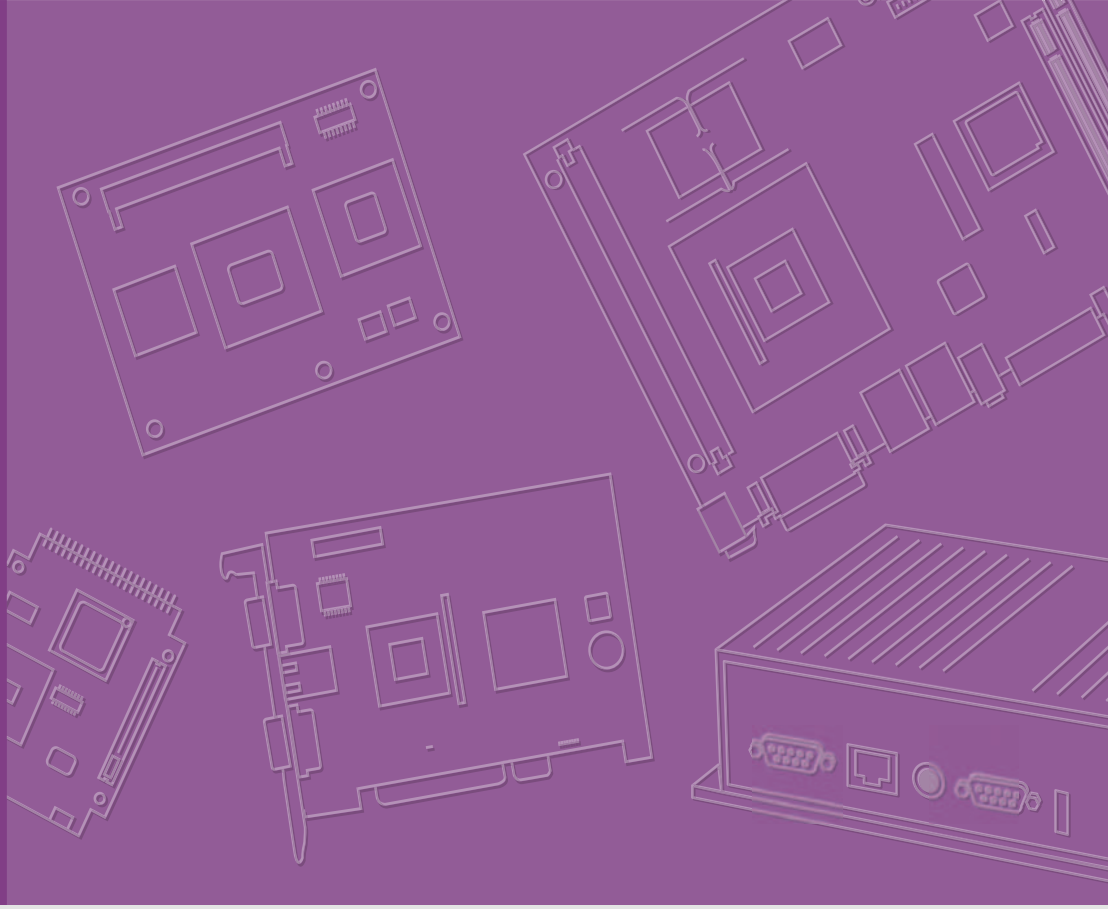

User Manual

AIMB-226

AIMB-226 Mobile AMD R-series Quad Core/Dual Core Mini-ITX with HDMI/LVDS/DP++, 6 COM and Dual LAN

ADVANTECH

Enabling an Intelligent Planet

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Part No. 2006B22600 Edition 1

August 2015

A Message to the Customer

Advantech Customer Services

Each and every Advantech product is built to the most exacting specifications to ensure reliable performance in the harsh and demanding conditions typical of industrial environments. Whether your new Advantech equipment is destined for the laboratory or the factory floor, you can be assured that your product will provide the reliability and ease of operation for which the name Advantech has come to be known.

Your satisfaction is our primary concern. Here is a guide to Advantech's customer services. To ensure you get the full benefit of our services, please follow the instructions below carefully.

Technical Support

We want you to get the maximum performance from your products. So if you run into technical difficulties, we are here to help. For the most frequently asked questions, you can easily find answers in your product documentation. These answers are normally a lot more detailed than the ones we can give over the phone.

So please consult this manual first. If you still cannot find the answer, gather all the information or questions that apply to your problem, and with the product close at hand, call your dealer. Our dealers are well trained and ready to give you the support you need to get the most from your Advantech products. In fact, most problems reported are minor and are able to be easily solved over the phone.

In addition, free technical support is available from Advantech engineers every business day. We are always ready to give advice on application requirements or specific information on the installation and operation of any of our products.

Declaration of Conformity

FCC Class B

This device complies with the requirements in part 15 of the FCC rules:

Operation is subject to the following two conditions:

- This device may not cause harmful interference
- This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this device in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense. The user is advised that any equipment changes or modifications not expressly approved by the party responsible for compliance would void the compliance to FCC regulations and therefore, the user's authority to operate the equipment.

Caution! *There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.*

Memory Compatibility Test

Test Purpose

The purpose of this test is to evaluate and ensure the Memory compatibility of the DUT.

Test Data

Category	Speed	Capacity	Vendor	Chip_PN	Advantech P/N	Result
DDR3	1066	1GB	Transcend	SEC 128 BCH9 K4B1G0846G	96SD3-1G1066NN-TR	PASS
DDR3	1066	2GB	Apacer	J1108BABG-AE-E	N/A	PASS
DDR3	1066	4GB	Apacer	H5TQ2G83BFR H9C	96SD3-4G1066NN-AP	PASS
DDR3	1066	4GB	G.SKILL	D3 256M8GEF 1037 H33J38	N/A	PASS
DDR3	1333	1GB	Apacer	H5TQ1G83DFR H9C	96SD3-1G1333NN-AP1	PASS
DDR3	1333	2GB	Apacer	J2108BCSE-DJ-F	96SD3-2G1333NN-AP1	PASS
DDR3	1333	4GB	Transcend	H5TQ2G83CFR H9C	96SD3-4G1333NN-TR1	PASS
DDR3	1333	8GB	Transcend	IZD27 D9PBC	96SD3-8G1333NN-TR	PASS
DDR3	1600	4GB	Apacer	H5TQ2G83CFR PBC	N/A	PASS
DDR3	1600	8GB	ATP	SEC K4B4G0846B	N/A	PASS
DDR3	1600	8GB	ATP	SEC 140 HYK0 K4B4G0846B	N/A	PASS
DDR3	1600	8GB	Apacer	2TD27 D9PCP	96SD3-8G1600NN-AP	PASS
DDR3	1600	8GB	Apacer	2TD27 D9PCP	96SD3-8G1600NN-AP	PASS
DDR3	1866	4GB	CORSAIR	SpecTek PEB12-15EF I320	N/A	PASS
DDR3L	1333	2GB	Transcend	SEC 234 HYK0 K4B2G0846D	N/A	PASS
DDR3L	1333	4GB	Apacer	2XE22 D9QBJ	96SD3L-4G1333NN-AP	PASS
DDR3L	1333	4GB	Apacer	2TD27 D9PCP	96SD3L-4G1333NN-AP	PASS
DDR3L	1333	4GB	Apacer	4JE77 D9QBJ	96SD3L-4G1333NN-AP	PASS
DDR3L	1333	8GB	DSL	J4208EBBG-GN-F	N/A	PASS
DDR3L	1333	8GB	Apacer	2XE22 D9QBJ	N/A	PASS
DDR3L	1600	2GB	Advantech	SEC 310 XYK0 K4B2G084GD	AQD-SD3L2GN16-SQ	PASS
DDR3L	1600	2GB	Advantech	H5TC2G83EFR PBA	AQD-SD3L2GN16-HQ	PASS
DDR3L	1600	2GB	ATP	SEC 437 BYK0 K4B2G0846Q	N/A	PASS
DDR3L	1600	4GB	ATP	4JE77 D9QBJ	N/A	PASS
DDR3L	1600	4GB	Advantech	SEC 316 XYK0 K4B4G0846B	AQD-SD3L4GN16-SG D DIE NEW	PASS
DDR3L	1600	4GB	ATP	SEC 410 BYK0 K4B4G0846D	N/A	PASS
DDR3L	1600	4GB	Advantech	SEC 316 XYK0 K4B4G0846B	AQD-SD3L4GN16-SG D DIE NEW	PASS
DDR3L	1600	8GB	ATP	3JE77 D9QBJ	N/A	PASS
DDR3L	1600	8GB	Advantech	SEC 401 HYK0 K4B4G0846B	AQD-SD3L8GN16-SG	PASS
DDR3L	1600	8GB	Advantech	2UD27 D9PCP	AQD-SD3L8GN16-MG	PASS
DDR3L	1600	8GB	ATP	SEC 440 BYK0 K4B4G08460	N/A	PASS
DDR3L	1600	8GB	DSL	J4208EBBG-GN-F	N/A	PASS
DDR3L	1866	4GB	Crucial	256MX8-A7H 2Rx8	N/A	PASS
DDR3L	1866	8GB	Crucial	4JN4I D9RVX 2Rx8	N/A	PASS
DDR3L	2133	4GB	Kingston	H5TQ4G83MFR PBC 2Rx8	N/A	PASS
DDR3L	2133	8GB	G.SKILL	SEC 419 HYK0 K484G0846Q2Rx8	N/A	PASS
DDR3L	2133	8GB	Kingston	H5TC4G83MFR PBA2Rx8	N/A	PASS

Ordering Information

Part Number	CPU	Display	TPM	GbE	SATA	COM	Thermal Solution
AIMB-226G2-00A1E	RX-427BB	HDMI/DP(LVDS)	(1)	2	3	6	Active
AIMB-226G2-01A1E	RX-225FB	HDMI/DP(LVDS)	(1)	2	3	6	Active

Product Warranty (2 years)

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandise authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Initial Inspection

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

- AIMB-226 AMD R-series mini-ITX motherboard
- 3 x SATA HDD cable
- 1 x SATA Power cable
- 1 x Serial port cable(1 to 4)
- 1 x Serial port cable(1 to 1)
- 1 x I/O port bracket
- 1 x Startup manual
- 1 x Warranty card
- 1 x CPU cooler

If any of these items are missing or damaged, contact your distributor or sales representative immediately. We have carefully inspected the AIMB-226 mechanically and electrically before shipment. It should be free of marks and scratches and in perfect working order upon receipt. As you unpack the AIMB-226, check it for signs of shipping damage. (For example, damaged box, scratches, dents, etc.) If it is damaged or it fails to meet the specifications, notify our service department or your local sales representative immediately. Also notify the carrier. Retain the shipping carton and packing material for inspection by the carrier. After inspection, we will make arrangements to repair or replace the unit.

Contents

Chapter 1

General Information

1.1 Introduction

AIMB-226 is a Mini-ITX motherboard based on the AMD Bald Eagle Quad core/Dual core processors, resulting in 20% compute performance improvement over AMD G-Series APU when running multiple industry-standard graphics-intensive benchmark (good graphics performance), designed with rich I/O functions and dual display support, AIMB-226 is ideal for any rugged applications such as Digital Surveillance, Digital Signage, Thin Client, Electronic Gaming Machines, etc. With the pre-loaded remote management software – SUSIAccess, AIMB-226 not only saves development cost but also enhances system management efficiency.

1.2 Features

- **Rich I/O connectivity:** 6 serial ports, 10 USB 2.0, 2 USB3.0, 3 SATA III, eSATA, Dual GbE LAN
- **Standard Mini-ITX form factor:** The AIMB-226 is a Mini-ITX motherboard
- **Wide selection of storage devices:** SATA HDD, SATA DOM, mSATA customers benefit from the flexibility of using the most suitable storage device for larger capacity
- **Optimized integrated graphic solution:** With AMD Radeon™ HD 9000 Graphics, Support DirectX® 11.1 and UVD 4.2

1.3 Specifications

1.3.1 Processor System

- **CPU:** AMD R-series, supports Quad/Dual core CPU
- **Max. Speed:** Quad Core 2.7 GHz (RX-427BB, TDP 35 W)/ Dual Core 2.2 GHz (RX-225FB, TDP 17W)
- **L2 Cache:** 2 MB
- **BIOS:** AMI 16 Mbit SPI

1.3.2 Expansion Slot

- **Mini-PCIe:** two, full size
- **PCIe x1:** 1
- **PCIe x16:** 1

1.3.3 Memory

- **Technology:** Dual channel DDR3/DDR3L 2133/1600 MHz
- **Max. Capacity:** 16 GB
- **Socket:** 2 x 204 pin SODIMM

1.3.4 Graphic Interface

- **Controller:** AMD Radeon™ HD 9000 Graphics
- **HDMI:** 2, supports up to 4096 x 2160 @ 24Hz, 3840 x 1260 @ 30Hz, 1920 x 1080p/i @ 60Hz (HDMI 1.4b)
- **LVDS:** 1, supports single channel 24-bit/ dual channel 48-bit LVDS up to 1900x 1200 (co-lay DP1, by BOM option)
- **DP 1.2:** 2, supports DP++, resolution up to 2560 x 1600 @ 60Hz or 3840 x 2160 @ 30Hz, DP1 co-lay LVDS
- **Multiple Display:** 4 independent display by DP(LVDS) / HDMI

1.3.5 Ethernet Interface

- **Interface:** 10/100/1000 Mbps
- **Controller:** GbE: Realtek RTL8111G
- **Connector:** RJ-45 x 2

1.3.6 SATA Interface

- **Max Data Transfer Rate:** 600 MB/s
- **Channel:** 3

1.3.7 Rear I/O

- **HDMI:** 2
- **DP:** 2
- **Ethernet:** 2
- **USB:** 4 (2USB2.0 & 2USB3.0)
- **Audio:** 3 (Mic-in, Line-out, Line-in)
- **DC jack:** 1 (4pin Phoenix connector)
- **eSATA:** 1
- **Serial:** 1 (RS-232)

1.3.8 Internal Connector

- **LVDS & Inverter:** 1
- **USB:** 8 (USB 2.0 compliant)
- **Serial:** 5 (4 x RS-232, 1 x RS-232/422/485;COM4 support 5V/12V power, COM3 RS-232/422/485 auto flow control)
- **SATA:** 3
- **SATA Power Connector:** 1
- **GPIO:** 16-bit
- **Mini PCIE slot:** 2miniPCIE slot, F/S support mSATA; F/S support SIM holder
- **Parallel:** 1

1.3.9 Watchdog Timer

- **Output:** System reset
- **Interval:** Programmable 1 ~ 255 sec/min

1.3.10 Power Requirement

- **Typical:**
  - Single Voltage 12V DC input by 1x external Phoenix 4pin power connector or 1x internal 2x2-pin power
  - AT/ATX Supported by Jumper
  - Max power consumption: 63.96 W (16G DDR3L RAM)

1.3.11 Environment

- **Temperature:**
  - 0 ~ 60° C (32 ~ 140° F), Operating
  - -40 ~ 85° C (-40 ~ 185° F), Non-operating

1.3.12 Physical Characteristics

- **Dimensions:** 170 mm x 170 mm (6.69" x 6.69")

1.4 Jumpers and Connectors

Connectors on the AIMB-226 motherboard link it to external devices such as hard disk drives and a keyboard. In addition, the board has a number of jumpers used to configure your system for your application.

The tables below list the function of each of the board jumpers and connectors. Later sections in this chapter give instructions on setting jumpers. Chapter 2 gives instructions for connecting external devices to your motherboard.

Table 1.1: Connector / Header List

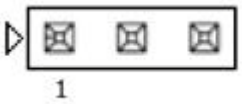
	Description	Part Reference
1	Case open pin header	JCASE1
2	Case open selection pin header	JCASEOP_SW1
3	COM1 connector	COM1
4	DC input connector	DCIN1
5	ATX 12V power supply connector	ATX12V1
6	LVDS Backlight inverter power connector	INV1
7	eSATA1 connector	ESATA1
8	LVDS panel voltage selection	JLVDS1
9	DisplayPort2(Up) + HDMI2(Down) stack connector	DP2+HDMI2
10	DisplayPort1(Up) + HDMI1(Down) stack connector	DP1+HDMI1
11	Low pin count interface header	LPC1
12	LVDS panel connector	LVDS1
13	RJ45 + USB3.0 stack connector	LAN1_USB12
14	RJ45 + USB2.0 stack connector	LAN2_USB1112
15	HD Audio Interface	AUDIO1
16	Audio amplifier output pin header	JAMP1
17	Front panel audio pin header	FPAUD1
18	Audio interface pin header	SPDIF1
19	PCI-Express x16 slot	PCIEX16_1
20	System fan2 connector	SYSFAN2
21	System fan1 connector	SYSFAN1
22	Power switch/HDD LED/SMBus/Speaker pin header	JFP1
23	DDR3 SO-DIMM socket	DIMMB1
24	DDR3 SO-DIMM socket	DIMMA1
25	5VSB input connector	ATX_5VSB1
26	CPU FAN connector	CPUFAN1
27	COMS Mode selection	JCOMS1
28	SIM Card holder	SIM2
29	AT/ATX Mode selection	PSON1
30	Dual port USB2.0 pin header	USB910
31	Dual port USB2.0 pin header	USB78
32	Dual port USB2.0 pin header	USB56
33	Dual port USB2.0 pin header	USB34
34	SPI BIOS flash socket	SPI1
35	Serial ATA interface connector	SATA2
36	Power LED and keyboard lock pin header	JFP2
37	Watchdog timer output and OBS beep	JWDT1+JOBS1

Table 1.1: Connector / Header List		
38	Serial ATA interface connector	SATA1
39	Serial ATA interface connector	SATA4
40	SATA power supply connector	SATA_PWR1
41	SATA DOM power selection pin header	JSATAPWR1
42	SPI Pin Header	SPI1_CN1
43	COM4 RI# selection pin header	JSETCOM4_V1
44	COM2 connector	COM2
45	MINIPCIE, mSATA connector	MINIPCIE1
46	16-bits General Purpose I/O pin header	GPIO1
47	COM3 ~ COM6 box header	COM3456
48	LVDS VESA, JEIDA format selection pin header	JLVDS_VCON1
49	CMOS battery wafer box	BAT1
50	MINIPCIE connector	MINIPCIE2

1. Case open pin header (JCASE1)

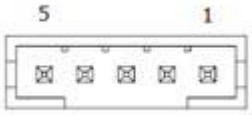
Pin	Signal
1	CASEOP
2	GND

2. Case open selection pin header (JCASEOP_SW1)



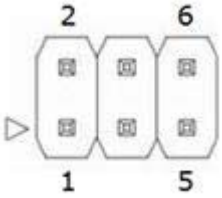
Pin	Signal
1	CASEOP#
2	HWM_CASEOP#
3	CASEOP

3. LVDS Backlight inverter power connector (INV1)



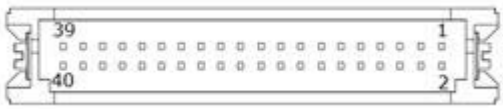
Pin	Signal
1	+12V
2	GND
3	BKL EN
4	BKL CTRL
5	+5V

4. LVDS panel voltage selection (JLVDS1)



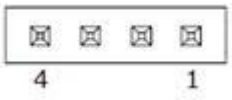
Pin	Signal
1	NC
2	+5V
3	+12V
4	LVDS_VDD
5	NC
6	+3.3V

5. LVDS panel connector (LVDS1)



Pin	Signal	Pin	Signal
1	VDD	2	VDD
3	LVDS DETECT#	4	GND
5	VDD	6	VDD
7	OD0-	8	ED0-
9	OD0+	10	ED0+
11	GND	12	GND
13	OD1-	14	ED1-
15	OD1+	16	ED1+
17	GND	18	GND
19	OD2-	20	ED2-
21	OD2+	22	ED2+
23	GND	24	GND
25	OCK-	26	ECK-
27	OCK+	28	ECK+
29	GND	30	GND
31	DDC CLK	32	DDC DAT
33	GND	34	GND
35	OD3-	36	ED3-
37	OD3+	38	ED3+
39	LVDS ENBKL	40	LVDS VCON

6. Audio amplifier output pin header (JAMP1)

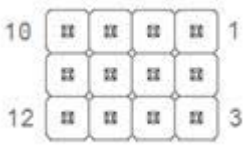


Pin	Signal
1	AMP_OUT-L-
2	AMP_OUT-L+
3	AMP_OUT-R-
4	AMP_OUT-R+

7. Audio interface pin header (SPDIF1)

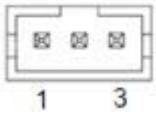
Pin	Signal
1	+5V
2	KEY
3	SPDIF OUT
4	GND

8. Power switch/HDD LED/SMBus/Speaker pin header (JFP1)



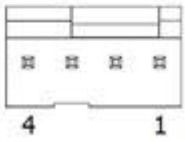
Pin	Signal	Pin	Signal
1	+5V	2	HDD LED+
3	Power Button+	4	NC
5	HDD LED-	6	Power Button-
7	SPK_P3	8	SMB_DATA
9	System Reset+	10	SPK_P4
11	SMB_CLK	12	System Reset-

9. DDR3 SO-DIMM socket (DIMMA1) Please see JEDEC STANDARD.
10. DDR3 SO-DIMM socket (DIMMB1) Please see JEDEC STANDARD.
11. 5VSB input connector (ATX_5VSB1)



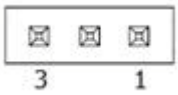
Pin	Signal
1	+5VSB
2	GND
3	PSON#

12. CPU FAN connector (CPUFAN1)



Pin	Signal
1	GND
2	+12V
3	DETECT
4	PWM IN

13. COMS Mode selection (JCOMS1)



Pin	Signal
1	VBAT
2	RTC RESET#
3	GND

14. Dual port USB2.0 pin header (USB910)

Pin	Signal	Pin	Signal
1	+5V	2	+5V
3	D0-	4	D1-
5	D0+	6	D1+
7	GND	8	GND
9	KEY	10	NC

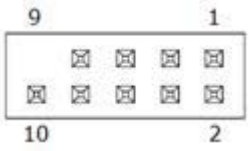
15. Dual port USB2.0 pin header (USB78)

Pin	Signal	Pin	Signal
1	+5V	2	+5V
3	D0-	4	D1-
5	D0+	6	D1+
7	GND	8	GND
9	KEY	10	NC

16. Dual port USB2.0 pin header (USB56)

Pin	Signal	Pin	Signal
1	+5V	2	+5V
3	D0-	4	D1-
5	D0+	6	D1+
7	GND	8	GND
9	KEY	10	NC

