B3 (435)	Microsoft ACPI-Compliant System
(ISA) 0x000001B4 (436)	Microsoft ACPI-Compliant System
(ISA) 0x000001B5 (437)	Microsoft ACPI-Compliant System
(ISA) 0x000001B6 (438)	Microsoft ACPI-Compliant System
(ISA) 0x000001B7 (439)	Microsoft ACPI-Compliant System
(ISA) 0x000001B8 (440)	Microsoft ACPI-Compliant System
(ISA) 0x000001B9 (441)	Microsoft ACPI-Compliant System
(ISA) 0x000001BA (442)	Microsoft ACPI-Compliant System
(ISA) 0x000001BB (443)	Microsoft ACPI-Compliant System
(ISA) 0x000001BC (444)	Microsoft ACPI-Compliant System
(ISA) 0x000001BD (445)	Microsoft ACPI-Compliant System
(ISA) 0x000001BE (446)	Microsoft ACPI-Compliant System
(ISA) 0x000001BF (447)	Microsoft ACPI-Compliant System
(ISA) 0x000001C0 (448)	Microsoft ACPI-Compliant System
(ISA) 0x000001C1 (449)	Microsoft ACPI-Compliant System
(ISA) 0x000001C2 (450)	Microsoft ACPI-Compliant System
(ISA) 0x000001C3 (451)	Microsoft ACPI-Compliant System
(ISA) 0x000001C4 (452)	Microsoft ACPI-Compliant System

(ISA) 0x000001C5 (453)	Microsoft ACPI-Compliant System
(ISA) 0x000001C6 (454)	Microsoft ACPI-Compliant System
(ISA) 0x000001C7 (455)	Microsoft ACPI-Compliant System
(ISA) 0x000001C8 (456)	Microsoft ACPI-Compliant System
(ISA) 0x000001C9 (457)	Microsoft ACPI-Compliant System
(ISA) 0x000001CA (458)	Microsoft ACPI-Compliant System
(ISA) 0x000001CB (459)	Microsoft ACPI-Compliant System
(ISA) 0x000001CC (460)	Microsoft ACPI-Compliant System
(ISA) 0x000001CD (461)	Microsoft ACPI-Compliant System
(ISA) 0x000001CE (462)	Microsoft ACPI-Compliant System
(ISA) 0x000001CF (463)	Microsoft ACPI-Compliant System
(ISA) 0x000001D0 (464)	Microsoft ACPI-Compliant System
(ISA) 0x000001D1 (465)	Microsoft ACPI-Compliant System
(ISA) 0x000001D2 (466)	Microsoft ACPI-Compliant System
(ISA) 0x000001D3 (467)	Microsoft ACPI-Compliant System
(ISA) 0x000001D4 (468)	Microsoft ACPI-Compliant System
(ISA) 0x000001D5 (469)	Microsoft ACPI-Compliant System
(ISA) 0x000001D6 (470)	Microsoft ACPI-Compliant System
(ISA) 0x000001D7 (471)	Microsoft ACPI-Compliant System
(ISA) 0x000001D8 (472)	Microsoft ACPI-Compliant System
(ISA) 0x000001D9 (473)	Microsoft ACPI-Compliant System
(ISA) 0x000001DA (474)	Microsoft ACPI-Compliant System
(ISA) 0x000001DB (475)	Microsoft ACPI-Compliant System
(ISA) 0x000001DC (476)	Microsoft ACPI-Compliant System
(ISA) 0x000001DD (477)	Microsoft ACPI-Compliant System
(ISA) 0x000001DE (478)	Microsoft ACPI-Compliant System
(ISA) 0x000001DF (479)	Microsoft ACPI-Compliant System
(ISA) 0x000001E0 (480)	Microsoft ACPI-Compliant System
(ISA) 0x000001E1 (481)	Microsoft ACPI-Compliant System
(ISA) 0x000001E2 (482)	Microsoft ACPI-Compliant System
(ISA) 0x000001E3 (483)	Microsoft ACPI-Compliant System
(ISA) 0x000001E4 (484)	Microsoft ACPI-Compliant System

