

AIMB-225

**AIMB-225 Mobile AMD G-series
Quad Core Mini-ITX with DVI-I/
LVDS/Display Port/eDP, 5COM
and Dual LAN**

Copyright

The documentation and the software included with this product are copyrighted 2014 by Advantech Co., Ltd. All rights are reserved. Advantech Co., Ltd. reserves the right to make improvements in the products described in this manual at any time without notice. No part of this manual may be reproduced, copied, translated or transmitted in any form or by any means without the prior written permission of Advantech Co., Ltd. Information provided in this manual is intended to be accurate and reliable. However, Advantech Co., Ltd. assumes no responsibility for its use, nor for any infringements of the rights of third parties, which may result from its use.

Acknowledgements

AMI is a trademark of American Megatrends Inc.

IBM and PC are trademarks of International Business Machines Corporation.

AMD G-series is trademark of AMD Corporation

Nuvoton is a trademark of Nuvoton Technology.

All other product names or trademarks are properties of their respective owners.

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

Brand	Size	Speed	Type	ECC	Vendor PN	Memory	Advantech PN	Result
Transcend	2GB	DDR3 1333	SODIMM DDR3	N	TS256MSK64 W3N	SEC 234 HYK0 K4B2G0846D		PASS
Apacer	4GB	DDR3 1333	SODIMM DDR3	N	78.B2GCV.AT 00C	MICRON 2XE22 D9QBJ	96SD3L-4G1333NN-AP	PASS
DSL	8GB	DDR3 1333	SODIMM DDR3	N	D3SE1208XL 15AB	ELPIDA J4208EBBG-GN-F		PASS
Apacer	8GB	DDR3 1333	SODIMM DDR3	N	78.C2GCV.AT 30C	2XE22 D9QBJ	96SD3L-8G1333NN-AP	PASS
Apacer	2GB	DDR3 1600	SODIMM DDR3	N	78.A2GCR.AT 00C	MICRON IYM22 D9PFJ (256x8)		PASS
Apacer	4GB	DDR3 1600	SODIMM DDR3	N	78.B2GCR.AF 10C	HYNIX H5TC2G83EFR		PASS
Apacer	4GB	DDR3 1600	SODIMM DDR3	N	78.B2GCZ.AT 00C	MICRON 2QE22 D9QBJ		PASS
Transcend	4GB	DDR3 1600	SODIMM DDR3	N	TS512MSK64 W6H	SEC 231 HYK0 K4B4G0846B	96SD3L-4G1600NN-TR	PASS
AQD	4GB	DDR3 1600	SODIMM DDR3	N	653555-0007	SEC 316 XYK0 K4B4G0846B	AQD-SD3L4GN16-SG	PASS
Apacer	8GB	DDR3 1600	SODIMM DDR3	N	78.C2GCZ.AT 30C	MICRON 2REI7 D9QBJ		PASS
DSL	8GB	DDR3 1600	SODIMM DDR3	N	D3SE1208XL 12AA	ELPIDA J4208EBBG-GN-F		PASS
ATP	8GB	DDR3 1600	SODIMM DDR3	N	AW24P64F8B LKOM	MICRON 2YE77 D9QBJ		PASS
AQD	8GB	DDR3 1600	SODIMM DDR3	N	653559-0021	SEC 316 XYK0 K4B4G08460	AQD-SD3L8GN16-SG	PASS
AQD	8GB	DDR3 1600	SODIMM DDR3	N	6657223-0463	SEC 401 HYKO K484G0846B	AQD-SD3L8GN16-SG	PASS
AQD	8GB	DDR3 1600	SODIMM DDR3	N	TS9KRH3080 0	MICRON 2UD27 D9PCP	AQD-SD3L8GN16-MG	PASS
AQD	2GB	DDR3 1600	SODIMM DDR3	N	665205-0397	SEC 310 XYKO K4B2G084GD	AQD-SD3L2GN16-SQ	PASS
AQD	2GB	DDR3 1600	SODIMM DDR3	N	20140350469 1	HYNIX H5TC2G83EFR	AQD-SD3L2GN16-HQ	PASS
AQD	4GB	DDR3 1600	SODIMM DDR3	N	665723-0556	SEC 401 XYKO K4B4G0846B	AQD-SD3L4GN16-SG	PASS

Ordering Information

Part Number	CPU	Display	TPM	GbE	SATA	COM	Thermal Solution
AIMB-225G2-00A1E	GX-424CC	DVI-I/eDP, DP++/LVDS	(1)	2	2	5	Active
AIMB-225G2-01A1E	GX-412HC	DVI-I/eDP, DP++/LVDS	(1)	2	2	5	Passive

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-225 AMD R-series mini-ITX motherboard
- 1 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 Driver CD
- 1 x Warranty card
- 1 x CPU cooler for AIMB-225G2-00A1E
- 1 x CPU heatsink for AIMB-225G2-01A1E

If any of these items are missing or damaged, contact your distributor or sales representative immediately. We have carefully inspected the AIMB-225 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-225, 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

1.1	Introduction	2
1.2	Features	2
1.3	Specifications	3
1.3.1	Processor System	3
1.3.2	Expansion Slot	3
1.3.3	Memory	3
1.3.4	Graphic Interface	3
1.3.5	Ethernet Interface	3
1.3.6	SATA Interface	3
1.3.7	EIDE	3
1.3.8	Rear I/O	4
1.3.9	Internal Connector	4
1.3.10	Watchdog Timer	4
1.3.11	Power Requirement	4
1.3.12	Environment	4
1.3.13	Physical Characteristics	4
1.4	Jumpers and Connectors	5
	Table 1.1: Connector / Header List	5
	Table 1.2: ATX_5V1	6
	Table 1.3: EDP1	6
	Table 1.4: INV2	7
	Table 1.5: LVDS1	7
	Table 1.6: AMPJ1	8
	Table 1.7: FP_AUDIO1	8
	Table 1.8: INV1	8
	Table 1.9: SPDIF_OUT1	8
	Table 1.10: COM1	9
	Table 1.11: USB56	9
	Table 1.12: USB78	9
	Table 1.13: COM2345	9
	Table 1.14: SATA_PWR1, SATA_PWR2	10
	Table 1.15: JFP3	11
	Table 1.16: GPIO1	11
	Table 1.17: LPT1	11
	Table 1.18: CPUFAN1, SYSFAN1	12
	Table 1.19: JFP1+JFP2	12
1.5	Board layout: Jumper and Connector Locations	13
	Figure 1.1 Jumper and Connector Location	13
1.6	AIMB-225 Board Diagram	14
	Figure 1.2 AIMB-225 Board Diagram	14
1.7	Safety Precautions	15
1.8	Jumper Settings	16
1.8.1	How to Set Jumpers	16
1.8.2	CMOS Clear (CMOS1)	16
	Table 1.20: CMOS1	16
1.8.3	PSON1: ATX, AT Mode Selector	16
	Table 1.21: PSON1: ATX, AT Mode Selector	16
1.9	System Memory	17
1.10	Memory Installation Procedures	17

Chapter 2 Connecting Peripherals 19

2.1	Introduction	20
-----	--------------------	----

2.2	LAN Ports and USB Ports (LAN1, LAN1_1, USB12, USB34, USB56, USB78)	20
	Table 2.1: LAN LED Indicator	20
2.3	DVI-I / DP Connector (DVI_D1, DP1)	21
2.4	Serial Ports (COM1, COM2345)	22
2.5	CPU Fan Connector (CPUFAN1)	23
2.6	System Fan Connector (SYSFAN1)	23
2.7	Front Panel Connectors (JFP1+JFP2)	24
	2.7.1 ATX soft power switch (JFP1/PWR_BTN)	24
	2.7.2 Reset (JFP1/RST_BTN)	24
	2.7.3 HDD LED (JFP2/HDD_LED)	24
	2.7.4 External speaker (JFP2/SPEAKER)	24
	2.7.5 Power LED and keyboard lock connector (JFP3 / PWR_LED & KEY LOCK)	25
	Table 2.2: ATX pwr supply LED status (No AT power support)	25
2.8	Line Out Connector (AUDIO1)	25
2.9	Serial ATA Interface (SATA1, SATA2) & SATA power Connector (SATA_PWR1, SATA_PWR2)	26
2.10	PCI Express x4 (PCIEX4_1)	26
2.11	ATX 12V/DCIN 12V Power Connector (ATX12V1/DCIN1)	27
2.12	SPI Flash connector (SPI_CN1)	27
2.13	LVDS Backlight Inverter Power Connector (INV1, JVBR1)	28
2.14	LVDS Connector (LVDS1)	29
2.15	General purpose I/O Connector (GPIO1)	29
2.16	PS/2 Keyboard and Mouse Connector (KBMS1)	30
2.17	Digital Audio Connector (SPDIF_OUT1)	30
2.18	Front Headphone Connector (FP_AUDIO1)	31
2.19	LPT Connector (LPT1)	32
2.20	eDP Backlight Inverter Power Connector (INV2, JVBR2)	32
2.21	eDP Connector (EDP1)	33
2.22	Full / Half Size Mini PCI Express Slot (MINI_PCIE1, MINI_PCIE2)	33

Chapter 3 BIOS Operation 35

3.1	Introduction	36
3.2	BIOS Setup	36
	3.2.1 Main Menu	37
	3.2.2 Advanced BIOS Features	38
	3.2.3 Chipset	49
	3.2.4 Boot	53
	3.2.5 Security	54
	3.2.6 Save & Exit	55

Chapter 4 Software Introduction & Service 57

4.1	Introduction	58
4.2	Value-Added Software Services	58
	4.2.1 Software API	58
	4.2.2 Software Utility	60

Chapter 5 Chipset Software Installation Utility 61

5.1	Before You Begin	62
5.2	Introduction	62
5.3	Windows 7 Driver Setup	63

Chapter 6	Graphics Setup	65
6.1	Introduction	66
6.2	Windows 7/8.1	66
Chapter 7	LAN Configuration.....	67
7.1	Introduction	68
7.2	Features	68
7.3	Installation	68
7.4	Windows 7/8.1 Driver Setup.....	69
Appendix A	Programming the Watchdog Timer..	71
A.1	Programming the Watchdog Timer	72
A.1.1	Watchdog Timer Overview.....	72
A.1.2	Programming the Watchdog Timer	72
	Table A.1: Watchdog Timer Registers	74
A.1.3	Example Program	75
Appendix B	I/O Pin Assignments	79
B.1	USB Header (USB56, USB78).....	80
	Table B.1: USB Header (USB56, USB78)	80
B.2	DVI-I Connector (DVI-I).....	80
	Table B.2: DVI-I Connector (DVI_D1).....	80
B.3	RS-232 Interface (COM2345)	81
	Table B.3: RS-232 Interface (COM2345).....	81
B.4	SPI Flash Connector (SPI_CN1).....	82
	Table B.4: CN4: SPI Fresh Card Pin Connector	82
B.5	CPU Fan Power Connector (CPUFAN1)	82
	Table B.5: CPU Fan Power Connector (CPUFAN1)	82
B.6	System Fan Power Connector (SYSFAN1)	82
	Table B.6: System Fan Power Connector (SYSFAN1).....	82
B.7	Power LED & Keyboard Lock Connector (JFP3)	83
	Table B.7: Power LED & Keyboard Lock Connector (JFP3).....	83
B.8	Power switch/HDD LED/SMBus/Speaker (JFP1+JFP2)	83
	Table B.8: Power Switch/HDD LED/SMBus/Speaker (JFP1+JFP2)	83
B.9	USB & LAN Connector (USB12, USB34, LAN1_1).....	84
	Table B.9: USB 3.0 Port (USB12).....	84
	Table B.10:USB 2.0 Port (USB34).....	84
	Table B.11:Ethernet 10/100/1000 Mbps RJ-45 Port	84
B.10	Line Out Connector (AUDIO1)	84
B.11	Serial ATA Connector (SATA1, SATA2)	85
	Table B.12:Serial ATA Connector (SATA1, SATA2).....	85
B.12	AT/ATX Mode (PSON1)	85
	Table B.13:AT/ATX Mode (PSON1)	85
B.13	GPIO Pin Header (GPIO1).....	85
	Table B.14:GPIO Pin Header (GPIO1)	85
B.14	LVDS Connector (LVDS1)	86
	Table B.15:LVDS1 Connector.....	86
B.15	LVDS Inverter (INV1)	86
	Table B.16:LVDS Inverter (INV1).....	86
B.16	eDP Inverter (INV2).....	87
	Table B.17:eDP Inverter (INV2)	87
B.17	ATX 12V connector (ATX12V1)	87

Table B.18:ATX 12 V connector (ATX12V1) 87

Chapter 1

General Information

1.1 Introduction

AIMB-225 is a new industrial-grade Mini-ITX motherboard based on the AMD eKabini Quad core/Dual core processors, resulting in ultra lower power consumption down to 5 watts TDP and up to 53% better graphics performance compared to previous G-Series SOC solutions. Designed with rich I/O functions and dual display support, AIMB-225 is ideal for any rugged applications such as ATM/Kiosks, automation, medical equipment, gaming machines etc. With the pre-loaded remote management software – SUSIAccess, AIMB-225 not only saves development cost but also enhances system management efficiency.

1.2 Features

- **Rich I/O connectivity:** 5 serial ports, 6 USB 2.0, 2 USB3.0, 2 SATA III, Dual GbE LAN
- **Standard Mini-ITX form factor with low height:** The AIMB-225 is a low-profile Mini-ITX motherboard to support 1U chassis
- **Wide selection of storage devices:** SATA HDD, CFast, 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™ R5E/R3E Graphics, Support DirectX® 11.1 and OpenGL 4.2

1.3 Specifications

1.3.1 Processor System

- **CPU:** AMD G-series system-on-chip (SOC), support Quad core CPU up to 2.4 GHz
- **Max. Speed:** Quad Core 2.4 GHz (TDP 25 W)/ Quad Core 1.2 GHz (TDP 7 W)
- **L2 Cache:** 2 MB
- **BIOS:** AMI 16 Mbit SPI

1.3.2 Expansion Slot

- **Mini-PCle:** 2
- **PCle x4:** 1

1.3.3 Memory

- **Technology:** Single channel DDR3 1333/1600 MHz
- **Max. Capacity:** 16 GB
- **Socket:** 2 x 204 pin SODIMM

1.3.4 Graphic Interface

- **Controller:** AMD Radeon™ R5E/R3E Graphics
- **VRAM:** None
- **DVI-I:** 1, supports up to SXGA 1920 x 1200, colay eDP
- **LVDS:** 1, supports dual channel 48-bit up to 1920 x 1200, colay DP 1.2 port
- **DP 1.2:** 1, supports DP++, resolution up to 2560 x 1600 x 24bpp @ 60 Hz, colay LVDS (optional)
- **Dual Display:** DVI-I+LVDS, DVI-I+DP, eDP+LVDS and eDP+DP, supports extended mode and clone mode

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:** 2

1.3.7 EIDE

- **Mode:** None
- **Channel:** None

1.3.8 Rear I/O

- **DVI-I:** 1
- **DP:** 1
- **Ethernet:** 2
- **USB:** 4 (2USB2.0 & 2USB3.0)
- **Audio:** 1 (supports Line out, converts to Mic in or Line in)
- **DC jack:** 1 (2.5 mm)

1.3.9 Internal Connector

- **LVDS & Inverter:** 1
- **USB:** 4 (USB 2.0 compliant)
- **Serial:** 5 (4 x RS-232, 1 x RS-232/422/485; COM 1 support RS-232/422/485 auto flow control; COM 5 support 5 V/12 V by jumper selection)
- **IDE:** None
- **SATA:** 2
- **SATA Power Connector:** 2
- **GPIO:** 8-bit
- **Mini PCIE slot:** 2miniPCIE slot, F/S support mSATA; H/S support wifi-module only
- **eDP:** 1
- **Parallel:** 1
- **PS/2 KB & MS:** 1

1.3.10 Watchdog Timer

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

1.3.11 Power Requirement

- **Typical:**
 - Single Voltage 12 V DC input by 1 x External DC phone Jack or 1 x Internal 2x2-pin Power Connector;
 - AT/ATX Supported by Jumper
 - Max power consumption: 22.63 W (16 G DDR3 RAM)

