



**User Manual**

# **AIMB-231**

**Intel® Core™ i5-5350U/i3-5010U  
Mini-ITX with eDP/DP (HDMI)/  
DP++, 2 COM, and Dual LAN**

**ADVANTECH**

*Enabling an Intelligent Planet*

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## FCC Class B

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

Operation is subject to the following two conditions:

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

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



## Memory Compatibility

Test Item	Description						Result	Remark
Brand	Size	Speed	Type	ECC	Vendor PN	Memory		
Apacer	4 GB	DDR3 1600	SODIMM DDR3	N	78.B2GCY. AT00C	MICRON 2XE22 D9QBJ	PASS	
AQD	4 GB	DDR3 1600	SODIMM DDR3	N	653555- 0007	SEC 316 XYK0K4B4G0846 B	PASS	
Transcend	4 GB	DDR3 1600	SODIMM DDR3	N	TS512MS K64W6H	SEC 231 HYK0 K4B4G0846B	PASS	
Transcend	8 GB	DDR3 1600	SODIMM DDR3	N	TS1GSK6 4W6H	SEC 231 HYK0 K4B4G0846B	PASS	

## Ordering Information

Order Number	CPU	Display	GbE	TPM	Storage	USB	PCIe/PCI
AIMB-231G2-U5A1E	i5	DP/HDMI, DP++, LVDS/eDP (optional)	2	Yes (optional)	3 x SATA III 1 x mSATA	4 x USB3.0 2 x USB2.0	1 x Full- size Mini- PCIe, 1 x half-size Mini-PCIe

Order Number	CPU	Display	GbE	COM	USB	Audio	Remark
AIMB-B12315-00Y1E	i5	DP/HDMI, DP++	2	2	4 x USB3.0 2 x USB2.0	Line Out Mic-In	Barebone, with thermal module
AIMB-B12315-00Y1E	i3	DP/HDMI, DP++	2	2	4 x USB3.0 2 x USB2.0	Line Out Mic-In	Barebone, with thermal module

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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-231 Intel® Core™ i5-5350U / i3 5010U Mini-ITX
- 2 x SATA HDD cable
- 2 x SATA Power cable
- 1 x CPU Fanless Heat Sink
- 1 x Startup manual
- 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-231 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-231, 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

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## 1.1 Introduction

AIMB-231 is designed with the Intel® BROADWELL ULT Dual Core processor for industrial applications that require both performance computing and enhanced power management capabilities. The motherboard supports Intel BROADWELL ULT Dual Core i5 1.8 GHz / i3 2.1 GHz processor up to 3 MB L3 cache and DDR3L SO-DIMM 1600 up to 16GB. A rich I/O connectivity of 2 serial ports, 4 USB 3.0, 2 USB 2.0, dual GbE LAN and 3 SATA III ports.

## 1.2 Features

- **Rich I/O connectivity:** 2 serial ports, 4 USB 3.0, 2 USB 2.0, 3 SATA 3.0, 1 mSATA, SIM card holder, Dual GbE LAN
- **Standard Mini-ITX form factor with industrial feature:** The AIMB-231 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:** BGA 1168 (MCP) 14 nm Processor / Intel BROADWELL ULT Dual Core i5 / i3 processor
- **BIOS:** AMI EFI 16 Mbit SPI BIOS
- **System chipset:** Intel® Wildcat Point-LP
- **SATA hard disk drive interface:**
  - Three on-board SATA connectors with data transmission rate up to 600 MB
- **mSATA Interface:** Supports mSATA slot

### 1.3.2 Memory

- **RAM:** Up to 16 GB in 2 slots 204-pin SODIMM sockets. Supports dual channel DDR3L 1600 MHz SDRAM

### 1.3.3 Input/Output

- **Serial ports:** Two serial ports, COM 1 support RS-232/422/485 +5 V / +12 V (without H/W auto flow control)
- **Keyboard and PS/2 mouse connector:** Supports PS/2 K/S,M/S with 5-pin wafer
- **USB port:** Supports up to six USB ports with transmission rate up to 625 MB, 2 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® HD Graphics 6000 / 5500 Support DirectX 11.2, OpenGL 4.2, OpenCL 1.3, Full AVC, VC1, MPEG2 H/W encoder
- **LVDS:** Through Chrontel CH7511 to support LVDS Support single channel 24-bit/ dual channel 48-bit LVDS, Max 1920 x 1200 @ 60 Hz
- **HDMI:** Supports HDMI 1.4 for HD Video playback Max resolution up to 4096 x 2304 at 24 Hz on HDMI
- **Display port:** Supports Display port up to resolution 3840 x 2160 at 60 Hz.

:

**Note!** Triple independent display need to use DP(HDMI) / DP++ / LVDS(eDP).



### 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 PHY I218-LM; LAN2: Intel I210

### 1.3.6 Industrial features

- **Watchdog timer:** Can generate a system reset. The watchdog timer is programmable, 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 speed and cooler solution)
- **Storage temperature:** -40 ~ 85° C (-40 ~ 185° F)
- **Humidity:** 5 ~ 95% non-condensing
- **Power supply voltage:** +12 V
- **Power consumption:** TBD  
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-231 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**

<b>Label</b>	<b>Function</b>
JFP1	Power switch/Reset switch
JFP2	HDD LED/SMBus/Speaker
JFP3	Power LED / 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 0 V/3.3 V/5 V/12 V selector for LVDS1 connector (Default 4-6, 3.3 V)
VCON1	Panel selection (Default 1, 3.3 V)
JVBR1	Brightness control selector for Analog or Digital (Default 1-2, Linear)
JCOM1	COM1 5V/12V selector (Default 1-2, RI)
JSETCOM1	RS232/RS485/RS422 selector (Default 5-6,7-9,8-10,13-15,14-16)
COM1_S1~S4	RS422/485 master or slave selection (Default 1-2 Slave)
JCPUFAN1, JSYSFAN1	FAN control by DC or PWM mode selection (Default 2-3)



**Table 1.2: Connectors**

<b>Label</b>	<b>Function</b>
LVDS1	LVDS1 connector
INV1	LVDS1 inverter connector
USB12	USB port 1, 2 connector
USB34	USB port 3, 4 connector
USB56	USB port 5, 6 (on board)
DP1	DP++ connector
DP2	DP2 (colay HDMI)
HDMI	HDMI connector (colay DP2)
EDP1	eDP connector
COM1, 2	Serial port connector (RS232); COM1: RS232/RS485/RS422 supports +5/+12V, COM2: RS232
KBMS1	PS/2 Keyboard and Mouse connector
CPUFAN1	CPU FAN 2.54mm connector (4-pin)
CPUFAN1_1	CPU FAN1 2.00mm connector (4-pin)
SYSFAN1	System FAN1 2.54mm connector (4-pin)
LAN1, LAN2	LAN1 / LAN2
USB12, USB34	USB 3.0 1, 2 / USB 3.0 3, 4
AUDIO1, 2	Audio connector
SPDIF_O1	SPDIF Audio out pin header
FP_AUDIO1	HD Audio Front Panel Pin Header
ATX_5V1	ATX power supply shutdown and wake up
SATA1	Serial ATA data connector 1
SATA2	Serial ATA data connector 2
SATA3	Serial ATA data connector 3
SATA_PWR1	Serial ATA power connector 1
SATA_PWR2	Serial ATA power connector 2
SATA_PWR3	Serial ATA power connector 3
DIMMA1	Memory connector channel
DIMMB1	Memory connector channel
LPC1	Low Pin Count Header
GPIO1	GPIO header
BAT1	Battery connector
ATX12V1, ATX12V2	ATX 12V Main power connector
DCIN1	DC jack 12V Main power connector
COM1, 2	COM port
LANLED1	LAN1 status connector
AMPJ1	Amplifier connector
MINI_PCIE1	Full-sized Mini PCI Express x 1 slot / mSATA x 1 slot / SIM card holder
MINI_PCIE2	Half-sized Mini PCI Express x 1

# 1.5 Board layout: Jumper and Connector Locations

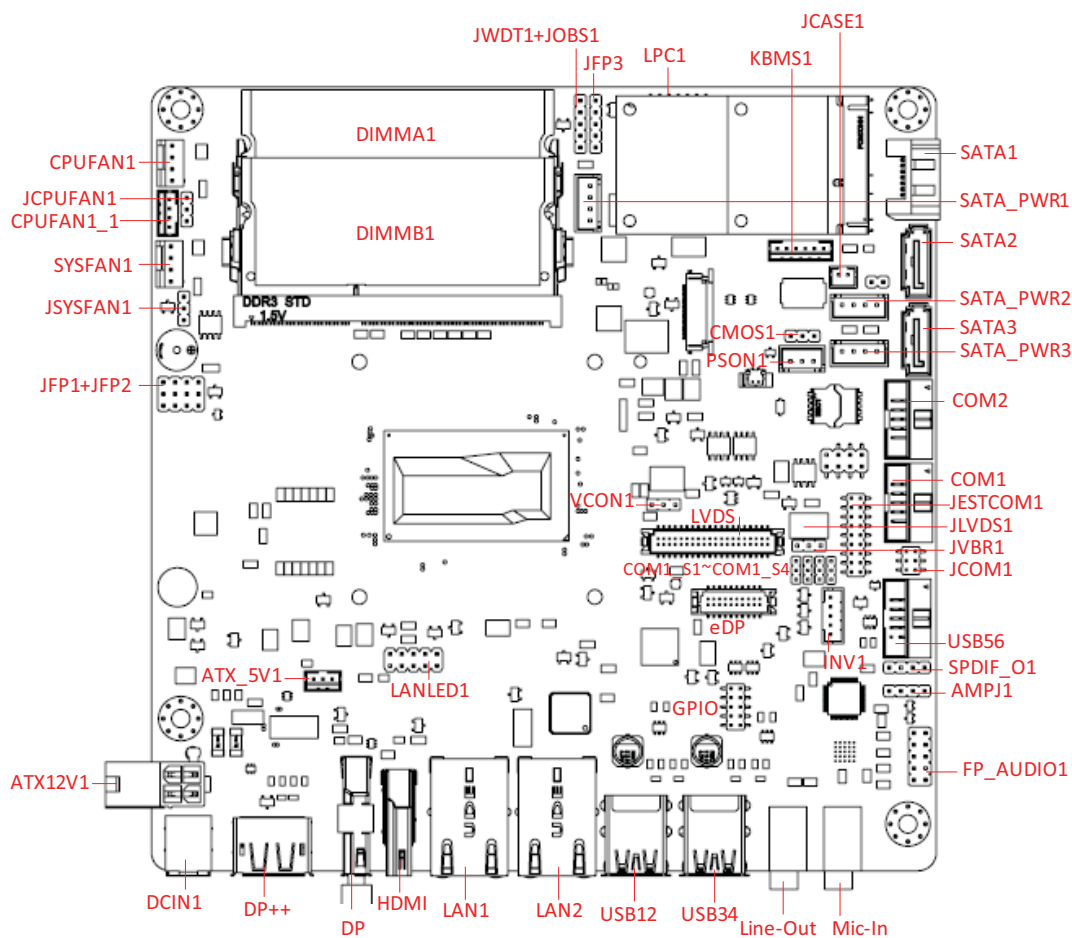
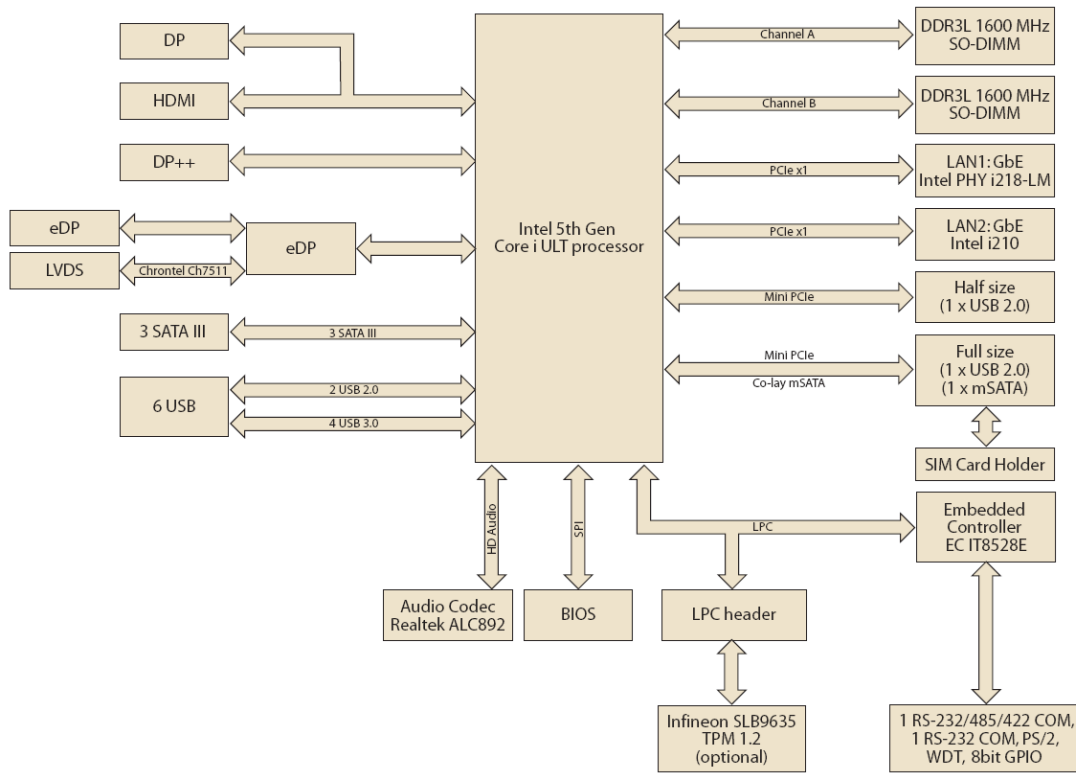


Figure 1.1 Jumper and Connector Location

## 1.6 AIMB-231 Board Diagram



**Figure 1.2 AIMB-231 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-231 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

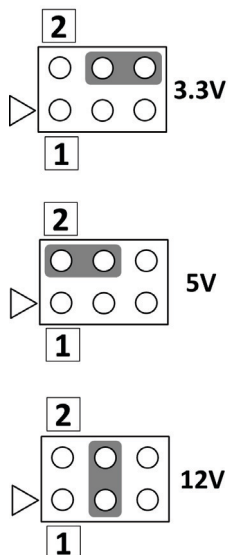
\* Default

## 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
4-6	Jumper for 3.3 V LVDS panel*
2-4	Jumper for 5 V LVDS panel
3-4	Jumper for 12 V LVDS panel

\*Default

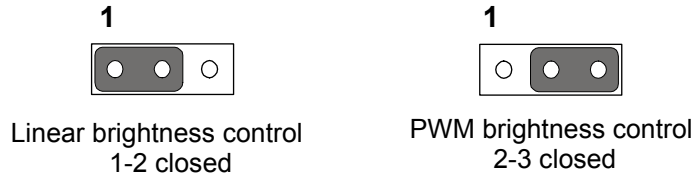


## 1.8.4 JVBR1: Backlight control selector for LVDS1

**Table 1.5: JVBR1: Backlight Control Selector for LVDS1**

Closed Pins	Result
1-2*	Linear brightness control
2-3	PWM brightness control

\*Default



## 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

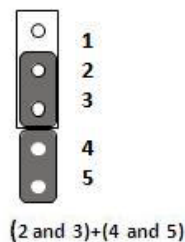


## 1.8.6 JWDT1+JOBS1: Watchdog Timer Output and OBS Alarm Option

**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



## 1.9 System Memory

The AIMB-231 has two sockets for a 204-pin DDR3L SODIMM. This socket uses a 3 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-231 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-231 supports a CPU with one of the following built-in full speed L3 caches: 3 MB for Intel Core i5-5350/i3-5010U. The built-in third-level cache in the processor yields much higher performance than conventional external cache memories.