17. Dual port USB2.0 pin header (USB34)

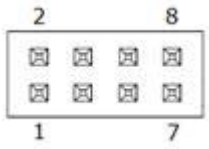


Pin	Signal	Pin	Signal
1	+5V	2	+5V
3	D0-	4	D1-
5	D0+	6	D1+
7	GND	8	GND
9	KEY	10	NC

18. Power LED and keyboard lock pin header (JFP2)

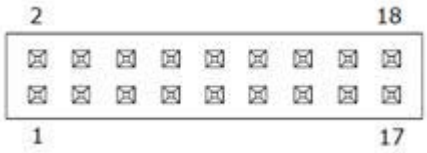
Pin	Signal
1	LED Power
2	NC
3	GND
4	NC
5	GND

19. SPI Pin Header (SPI1_CN1)



Pin	Signal
1	CS#
2	+3.3V
3	MISO
4	NC
5	NC
6	SCLK
7	GND
8	MOSI

20. 16-bits General Purpose I/O pin header (GPIO1)

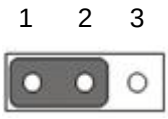
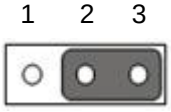


Pin	Signal	Pin	Signal
1	GPIO0	2	GPIO8
3	GPIO1	4	GPIO9
5	GPIO2	6	GPIO10
7	GPIO3	8	GPIO11
9	GPIO4	10	GPIO12
11	GPIO5	12	GPIO13
13	GPIO6	14	GPIO14
15	GPIO7	16	GPIO15
17	+5V	18	GND

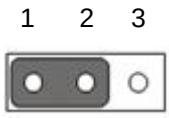
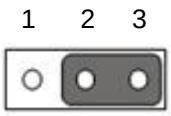
Table 1.2: Jumper Setting List

	Description	Part Reference
1	Case open selection pin header	JCASEOP_SW1
2	COM1_RI# Pin RI#/5V/12V selection	JSETCOM1_V1
3	COM2_RI# Pin RI#/5V/12V selection	JSETCOM2_V1
4	COM5 RS232,RS422,RS485 selection pin header	JSETCOM5
5	COMS Mode selection	JCOMS1
6	Watchdog timer output and OBS beep	JWDT1+JOBS1
7	Power switch/HDD LED/SMBus/Speaker pin header	JFP1
8	AT/ATX Mode selection	PSON1
9	LVDS panel voltage selection	JLVDS1

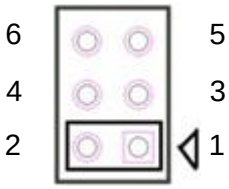
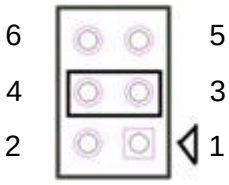
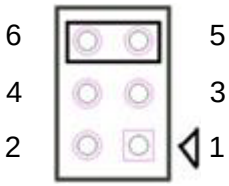
1. Case open selection pin header (JCASEOP_SW1)

Function	Setting
Normal Close (Default)	
Normal Open	

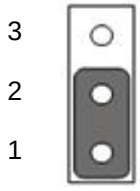
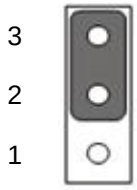
2. SATA DOM power selection pin header (JSATAPWR1)

Function	Setting
SATA4 (Default)	
SATA DOM PWR	

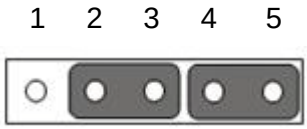
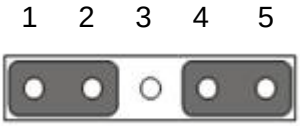
3. COM4_RI# Pin RI#/5V/12V selection (JSETCOM4_V1)

Function	Setting
Set COM4_RI# as RI# (Default)	
Set COM4_RI# as 5V	
Set COM4_RI# as 12V	

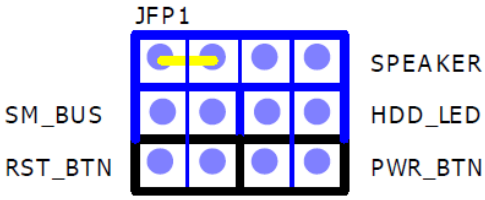
4. COMS Mode selection (JCOMS1)

Function	Setting
Normal (Default)	
Clear CMOS	

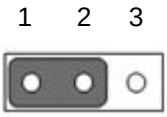
5. Watchdog timer output and OBS beep (JWDT1+JOBS1)

Function	Setting
Watchdog Timer Output(2-3) (Default) OBS BEEP(4-5) (Default)	
Watchdog Timer Disable(1-2) OBS BEEP (4-5) (Default)	

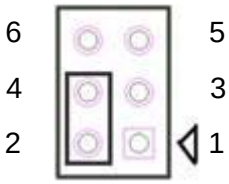
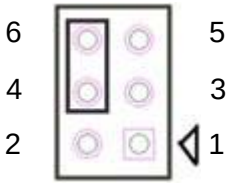
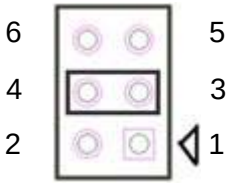
6. Power switch/HDD LED/SMBus/Speaker pin header (JFP1)

Function	Setting
JFP1(7-10) (Default)	 

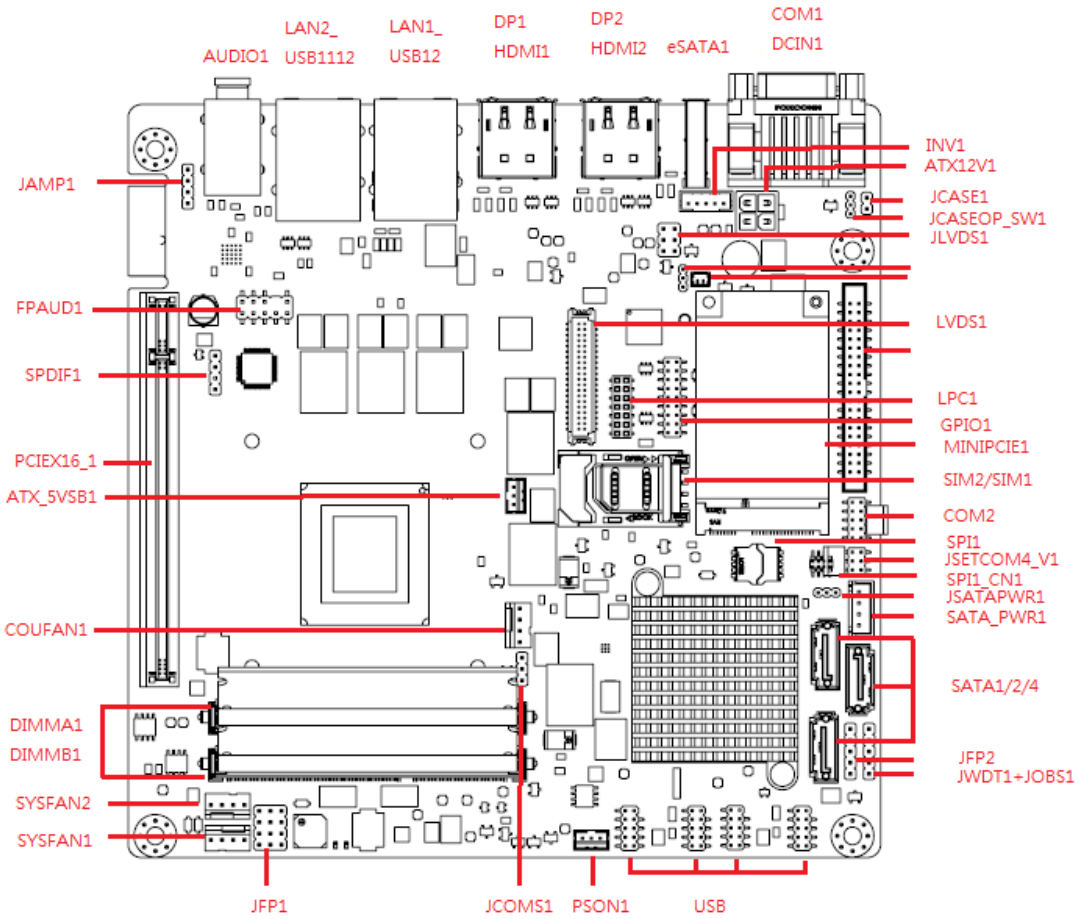
7. AT/ATX Mode selection (PSON1)

Function	Setting
AT Mode	
ATX Mode (Default)	

8. LVDS panel voltage selection (JLVDS1)

Function	Setting
Set LVDS Panel as +5V	
Set LVDS Panel as +3.3V (Default)	
Set LVDS Panel as +12V	

1.5 Board layout: Jumper and Connector Locations



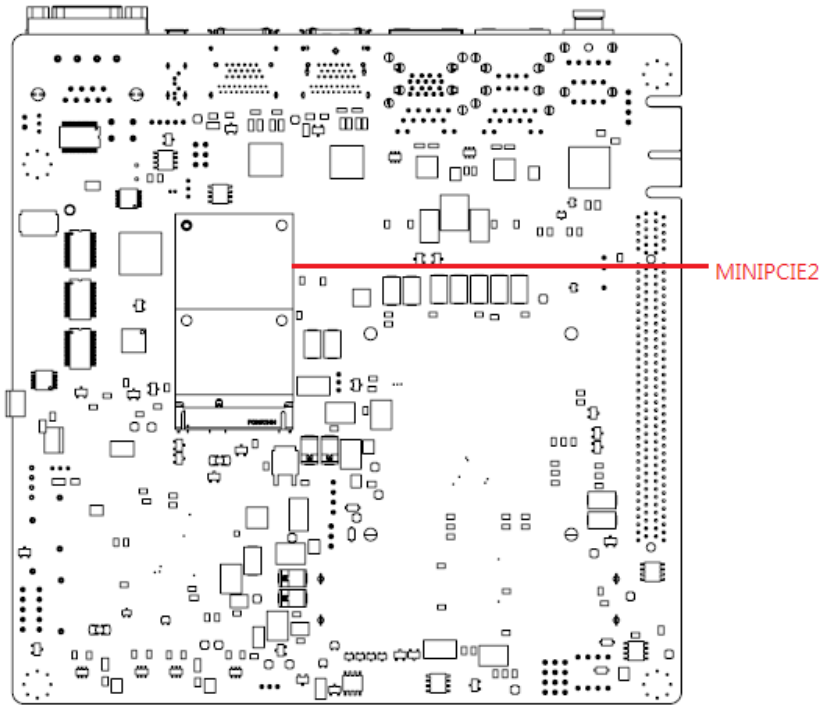


Figure 1.1 Jumper and Connector Location

1.6 AIMB-226 Board Diagram

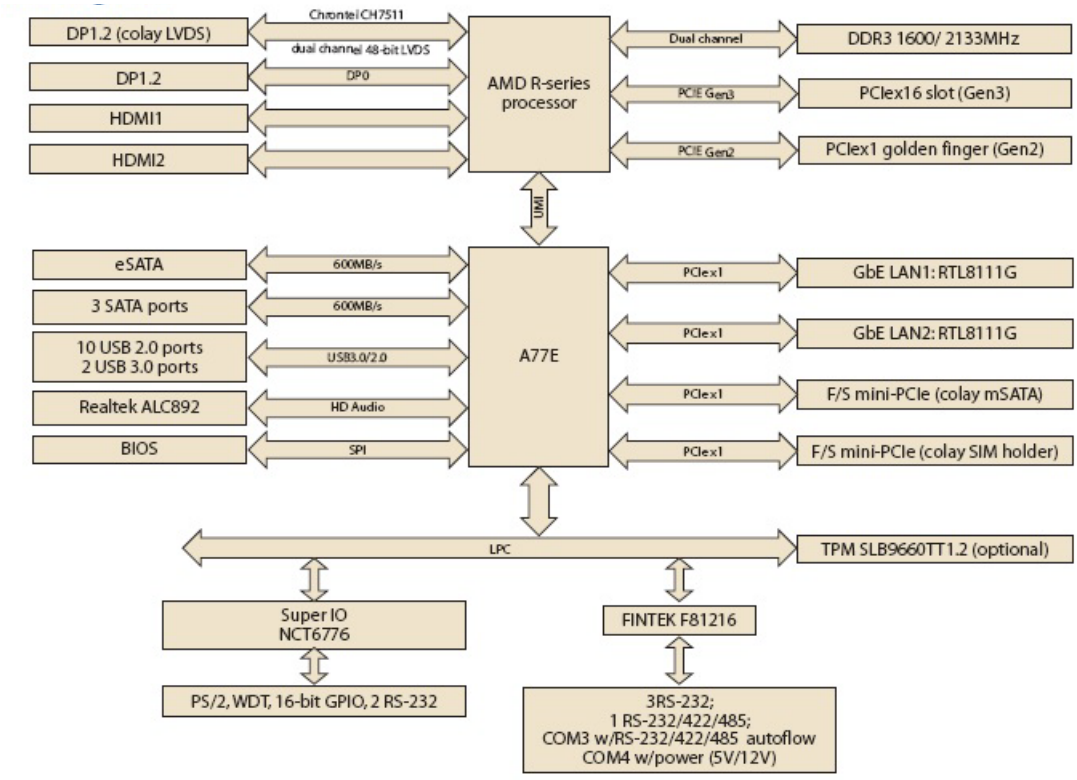


Figure 1.2 AIMB-226 Board Diagram

1.7 Safety Precautions

Warning! *Always completely disconnect the power cord from chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.*

Caution! *Always ground yourself to remove any static charge before touching the motherboard. Modern electronic devices are very sensitive to electro-static discharges. As a safety precaution, 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.*

Caution! *The computer is provided with a battery-powered real-time clock circuit. There is a danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent type recommended by the manufacturer. Discard used batteries according to manufacturer's instructions.*

Caution! *There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the man-ufacturer. Discard used batteries according to the manufacturer's instructions.*

1.8 Jumper Settings

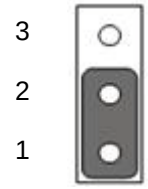
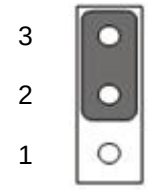
This section provides instructions on how to configure your motherboard by setting the jumpers. It also includes the motherboards's default settings and your options for each jumper.

1.8.1 How to Set Jumpers

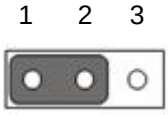
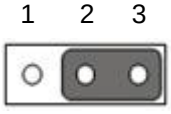
You can configure your motherboard to match the needs of your application by setting the jumpers. A jumper is a metal bridge that closes an electrical circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” (or turn ON) a jumper, you connect the pins with the clip. To “open” (or turn OFF) a jumper, you remove the clip. Sometimes a jumper consists of a set of three pins, labeled 1, 2, and 3. In this case you connect either pins 1 and 2, or 2 and 3. A pair of needle-nose pliers may be useful when setting jumpers.

1.8.2 CMOS Clear (JCMOS1)

The AIMB-226 motherboard contains a jumper that can erase CMOS data and reset the system BIOS information. Normally this jumper should be set with pins 1-2 closed. If you want to reset the CMOS data, set J1 to 2-3 closed for just a few seconds, and then move the jumper back to 1-2 closed. This procedure will reset the CMOS to its default setting.

Function	Setting
Normal (Default)	
Clear CMOS	

1.8.3 PSON1: ATX, AT Mode Selector

Function	Setting
AT Mode	
ATX Mode (Default)	

1.9 System Memory

The AIMB-226 has two sockets for a 204-pin SODIMM. This socket can use 1.35 V or 1.25 V (optional) unbuffered double-data-rate three synchronous, low-voltage DRAM (DDR3L SDRAM). DRAM is available in capacities of 1 GB/2 GB/4 GB and 8 GB. The socket can be filled in any combination with DIMMs of any size, giving a total memory size between 2MB to 16GB. AIMB-226 does not support ECC (error checking and correction) memory.

1.10 Memory Installation Procedures

To install SODIMMs, first make sure the handles of the SODIMM socket are in the “open” position, i.e., the handles lean outward. Slowly slide the SODIMM module along the plastic guides on both ends of the socket. Then press the SODIMM module well down into the socket, until you hear a click when the two handles have automatically locked the memory module into the correct position of the SODIMM socket. To remove the memory module, just push both handles outward, and the memory module will be ejected.

Chapter 2

Connecting Peripherals

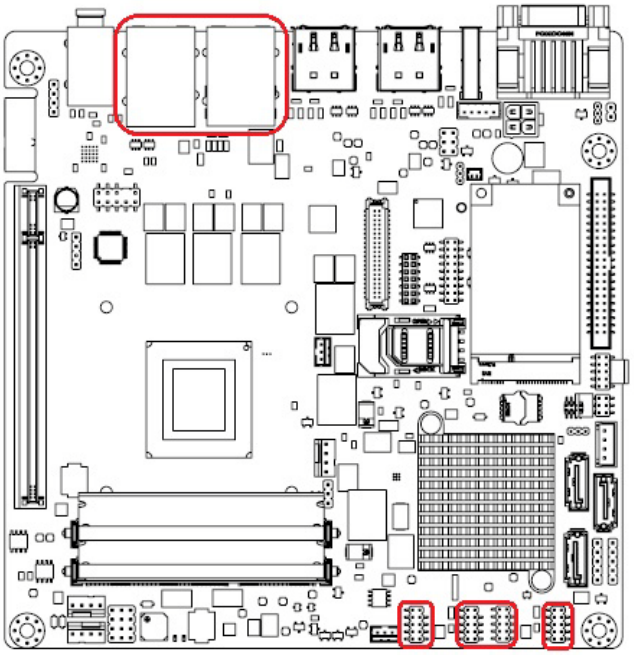
2.1 Introduction

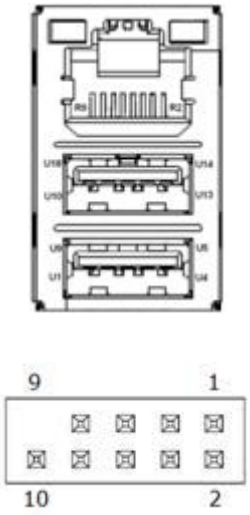
You can access most of the connectors from the top of the board as it is being installed in the chassis. If you have a number of cards installed or have a packed chassis, you may need to partially remove the card to make all the connections.

2.2 LAN Ports and USB Ports (LAN1_USB12, LAN2_USB1112, USB34, USB56, USB78, USB910)

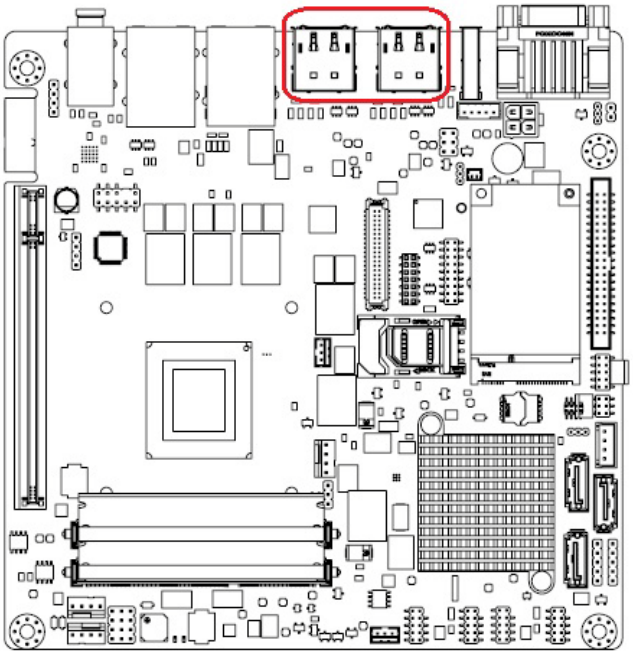
The AIMB-226 provides up to eight USB ports. The USB interface complies with USB Specification Rev. 3.0 supporting transmission rate up to 600 Mbps and is fuse protected. The USB interface can be disabled in the system BIOS setup.

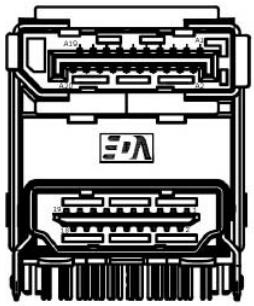
The AIMB-226 is equipped with two high-performance 1000 Mbps Ethernet LAN adapters, which are supported by all major network operating systems. The RJ-45 jacks on the rear panel provide for convenient LAN connection.





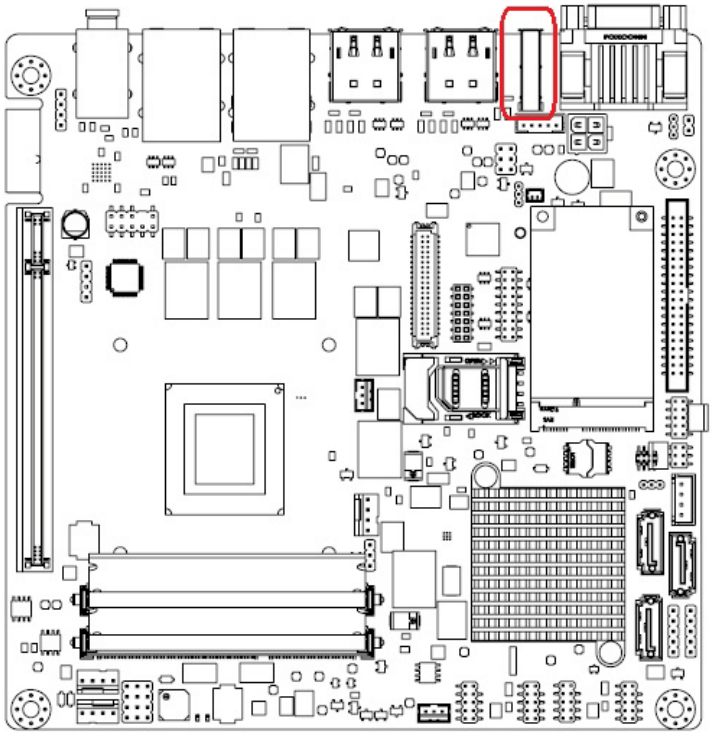
2.3 DP1+HDMI1, DP2+HDMI2 / DP Connector (ESATA1)

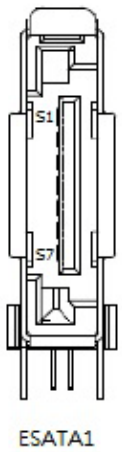




The AIMB-226 includes two DP++, which can support DP outputs and convert to HDMI through DP-to-HDMI cables. Pin assignments for DP++ and HDMI are detailed in Appendix B.