1.3.12 Environment

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

1.3.13 Physical Characteristics

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

1.4 Jumpers and Connectors

Connectors on the AIMB-225 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	DC-IN adaptor connector	DCIN1
2	Display Port connector	DP1
3	eDP panel voltage selection	JLVDS3+JLVDS4
4	DVI-I connector	DVI_D1
5	Serial ATA interface connector	SATA2
6	SATADOM power pin header	JSATAPWR1
7	Serial ATA interface connector	SATA1
8	CMOS battery wafer box	BAT1
9	System fan control mode selection	JSYSFAN1
10	USB3.0 * 2 stack connector	USB12
11	SPI BIOS socket	BIOS_1
12	USB2.0 * 2 stack connector	USB34
13	COM1 box header	COM1
14	Watchdog timer output and OBS beep	JWDT1+JOBS1
15	RJ45(LAN1+LAN2) connector	LAN1_1
16	SPDIF interface pin header	SPDIF_OUT1
17	HD Analog Audio Interface	AUDIO1
18	Front panel audio pin header	FP_AUDIO1
19	Audio amplifier output pin header	AMPJ1
20	PCI-Express x4 slot	PCIEX4_1
21	LVDS VESA, JEIDA format selection pin header	VCON1
22	LVDS panel connector	LVDS1
23	Dual port USB2.0 pin header	USB56
24	LVDS panel voltage selection	JLVDS1+JLVDS2
25	COM5 RI# selection pin header	JSETCOM5_V1
26	LVDS Backlight inverter power connector	INV1
27	8-bits General Purpose I/O pin header	GPIO1
28	COM2 ~ COM5 box header	COM2345
29	AT/ATX Mode selection	PSON1
30	ATX Power supply(5VSB) connector	ATX_5V1
31	COM1 RS232,RS422,RS485 selection pin header	JSETCOM1
32	SATA power connector	SATA_PWR1
33	CPU fan control mode selection	JCPUFAN1
34	System fan connector	SYSFAN1
35	Case open selection pin header	JCASEOP_SW1
36	Case open pin header	JCASE1
37	PS/2 keyboard and PS/2 mouse connector	KBMS1

38	MINIPCIIE connector	MINI_PCIE2
39	MINIPCIIE, mSATA connector	MINI_PCIE1
40	CPU fan connector	CPUFAN1
41	Low pin count interface header	LPC1
42	BIOS flash pin header	SPI_CN1
43	RTC reset pin header	CMOS1
44	SATA Power connector	SATA_PWR2
45	Dual port USB2.0 pin header	USB78
46	EDP backlight inverter power connector	INV2
47	eDP connector	eDP1
48	Power LED and keyboard lock pin header	JFP3
49	Power switch/HDD LED/SMBus/Speaker pin header	JFP1+JFP2
50	Internal parallel port connector	LPT1
51	eDP Backlight inverter power connector	JVBR2
52	ATX 12V power supply connector	ATX12V1
53	SIM Card holder	SIM1
54	RS-485 terminal resistor jumper	J485T
55	RS-422 terminal resistor jumper	J422T
56	Buzzer	SP1
57	LVDS backlight inverter power connector	JVBR1

Table 1.2: ATX_5V1

PIN	PIN_NAME
1	+5VSB_IN
2	GND
3	PS_ON#

Table 1.3: EDP1

PIN	PIN_NAME
1	EDP_DET_R
2	GND
3	EDP_TX0_C_N
4	EDP_TX3_C_N
5	EDP_TX0_C_P
6	EDP_TX3_C_P
7	GND
8	NC
9	EDP_TX1_C_N
10	GND
11	EDP_TX1_C_P
12	EDP_AUX1_C_N
13	GND
14	EDP_AUX1_C_P
15	EDP_TX2_C_N
16	GND
17	EDP_TX2_C_P

Table 1.3: EDP1

18	EDP_HPD_C
19	VDD_EDP
20	VDD_EDP

Table 1.4: INV2

PIN	PIN_NAME
1	+12 V
2	GND
3	BL_EN_EDP
4	BL_ADJ
5	+5 V

Table 1.5: LVDS1

PIN	PIN_NAME
1	VDD_LVDS
2	VDD_LVDS
3	LVDS_DET#
4	GND
5	VDD_LVDS
6	VDD_LVDS
7	LVDS_L0_N
8	LVDS_U0_N
9	LVDS_L0_P
10	LVDS_U0_P
11	GND
12	GND
13	LVDS_L1_N
14	LVDS_U1_N
15	LVDS_L1_P
16	LVDS_U1_P
17	GND
18	GND
19	LVDS_L2_N
20	LVDS_U2_N
21	LVDS_L2_P
22	LVDS_U2_P
23	GND
24	GND
25	LVDS_CLKL_N
26	LVDS_CLKU_N
27	LVDS_CLKL_P
28	LVDS_CLKU_P
29	GND
30	GND
31	LVDS_CH7511_DDC_CLK

Table 1.5: LVDS1

32	LVDS_CH7511_DDC_DATA
33	GND
34	GND
35	LVDS_L3_N
36	LVDS_U3_N
37	LVDS_L3_P
38	LVDS_U3_P
39	LVDS_BL_EN
40	VCON

Table 1.6: AMPJ1

PIN	PIN_NAME
1	AMP_L-
2	AMP_L+
3	AMP_R-
4	AMP_R+

Table 1.7: FP_AUDIO1

PIN	PIN_NAME
1	MIC2L
2	AGND
3	MIC2R
4	Pull up to 3.3V
5	LINE2R
6	MIC2-JD
7	SENSEB
8	
9	LINE2L
10	LINE2-JD

Table 1.8: INV1

PIN	PIN_NAME
1	+12V
2	GND
3	BL_EN_EDP
4	BL_ADJ
5	+5V

Table 1.9: SPDIF_OUT1

PIN	PIN_NAME
------------	-----------------

Table 1.9: SPDIF_OUT1

1	+5V
2	X
3	SPDIF_O
4	GND

Table 1.10: COM1

PIN	PIN_NAME
1	COM1_DCD#
2	COM1_DSR#
3	COM1_SIN
4	COM1_RTS#
5	COM1_SOUT
6	COM1_CTS#
7	COM1_DTR#
8	COM1_RI#
9	GND

Table 1.11: USB56

PIN	PIN_NAME
1	USBV56
2	USBV56
3	USB_CM_N4
4	USB_CM_N5
5	USB_CM_P4
6	USB_CM_P5
7	GND
8	GND
10	GND

Table 1.12: USB78

PIN	PIN_NAME
1	USBV78
2	USBV78
3	USB_CM_N6
4	USB_CM_N7
5	USB_CM_P6
6	USB_CM_P7
7	GND
8	GND
10	GND

Table 1.13: COM2345

PIN	PIN_NAME
1	COM2_DCD#

Table 1.13: COM2345

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

Table 1.14: SATA_PWR1,SATA_PWR2

PIN	PIN_NAME
1	+5V

Table 1.14: SATA_PWR1,SATA_PWR2

2	GND
3	GND
4	+12V

Table 1.15: JFP3

PIN	PIN_NAME
1	POWER_LED+
2	X
3	POWER_LED-
4	FRP_KEYLOCK#
5	GND

Table 1.16: GPIO1

PIN	PIN_NAME
1	SIO_GPIO0
2	SIO_GPIO4
3	SIO_GPIO1
4	SIO_GPIO5
5	SIO_GPIO2
6	SIO_GPIO6
7	SIO_GPIO3
8	SIO_GPIO7
9	VCC_GPIO
10	GND

Table 1.17: LPT1

PIN	PIN_NAME
1	LPT1_A_STB#
2	LPT1_AFD#
3	LPT1_A_PD0
4	LPT1_ERR#
5	LPT1_A_PD1
6	LPT1_INIT#
7	LPT1_A_PD2
8	LPT1_SLIN#
9	LPT1_A_PD3
10	GND
11	LPT1_A_PD4
12	GND
13	LPT1_A_PD5
14	GND
15	LPT1_A_PD6
16	GND
17	LPT1_A_PD7

Table 1.17: LPT1

18	GND
19	LPT1_ACK#
20	GND
21	LPT1_BUSY
22	GND
23	LPT1_PE
24	GND
25	LPT1_SLCT

Table 1.18: CPUFAN1,SYSFAN1

PIN	PIN_NAME
1	GND
2	VCC
3	FEEDBACK
4	PWM

Table 1.19: JFP1+JFP2

PIN	PIN_NAME
1	+5V
2	HDDLED+
3	Power Button+
4	NC
5	HDDLED-
6	Power Button-
7	SPK_P3
8	SMB_DATA
9	System Reset+
10	SPK_P4
11	SMB_CLK
12	System Reset

1.5 Board layout: Jumper and Connector Locations

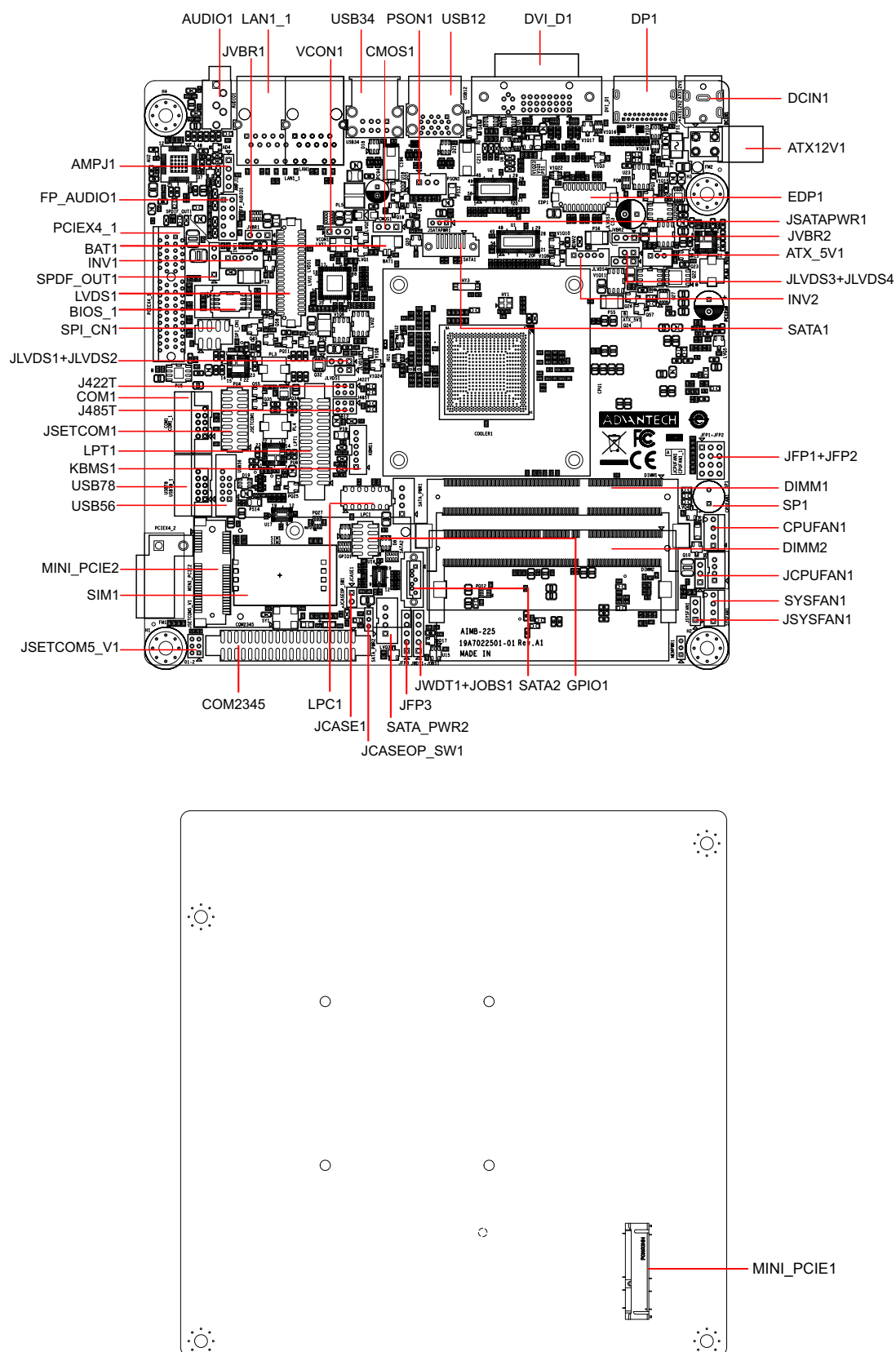


Figure 1.1 Jumper and Connector Location

1.6 AIMB-225 Board Diagram

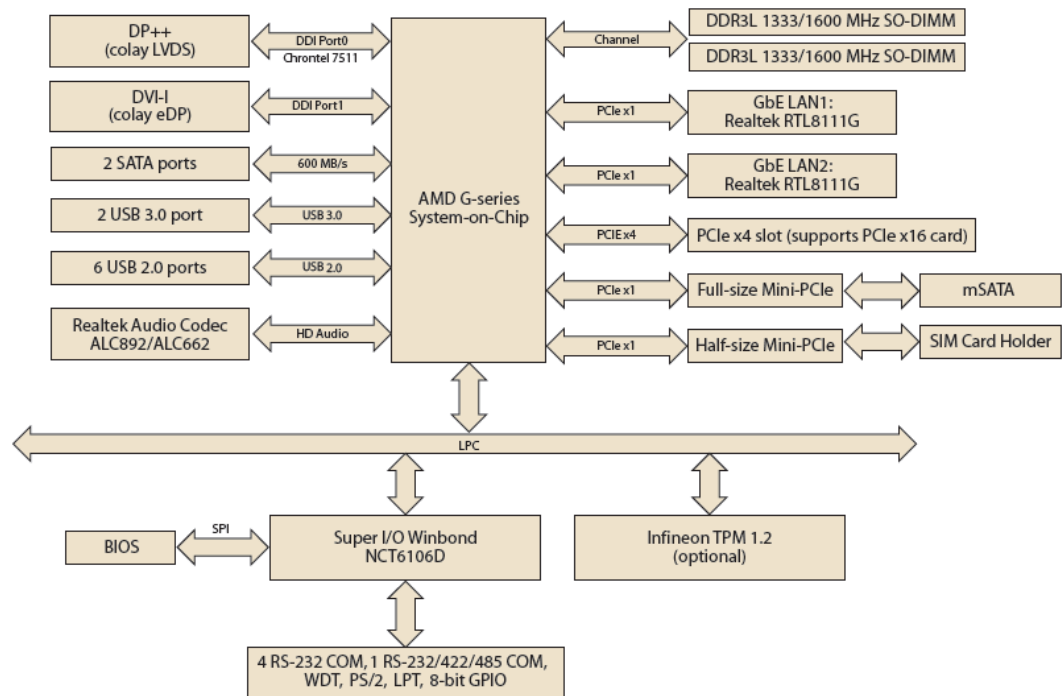


Figure 1.2 AIMB-225 Board Diagram

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 manufacturer. 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.

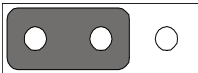
1.8.1 How to Set Jumpers

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 (CMOS1)

The AIMB-225 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.

Table 1.20: CMOS1

Function	Jumper Setting
*Keep CMOS data	 1-2 closed
Clear CMOS data	 2-3 closed

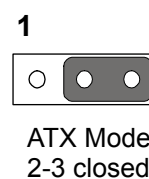
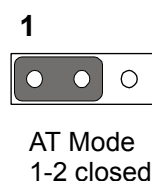
* Default

1.8.3 PSON1: ATX, AT Mode Selector

Table 1.21: PSON1: ATX, AT Mode Selector

Closed Pins	Result
1-2	AT Mode
2-3*	ATX Mode

*Default



1.9 System Memory

The AIMB-225 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-225 does not support ECC (error checking and correction) memory.

1.10 Memory Installation Procedures

To install SODIMMs, first make sure the handle 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 by the mechanism.

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, LAN1_1, USB12, USB34, USB56, USB78)

The AIMB-225 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-225 is equipped with two high-performance 1000 Mbps Ethernet LAN adapter, which are supported by all major network operating systems. The RJ-45 jacks on the rear panel provide for convenient LAN connection.

