User Manual

AIMB-273

Intel® Core™ i7/i5/i3/Celeron uFC-PGA988 Mini-ITX with 2 DP/ HDMI/LVDS/CRT, 2 COM, Dual LAN, PCIe x16

ADVANTECH

Enabling an Intelligent Planet

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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.

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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.*

CPU Compatibility

CPU Family	Speed	Core Stepping	TDP	L3 cache
Intel i7-3610QE	2.3 GHz	D-4	45 W	6 MB
Intel i7-2710QE	2.1 GHz	D-4	45 W	6 MB
Intel i5-3610ME	2.7 GHz	D-2	35 W	3 MB
Intel i5-2510E	2.5 GHz	D-2	35 W	3 MB
Intel i3-3120ME	2.4 GHz	D-2	35 W	3 MB
Intel i3-2330	2.2 GHz	D-2	35 W	3 MB
Inel Celeron B810	1.6 GHz	D-2	35 W	2 MB

Memory Compatibility

Test Item	Description						Result	Remark
Brand	Size	Speed	Type	ECC	Vendor PN	Memory		
Transcend	1GB	DDR3 1066	SODIMM DDR3	N	TS128MS K64V1U	SEC K4B1G0846G-BCH9	PASS	
Transcend	2GB	DDR3 1066	SODIMM DDR3	N	TS128MS K64V1U	SEC HCH9 K4B1G0846D (128x8)	PASS	
Transcend	4GB	DDR3 1066	SODIMM DDR3	N	TS7KSN28 420-1Y	HYNIX H5TQ2G83BFR (256x8)	PASS	
Apacer	4GB	DDR3 1066	SODIMM DDR3	N	78.B2GC8. AF1	HYNIX H5TQ2G83BFR (256x8)	PASS	
Transcend	1GB	DDR3 1333	SODIMM DDR3	N	TS128MS K64V3U	ELPIDA J1108BFBG-DJ-F	PASS	
Transcend	2GB	DDR3 1333	SODIMM DDR3	N	TS256MS K64V3N	HYNIX H5TQ2G83CFR	PASS	
Transcend	4GB	DDR3 1333	SODIMM DDR3	N	TS512MS K64V3N	HYNIX H5TQ2G83BFR (256x8)	PASS	
Transcend	8GB	DDR3 1333	SODIMM DDR3	N	TS1GSK6 4V3H	MICRON IVD22 D9PBC	PASS	
Apacer	1GB	DDR3 1333	SODIMM DDR3	N	78.02GC6. AF0	HYNIX H5TQ1G83DFR-H9C	PASS	
	1GB	DDR3 1333	SODIMM DDR3	N		HYNIX H5TQ1G83TFR-H9C	PASS	
Apacer	2GB	DDR3 1333	SODIMM DDR3	N	78.A2GC9. 4200C	ELPIDA J2108BCSE-DJ-F	PASS	
Apacer	4GB	DDR3 1333	SODIMM DDR3	N	78.B2GC9. AF1	HYNIX H5TQ2G83BFR (256x8)	PASS	
Apacer	4GB	DDR3 1333	SODIMM DDR3	N	78.B2GC9. 4210C	ELPIDA J2108BCSE-DJ-F	PASS	
DSL	4GB	DDR3 1333	SODIMM DDR3	N	D3SH5608 2XH15AA	HYNIX H5TQ2G83BFR (256x8)	PASS	
DSL	2GB	DDR3 1600	SODIMM DDR3	N	D3SS5608 1XH12AA	SEC 113 HCK0 K4B2G0846C (256x8)	PASS	
DSL	4GB	DDR3 1600	SODIMM DDR3	N	D3SS5608 2XH12AA	SEC 113 HCK0 K4B2G0846C (256x8)	PASS	
Transcend	2GB	DDR3 1600	SODIMM DDR3	N	TS256MS K64V6N	MICRON IVM77 D9PFJ	PASS	
Transcend	4GB	DDR3 1600	SODIMM DDR3	N	TS512MS K64N6N	MICRON IRM72 D9PFJ	PASS	

Ordering Information

Part Number	Chipset	PCH	VGA	HDMI	LVDS	DP	SATA	USB	COM	GbE LAN
AIMB-273G2-00A1E	QM77	QM77	Yes	Yes	Yes	Yes	4	8	2	2

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:

- 1 x AIMB-273 Intel Core™ i7/i5/i3/Celeron uFC-PGA988 Mini-ITX motherboard
- 2 x SATA HDD cable
- 1 x CPU cooler
- 1 x Cable kit for 2 serial ports
- 1 x I/O port bracket
- 1 x Startup manual
- 1 x Driver CD
- 1 x Warranty card

If any of these items are missing or damaged, contact your distributor or sales representative immediately. We have carefully inspected the AIMB-273 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-273, 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.

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Chapter   1

General Information

1.1 Introduction

AIMB-273 is designed with the Intel® QM77/HM67 for industrial applications that require both performance computing and enhanced power management capabilities. The motherboard supports Intel mobiel Core i7-3610QE 2.3GHz / Core i5-3610ME 2.7 GHz / Core i3-3120ME 2.4 GHz / Celeron B810 1.6 GHz processor up to 6 MB L3 cache and DDR3 SO-DIMM 1333/1600 up to 16GB. A rich I/O connectivity of 2 serial ports, 8 USB, dual GbE LAN and 4 SATA ports.

1.2 Features

- **Rich I/O connectivity:** 2 serial ports, 4 USB 3.0, 4 USB 2.0, 2 SATA 2.0, 2 SATA 3.0, Dual GbE LAN
- **Standard Mini-ITX form factor with industrial feature:** The AIMB-273 is a full-featured Mini-ITX motherboard with balanced expandability and performance
- **Wide selection of storage devices:** SATA HDD, customers benefit from the flexibility of using the most suitable storage device for larger capacity
- **Optimized integrated graphic solution:** With Intel® Graphics Flexible, it supports versatile display options and 32-bit 3D graphics engine

1.3 Specifications

1.3.1 System

- **CPU:** uFC-PGA988 Intel mobiel Core i7-3610QE 2.3GHz / Core i5-3610ME 2.7 GHz / Core i3-3120ME 2.4 GHz / Celeron B810 1.6 GHz processor
- **BIOS:** AMI EFI 64 Mbit SPI BIOS
- **System chipset:** Intel® QM77/HM67
- **SATA hard disk drive interface:**
  - Two on-board SATA connectors with data transmission rate up to 300 MB
  - Two on-board SATA connector with data transmission rate up to 600 MB
- **CFast Interface:** Supports CFast socket

1.3.2 Memory

- **RAM:** Up to 16 GB in 2 slots 204-pin SODIMM sockets. Supports dual channel DDR3 1333/1600 MHz SDRAM

1.3.3 Input/Output

- **PCI bus:** 1 PCIe x16 slot
- **Serial ports:** Two serial ports, only RS-232 serial ports
- **Keyboard and PS/2 mouse connector:** Supports one standard PS/2 keyboard, one standard PS/2 mouse
- **USB port:** Supports up to eight USB ports with transmission rate up to 625 MB, 4 on board pin header with USB 2.0 and 4 external ports with USB 3.0
- **GPIO connector:** 8-bit general purpose Input/Output

1.3.4 Graphics

- ■ **Controller:** Intel® Gfx Gen 7, HD graphics
- ■ **Display memory:** 1 GB maximum shared memory with 2GB and above system memory installed
- ■ **VGA:** Supports VGA up to resolution 2048 x 1536 @ 75Hz refresh rate
- ■ **LVDS:** Supports LVDS up to resolution 1920 x 1200
- ■ **HDMI:** Supports HDMI up to resolution 1920 x 1080 (1080P)
- ■ **Display port:** Support Display port up to resolution 2560x1600

:

Note!   *Triple independent display need to use DP+LVDS+HDMI,*
          DP+DP+HDMI, DP+DP+LVDS, DP+CRT+HDMI.

Note!   *Celeron B810 can't support triple display.*

1.3.5 Ethernet LAN

- ■ Supports dual 10/100/1000 Mbps Ethernet port (s) via PCI Express x1 bus which provides 500 MB/s data transmission rate
- ■ **Controller:** LAN1: Intel 82579LM; LAN2: Intel 82583V

1.3.6 Industrial features

- ■ **Watchdog timer:** Can generate a system reset. The watchdog timer is pro-grammable, with each unit equal to one second or one minute (255 levels)

1.3.7 Mechanical and environmental specifications

- ■ **Operating temperature:** 0 ~ 60° C (32 ~ 140° F, Depending on CPU)
- ■ **Storage temperature:** -40 ~ 85° C (-40 ~ 185° F)
- ■ **Humidity:** 5 ~ 95% non-condensing
- ■ **Power supply voltage:** +3.3 V, +5 V, +12 V, -12 V, 5 Vsb
- ■ **Power consumption:**
  Intel® Core™ ii7-3610QE 2.3 GHz, 6 MB L3 cache, 2 pcs 4 GB DDR3 1333 MHz, +5 V @ 3.42 A, +3.3 V @ 1.1 A, +12 V @ 1.19 A, 5 VSB @ 0.5 A, -12 V @ 0 A

  Measure the maximum current value which system under maximum load (CPU: Top speed, RAM & Graphic: Full loading)
- ■ **Board size:** 170 mm x 170 mm (6.69" x 6.69")
- ■ **Board weight:** 0.365 kg

1.4 Jumpers and Connectors

Connectors on the AIMB-273 motherboard link it to 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: Jumpers	
Label	**Function**
JFP1	Power switch/HDD LED/SMBus/Speaker
JFP2	Power LED and Keyboard lock
CMOS1	CMOS clear (Default 1-2)
PSON1	AT(1-2) / ATX(2-3) (Default 2-3)
JWDT1+JOBS1	Watchdog Reset and OBS Alarm
JLVDS1	Voltage 3.3V/5V/12V selector for LVDS1 connector (Default 4-6, 3.3V)
JLVDS_CLT1	Brightness control selector for Analog or Digital (Default 1-2, Linear)
JCOM1	COM1 5V/12V selector (Default 1-2, RI)

Table 1.2: Connectors	
Label	**Function**
LVDS1	LVDS1 connector
INV1	LVDS1 inverter connector
USB56	USB port 5, 6 (on board)
USB78	USB port 7, 8 (on board)
VGA1	VGA connector
COM12	Serial port connector (RS232)
KBMS1	PS/2 Keyboard and Mouse connector
CPUFAN1	CPU FAN connector (3-pin)
SYSFAN1	System FAN1 connector (3-pin)
SYSFAN2	System FAN2 connector (3-pin)
LAN1_USB12	LAN1 / USB port 1, 2
LAN2_USB34	LAN2 / USB port 3, 4
AUDIO1	Audio connector
SPDIF_OUT1	SPDIF Audio out pin header
FPAUD1	HD Audio Front Panel Pin Header
PCIEX16_1	PCIe x16 Slot
SATA1	Serial ATA data connector 1
SATA2	Serial ATA data connector 2
SATA3	Serial ATA data connector 3
SATA4	Serial ATA data connector 4
DIMMA1	Memory connector channel
DIMMB1	Memory connector channel
SPI_CN1	SPI flash update connector.
GPIO1	GPIO header

Table 1.2: Connectors	
ATX12V_1	ATX 12V Auxiliary power connector (for CPU)
ATXPWR1	ATX 20 Pin Main power connector (for System)
CF1	CFast connector
DP+HDMI1	Display port AND HDMI connector
JHDMI1	Display Port to HDMI Convertor F/W Programming Port
MINIPCIE1	Mini PCI Express x1 slot

1.5 Board layout: Jumper and Connector Locations
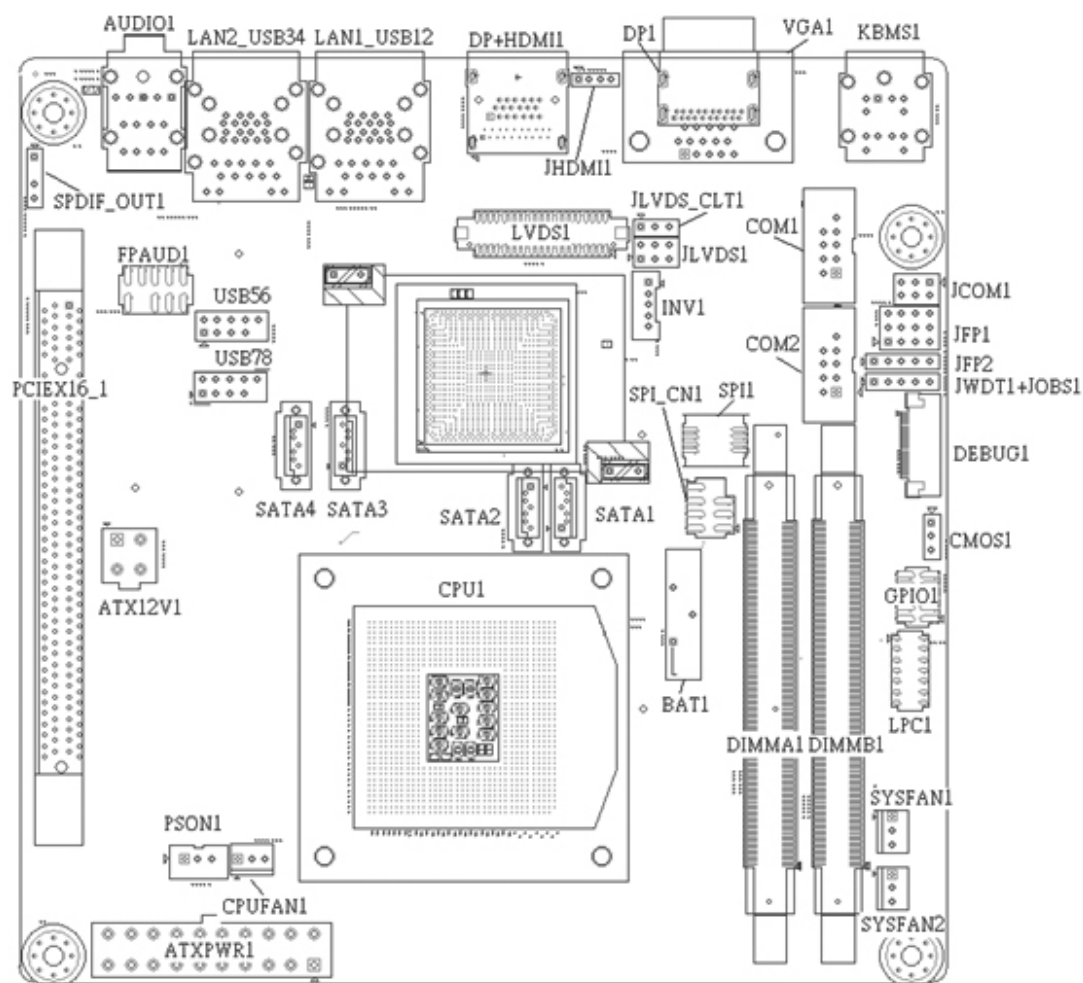
Figure 1.1 Jumper and Connector Location

1.6 AIMB-273 Board Diagram
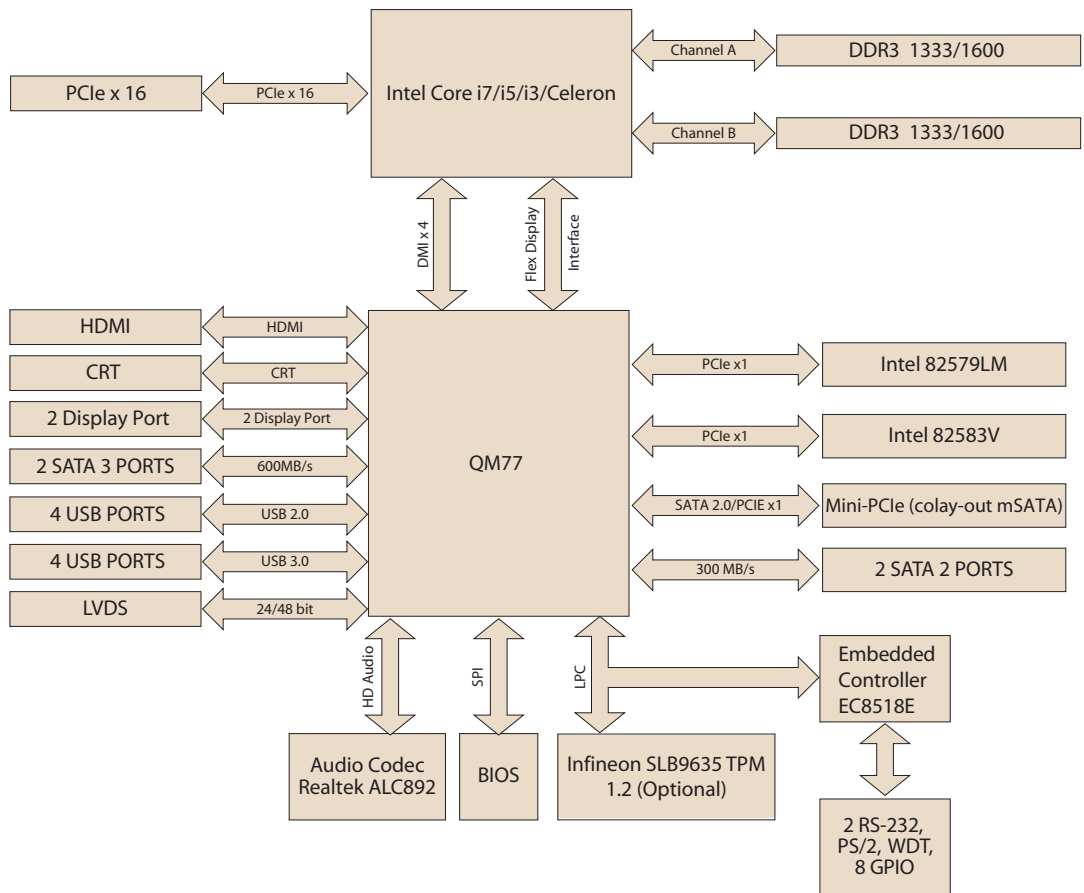
Figure 1.2 AIMB-273 Board Diagram

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 electrostatic 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.
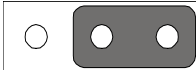
1.8.1 How to Set Jumpers