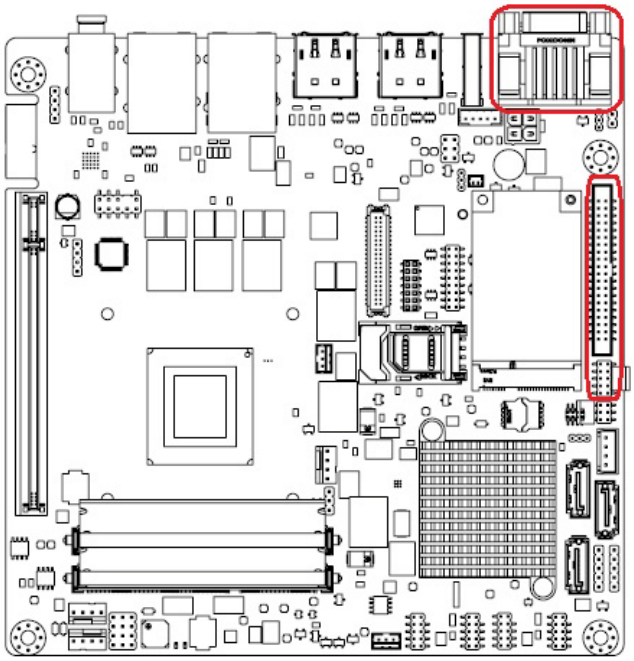
2.4 ESATA connector (ESATA1)

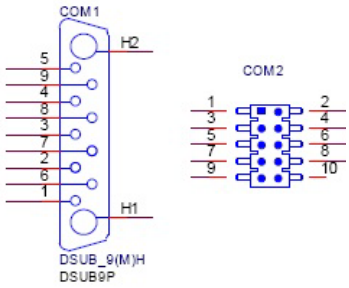


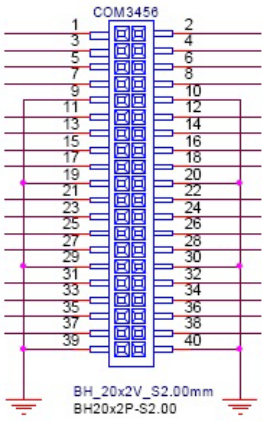


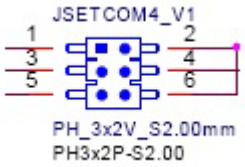
ESATA1

2.5 Serial Ports (COM1, COM2, COM3456)





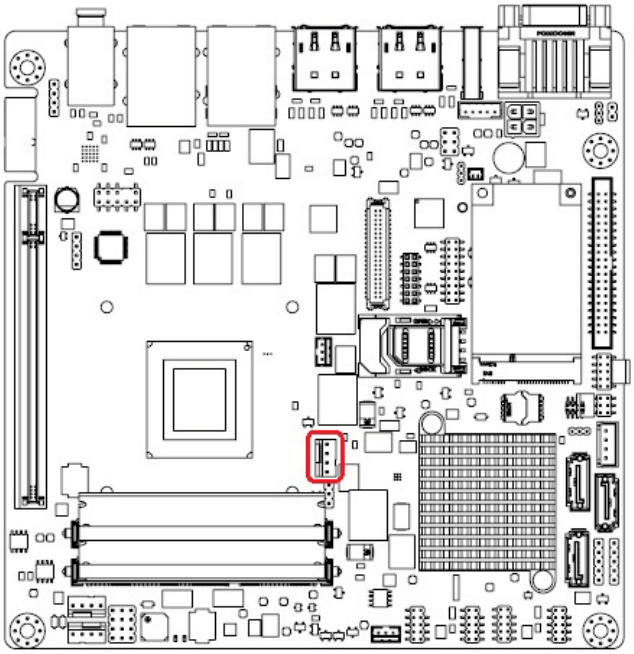


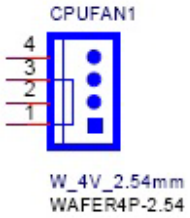


Serial Ports Voltage Select
1-2:Ring
3-4:+5V
5-6:+12V
(DEFAULT:1-2)

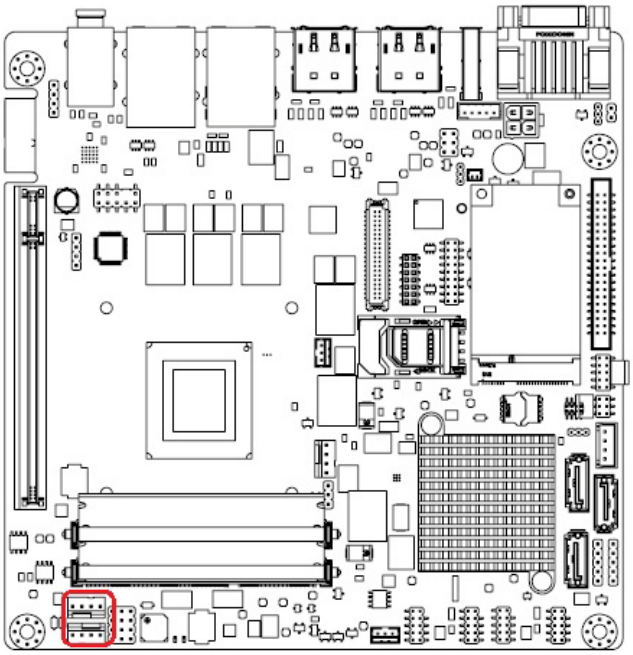
AIMB-226 supports six serial ports. Rear COM1 supports RS-232 only. Pin header COM2 supports RS-232 only. Box header COM4~6 supports RS-232; COM4 supports 5V/12V power and COM3 RS-232/422/485 has auto flow control. These ports can connect to serial devices, like a thermal printer, or to a communication network. The IRQ and address ranges for both ports are fixed. However, if you want to disable the port or change these parameters later, you can do this in the system BIOS setup. Different devices implement the RS-232 standards in different ways. If you have problems with a serial device, be sure to check the pin assignments for the connector.

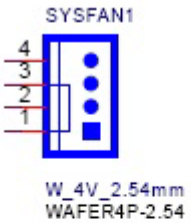
2.6 CPU Fan Connector (CPUFAN1)

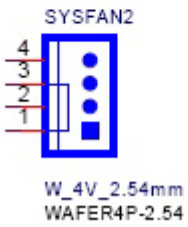




2.7 System Fan Connector (SYSFAN1, SYSFAN2)

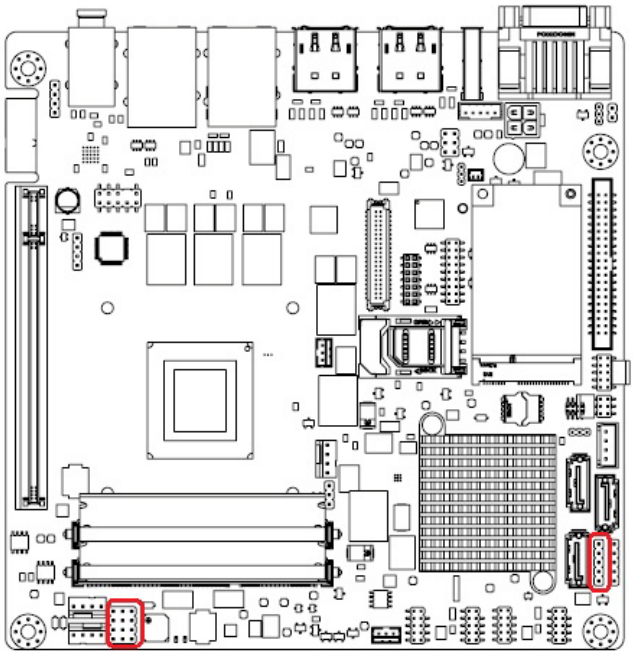


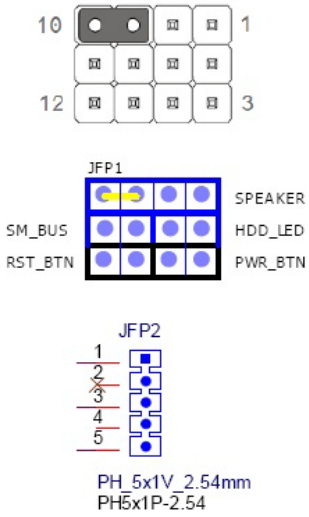




2.8 Front Panel Connectors (JFP1+JFP2)

There are several external switches that monitor and control the AIMB-226.





2.8.1 ATX soft power switch (JFP1/PWR_BTN)

If your computer case is equipped with an ATX power supply, you should connect the power on/off button on your computer case to (JFP1/ PWR_BTN), for convenient power on and off.

2.8.2 Reset (JFP1/RST_BTN)

Many computer cases offer the convenience of a reset button. Connect the wire for the reset button.

2.8.3 HDD LED (JFP1/HDD_LED)

You can connect an LED to connector (JFP1/HDD_LED) to indicate when the HDD is active.

2.8.4 External speaker (JFP1/SPEAKER)

JFP1/SPEAKER is a 4-pin connector for an external speaker. If there is no external speaker, the AIMB-226 provides an onboard buzzer as an alternative. To enable the buzzer, set pins 7 & 10 closed.

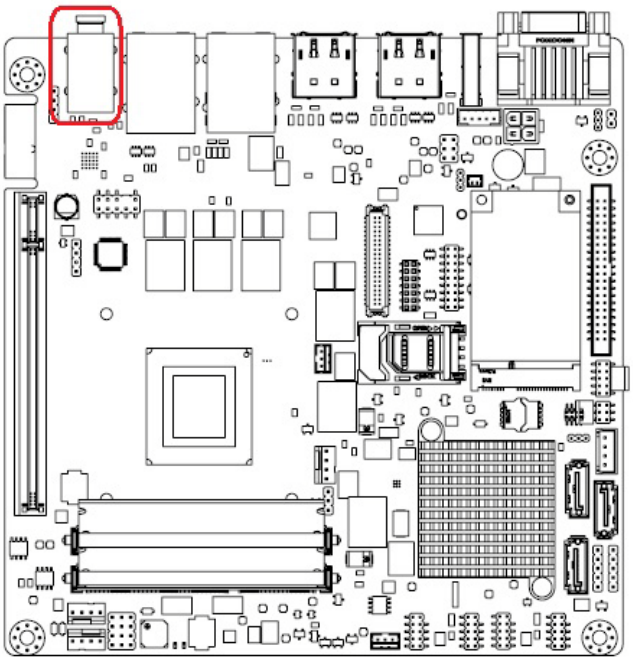
2.8.5 Power LED and keyboard lock connector (JFP2 / PWR_LED & KEY LOCK)

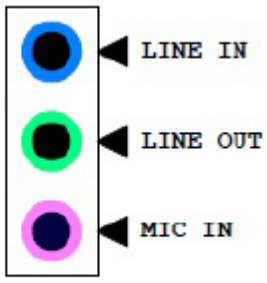
(JFP2 / PWR_LED & KEY LOCK) is a 5-pin connector for the power on LED and Key Lock function. Refer to Appendix B for detailed information on the pin assignments. The first is “ATX power mode”; the system turns on/off by a momentary power button. The second is “AT Power Mode”; the system turns on/off via the power supply switch. The third is another “AT Power Mode” which makes use of the front panel power switch. The power LED status is indicated in the following table:

Table 2.1: ATX pwr supply LED status (No AT power support)

Power mode	LED (ATX Power Mode) (On/off by momentary button)	LED (AT power Mode) (On/off by switching power supply)	LED (AT power Mode) (On/off by front panel switch)
PSON1 (on back plane) jumper setting	pins 2-3 closed	pins 1-2 closed	Connect pins 1 & 2 to panel switch via cable
System On	On	On	On
System Suspend	Fast flashes	Fast flashes	Fast flashes
System Off	Slow flashes	Off	Off

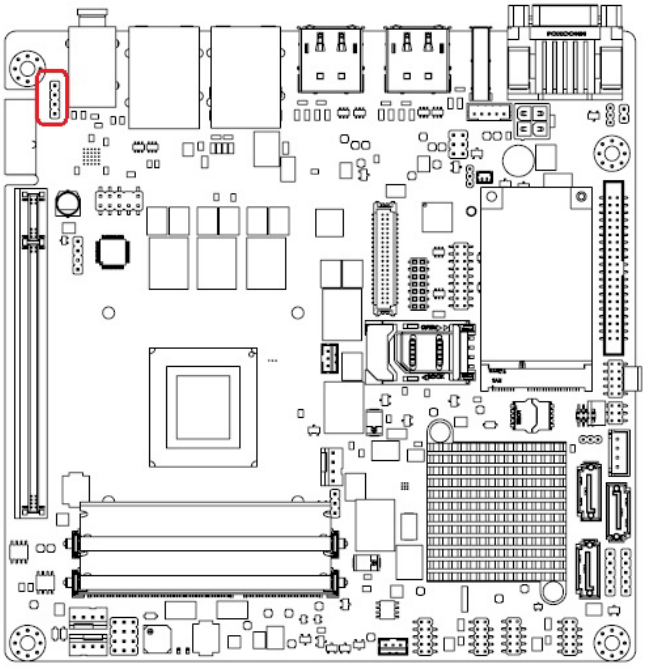
2.9 Audio Connector (AUDIO1)

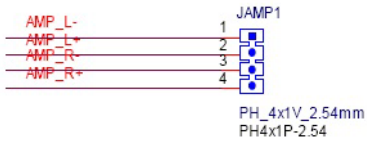




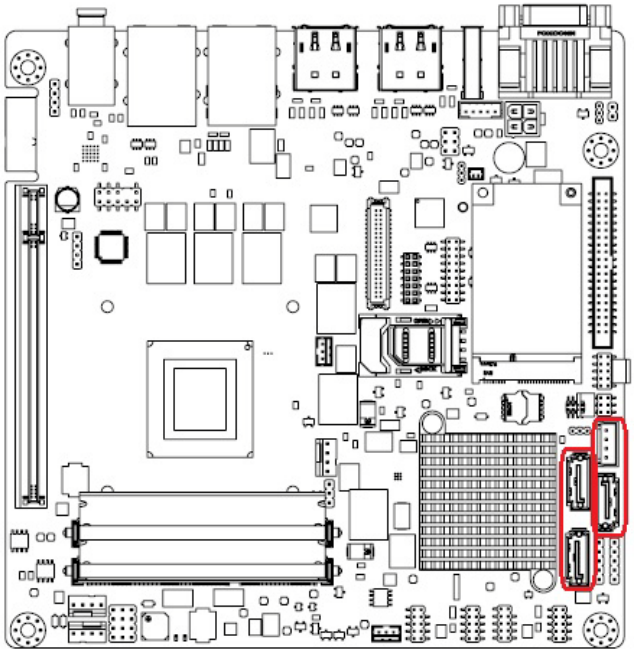
AUDIO1

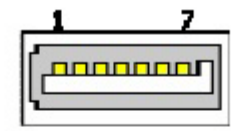
2.10 Audio amplifier output pin header (JAMP1)





2.11 Serial ATA Interface (SATA1, SATA2, SATA3) & SATA power Connector (SATA_PWR1)



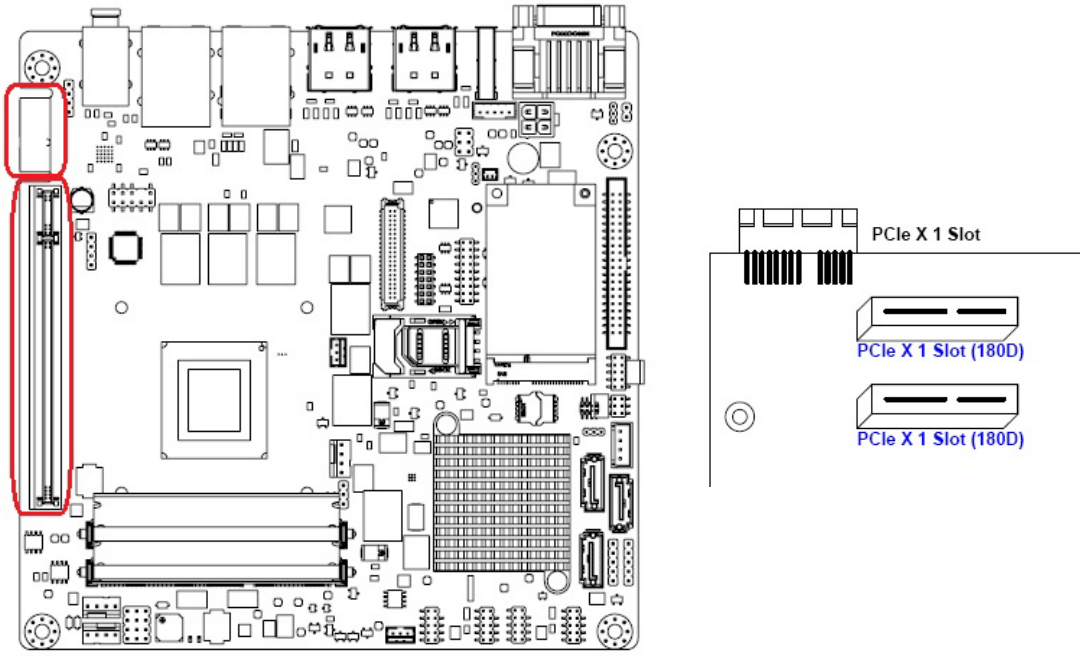


SATA1, SATA2, SATA 3

SATA_PWR1

AIMB-226 features a high performance Serial ATA interface (up to 600 MB/s) which eases cabling to hard drives with long, thin cables.

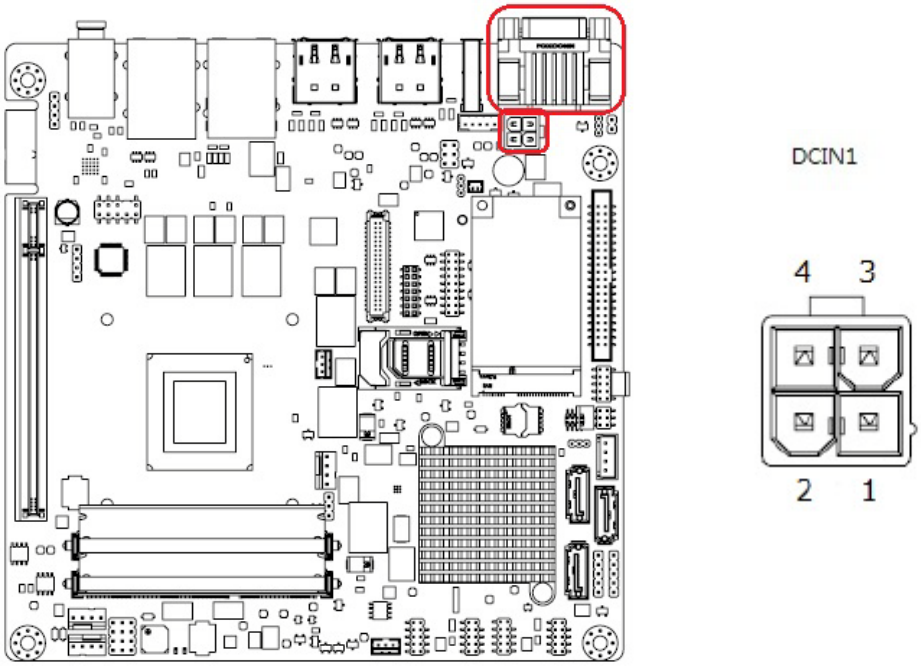
2.12 PCI Express slot (PCIEX16_1, GF1)



AIMB-226 provides 1x PCI express x16 slot and 1x golden-finger PCIex1

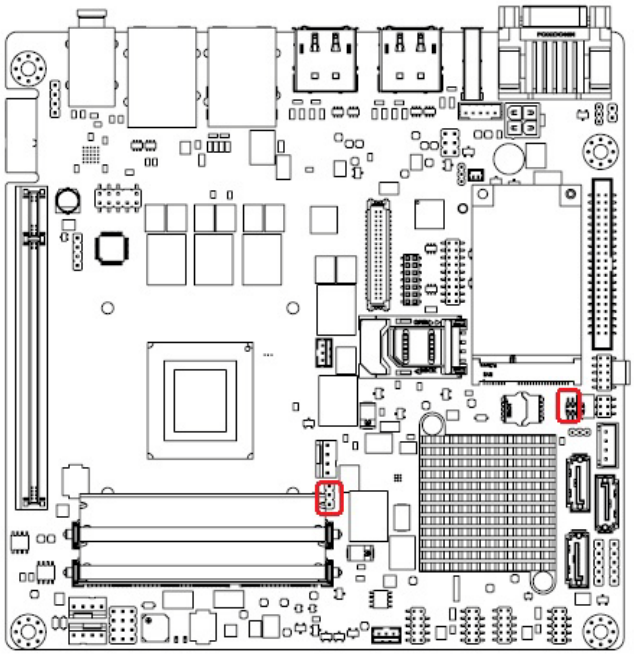
2.13 ATX 12V/DCIN 12V Power Connector (ATX12V1/ DCIN1)

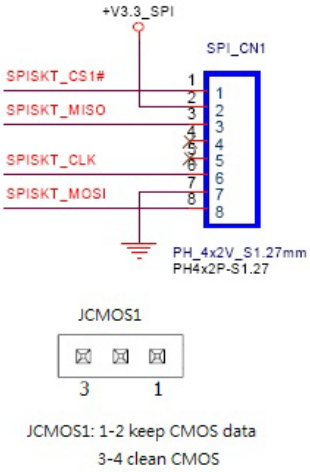
This connector is for an ATX Micro-Fit power supply. The plugs from the power supply are designed to fit these connectors in only one direction. Determine the proper orientation and push down firmly until the connectors mate completely.