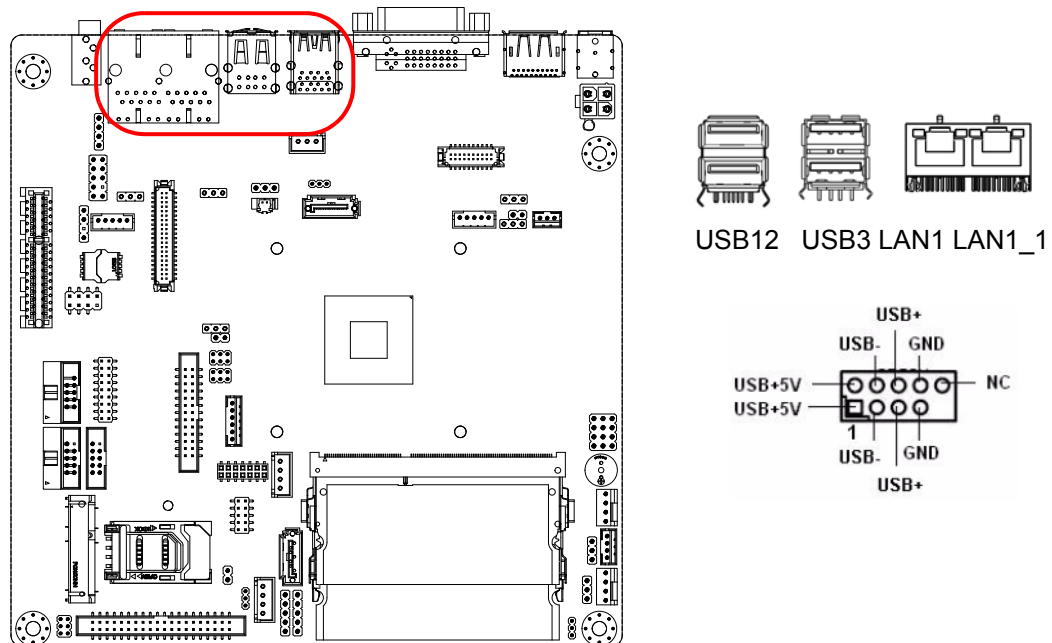
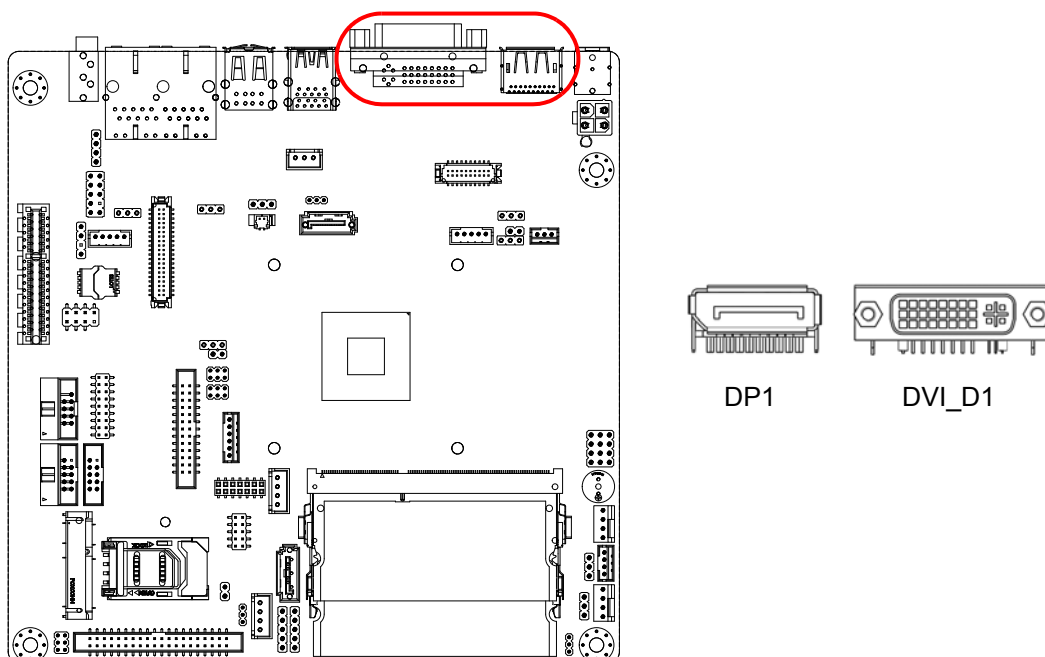


Table 2.1: LAN LED Indicator

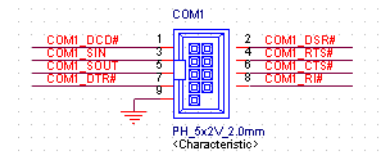
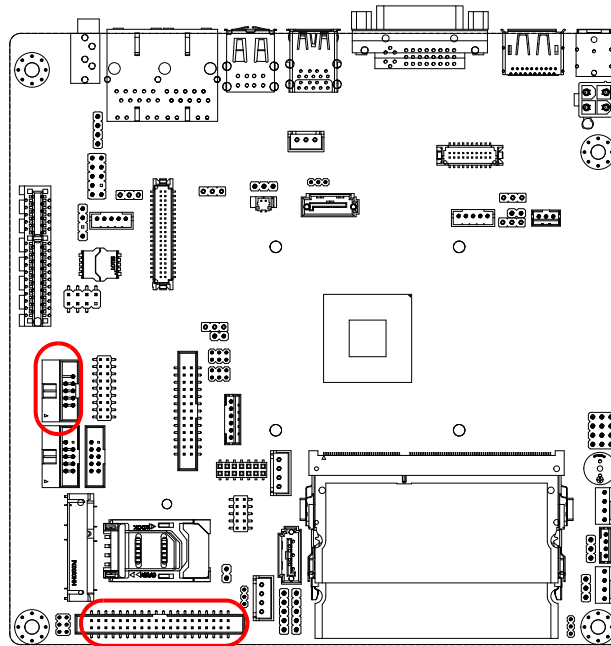
LAN Mode	LAN Indicator	
LAN1 indicator	LED1 (Right)	off for mal-link; Link (On) / Active (Flash)
	LED2 (Left)	100 Mbps (On) / 10 Mbps (Off)
	LED2 (Left)	1000 Mbps (On)
LAN2 indicator	LED1 (Right)	off for mal-link; Link (On) / Active (Flash)
	LED2 (Left)	100 Mbps (On) / 10 Mbps (Off)
	LED2 (Left)	1000 Mbps (On)

2.3 DVI-I / DP Connector (DVI_D1, DP1)

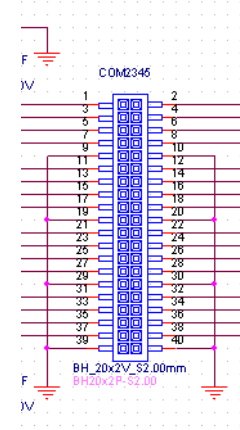


The AIMB-225 includes one DP++, which can support DP outputs and convert to HDMI through DP-to-HDMI cables, and one DVI-I, which can drive conventional VGA and DVI-D display interfaces. Pin assignments for DP++ and DVI-I are detailed in Appendix B.

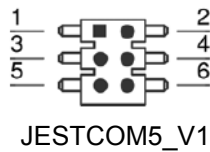
2.4 Serial Ports (COM1, COM2345)



COM1



COM2345

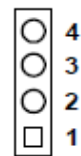
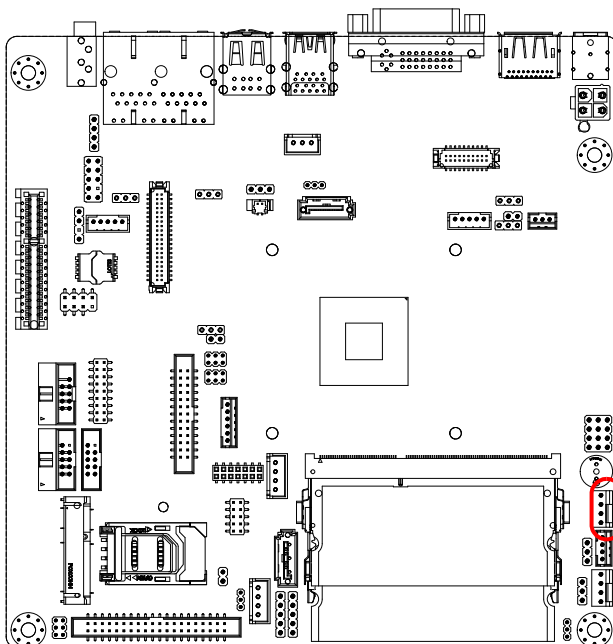


Serial Ports Voltage Select

1-2: Ring
3-4: +5V
5-6: +12V
(DEFAULT: 1-2)

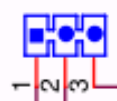
AIMB-225 supports five serial ports. Box header COM1 support RS-232/422/485 auto flow control function. Pin header COM2~5 support RS-232 and COM5 support 5V/12V by jumper selection. These ports can connect to serial devices, like a thermal printer, or to a communication network. The IRQ and address ranges 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.

2.5 CPU Fan Connector (CPUFAN1)



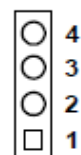
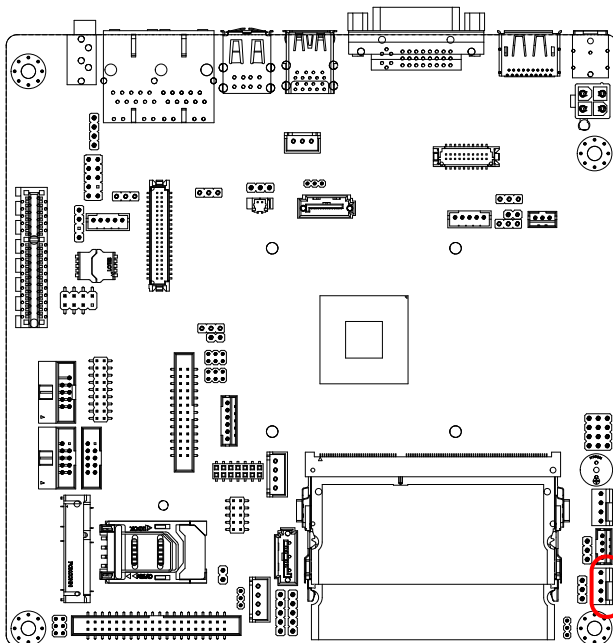
CPUFAN1

JCPUFAN1



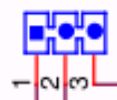
If a fan is used, this connector supports cooling fans of 500 mA (6 W) or less.

2.6 System Fan Connector (SYSFAN1)



SYSFAN1

JSYSFAN1



If a fan is used, this connector supports cooling fans of 500 mA (6 W) or less.

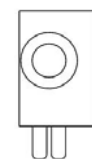
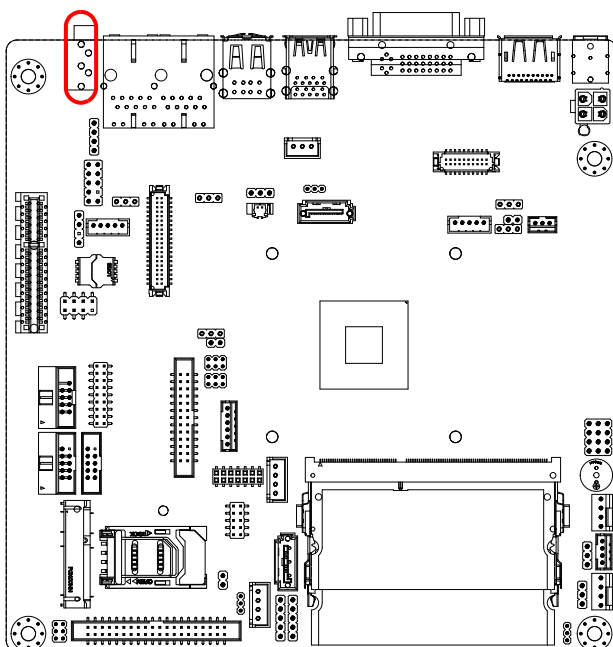
2.7.5 Power LED and keyboard lock connector (JFP3 / PWR_LED & KEY LOCK)

(JFP3 / 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 Power LED cable should be connected to pin 1-3. The key lock button cable should be connected to pin 4-5. There are 3 modes for the power supply connection. 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 2.2: ATX pwr supply LED status (No AT power support)

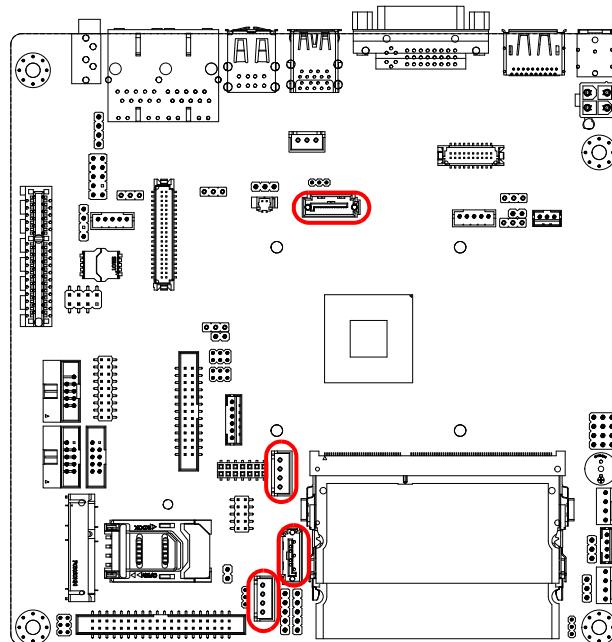
Power mode	LED (ATX Power Mode) (On/off by momentary button)	LED (AT power Mode) (On/off by switching power supply)	LED (AT power Mode) (On/off by front panel switch)
PSON1 (on back plane) jumper setting	pins 2-3 closed	pins 1-2 closed	Connect pins 1 & 2 to panel switch via cable
System On	On	On	On
System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

2.8 Line Out Connector (AUDIO1)

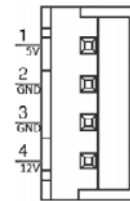


Line out

2.9 Serial ATA Interface (SATA1, SATA2) & SATA power Connector (SATA_PWR1, SATA_PWR2)



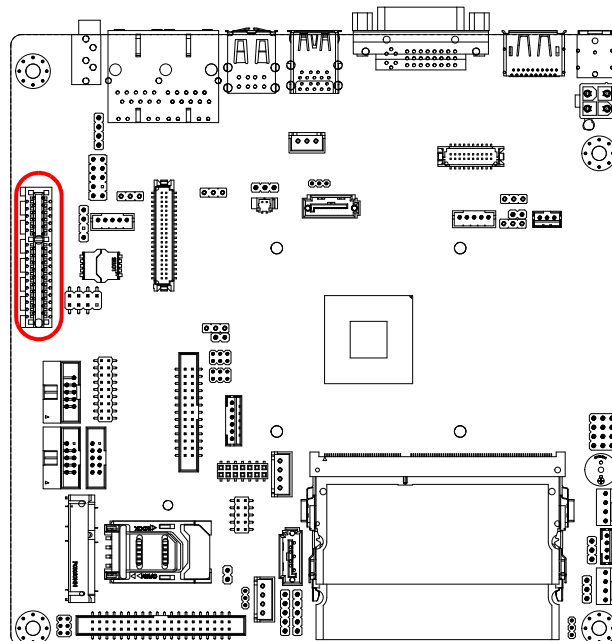
SATA1, SATA2



SATA_PWR1, SATA_PWR2

AIMB-225 features a high performance Serial ATA interface (up to 600 MB/s) which eases cabling to hard drives with long, thin cables.

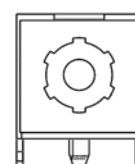
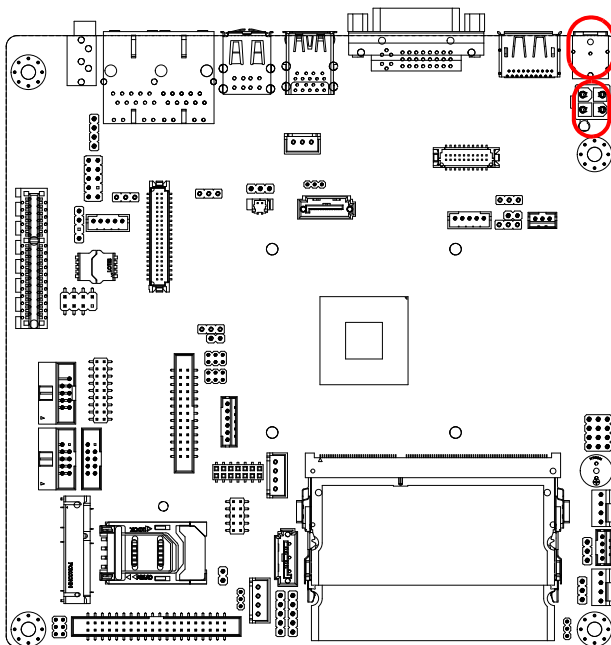
2.10 PCI Express x4 (PCIEX4_1)



AIMB-225 provides 1x PCI express x4 slot.

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

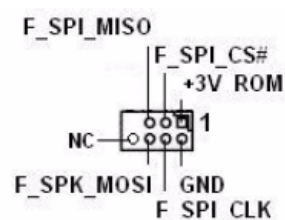
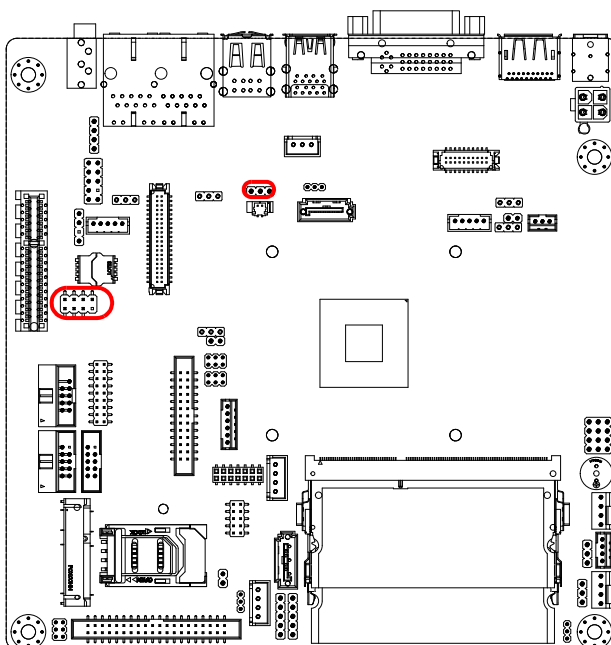
This connector is for an ATX Micro-Fit power supply. The plugs from the power supply are designed to fit these connectors in only one direction. Determine the proper orientation and push down firmly until the connectors mate completely.