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-273 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 CMOS1 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 1.3: CMOS1		
Function	**Jumper Setting**	
*Keep CMOS data		1-2 closed
Clear CMOS data		2-3 closed

* Default

1.8.3 JLVDS1: LCD Power 3.3 V/5 V/ 12 V Selector

Table 1.4: JLVDS1: LCD Power 3.3 V/5 V/ 12 V Selector	
Closed Pins	**Result**
JLVDS1	
2-4	Jumper for 5V LVDS panel
4-6	Jumper for 3.3V LVDS panel*
3-4	Jumper for 12V LVDS panel

*Default

2 and 4

4 and 6

3 and 4
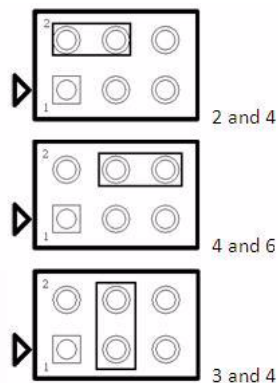
1.8.4 JLVDS_CLT1: Backlight control selector for LVDS1

Table 1.5: JLVDS_CLT1: Backlight control selector for LVDS1	
Closed Pins	Result
1-2*	Linear brightness control
2-3	PWM brightness control

*Default

Linear brightness control
1-2 closed

PWM brightness control
2-3 closed
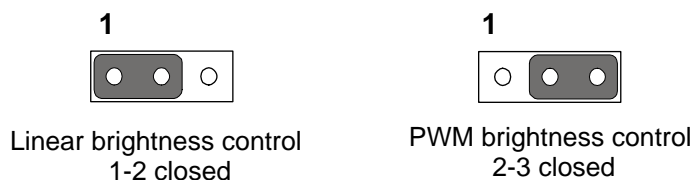
1.8.5 PSON1: ATX, AT Mode Selector

Table 1.6: PSON1: ATX, AT Mode Selector	
Closed Pins	**Result**
1-2	AT Mode
2-3*	ATX Mode

*Default

AT Mode
1-2 closed

ATX Mode
2-3 closed

1.8.6 JWDT1+JOBS1: Watchdog Timer Output and OBS Alarm Option

Table 1.7: JWDT1+JOBS1: Watchdog Timer Output and OBS Alarm Option	
Closed Pins	**Result**
1-2	NC
2-3*	Watchdog Timer Output OBS_Beep
4-5*	Error Beep*

*Default

(2 and 3)+(4 and 5)
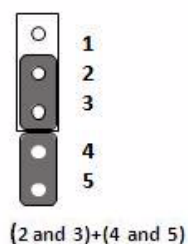
1.9 System Memory

The AIMB-273 has two sockets for a 204-pin DDR3 SODIMM. This socket uses a 1.5 V unbuffered double data rate synchronous DRAM (DDR SDRAM). DRAM is available in capacities of 1 GB, 2 GB, 4 GB and 8 GB. The sockets can be filled in any combination with SODIMMs of any size, giving a total memory size between 1 GB, 2 GB, 4 GB and 8 GB. AIMB-273 does NOT support ECC (error checking and correction).

1.10 Memory Installation Procedures

To install SODIMMs, first make sure the two 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 firmly but gently (avoid pushing down too hard) 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.

1.11 Cache Memory

The AIMB-273 supports a CPU with one of the following built-in full speed L2 caches:

6 MB for Intel Core i7-3610QE

3 MB for Intel Core i5-3610ME

3 MB for Intel Core i3-3120ME

2 MB for Intel Celeron B810

The built-in second-level cache in the processor yields much higher performance than conventional external cache memories.

1.12 Processor Installation

The AIMB-273 is designed for µFC-PGA988, Intel mobile Core i7/Core i5/Core i3/Celeron processor.

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 USB Ports (LAN1_USB12/LAN2_USB34/USB56/ USB78)

The AIMB-273 provides up to eight USB ports. Four USB3.0 on the real side and four pin header on the board. The USB interface complies with USB Specification Rev. 2.0 and Rev. 3.0 supporting transmission rate up to 625 Mbps and is fuse protected. The USB interface can be disabled in the system BIOS setup.

The AIMB-273 is equipped with one high-performance 1000 Mbps Ethernet LAN adapter, and one 100 Mbps LAN adapter, both of which are supported by all major network operating systems. The RJ-45 jacks on the rear panel provide for convenient LAN connection.

LAN1_USB12   LAN2_USB34
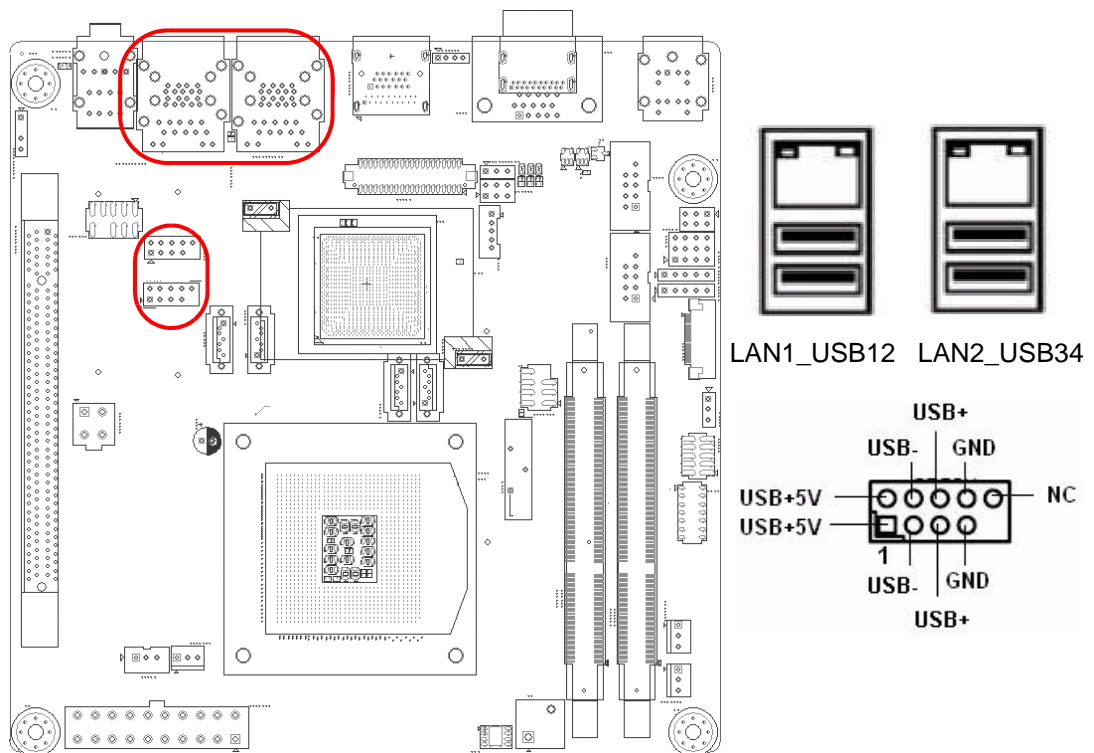
Table 2.1: LAN LED Indicator		
LAN Mode	**LAN Indicator**	
LAN1 indicator	LED1 (Right)	off for mal-link; Link (On) / Active (Flash)
	LED2 (Left)	100 Mbps (On) / 10 Mbps (Off)
	LED2 (Left)	1000 Mbps (On)
LAN2 indicator	LED1 (Right)	off for mal-link; Link (On) / Active (Flash)
	LED2 (Left)	100 Mbps (On) / 10 Mbps (Off)
	LED2 (Left)	1000 Mbps (On)

2.3   VGA Connector(VGA1)
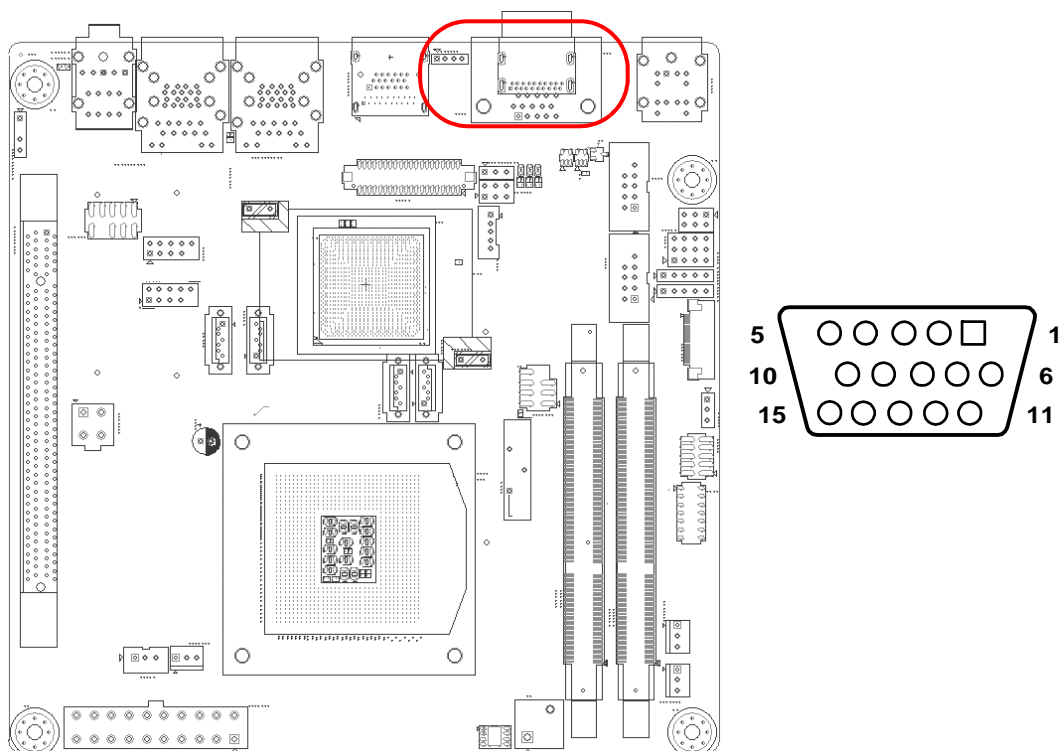
The AIMB-273 includes VGA interface that can drive conventional VGA displays. VGA1 is a standard 15-pin D-SUB connector commonly used for VGA.

2.4 Serial Ports (COM1~COM2)

COM1/COM2
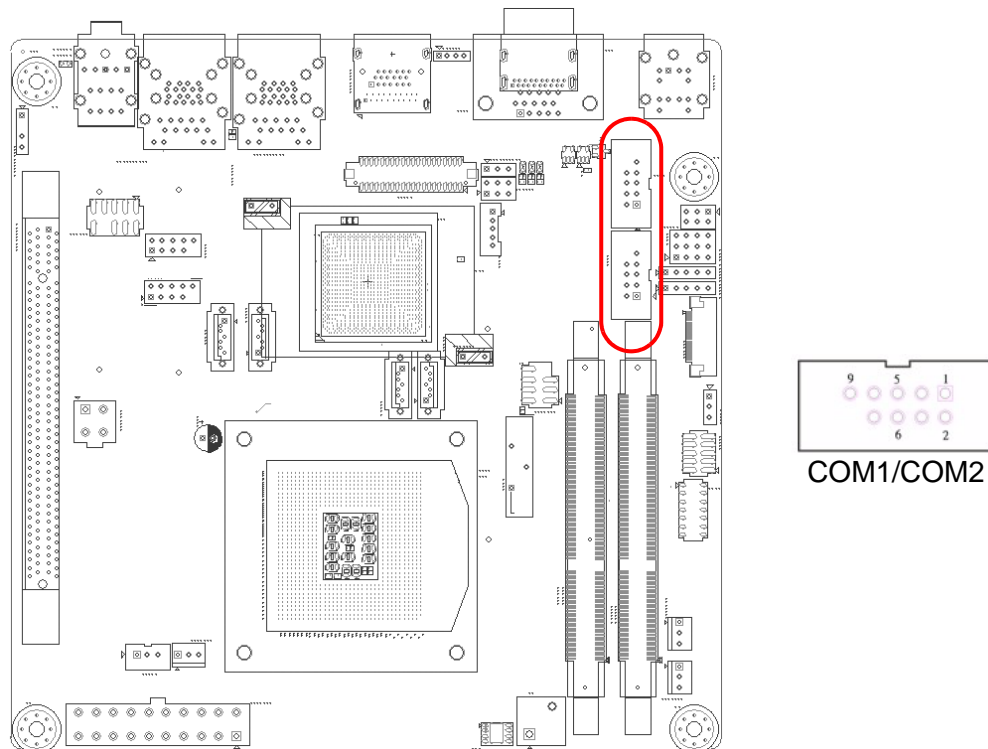
AIMB-273 supports two serial ports, and only support RS-232 function.

These ports can connect to serial devices, such as a mouse or a printer, or to a communications 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 PS/2 Keyboard and Mouse Connector (KBMS1)
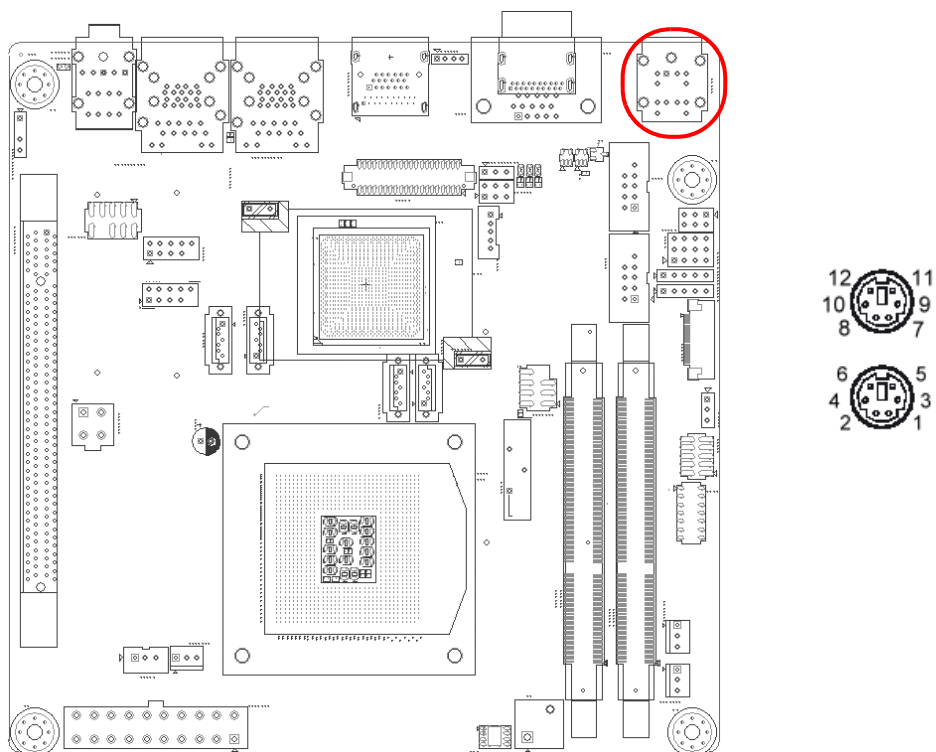
Two 6-pin mini-DIN connectors (KBMS1) on the motherboard provide connection to a PS/2 keyboard and a PS/2 mouse, respectively.

2.6 CPU Fan Connector (CPU_FAN1)
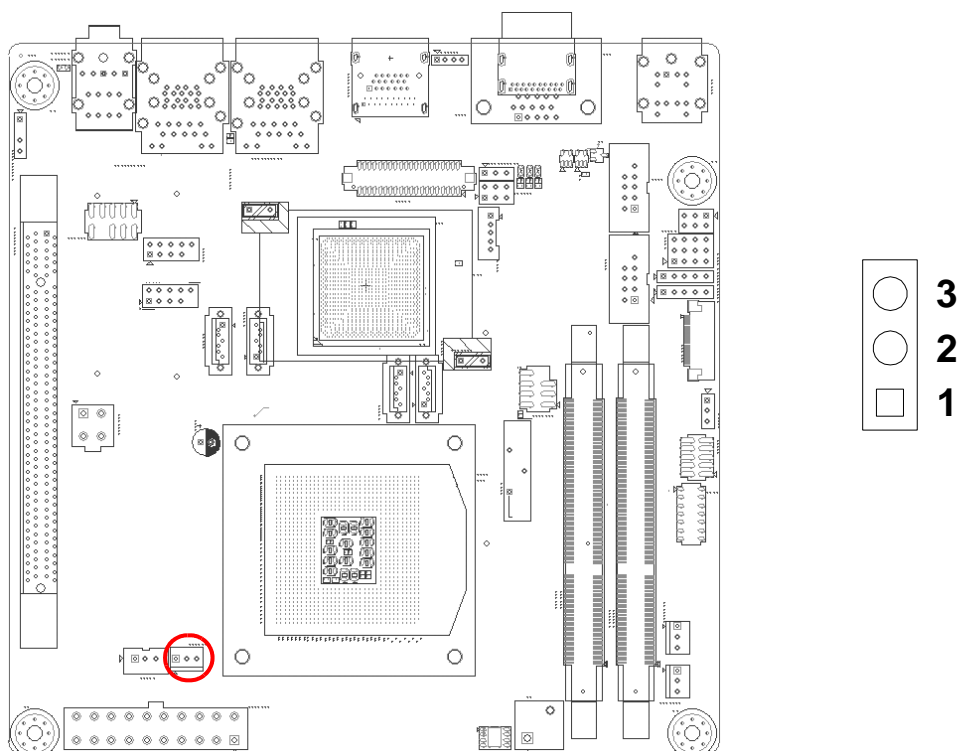
If a fan is used, this connector supports cooling fans of 500 mA (6 W) or less.