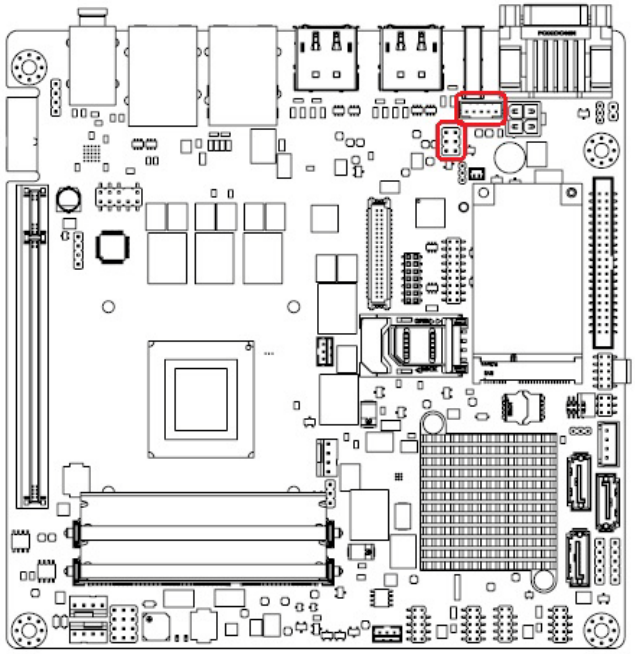
2.14 SPI Flash connector (SPI_CN1)

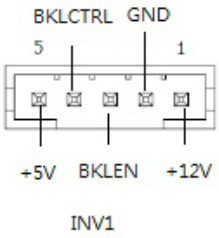
The SPI flash card pin header may be used to flash BIOS if the AIMB-226 cannot power on.

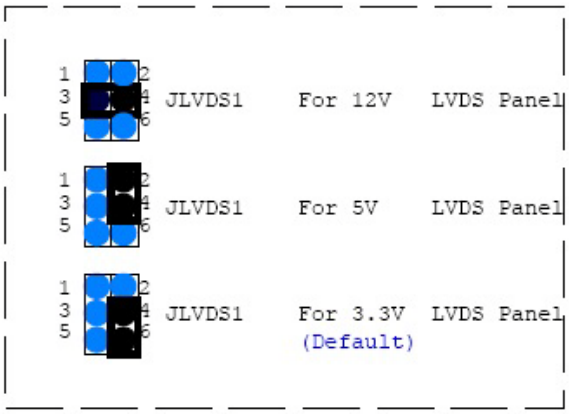


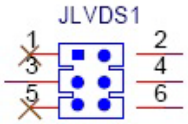


2.15 LVDS Backlight Inverter Power Connector (INV1, JLVDS1)

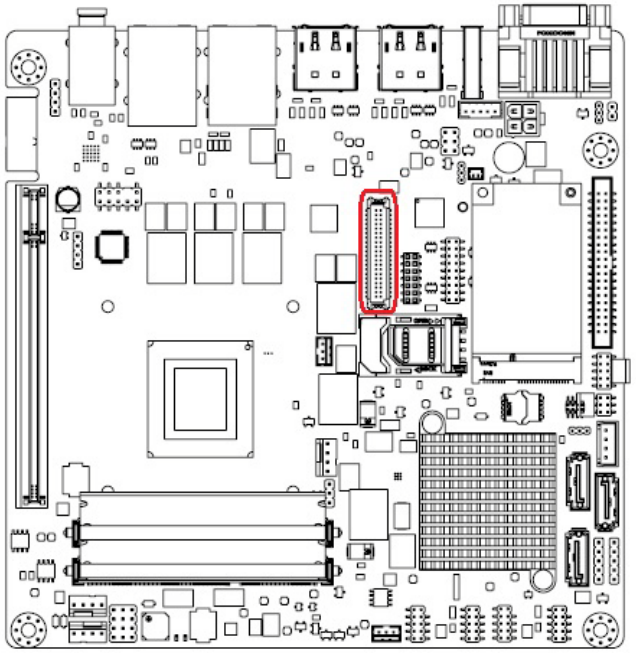


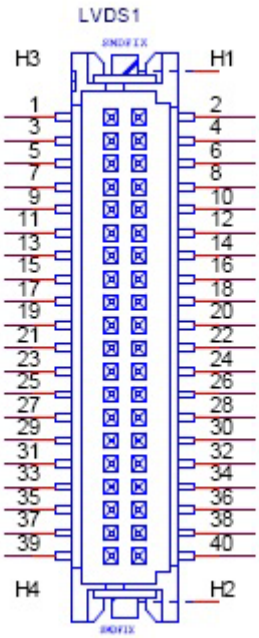




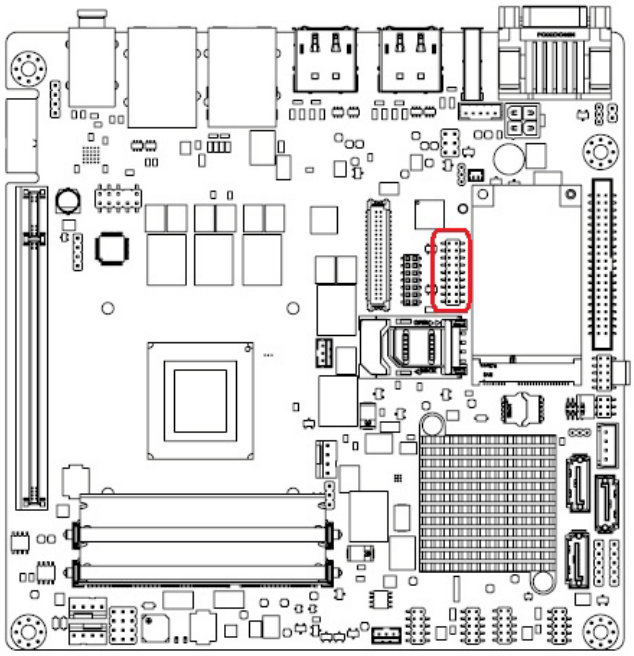


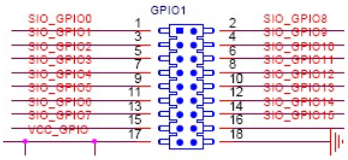
2.16 LVDS Connector (LVDS1)



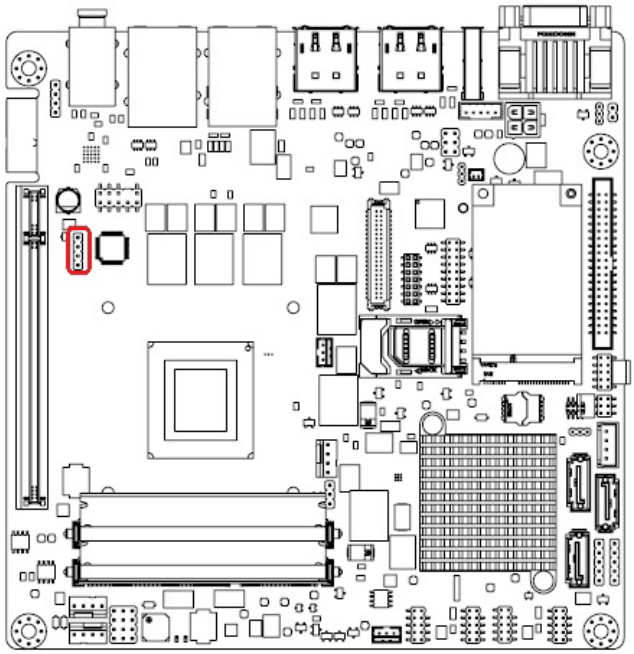


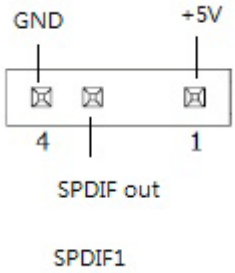
2.17 General purpose I/O Connector (GPIO1)





2.18 Digital Audio Connector (SPDFI1)

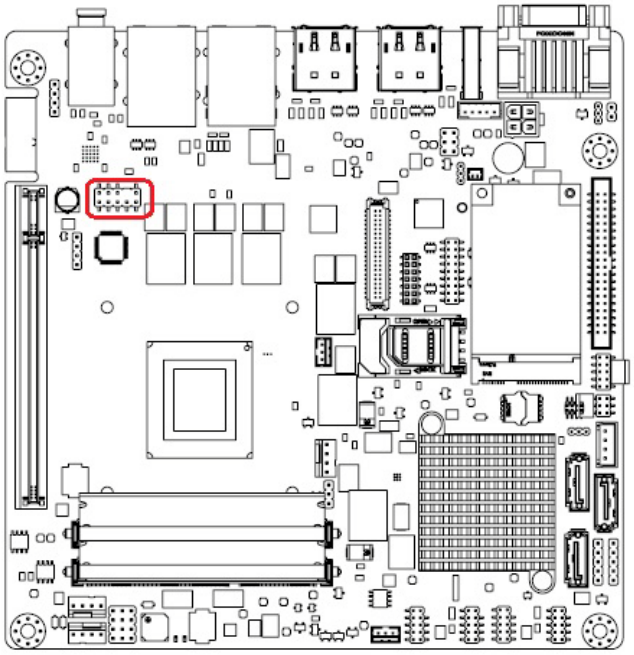


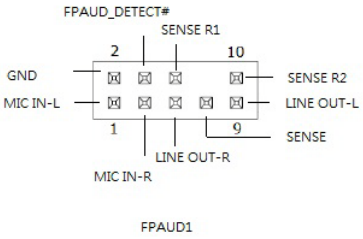


SPDIF1

2.19 Front Headphone Connector (FPAUD1)

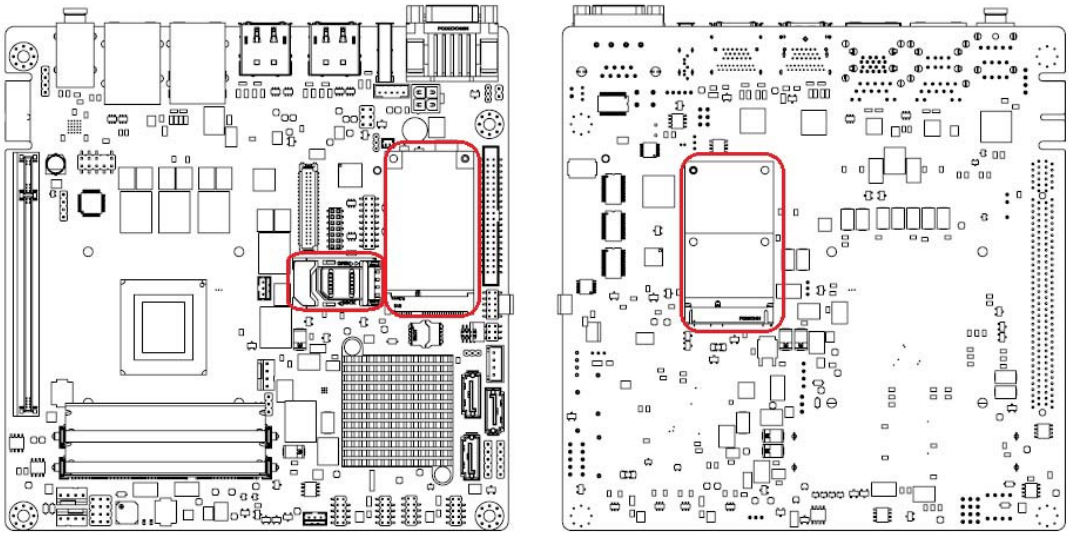
This connector is for a chassis-mounted front panel audio I/O module that supports either HD Audio or legacy AC'97 (optional) audio standard. Connect this connector with the front panel audio I/O module cable.





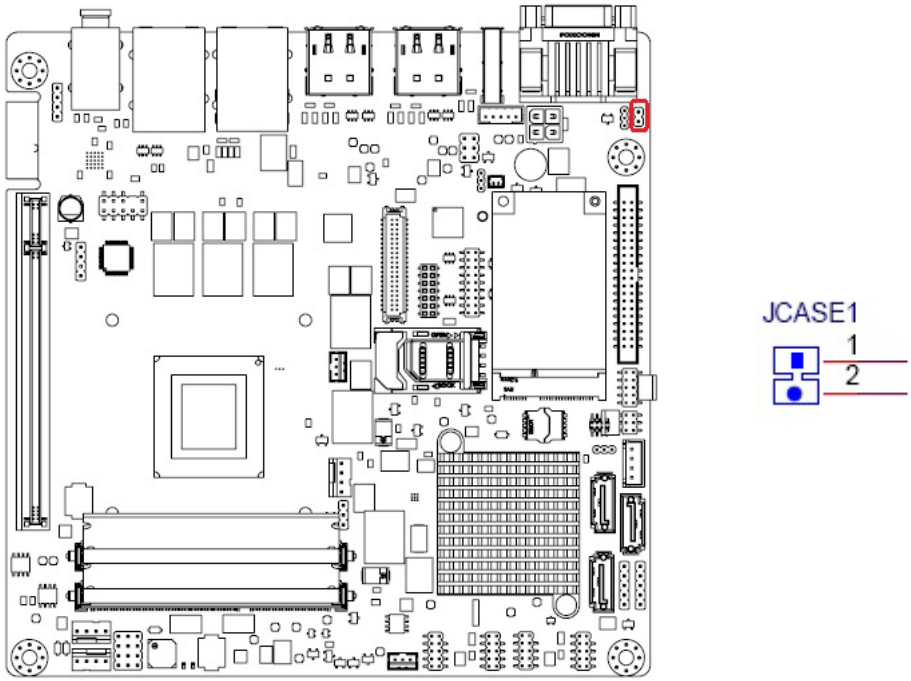
Note! *For motherboards with the optional HD Audio feature, we recommend that you connect a high-definition front panel audio module to this connector to take advantage of the motherboard's high definition audio capability.*

2.20 Full Size Mini PCI Express Slot (MINIPCIE1, MINIPCIE2)

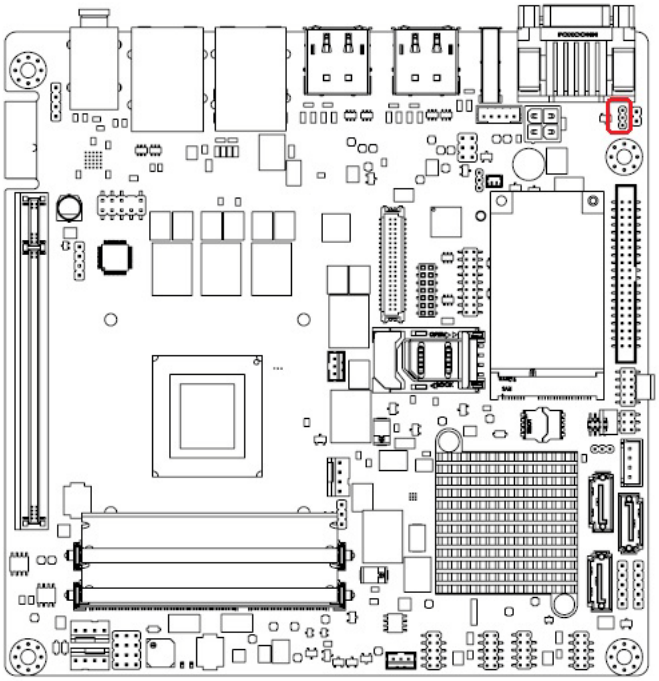


The AIMB-226 provides 1 Full size Mini PCI express slot to support mSATA (MINIPCIE1) and 1 Full size Mini PCI express slot to support SIM card holder (MINIPCIE2).

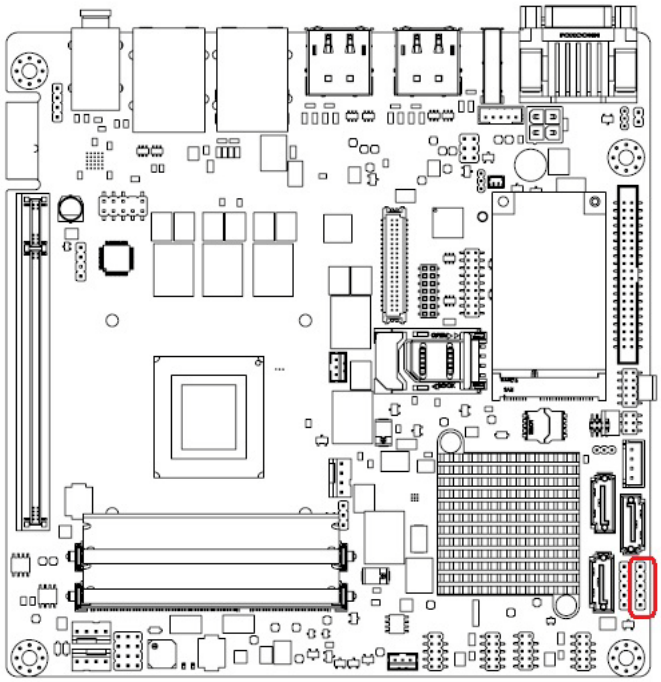
2.21 Case open pin header (JCASE1)

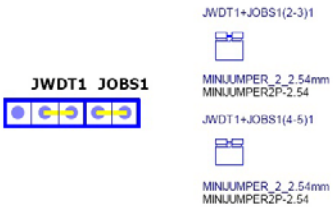


2.22 Case open selection pin header (JCASEOP_SW1)

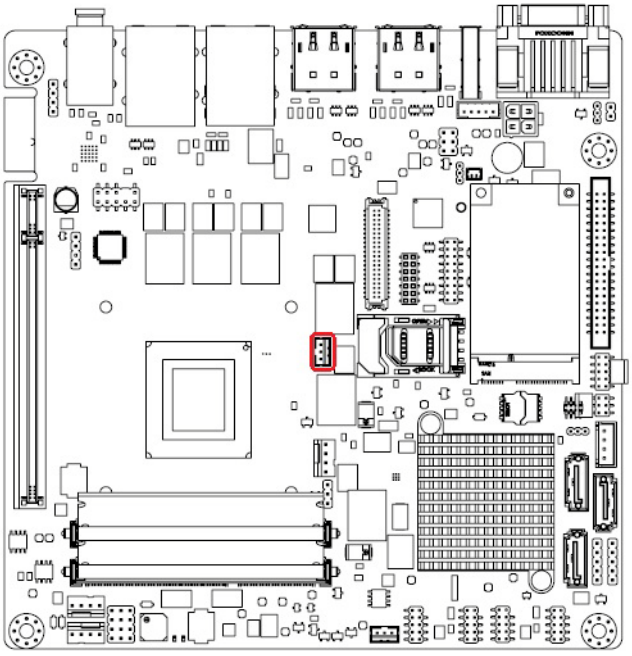


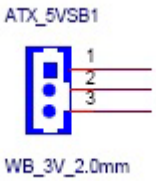
2.23 Watchdog timer output and OBS beep (JWDT1+JOBS1)





2.24 5VSB input connector (ATX_5VSB1)





Chapter 3

BIOS Operation

3.1 Introduction

AMI BIOS has been integrated into many motherboards, and has been very popular for over a decade. People sometimes refer to the AMI BIOS setup menu as BIOS, BIOS setup or CMOS setup.

With the AMI BIOS Setup program, you can modify BIOS settings and control the special features of your computer. The Setup program uses a number of menus for making changes and turning special features on or off. This chapter describes the basic navigation of the AIMB-226 setup screens.

3.2 BIOS Setup

The AIMB-226 Series system has AMI BIOS built in, with a CMOS SETUP utility that allows users to configure required settings or to activate certain system features.

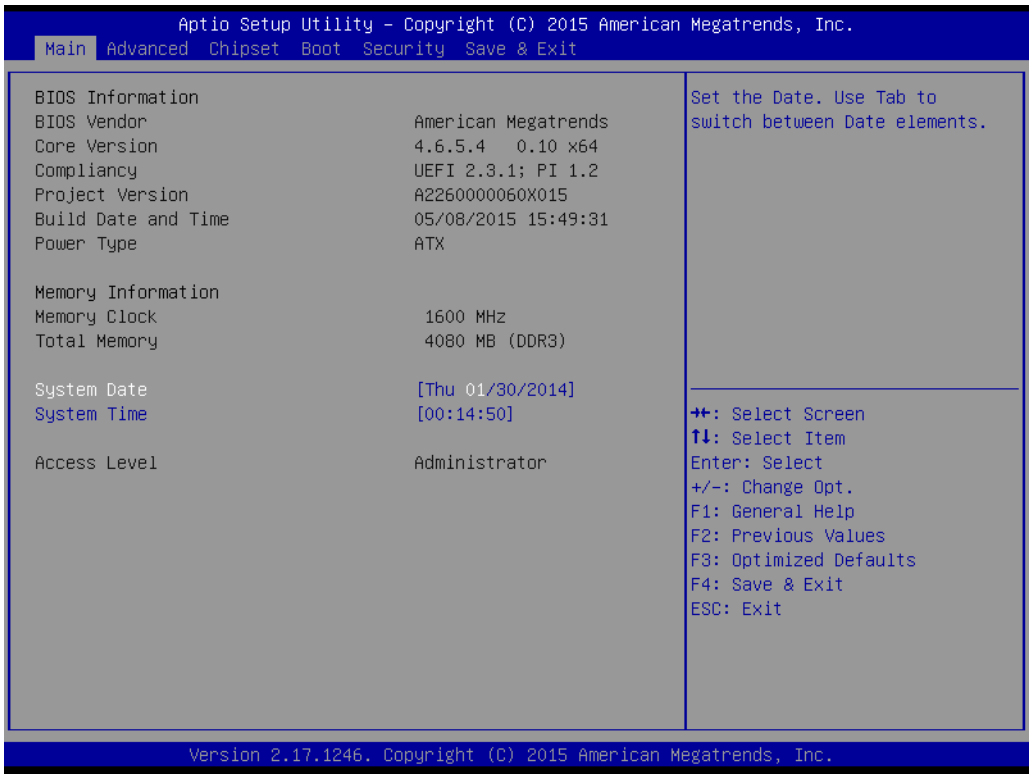
The CMOS SETUP saves the configuration in the CMOS RAM of the motherboard. When the power is turned off, the battery on the board supplies the necessary power to preserve the CMOS RAM.

When the power is turned on, press the <Del> button during the BIOS POST (Power-On Self Test) to access the CMOS SETUP screen.

Control Keys	
< ↑ >< ↓ >< ← >< → >	Move to select item
<Enter>	Select Item
<Esc>	Main Menu - Quit and not save changes into CMOS Sub Menu - Exit current page and return to Main Menu
<Page Up/+>	Increase the numeric value or make changes
<Page Down/->	Decrease the numeric value or make changes
<F1>	General help, for Setup Sub Menu
<F2>	Item Help
<F5>	Load Previous Values
<F7>	Load Setup Defaults
<F10>	Save all CMOS changes

3.2.1 Main Menu

Press <Del> to enter AMI BIOS CMOS Setup Utility, the Main Menu will appear on the screen. Use arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.