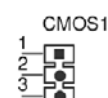
DCIN1

2.12 SPI Flash connector (SPI_CN1)

The SPI flash card pin header may be used to flash BIOS if the AIMB-225 cannot power on.

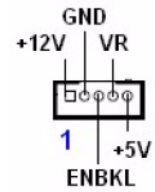
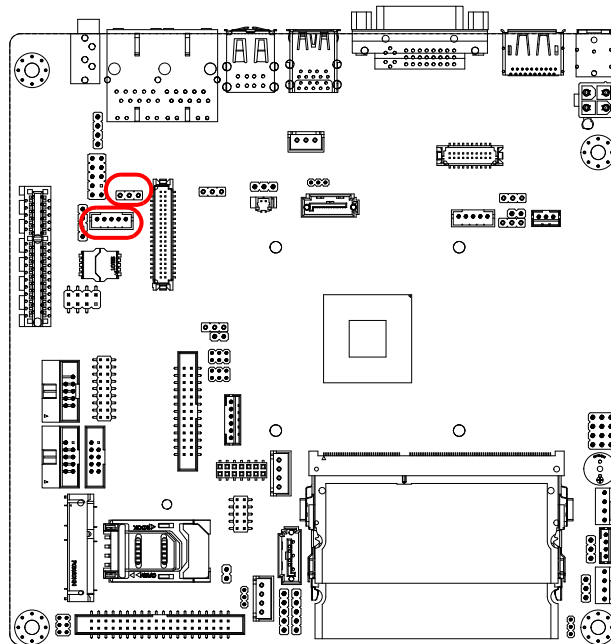


Clean CMOS(CMOS1)
Clean CMOS and reset RTC



CMOS1: 1-2 Keep CMOS data*
3-4 Clean CMOS

2.13 LVDS Backlight Inverter Power Connector (INV1, JVBR1)

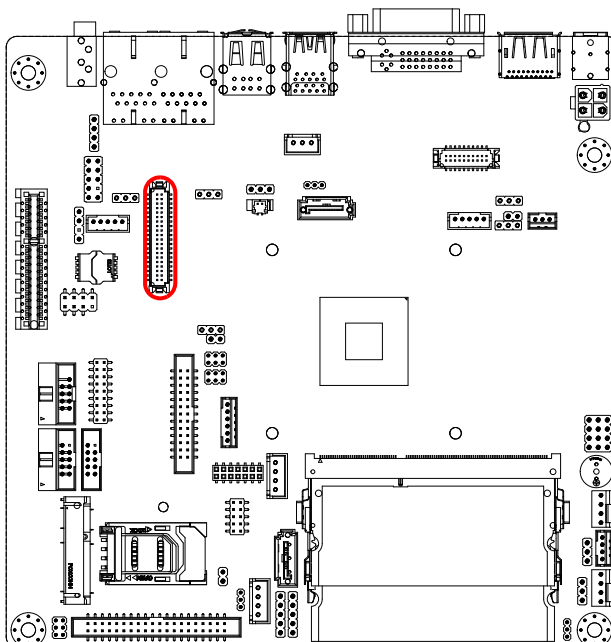


INV1



JVBR1: LCD backlight control
DC mode: 1-2
PWM mode: 2-3
(DEFAULT: 1-2)

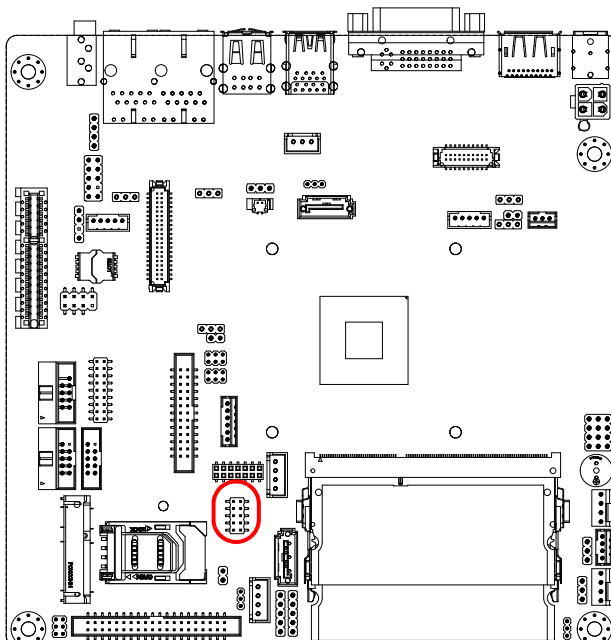
2.14 LVDS Connector (LVDS1)



LVDS 1

VDDSAFE_1		VDDSAFE_2	
GND_1		GND_7	
VDDSAFE_3		VDDSAFE_4	
OD0-		ED0-	
OD0+		ED0+	
GND_2		GND_8	
OD1-		ED1-	
OD1+		ED1+	
GND_3		GND_9	
OD2-		ED2-	
OD2+		ED2+	
GND_4		GND_10	
OCK-		ECK-	
OCK+		ECK+	
GND_5		GND_11	
DDC_CLK		DDC_DAT	
GND_6		GND_12	
NC		NC	
NC		NC	
HPLG		VCON	

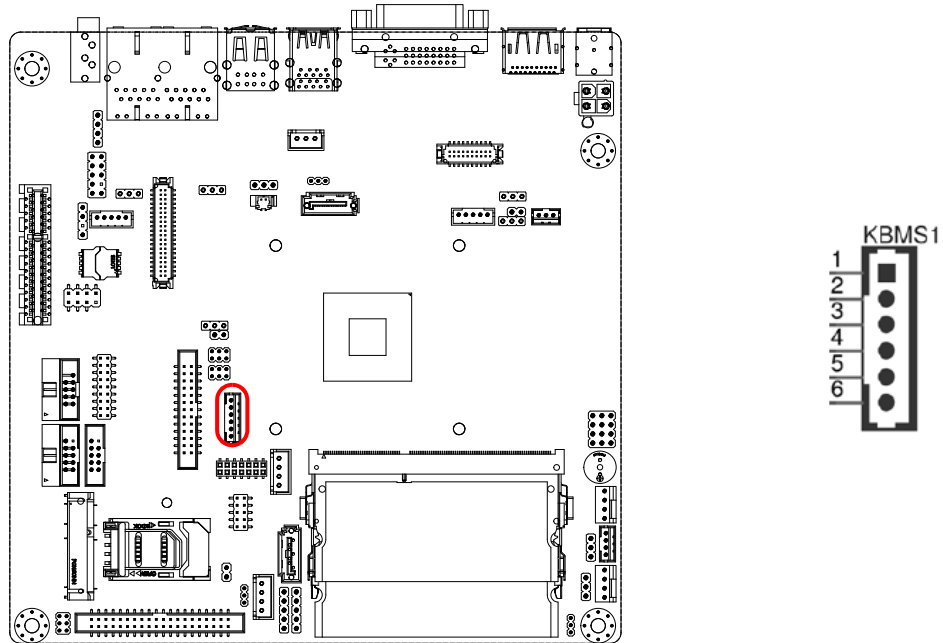
2.15 General purpose I/O Connector (GPIO1)



1

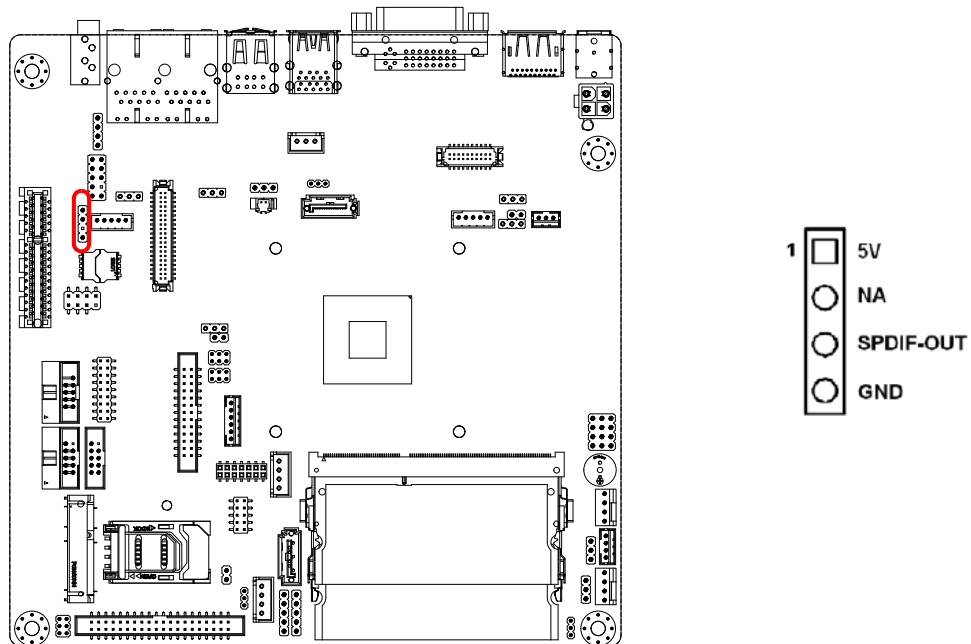
GPI00		GPI04
GPI01		GPI05
GPI02		GPI06
GPI03		GPI07
+5V		GND

2.16 PS/2 Keyboard and Mouse Connector (KBMS1)



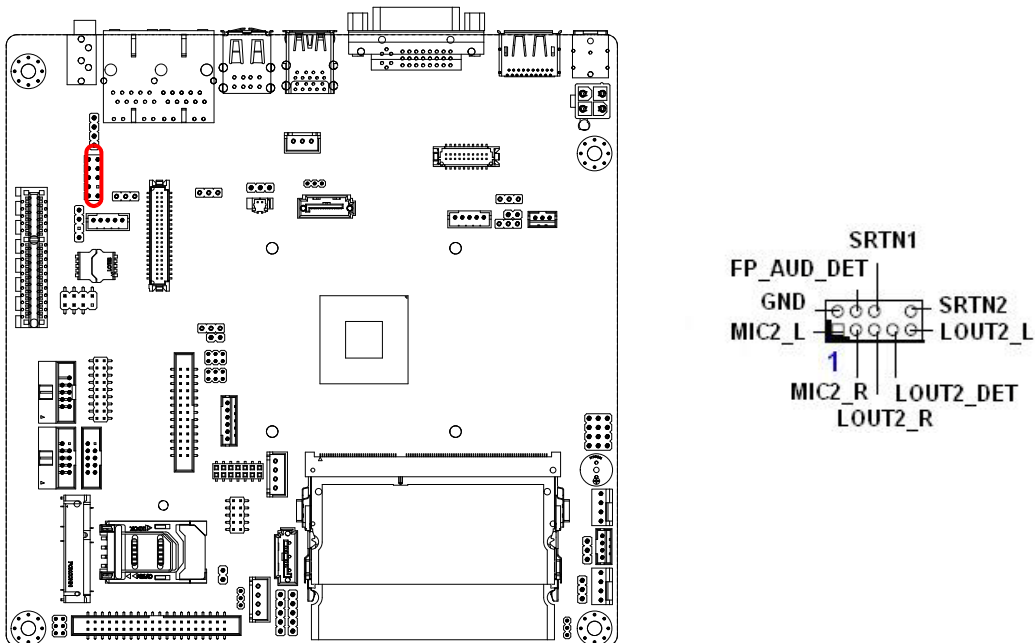
6-pin wafer box connectors (KBMS1) on the motherboard provide connection to a PS/2 keyboard and a PS/2 mouse, respectively.

2.17 Digital Audio Connector (SPDIF_OUT1)



2.18 Front Headphone Connector (FP_AUDIO1)

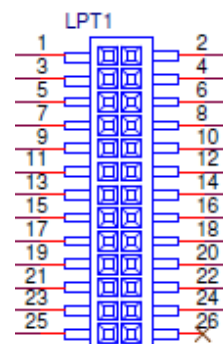
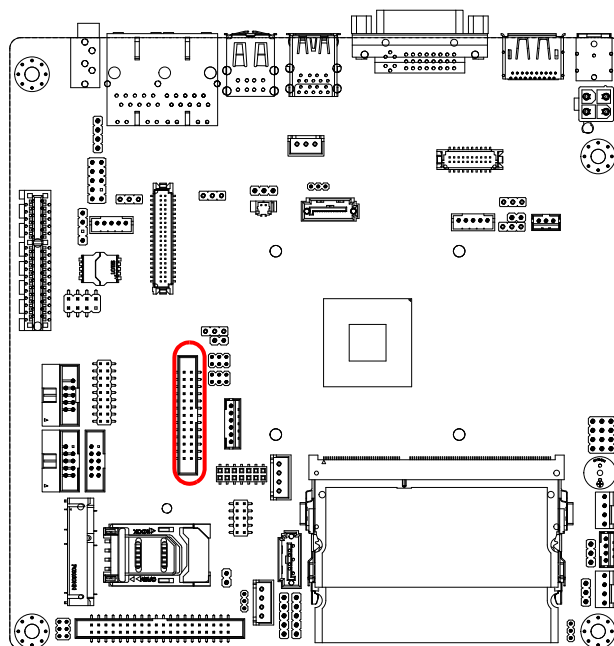
This connector is for a chassis-mounted front panel audio I/O module that supports either HD Audio or legacy AC'97 (optional) audio standard. Connect this connector with the front panel audio I/O module cable.



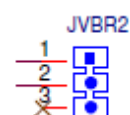
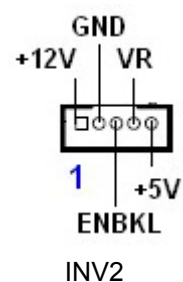
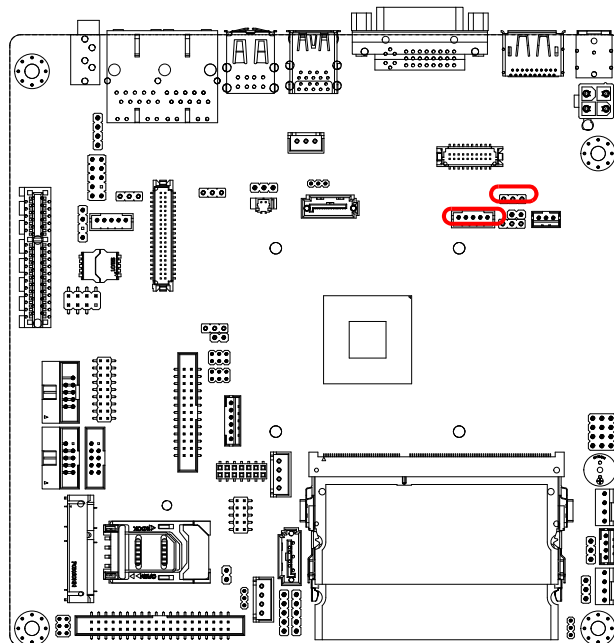
Note! *For motherboards with the optional HD Audio feature, we recommend that you connect a high-definition front panel audio module to this connector to take advantage of the motherboard's high definition audio capability.*



2.19 LPT Connector (LPT1)

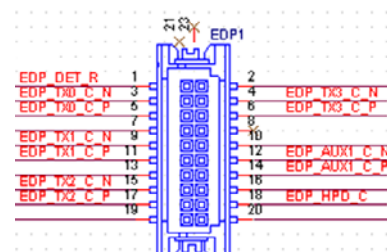
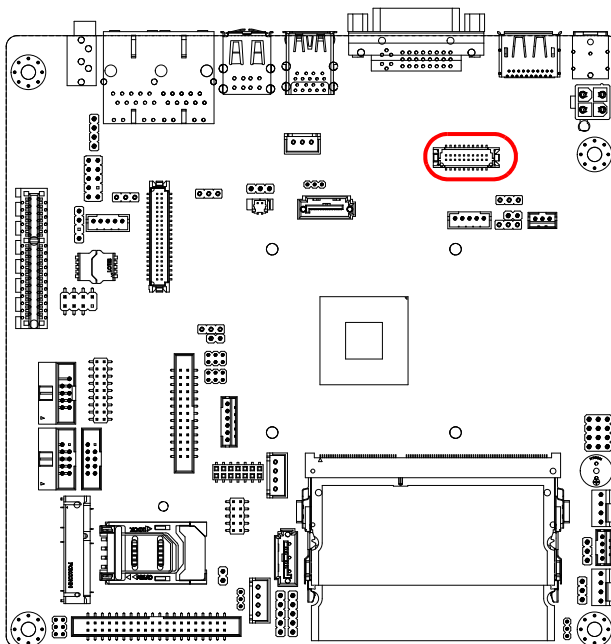


2.20 eDP Backlight Inverter Power Connector (INV2, JVBR2)

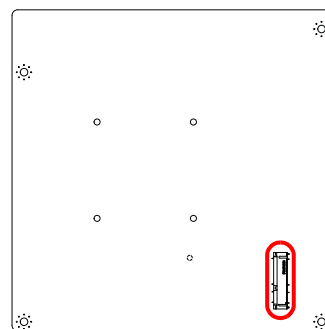
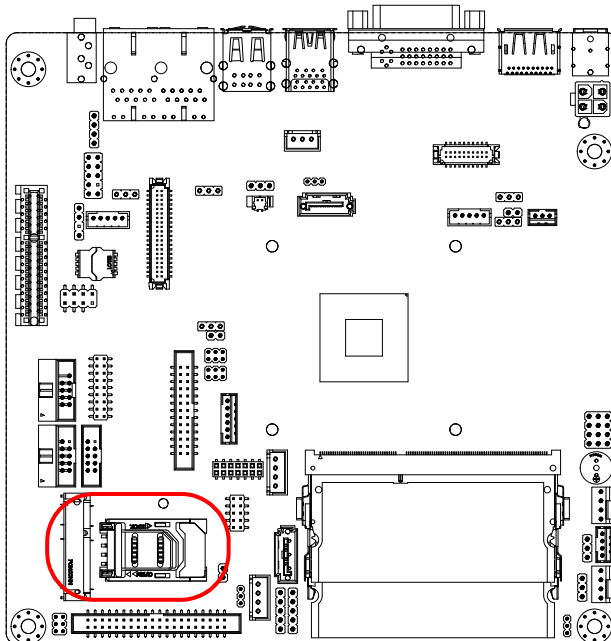


JVBR2:eDP backlight control
 DC mode: 1-2
 PWM mode: 2-3
 (DEFAULT: 1-2)

2.21 eDP Connector (EDP1)



2.22 Full / Half Size Mini PCI Express Slot (MINI_PCIE1, MINI_PCIE2)



The AIMB-225 provides 1 Full size Mini PCI express slot to support mSATA and 1 Half size Mini PCI express slot to support SIM card holder.