# Chapter 2

Connecting  
Peripherals

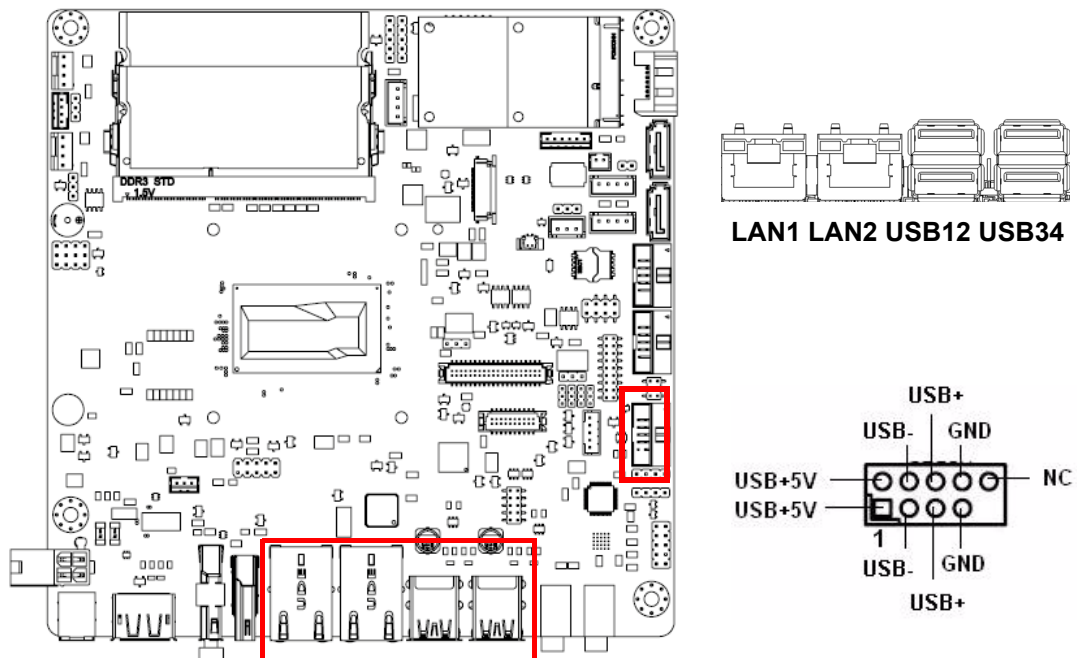
## 2.1 Introduction

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

## 2.2 LAN Ports and USB Ports (LAN1, LAN2, USB12, USB34, USB56)

The AIMB-231 provides up to six USB ports. Four USB3.0 on the real side and two-pin headers 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-231 is equipped with two high-performance 1000 Mbps Ethernet 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.



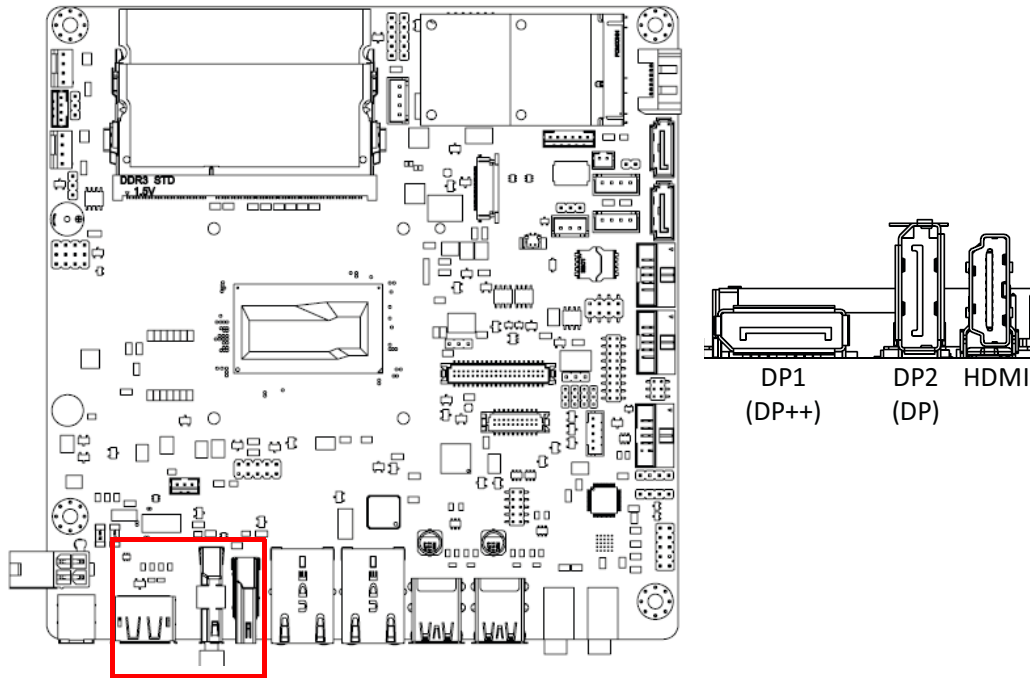
**Table 2.1: LAN LED Indicator**

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)

### Front Panel LAN LED(LANLED1)

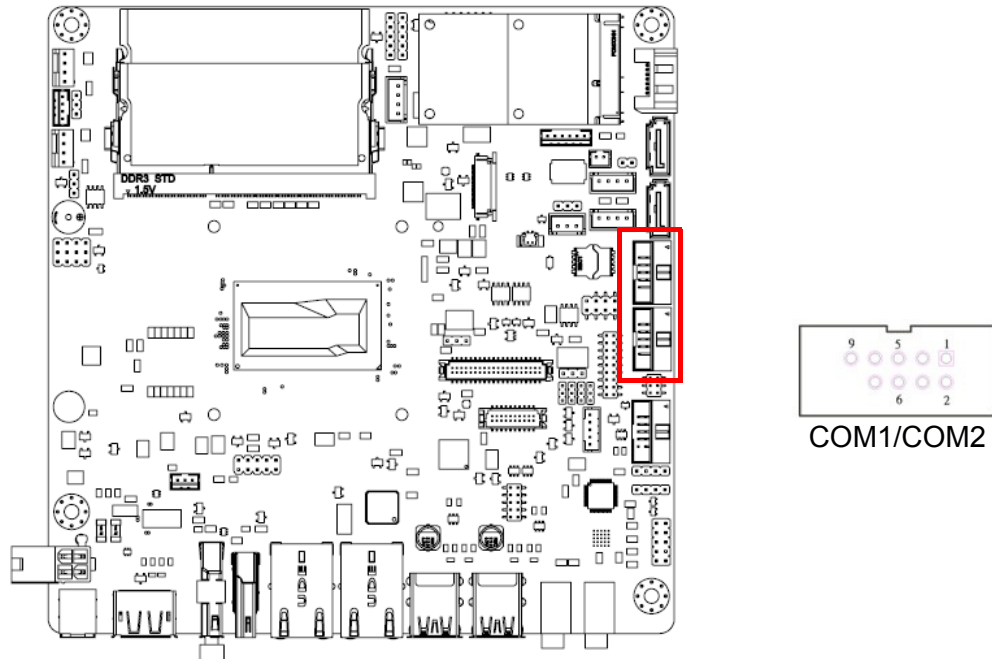
		LANLED1	
LAN1_ACTLED- R	1	2	LAN2_ACTLED- R
+3.3V_A_LAN1	3	4	+3.3V_A_LAN2
LAN1_LED1000- R	5	6	LAN2_LED1000- R
LAN1_LED100-	7	8	LAN2_LED100-
+3.3V_A_LAN1	9		

## 2.3 DP/HDMI and DP++ Connector (DP-HDMI1/DP1)



The AIMB-231 includes DP/HDMI and DP++ interface that can drive conventional DP/HDMI and DP++ displays. DP and HDMI only one can be used at same time. default setting is at HDMI.

## 2.4 Serial Ports (COM1~COM2)



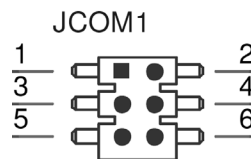
AIMB-231 supports two serial ports, and COM1 supports RS232/485/422 function and 5V/12V selected by jumpers RS-485 without H/W auto flow control function.

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.

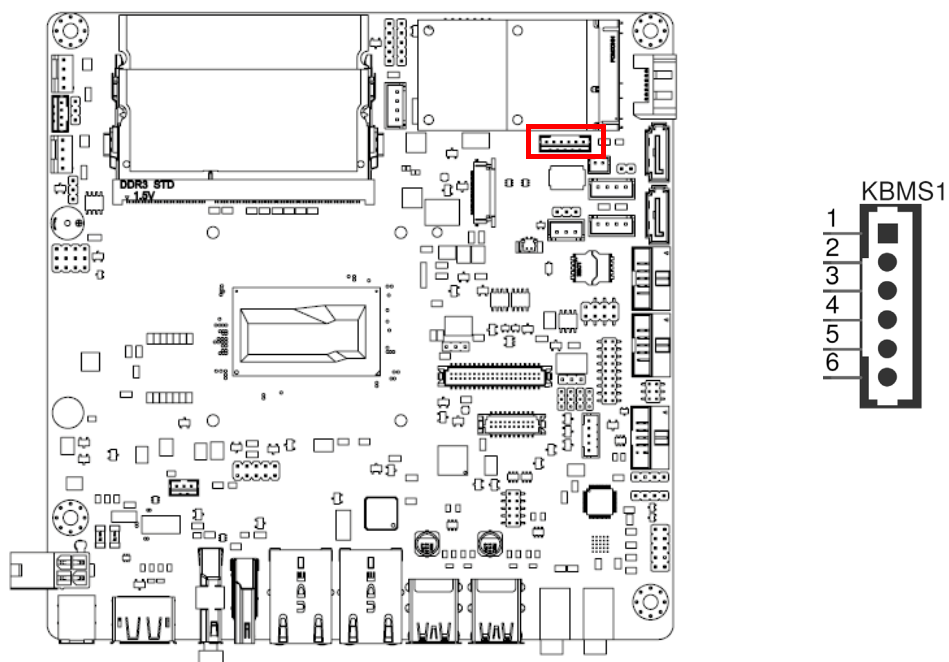
Different devices implement the RS-232 standards in different ways. If you have problems with a serial device, be sure to check the pin assignments for the connector.

### Serial Ports Voltage Select



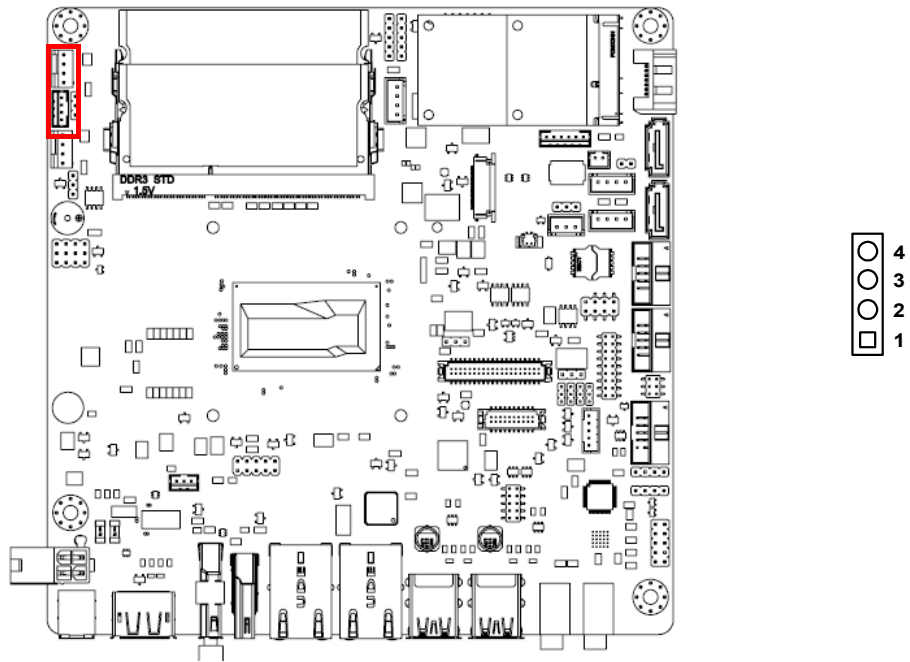
JCOM1: 1-2	5V
3-4*	0V
5-6	12V

## 2.5 PS/2 Keyboard and Mouse Connector (KBMS1)



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

## 2.6 CPU Fan Connector (CPU\_FAN1)

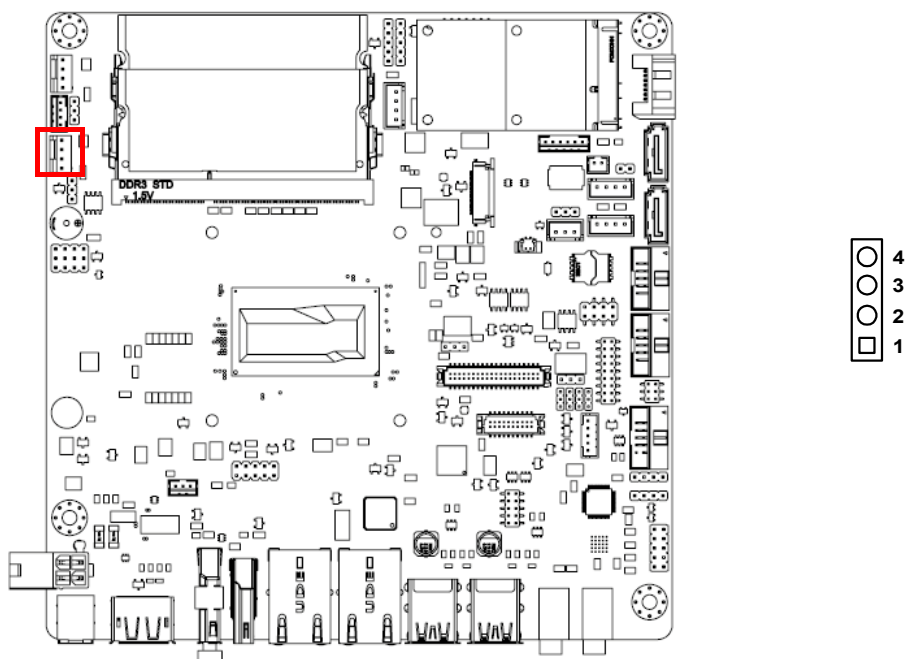


CPU fan can support Voltage mode and PWN mode by jumper JCPUFAN1.(default is voltage mode)

**Note!** when using a 3 pin cooler, don't use PWM mode.



## 2.7 System FAN Connector (SYSFAN1)



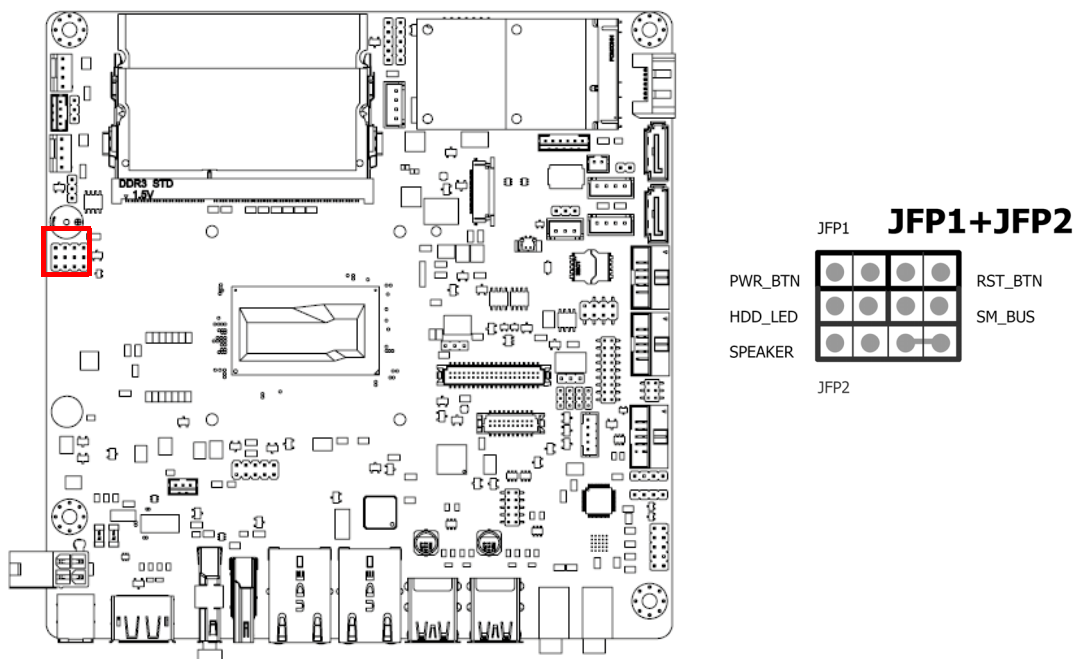
System fan can support Voltage mode and PWN mode by jumper JSYSFAN1.(default is voltage mode).