(ISA) 0x000001E5 (485)	Microsoft ACPI-Compliant System
(ISA) 0x000001E6 (486)	Microsoft ACPI-Compliant System
(ISA) 0x000001E7 (487)	Microsoft ACPI-Compliant System
(ISA) 0x000001E8 (488)	Microsoft ACPI-Compliant System
(ISA) 0x000001E9 (489)	Microsoft ACPI-Compliant System
(ISA) 0x000001EA (490)	Microsoft ACPI-Compliant System
(ISA) 0x000001EB (491)	Microsoft ACPI-Compliant System
(ISA) 0x000001EC (492)	Microsoft ACPI-Compliant System
(ISA) 0x000001ED (493)	Microsoft ACPI-Compliant System
(ISA) 0x000001EE (494)	Microsoft ACPI-Compliant System
(ISA) 0x000001EF (495)	Microsoft ACPI-Compliant System
(ISA) 0x000001F0 (496)	Microsoft ACPI-Compliant System
(ISA) 0x000001F1 (497)	Microsoft ACPI-Compliant System
(ISA) 0x000001F2 (498)	Microsoft ACPI-Compliant System
(ISA) 0x000001F3 (499)	Microsoft ACPI-Compliant System
(ISA) 0x000001F4 (500)	Microsoft ACPI-Compliant System
(ISA) 0x000001F5 (501)	Microsoft ACPI-Compliant System
(ISA) 0x000001F6 (502)	Microsoft ACPI-Compliant System
(ISA) 0x000001F7 (503)	Microsoft ACPI-Compliant System
(ISA) 0x000001F8 (504)	Microsoft ACPI-Compliant System
(ISA) 0x000001F9 (505)	Microsoft ACPI-Compliant System
(ISA) 0x000001FA (506)	Microsoft ACPI-Compliant System
(ISA) 0x000001FB (507)	Microsoft ACPI-Compliant System
(ISA) 0x000001FC (508)	Microsoft ACPI-Compliant System
(ISA) 0x000001FD (509)	Microsoft ACPI-Compliant System
(ISA) 0x000001FE (510)	Microsoft ACPI-Compliant System
(ISA) 0x000001FF (511)	Microsoft ACPI-Compliant System
(PCI) 0x0000000B (11)	Mobile 5th Generation Intel(R) Core(TM) SMBus Controller - 9CA2
(PCI) 0x00000010 (16)	PCI standard PCI-to-PCI bridge
(PCI) 0x00000016 (22)	High Definition Audio Controller
(PCI) 0x00000017 (23)	Mobile 5th Generation Intel(R) Core(TM) USB EHCI Controller - 9CA6
(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
(PCI) 0xFFFFFFF8 (-8)	Intel(R) Ethernet Connection I218-LM
(PCI) 0xFFFFFFF9 (-7)	Intel(R) Management Engine Interface
(PCI) 0xFFFFFFFA (-6)	Intel(R) HD Graphics 6000
(PCI) 0xFFFFFFFB (-5)	Intel(R) USB 3.0 eXtensible Host Controller - 0100 (Microsoft)
(PCI) 0xFFFFFFFC (-4)	Intel(R) 9 Series Chipset Family SATA AHCI Controller
(PCI) 0xFFFFFFFD (-3)	Intel(R) 82801 PCI Bridge - 2448
(PCI) 0xFFFFFFFE (-2)	Mobile 5th Generation Intel(R) Core(TM) PCI Express Root Port #4 - 9C9