2.7 System FAN Connector (SYSFAN1/2)
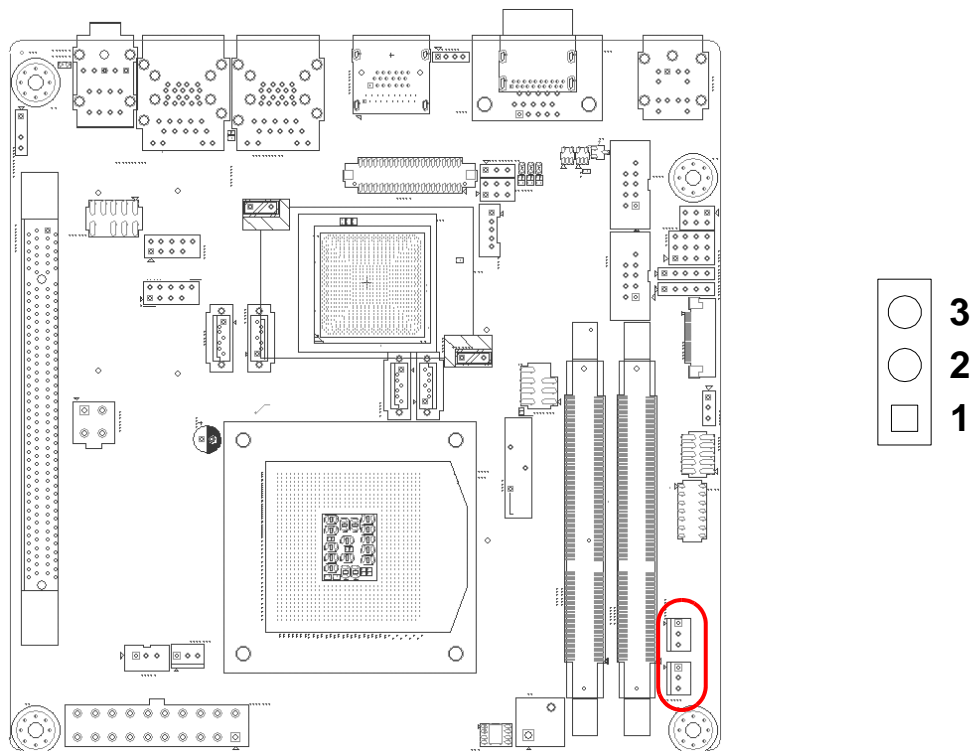
If a fan is used, this connector supports cooling fans of 500 mA (6 W) or less.

2.8 Front Panel Connectors (JFP1/JFP2)

There are several headers for monitoring and controlling the AIMB-273.
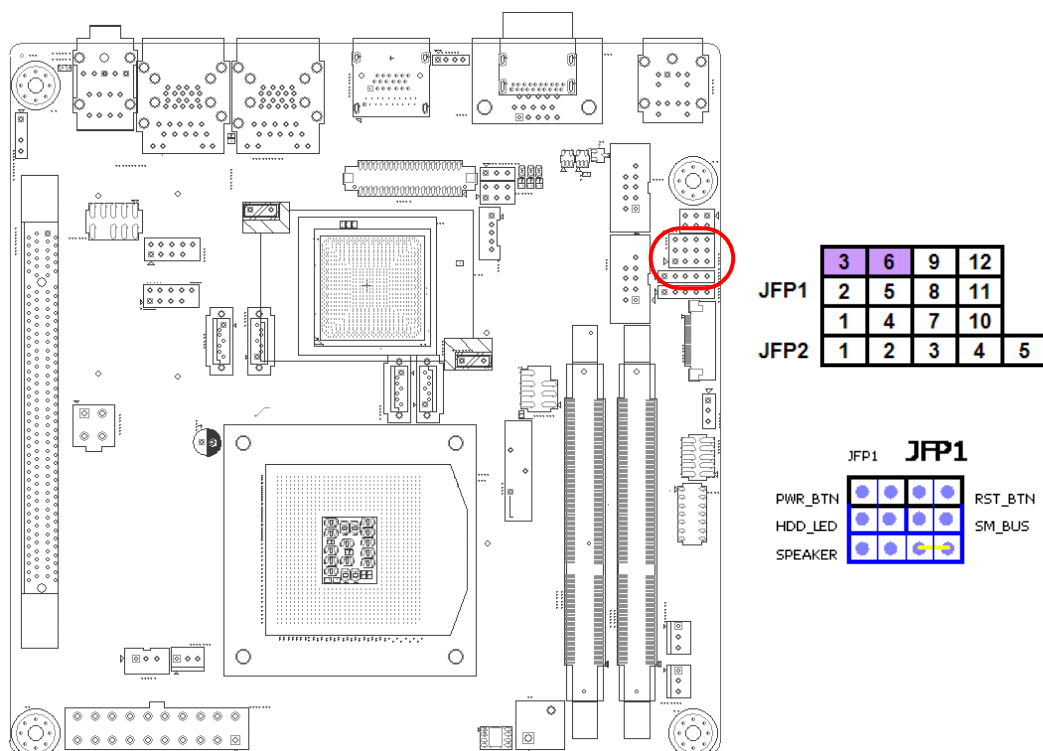
2.8.1 ATX soft power switch ((JFP1/PWR_SW))

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_SW)), for convenient power on and off.

2.8.2 Reset (JFP1/RESET)

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

2.8.3 HDD LED (JFP1/HDDLED)

You can connect an LED to connector (JFP2/HDDLED) 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-273 provides an onboard buzzer as an alternative. To enable the buzzer, set pins 7 & 10 as 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 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 power supply LED status (No support for AT power)			
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 Line In, Line Out, Mic In Connector (AUDIO1)
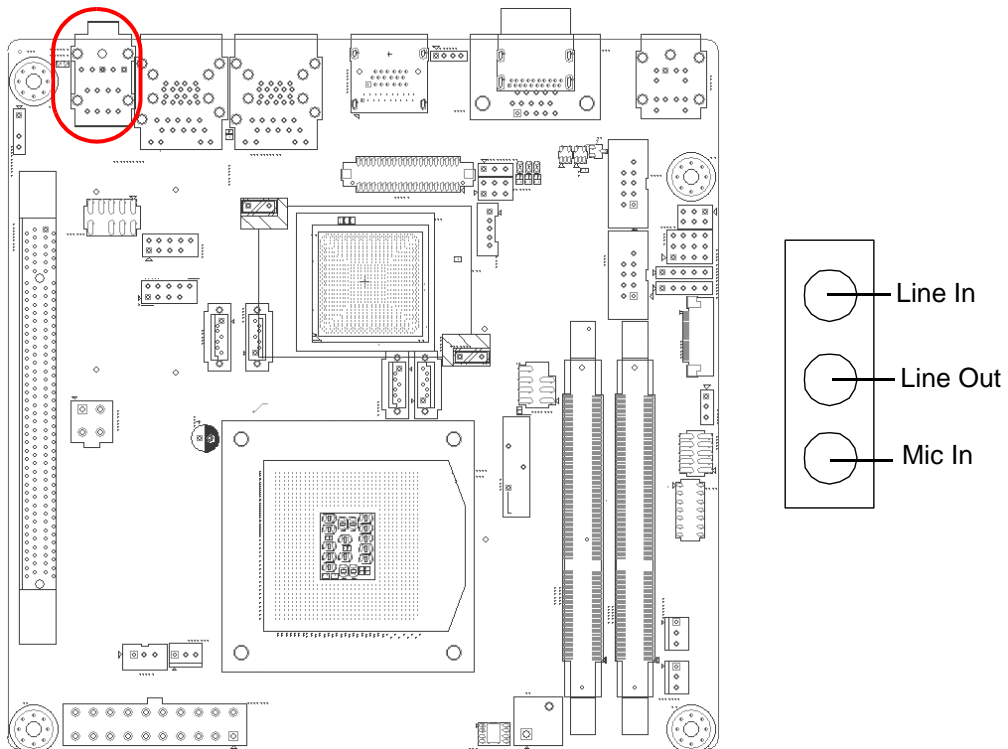
2.10 Digital Audio Connector (SPDIF_OUT1)
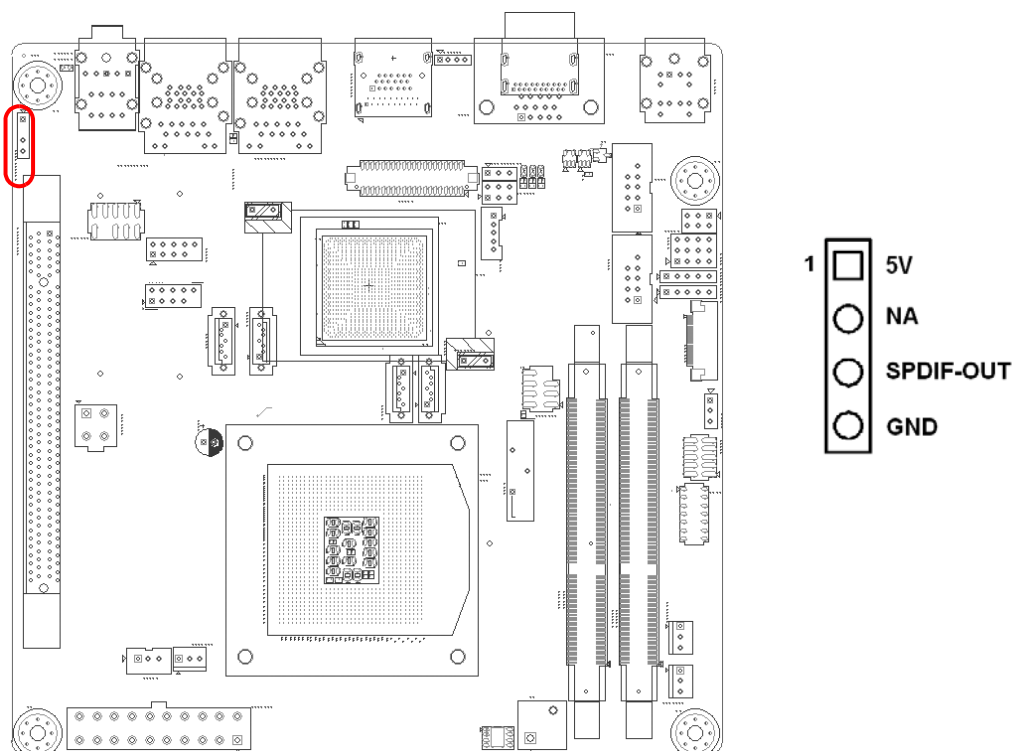
2.11 Serial ATA Interface (SATA1 ~ SATA4)
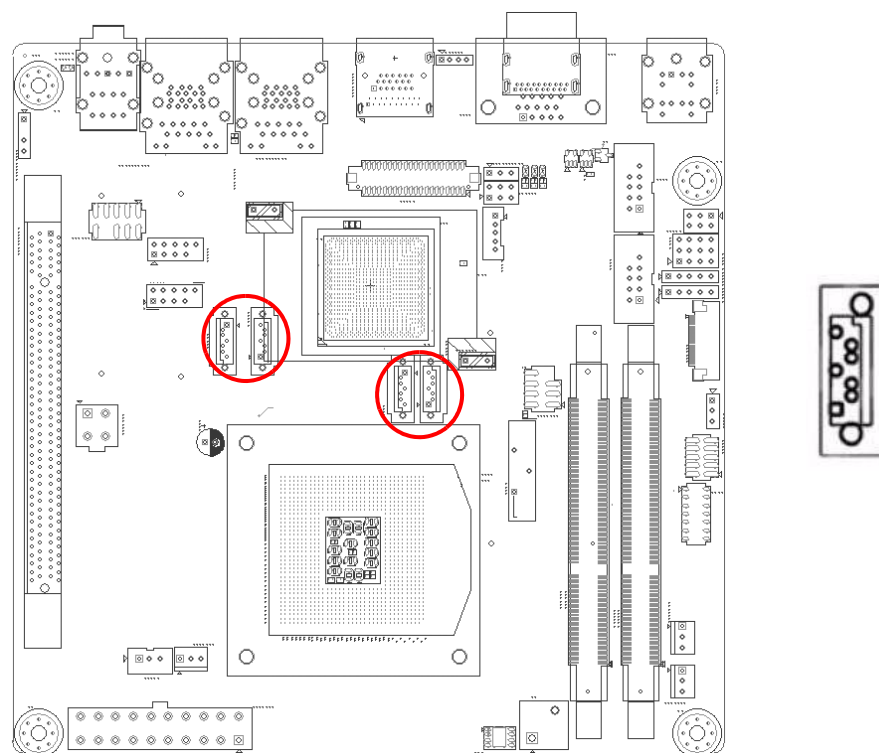
AIMB-273 features a high performance Serial ATA interface (up to 300 MB/s) and Serial ATA III interface (up to 600 MB/s) which eases hard drive cabling with thin, space-saving cables.

2.12 PCI express x16 slot
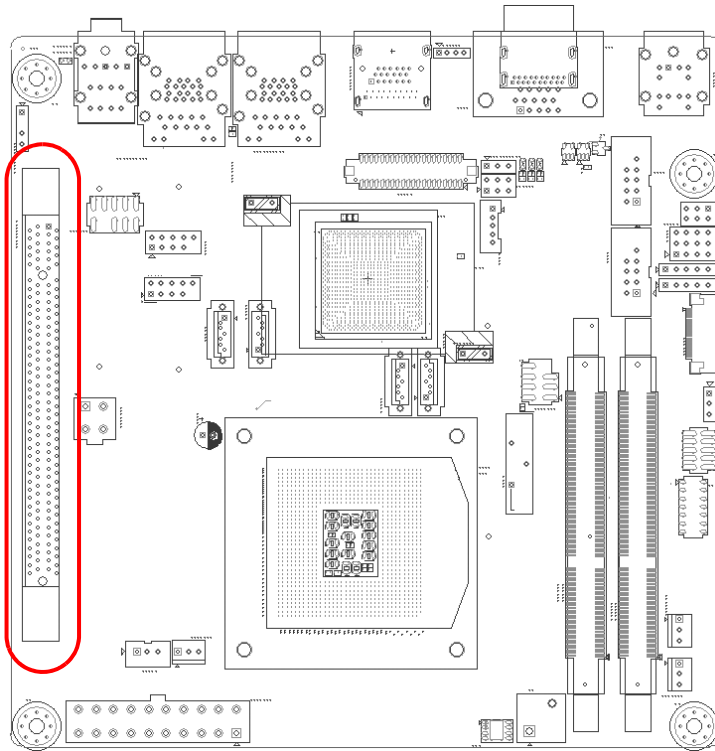
The AIMB-273 provides 1 x PCI express x16 slot.

Note!

Intel QM77 chipset supports PCIe x16 slot (Gen 2.0), but it still has some compatibility issues with certain interface cards; below is the compatibility list table.

Table 2.3: PCI Express Card (x1/x4/x8/x16) Compatibility Test

Test Item		Description		Result	Remark
Type	Brand Name	Model	Interface		
LAN	Intel	Intel 9400PT Server adapter	PCI-E X1	PASS	
LAN	Intel	EXPI9301CTBLK	PCI-E X1	PASS	
LSI Raid SATA 2 port 3GB/S 128MB	UPMOST	3W-9650SE-2LP	PCI-E X1	PASS	
Raid Card	UPMOST	MegaRAID SAS 8704EM2	PCI-E X8	PASS	
TV- Card	COMPRO	Vista E500F	PCI-E X1	PASS	
USB	FORCOM	PE20U3 (USB 3.0) (chip: NEC APAN D720200F1)	PCI-E X1	PASS	
Combo (1394B+USB2.0)	SUNIX	UFC2412	PCI-E X1	PASS	
Sound	Creative	SB X-Fi Titanium Fatallty Pro	PCI-E X1	PASS	
LAN	Intel	Intel E1G42ETG1P20	PCI-E x4	PASS	
SATAII/SAS RAID	Adaptec	AAR-1430SA (4 ports)	PCI-E X4	PASS	
PCIe x16_VGA Card	GIGABYTE	GV-N2500C-1GI (NVIDIA GeForce GTS 250)	PCI-E X16 (Gen2)	PASS	
PCIe x16_VGA Card	GIGABYTE	GV-R5450C-512I (ATI Radeon HD 5450)	PCI-E X16 (Gen2)	PASS	
PCIe x16_VGA Card	GIGABYTE	GV-R467ZL-1GI (ATI HD 4670)	PCI-E X16	PASS	
PCIe x16_VGA Card	MSI	R5770 Hawk 1G/DDR5 (ATI Radeon HD 5770)	PCI-E X16 (Gen2)	PASS	
PCIe x16_VGA Card	Leadtek	PX9800 GT 1024M DDR3 256 BIT (NVIDIA GeForce 9800 GT)	PCI-E X16 (Gen2)	PASS	
PCIe x16_VGA Card	Leadtek	Quadro FX370 256M DDR2 64BIT (NVIDIA Quadro FX370)	PCI-E X16 (Gen2)	PASS	
PCIe x16_VGA Card	ASUS	ENGT240/DI/1GD5/WW (NVIDIA GeForce GT240)	PCI-E X16 (Gen2)	PASS	
PCIe x16_VGA Card	ASUS	ATI Radeon™ HD 5850 (power of moren than 500 w can support)	PCI-E X16 (Gen2)	PASS	
PCIe x16_VGA Card	ASUS	EAH5750 FML/2DI/1GD5 (ATI Radeon HD 5750)	PCI-E X16 (Gen2)	PASS	
VGA card	ASUS	ENGT240/DI/1GD5/WW (NVIDIA GeForce GT240)	PCI-E X16 (Gen2)	PASS	
VGA card	ASUS	EAH5750 FML/2DI/1GD5 (ATI Radeon HD 5750)	PCI-E X16 (Gen2)	PASS	