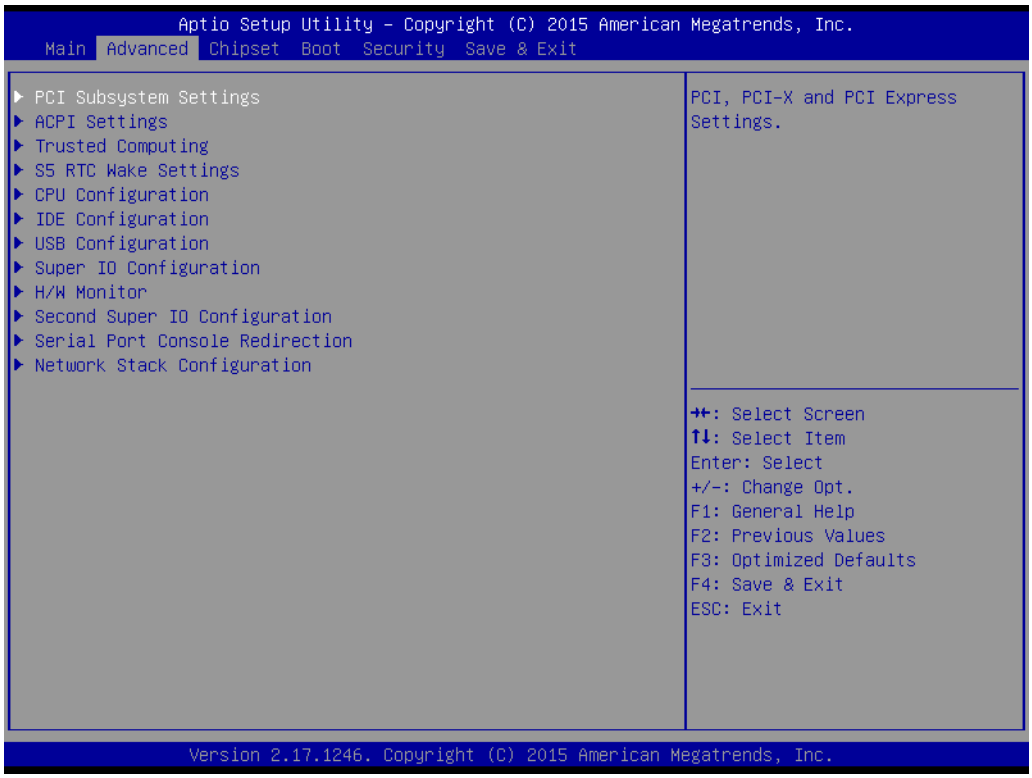
The Main BIOS setup screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured; options in blue can. The right frame displays the key legend.

Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

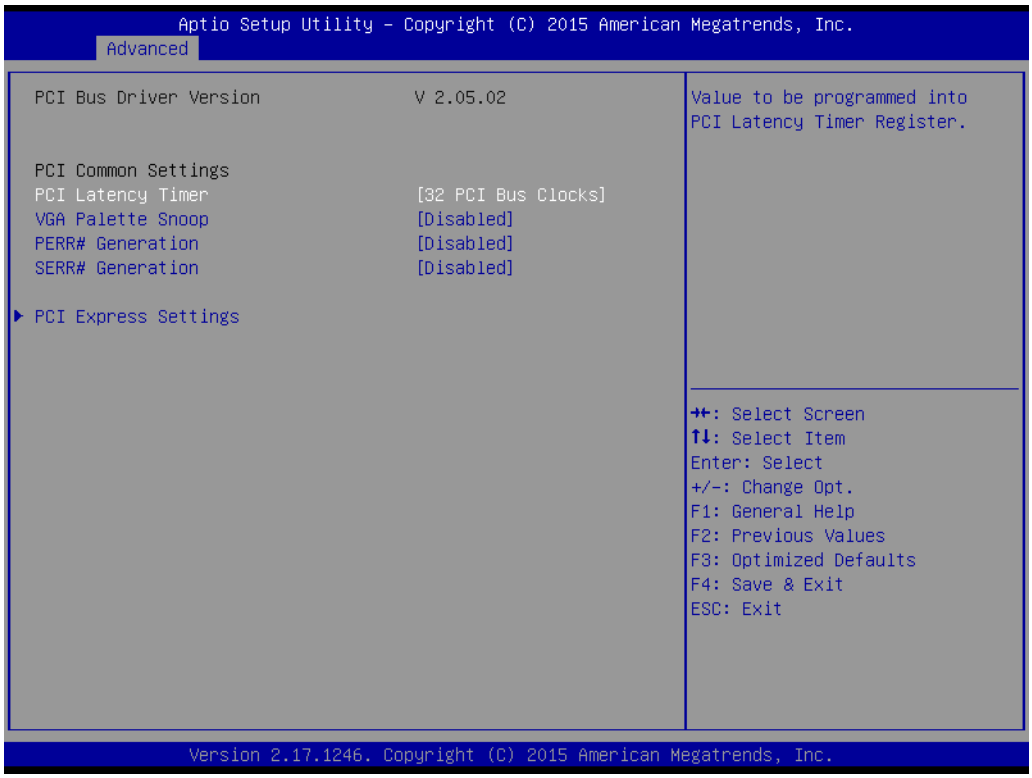
- **System time / System date**
  Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time must be entered in HH:MM:SS format.

3.2.2 Advanced BIOS Features

Select the Advanced tab from the AIMB-226 setup screen to enter the Advanced BIOS Setup screen. You can select any of the items in the left frame of the screen, to go to the sub menu for that item. You can display an Advanced BIOS Setup option by highlighting it using the <Arrow> keys. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup screen is shown below. The sub menus are described on the following pages.

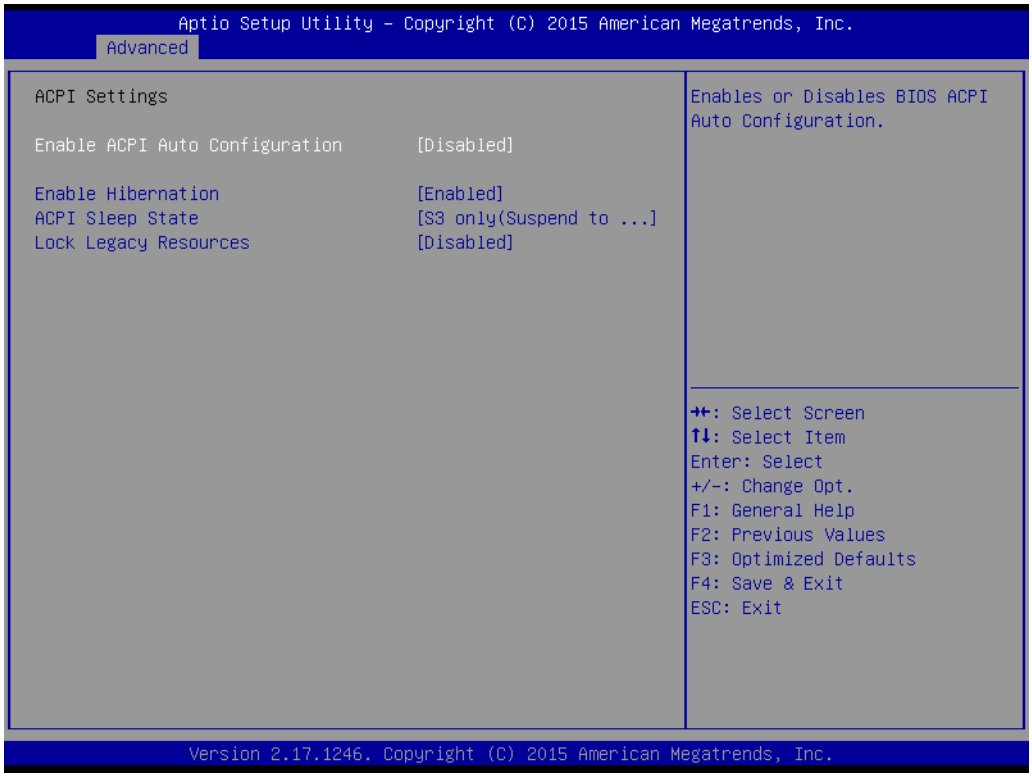


3.2.2.1 PCI Subsystem settings



- **PCI Latency Time**
  The value to be programmed in PCI Latency Timer Register.
- **VGA Palette Snoop**
  Enables or Disables VGA Palette Registers Snooping.
- **PERR# Generation**
  Enables or Disables PCI Device to Generate PERR#.
- **SERR# Generation**
  Enables or Disables PCI Device to Generate SERR#.

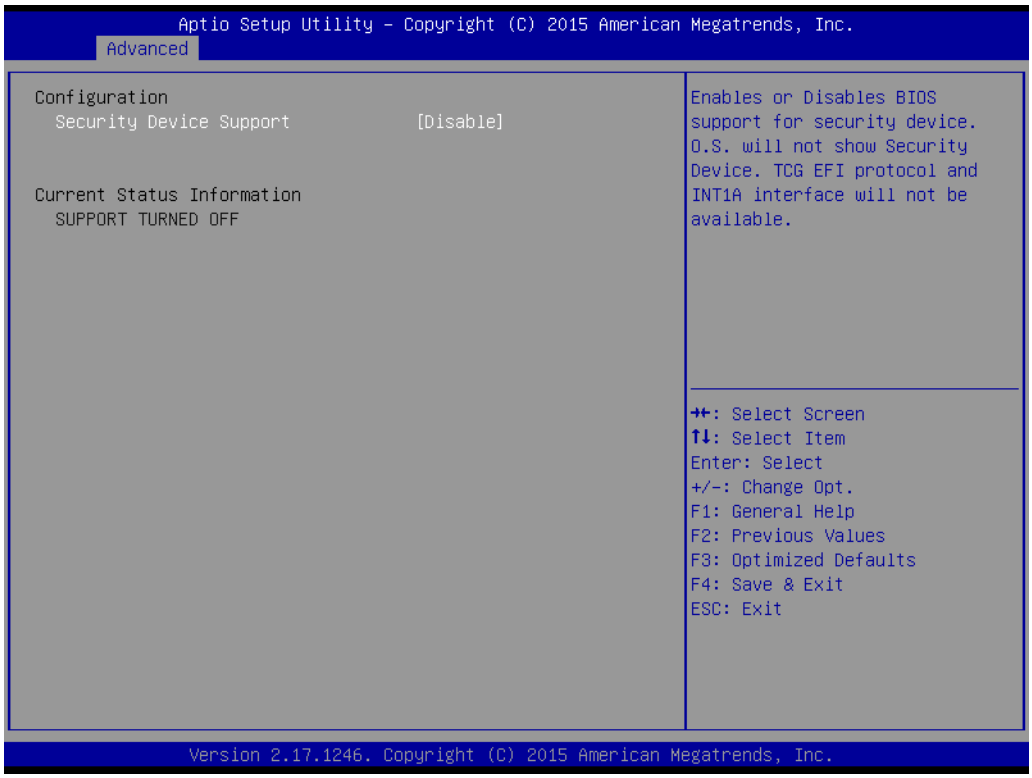
3.2.2.2 ACPI Setting



- **Enable ACPI Auto Configuration**
  Enable or disable BIOS ACPI auto configuration.
- **Enable Hibernation**
  Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.
- **ACPI Sleep State**
  Select ACPI sleep state the system will enter when the SUSPEND button is pressed.
- **Lock Legacy Resources**
  Enables or Disables Lock of Legacy Resources.

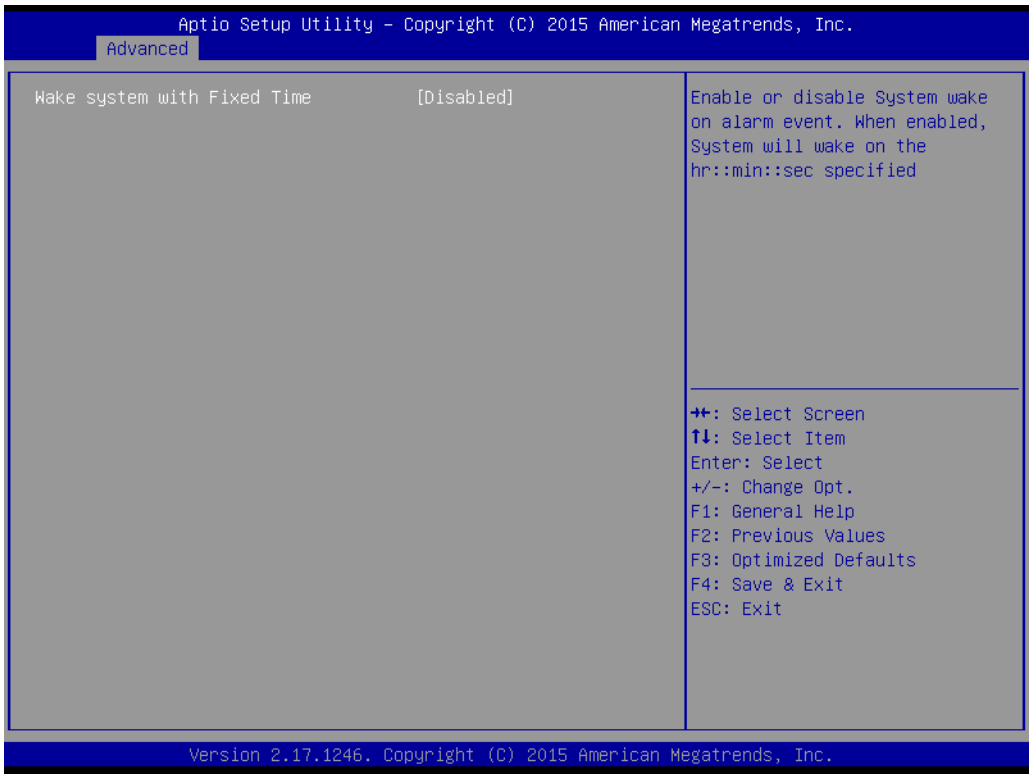
3.2.2.3 Trusted Computing

To enable/disable TPM (TPM 1.2) set up in BIOS. TPM (Trusted Platform Module) is a secure key generator and key cache management component, enables protected storage of encryption keys and authentication credentials for enhanced security capabilities.



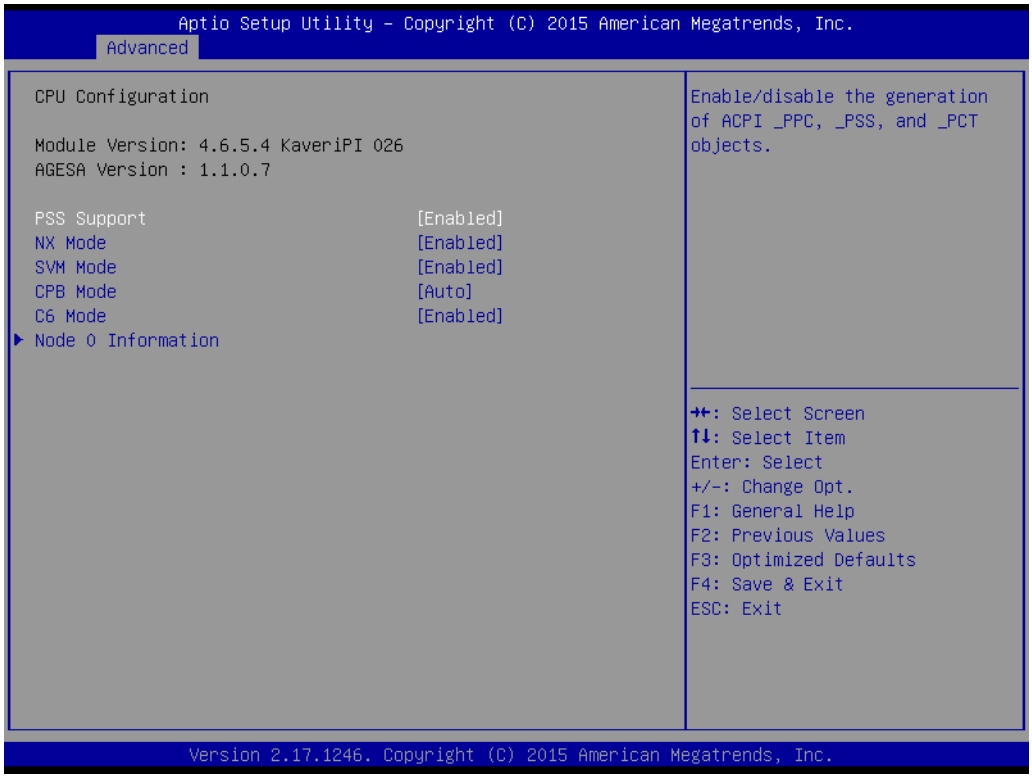
- **TPM SUPPORT**
  Disable/Enable TPM function.

3.2.2.4 S5 RTC Wake Settings



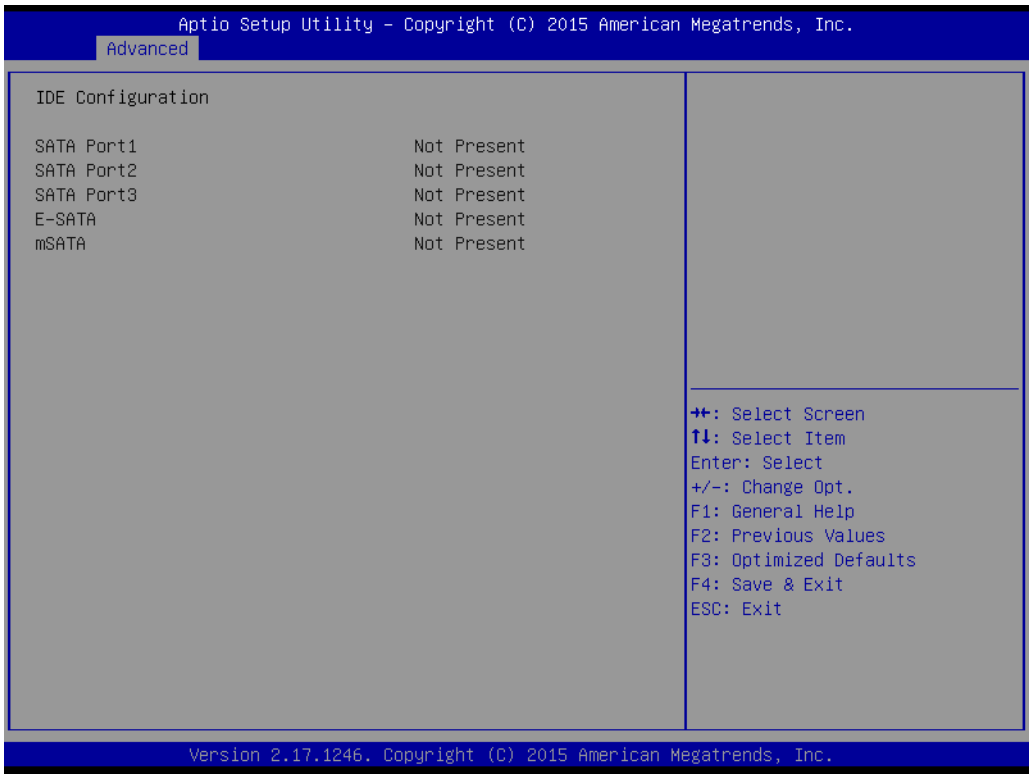
- **Wake system with fixed time**
  Enable or disable system wake on alarm event.

3.2.2.5 CPU Configuration



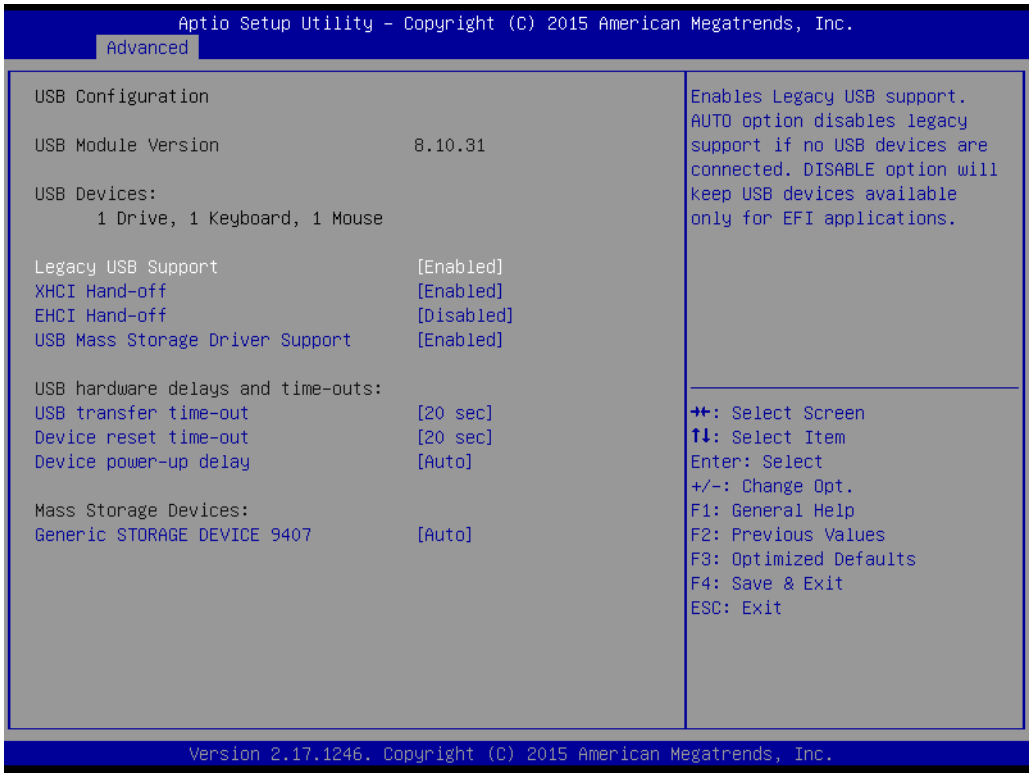
- **PSS Support**
  This item allows you to enable or disable the ACPI _PPC, _PSS, and _PCT objects.
- **NX mode**
  This item allows you to enable or disable the No-execute page protection function.
- **SVM mode**
  This item allows you to enable or disable the CPU virtualization.
- **C6 mode**
  This item allows you to auto or disable C6 function.
- **CPB mode**
  This item allows you to auto or disable CPB.