B.4 DMA Channel Assignments

Memory

[00000000000A0000 - 00000000000BFFFF] Intel(R) HD Graphics 6000
[00000000000A0000 - 00000000000BFFFF] PCI Express Root Complex
[000000007E000000 - 00000000FEAFFFFF] PCI Express Root Complex
[0000000080000000 - 000000008000FFFF] Motherboard resources
[0000000080010000 - 000000008001FFFF] Motherboard resources
[0000000081000000 - 0000000081FFFFFF] Intel(R) HD Graphics 6000
[0000000082000000 - 00000000827FFFFF] Intel(R) I211 Gigabit Network Connection
[0000000082000000 - 00000000828FFFFF] Mobile 5th Generation Intel(R) Core(TM) PCI Express
[0000000082800000 - 0000000082803FFF] Intel(R) I211 Gigabit Network Connection
[0000000082900000 - 000000008291FFFF] Intel(R) Ethernet Connection I218-LM
[0000000082920000 - 000000008292FFFF] Intel(R) USB 3.0 eXtensible Host Controller - 0100 (Mi
[0000000082930000 - 0000000082933FFF] High Definition Audio Controller
[0000000082934000 - 0000000082937FFF] Mobile 5th Generation Intel(R) Core(TM) and Intel(R)
[0000000082938000 - 00000000829380FF] Mobile 5th Generation Intel(R) Core(TM) SMBus Cont
[0000000082939000 - 00000000829397FF] Intel(R) 9 Series Chipset Family SATA AHCI Controller
[000000008293A000 - 000000008293A3FF] Mobile 5th Generation Intel(R) Core(TM) USB EHCI C
[000000008293B000 - 000000008293BFFF] Intel(R) Ethernet Connection I218-LM
[000000008293E000 - 000000008293E01F] Intel(R) Management Engine Interface
[0000000090000000 - 000000009FFFFFFF] Intel(R) HD Graphics 6000
[00000000F8000000 - 00000000FBFFFFFF] Motherboard resources
[00000000FED00000 - 00000000FED003FF] High precision event timer
[00000000FED10000 - 00000000FED17FFF] Motherboard resources
[00000000FED18000 - 00000000FED18FFF] Motherboard resources
[00000000FED19000 - 00000000FED19FFF] Motherboard resources
[00000000FED1C000 - 00000000FED1FFFF] Motherboard resources
[00000000FED20000 - 00000000FED3FFFF] Motherboard resources
[00000000FED40000 - 00000000FED44FFF] Trusted Platform Module 1.2
[00000000FED45000 - 00000000FED8FFFF] Motherboard resources
[00000000FED90000 - 00000000FED93FFF] Motherboard resources
[00000000FEE00000 - 00000000FEEFFFFF] Motherboard resources
[00000000FF000000 - 00000000FFFFFFFF] Intel(R) 82802 Firmware Hub Device
[00000000FF000000 - 00000000FFFFFFFF] Intel(R) 82802 Firmware Hub Device
[00000000FF000000 - 00000000FFFFFFFF] Motherboard resources

Appendix C

Mating Connectors

C.1 List of Mating Connectors and Cables

The table notes mating connectors and available cables.

Connector Label	Function	Mating Connector		Available Cable	Cable P/N
		Vendor	Model no		
CN1	Amplifier right channel output	Molex	51021-0200	N/A	N/A
CN2	Amplifier left channel output	Molex	51021-0200	N/A	N/A
CN3	ATX 4P Power In	Molex	39-01-2040	Power Cable	1702040151
CN4	+9~24V Vin Connector	N/A	N/A	Power Cable	1702002010
CN6	Audio Connector	Molex	51021-1000	Audio Cable	1709100254
CN7	USB Port Connector	Molex	51021-0500	USB Wafer Cable	1700050207
CN8	Front Panel Connector	Molex	51021-1000	N/A	N/A
CN9	Digital I/O | LPT Connector	Neltron	2026B-10	N/A LPT Cable	N/A 1701260308
CN10	USB Port Connector	Molex	51021-0500	USB Wafer Cable	1700050207
CN11	USB Port Connector	Molex	51021-0500	USB Wafer Cable	1700050207
CN14	+5Vout Connector	JST	PHR-2	2 Pins For SATA HDD Power	1702150155