Table 2.4: Mini Pci-e Devices (MSATA device) Compatibility Test							
Test Item			**Description**			**Result**	**Remark**
Brand Name	Model	Type	Capacity/ Speed	Mode	Vendor PN		
Advantech (0 ~ 70° C)	SQF MSATA 4G SLC 4-CH		4GB	MINI-PCIE	SQF-SMSS4-4G-S5C	PASS	
Advantech (0 ~ 70° C)	SQF MSATA 32G SLC 8-CH		32GB	MINI-PCIE	SQF-SMSS8-32G-S5C	PASS	
Transcend	SLC 16G TS16GMSA500		16GB	MINI-PCIE	NA	PASS	
Transcend	MLC 32G TS32GMSA300		32GB	MINI-PCIE	NA	PASS	
Intel	Soda Creek Msata SSDMAEMC080G2C1		80GB	MINI-PCIE	NA	PASS	
Advantech (0 ~ 70° C)	SQF MSATA 128G MLC 8-CH		128GB	MINI-PCIE	SQF-SMSM8-128G-S5C	PASS	
Advantech (0 ~ 70° C)	SQF MSATA 4G MLC 1-CH		4GB	MINI-PCIE	SQF-SMSM1-4G-S5C	PASS	

2.13 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.
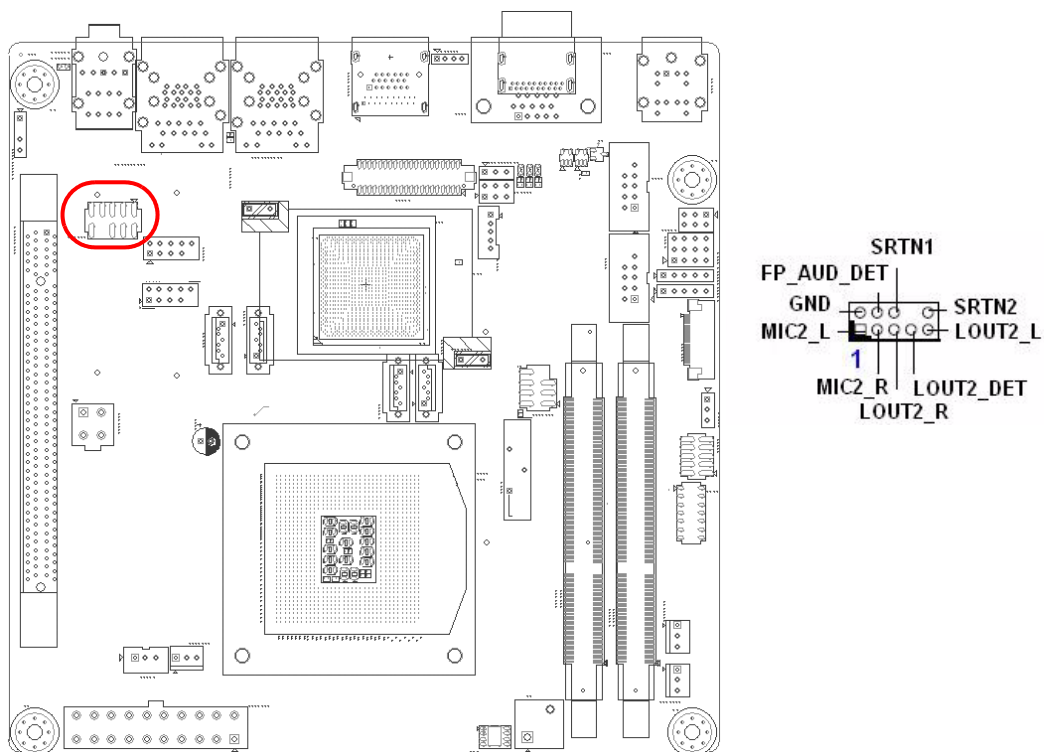
> **Note!** For motherboards with the optional HD Audio feature, we recommend that you connect a high-definition front panel audio module to this connector to take advantage of the motherboard's high definition audio capability.

2.14 ATX Power Connector (EATXPWR1, ATX12V1)

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.
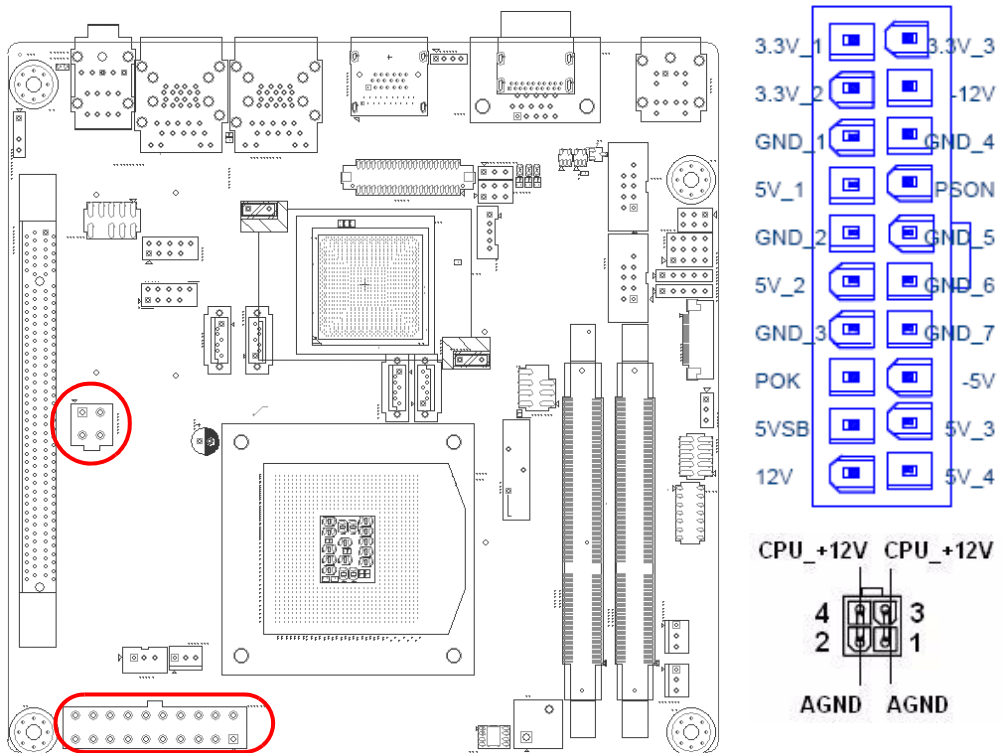
Note!

1. Please do connect the ATX12V1 connector with the PSU ATX 12V 4-pin connector.

2. For a fully configured system, we recommend that you use a power supply unit (PSU) that complies with ATX 12 V Specification 2.0 (or later version) and provides a minimum power of 180 W.

2.15 SPI Flash connector(SPI_CN1)

The SPI flash card pin header may be used to flash BIOS if the AIMB-273 cannot power on.
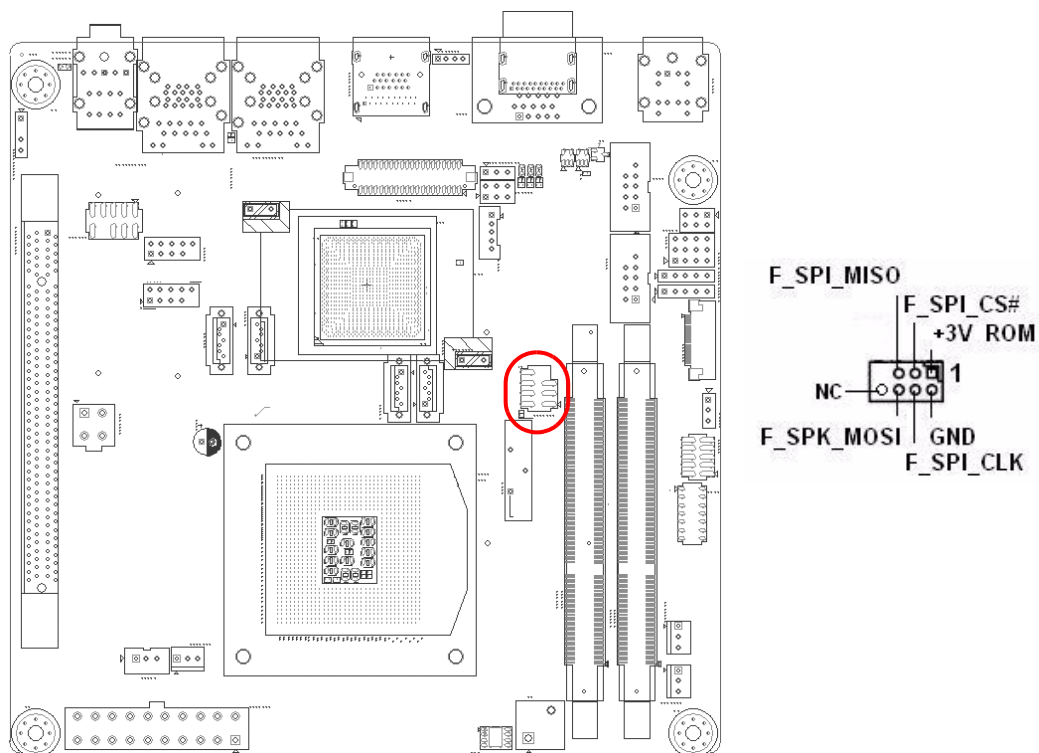
2.16 LCD Inverter Connector (INV1)
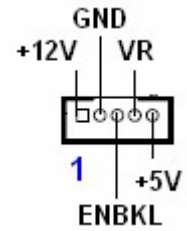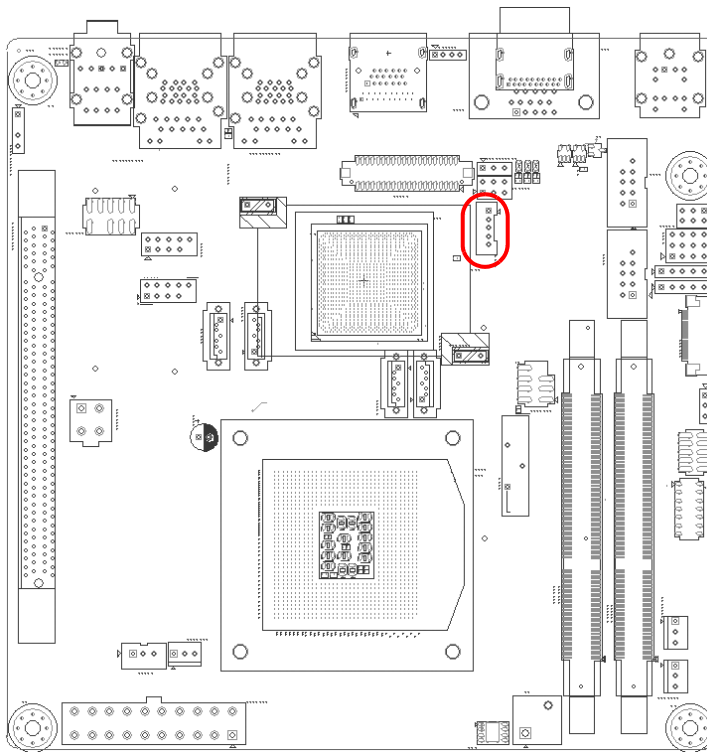
Note! ■ **Signal Description**

Signal	Signal Description
VR	Vadj=0.75 V
	(Recommended: 4.7 KΩ, >1/16 W)
ENBKL	LCD backlight ON/OFF control signal

2.17 LVDS Connector (LVDS1)
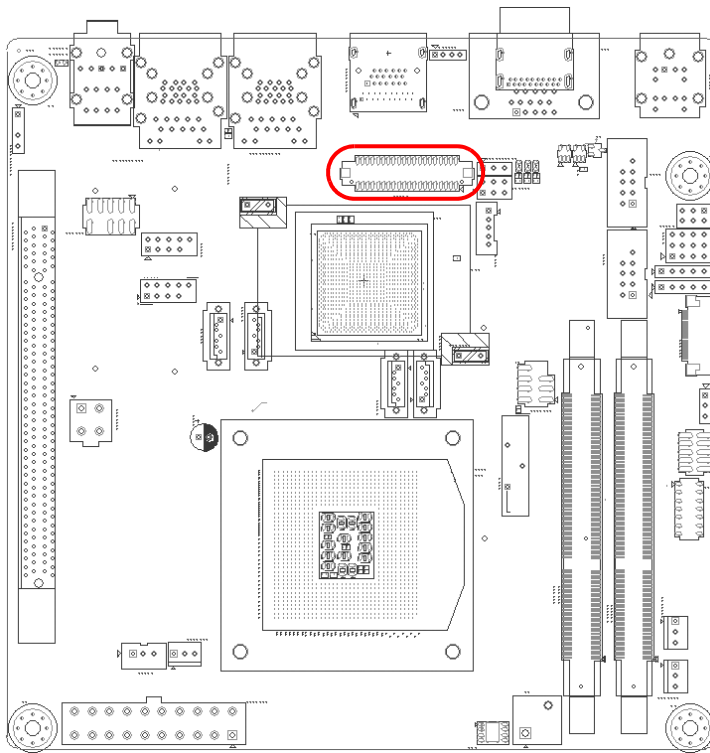
LVDS 1

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

2.18 General purpose I/O Connector (GPIO1)
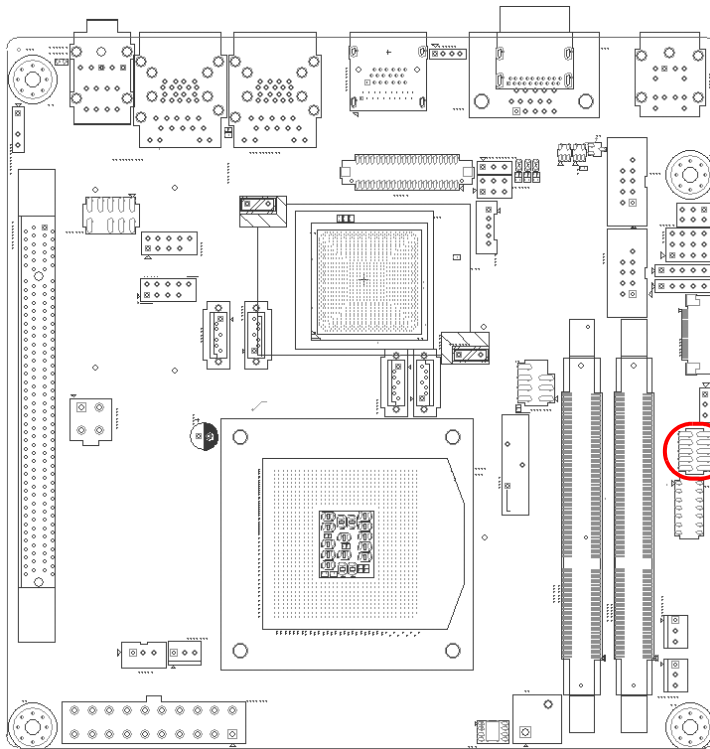
	1	
GPIO0		GPIO4
GPIO1		GPIO5
GPIO2		GPIO6
GPIO3		GPIO7
+5V		GND

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-273 setup screens.

3.2 BIOS Setup

The AIMB-273 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.

```
             Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
  Main  Advanced  Chipset  Boot  Security  Save & Exit

  BIOS Information                                        Set the Date. Use Tab to
  BIOS Vendor                 American Megatrends         switch between Date elements.
  Core Version                4.6.5.3   0.18 x64
  Compliancy                  UEFI 2.3; PI 1.2
  Project Version             A273X015
  Build Date and Time         05/31/2012 20:10:14

  Total Memory                2048 MB (DDR3)


  System Date                 [Sat 01/03/2009]
  System Time                 [16:30:43]

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



             Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

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.

3.2.1.1 System time / System date

Use this option to change the system time and date. Highlight System Time or Sys?tem 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-273 setup screen to enter the Advanced BIOS Setup screen. You can select any of the items in the left frame of the screen, such as CPU Configuration, 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.

```
                 Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
            Main  Advanced  Chipset  Boot  Security  Save & Exit

        ▶ Advantech Bios Update V1.3                          Press [Enter] to do BIOS
        ▶ ACPI Settings                                       update.
        ▶ Trusted Computing                                   Please put new bios UPDATE.BIN
        ▶ S5 RTC Wake Settings                                in disk (FS0).
        ▶ CPU Configuration
        ▶ SATA Configuration
        ▶ Intel(R) Rapid Start Technology
        ▶ Intel TXT(LT) Configuation
        ▶ PCH-FW Configuration
        ▶ Intel(R) Anti-Theft Technology Configuration
        ▶ AMT Configuration
        ▶ USB Configuration
        ▶ SMART Settings
        ▶ Embeded Controller Configuration                    ▸←: Select Screen
        ▶ Intel(R) Smart Connect Technology                   ↑↓: Select Item
        ▶ Super IO Configuration                              Enter: Select
        ▶ Serial Port Console Redirection                     +/-: Change Opt.
        ▶ CPU PPM Configuration                               F1: General Help
        ▶ Switchable Graphics                                 F2: Previous Values
        ▶ Sandybridge DTS Configuration                       F3: Optimized Defaults
                                                              F4: Save & Exit
                                                              ESC: Exit

                 Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

3.2.2.1 ACPI settings

```
                Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
     Advanced

   ACPI Settings                                             Enables or Disables BIOS ACPI
                                                             Auto Configuration.
   Enable ACPI Auto Configuration        [Disabled]

   Enable Hibernation                    [Enabled]
   ACPI Sleep State                      [Both S1 and S3 ava...]
   Lock Legacy Resources                 [Disabled]
   S3 Video Repost                       [Disabled]
   PowerOn by Modem                      [Disabled]


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



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```

- ■ **Enable ACPI Auto Configuration**
  Enable or disable BIOS ACPI Auto Configuration
- ■ **Enable Hibernation**
  This item allows users to enable or disable hibernation
- ■ **ACPI Sleep state**
  This item allows users to set the ACPI sleep state
- ■ **Lock Legacy Resources**
  This item allows users to lock legacy devices' resources.
- ■ **S3 Video Repost**
  Enable or disable video repost
- ■ **Power on by Modem**
  Disable/Enable power on modem function

3.2.2.2 Trusted Computing

```
            Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
   Advanced

 Configuration                                          Enables or Disables BIOS
   Security Device Support            [Disable]         support for security device.
                                                        O.S. will not show Security
                                                        Device. TCG EFI protocol and
 Current Status Information                             INT1A interface will not be
   SUPPORT TURNED OFF                                   available.