**Note!** When use 3 pin cooler, don't use PWM mode.



## 2.8 Front Panel Connectors (JFP1/JFP2)

There are several headers for monitoring and controlling the AIMB-231.



### 2.8.1 ATX soft power switch ((JFP1/PWR\_BTN))

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

### 2.8.2 Reset (JFP1/RST\_BTN)

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

### 2.8.3 HDD LED (JFP2/HDD\_LED)

You can connect an LED to connector (JFP2/HDDLED) to indicate when the HDD is active.

### 2.8.4 External speaker (JFP2/SPEAKER)

JFP2/SPEAKER is a 4-pin connector for an external speaker. If there is no external speaker, the AIMB-231 provides an onboard buzzer as an alternative. To enable the buzzer, set pins 7 & 10 as closed.



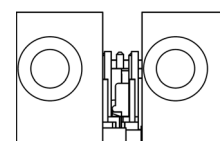
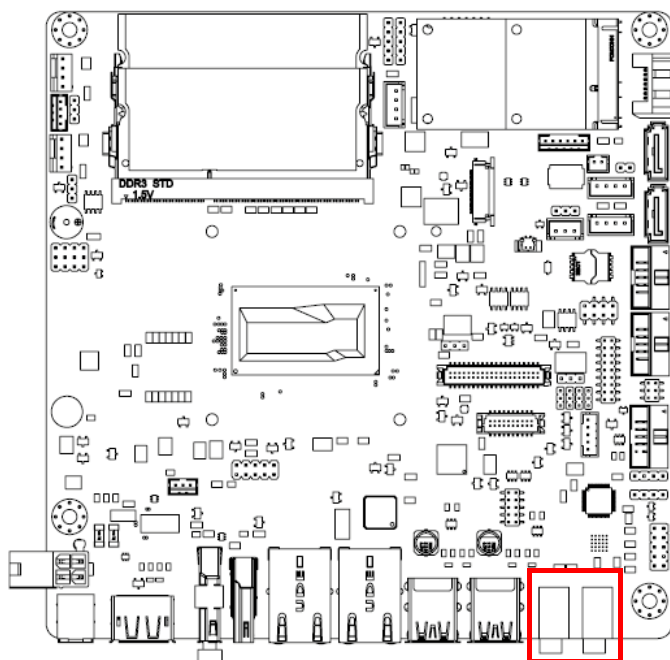
## 2.8.5 Power LED and keyboard lock connector (JFP3/PWR\_LED & KEY LOCK)

(JFP3/PWR\_LED & KEY LOCK) is a 5-pin connector for the power on LED and Key Lock function. Refer to Appendix B for detailed information on the pin assignments. The Power LED cable should be connected to pin 1-3. The key lock button cable should be connected to pin 4-5. There are 3 modes for the power supply connection. The first is “ATX power mode”; the system turns on/off by a momentary power button. The second is “AT Power Mode”; the system turns on/off via the power supply switch. The third is another “AT Power Mode” which makes use of the front panel power switch. The power LED status is indicated in the following table:

**Table 2.2: ATX power supply LED status (No support for AT power)**

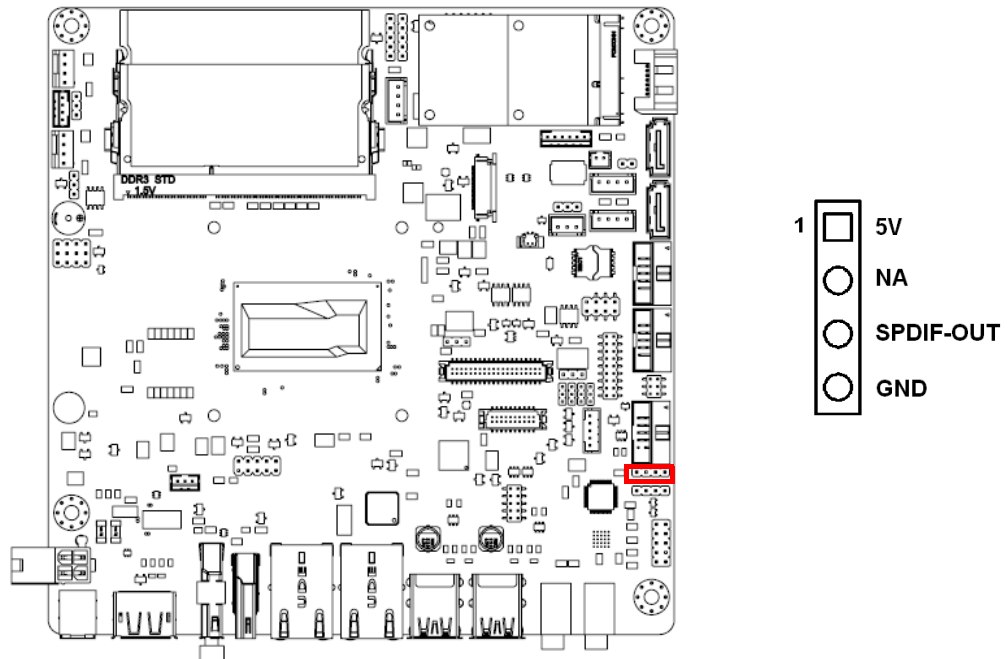
Power mode	LED (ATX Power Mode) (On/off by momentary button)	LED (AT power Mode) (On/off by switching power supply)	LED (AT power Mode) (On/off by front panel switch)
PSO1 (on back plane) jumper setting	pins 2-3 closed	pins 1-2 closed	Connect pins 1 & 2 to panel switch via cable
System On	On	On	On
System Off	Slow flashes	Off	Off
S3	Fast flashes	N/A	N/A
S4	Slow flashes	N/A	N/A

## 2.9 Line Out, Mic In Connector (AUDIO1/AUDIO2)

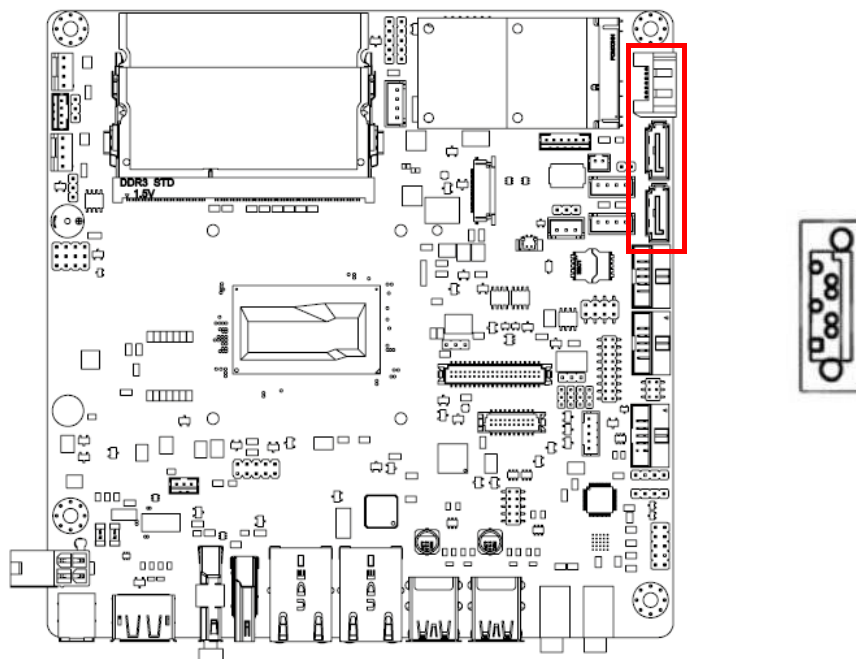


**Line Out Mic In**

## 2.10 Digital Audio Connector (SPDIF\_O1)

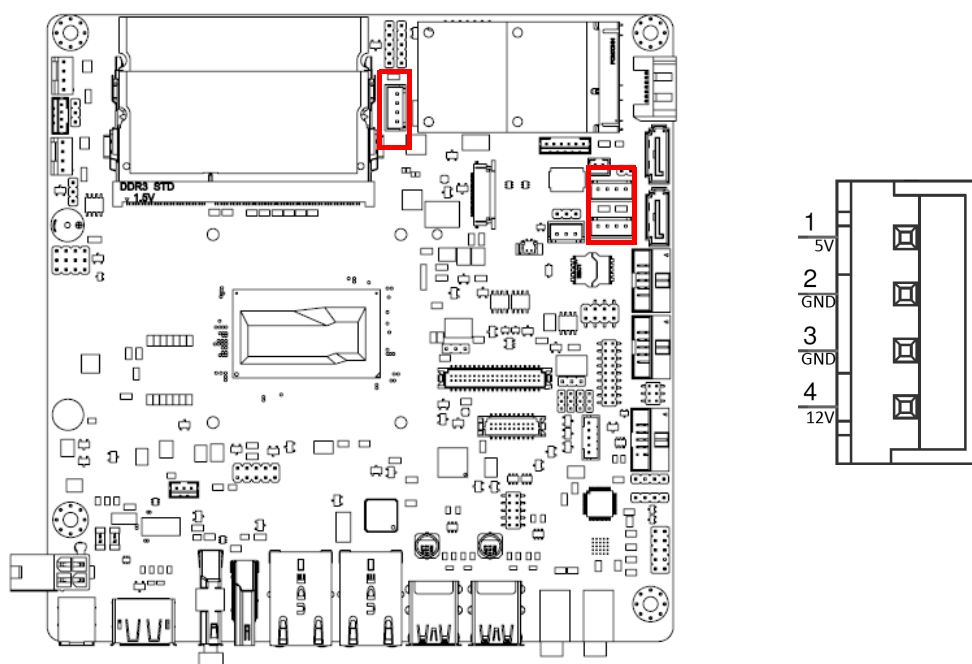


## 2.11 Serial ATA Interface (SATA1)

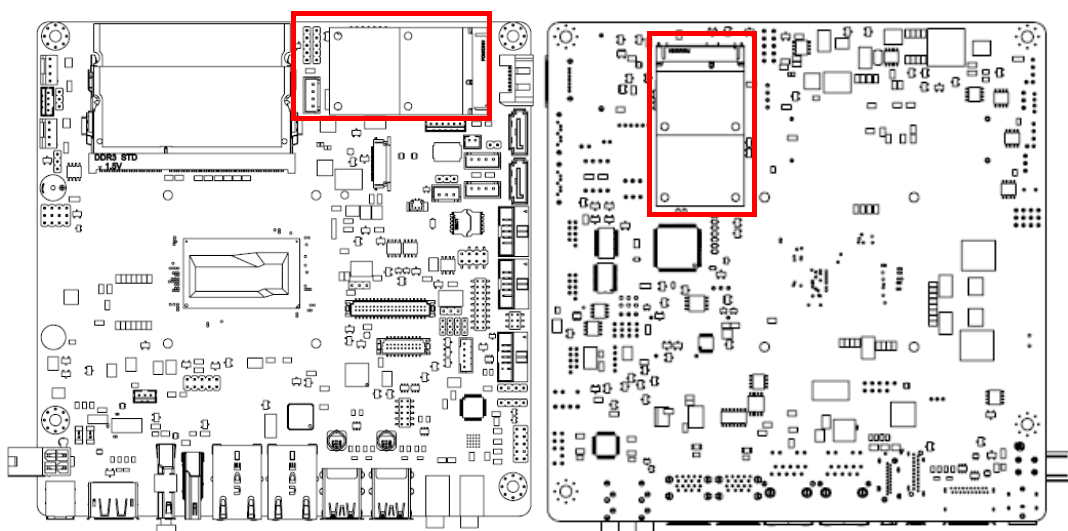


AIMB-231 features a high performance Serial ATA interface (up to 300 MB/s) and Serial ATA III interface (up to 600 MB/s) which eases hard drive cabling with thin, space-saving cables.

## 2.12 SATA power connector(SATA\_PWR1~3)



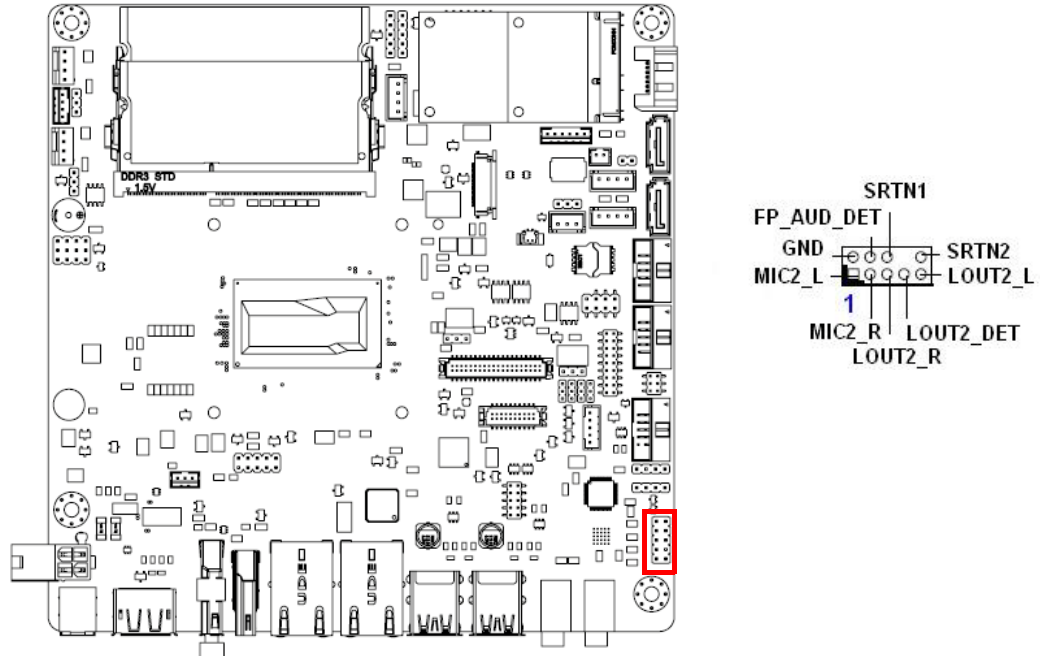
## 2.13 Full / Half Size Mini PCI Express Slot




The AIMB-231 provides 1 Full size Mini PCI express slot (Co-lay mSATA & SIM card holder) and 1 Half size Mini PCI express slot.