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-225 setup screens.

3.2 BIOS Setup

The AIMB-225 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.

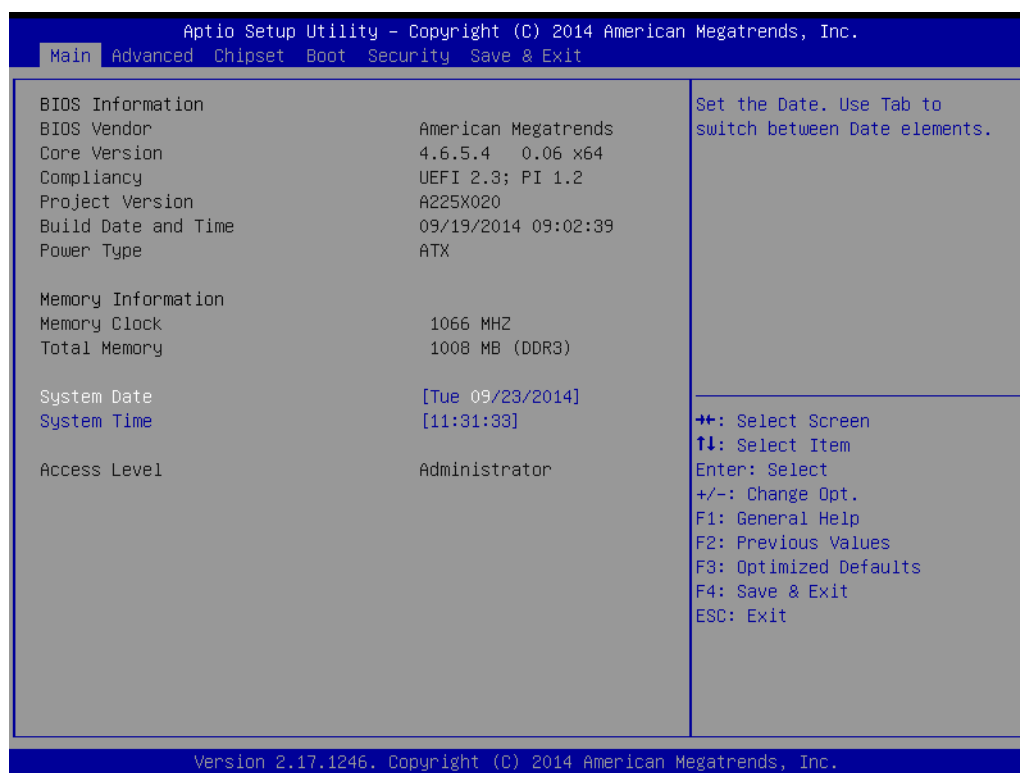
The CMOS SETUP saves the configuration in the CMOS RAM of the motherboard. When the power is turned off, the battery on the board supplies the necessary power to preserve the CMOS RAM.

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.

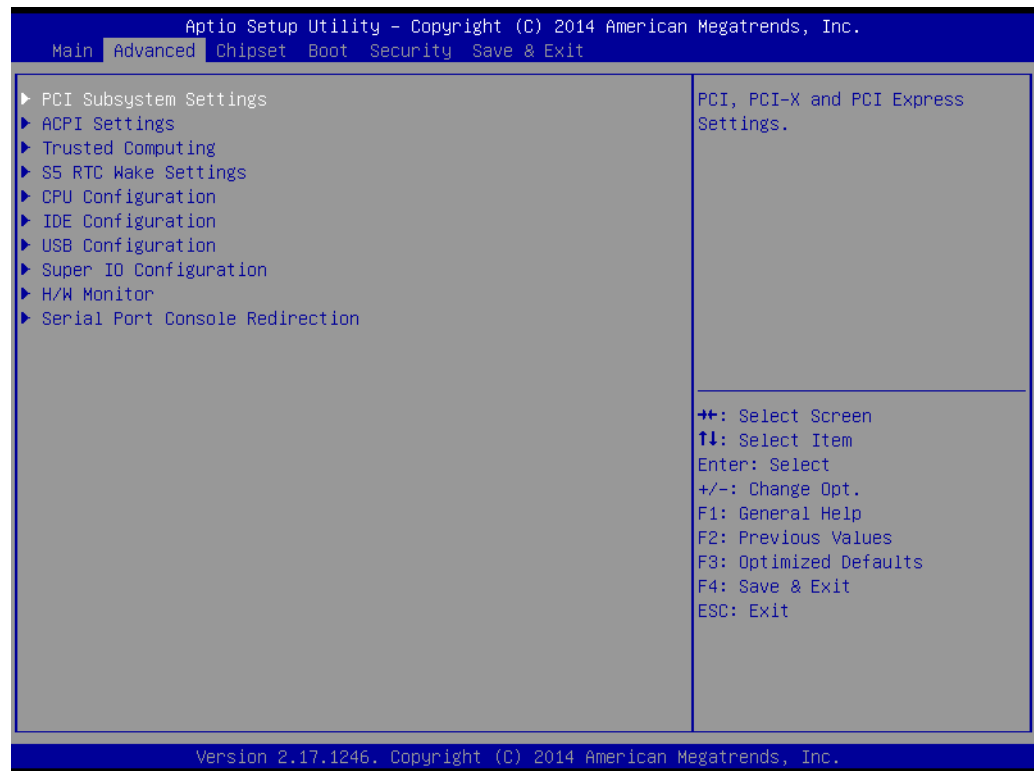
Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

■ System time / System date

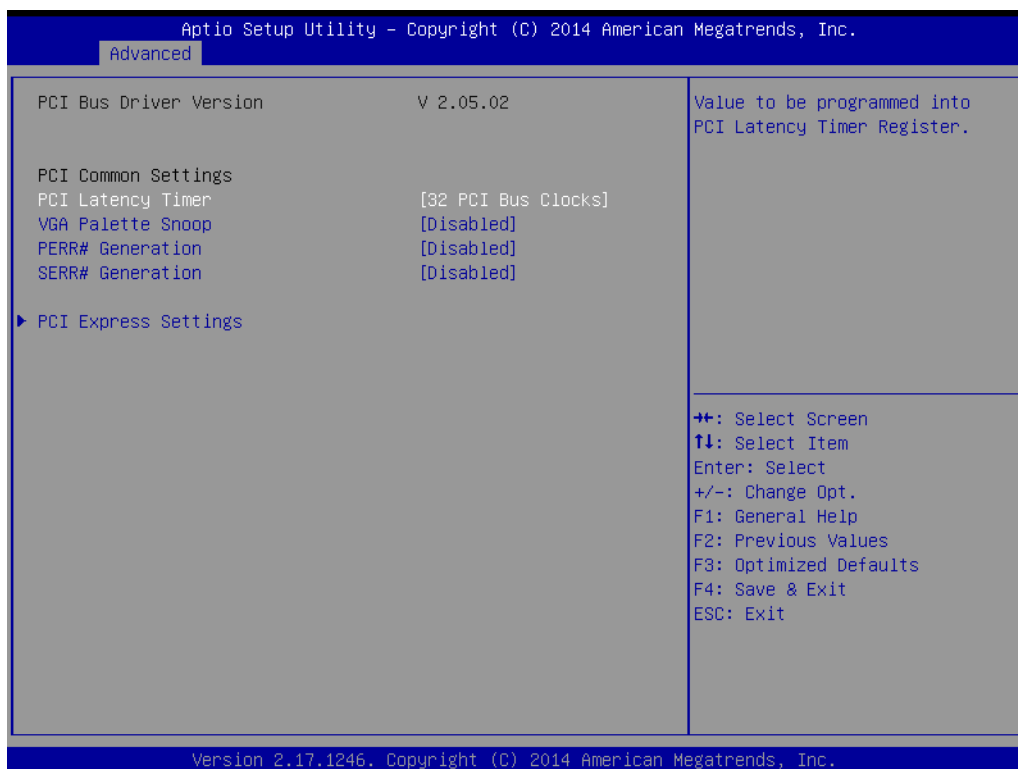
Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time must be entered in HH:MM:SS format.

3.2.2 Advanced BIOS Features

Select the Advanced tab from the AIMB-225 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.

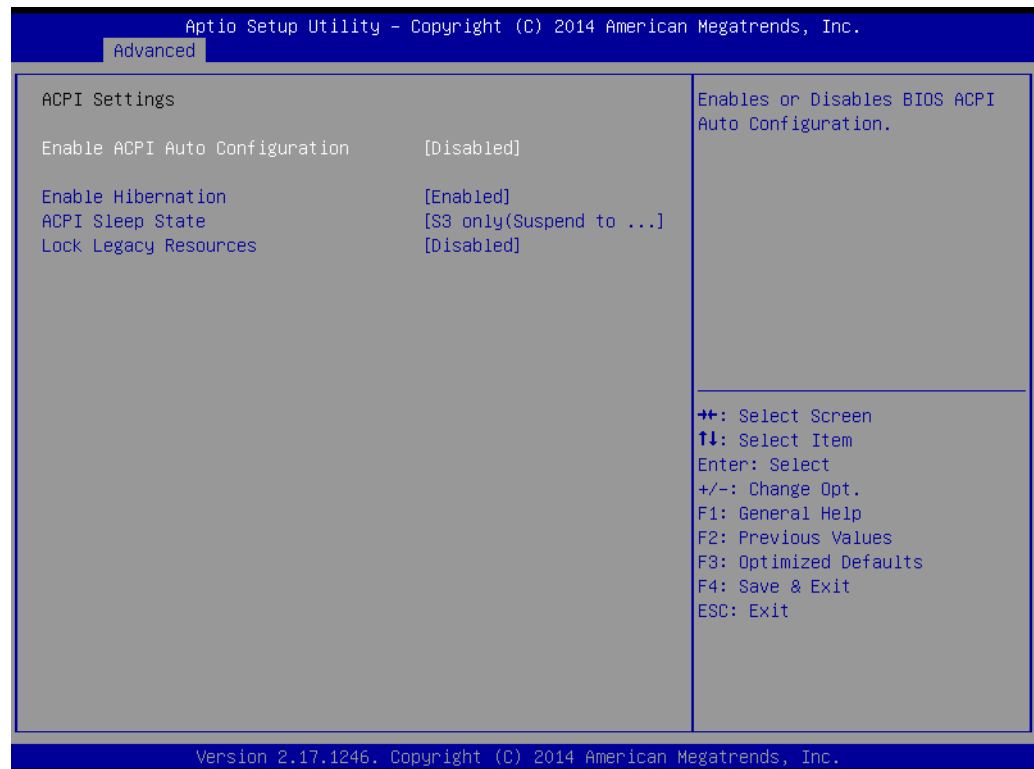


3.2.2.1 PCI Subsystem settings



- **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.

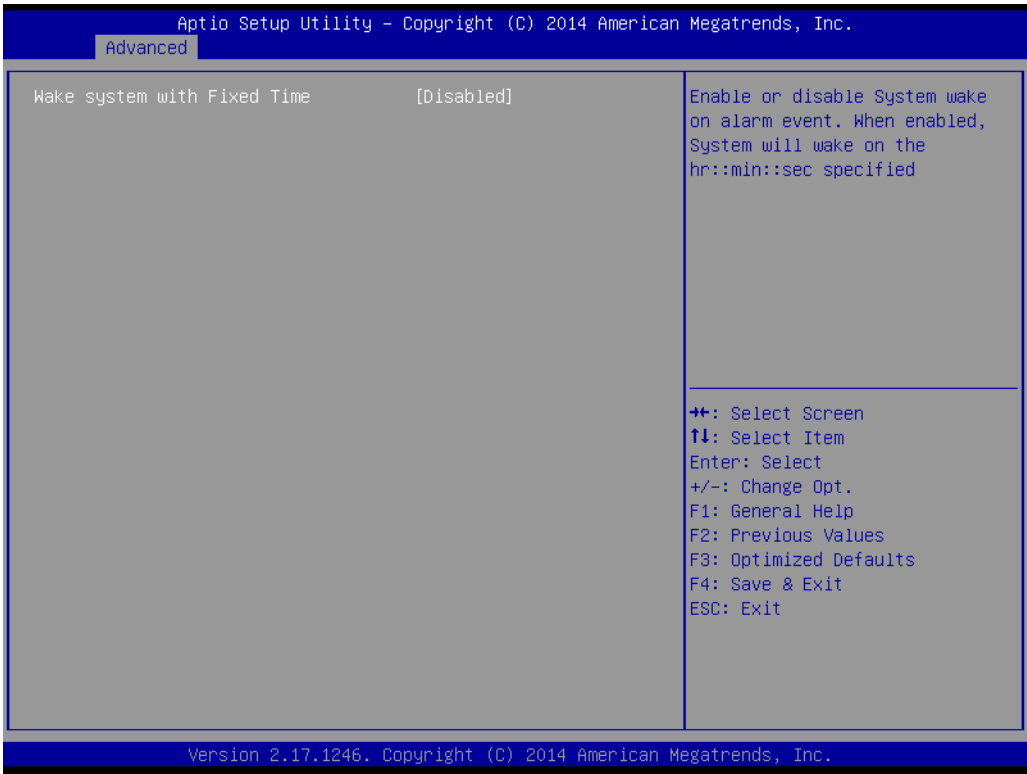
3.2.2.3 Trusted Computing

To enable/disable TPM (TPM 1.1/1.2) 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.



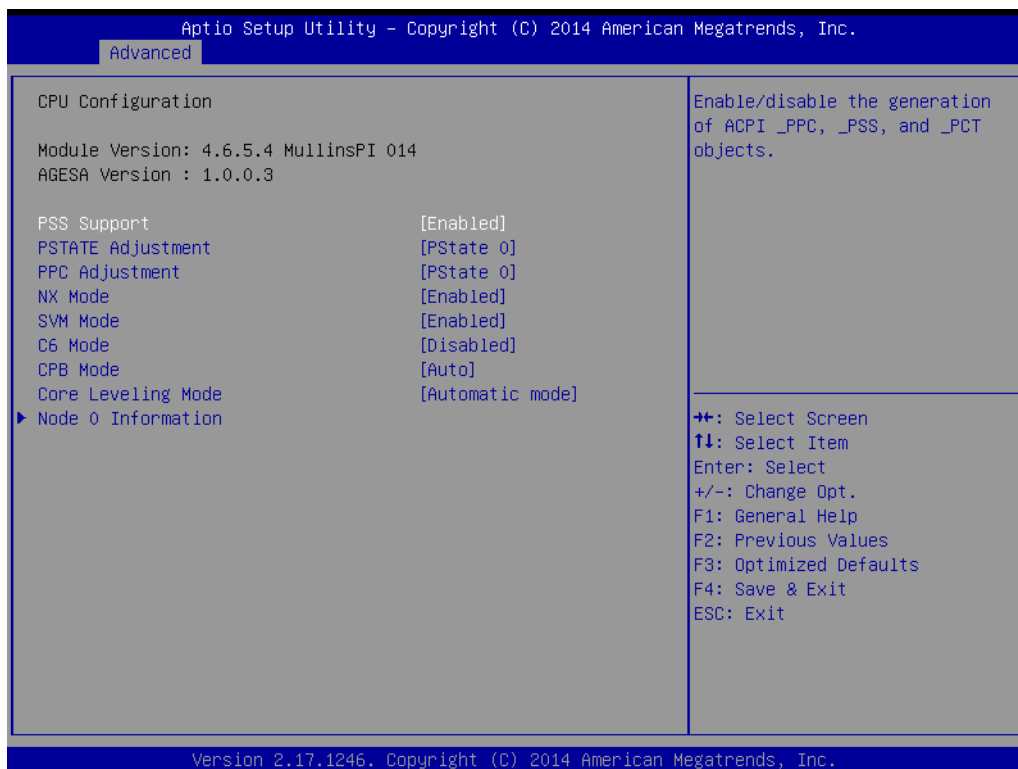
- **TPM SUPPORT**
Disable/Enable TPM function.