3.2.2.6 IDE Configuration



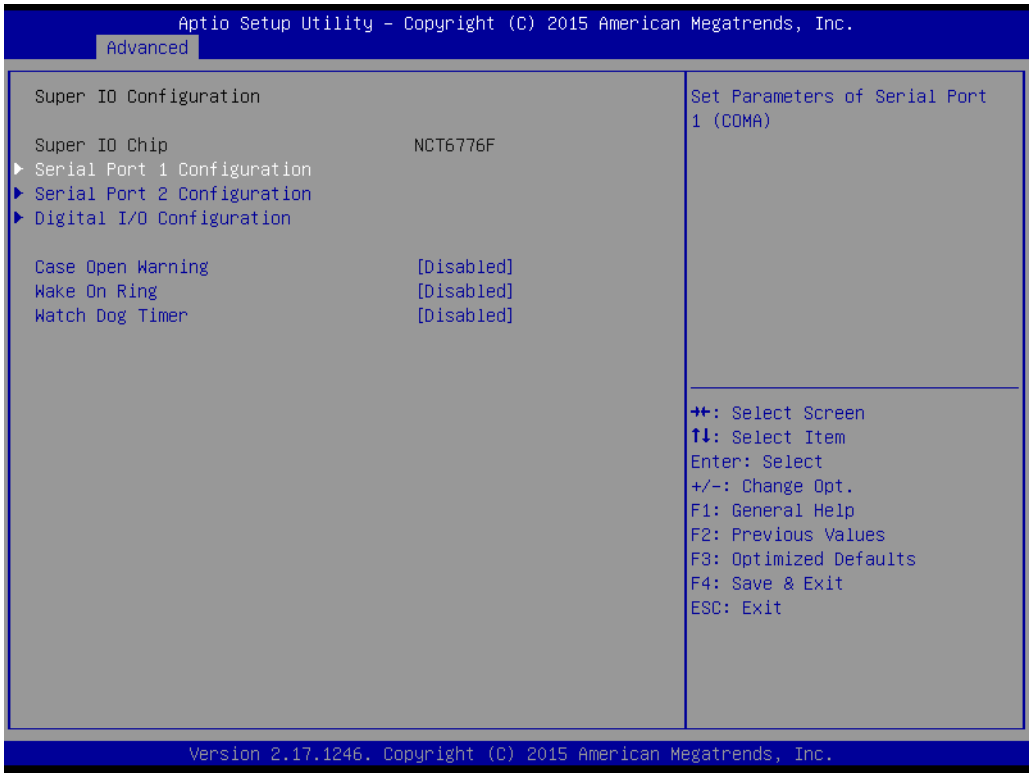
- **IDE Configuration**
  Display SATA Port1 / SATA Port2/ SATA Port3/E-SATA/mSATA information.

3.2.2.7 USB Configuration



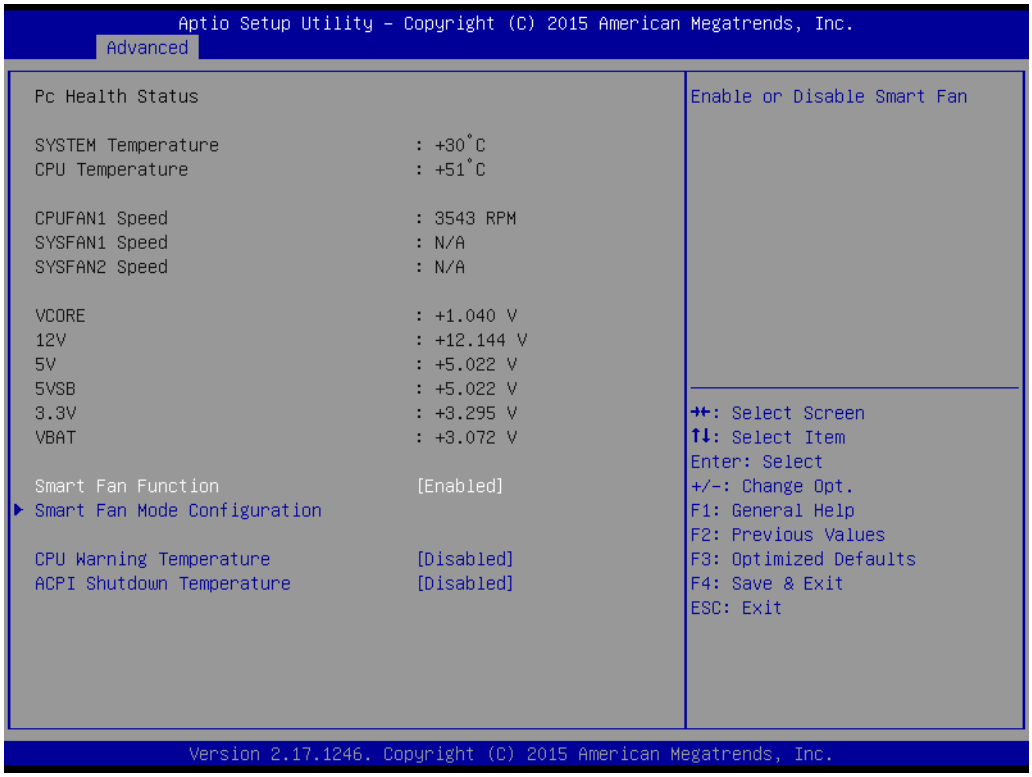
- **Legacy USB support**
  Enables support for legacy USB. Auto option disables legacy support if no USB devices are connected.
- **XHCI Hand-off**
  This is a workaround for OS without XHCI hand-off support. The XHCI ownership change should claim by XHCI driver.
- **EHCI Hand-off**
  This is a workaround for OS without EHCI hand-off support. The EHCI ownership change should claim by EHCI driver.
- **USB Mass Storage Driver Support**
- **USB transfer time-out**
  Time-out value for control, bulk, and interrupt transfers.
- **Device reset time-out**
  USB mass storage device starts unit command time-out.
- **Device power-up delay**
  Maximum time the device will take before it properly report itself to the host controller.
- **Mass Storage Devices**
  Shows USB mass storage device information.

3.2.2.8 Super IO Configuration



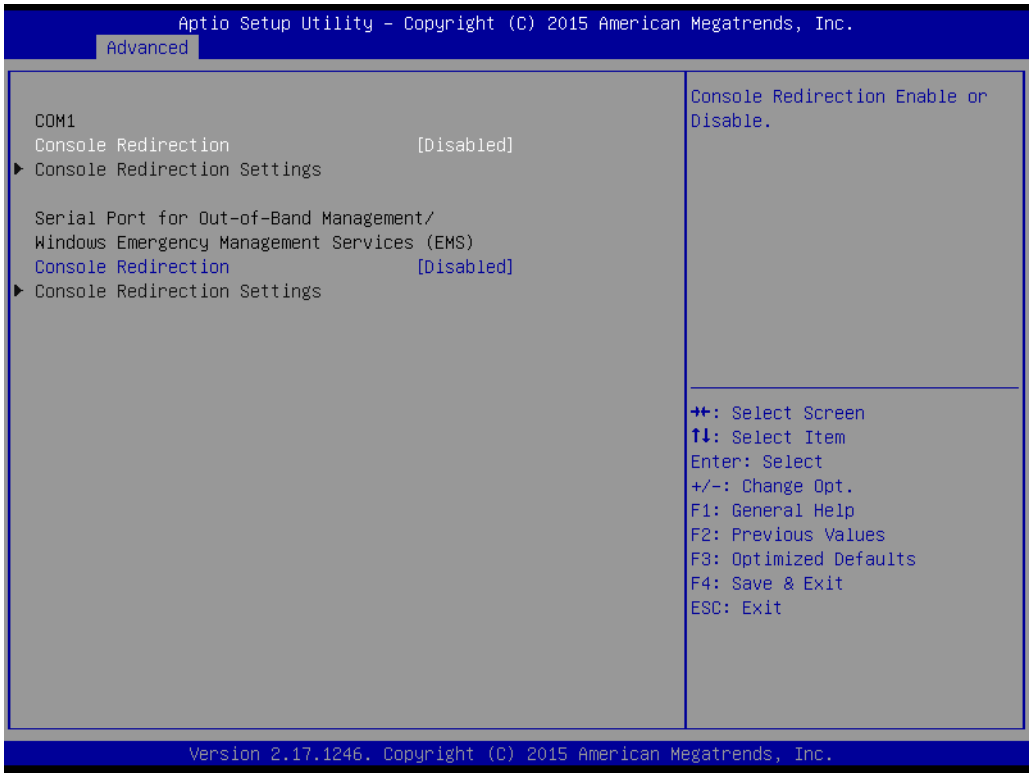
- **Case Open Warning**
  This item will allow to enable/disable case open warning.
- **Wake on Ring**
  Disable/Enable RI wake event.
- **Watch Dog Timer**
  This item allows you to enable/disable the watchdog timer.

3.2.2.9 H/W Monitor



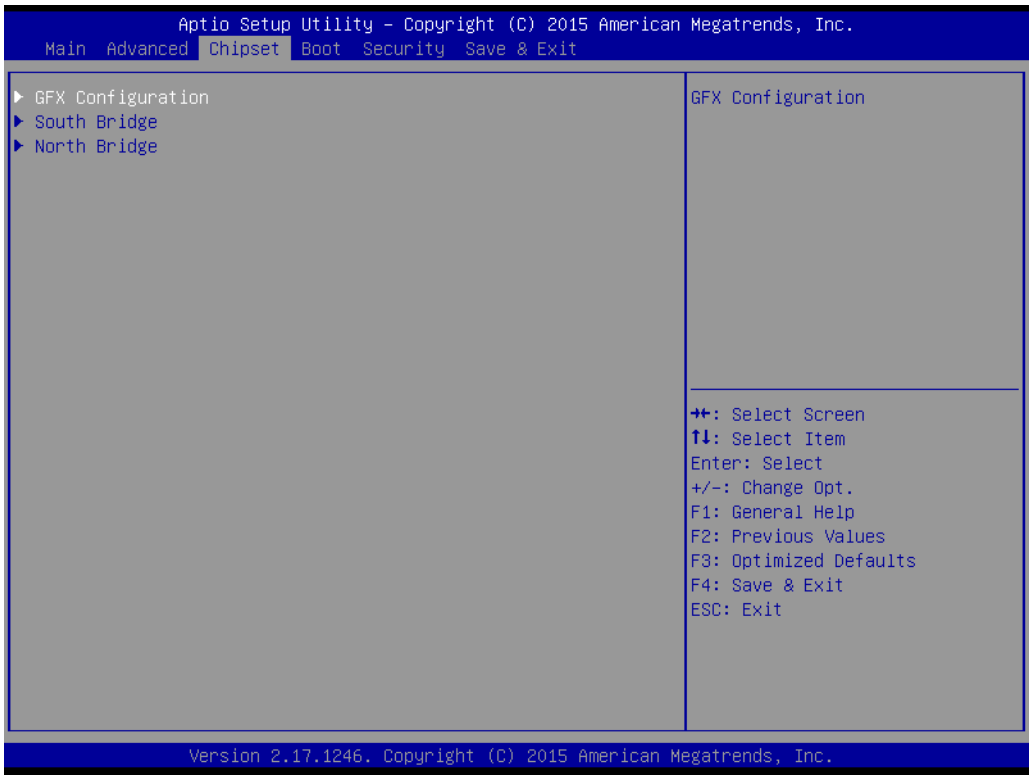
- **Smart Fan Function**
  This item allows you to enable/disable CPU cooler smart function.
- **CPU Warning Temperature**
  Use this to set the CPU warning temperature threshold. When the system reaches the warning temperature, the speaker will beep.
- **ACPI Shutdown Temperature**
  Use this to set the ACPI shutdown temperature threshold. When the system reaches the shutdown temperature, it will be automatically shut down by ACPI OS to protect the system from overheating damage.

3.2.2.10 Serial Port Console Redirection



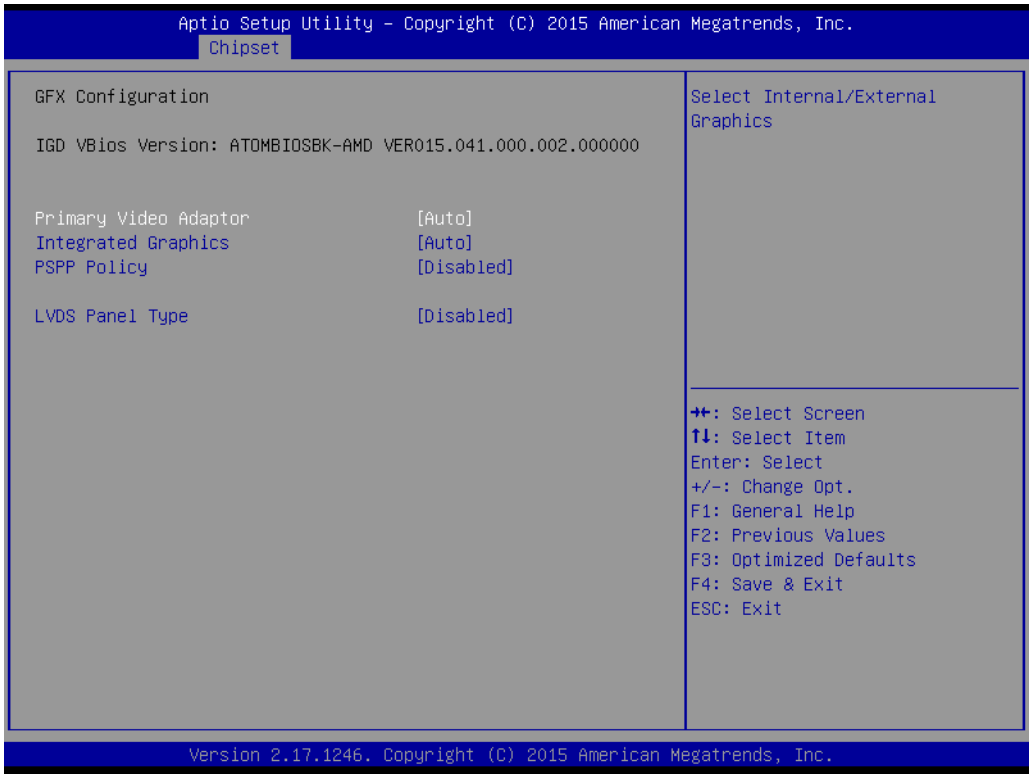
- **Console Redirection**
  This item allows users to enable or disable console redirection for Microsoft Windows Emergency Management Services (EMS).

3.2.3 Chipset



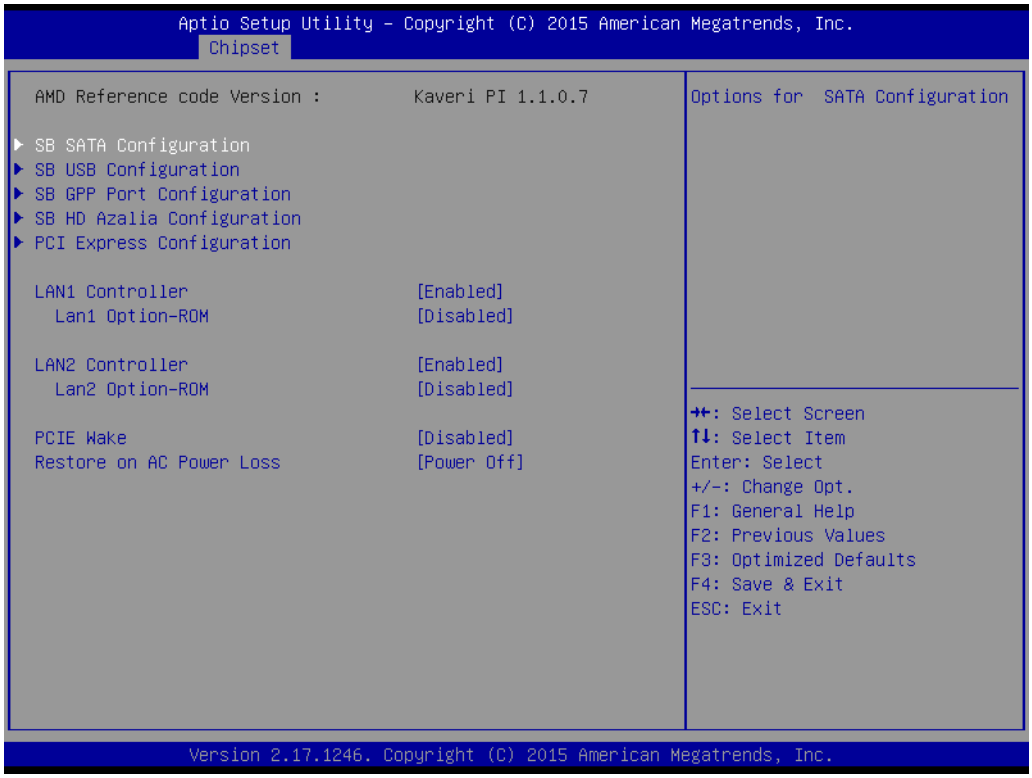
- **GFX Configuration**
  Details of display items.
- **South Bridge Configuration**
  Details of South bridge items.
- **North Bridge Configuration**
  Detail of North Bridge items.

3.2.3.1 GFX Configuration



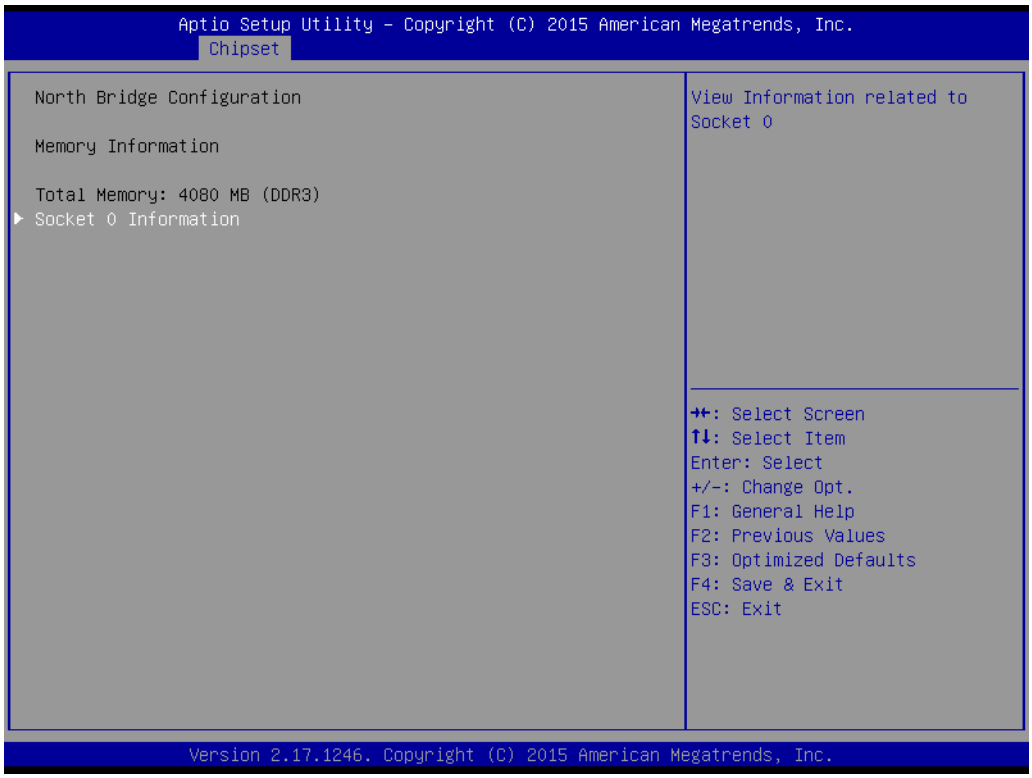
- **Primary Video Device**
  Select main display outputs when add-on cards are used.
- **Integrated Graphics**
  Select SOC display outputs.
- **PSPP Policy**
  the processor supports dynamically changing the link frequency
- **LVDS Panel Type**
  Select LVDS panel types of resolution.