## 2.14 Front Headphone Connector (FP\_AUDIO1)

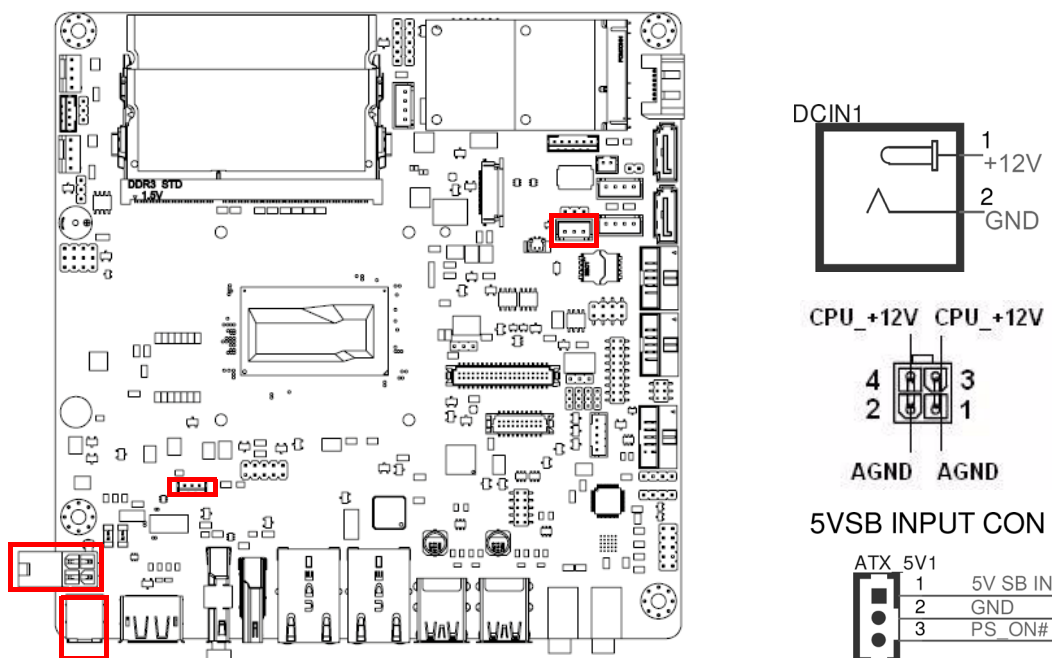
This connector is for a chassis-mounted front panel audio I/O module that supports either HD Audio or legacy AC'97 (optional) audio standard. Connect this connector with the front panel audio I/O module cable.



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

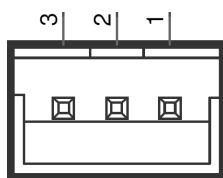
## 2.15 ATX 12V/DCIN 12V/5V SB Input Power Connector (ATX12V1/DCIN1)

This connector is for an ATX 12 V 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 not 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.
  3. ATX\_5V1 for Operation system shutdown command, if you used ATX12V1 input, you can use the connector to power shutdown system.

PSON1 is for AT/ATX mode selection (PSON1)

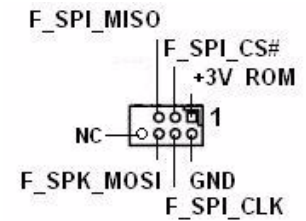
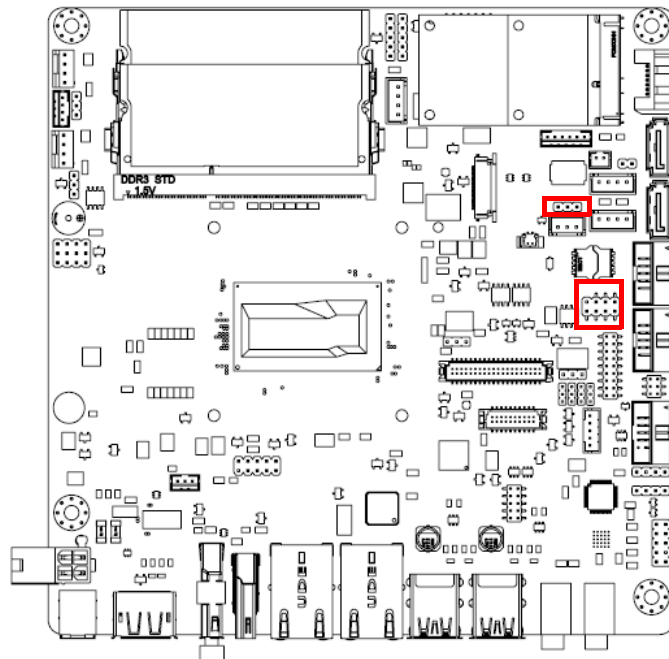


PSON1

PSON1:1-2	AT*
2-3	ATX

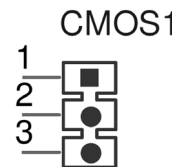
## 2.16 SPI Flash Connector(SPI\_CN1)

The SPI flash card pin header may be used to flash BIOS if the AIMB-231 cannot power on.



Clean CMOS(CMOS1)

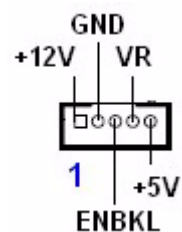
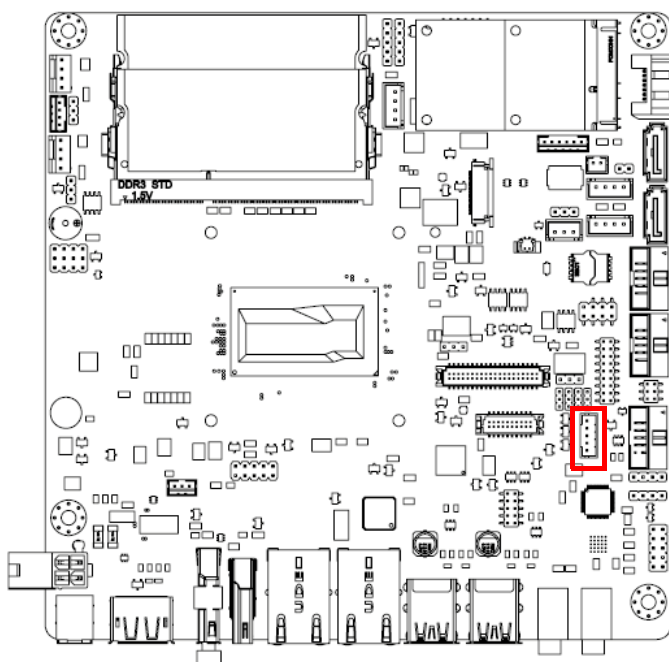
Clean CMOS and reset RTC



CMOS1: 1-2 Keep CMOS data\*

3-4 Clean CMOS

## 2.17 LCD Inverter Connector (INV1)



### Note! ■ Signal Description



#### Signal

VR

ENBKL

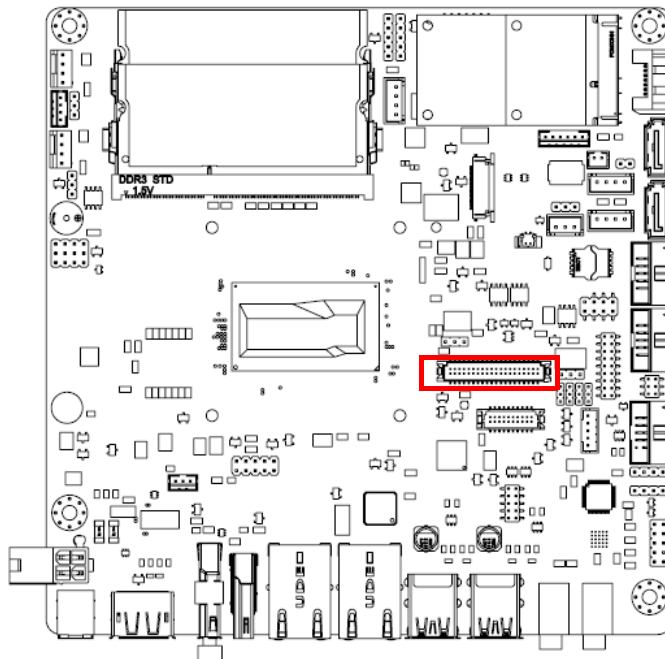
#### Signal Description

$V_{adj}=0.75\text{ V}$

(Recommended:  $4.7\text{ K}\Omega$ ,  $>1/16\text{ W}$ )

LCD backlight ON/OFF control signal

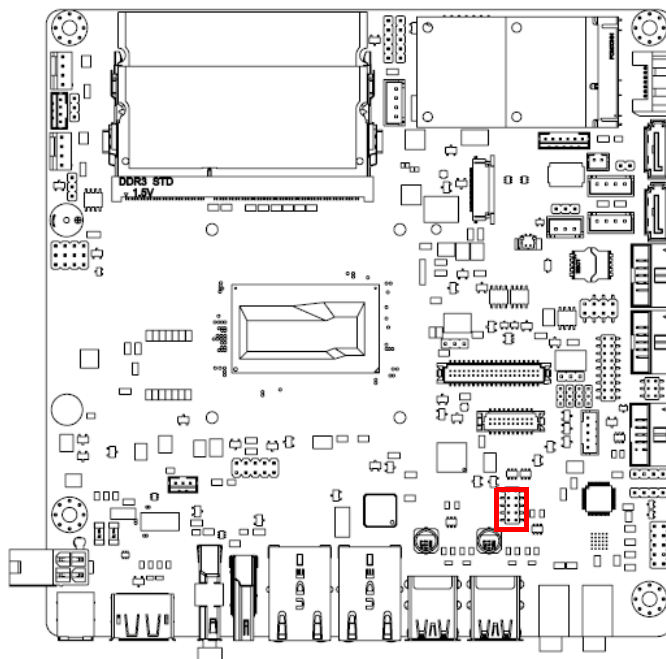
## 2.18 LVDS Connector (LVDS1)



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	○

## 2.19 General Purpose I/O Connector (GPIO1)



1			
GPIO0	□	□	GPIO4
GPIO1	□	□	GPIO5
GPIO2	□	□	GPIO6
GPIO3	□	□	GPIO7
+3.3V	□	□	GND



# Chapter 3

BIOS Operation

## 3.1 Introduction

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-231 setup screens.

## 3.2 BIOS Setup

The AIMB-231 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.

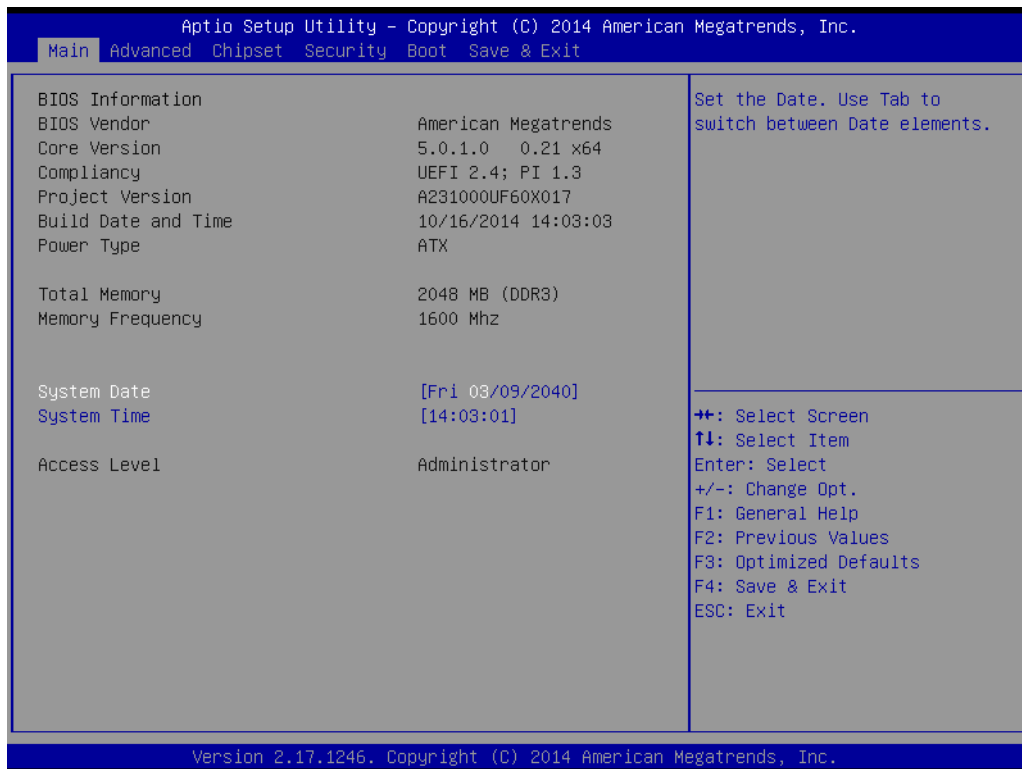
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<b>Control Keys</b>	
< ↑ >< ↓ >< ← >< → >	Move to select item
<Enter>	Select Item
<Esc>	Main Menu - Quit and not save changes into CMOS Sub Menu - Exit current page and return to Main Menu
<Page Up/+>	Increase the numeric value or make changes
<Page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

---

### 3.2.1 Main Menu

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



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

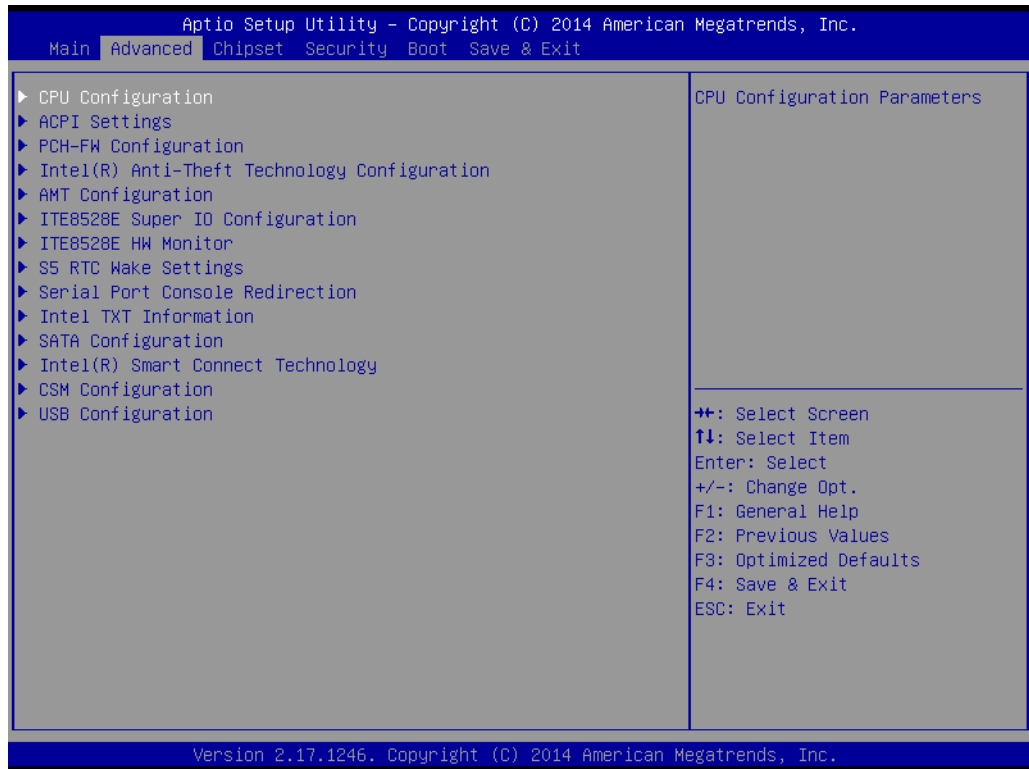
Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

#### ■ System time / System date

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

### 3.2.2 Advanced BIOS Features

Select the Advanced tab from the AIMB-231 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.