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




            Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

■ **Security Device Suport**
    Enable or disable BIOS support for security device.

3.2.2.3 S5 RTC wake Settings

```
            Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
     Advanced

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




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




            Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

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

■ **Wake system with Dynamic Time**
  This item allows you to enable or disable system wake on dynamic time

3.2.2.4 CPU Configuration

```
                 Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
  Advanced

  CPU Configuration                                            ▲ Enabled for Windows XP and
                                                                 Linux (OS optimized for
  Intel(R) Core(TM) i7-3610QE CPU @ 2.30GHz                      Hyper-Threading Technology)
  CPU Signature                        306a8                     and Disabled for other OS (OS
  Microcode Patch                      c                         not optimized for
  Max CPU Speed                        2300 MHz                  Hyper-Threading Technology).
  Min CPU Speed                        1200 MHz                  When Disabled only one thread
  CPU Speed                            2300 MHz                  per enabled core is enabled.
  Processor Cores                      4
  Intel HT Technology                  Supported
  Intel VT-x Technology                Supported
  Intel SMX Technology                 Supported
  64-bit                               Supported
                                                               ─────────────────────────────
  L1 Data Cache                        32 kB x 4               ↔: Select Screen
  L1 Code Cache                        32 kB x 4               ↕: Select Item
  L2 Cache                             256 kB x 4              Enter: Select
  L3 Cache                             6144 kB                 +/-: Change Opt.
                                                               F1: General Help
  Hyper-threading                      [Enabled]              F2: Previous Values
  Active Processor Cores               [All]                  F3: Optimized Defaults
  Limit CPUID Maximum                  [Disabled]             F4: Save & Exit
  Execute Disable Bit                  [Enabled]              ESC: Exit
  Intel Virtualization Technology      [Disabled]
  Hardware Prefetcher                  [Enabled]             ▼

                 Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

■ **Hyper Threading**

This item allows users to enable or disable Intel® Hyper Threading technology.

■ **Active Processor Cores**

This item allows users to set how many processor cores should be active.

■ **Limit CPUID Maximum**

This item allows users to limit the maximum value of CPUID.

■ **Execute Disable Bit**

This item allows users to enable or disable the No-Execution page protection technology.

■ **Intel Virtualization Technology**

This item allows users to enable or disable the Intel virtualization technology

■ **Hardware Prefetcher**

This item allows users to enable or disable the hardware prefetcher feature.

3.2.2.5 SATA configuration

```
            Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
    Advanced

SATA Controller(s)              [Enabled]                Enable or disable SATA Device.
SATA Mode Selection             [IDE]

Serial ATA Port 1               Empty
   Software Preserve            Unknown
Serial ATA Port 2               Empty
   Software Preserve            Unknown
mSATA                           Empty
   Software Preserve            Unknown
Serial ATA Port 3               Empty
   Software Preserve            Unknown
Serial ATA Port 4               Empty
   Software Preserve            Unknown
CFast                           Empty                    ++: Select Screen
   Software Preserve            Unknown                  ↑↓: Select Item
                                                         Enter: Select
                                                         +/-: Change Opt.
                                                         F1: General Help
                                                         F2: Previous Values
                                                         F3: Optimized Defaults
                                                         F4: Save & Exit
                                                         ESC: Exit


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```

■ **SATA Controller(s)**
  This item allows users to enable or disable the SATA controller(s).
■ **SATA Mode Selection**
  This item allows users to select mode of SATA controller(s).

3.2.2.6 INTEL Rapid Star Technology

```
          Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
  Advanced

  Intel(R) Rapid Start Technology       [Disabled]


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


          Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```
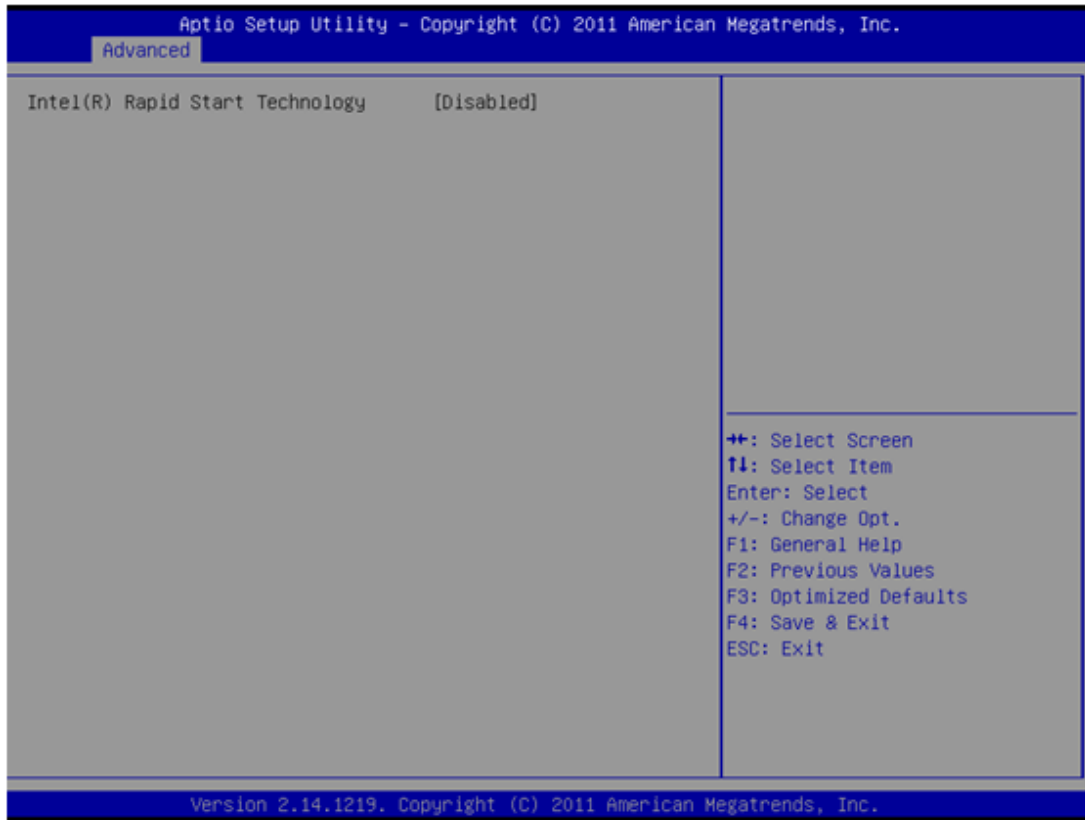
■ **Intel® Rapid start technology**
   This item allows users to enable or disable Intel rapid start technology.

3.2.2.7 INTEL TXT(LT) Configuration

```
          Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
   Advanced

  Intel Trusted Execution Technology Configuration

  Intel TXT support only can be enabled/disabled if SMX
  is enabled. VT and VT-d support must also be enabled
  prior to TXT.

  Secure Mode Extensons (SMX)              Enabled

  Intel TXT(LT) Support                    [Disabled]

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

          Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

■ **Secure Mode Extensions (SMX)**
   This item allows users to enable or disable SMX.

■ **Intel TXT(LT) Support**
   This item allows users to enable or disable Intel TXT.

3.2.2.8 PCH(FW) Configuration

```
          Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
          Advanced

  ME FW Version                    8.0.3.1427            Enable/Disable MDES BIOS
  ME Firmware Mode                 Normal Mode           Status Code.
  ME Firmware Type                 Full Sku Firmware
  ME Firmware SKU                  5MB
  MDES BIOS Status Code            [Disabled]
▶ Firmware Update Configuration

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

          Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

```
          Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
          Advanced

  Me FW Image Re-Flash             [Disabled]            Enable/Disable Me FW Image
                                                         Re-Flash function.

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

          Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

■ **Me FW Image Re-Flash**
   This item allows users to enable or disable Me FW image re-flash function.

3.2.2.9 Intel® Anti-Theft Technology Configuration

```
              Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
     Advanced

  Intel(R) Anti-Theft Technology Configuration          Enable/Disable Intel(R) AT in
                                                         BIOS for testing only.
  Intel(R) Anti-Theft Technology      [Disabled]
  Intel(R) Anti-Theft Technology Rec    3
  Enter Intel(R) AT Suspend Mode      [Disabled]




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



              Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

■ **Intel® Anti-theft Technology**
   This item allows users to enable or disable Intel AT in bios for testing only.

■ **Enter Intel® AT Suspend Mode**
   This item allows users to enable or disable enter Intel AT suspend mode function.

3.2.2.10 Intel AMT Configuration

```
                    Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
          Advanced

 Intel AMT                               [Enabled]              Enable/Disable Intel (R)
 BIOS Hotkey Pressed                     [Disabled]             Active Management Technology
 MEBx Selection Screen                   [Disabled]             BIOS Extension.
 Hide Un-Configure ME Confirmation       [Disabled]             Note : iAMT H/W is always
 MEBx Debug Message Output               [Disabled]             enabled.
 Un-Configure ME                         [Disabled]             This option just controls the
 Amt Wait Timer                          0                      BIOS extension execution.
 Disable ME                              [Disabled]             If enabled, this requires
 ASF                                     [Enabled]              additional firmware in the SPI
 Activate Remote Assistance Process      [Disabled]             device
 USB Configure                           [Enabled]
 PET Progress                            [Enabled]
 AMT CIRA Timeout                        0
 WatchDog                                [Disabled]             ++: Select Screen
  OS Timer                               0                      ↑↓: Select Item
  BIOS Timer                             0                      Enter: Select
                                                                +/-: Change Opt.
                                                                F1: General Help
                                                                F2: Previous Values
                                                                F3: Optimized Defaults
                                                                F4: Save & Exit
                                                                ESC: Exit

                   Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

■ **Intel AMT**

This item allows users to enable or disable Intel AMT BIOS extension.

■ **BIOS Hotkey Pressed**

This item allows users to enable or disable BIOS hotkey press.

■ **MEBx Selection Screen**

This item allows users to enable or disable MEBx selection screen.

■ **Hide Un-Configuration ME Confirmation**

This item allows users to hide un-configure ME without password confirmation prompt.

■ **MEBx Debug Message Output**

This item allows users to enable or disable MEBx debug message.

■ **Un-Configure ME**

This item allows users to un-configure ME without password.

■ **Amt Wait Timer**

Set timer to wait before sending ASF_GET_BOOT_OPTIONS.

■ **Disable ME**

This item allows users to enable or disable ME function.

■ **ASF**

This item allows users to enable or disable Alert Specification Format.

■ **Activate Remote Assistance Process**

This item allows users to enable or disable trigger CIRA boot.

■ **USB Configure**

This item allows users to enable or disable USB configure function.

■ **PET Progress**

This item allows users to enable or disable PET events progress to receive PET events or not.

■ **AMT CIRA Timeout**

OEM defined timeout for MPS connection to be established.

■ **WatchDog**

This item allows users to enable or disable WatchDog Timer.

■ **OS Timer**

Sets OS watchdog timer.

■ **BIOS Timer**

Sets BIOS watchdog timer.

3.2.2.11 USB configuration

```
              Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
        Advanced

USB Configuration                                          Enables Legacy USB support.
                                                           AUTO option disables legacy
USB Devices:                                               support if no USB devices are
        1 Drive, 1 Keyboard, 2 Hubs                        connected. DISABLE option will
                                                           keep USB devices available
Legacy USB Support              [Enabled]                  only for EFI applications.
USB3.0 Support                  [Enabled]
XHCI Hand-off                   [Enabled]
EHCI Hand-off                   [Disabled]

USB hardware delays and time-outs:
USB transfer time-out           [20 sec]
Device reset time-out           [20 sec]
Device power-up delay           [Auto]                     ←→: Select Screen
                                                           ↑↓: Select Item
Mass Storage Devices:                                      Enter: Select
JetFlashTranscend 8GB 1100      [Auto]                     +/-: Change Opt.
                                                           F1: General Help
                                                           F2: Previous Values
                                                           F3: Optimized Defaults
                                                           F4: Save & Exit
                                                           ESC: Exit


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```

■ **Legacy USB support**

Enables support for legacy USB. Auto option disables legacy support if no USB devices are connected.

■ **USB3.0 support**

This item allows user to enable or disable USB3.0 function.

■ **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 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.

3.2.2.12 Smart Settings

```
          Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
  Advanced

SMART Settings                                              Run SMART Self Test on all
                                                            HDDs during POST.
SMART Self Test                    [Disabled]




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




          Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```
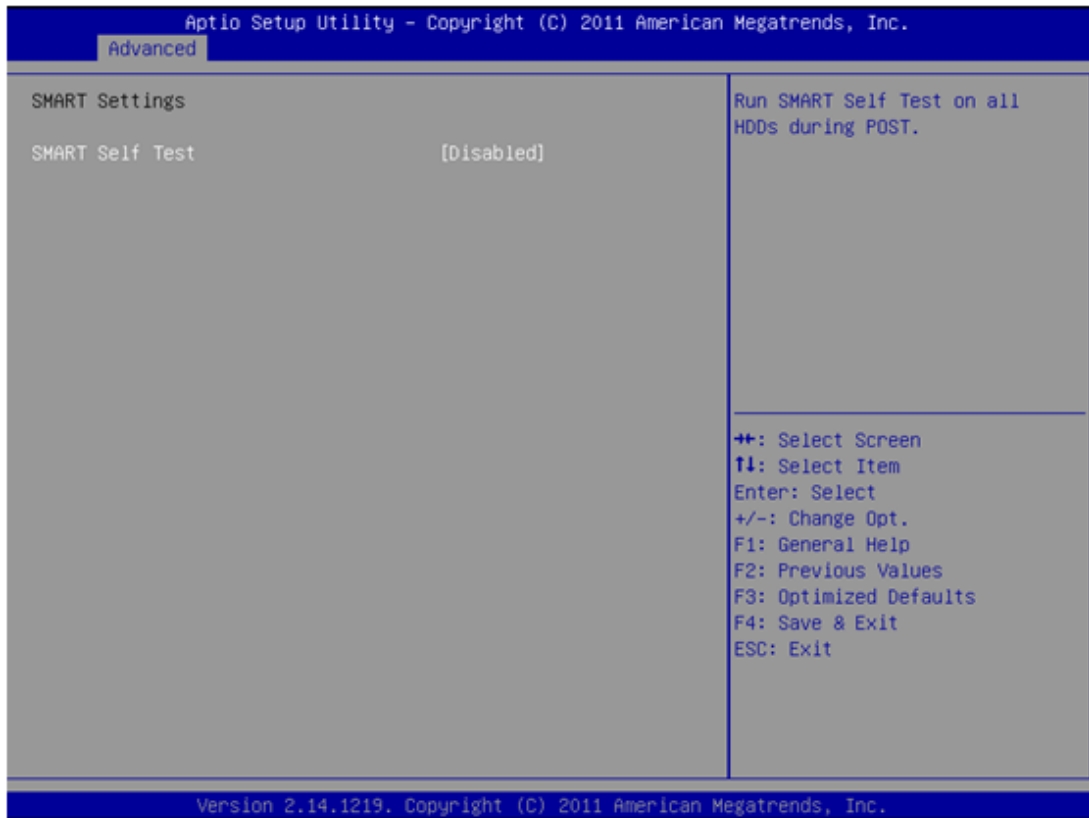
- ■ **Smart Self Test**

  Enable or disable Run SMART Self test on all HDDs during Post.

3.2.2.13 Embedded Controller configuration

```
            Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
     Advanced

 EC Firmware Version              I1860X0010              Select Irq Number eBrain
 EC iManager WatchDog IRQ         [IRQ7]                  WatchDog
 EC Power Saving Mode             [Normal]

 EC Hardware Monitor
 CPU Temperature                  : +65°C/ +149°F

 VBAT                             : +3.026 V
 5VSB                             : +5.060 V
 12V                              : +11.976 V
 5V                               : +5.096 V
 3.3V                             : +3.400 V
 CPU FAN                          : 5109 RPM
 SYS FAN1                         : N/A                  →←: Select Screen
 SYS FAN2                         : N/A                  ↑↓: Select Item
                                                         Enter: Select
 CPU Shutdown Temperature         [Disable]              +/-: Change Opt.
 EC iManager Smart FAN            [Enabled]              F1: General Help
                                                         F2: Previous Values
 Backlight Polarity               [Native]               F3: Optimized Defaults
                                                         F4: Save & Exit
                                                         ESC: Exit


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```

- **EC iManager WatchDog IRQ**
  This item allows users to set the irq number of EC watchdog.
- **EC Power Saving Mode**
  This item allows users to set board°Øs power saving mode when off.
- **CPU Shutdown Temperature**
  This item allows users to set the value of CPU shutdown temperature.
- **EC iManager Smart FAN**
  This item allows users to enable or disable smart FAN feature.
- **Backlight Enable Polarity**
  This item allows users to set backlight enable polarity.