3.2.2.4 S5 RTC Wake Settings



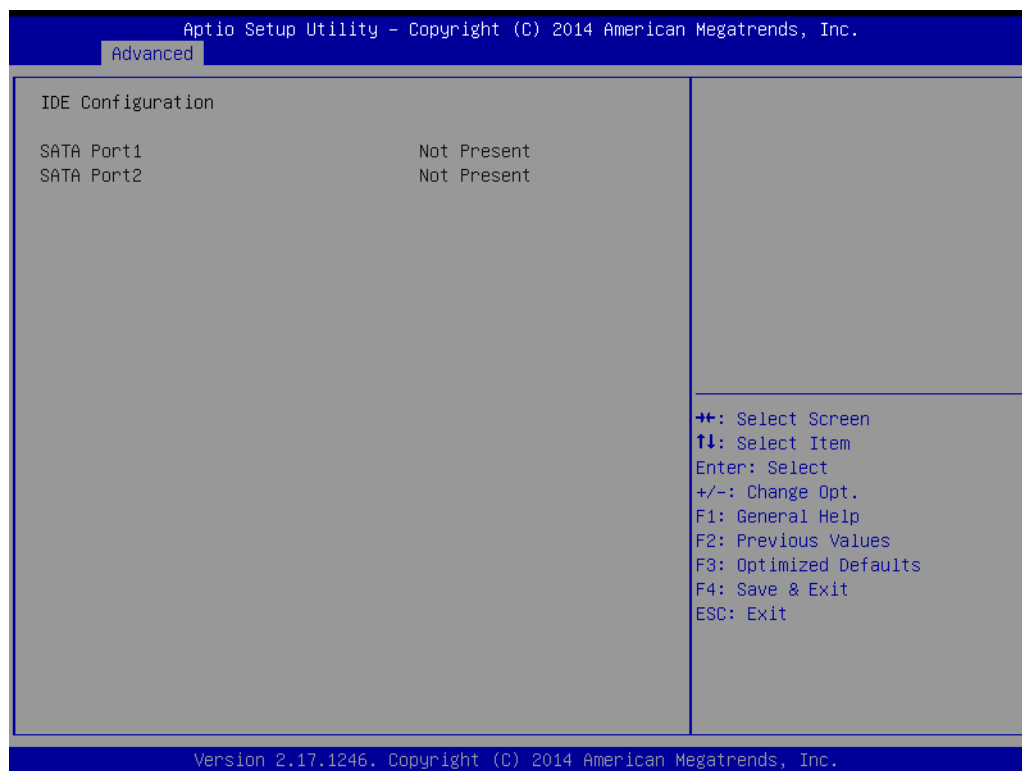
- **Wake system with fixed time**
Enable or disable system wake on alarm event.

3.2.2.5 CPU Configuration



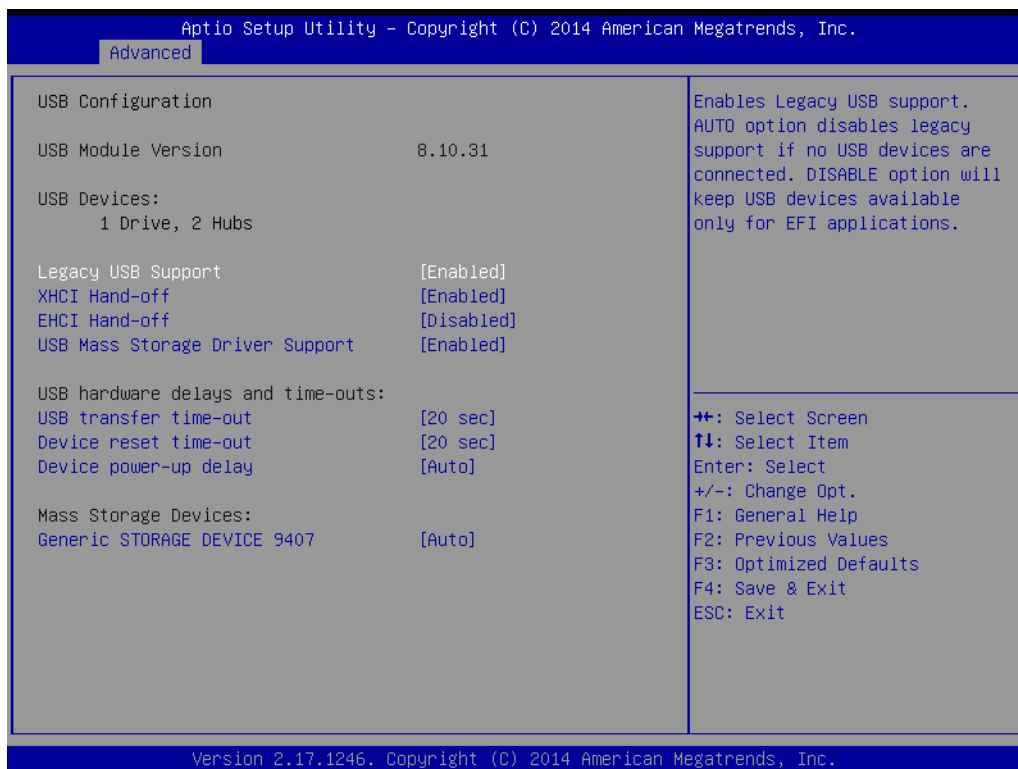
- **PSS Support**
This item allows you to enable or disable the ACPI _PPC, _PSS, and _PCT objects.
- **PSTATE Adjustment**
This item allows you to provide P-state level.
- **PPC Adjustment**
This item allows you to provide _PPC object.
- **NX mode**
This item allows you to enable or disable the No-execute 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



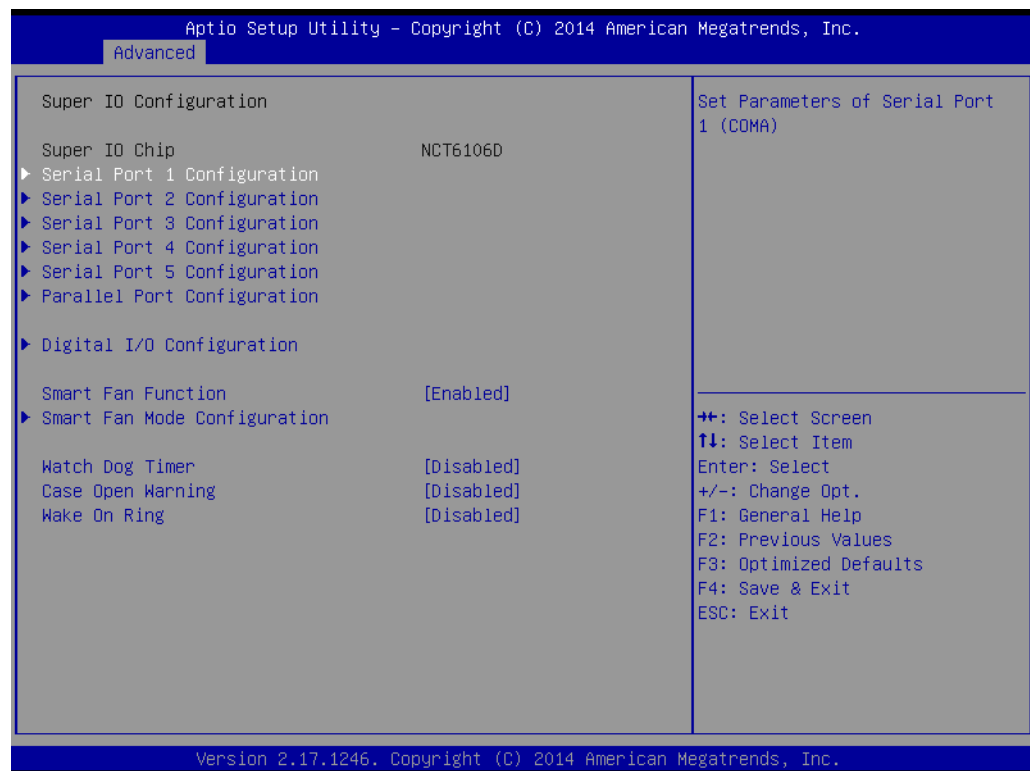
- **IDE Configuration**
Display SATA Port1 / SATA Port2 information.

3.2.2.7 USB Configuration



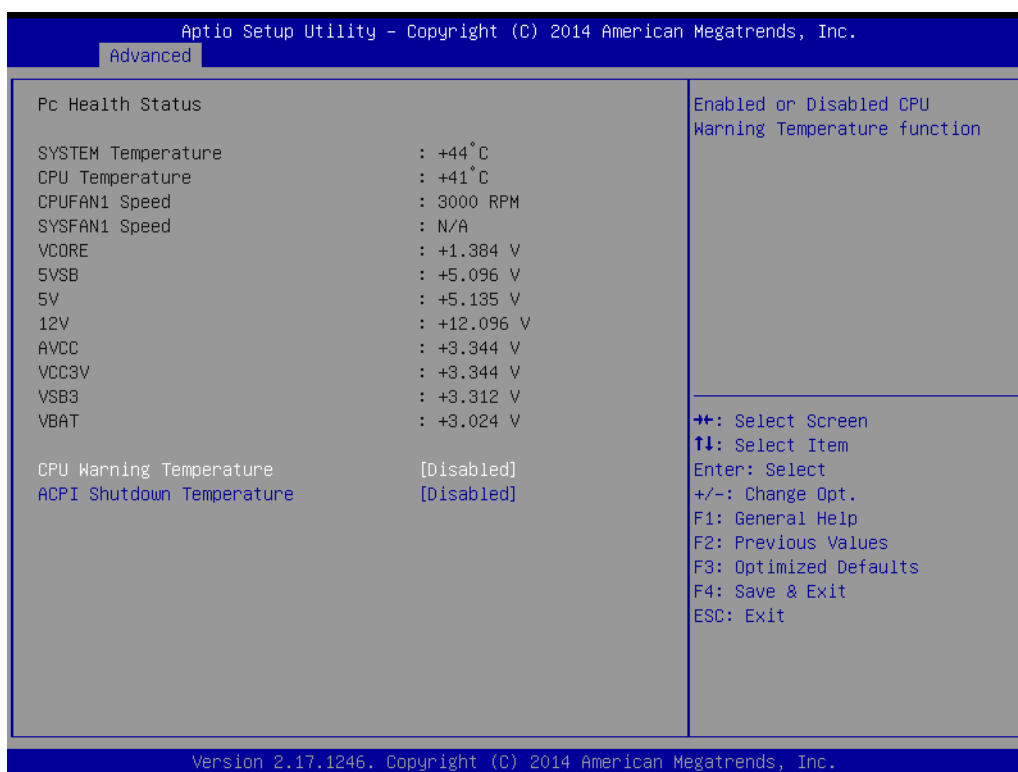
- **Legacy USB support**
Enables support for legacy USB. Auto option disables legacy support if no USB devices are connected.
- **XHCI Hand-off**
This is a workaround for OS without XHCI hand-off support. The XHCI ownership change should claim by XHCI driver.
- **EHCI Hand-off**
This is a workaround 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



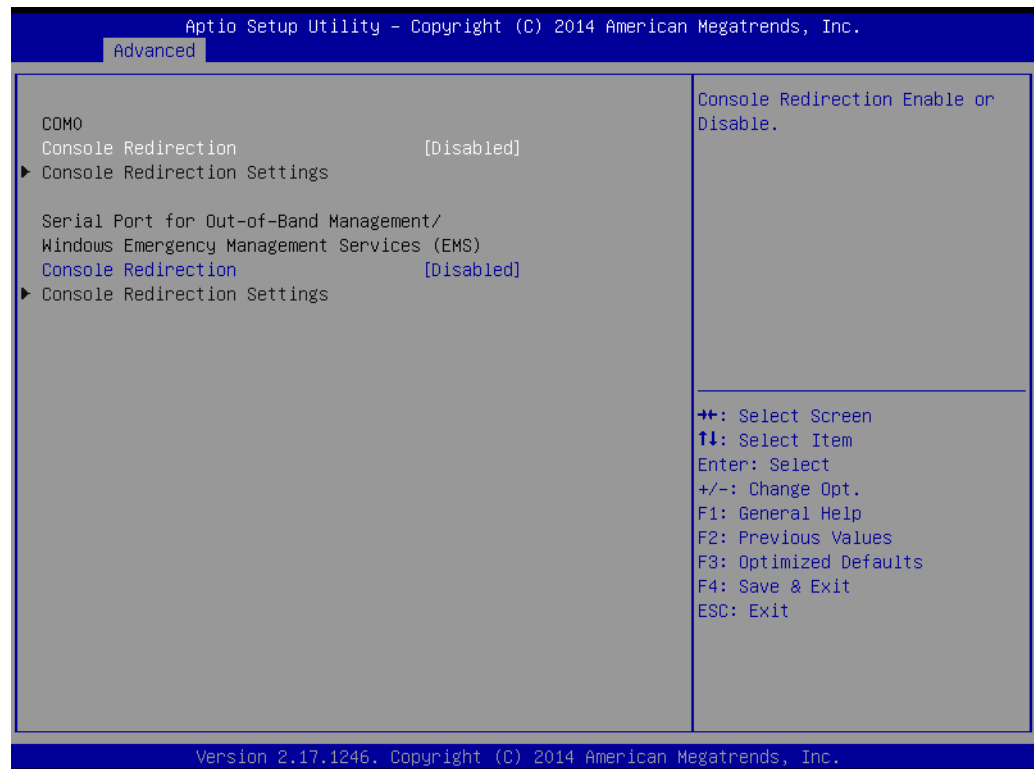
- **Smart Fan Function**
This item allows you to enable/disable CPU cooler smart function.
- **Watch Dog Timer**
This item allows you to enable/disable the watchdog timer.
- **Case Open Warning**
This item will allow to enable/disable case open warning.
- **Wake on Ring**
Disable/Enable RI wake event.

3.2.2.9 H/W Monitor



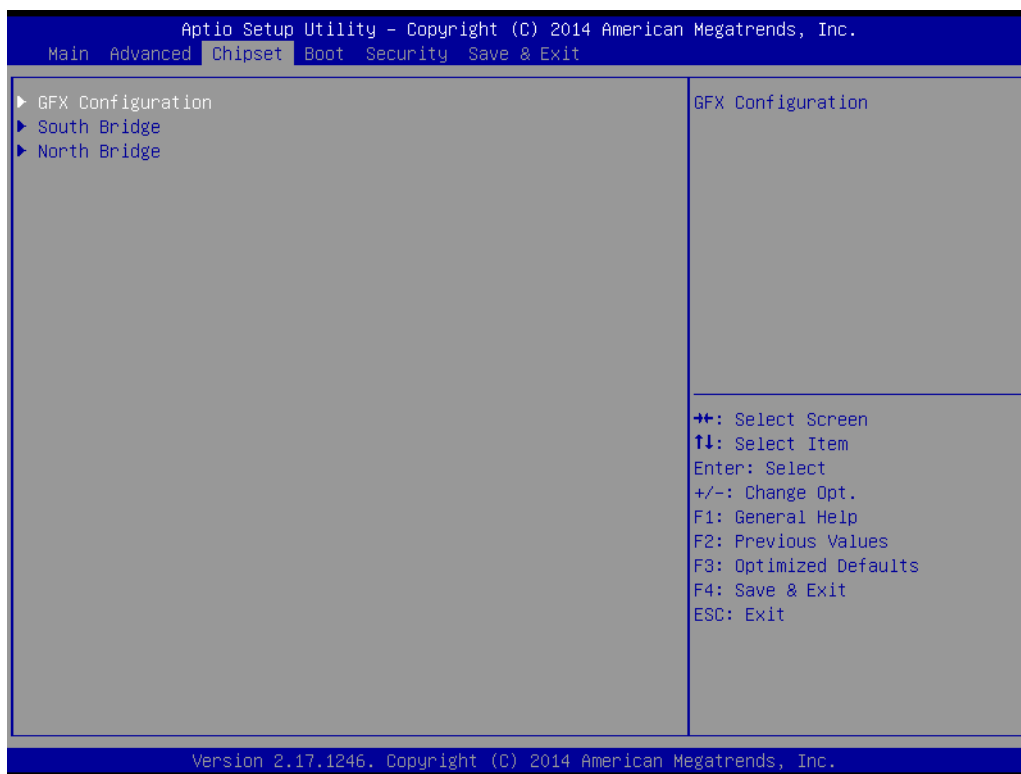
- **CPU Warning Temperature**
Use this to set the CPU warning temperature threshold. When the system reaches the warning temperature, the speaker will beep.
- **ACPI Shutdown Temperature**
Use this to set the ACPI shutdown temperature threshold. When the system reaches the shutdown temperature, it will 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



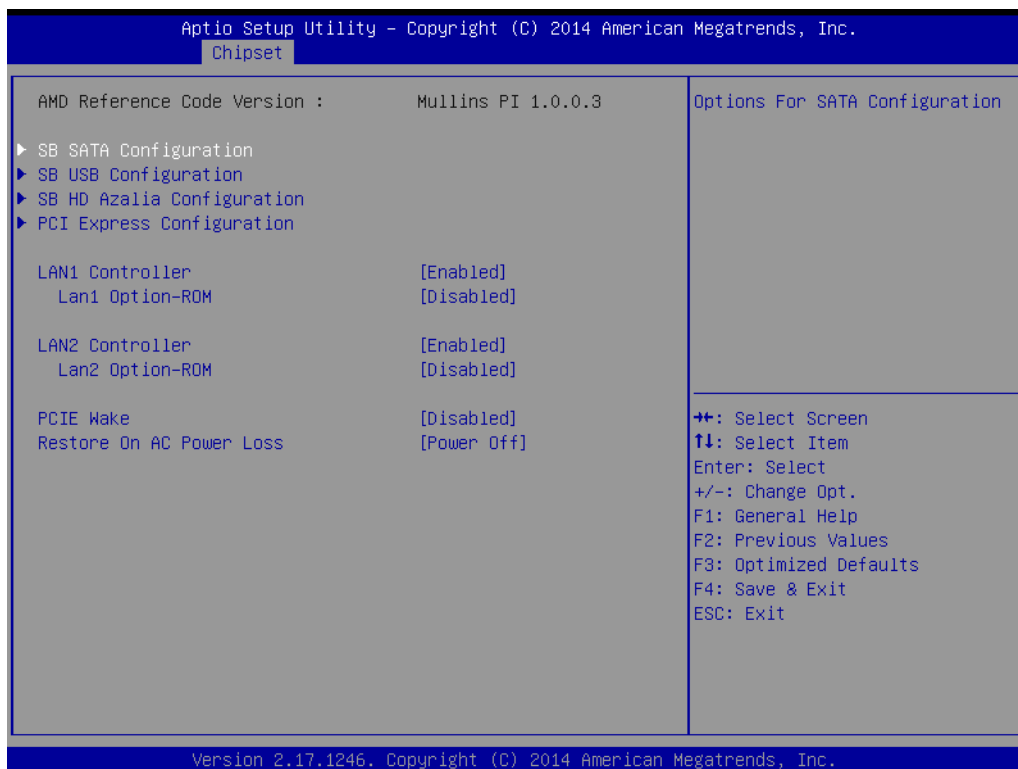
- **GFX Configuration**
Details of display items.
- **South Bridge Configuration**
Details of South bridge items.
- **North Bridge Configuration**
Detail of North Bridge items.