CN17	CPU Fan Connector	Molex	22-01-2035	N/A	N/A
CN18	P/S2 KB/MS Connector	Molex	51021-0600	P/S2 KB/MS Cable	1700060158
CN19	Touch Screen Connector	JST	SHR-9V-S-B	N/A	N/A
CN21	COM Port 6 Connector	Molex	51021-0900	Serial Port Cable	1701090150
CN22	COM Port 5 Connector	Molex	51021-0900	Serial Port Cable	1701090150
CN23	COM Port 1 Connector	Molex	51021-0900	Serial Port Cable	1701090150
CN24	eDP/LVDS Inverter Connector	JST	PHR-5	N/A	N/A
CN25	eDP/LVDS Connector	HIROSE	DF13-30DS-1.25C	N/A	N/A
CN28	COM Port 4 Connector	Molex	51021-0900	Serial Port Cable	1701090150
CN29	COM Port 3 Connector	Molex	51021-0900	Serial Port Cable	1701090150
CN32	LVDS Connector	HIROSE	DF13-30DS-1.25C	N/A	N/A
CN36	LVDS Inverter Connector	JST	PHR-5	N/A	N/A
CN37	USB Port Connector	Molex	51021-0500	USB Wafer Cable	1700050207
BATTA1	External RTC Connector	Molex	51021-0200	Battery Cable	175011901C

Appendix

D

Electrical Specifications for I/O Ports

D.1 Electrical Specifications for I/O Ports

I/O	Reference	Signal Name	Rate Output
LVDS Port1/eDP Inverter/Backlight Connector	CN24	VDD	+5V/2A or +12V/2A
LVDS Port 2 Inverter/Backlight Connector	CN36	VDD	+5V/2A or +12V/2A
USB 3.0 Port 1 & 2	CN30	+5VSB	+5VSB/1A (per channel)
USB 2.0 Port 3	CN10	+5VSB	
USB 2.0 Port 4	CN7	+5VSB	+5VSB/0.5A
USB 2.0 Port 5	CN11	+5VSB	(per channel)
USB 2.0 Port 6	CN37	+5VSB	
Audio I/O Port	CN6	+5V	+5V/0.5A
LVDS Port 1	CN25	VCC	+3.3V/2A or +5V/2A
LVDS Port 2	CN32	VCC	+3.3V/2A or +5V/2A
COM Port 2	CN33B	+5V/+12V	+5V/1A or +12V/1A
COM Port 3	CN29	+5V/+12V	+5V/1A or +12V/1A
Digital IO Port	CN9	D0~D7	+5V/(Open drain)
PS/2 Keyboard/Mouse Combo Port	CN18	+5VSB	+5VSB/1A
CPU FAN	CN17	VDD	+12V/0.5A
+5V Output for SATA HDD	CN14	+5V	+5V/1A
VGA Ports	CN34	VGA: +5V	+5V/1A (reserved)
Mini-Card Slot	CN12 CN38	+3.3VSB +1.5V	+3.3V/1.1A +1.5V/0.375A

LPC Port	CN20	+3.3V	+3.3V/0.5A
LVDS Port1/eDP Inverter/Backlight Connector	CN24	VDD	+5V/2A or +12V/2A
LVDS Port 2 Inverter/Backlight Connector	CN36	VDD	+5V/2A or +12V/2A

Appendix E

Digital I/O Ports

E.1 Electrical Specifications for Digital I/O Ports

Table 1 : Digital Input/Output Pin Electrical Specification

Pin	Type	Input Threshold Voltage		Output Voltage		Note
		Low	High	Low	High	
DIO1	I/O	0.8	2.0	0	5	
DIO2	I/O	0.8	2.0	0	5	
DIO3	I/O	0.8	2.0	0	5	
DIO4	I/O	0.8	2.0	0	5	
DIO5	I/O	0.8	2.0	0	5	
DIO6	I/O	0.8	2.0	0	5	
DIO7	I/O	0.8	2.0	0	5	
DIO8	I/O	0.8	2.0	0	5	
DIO9	I/O	0.8	2.0	0	5	
DIO10	I/O	0.8	2.0	0	5	
DIO11	I/O	0.8	2.0	0	5	
DIO12	I/O	0.8	2.0	0	5	
DIO13	I/O	0.8	2.0	0	5	
DIO14	I/O	0.8	2.0	0	5	
DIO15	I/O	0.8	2.0	0	5	
DIO16	I/O	0.8	2.0	0	5	

Note: All DIO pins are 5V tolerance in input mode.