3.2.2.14 Intel Smart Connect Technology

```
              Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
    Advanced

    ISCT Configuration            [Disabled]        Enable/Disable ISCT
                                                    Configuration




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



              Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```
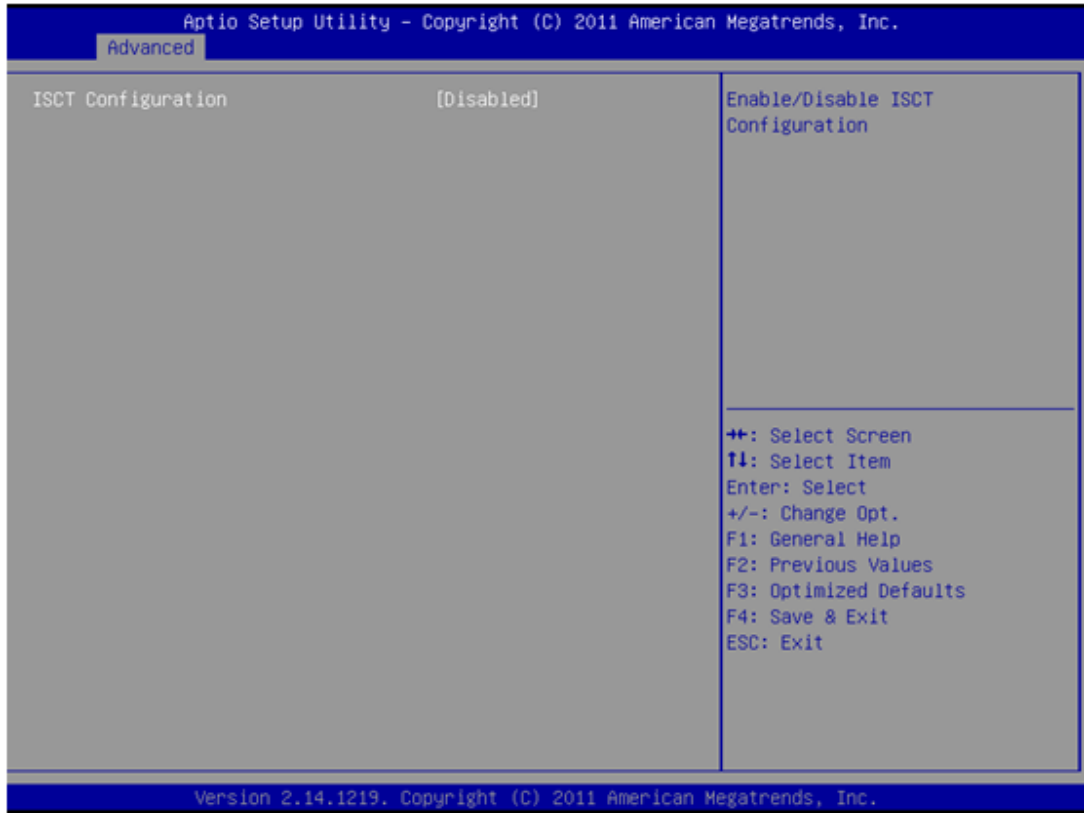
■   **ISCT Configuration**
    Enable or disable ISCT configuration.

3.2.2.15 Super IO configuration

```
        Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
       Advanced

 Super IO Configuration                              Set Parameters of Serial Port
                                                     0 (COMA)
 Super IO Chip                      ITE 8518
 ▶ Serial Port 0 Configuration
 ▶ Serial Port 1 Configuration




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



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```

```
        Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
       Advanced

 Serial Port 0 Configuration                         Enable or Disable Serial Port
                                                     (COM)
 Serial Port                        [Enabled]
 Device Settings                    IO=3F8h; IRQ=4;

 Change Settings                    [Auto]
 Device Mode                        [Normal]




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



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```

- ■ **Serial Port**

  This item will allow user to enable or disable serial port.
- ■ **Change Settings**

  This item allows user to change the serial port setting.
- ■ **Device Mode**

  This item allows user to change the device mode.

3.2.2.16 Serial Port Console Redirection
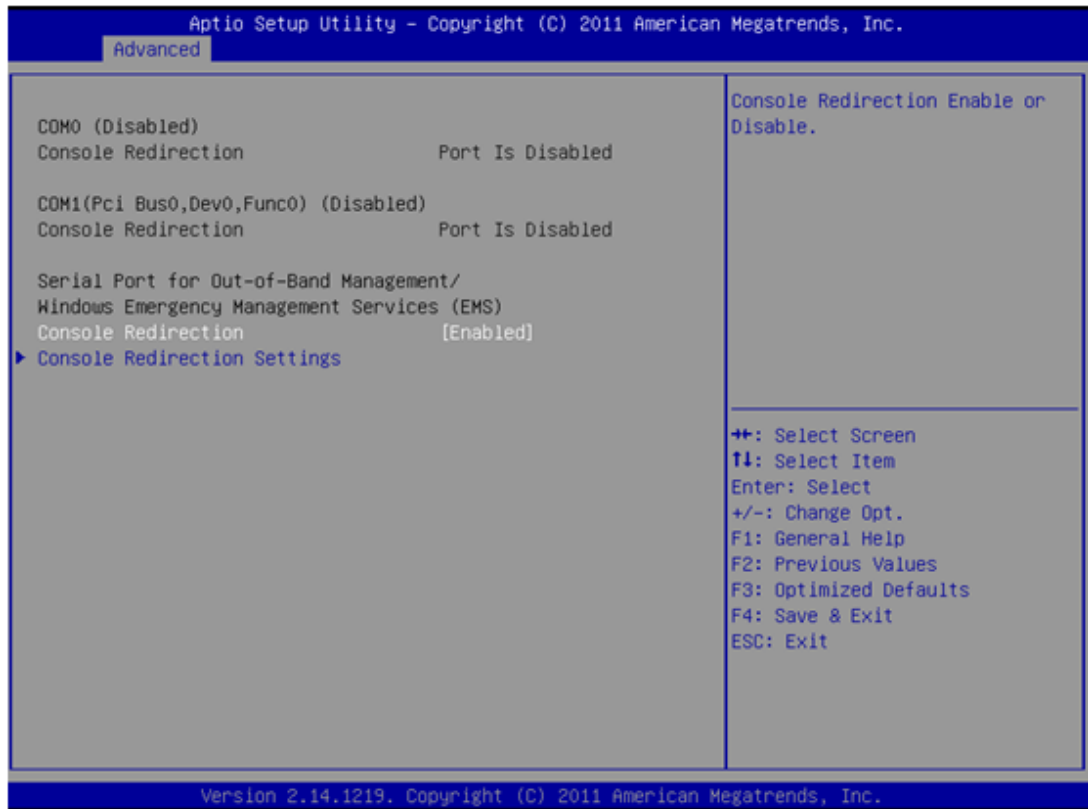
- ■ **Console Redirection**

  This item allows users to enable or disable console redirection for Microsoft Windows Emergency Management Services (EMS).
- ■ **Out-of-Band Mgmt Port**

  Select the port for Microsoft Windows Emergency Management Services (EMS) to allow for remote management of a Windows Server OS.
- ■ **Terminal Type**

  VT-UTF8 is the preferred terminal type for out-of-band management. The next best choice is VT100+ and then VT100. See above, in Console Redirection Settings page, for more Help with Terminal Type/Emulation.

3.2.2.17 CPU PPM Configuration

```
           Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
  Advanced

  CPU PPM Configuration                                  Enable/Disable Intel SpeedStep

  EIST                          [Enabled]
  Turbo Mode                    [Enabled]
  CPU C3 Report                 [Enabled]
  CPU C6 report                 [Enabled]
  CPU C7 report                 [Enabled]
  Config TDP LOCK               [Disabled]
  ACPI T State                  [Disabled]

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

           Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

■ **EIST**

CPU runs at its default speed if disabled; CPU speed is controlled by the operating system if enabled.

■ **Turbo Mode**

This item allows users to enable or disable turbo mode.

■ **CPU C3/C6/C7 Report**

This item allows users to enable or disable CPU C-state support.

■ **Config TDP LOCK**

This item allows users to enable or disable CPU TDP lock function.

■ **ACPI T state**

This item allows users to enable or disable ACPI T state function.

3.2.2.18 Switchable Graphic

```
                Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
  Advanced

 SG Mode Select                      [Muxless]

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

                Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```
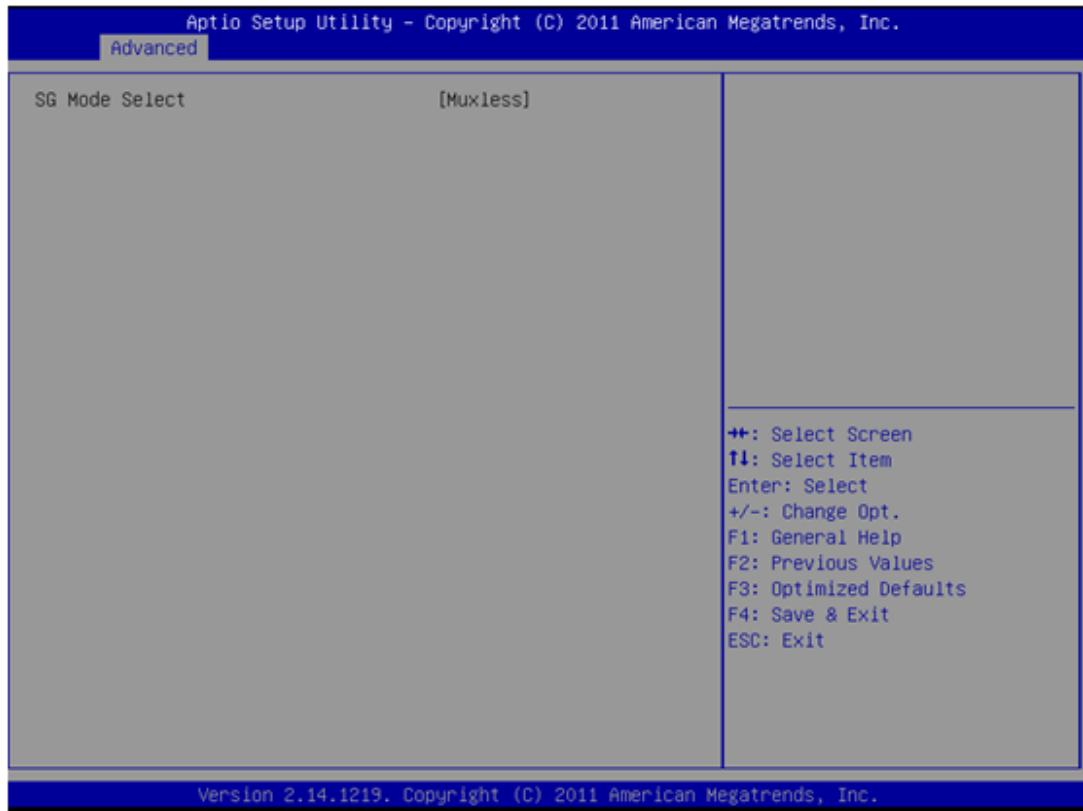
■ **SG Mode Select**
   This item allows users to select switchable graphics mode.

3.2.2.19 Sandybridge DTS Configuration

```
            Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
   Advanced

 Sandybridge DTS Configuration                          Disabled: ACPI thermal
                                                         management uses EC reported
 CPU DTS                           [Disabled]            temperature values.
                                                         Enabled: ACPI thermal
                                                         management uses DTS SMM
                                                         mechanism to obtain CPU
                                                         temperature values.
                                                         Out of Spec: ACPI Thermal
                                                         Management uses EC reported
                                                         temperature values and DTS SMM
                                                         is used to handle Out of Spec


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



            Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```
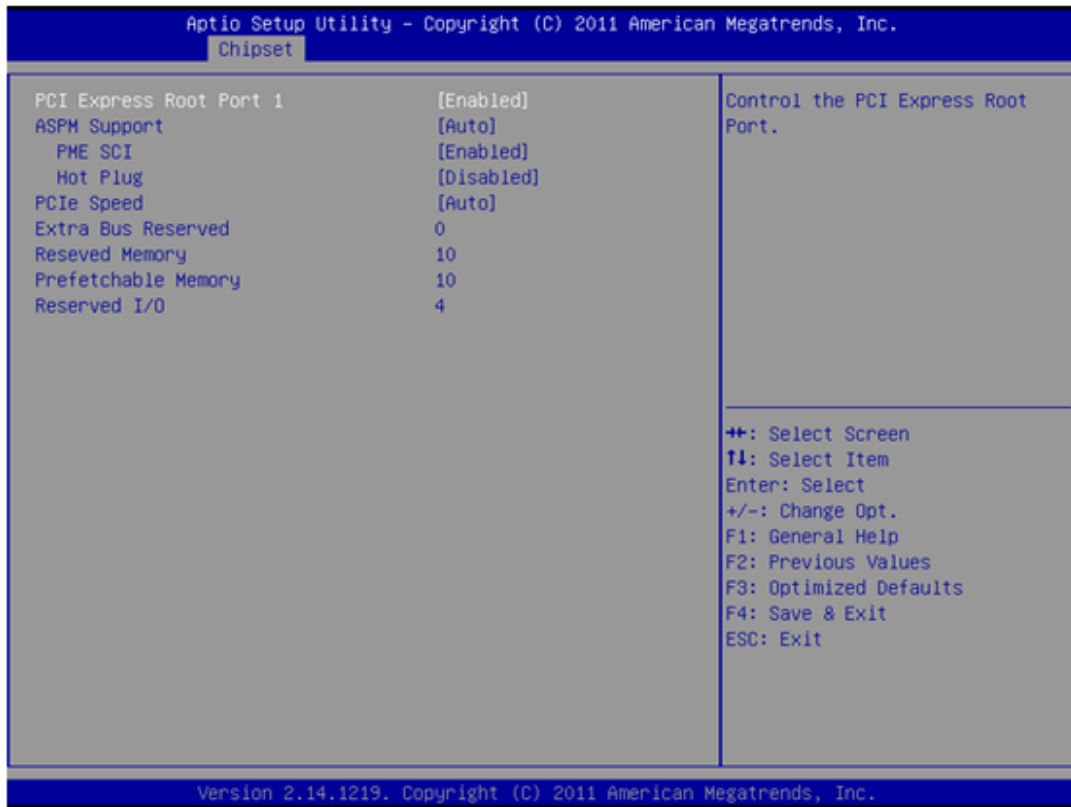
■ **CPU DTS**

This item allows users to select the ACPI thermal management uses EC reported temperature value function.

3.2.3 Chipset

```
                Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
                   Chipset

  Intel PCH RC Version          1.1.0.0              PCI Express Configuration
  Intel PCH SKU Name            QM77                 settings
  Intel PCH Rev ID              04/C1

 ▶ PCI Express Configuration
 ▶ USB Configuration
 ▶ PCH Azalia Configuration

  LAN1 Controller               [Enabled]
    Lan1 Option-ROM             [Disabled]
    Wake on LAN1                [Disabled]
  LAN2 Controller               [Enabled]
    Lan2 Option-ROM             [Disabled]           ↔: Select Screen
    PCIE Wake                   [Disabled]           ↑↓: Select Item
                                                     Enter: Select
  High Precision Event Timer Configuration           +/-: Change Opt.
  High Precision Timer          [Enabled]            F1: General Help
                                                     F2: Previous Values
  SLP_S4 Assertion Width        [4-5 Seconds]        F3: Optimized Defaults
  Restore AC Power Loss         [Power Off]          F4: Save & Exit
                                                     ESC: Exit



                Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```
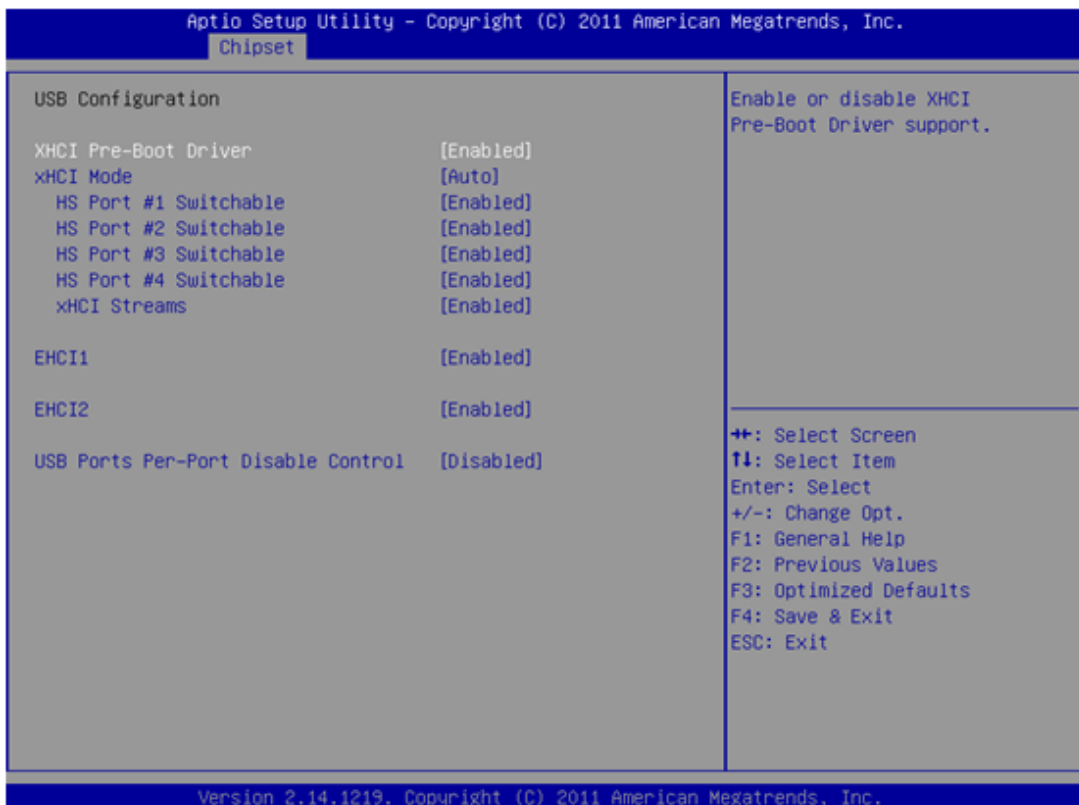
■ **PCI Express Configuration**
Detail of PCI Express items.

■ **USB Configuration**
Details of USB items.

■ **PCH Azalia Configuration**
Details of PCH azalia items.

■ **LAN controller**
Enables or disables the LAN1/2 controller.

■ **LAN option-ROM**
Enables or disables the LAN1/2 option-ROM.

■ **Wake on LAN**
Enables or disables LAN1/2 wake up from sleep state.

■ **High Precision Timer**
Enables or disables the high precision timer.

■ **SLP_S4 Assertion Width**
This item allows users to set a delay of sorts.

■ **Restore AC Power Loss**
This item allows users to select off, on and last state.

3.2.3.1 PCI Express Configuration