### 3.2.2.1 CPU Configuration

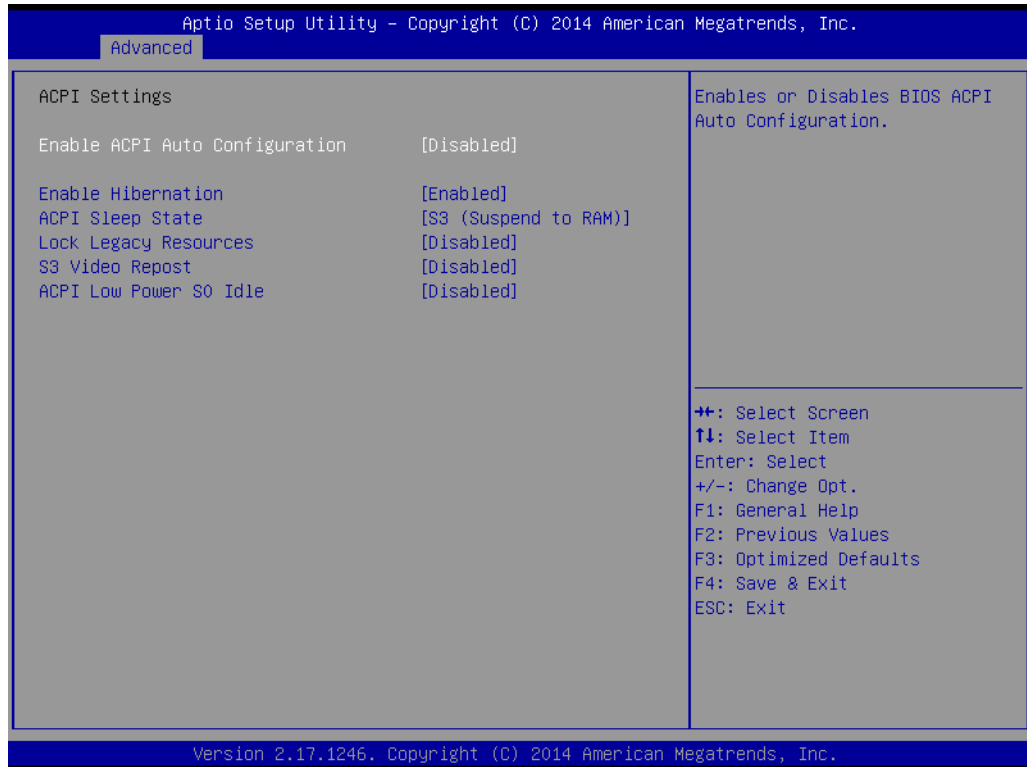
Aptio Setup Utility - Copyright (C) 2014 American Megatrends, Inc.

Advanced

<p>CPU Configuration</p> <p>Genuine Intel(R) CPU 0000 @ 1.60GHz</p> <p>CPU Signature                    306d3</p> <p>Microcode Patch                ffff0010</p> <p>Max CPU Speed                 1600 MHz</p> <p>Min CPU Speed                 600 MHz</p> <p>CPU Speed                      1900 MHz</p> <p>Processor Cores                2</p> <p>Intel HT Technology            Supported</p> <p>Intel VT-x Technology         Supported</p> <p>Intel SMX Technology         Supported</p> <p>64-bit                            Supported</p> <p>EIST Technology                Supported</p> <p>CPU C3 state                    Supported</p> <p>CPU C6 state                    Supported</p> <p>CPU C7 state                    Supported</p> <p>L1 Data Cache                 32 KB x 2</p> <p>L1 Code Cache                 32 KB x 2</p> <p>L2 Cache                        256 KB x 2</p> <p>L3 Cache                        4 MB</p> <p>L4 Cache                        Not Present</p> <p>Hyper-threading                [Enabled]</p>	<p>Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology). When Disabled only one thread per enabled core is enabled.</p> <hr/> <p>++: Select Screen          ↑↓: Select Item          Enter: Select          +/-: Change Opt.          F1: General Help          F2: Previous Values          F3: Optimized Defaults          F4: Save &amp; Exit          ESC: Exit</p>
--	---

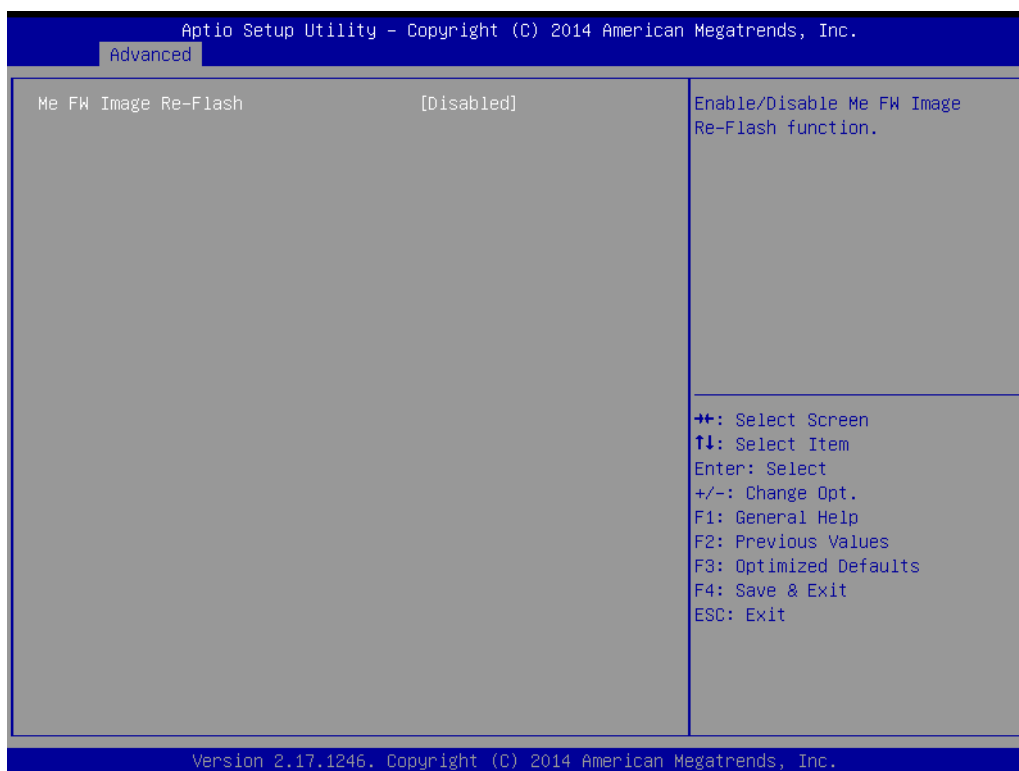
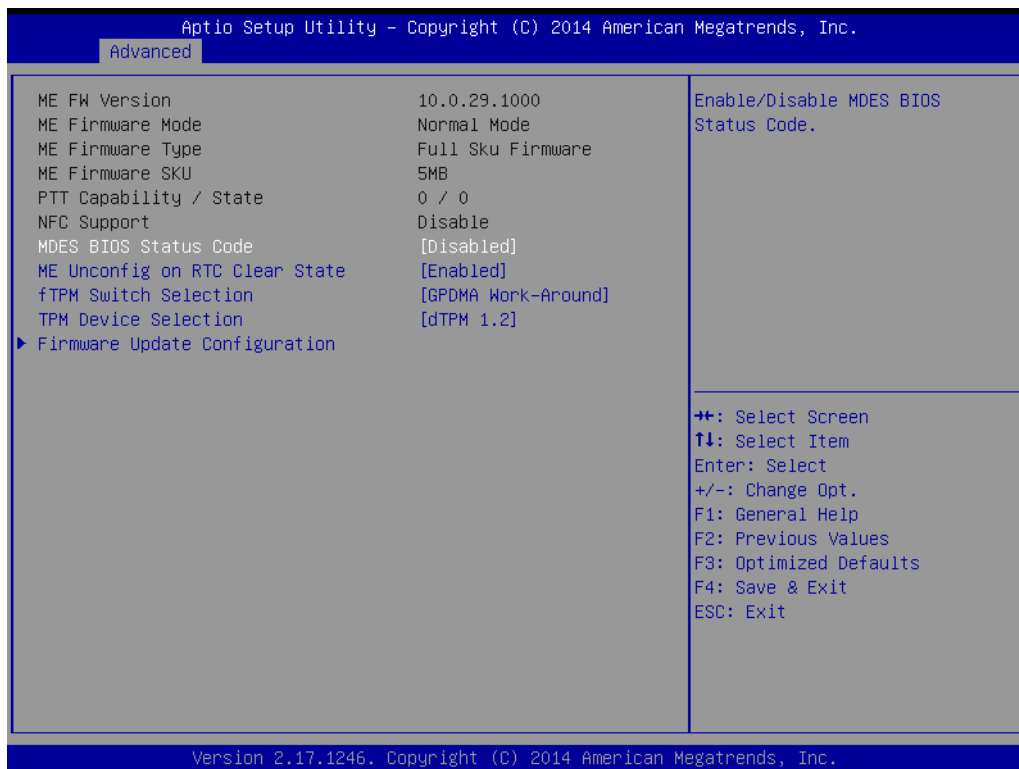
Version 2.17.1246. Copyright (C) 2014 American Megatrends, Inc.

### 3.2.2.2 ACPI settings



- **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

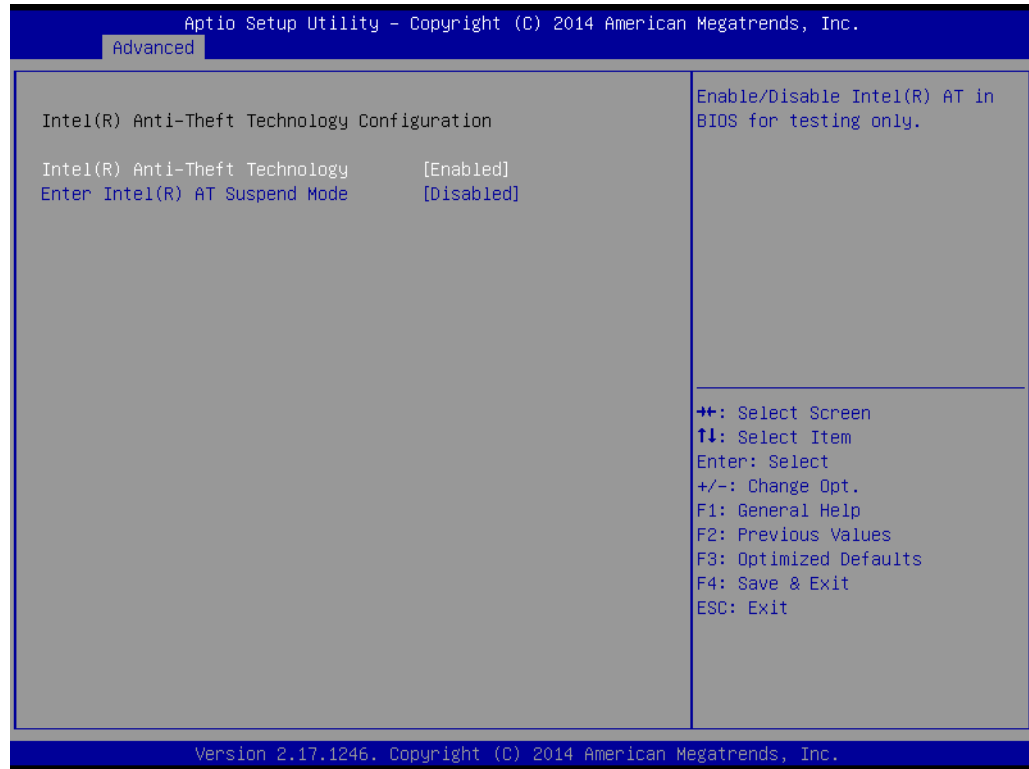
### 3.2.2.3 PCH-FW Configuration



- **Me FW Image Re-Flash**

This item allows users to enable or disable Me FW image re-flash function.

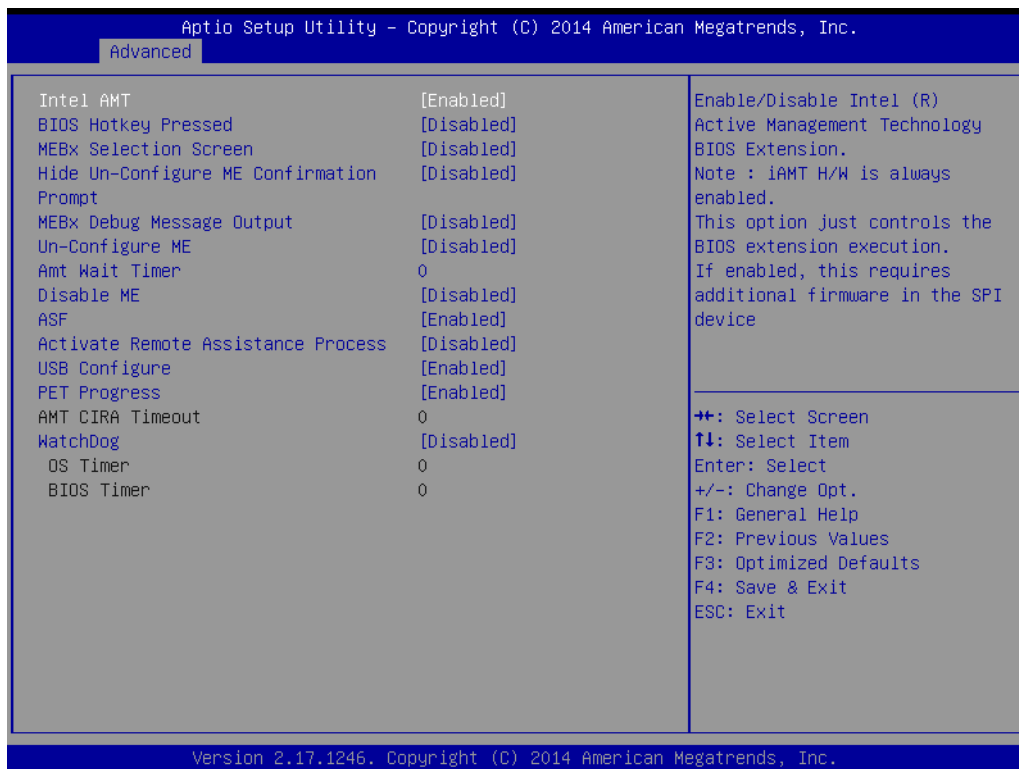
### 3.2.2.4 Intel(R) Anti-Theft Technology Configuration



- **Intel(R) Anti-Theft Technology**  
Enabled or disabled Intel(R) Anti-Theft Technology.
- **Enter Intel(R) AT Suspend mode**  
Enabled or disabled Intel(R) AT suspend mode.