3.2.3.2 SB Configuration

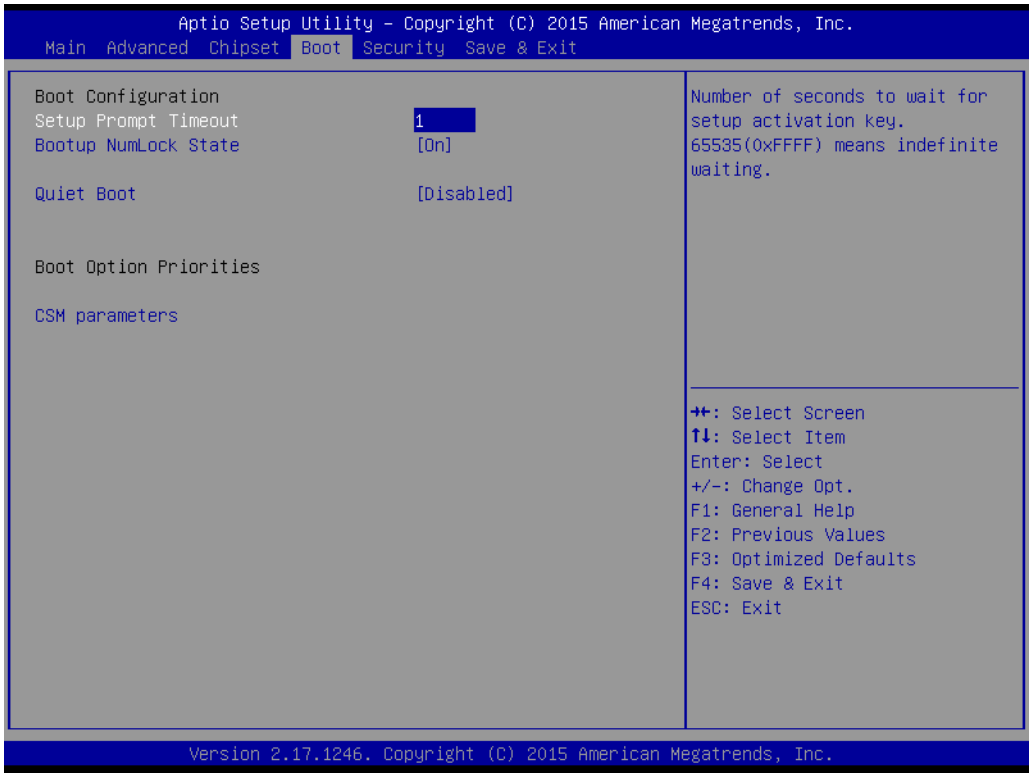


- **SB SATA Configuration**
  Options for SATA configuration.
- **SB USB Configuration**
  Options for USB configuration.
- **SB GPP Port Configuration**
  Options for GPP configuration
- **SB HD Azalia Configuration**
  Options for SB azalia.
- **PCI Express Configuration**
  Options for PCI express configuration

3.2.3.3 North Bridge Configuration

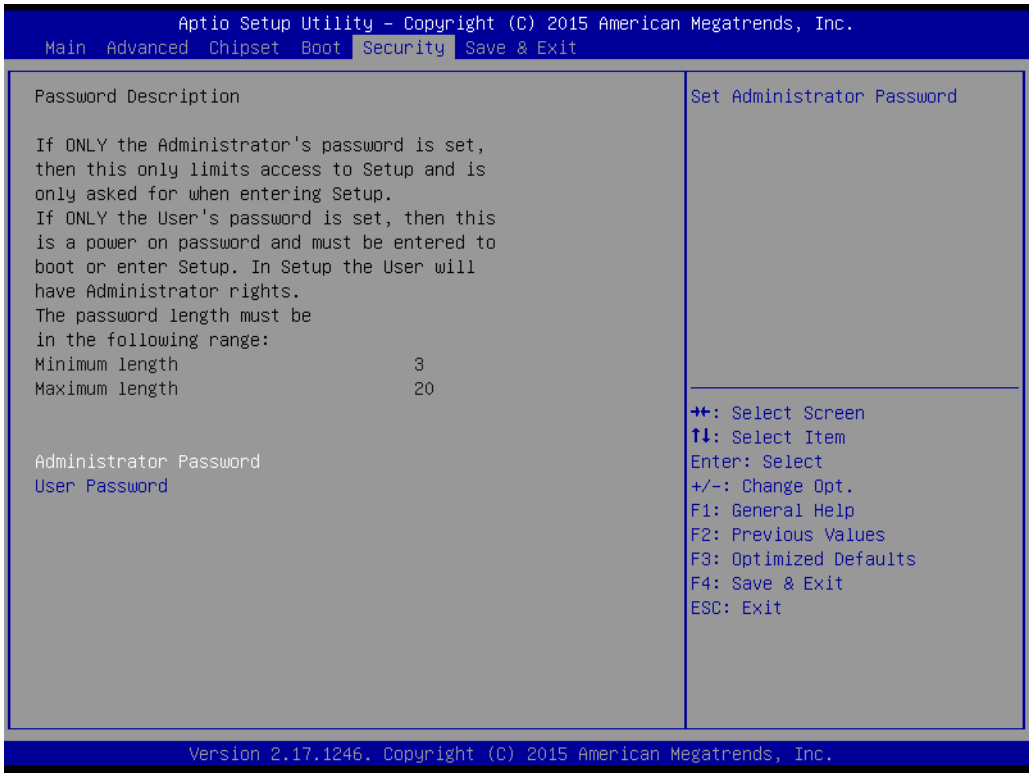


3.2.4 Boot



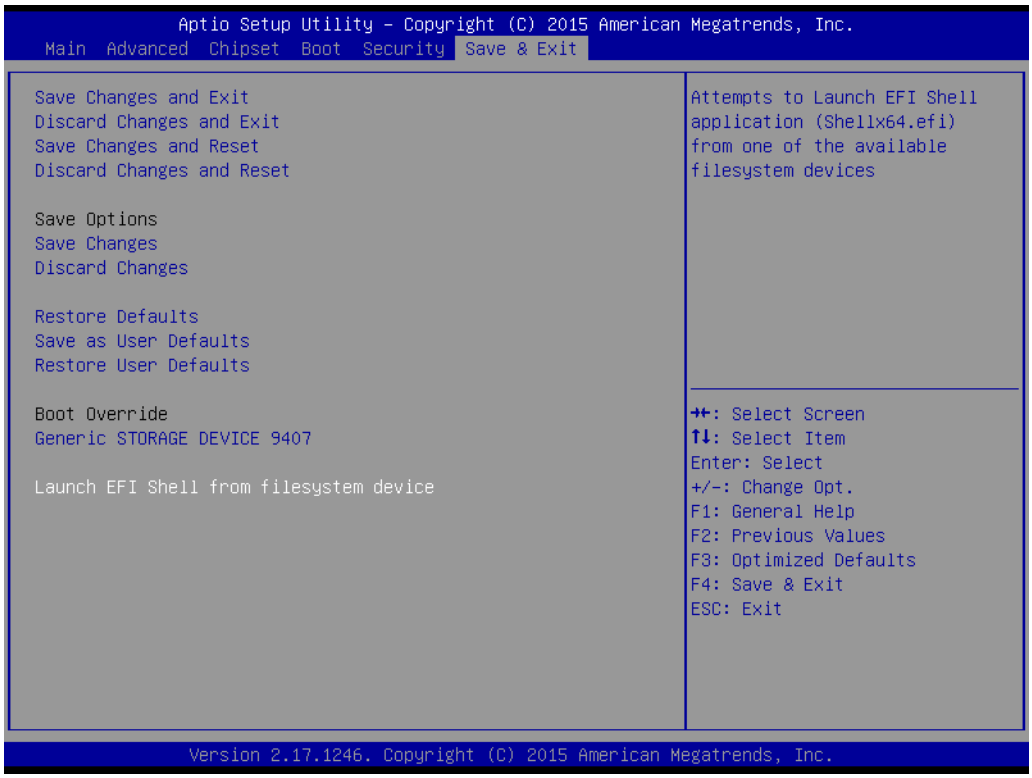
- **Setup Prompt Timeout**
  This item allows you to change number of seconds to wait for setup activation key.
- **Bootup NumLock State**
  Select the Power-on state for Numlock.
- **Quiet Boot**
  If this option is set to Disabled, the BIOS display normal POST messages. If Enabled, an OEM Logo is shown instead of POST messages.
- **Boot Option Priorities**
  Set the system boot order.

3.2.5 Security



Select Security Setup from the AIMB-226 Setup main BIOS setup menu. All Security Setup options, such as password protection and virus protection, are described in this section. To access the sub menu for the following items, select the item and press <Enter>: Change Administrator / User Password.

3.2.6 Save & Exit



- **Save Changes and Exit**
  This item allows you to exit system setup after saving changes.
- **Discard Changes and Exit**
  This item allows you to exit system setup without saving any changes.
- **Save Changes and Reset**
  This item allows you to reset the system after saving the changes.
- **Discard Changes and Reset**
  This item allows you to rest system setup without saving any changes.
- **Save Changes**
  This item allows you to save changes done so far to any of the options.
- **Discard Changes**
  This item allows you to discard changes done so far to any of the options.
- **Restore Defaults**
  This item allows you to restore/load default values for all the options.
- **Save as User Defaults**
  This item allows you to save the changes done so far as user defaults.
- **Restore User Defaults**
  This item allows you to restore the user defaults to all the options.
- **Boot Override**
  Boot device select can override your boot priority.

Chapter 4

Software Introduction & Service

4.1 Introduction

The mission of Advantech Embedded Software Services is to "Enhance quality of life with Advantech platforms and Microsoft® Windows® embedded technology." We enable Windows® Embedded software products on Advantech platforms to more effectively support the embedded computing community. Customers are freed from the hassle of dealing with multiple vendors (hardware suppliers, system integrators, embedded OS distributors) for projects. Our goal is to make Windows® Embedded Software solutions easily and widely available to the embedded computing community.

4.2 Value-Added Software Services

Software API: An interface that defines the ways by which an application program may request services from libraries and/or operating systems. Provides not only the underlying drivers required but also a rich set of user-friendly, intelligent and integrated interfaces, which speeds development, enhances security and offers add-on value for Advantech platforms. It plays the role of catalyst between developer and solution, and makes Advantech embedded platforms easier and simpler to adopt and operate with customer applications.

4.2.1 Software API

4.2.1.1 Control

GPIO

General Purpose Input/Output is a flexible parallel interface that allows a variety of custom connections. Allows users to monitor the level of signal input or set the output status to switch on/off the device. Our API also provide Programmable GPIO, which allows developers to dynamically set the GPIO input or output status.

SMBus

SMBus is the System Management Bus defined by Intel® Corporation in 1995. It is used in personal computers and servers for low-speed system management communications. The SMBus API allows a developer to interface a embedded system environment and transfer serial messages using the SMBus protocols, allowing multiple simultaneous device control.

4.2.1.2 Display

Brightness Control

The Brightness Control API allows a developer to access embedded devices and easily control brightness.

Backlight

The Backlight API allows a developer to control the backlight (screen) on/off in embedded devices.

4.2.1.3 Monitor

Watchdog

A watchdog timer (WDT) is a device that performs a specific operation after a certain period of time if something goes wrong and the system does not recover on its own. A watchdog timer can be programmed to perform a warm boot (restarting the system) after a certain number of seconds.

Hardware Monitor

The Hardware Monitor (HWM) API is a system health supervision API that inspects certain condition indexes, such as fan speed, temperature and voltage.

4.2.1.4 Power Saving

CPU Speed

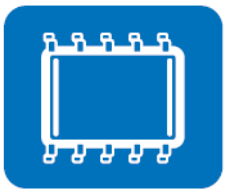
Makes use of Intel® SpeedStep technology to save power consumption. The system will automatically adjust the CPU speed depending on the system loading.

System Throttling

Refers to a series of methods for reducing power consumption in computers by lowering the clock frequency. This API allows the user to adjust the clock from 87.5% to 12.5%.

4.2.2 Software Utility

BIOS Flash



The BIOS Flash utility allows customers to update the flash ROM BIOS version, or use it to back up current BIOS by copying it from the flash chip to a file on customers' disk. The BIOS Flash utility also provides a command line version and an API for fast implementation into customized applications.

Embedded Security ID

The embedded application is the most important property of a system integrator. It contains valuable intellectual property, design knowledge and innovation, but it is easy to be copied! Embedded Security ID utility which provides reliable security functions for customers to secure their application data within embedded BIOS.

Monitoring

Monitoring is a utility that lets the customer monitor system health, like voltage, CPU and system temperature and fan speed. These items are important to a device, if the critical errors occur and are not solved quickly, permanent damage may be caused.

Flash Lock

Flash Lock is a mechanism to bind the Board and CF card (SQFlash) together. User can "Lock" SQFlash via Flash Lock function and "Unlock" by BIOS while booting. A locked SQFlash cannot be read by any card reader or boot from other platforms without a BIOS with "Unlock" feature.

eSOS

The eSOS is a small OS stored in BIOS ROM. It will boot up in case of a main OS crash. It will diagnose the hardware status, and then send an e-mail to the designated administrator. The eSOS also provide for remote connection via Telnet server and FTP server so the administrator can attempt to rescue the system. Note: This function requires BIOS customization.

Chapter 5

Chipset Software Installation Utility

5.1 Before You Begin

To facilitate the installation of the enhanced display drivers and utility software, read the instructions in this chapter carefully. The drivers for the AIMB-226 are located on Advantech website. Updates are provided via Service Packs from Microsoft®.

5.2 Introduction

The AMD Chipset Software Installation (CSI) utility installs the Windows INF files that outline to the operating system how the chipset components will be configured. This is needed for the proper functioning of the following features:

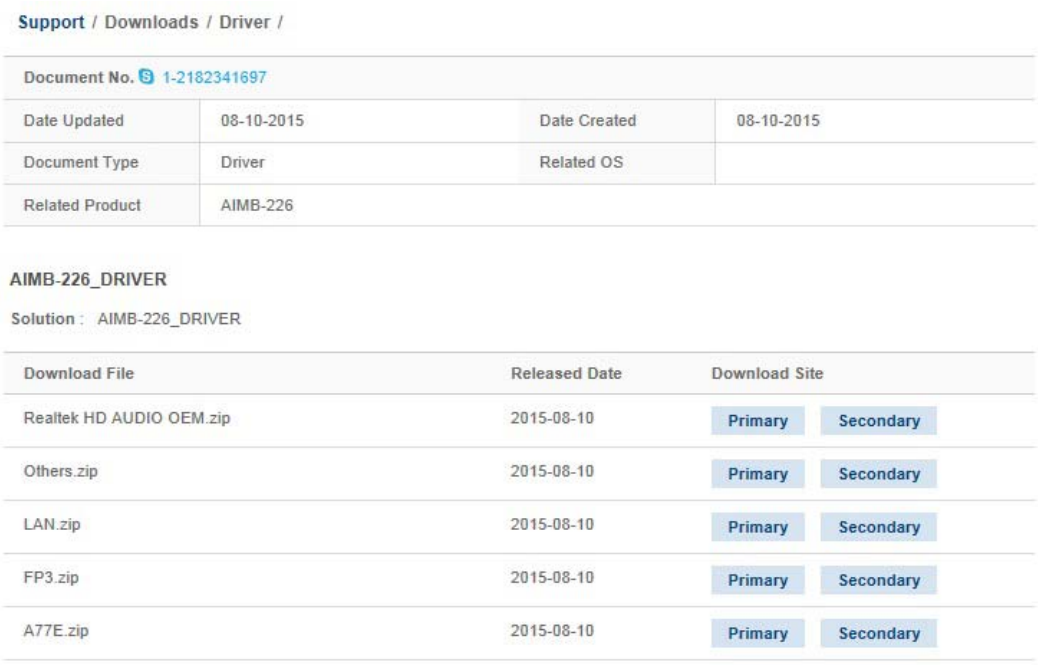
- Core PCI PnP services
- IDE Ultra ATA 100/66/33 and Serial ATA interface support
- USB 1.1/2.0 support (USB 2.0 driver needs to be installed separately for Win98)
- Identification of AMD chipset components in the Device Manager

Note! *This utility is used for the following versions of Windows, and it has to be installed **before** installing all the other drivers:*

- *Windows 7*
- *Windows 8.1*

5.3 Windows 7/8.1 Driver Setup

1. Browse Advantech website and you can see the driver links.



Chapter 6

Graphics Setup

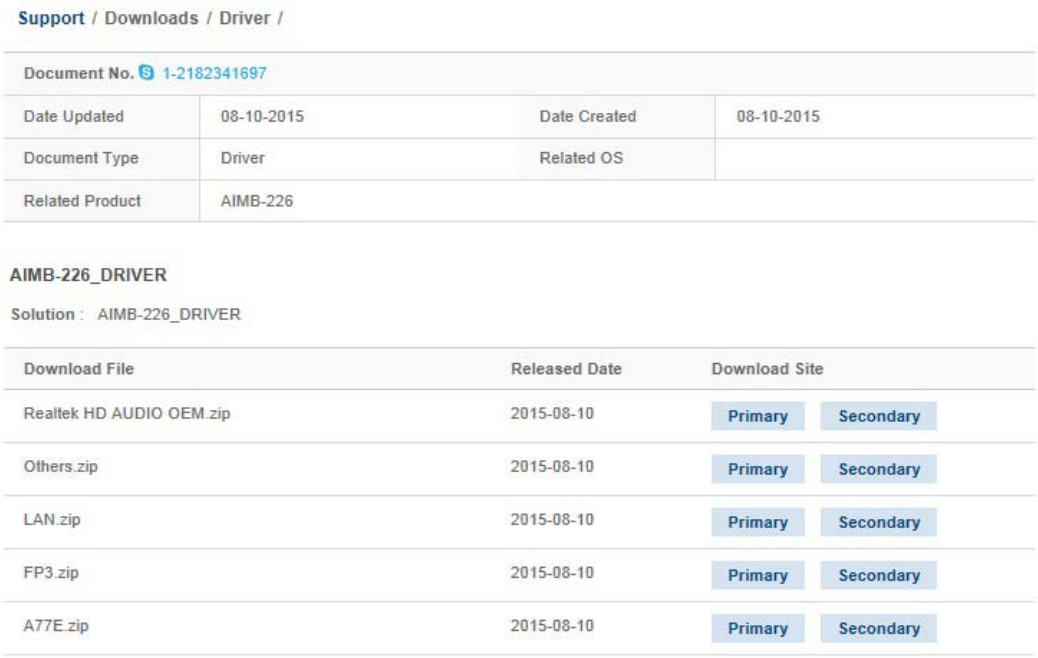
6.1 Introduction

To benefit from the AMD R-series integrated graphics controller, you need to install the graphic driver.

6.2 Windows 7/8.1

Note! *Before installing this driver, make sure the CSI utility has been installed in your system. See Chapter 5 for information on installing the CSI utility.*

Browse Advantech website and you can see the driver links.



Support / Downloads / Driver /

Document No. 1-2182341697			
Date Updated	08-10-2015	Date Created	08-10-2015
Document Type	Driver	Related OS	
Related Product	AIMB-226		

AIMB-226_DRIVER

Solution : AIMB-226_DRIVER

Download File	Released Date	Download Site
Realtek HD AUDIO OEM.zip	2015-08-10	Primary Secondary
Others.zip	2015-08-10	Primary Secondary
LAN.zip	2015-08-10	Primary Secondary
FP3.zip	2015-08-10	Primary Secondary
A77E.zip	2015-08-10	Primary Secondary

Chapter 7

LAN Configuration

7.1 Introduction

The AIMB-226 has dual Gigabit Ethernet LANs via dedicated PCI Express x1 lanes (Realtek RTL8111G for LAN1&2) that offer bandwidth of up to 500 MB/sec, eliminating the bottleneck of network data flow and incorporating Gigabit Ethernet at 1000 Mbps.

7.2 Features

- Integrated 10/100/1000 Mbps transceiver
- 10/100/1000 Mbps triple-speed MAC
- High-speed RISC core with 24-KB cache
- On-chip voltage regulation
- Wake-on-LAN (WOL) support
- PCI Express x4 host interface

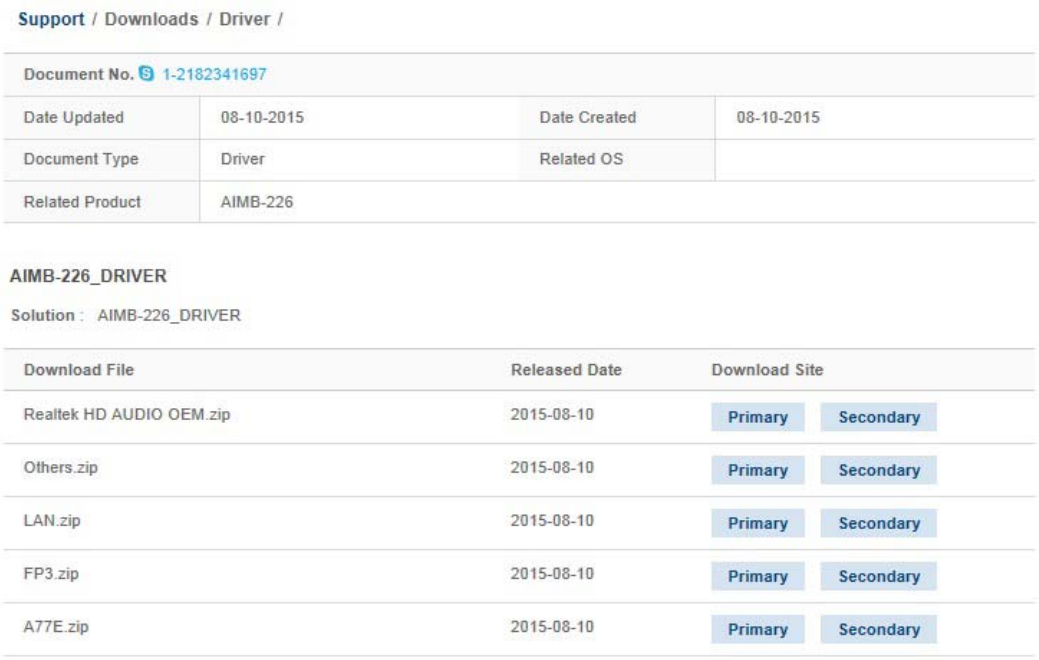
7.3 Installation

Note! *Before installing the LAN drivers, make sure the CSI utility has been installed on your system. See Chapter 5 for information on installing the CSI utility.*

The AIMB-226's Realtek RTL8111G (LAN1&LAN2) Gigabit integrated controllers support all major network operating systems. However, the installation procedure varies from system to system. Please find and use the section that provides the driver setup procedure for the operating system you are using.

7.4 Windows 7/8.1 Driver Setup

Browse Advantech website and find the needed drivers. Select the LAN folder then navigate to the directory for your OS.



Support / Downloads / Driver /

Document No. 1-2182341697			
Date Updated	08-10-2015	Date Created	08-10-2015
Document Type	Driver	Related OS	
Related Product	AIMB-226		

AIMB-226_DRIVER

Solution : AIMB-226_DRIVER

Download File	Released Date	Download Site
Realtek HD AUDIO OEM.zip	2015-08-10	Primary Secondary
Others.zip	2015-08-10	Primary Secondary
LAN.zip	2015-08-10	Primary Secondary
FP3.zip	2015-08-10	Primary Secondary
A77E.zip	2015-08-10	Primary Secondary

Appendix A

Programming the Watchdog Timer

A.1 Programming the Watchdog Timer

The AIMB-226's watchdog timer can be used to monitor system software operation and take corrective action if the software fails to function within the programmed period. This section describes the operation of the watchdog timer and how to program it.

A.1.1 Watchdog Timer Overview

The watchdog timer is built into the super I/O controller NCT6776D. It provides the following user-programmable functions:

- Can be enabled and disabled by user program
- Timer can be set from 1 to 255 seconds or 1 to 255 minutes
- Generates an interrupt or resets signal if the software fails to reset the timer before time-out

A.1.2 Programming the Watchdog Timer

The I/O port address of the watchdog timer is 2E (hex) and 2F (hex). 2E (hex) is the address port. 2F (hex) is the data port. You must first assign the address of register by writing an address value into address port 2E (hex), then write/read data to/from the assigned register through data port 2F (hex).