3.2.3.1 GFX Configuration



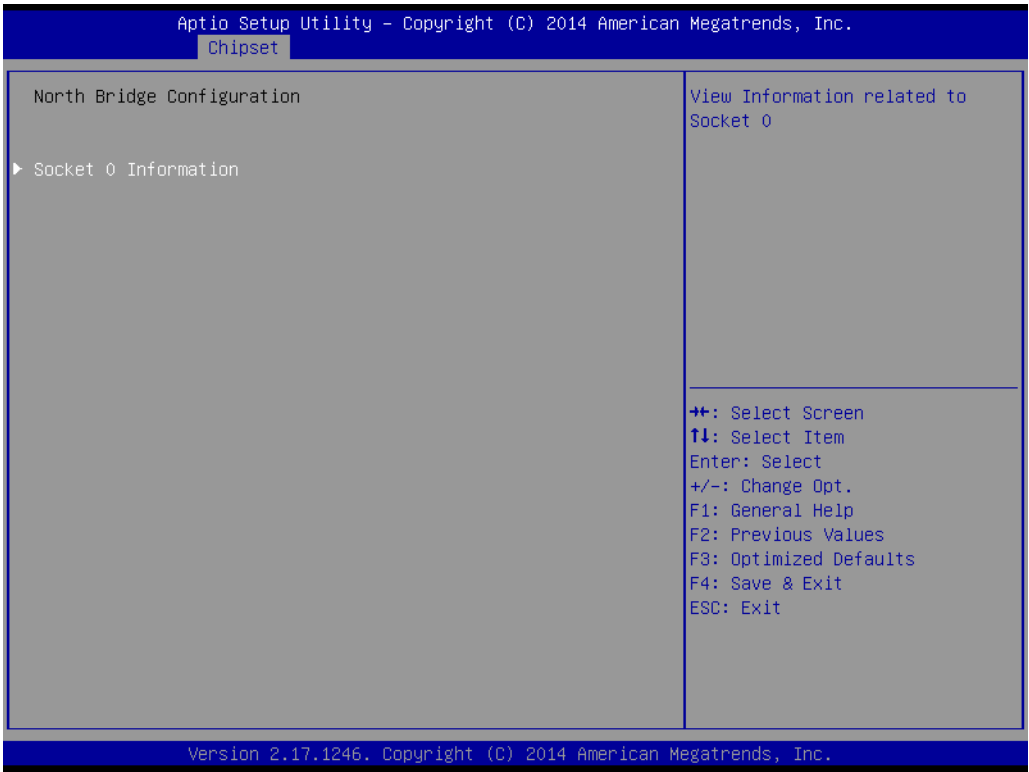
- **Primary Video Device**
Select main display outputs when add-on cards are used.
- **Integrated Graphics**
Select SOC display outputs.
- **LVDS Panel Type**
Select LVDS panel types of resolution.

3.2.3.2 SB Configuration

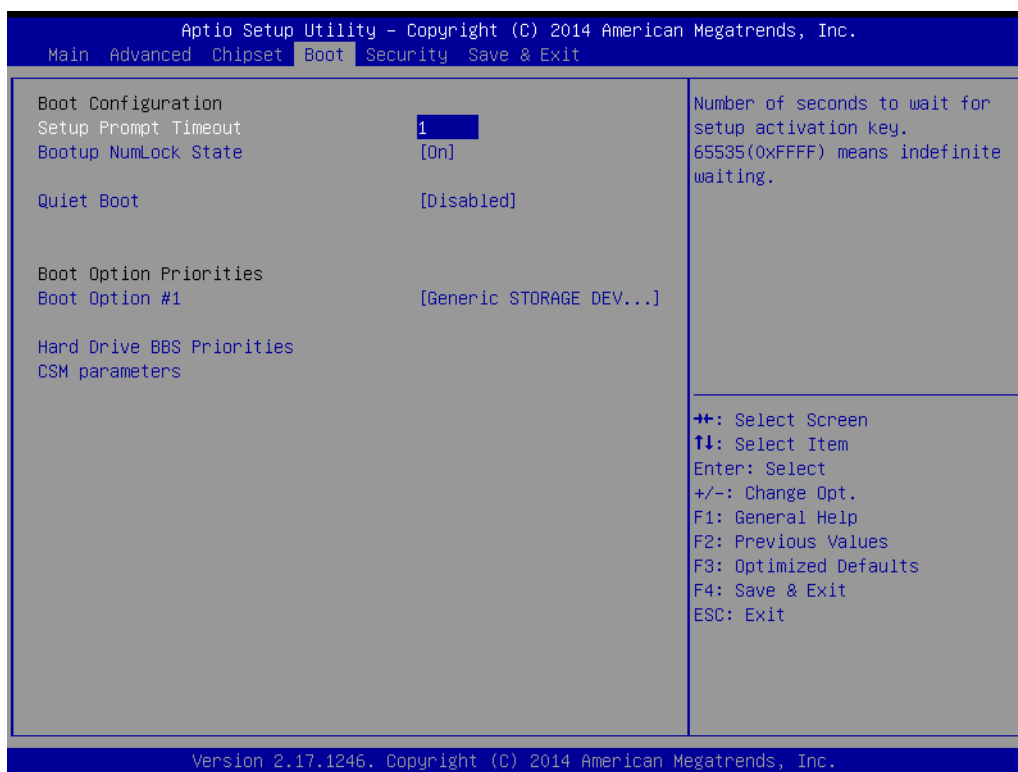


- **SB SATA Configuration**
Options for SATA configuration.
- **SB USB Configuration**
Options for USB configuration.
- **SB HD Azalia Configuration**
Options for SB azalia.
- **PCI Express Configuration**
Options for PCI express configuration

3.2.3.3 North Bridge Configuration

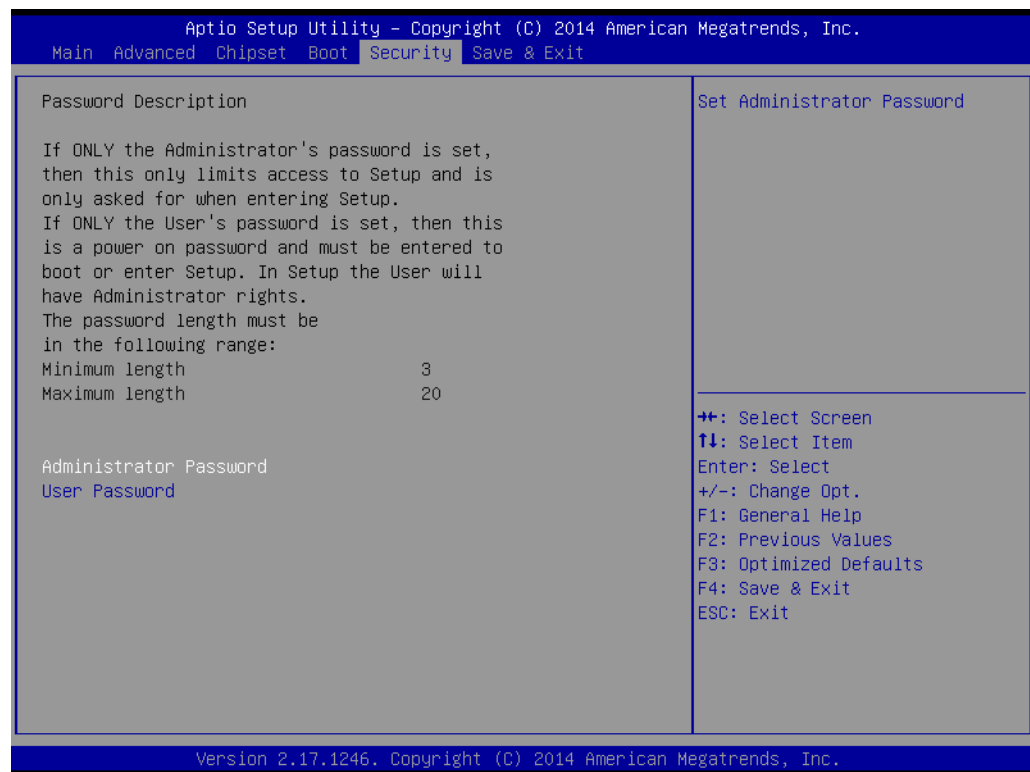


3.2.4 Boot



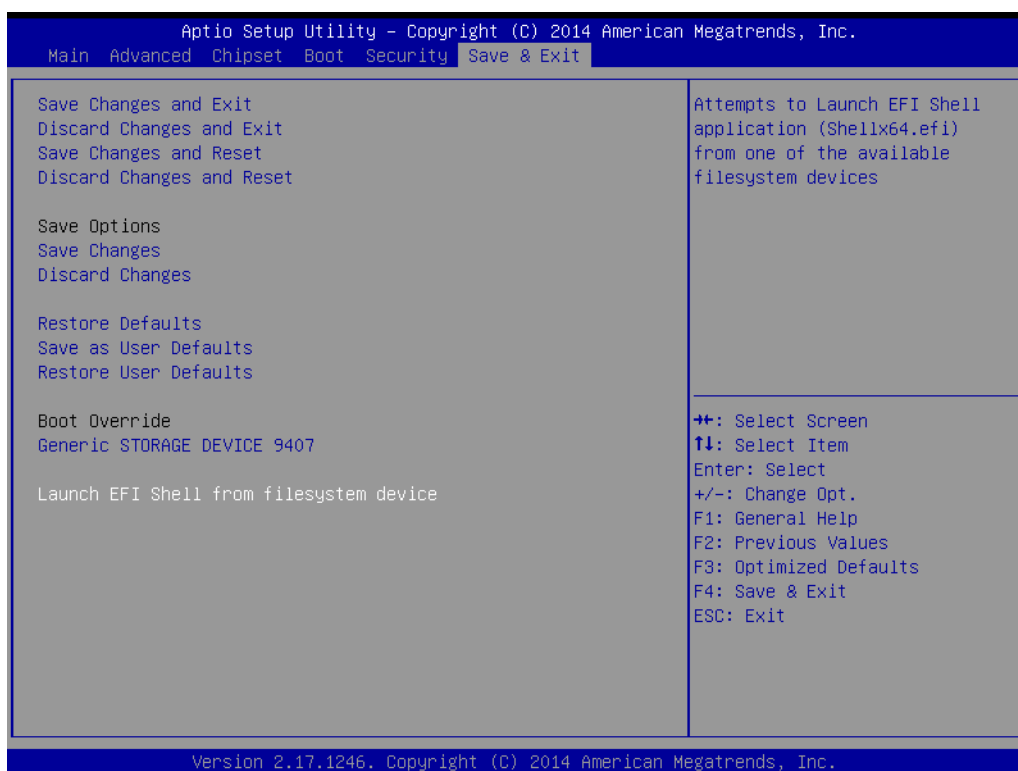
- **Setup Prompt Timeout**
This item allows you to change number of seconds to wait for setup activation key.
- **Bootup NumLock State**
Select the Power-on state for Numlock.
- **Quiet Boot**
If this option is set to Disabled, the BIOS display normal POST messages. If Enabled, an OEM Logo is shown instead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

3.2.5 Security



Select Security Setup from the AIMB-225 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.

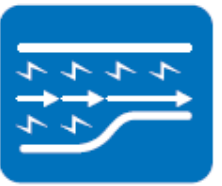
4.2.1.4 Power Saving

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.

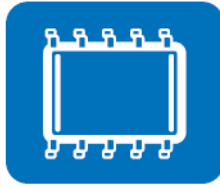
System Throttling



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



The Monitoring is a utility for customer to monitor the 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 immediately, 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-225 are located on the software installation CD. The driver in the folder of the driver CD will guide and link you to the utilities and drivers under a Windows system. Updates are provided via Service Packs from Microsoft*.

Note!



The files on the software installation CD are compressed. Do not attempt to install the drivers by copying the files manually. You must use the supplied SETUP program to install the drivers.

Before you begin, it is important to note that most display drivers need to have the relevant software application already installed in the system prior to installing the enhanced display drivers. In addition, many of the installation procedures assume that you are familiar with both the relevant software applications and operating system commands. Review the relevant operating system commands and the pertinent sections of your application software's user manual before performing the installation.

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
- Integrates superior video features. These include filtered sealing of 720 pixel DVD content, and MPEG-2 motion compensation for software DVD

Note!

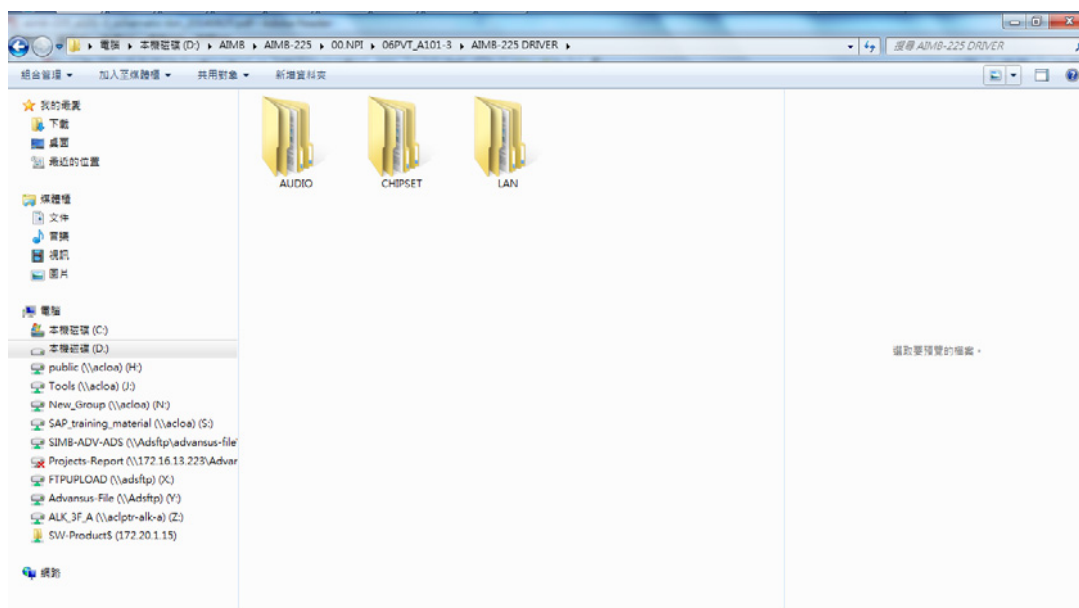


*This utility is used for the following versions of Windows, and it has to be installed **before** installing all the other drivers:*

- Windows 7
- Windows 8.1

5.3 Windows 7 Driver Setup

1. Insert the driver CD into your system's CD-ROM drive. You can see the driver folder items. Navigate to the "Chipset" folder and click "infinst_autol.exe" to complete the installation of the driver.