```
          Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
          Chipset

PCI Express Root Port 1          [Enabled]              Control the PCI Express Root
ASPM Support                     [Auto]                 Port.
  PME SCI                        [Enabled]
  Hot Plug                       [Disabled]
PCIe Speed                       [Auto]
Extra Bus Reserved               0
Reseved Memory                   10
Prefetchable Memory              10
Reserved I/O                     4

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

          Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```
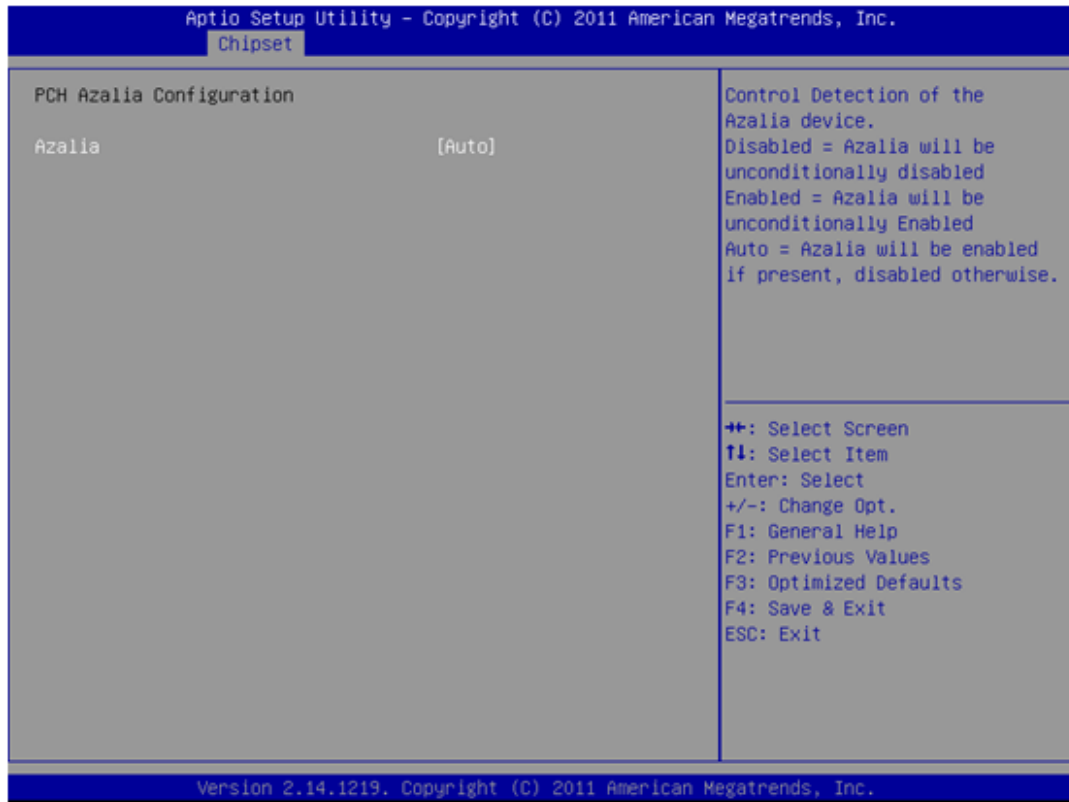
■ **PCI Express Root Port 1**
   This item allows users to enable or disable the PCI Express Root Port.

■ **ASPM Support**
   This item allows users to enable or disable PEG ASPM.

■ **PME SCI**
   This item allows users to enable or disable the PME SCI function.

■ **Hot Plug**
   This item allows users to enable or disable the PCI Express hot plug function.

■ **PCIe Speed**
   This item allow users to select PCIe speed.

3.2.3.2 USB Configuration

```
          Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
           Chipset
 USB Configuration                                           Enable or disable XHCI
                                                             Pre-Boot Driver support.
 XHCI Pre-Boot Driver              [Enabled]
 xHCI Mode                         [Auto]
   HS Port #1 Switchable           [Enabled]
   HS Port #2 Switchable           [Enabled]
   HS Port #3 Switchable           [Enabled]
   HS Port #4 Switchable           [Enabled]
   xHCI Streams                    [Enabled]

 EHCI1                             [Enabled]

 EHCI2                             [Enabled]

 USB Ports Per-Port Disable Control  [Disabled]
                                                             ++: Select Screen
                                                             ↑↓: Select Item
                                                             Enter: Select
                                                             +/-: Change Opt.
                                                             F1: General Help
                                                             F2: Previous Values
                                                             F3: Optimized Defaults
                                                             F4: Save & Exit
                                                             ESC: Exit


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```

- **XHCI Pre-Boot Driver**
  This item allows user to enable or disable XHCI Pre-boot driver.
- **XHCI Mode**
  This item allows user to enable or disable XHCI Mode.
- **EHCI 1/2**
  Enables or disables the EHCI controller.
- **USB Ports pre-port Disable Control**
  This item allows users to enable or disable each USB port individually.

3.2.3.3 PCH Azalia Configuration

```
            Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
             Chipset

  PCH Azalia Configuration                                 Control Detection of the
                                                           Azalia device.
  Azalia                              [Auto]                Disabled = Azalia will be
                                                           unconditionally disabled
                                                           Enabled = Azalia will be
                                                           unconditionally Enabled
                                                           Auto = Azalia will be enabled
                                                           if present, disabled otherwise.



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


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```

◼ **Azalia**
This item allows user to enable or disable azalea device.

3.2.3.4 System Agent (SA) Configuration

■ **VT-d**
    This item allows users to enable or disable VT-d.

3.2.3.5 Graphic Configuration

```
              Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
                Chipset

 Graphics Configuration                               Select which of IGFX/PEG/PCI
 IGFX VBIOS Version               2137                Graphics device should be
 IGfx Frequency                  350 MHz             Primary Display Or select SG
                                                      for Switchable Gfx.
 Primary Display                  [Auto]
 Internal Graphics                [Auto]
 GTT Size                         [2MB]
 Aperture Size                    [256MB]
 DVMT Pre-Allocated               [64M]
 DVMT Total Gfx Mem               [256M]
 Gfx Low Power Mode               [Enabled]
 Graphics Performance Analyzers   [Disabled]
 ▶ LCD Control                                        →←: Select Screen
                                                      ↑↓: Select Item
                                                      Enter: Select
                                                      +/-: Change Opt.
                                                      F1: General Help
                                                      F2: Previous Values
                                                      F3: Optimized Defaults
                                                      F4: Save & Exit
                                                      ESC: Exit


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```

■ **Primary Display**

This item allows users to select which graphics controller to use as the primary boot device.

■ **Internal Graphics**

This item allows users to enable or disable IGD.

■ **GTT Size**

This item allows users to select GTT size.

■ **Aperture Size**

This item allows users to select aperture size.

■ **DVMT Pre-Allocated**

This item allows users to select DVMT pre-allocated memory size.

■ **DVMT Total Gfx Mem**

This item allows users to select DVMT total memory size.

■ **Gfx Low Power Mode**

This item allows users to enable or disable IGD low power mode.

■ **Graphic Performance Analyzers**

This item allows users to enable or disable graphic performance analyzer function.

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3.2.3.6 NB PCIe Configuration

```
          Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
          Chipset

 NB PCIe Configuration                                    Configure PEG0 B0:D1:F0
 PEG0                            Not Present              Gen1-Gen3
   PEG0 - Gen X                  [Auto]

 Enable PEG                      [Auto]
 PEG Sampler Calibrate           [Auto]
 Swing Control                   [Full]
 Gen3 Equalization               [Enabled]
  Gen3 Eq Phase 2                [Auto]
 ▶ PEG Gen3 Root Port Preset Value for each Lane
 ▶ PEG Gen3 Endpoint Preset Value each Lane
 ▶ PEG Gen3 Endpoint Hint Value each Lane
   Gen3 Eq Preset Search         [Disabled]              ↔: Select Screen
 Fast PEG Init                   [Enabled]               ↑↓: Select Item
 RxCEM Loop back                 [Disabled]              Enter: Select
                                                         +/-: Change Opt.
                                                         F1: General Help
                                                         F2: Previous Values
                                                         F3: Optimized Defaults
                                                         F4: Save & Exit
                                                         ESC: Exit



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```

- ◼ **PEG0 - Gen x**
  Select PEG0 speed.
- ◼ **Enable PEG**
  This item allows users to enable or disable PEG always.
- ◼ **PEG Sampler Calibrate**
  This item allows users to enable or disable PEG sampler calibrate function

3.2.4 Boot

```
              Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
       Main  Advanced  Chipset  Boot  Security  Save & Exit

    Boot Configuration                                      Number of seconds to wait for
    Setup Prompt Timeout              1                     setup activation key.
    Bootup NumLock State              [On]                  65535(0xFFFF) means indefinite
                                                            waiting.
    Quiet Boot                        [Disabled]

    CSM16 Module Version              07.68

    GateA20 Active                    [Upon Request]
    Option ROM Messages               [Force BIOS]
    INT19 Trap Response               [Immediate]

    Boot Option Priorities
    Boot Option #1                    [JetFlashTranscend ...]   ↔: Select Screen
    Boot Option #2                    [UEFI: JetFlashTran...]   ↑↓: Select Item
                                                            Enter: Select
    Hard Drive BBS Priorities                               +/-: Change Opt.
                                                            F1: General Help
                                                            F2: Previous Values
                                                            F3: Optimized Defaults
                                                            F4: Save & Exit
                                                            ESC: Exit

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```

- **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.

- **GateA20 Active**

  This item allows you to select upon request or Always.

- **Option ROM Messages**

  Sets display mode for option ROM.

- **INT19 Trap Response**

  This item allows option ROMs to trap interrupt 19.

- **Boot Option Priorities**

  Set the system boot order.

3.2.5 Security

```
           Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
     Main  Advanced  Chipset  Boot  Security  Save & Exit

   Password Description                                      Set Administrator Password

   If ONLY the Administrator's password is set,
   then this only limits access to Setup and is
   only asked for when entering Setup.
   If ONLY the User's password is set, then this
   is a power on password and must be entered to
   boot or enter Setup. In Setup the User will
   have Administrator rights.
   The password length must be
   in the following range:
   Minimum length              3
   Maximum length              20
                                                             →←: Select Screen
                                                             ↑↓: Select Item
   Administrator Password                                    Enter: Select
   User Password                                             +/-: Change Opt.
                                                             F1: General Help
                                                             F2: Previous Values
   UEFI Secure Boot Management                               F3: Optimized Defaults
   Secure Boot control          [Enabled]                   F4: Save & Exit
 ▶ Secure Boot Policy                                        ESC: Exit
 ▶ Key Management