### 3.2.2.5 AMT Configuration

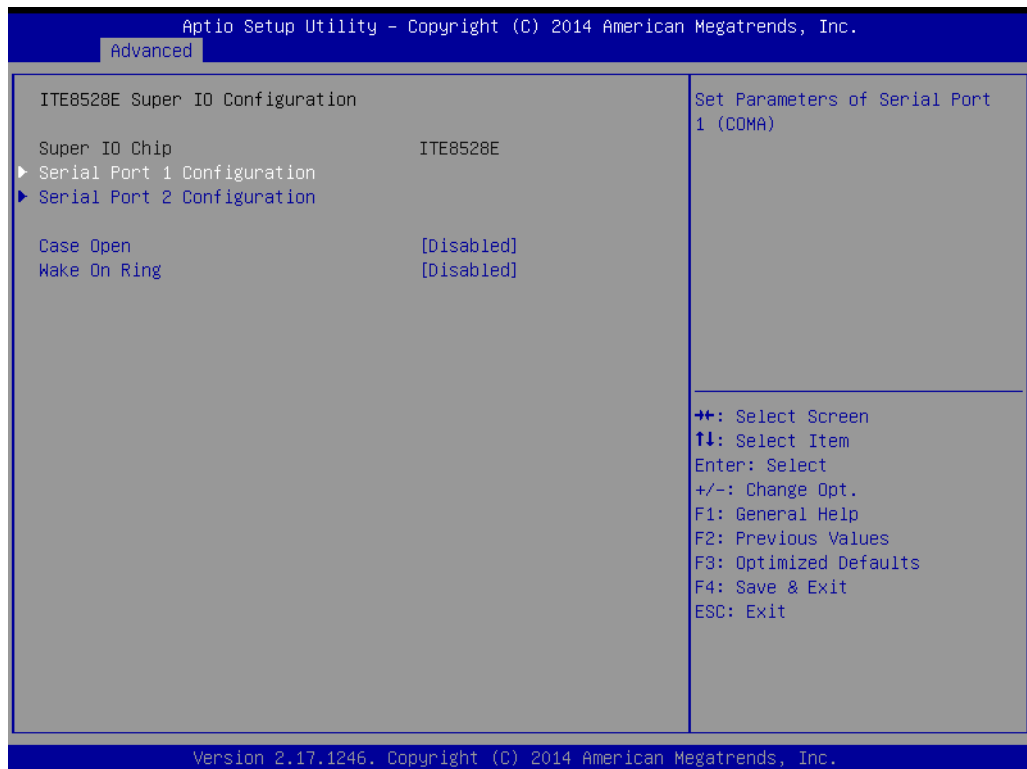


- **Intel AMT**  
This item allows users to enable or disable Intel AMT BIOS extension.
- **BIOS Hotkey Pressed**  
This item allows users to enable or disable BIOS hotkey press.
- **MEBx Selection Screen**  
This item allows users to enable or disable MEBx selection screen.
- **Hide Un-Configuration ME Confirmation Prompt**  
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 Intel ME.
- **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.

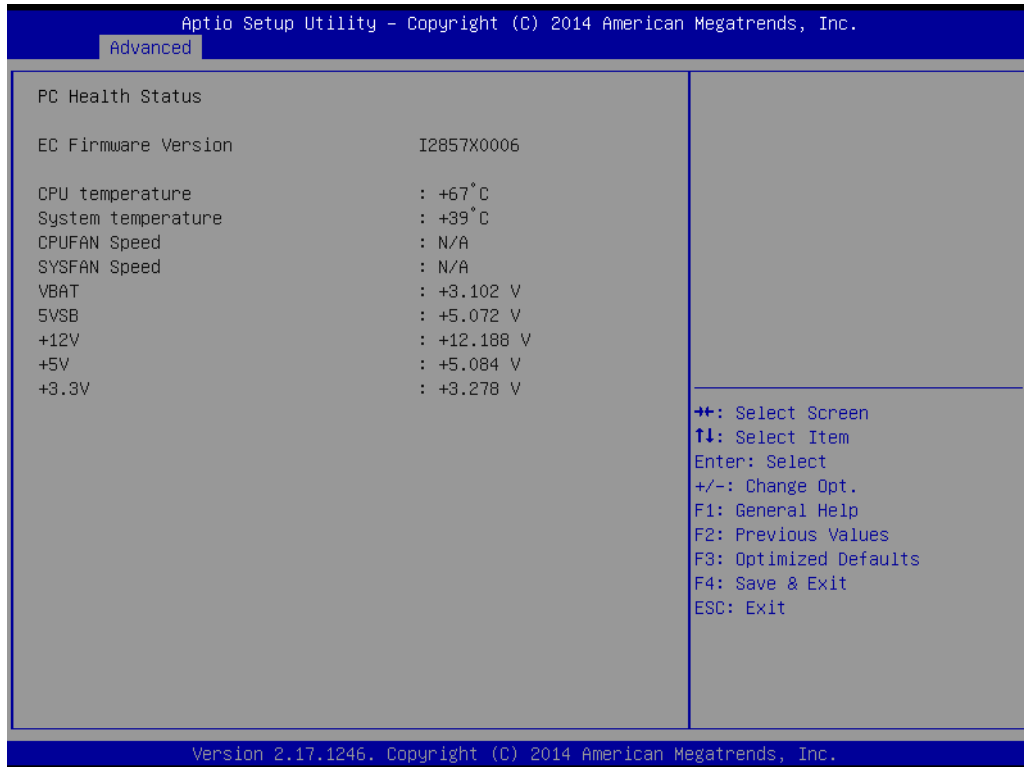
- **AMT CIRA Timeout**  
OEM defined timeout for MPS connection to be established.
- **WatchDog**  
This item allows users to enable or disable WatchDog Timer.
- **OS Timer**  
Set OS watchdog timer.
- **BIOS Timer**  
Set BIOS watchdog timer.

### 3.2.2.6 ITE8528E Super IO Configuration



- **Serial Port 1 Configuration**  
Set Parameters of Serial Port 1(COM1\_1)
- **Serial Port 2 Configuration**  
Set Parameters of Serial Port 2 (COM1\_2)
- **Case Open**  
Enabled or Disabled Case Open warning beep.
- **Wake On Ring**  
Enabled or disabled wake on ring function.

### 3.2.2.7 ITE8528E HW Monitor

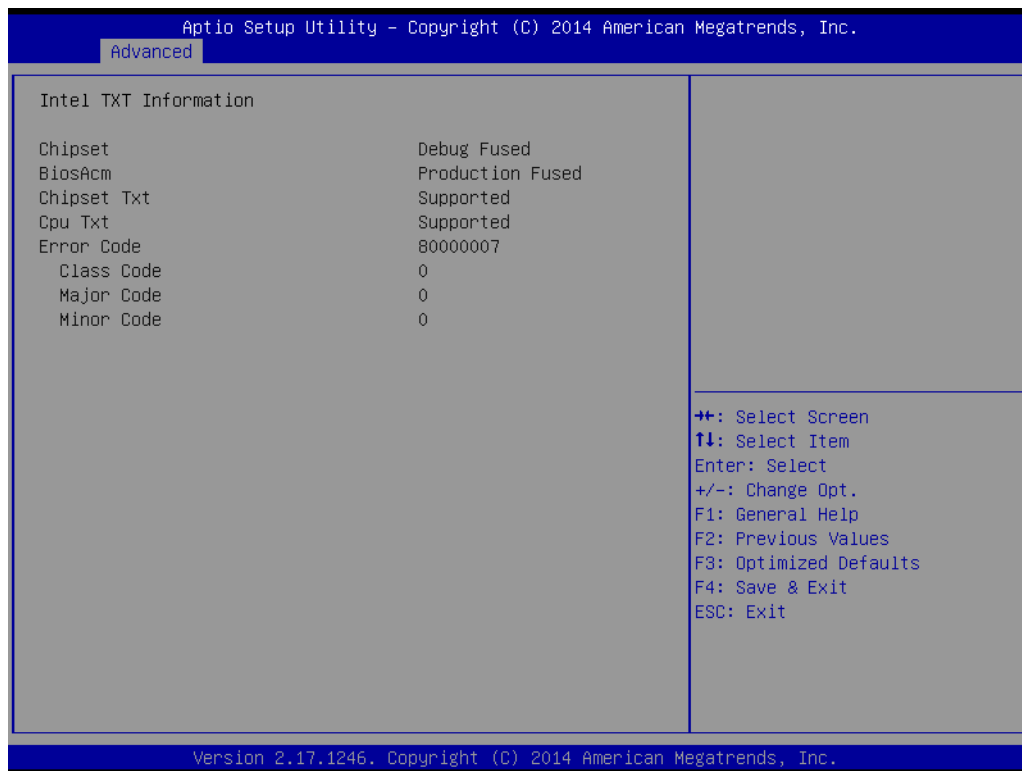


### 3.2.2.8 S5 RTC Wake Setting

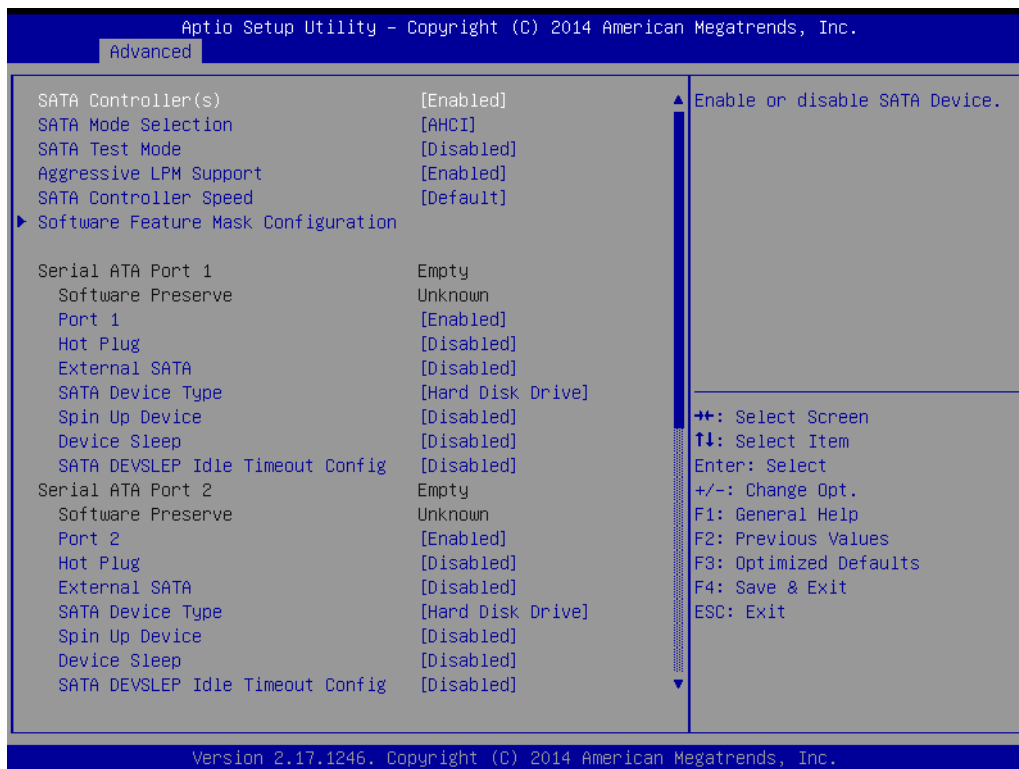


- **Wake system from S5**  
Enabled or disabled wake system from S5.