Chapter 6

Graphics Setup

6.1 Introduction

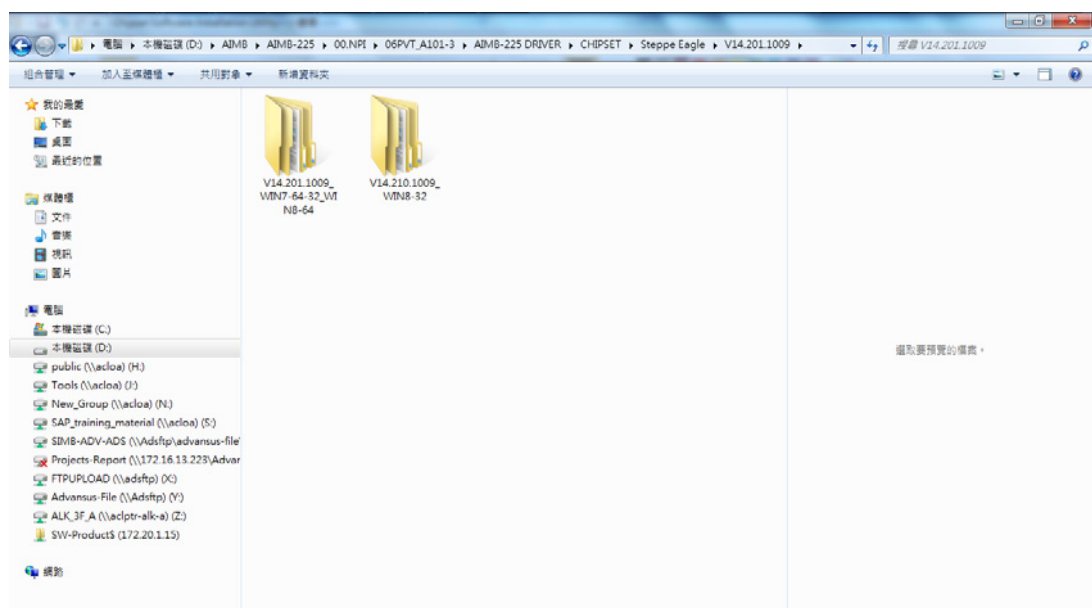
To benefit from the AMD G-series integrated graphics controller, you need to install the graphic driver.

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.



Insert the driver CD into your system's CD-ROM drive. You can see the driver folders items. Navigate to the "Graphic" folder and click "setup.exe" to complete the installation of the drivers for Windows 7 and Windows 8.1.



Chapter 7

LAN Configuration

7.1 Introduction

The AIMB-225 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

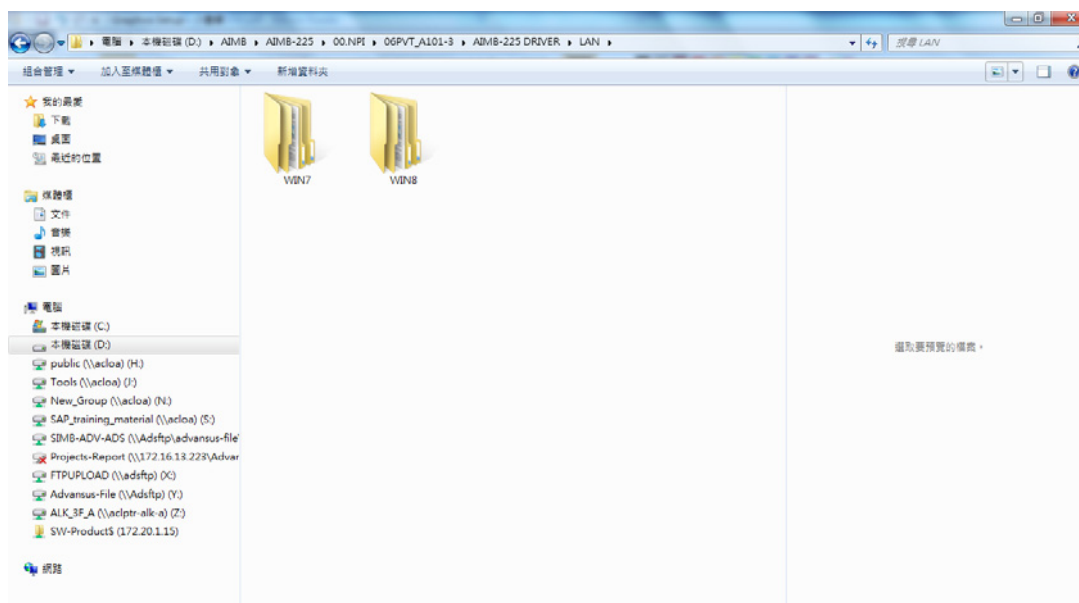
Note! *Before installing the LAN drivers, make sure the CSI utility has been installed on your system. See Chapter 5 for information on installing the CSI utility.*



The AIMB-225'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

Insert the driver CD into your system's CD-ROM drive. Select the LAN folder then navigate to the directory for your OS.



Appendix **A**

Programming the Watchdog Timer

A.1 Programming the Watchdog Timer

The AIMB-225'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 NCT6106D. 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).

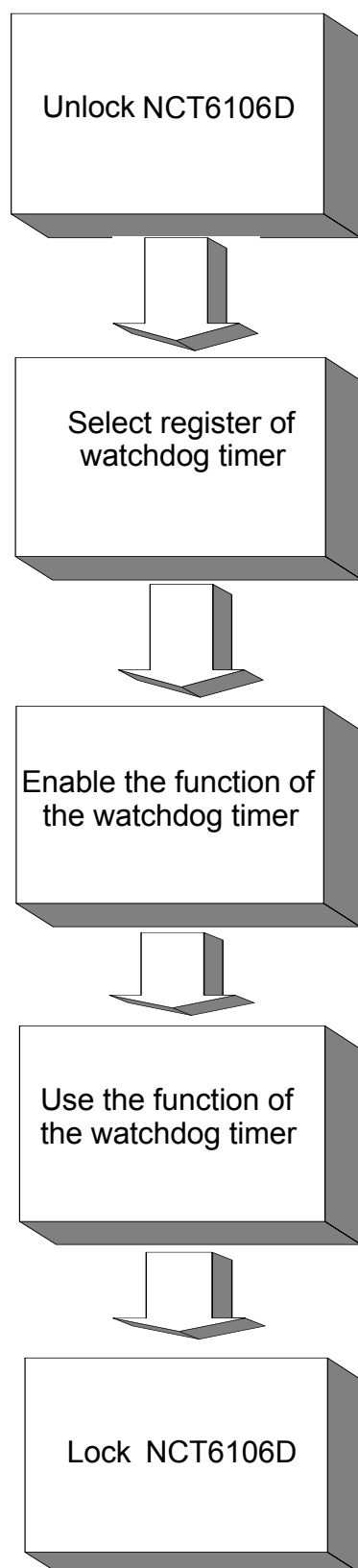


Table A.1: Watchdog Timer Registers

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 NCT6106D.
07 (hex)	write	Write 08 (hex) to select register of watchdog timer.
30 (hex)	write	Write 01 (hex) to enable the function of the watchdog 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 watchdog 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 keyboard to reset the timer, 0 to disable. [default] Bit 5: Write 1 to generate a timeout signal immediately 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 NCT6106D
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 NCT6106D
Mov al,0aah
Out dx,al

```

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

```

;-----
Mov dx,2eh ; Unlock NCT6106D
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 NCT6106D
Mov al,0aah
Out dx,al
3. Enable watchdog timer to be reset by mouse
;-----
Mov dx,2eh ; Unlock NCT6106D
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 NCT6106D
Mov al,0aah
Out dx,al
4.   Enable watchdog timer to be reset by keyboard
;-----
Mov dx,2eh ; Unlock NCT6106D
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 NCT6106D
Mov al,0aah
Out dx,al
5.   Generate a time-out signal without timer counting
;-----
Mov dx,2eh ; Unlock NCT6106D
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 NCT6106D
Mov al,0aah
Out dx,al

```

Appendix **B**

I/O Pin Assignments

B.1 USB Header (USB56, USB78)

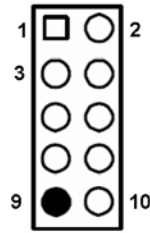


Table B.1: USB Header (USB56, USB78)

Pin	Signal	Pin	Signal
1	USBV56	2	USBV56
3	USB_CM_N4	4	USB_CM_N5
5	USB_CM_P4	6	USB_CM_P5
7	GND	8	GND
9	Key	10	GND

B.2 DVI-I Connector (DVI-I)

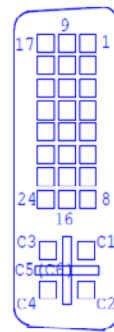


Table B.2: DVI-I Connector (DVI_D1)

Pin	Signal	Pin	Signal
1	TMDS2-	2	TMDS2+
3	TMDS_2/4_Shield	4	TMDS4-
5	TMDS4+	6	DDC_CLK
7	DDC_DATA	8	VSYNC
9	TMDS1-	10	N/C
11	TMDS_1/3_Shield	12	TMDS3-
13	TMDS3+	14	VCC
15	GND	16	HOTPLUG_DETECT
17	TMDS0-	18	TMDS0+
19	TMDS_0/5_Shield	20	TMDS5-
21	TMDS5+	22	TMDSCLK_Shield
23	TMDSCLK+	24	TMDSCLK-
C1	RED	C2	GREEN
C3	BLUE	C4	HSYNC
C5	AGND_1	C6	AGND_2

B.3 RS-232 Interface (COM2345)

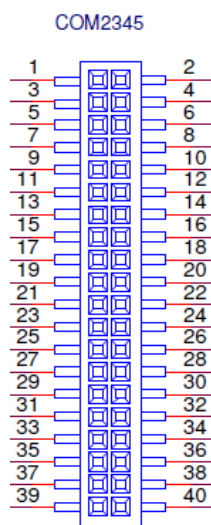


Table B.3: RS-232 Interface (COM2345)

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.4 SPI Flash Connector (SPI_CN1)

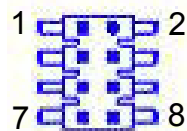


Table B.4: CN4: SPI Fresh Card Pin Connector

Pin	Signal	Pin	Signal
1	+3.3VSB_SPI	2	GND
3	SPI_CS#_CON	4	SPI_CLK_CON
5	SPI_DI_CON	6	SPI_DO_CON
7	NC	8	NC

B.5 CPU Fan Power Connector (CPUFAN1)

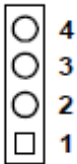


Table B.5: CPU Fan Power Connector (CPUFAN1)

Pin	Signal
1	GND
2	VCC
3	FEEDBACK
4	PWM

B.6 System Fan Power Connector (SYSFAN1)

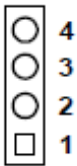


Table B.6: System Fan Power Connector (SYSFAN1)

Pin	Signal
1	GND
2	VCC
3	FEEDBACK
4	PWM

B.7 Power LED & Keyboard Lock Connector (JFP3)

You can use an LED to indicate when the single board computer is on. Pin 1 of JFP3 supplies the LED's power, and Pin 5 is the ground.

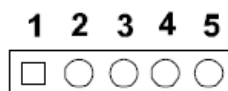


Table B.7: Power LED & Keyboard Lock Connector (JFP3)

Pin	Signal
1	POWER_LED+
2	NC
3	POWER_LED-
4	FRP_KEYLOCK#
5	GND

B.8 Power switch/HDD LED/SMBus/Speaker (JFP1+JFP2)

The single board computer has its own buzzer. You can also connect it to the external speaker on your computer chassis.

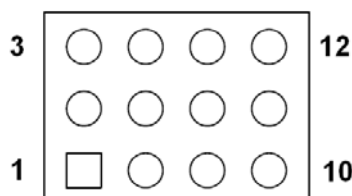


Table B.8: Power Switch/HDD LED/SMBus/Speaker (JFP1+JFP2)

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

B.9 USB & LAN Connector (USB12, USB34, LAN1_1)

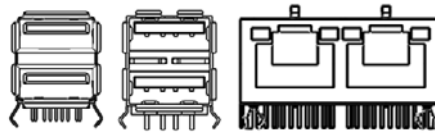


Table B.9: USB 3.0 Port (USB12)

Pin	Signal	Pin	Signal
1	VBUS_1	2	D-_1
3	D+_1	4	GND_1
5	StdA_SSRX-_1	6	StdA_SSRX+_1
7	GND_DRAIN_1	8	StdA_SSTX-_1
9	StdA_SSTX+_1	10	VBUS_1
11	D-_1	12	D+_1
13	GND_1	14	StdA_SSRX-_1
15	StdA_SSRX+_1	16	GND_DRAIN_1
17	StdA_SSTX-_1	18	StdA_SSTX+_1

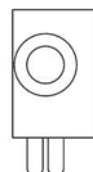
Table B.10: USB 2.0 Port (USB34)

Pin	Signal	Pin	Signal
1	VCC_USB0	2	USB-0_B
3	USB+0_B	4	GND_1
5	VCC_USB1	6	USB-1_B
7	USB+1_B	8	GND_2
9	PTH_1	10	PTH_2
11	PTH_3	12	PTH_4

Table B.11: Ethernet 10/100/1000 Mbps RJ-45 Port

Pin	Signal	Pin	Signal
1	VCC_USB0	2	USB-0_B
3	USB+0_B	4	GND_1
5	VCC_USB1	6	USB-1_B
7	USB+1_B	8	GND_2
9	PTH_1	10	PTH_2
11	PTH_3	12	PTH_4

B.10 Line Out Connector (AUDIO1)



B.11 Serial ATA Connector (SATA1, SATA2)

Table B.12: Serial ATA Connector (SATA1, SATA2)

Pin	Signal	Pin	Signal
1	GND	2	SATA_0TX+
3	SATA_0TX-	4	GND
5	SATA_0RX-	6	SATA_0RX+
7	GND	8	

B.12 AT/ATX Mode (PSON1)

Table B.13: AT/ATX Mode (PSON1)

Pin	Signal	Pin	Signal
1	VCCAT	2	PANSWIN#
3	VCCATX		

B.13 GPIO Pin Header (GPIO1)

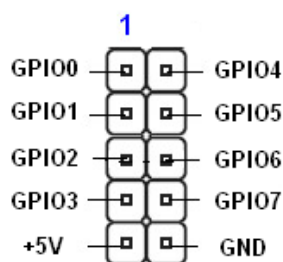


Table B.14: GPIO Pin Header (GPIO1)

Pin	Signal	Pin	Signal
1	GPI00	2	GPI04
3	GPI01	4	GPI05
5	GPI02	6	GPI06
7	GPI03	8	GPI07
9	+5V	10	GND

B.14 LVDS Connector (LVDS1)

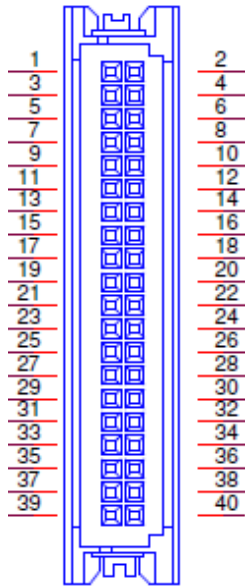


Table B.15: LVDS1 Connector

Pin	Signal	Pin	Signal
1	VDD_LVDS	2	VDD_LVDS
3	LVDS_DET#	4	GND
5	VDD_LVDS	6	VDD_LVDS
7	LVDS_L0_N	8	LVDS_U0_N
9	LVDS_L0_P	10	LVDS_U0_P
11	GND	12	GND
13	LVDS_L1_N	14	LVDS_U1_N
15	LVDS_L1_P	16	LVDS_U1_P
17	GND	18	GND
19	LVDS_L2_N	20	LVDS_U2_N
21	LVDS_L2_P	22	LVDS_U2_P
23	GND	24	GND
25	LVDS_CLKL_N	26	LVDS_CLKU_N
27	LVDS_CLKL_P	28	LVDS_CLKU_P
29	GND	30	GND
31	LVDS_CH7511_DDC_CLK	32	LVDS_CH7511_DDC_DATA
33	GND	34	GND
35	LVDS_L3_N	36	LVDS_U3_N
37	LVDS_L3_P	38	LVDS_U3_P
39	LVDS_BL_EN	40	VCON

B.15 LVDS Inverter (INV1)

Table B.16: LVDS Inverter (INV1)

Pin	Signal
-----	--------

Table B.16: LVDS Inverter (INV1)

1	+12V
2	GND
3	BL_EN_EDP
4	BL_ADJ
5	+5V

B.16 eDP Inverter (INV2)

Table B.17: eDP Inverter (INV2)

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

B.17 ATX 12V connector (ATX12V1)

**Table B.18: ATX 12 V connector (ATX12V1)**

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



Enabling an Intelligent Planet

www.advantech.com

Please verify specifications before quoting. This guide is intended for reference purposes only.

All product specifications are subject to change without notice.

No part of this publication may be reproduced in any form or by any means, electronic, photocopying, recording or otherwise, without prior written permission of the publisher.

All brand and product names are trademarks or registered trademarks of their respective companies.

© Advantech Co., Ltd. 2014