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```

Select Security Setup from the AIMB-273 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

```
          Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
   Main  Advanced  Chipset  Boot  Security  Save & Exit

 Save Changes and Exit                                Exit system setup after saving
 Discard Changes and Exit                             the changes.
 Save Changes and Reset
 Discard Changes and Reset

 Save Options
 Save Changes
 Discard Changes

 Restore Defaults
 Save as User Defaults
 Restore User Defaults

 Boot Override                                        →←: Select Screen
 JetFlashTranscend 8GB 1100                           ↑↓: Select Item
 UEFI: JetFlashTranscend 8GB 1100                     Enter: Select
                                                      +/-: Change Opt.
 Launch EFI Shell from filesystem device             F1: General Help
                                                      F2: Previous Values
                                                      F3: Optimized Defaults
                                                      F4: Save & Exit
                                                      ESC: Exit

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```

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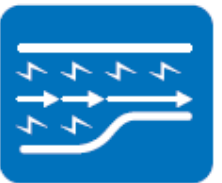
Refers to a series of methods for reducing power consumption in computers by lowering the clock frequency. This API allows the user to adjust the clock from 87.5% to 12.5%.

4.2.2 Software Utility

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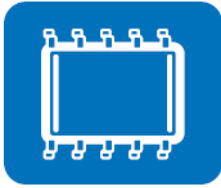
The BIOS Flash utility allows customers to update the flash ROM BIOS version, or use it to back up current BIOS by copying it from the flash chip to a file on customers' disk. The BIOS Flash utility also provides a command line version and an API for fast implementation into customized applications.

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.

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-273 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 Intel® 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 Intel® 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 (32-bit)*
- *Windows 7 (64-bit)*
- *Windows XP professional edition (32-bit)*
- *Windows XP professional edition (64-bit)*

5.3 Windows XP/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.

AIMB-273 User Manual
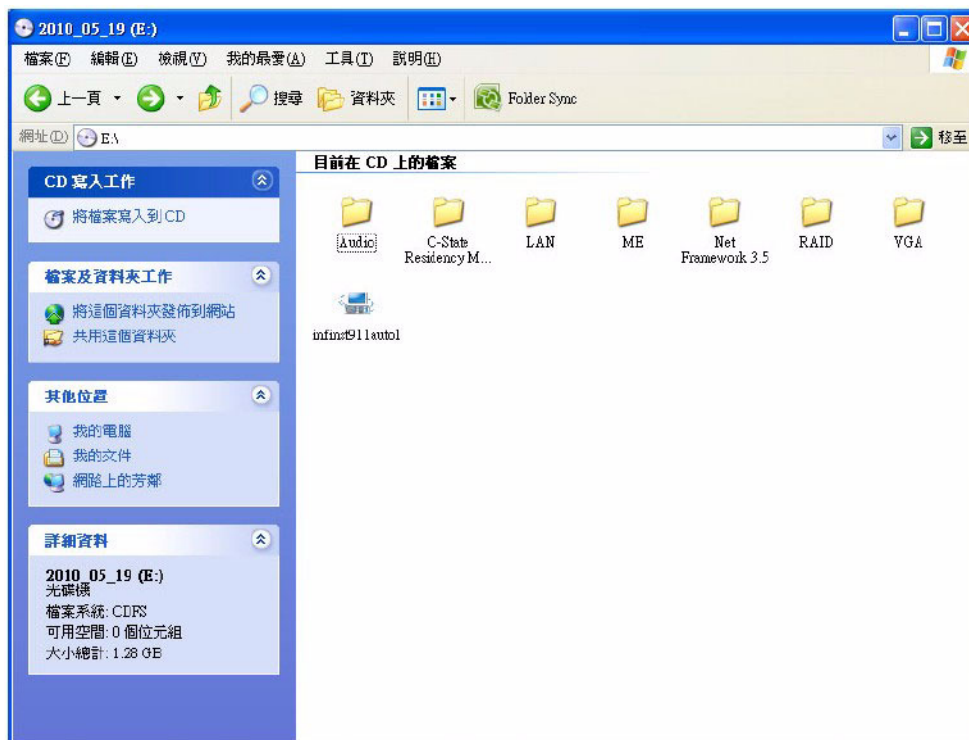
Chapter **6**

VGA Setup

6.1 Introduction

The Intel mobile Core i7-3610QE, Core i5-3610ME, Core i3-3120ME, Celeron B810 CPUs with dual core are embedded with an integrated graphics controller. You need to install the VGA driver to enable the function.

Optimized integrated graphic solution: With Intel Graphics Flexible, it supports versatile display options and 32-bit 3D graphics engine. Dual independent display, enhanced display modes for widescreen flat panels for extend, twin, and clone dual display mode, and optimized 3D support deliver an intensive and realistic visual experience.

6.2 Windows 7/XP

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 "VGA" folder and click "setup.exe" to complete the installation of the drivers for Windows 7 and Windows XP.
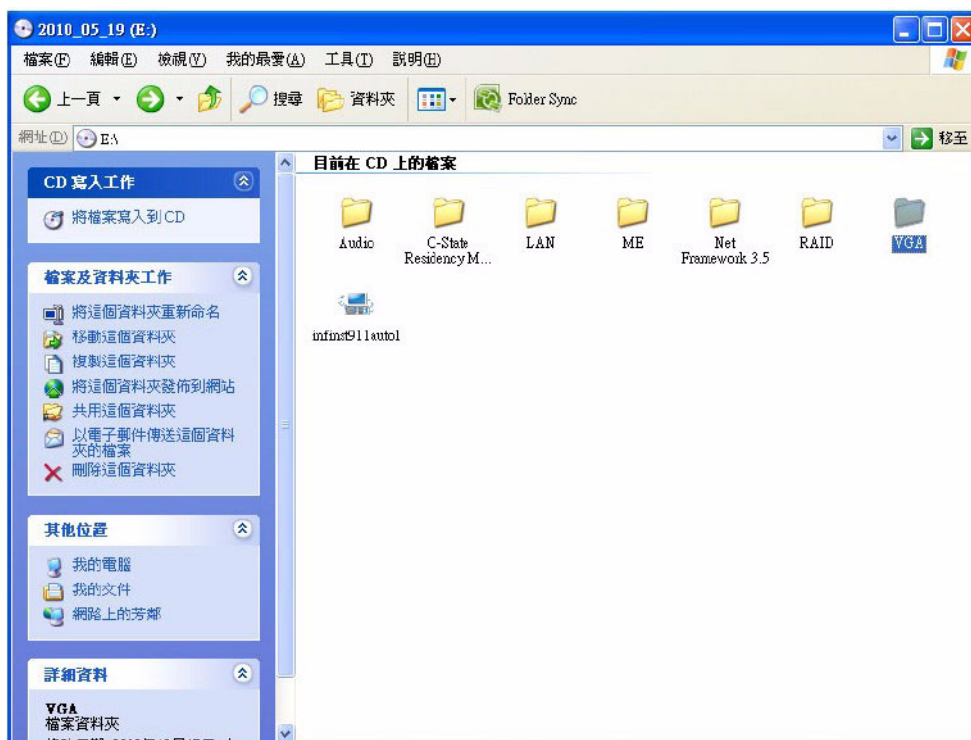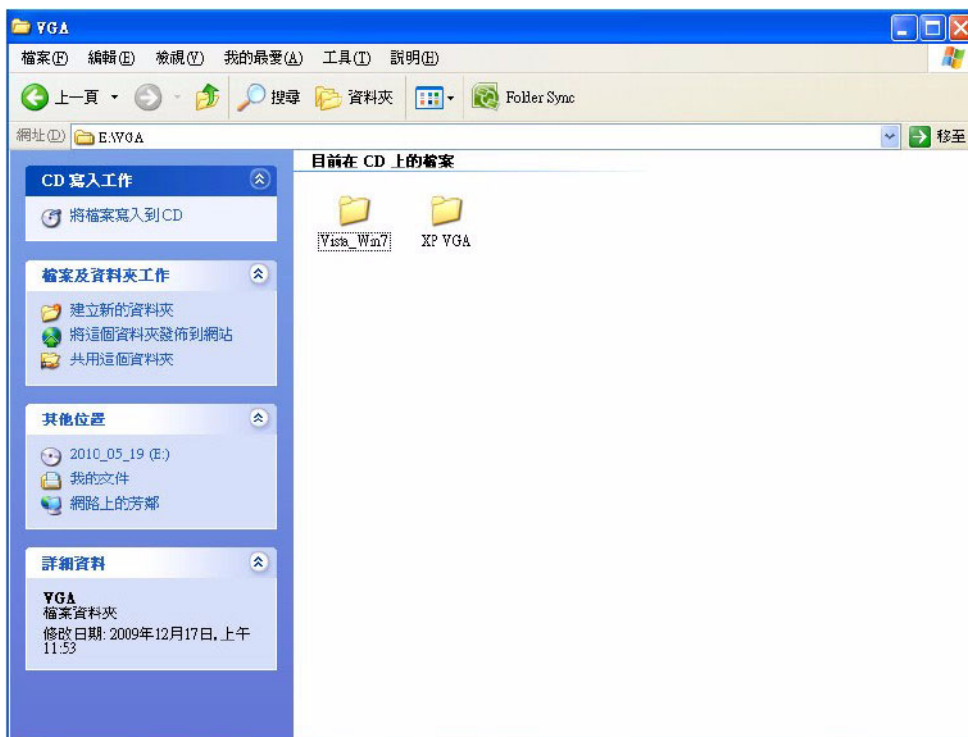
Chapter 7

LAN Configuration

7.1 Introduction

The AIMB-273 has dual Gigabit Ethernet LANs via dedicated PCI Express x1 lanes (Intel 82579LM (LAN1) and 82583V (LAN2)) 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 X1 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-273's Intel 82579LM (LAN1) and 82583V (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/XP Driver Setup (Intel 82579LM/ 82583V)

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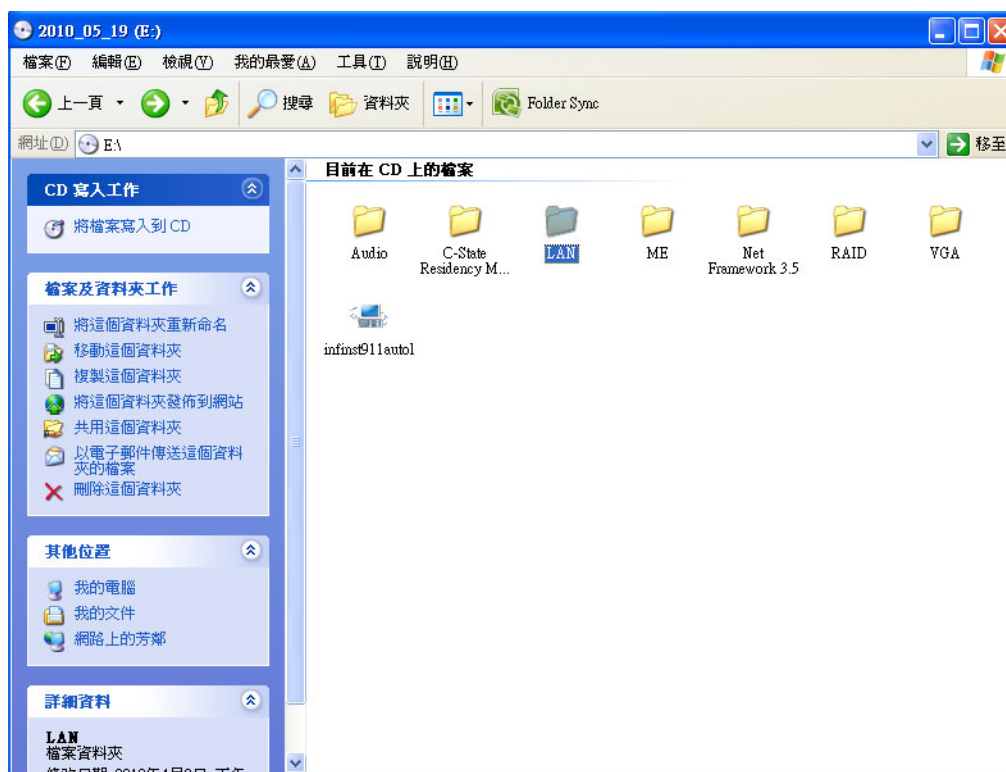
Appendix A

I/O Pin Assignments

A.1 USB Header (USB56, USB78)
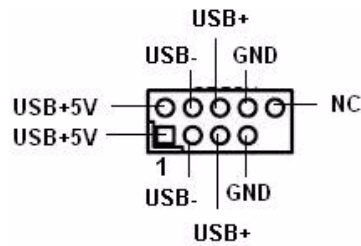
Table A.1: USB Header (USB56)			
Pin	**Signal**	**Pin**	**Signal**
1	USB0_VCC5	2	USB1_VCC5
3	USB0_D-	4	USB1_D-
5	USB0_D+	6	USB1_D+
7	GND	8	GND
9	Key	10	N/C

A.2 VGA Connector (VGA1)
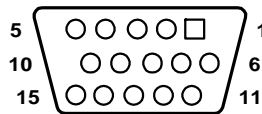
Table A.2: VGA Connector (VGA1)			
Pin	**Signal**	**Pin**	**Signal**
1	RED	9	CRT_VCCIN
2	VGA_G	10	GND
3	VGA_B	11	N/C
4	N/C	12	V_SDAT
5	GND	13	H-SYNC
6	GND	14	V-SYNC
7	GND	15	V_SCLK

A.3 HDMI1: HDMI Connector
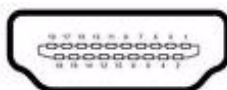
Table A.3: HDMI1:HDMI Connector			
Pin	**Signal**	**Pin**	**Signal**
1	TMDS Data2+	2	TMDS Data2 Shield
3	TMDS Data2-	4	TMDS Data1+
5	TMDS Data1 Shield	6	TMDS Data1-
7	TMDS Data0+	8	TMDS Data0 Shield
9	TMDS Data0-	10	TMDS Clock+
11	TMDS Clock Shield	12	TMDS Clock-
13	CEC	14	Reserved
15	SCL	16	SDA
17	DDC/CEC/HEC Ground	18	+5 V Power (max 50 mA)
19	Hot Plug Detect		

A.4 SPI_CN1: SPI Fresh Card Pin Connector
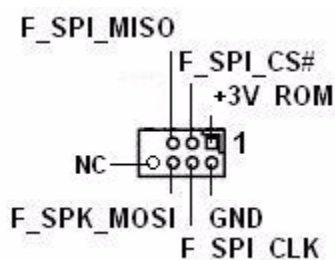
Table A.4: SPI_CN1:SPI Fresh Card Pin Connector			
Pin	**Signal**	**Pin**	**Signal**
1	+F1_3V	2	GND
3	F1_SPI_CS#_Q	4	F1_SPI_CLK_Q
5	F1_SPI_MISO_Q	6	F1_SPI_MOSI_Q
7	KEY	8	NC

A.5 PS/2 Keyboard and Mouse Connector (KBMS1)

Table A.5: PS/2 Keyboard and Mouse Connector (KBMS1)	
Pin	Signal
1	KB DATA
2	N/C
3	GND
4	KB VCC
5	KB CLK
6	N/C
7	M_DATA
8	N/C
9	GND
10	M_VCC
11	M_CLK
12	N/C

A.6 CPU Fan Power Connector (CPU_FAN1)
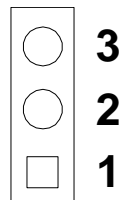
Table A.6: CPU Fan Power Connector (CPU_FAN1)	
Pin	Signal
1	GND
2	+12V PWM
3	DETECT

A.7 System Fan Power Connector (SYS_FAN1/2)

3
2
1
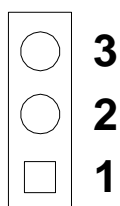
Table A.7: System Fan Power Connector (SYSFAN1/SYSFAN2)	
Pin	**Signal**
1	GND
2	+12V PWM
3	DETECT

A.8 Power LED & Keyboard Lock Connector (JFP2)

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 3 is the ground.

1 2 3 4 5
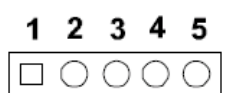
Table A.8: Power LED & Keyboard Lock Connector (JFP2)	
Pin	**Function**
1	LED power
2	NC
3	GND
4	KEYLOCK#
5	GND

A.9 Power switch/HDD LED/SMBus/Speaker (JFP1)

The single board computer has its own buzzer. You can also connect it to the external speaker on your computer chassis.
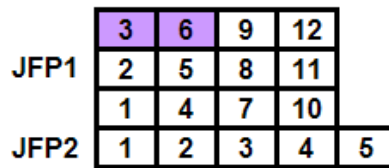
Table A.9: Power Switch/HDD LED/SMBus/Speaker (JFP1)			
Pin	Signal	Pin	Signal
1	SPK_P1	2	HDDLED+
3	PWR	4	NC
5	HDDLED-	6	GND
7	SPK_P3	8	SMB_DAT
9	SYS_RST(+)	10	SPK_P4
11	SMB_CLK	12	SYS_RST(-)

A.10 USB/LAN ports (LAN1_USB12/LAN2_USB34)
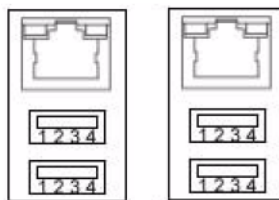
Table A.10: USB Port			
Pin	Signal	Pin	Signal
1	VCC	3	Data0+
2	Data0-	4	GND

Table A.11: Ethernet 10/100 Mbps RJ-45 Port			
Pin	Signal	Pin	Signal
1	XMT+	5	N/C
2	XMT-	6	RCV-
3	RCV+	7	N/C
4	N/C	8	N/C

A.11 Line In, Line Out, Mic In Connector (AUDIO1)
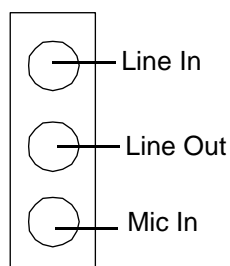
A.12 Serial ATA0/1 (SATA1 ~ 4)

Table A.12: Serial ATA 0/1 (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	

A.13 AT/ATX Mode (PSON1)

Table A.13: AT/ATX Mode (PSON1)			
Pin	**Signal**	**Pin**	**Signal**
1	#PSON_SIO (to super IO)	2	#PSON (to power supply)
3	GND		

A.14 HD Audio Interface (FPAUD1)
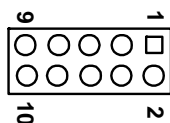
Table A.14: AC-97 Audio Interface (FPAUD1)			
Pin	**Signal**	**Pin**	**Signal**
1	MIC2_L	2	GND
3	MIC2_R	4	FP_AUD_DET
5	LOUT2_R	6	SRTN1
7	LOUT2_DET	8	KEY
9	LOUT2_L	10	SRTN2

A.15 GPIO Pin Header (GPIO1)
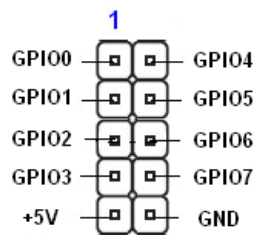
Table A.15: GPIO Pin Header (GPIO1)			
Pin	Signal	Pin	Signal
1	GPIO0	2	GPIO4
3	GPIO1	4	GPIO5
5	GPIO2	6	GPIO6
7	GPIO3	8	GPIO7
9	+5V	10	GND

A.16 LVDS Connector: LVDS1
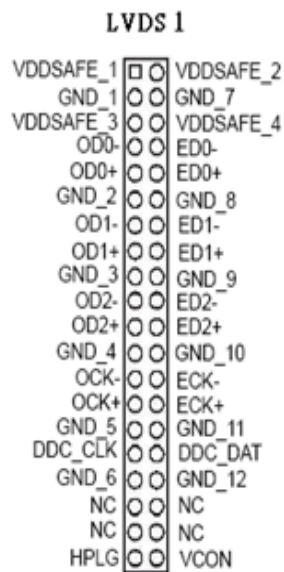
Table A.16: LVDS1 Connector			
Pin	Signal	Pin	Signal
1	VDDSAFE_1	2	VDDSAFE_2
3	GND_1	4	GND_7
5	VDDSAFE_3	6	VDDSAFE_4
7	OD0-	8	ED0-
9	OD0+	10	ED0+
11	GND_2	12	GND_8
13	OD1-	14	ED1-
15	OD1+	16	ED1+

Table A.16: LVDS1 Connector			
17	GND_3	18	GND_9
19	OD2-	20	ED2-
21	OD2+	22	ED2+
23	GND_4	24	GND_10
25	OCK-	26	ECK-
27	OCK+	28	ECK+
29	GND_3	30	GND_11
31	DDC_CLK	32	DDC_DAT
33	GND_6	34	GND_12
35	NC	36	NC
37	NC	38	NC
39	HPLG	40	VCON

A.17 LVDS Power Jumper (JLVDS1)

2 and 4   4 and 6   3 and 4
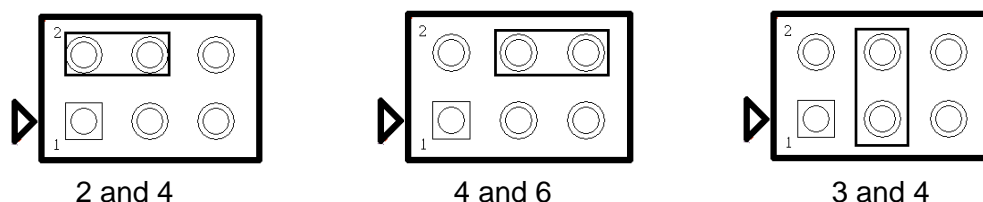
Table A.17: LVDS Power Jumper (JLVDS1)			
Pin	Signal	Pin	Signal
1	N/C	2	5V
3	12V	4	VCC_LCD
5	N/C	6	3.3V

A.18 LVDS Inverter (INV1)

Table A.18: LVDS Power Jumper	
Pin	Signal
1	+12V
2	GND
3	BL_EN
4	BL_CLT
5	+5V

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A.19 ATX Power Connector (ATXPWR1)
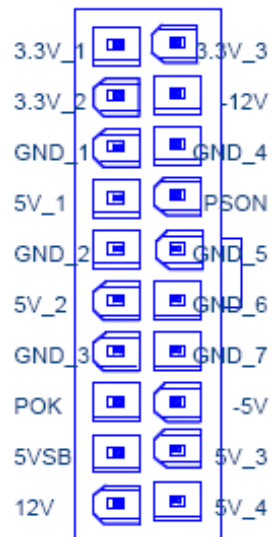
Table A.19: ATX Power Connector (ATXPWR1)			
Pin	Signal	Pin	Signal
1	+3.3 V	11	3.3 V
2	+3.3 V	12	-12 V
3	GND	13	GND
4	+5 V	14	PSON
5	GND	15	GND
6	+5 V	16	GND
7	GND	17	GND
8	POK	18	-5 V
9	5 VSB	19	+5 V
10	12 V	20	+5 V

A.20 ATX 12 V connector (ATX12V1)
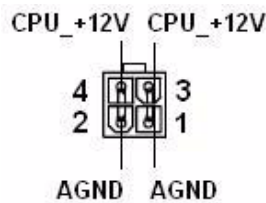
Table A.20: ATX 12 V connector (ATX12V1)			
Pin	Signal	Pin	Signal
1	aGND	2	aGND
3	CPU_+12V	4	CPU_+12V

A.21 HD Digital Audio Interface (SPDIF_OUT1)
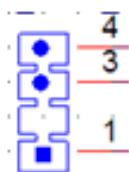
Table A.21: HD Digital Audio Interface (SPDIF_OUT1)	
Pin	Signal
1	+5V
3	SPDIF Out
4	GND

A.22 Display Port Connector (Top of DP+HDMI1, DP1)
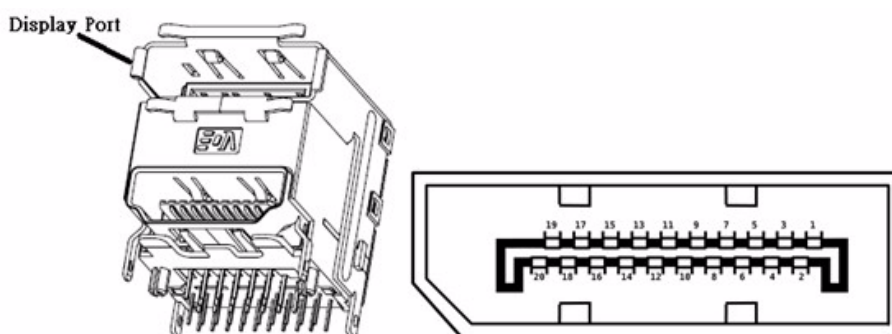
Table A.22: Display Port Connector (Top of DP+HDMI1, DP1)			
Pin	Signal	Pin	Signal
1	Lane 0+	2	GND
3	Lane 0-	4	Lane 1+
5	GND	6	Lane 1-
7	Lane 2+	8	GND
9	Lane 2-	10	Lane 3+
11	GND	12	Lane 3-
13	Config 1	14	Config 2
15	Auxiliary Chanel+	16	GND
17	Auxiliary Chanel-	18	Hot Plug
19	Return	20	+3.3V

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