### 3.2.2.9 Intel TXT Information

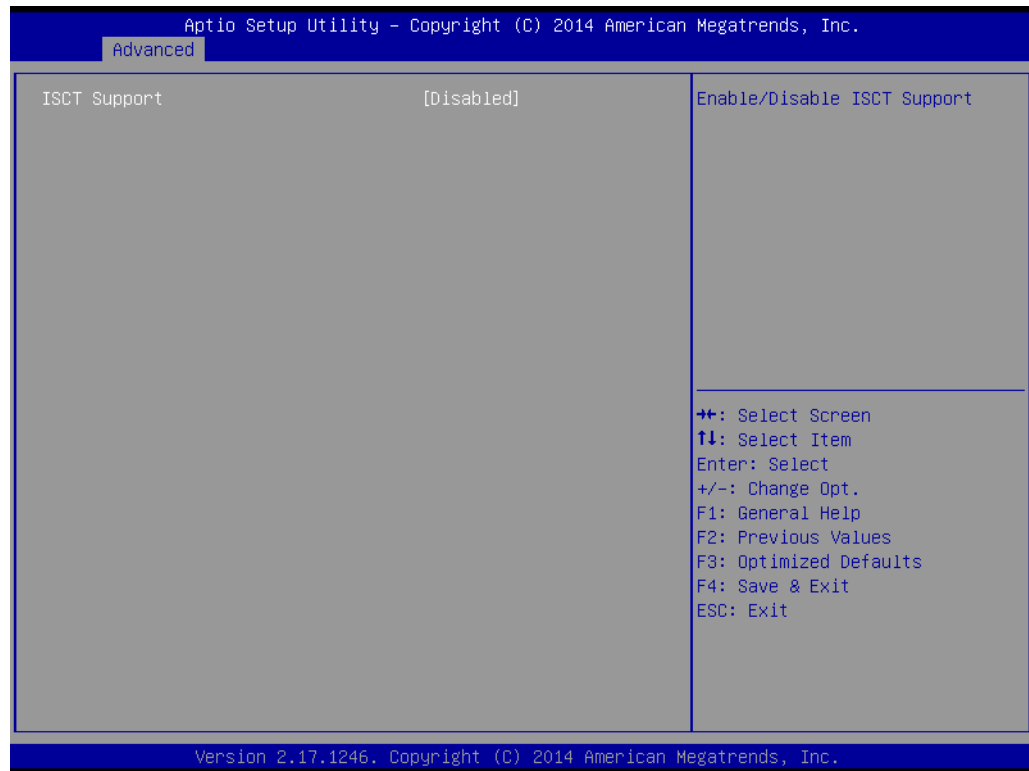


### 3.2.2.10 SATA Configuration



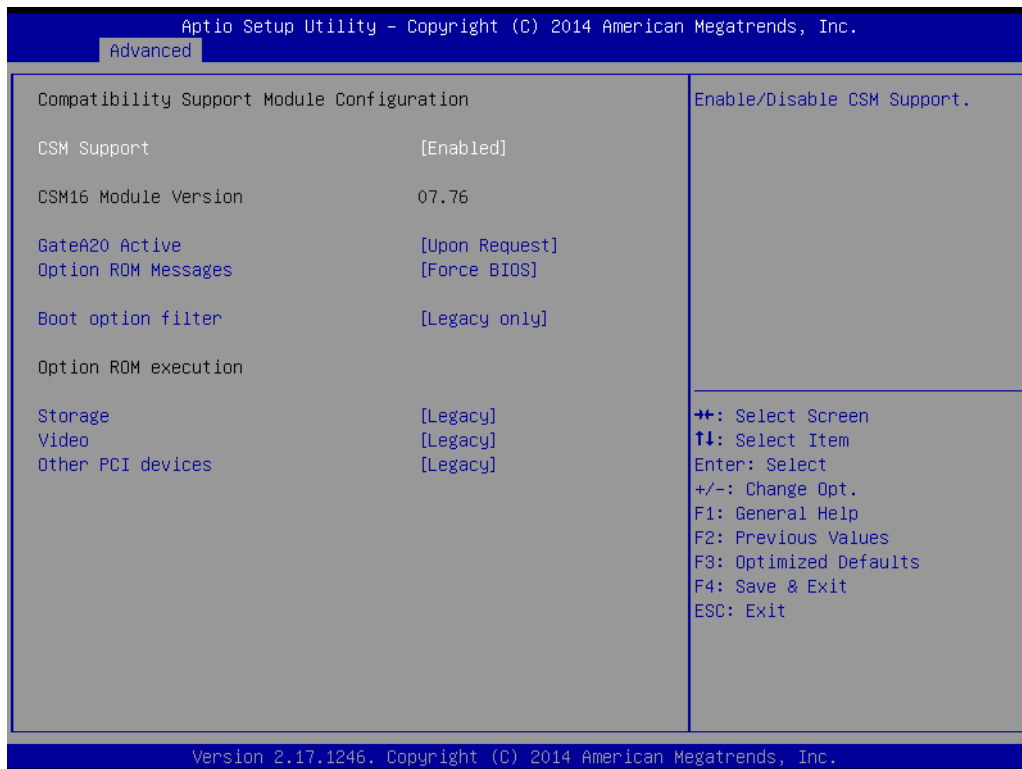
- **SATA Controller(s)**  
This item allows users to enable or disable the SATA controller(s).
- **SATA Mode Selection**  
This item allows users to select mode of SATA controller(s).
- **SATA Test Mode**  
This item allows users to enable or disable the SATA test mode.
- **Aggerssive LPM Support**  
This item allows users to enable or disable the Aggerssive LPM Support.
- **SATA Controller Speed**  
This item allows users to select mode of SATA Controller Speed.
- **Serial ATA Port 1/2/3**  
This item allows users to enable or disable the SATA Port.
- **Hot Plug**  
This item allows users to enable or disable the Hot Plug.
- **External SATA**  
This item allows users to enable or disable the External SATA.
- **SATA Device type**  
This item allows users to select mode of SATA Device type.
- **Spin up Device**  
This item allows users to enable or disable the Spin up Device.
- **Device Sleep**  
This item allows users to enable or disable the Device Sleep.
- **SATA DEVSLEP idle Timeout Config**  
This item allows users to enable or disable the SATA DEVSLEP idle Timeout Config.

### 3.2.2.11 Intel (R) Smart Connect Technology



- **ISCT Support**  
Enabled or disabled intel smart connect technology.

### 3.2.2.12 CSM Configuration



- **Compatibility Support Module Configuration**  
Enabled or disabled CSM support.
- **GateA20 Active**  
UPON REQUEST - GA20 can be disabled using BIOS services. Never allow disabling of GA20; this option is useful when any RT code is executed above 1 MB.
- **Option ROM Messages**  
Set display mode for Option ROM.
- **Boot option filter**  
This option controls Legacy/UEFI ROM priority.
- **Option ROM execution**
  - **Storage**  
Controls the execution of UEFI and Legacy Storage OpROM.
  - **Video**  
Controls the execution of UEFI and Legacy Video OpROM.
  - **Other PCI devices**  
Determines OpROM execution policy for devices other than Network, Storage, or Video.

### 3.2.2.13 USB Configuration



- **Legacy USB support**  
Enables support for legacy USB. Auto option disables legacy support if no USB devices are connected.
- **XHCI Hand-off**  
This is a workaround for OS without XHCI hand-off support. The XHCI ownership change should claim by XHCI driver.
- **EHCI Hand-off**  
This is a workaround for OS without EHCI hand-off support. The EHCI ownership change should claim by EHCI driver.
- **USB Mass Storage Driver Support**  
This item allows users to enable or disable USB Mass Storage Driver.
- **USB transfer time-outs**  
Time-out value for control, bulk, and interrupt transfers.
- **Device reset time-out**  
USB mass storage device starts unit command time-out.
- **Device power-up delay**  
Maximum time the device will take before it properly report itself to the host controller.
- **Mass storage device**  
Mass storage device emulation type. 'AUTO' enumerates devices according to their media format. Optical drives are emulated as 'CDROM', drives with no media will be emulated according to a drive type.

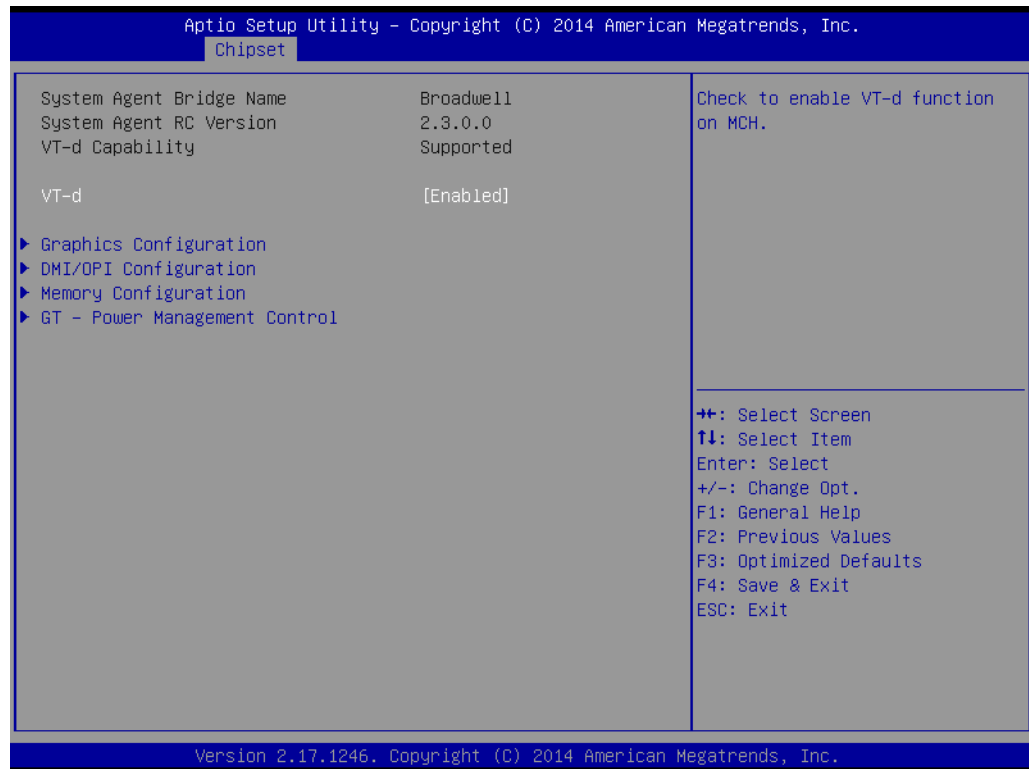


### 3.2.3 Chipset



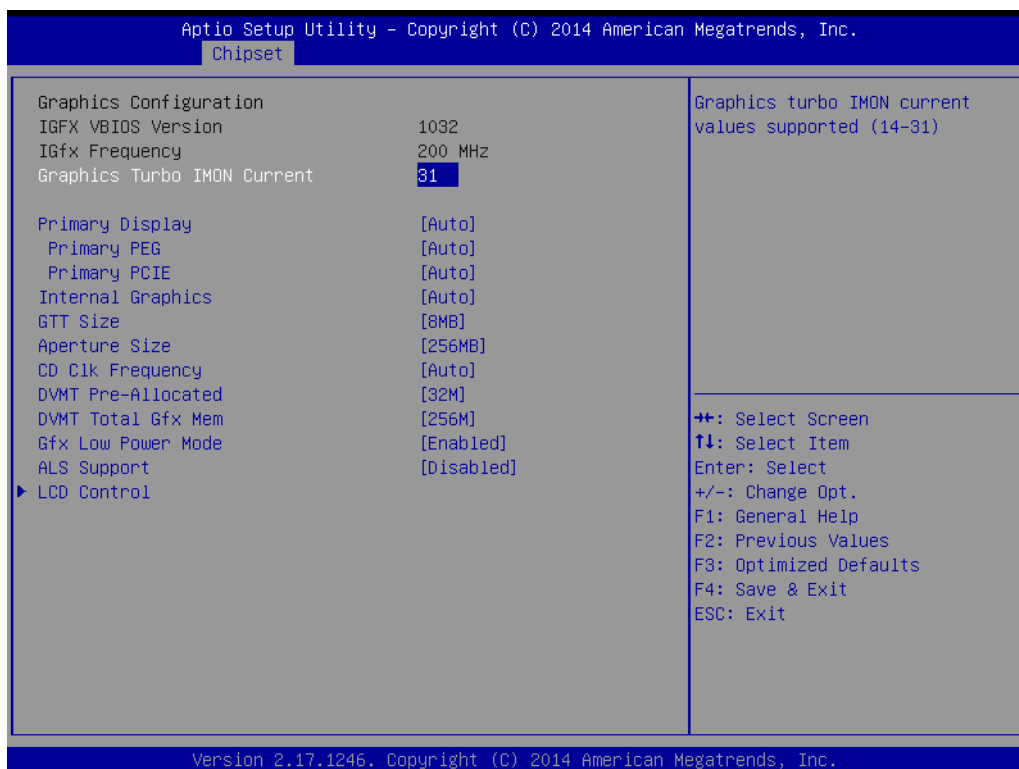
- **VT-D**  
Enabled or disabled VT-d.

### 3.2.3.1 System Agent (SA) Configuration



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

### 3.2.3.2 Graphics Configuration



- **Graphics Turbo IMON Current**  
This item allows users to select which Graphics Turbo IMON Current.
- **Primary Display**  
Select which of IGFX/PEG/PCI graphics device should be Primary display or select SG for Switchable Gfx.
  - **Primary PEG**  
Select PEG0/PEG1/PEG2/PEG3 graphics device should be Primary PEG.
  - **Primary PCIE**  
Select PCIE0/PCIE1/PCIE2/PCIE3/PCIE4/PCIE5/PCIE6/PCIE7 graphics device should be Primary PCIE.
- **Internal Graphics**  
Keep IGD enabled based on the setup option.
- **GTT size**  
Select the GTT size.
- **Aperture Size**  
Select the Aperture size.
- **CD Clk Frequency**  
Select Cd Clk Frequency.
- **DVMT Pre-Allocated**  
Select DVMT 5.0 Pre-allocated (fixed) graphics memory size used by the Internal graphics device.
- **DVMT Total Gfx Mem**  
Select DVMT 5.0 total graphic memory size used by the Internal graphics device.
- **Gfx Low Power Mode**  
This item allows users to enable or disable Gfx low power mode.

- **ALS Support**

This item allows users to enable or disable ALS support.

### 3.2.3.3 LCD Control



- **Primary IGFX Boot Display**

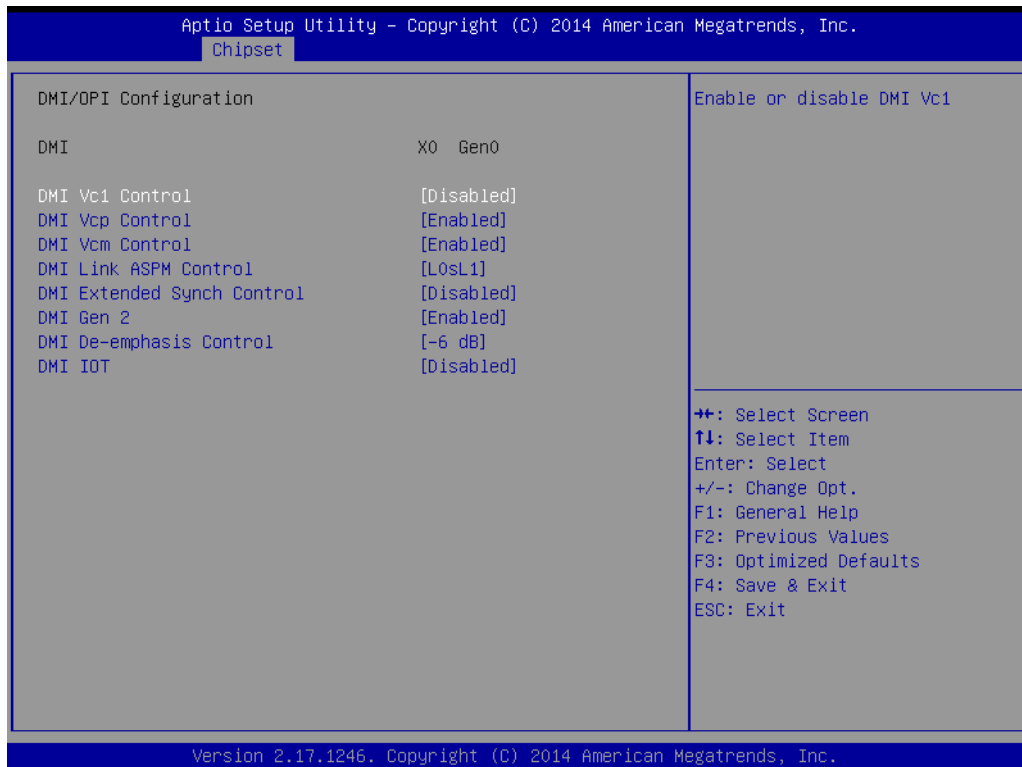
Select the video device which will be activated during POST. Secondary boot display selection will appear based on customer's selection.

VGA modes will be supported only on Primary display.