N

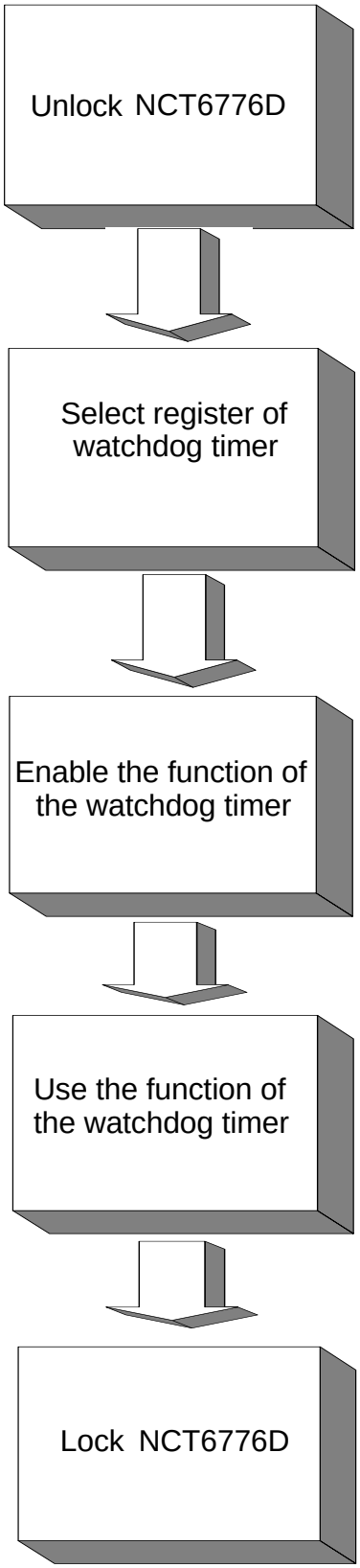

Unlock NCT6776D
Select register of watchdog timer
Enable the function of the watchdog timer
Use the function of the watchdog timer
Lock NCT6776D

Table A.1: Watchdog Timer Registers		
Address of Register (2E)	**Attribute**	
Read/Write	Value (2F) & description	
87 (hex)	-----	Write this address to I/O address port 2E (hex) twice to unlock the NCT6776D.
07 (hex)	write	Write 08 (hex) to select register of watchdog timer.
30 (hex)	write	Write 01 (hex) to enable the function of the watch-dog timer. Disabled is set as default.
F5 (hex)	write	Set seconds or minutes as units for the timer. Write 0 to bit 3: set second as counting unit. [default] Write 1 to bit 3: set minutes as counting unit.
F6 (hex)	write	0: stop timer [default] 01~FF (hex): The amount of the count, in seconds or minutes, depends on the value set in register F5 (hex). This number decides how long the watch-dog timer waits for strobe before generating an interrupt or reset signal. Writing a new value to this register can reset the timer to count with the new value.
F7 (hex)	read/write	Bit 7:Write 1 to enable mouse to reset the timer, 0 to disable[default]. Bit 6: Write 1 to enable key-board to reset the timer, 0 to disable.[default] Bit 5: Write 1 to generate a timeout signal immedi-ately and automatically return to 0. [default=0] Bit 4: Read status of watchdog timer, 1 means timer is “timeout”.
AA (hex)	-----	Write this address to I/O port 2E (hex) to lock the watchdog timer 2.

A.1.3 Example Program

1. Enable watchdog timer and set 10 sec. as timeout interval

```
;----------------------------------------------------------
Mov dx,2eh ; Unlock NCT6776D
Mov al,87h
Out dx,al
Out dx,al
;----------------------------------------------------------
Mov al,07h ; Select registers of watchdog timer
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;----------------------------------------------------------
Dec dx ; Enable the function of watchdog timer
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;----------------------------------------------------------
Dec dx ; Set second as counting unit
Mov al,0f5h
Out dx,al
Inc dx
In al,dx
And al,not 08h
Out dx,al
;----------------------------------------------------------
Dec dx ; Set timeout interval as 10 seconds and start counting
Mov al,0f6h
Out dx,al
Inc dx
Mov al,10
Out dx,al
;----------------------------------------------------------
Dec dx ; Lock NCT6776D
Mov al,0aah
Out dx,al
```

2. Enable watchdog timer and set 5 minutes as timeout interval

```
;----------------------------------------------------------
Mov dx,2eh ; Unlock NCT6776D
Mov al,87h
Out dx,al
Out dx,al
```

```
;------------------------------------------------------------
Mov al,07h ; Select registers of watchdog timer
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;------------------------------------------------------------
Dec dx ; Enable the function of watchdog timer
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;------------------------------------------------------------
Dec dx ; Set minute as counting unit
Mov al,0f5h
Out dx,al
Inc dx
In al,dx
Or al,08h
Out dx,al
;------------------------------------------------------------
Dec dx ; Set timeout interval as 5 minutes and start counting
Mov al,0f6h
Out dx,al
Inc dx
Mov al,5
Out dx,al
;------------------------------------------------------------
Dec dx ; Lock NCT6776D
Mov al,0aah
Out dx,al
```

3. Enable watchdog timer to be reset by mouse

```
;------------------------------------------------------------
Mov dx,2eh ; Unlock NCT6776D
Mov al,87h
Out dx,al
Out dx,al
;------------------------------------------------------------
Mov al,07h ; Select registers of watchdog timer
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;------------------------------------------------------------
```

```
Dec dx ; Enable the function of watchdog timer
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;--------------------------------------------------------
Dec dx ; Enable watchdog timer to be reset by mouse
Mov al,0f7h
Out dx,al
Inc dx
In al,dx
Or al,80h
Out dx,al
;--------------------------------------------------------
Dec dx ; Lock NCT6776D
Mov al,0aah
Out dx,al
```

4. Enable watchdog timer to be reset by keyboard

```
;--------------------------------------------------------
Mov dx,2eh ; Unlock NCT6776D
Mov al,87h
Out dx,al
Out dx,al
;--------------------------------------------------------
Mov al,07h ; Select registers of watchdog timer
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;--------------------------------------------------------
Dec dx ; Enable the function of watchdog timer
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;--------------------------------------------------------
Dec dx ; Enable watchdog timer to be strobed reset by keyboard
Mov al,0f7h
Out dx,al
Inc dx
In al,dx
Or al,40h
Out dx,al
```

```
;--------------------------------------------------------
Dec dx ; Lock NCT6776D
Mov al,0aah
Out dx,al
```

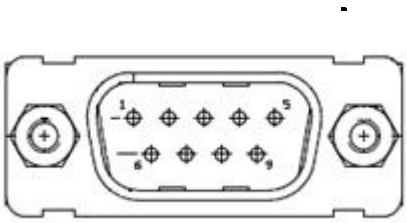
5. Generate a time-out signal without timer counting

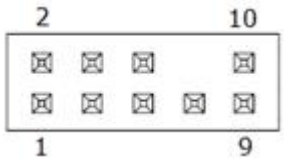
```
;--------------------------------------------------------
Mov dx,2eh ; Unlock NCT6776D
Mov al,87h
Out dx,al
Out dx,al
;--------------------------------------------------------
Mov al,07h ; Select registers of watchdog timer
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;--------------------------------------------------------
Dec dx ; Enable the function of watchdog timer
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;--------------------------------------------------------
Dec dx ; Generate a time-out signal
Mov al,0f7h
Out dx,al ;Write 1 to bit 5 of F7 register
Inc dx
In al,dx
Or al,20h
Out dx,al
;--------------------------------------------------------
Dec dx ; Lock NCT6776D
Mov al,0aah
Out dx,al
```

Appendix B

I/O Pin Assignments

B.1 RS-232 Interface (COM1/2/4/5/6)





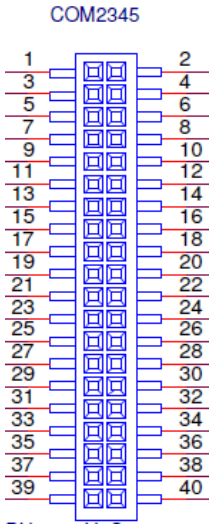
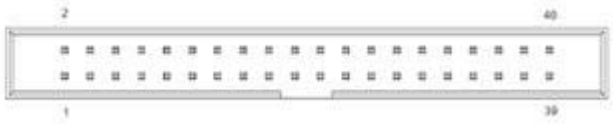


Table B.1: RS-232 Interface (COM2345)

Pin	Signal	Pin	Signal
1	COM2_DCD#	2	COM2_DSR#
3	COM2_SIN	4	COM2_RTS#
5	COM2_SOUT	6	COM2_CTS#
7	COM2_DTR#	8	COM2_RI#
9	GND	10	GND
11	COM3_DCD#	12	COM3_DSR#
13	COM3_SIN	14	COM3_RTS#
15	COM3_SOUT	16	COM3_CTS#
17	COM3_DTR#	18	COM3_RI#
19	GND	20	GND
21	COM4_DCD#	22	COM4_DSR#
23	COM4_SIN	24	COM4_RTS#
25	COM4_SOUT	26	COM4_CTS#
27	COM4_DTR#	28	COM4_RI#
29	GND	30	GND
31	COM5_DCD#	32	COM5_DSR#
33	COM5_SIN	34	COM5_RTS#
35	COM5_SOUT	36	COM5_CTS#
37	COM5_DTR#	38	COM5_RI_V#
39	GND	40	GND

B.2 RS-232/422/485 Interface (COM3456)

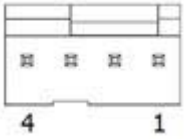


Pin	Signal	Pin	Signal
1	DCD#[3]	2	DSR#[3]
3	RXD[3]	4	RST#[3]
5	TXD[3]	6	CTS#[3]
7	DTR#[3]	8	RI#[3]
9	GND	10	GND
11	DCD#[4]	12	DSR#[4]
13	RXD[4]	14	RST#[4]
15	TXD[4]	16	CTS#[4]
17	DTR#[4]	18	RI#[4]
19	GND	20	GND
21	DCD#[5]	22	DSR#[5]
23	RXD[5]	24	RST#[5]
25	TXD[5]	26	CTS#[5]
27	DTR#[5]	28	RI#[5]
29	GND	30	GND
31	DCD#[6]	32	DSR#[6]
33	RXD[6]	34	RST#[6]
Pin	Signal	Pin	Signal
35	TXD[6]	36	CTS#[6]
37	DTR#[6]	38	RI#[6]
39	GND	40	GND

B.3 SPI BIOS flash socket (SPI1)

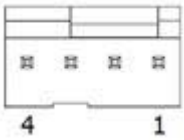
Pin	Signal	Pin	Signal
1	CS#	5	MOSI
2	MISO	6	SCLK
3	WP# / IO2	7	HOLD# / IO3
4	GND	8	+3.3V

B.4 System fan1 connector (SYSFAN1)



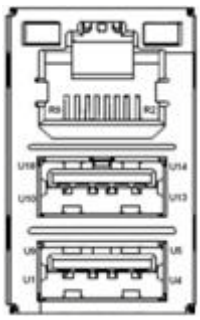
Pin	Signal
1	GND
2	+12V
3	DETECT
4	PWM IN

B.5 System fan2 connector (SYSFAN2)



Pin	Signal
1	GND
2	+12V
3	DETECT
4	PWM IN

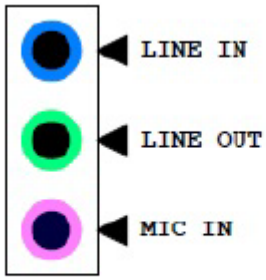
B.6 USB & LAN Connector (LAN1_USB12,LAN2_USB1112)



Pin	Signal	Pin	Signal
R2	MDI_0+	R3	MDI_0-
R4	MDI_1+	R5	MDI_1-
R6	MDI_2+	R7	MDI_2-
R8	MDI_3+	R9	MDI_3-
U1	+5V	U2	D0-

U3	D0+	U4	GND
U5	RX0-	U6	RX0+
U7	GND	U8	TX0-
U9	TX0+	U10	+5V
U11	D1-	U12	D1+
U13	GND	U14	RX1-
U15	RX1+	U16	GND
U17	TX1-	U18	TX1+

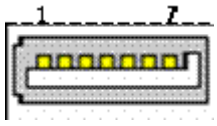
B.7 HD Analog Audio Interface (AUDIO1)



AUDIO1

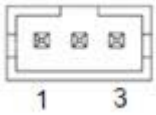
Pin	Signal
1	MIC IN
2	LINE OUT
3	LINE IN

B.8 Serial ATA Connector (SATA1, SATA2, SATA3)



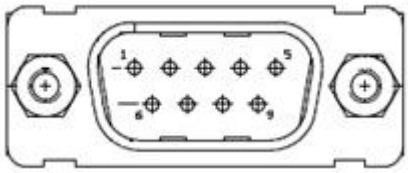
Pin	Signal
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

B.9 AT/ATX Mode (PSON1)



Pin	Signal
1	VCCAT
2	+3.3V
3	VCCATX

B.10 COM1 connector (COM1)

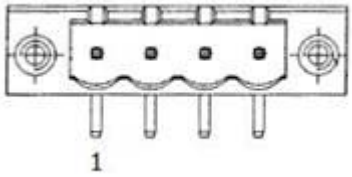


Pin	Signal
1	DCD#[1]
2	RXD[1]
3	TXD[1]
4	DTR#[1]
5	GND
6	DSR#[1]
7	RTS#[1]
8	CTS#[1]
9	RI#[1]

B.11 ATX 12V connector (ATX12V1)

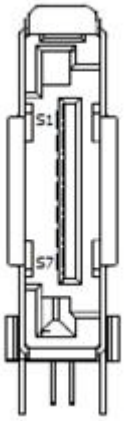
Pin	Signal
1	GND
2	GND
3	+12V
4	+12V

B.12 DC input connector (DCIN1)



Pin	Signal
1	GND
2	+12V
3	+12V
4	GND

B.13 eSATA1 connector (ESATA1)

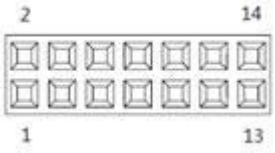


Pin	Signal
S1	GND
S2	TX+
S3	TX-
S4	GND
S5	RX-
S6	RX+
S7	GND

B.14 Stack connector (DP1+HDMI1,DP2+HDMI2)

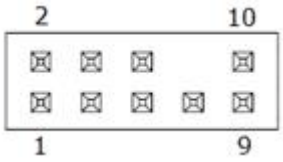
Pin	Signal	Pin	Signal
1	TMDS D2+	A1	ML0+
2	GND	A2	GND-
3	TMDS D2-	A3	ML0-
4	TMDS D1+	A4	ML1+
5	GND	A5	GND
6	TMDS D1-	A6	ML1-
7	TMDS D0+	A7	ML2+
8	GND	A8	GND
9	TMDS D0-	A9	ML2-
10	TMDS Clock+	A10	ML3+
11	GND	A11	GND
12	TMDS Clock-	A12	ML3-
13	N/A	A13	CONFIG1
14	N/A	A14	CONFIG2
15	SCL	A15	AUX CH+
16	SDA	A16	GND
17	GND	A17	AUX CH-
18	+5V	A18	Hot Plug
19	Hot Plug	A19	GND
		A20	DP_PWR

B.15 Low pin count interface header (LPC1)



Pin	Signal	Pin	Signal
1	LPC CLK (33MHz)	2	AD1
3	RESET#	4	AD0
5	FRAME#	6	+3.3V
7	AD3	8	GND
9	AD2	10	SMBus CLK
11	SERIRQ	12	SMBus DAT
13	+5VSB	14	+5V

B.16 Front panel audio pin header (FPAUD1)



Pin	Signal
1	MIC IN-L
2	GND
3	MIC IN-R
4	FPAUD_DETECT#
5	LINE OUT-R
6	SENSE R1
7	SENSE
8	KEY
9	LINE OUT-L
10	SENSE R2

B.17 PCI-Express x16 slot (PCIEX16_1)

Pin	Signal	Pin	Signal
B1	+12V	A1	PRSNT1#
B2	+12V	A2	+12V
B3	+12V	A3	+12V
B4	GND	A4	GND
B5	SMB_CLK	A5	Reserved
B6	SMB_DATA	A6	Reserved
B7	GND	A7	Reserved
B8	+3.3V	A8	Reserved
B9	Reserved	A9	+3.3V
B10	+3.3VAUX	A10	+3.3V
B11	WAKE#	A11	PWRGD
B12	Reserved	A12	GND
B13	GND	A13	REFCLK+
B14	TX0+	A14	REFCLK-
B15	TX0-	A15	GND
B16	GND	A16	RX0+
B17	Reserved	A17	RX0-
B18	DETECT#	A18	GND
B19	TX1+	A19	CONFIG1
B20	TX1-	A20	GND
B21	GND	A21	RX1+
B22	GND	A22	RX1-
B23	TX2+	A23	GND
B24	TX2-	A24	GND
B25	GND	A25	RX2+
B26	GND	A26	RX2-
B27	TX3+	A27	GND
B28	TX3-	A28	GND
B29	GND	A29	RX3+
B30	Reserved	A30	RX3-
B31	Reserved	A31	GND
B32	GND	A32	CONFIG2
B33	TX4+	A33	Reserved
B34	TX4-	A34	GND
B35	GND	A35	RX4+
B36	GND	A36	RX4-
B37	TX5+	A37	GND
B38	TX5-	A38	GND
B39	GND	A39	RX5+
B40	GND	A40	RX5-

B41	TX6+	A41	GND
B42	TX6-	A42	GND
B43	GND	A43	RX6+
B44	GND	A44	RX6-
B45	TX7+	A45	GND
B46	TX7-	A46	GND
B47	GND	A47	RX7+
B48	Reserved	A48	RX7-
B49	GND	A49	GND
B50	TX8+	A50	Reserved
B51	TX8-	A51	GND
B52	GND	A52	RX8+
B53	GND	A53	RX8-
B54	TX9+	A54	GND
B55	TX9-	A55	GND
B56	GND	A56	RX9+
B57	GND	A57	RX9-
B58	TX10+	A58	GND
B59	TX10-	A59	GND
B60	GND	A60	RX10+
B61	GND	A61	RX10-
B62	TX11+	A62	GND
B63	TX11-	A63	GND
B64	GND	A64	RX11+
B65	GND	A65	RX11-
B66	TX12+	A66	GND
B67	TX12-	A67	GND
B68	GND	A68	RX12+
B69	GND	A69	RX12-
B70	TX13+	A70	GND
B71	TX13-	A71	GND
B72	GND	A72	RX13+
B73	GND	A73	RX13-
B74	TX14+	A74	GND
B75	TX14-	A75	GND
B76	GND	A76	RX14+
B77	GND	A77	RX14-
B78	TX15+	A78	GND
B79	TX15-	A79	GND
B80	GND	A80	RX15+
B81	Reserved	A81	RX15-
B82	Reserved	A82	GND

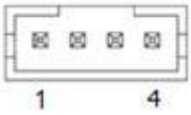
B.18 SIM Card holder (SIM2)

Pin	Signal
1	UIM_PWR
2	UIM_RESET
3	UIM_CLK
4	Reserved
5	GND
6	UIM_VPP
7	UIM_DATA
8	Reserved

B.19 Watchdog timer output and OBS beep (JWDT1+JOBS1)

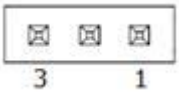
Pin	Signal
1	NC
2	WDT
3	RESET#
4	SIO BEEP
5	FRP BEEP

B.20 SATA power supply connector (SATA_PWR1)



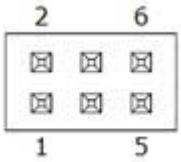
Pin	Signal
1	+5V
2	GND
3	GND
4	+12V

B.21 SATA DOM power selection pin header (JSATAPWR1)



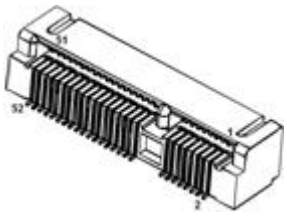
Pin	Signal
1	GND
2	DOM PWR
3	+5V

B.22 COM4 RI# selection pin header (JSETCOM4_V1)



Pin	Signal
1	RI#
2	RI#_VCON
3	RI#_VCON
4	+5V
5	+12V
6	RI#_VCON

B.23 MINIPCIE, mSATA connector (MINIPCIE1)



MINIPCIE:

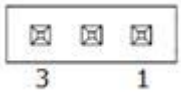
Pin	Signal	Pin	Signal
1	WAKE#	2	+3.3Vaux
3	Reserved	4	GND
5	Reserved	6	+1.5V
7	CLKREQ#	8	Reserved
9	GND	10	Reserved
11	REFCLK-	12	Reserved
13	REFCLK+	14	Reserved
15	GND	16	Reserved
17	Reserved	18	GND
19	Reserved	20	DISABLE#
21	DETECT#	22	RESET#
23	PCIE_RX+	24	+3.3Vaux
25	PCIE_RX-	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PCIE_TX-	32	SMB_DATA
33	PCIE_TX+	34	GND
35	GND	36	USB_D-
37	GND	38	USB_D+
39	+3.3Vaux	40	GND
41	+3.3Vaux	42	Reserved
43	V1.2_DETECT#	44	LED_WLAN#
45	Reserved	46	Reserved
47	Reserved	48	+1.5V
49	Reserved	50	GND
51	MSATA_DETECT#	52	+3.3Vaux

mSATA:

Pin	Signal	Pin	Signal
1	Reserved	2	+3.3V
3	Reserved	4	GND
5	Reserved	6	+1.5V
7	Reserved	8	Reserved
9	GND	10	Reserved
11	Reserved	12	Reserved

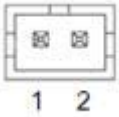
13	Reserved	14	Reserved
15	GND	16	Reserved
17	Reserved	18	GND
19	Reserved	20	Reserved
21	DETECT#	22	Reserved
23	RX+	24	+3.3V
25	RX-	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	TX-	32	SMB_DATA
33	TX+	34	GND
35	GND	36	Reserved
37	GND	38	Reserved
39	+3.3V	40	GND
41	+3.3V	42	Reserved
43	Reserved	44	Reserved
45	Reserved	46	Reserved
47	Reserved	48	+1.5V
49	Reserved	50	GND
51	MSATA_DETECT#	52	+3.3V

B.24 LVDS VESA, JEIDA format selection pin header (JLVDS_VCON1)



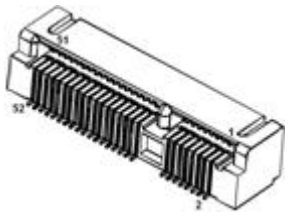
Pin	Signal
1	+3.3V
2	OPTION
3	GND

B.25 CMOS battery wafer box (BAT1)



Pin	Signal
1	BAT VCC
2	GND

B.26 MINIPCIE connector (MINIPCIE2)



Pin	Signal	Pin	Signal
1	WAKE#	2	+3.3Vaux
3	Reserved	4	GND
5	Reserved	6	+1.5V
7	CLKREQ#	8	UIM_PWR
9	GND	10	UIM_DATA
11	REFCLK-	12	UIM_CLK
13	REFCLK+	14	UIM_RESET
15	GND	16	UIM_VPP
17	Reserved	18	GND
19	Reserved	20	Reserved
21	DETECT#	22	PERST#
23	PCIE_RX-	24	+3.3Vaux
25	PCIE_RX+	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PCIE_TX-	32	SMB_DATA
33	PCIE_TX+	34	GND
35	GND	36	USB_D-
37	GND	38	USB_D+
39	+3.3Vaux	40	GND
41	+3.3Vaux	42	Reserved
43	V1.2_DETECT#	44	LED_WLAN#
45	Reserved	46	Reserved
47	Reserved	48	+1.5V
49	Reserved	50	GND
51	Reserved	52	+3.3Vaux

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