E.2 DI/O Programming

EPIC-BDU7 utilizes FINTEK F81866D chipset as its Digital I/O controller. Below are the procedures to complete its configuration and the AAEON initial DIO program is also attached based on which you can develop customized program to fit your application. There are three steps to complete the configuration setup: (1) Enter the MB PnP Mode; (2) Modify the data of configuration registers; (3) Exit the MB PnP Mode. Undesired result may occur if the MB PnP Mode is not exited normally.

E.3 Digital I/O Register

Table 2 : SuperIO relative register table		
	Default Value	**Note**
Index	**0x2E**	SIO MB PnP Mode Index Register 0x2E or 0x4E
Data	**0x2F**)	SIO MB PnP Mode Data Register 0x2F or 0x4F

Table 3 : Digital Input/Output relative register table				
	LDN	**Register**	**Bit**	**Note**
GPIO1 Direction	**0x06**	**0x88**	**0**	0:input, 1: output
GPIO2 Direction	**0x06**	**0x88**	**1**	
GPIO3 Direction	**0x06**	**0x88**	**2**	
GPIO4 Direction	**0x06**	**0x88**	**3**	
GPIO5 Direction	**0x06**	**0x88**	**4**	
GPIO6 Direction	**0x06**	**0x88**	**5**	
GPIO7 Direction	**0x06**	**0x88**	**6**	
GPIO8 Direction	**0x06**	**0x88**	**7**	
GPIO9 Direction	**0x06**	**0x80**	**0**	
GPIO10 Direction	**0x06**	**0x80**	**1**	
GPIO11 Direction	**0x06**	**0x80**	**2**	
GPIO12 Direction	**0x06**	**0x80**	**3**	
GPIO13 Direction	**0x06**	**0x80**	**4**	
GPIO14 Direction	**0x06**	**0x80**	**5**	
GPIO15 Direction	**0x06**	**0x80**	**6**	
GPIO16 Direction	**0x06**	**0x80**	**7**	
GPIO1 Output Level	**0x06**	**0x89**	**0**	0:low, 1: high
GPIO2 Output Level	**0x06**	**0x89**	**1**	
GPIO3 Output Level	**0x06**	**0x89**	**2**	
GPIO4 Output Level	**0x06**	**0x89**	**3**	
GPIO5 Output Level	**0x06**	**0x89**	**4**	
GPIO6 Output Level	**0x06**	**0x89**	**5**	
GPIO7 Output Level	**0x06**	**0x89**	**6**	
GPIO8 Output Level	**0x06**	**0x89**	**7**	

GPIO9 Output Level	0x06	0x81	0	
GPIO10 Output Level	0x06	0x81	1	
GPIO11 Output Level	0x06	0x81	2	
GPIO12 Output Level	0x06	0x81	3	
GPIO13 Output Level	0x06	0x81	4	
GPIO14 Output Level	0x06	0x81	5	
GPIO15 Output Level	0x06	0x81	6	
GPIO16 Output Level	0x06	0x81	7	
GPIO1 Status	0x06	0x8A	0	0:low, 1: high
GPIO2 Status	0x06	0x8A	1	
GPIO3 Status	0x06	0x8A	2	
GPIO4 Status	0x06	0x8A	3	
GPIO5 Status	0x06	0x8A	4	
GPIO6 Status	0x06	0x8A	5	
GPIO7 Status	0x06	0x8A	6	
GPIO8 Status	0x06	0x8A	7	
GPIO9 Status	0x06	0x82	0	
GPIO10 Status	0x06	0x82	1	
GPIO11 Status	0x06	0x82	2	
GPIO12 Status	0x06	0x82	3	
GPIO13 Status	0x06	0x82	4	
GPIO14 Status	0x06	0x82	5	
GPIO15 Status	0x06	0x82	6	
GPIO16 Status	0x06	0x82	7	

E.4 Digital I/O Sample Program

```
****************************************************************************
// SuperIO relative definition (Please reference to Table 2)
#define   SIOIndex   0x2E
#define   SIOData    0x2F
#define   DIOLDN     0x06
IOWriteByte(byte IOPort, byte Value);
IOReadByte(byte IOPort);
// DIO relative definition (Please reference to Table 3)
#define   DirReg_L        0x88          // 0:input, 1: output
#define   DirReg_H        0x80          // 0:input, 1: output
     #define   InputPin       0x00
     #define   OutputPin      0x01
#define   OutputReg_L     0x89          // 0:low, 1: high
#define   OutputReg_H     0x81          // 0:low, 1: high
#define   StatusReg_L     0x8A          // 0:low, 1: high
#define   StatusReg_H     0x82          // 0:low, 1: high
     #define   PinLow         0x00
     #define   PinHigh        0x01
#define   Pin1Bit       0x00
#define   Pin2Bit       0x01
#define   Pin3Bit       0x02
#define   Pin4Bit       0x03
#define   Pin5Bit       0x04
#define   Pin6Bit       0x05
#define   Pin7Bit       0x06
#define   Pin8Bit       0x07
#define   Pin9Bit       0x08
#define   Pin10Bit      0x09
#define   Pin11Bit      0x0A
#define   Pin12Bit      0x0B
#define   Pin13Bit      0x0C
#define   Pin14Bit      0x0D
#define   Pin15Bit      0x0E
#define   Pin16Bit      0x0F
```

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

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

        // Procedure : AaeonReadPinStatus
        // Input :
        //         Example, Read Digital I/O Pin 3 status
        // Output :
        //         InputStatus :
        //                  0: Digital I/O Pin level is low
        //                  1: Digital I/O Pin level is High
        PinStatus = AaeonReadPinStatus(Pin3Bit);

        // Procedure : AaeonSetOutputLevel
        // Input :
        //         Example, Set Digital I/O Pin 2 to high level
        AaeonSetOutputLevel(Pin2Bit, PinHigh);
}
**************************************************************************

**************************************************************************
Boolean   AaeonReadPinStatus(byte PinBit){
        Boolean PinStatus ;

        if (PinBit < Pin9Bit)
        {
             PinStatus = SIOBitRead(DIOLDN, StatusReg_L, PinBit);
        } else
        {
             PinStatus = SIOBitRead(DIOLDN, StatusReg_H, PinBit - Pin9Bit);
        }
        Return PinStatus ;
}
VOID   AaeonSetOutputLevel(byte PinBit, byte Value){
```

```
        ConfigDioMode(PinBit, OutputPin);
        if (PinBit < Pin9Bit)
        {
            SIOBitSet(DIOLDN, OutputReg_L, PinBit, Value);
        } else
        {
            SIOBitSet(DIOLDN, OutputReg _H, PinBit - Pin9Bit, Value);
        }
}
*****************************************************************************

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

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

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

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

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

```
}

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

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

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

        SIOEnterMBPnPMode();
        SIOSelectLDN(DIOLDN);
        if (PinBit < Pin9Bit)
        {
                IOWriteByte(SIOIndex, DirReg_L);
                TmpValue = IOReadByte(SIOData);
                TmpValue |= (Mode << PinBit);
                IOWriteByte(SIOData, DirReg_L);
        } else
```

```
        {
                IOWriteByte(SIOIndex, DirReg_H);
                TmpValue = IOReadByte(SIOData);
                TmpValue |= (Mode << (PinBit – Pin9Bit));
                IOWriteByte(SIOData, DirReg_L);
        }

        SIOExitMBPnPMode();
}
***************************************************************************
```