- **LVDS Panel Type**

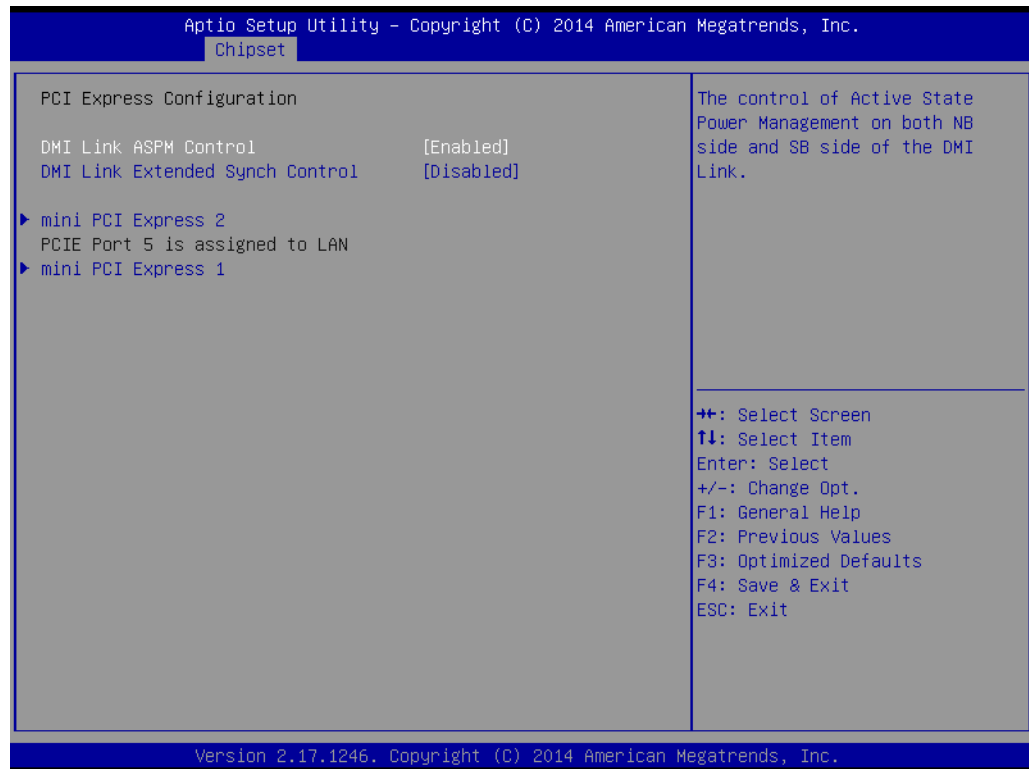
LVDS Panel Type selection.

### 3.2.3.4 DMI/OPI Configuration



- **DMI Vc1 Control**  
This item allows users to enable or disable DMI Vc1 Control.
- **DMI Vcp Control**  
This item allows users to enable or disable DMI Vcp Control.
- **DMI Vcm Control**  
This item allows users to enable or disable DMI Vcm Control.
- **DMI Link ASPM Control**  
This item allows users to enable or disable DMI Link ASPM Control.
- **DMI Extended Synch Control**  
This item allows users to enable or disable DMI extended synch Control.
- **DMI Gen2**  
This item allows users to enable or disable DMI Gen2 Control.
- **DMI De-emphasis Control**  
Configure the De-emphasis control on DMI.
- **DMI IOT**  
This item allows users to enable or disable DMI IOT Control.

### 3.2.3.5 PCI Express Configuration



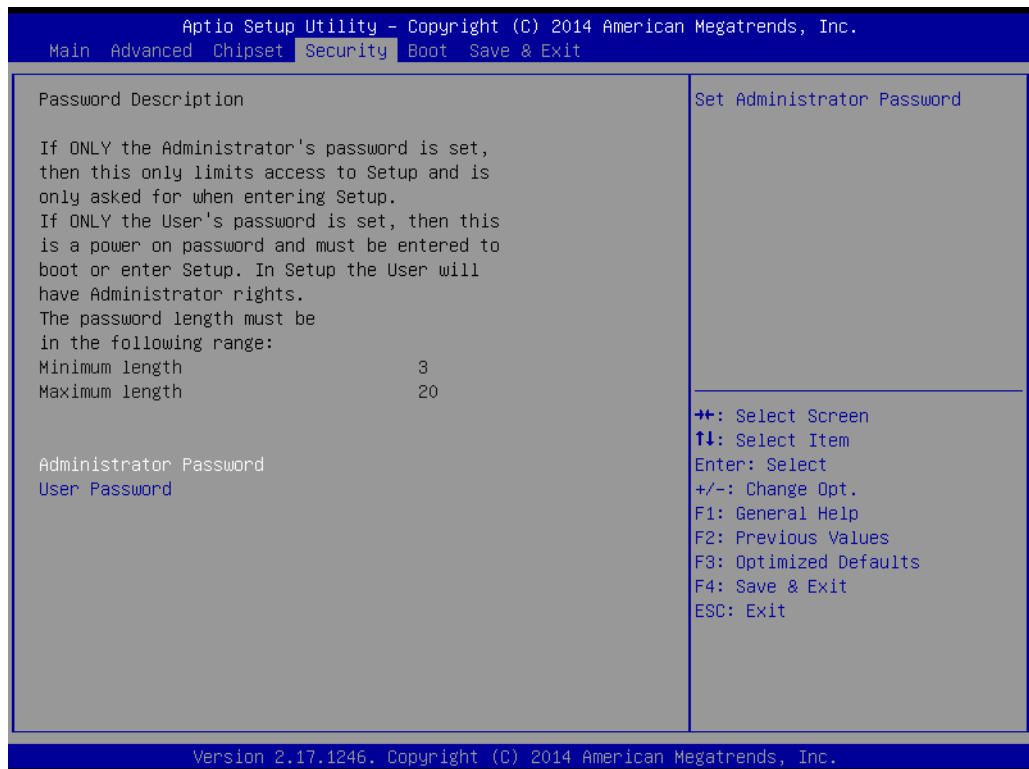
- **DMI Link ASPM Control**  
This item allows users to enable or disable DMI Link ASPM Control.
- **DMI Link Extended Synch Control**  
This item allows users to enable or disable DMI Link extended synch Control.

### 3.2.3.6 PCH-IO Configuration



- **PCI Express Configuration**  
Details of PCI Express Options.
- **USB Configuration**  
Details of USB items.
- **PCH Azalia Audio**  
PCH Azalia Audio Options.
- **LAN 1 controller**  
Enable or disable the LAN 1 controller.
- **LAN 2 controller**  
Enable or disable the LAN 2 controller.
- **DeepSx Power Policies**  
Enable or disable deepsx power policies.
- **Launch PXE OpROM policy**  
Controls the execution of UEFI and Legacy PXE OpROM.
- **PCIE Wake**  
Enable or disable PCIE to wake the system from S5.
- **Restore AC Power Loss**  
This item allows users to select off, on and last state.

## 3.2.4 Security



Select Security Setup from the AIMB-231 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.



### 3.2.5 Boot



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

## 3.2.6 Save & Exit



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

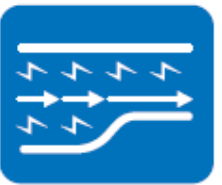
#### 4.2.1.4 Power Saving

##### 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

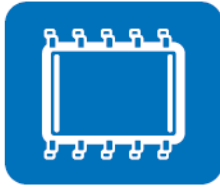


Refers to a series of methods for reducing power consumption in computers by lowering the clock frequency. This API allows the user to adjust the clock from 87.5% to 12.5%.

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## 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.

### 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.

# 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-231 are located on website. The driver in the folder 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 website 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 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
- Serial ATA interface support
- USB 2.0/3.0 support
- 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 8 (64-bit)



## 5.3 Windows 7 Driver Setup

1. From Website, you can see the driver folder items. Navigate to the "Chipset" folder and click "infnst\_autol.exe" to complete the installation of the driver.

 1.Chipset	2015/2/6 _
 2.RST	2015/4/10
 3.VGA	2015/4/10
 4.ME	2015/3/20
 5.LAN	2015/2/12
 6.Audio	2015/2/6 _
 7.USB3	2015/2/6 _
 Chipset_10.0.22_Public.zip	2014/12/3



# Chapter 6

## VGA Setup

---

## 6.1 Introduction

The Intel mobile Core i7, Core i5, Core i3, Celeron 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

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



From website, 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 8.

 Production Version 15.36.15.4099      2015/2/6 .

# Chapter 7

## LAN Configuration

---

## 7.1 Introduction

The AIMB-231 has dual Gigabit Ethernet LANs via dedicated PCI Express x1 lanes Intel I218(LAN1) and Intel I210(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

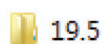
**Note!** *Before installing the LAN drivers, make sure the chipset utility has been installed on your system. See Chapter 5 for information on installing the chipset utility.*



The AIMB-231's Intel I218 (LAN1) and Intel I210 (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 Driver Setup (Intel I210)

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

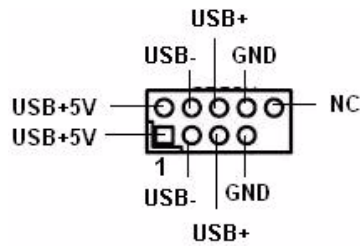


2015/2/6

# Appendix **A**

I/O Pin Assignments

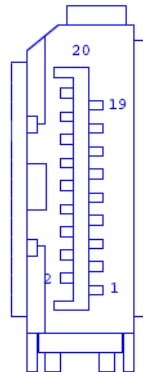
## A.1 USB Header (USB56)



**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 DP Connector

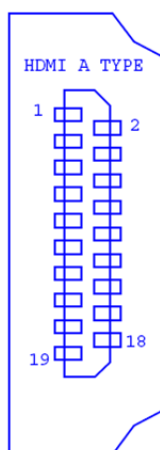


**Table A.2: DP Connector**

Pin	Signal	Pin	Signal
1	DP0+	11	GND
2	GND	12	DP3-
3	DP0-	13	DP2_DET
4	DP1+	14	GND
5	GND	15	DP_AUX-
6	DP1-	16	GND
7	DP2+	17	DP_AUX+
8	GND	18	DP2_HPDP
9	DP2-	19	GND
10	DP3+	20	+3.3V



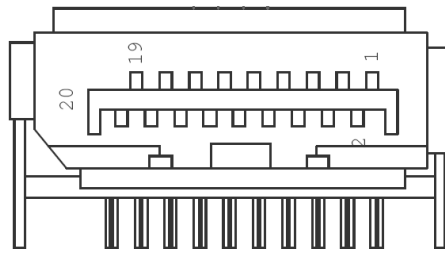
## A.3 HDMI Connector



**Table A.3: HDMI Connector**

Pin	Signal	Pin	Signal
1	DP2-	11	GND
2	GND	12	Clock+
3	DP2+	13	NC
4	DP1-	14	NC
5	GND	15	HDMI_CLK
6	DP1+	16	HDMI_DATA
7	DP0-	17	GND
8	GND	18	+5V
9	DP0+	19	HDMI_HPD
10	Clock-		

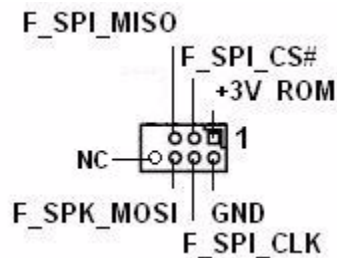
## A.4 DP Connector



**Table A.4: DP Connector**

Pin	Signal	Pin	Signal
1	DP2_0+	11	GND
2	GND	12	DP2_3-
3	DP2_0-	13	DP2_AUX_EN
4	DP2_1+	14	GND
5	GND	15	DP2_AUX+
6	DP2_1-	16	GND
7	DP2_2+	17	DP2_AUX-
8	GND	18	DP2_HPD
9	DP2_2-	19	GND
10	DP2_3+	20	+V3.3

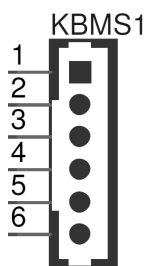
## A.5 SPI\_CN1: SPI Fresh Card Pin Connector



**Table A.5: 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

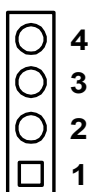
## A.6 PS/2 Keyboard and Mouse Connector (KBMS1)



**Table A.6: PS/2 Keyboard and Mouse Connector (KBMS1)**

Pin	Signal	Pin	Signal
1	KB_CLK	4	GND
2	KB_DAT	5	VCC_KBMS
3	MS_DAT	6	MS_CLK

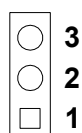
## A.7 CPU Fan Power Connector (CPUFAN1/CPUFAN1\_1)



**Table A.7: CPU Fan Power Connector (CPUFAN1/CPUFAN\_1)**

Pin	Signal
1	GND
2	CPU FAN VCC
3	DETECT
4	CPU PWM

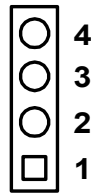
## A.8 CPU Fan Speed Control (JCPUFAN1)



**Table A.8: CPU Fan Speed Control (JCPUFAN1)**

Pin	Signal
1-2	VCC Control
2-3*	PWM Control

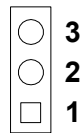
## A.9 System Fan Power Connector (SYS\_FAN1)



**Table A.9: System Fan Power Connector (SYSFAN1)**

Pin	Signal
1	GND
2	SYS FAN VCC
3	DETECT
4	SYS FAN PWM

## A.10 System Fan Speed Control (JSYSFAN1)

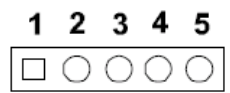


**Table A.10: CPU Fan Speed Control (JCPUFAN1)**

Pin	Signal
1-2	VCC Control
2-3*	PWM Control

## A.11 Power LED & Keyboard Lock Connector (JFP3)

You can use an LED to indicate when the single board computer is on. Pin 1 of JFP3 supplies the LED's power, and Pin 3 is the ground.

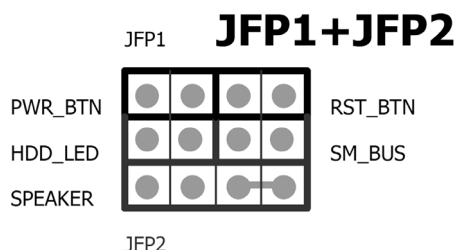


**Table A.11: Power LED & Keyboard Lock Connector (JFP2)**

Pin	Function
1	LED power
2	NC
3	GND
4	KEYLOCK#
5	GND

## A.12 Power Switch/Reset Switch/HDD LED/SMBus/ Speaker (JFP1/JFP2)

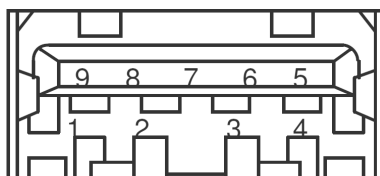
The single board computer has its own buzzer. You can also connect it to the external speaker on your computer chassis.



**Table A.12: Power Switch/Reset Switch/HDD LED/SMBus/Speaker (JFP1/JFP2)**

Pin	Signal	Pin	Signal
1	+5V	7	Speaker 3
2	+3.3V	8	SMB_DAT
3	Power Switch+	9	Reset Switch+
4	NC	10	Speaker 4
5	HDD LED	11	SMB_CLK
6	GND	12	GND

## A.13 USB/LAN Ports (LAN1/LAN2/USB12/USB34)



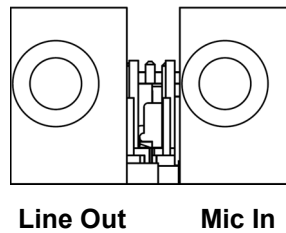
**Table A.13: USB Port**

Pin	Signal	Pin	Signal
1	VCC	6	USB3_RX+
2	USB2_D-	7	GND
3	USB2_D+	8	USB3_TX-
4	GND	9	USB3_TX+
5	USB3_RX-		

**Table A.14: Ethernet 10/100/1000 Mbps RJ-45 Port**

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

## A.14 Line Out, Mic In Connector (AUDIO1/AUDIO2)



## A.15 Serial ATA (SATA1 ~ 3)

**Table A.15: Serial ATA 0/1 (SATA1/SATA2)**

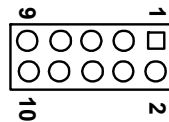
Pin	Signal	Pin	Signal
1	GND	2	SATA_0TX+
3	SATA_0TX-	4	GND
5	SATA_0RX-	6	SATA_0RX+
7	GND	8	

## A.16 AT/ATX Mode (PSON1)

**Table A.16: AT/ATX Mode (PSON1)**

Pin	Signal	Pin	Signal
1	#PSON_SIO (to super IO)	2	#PSON (to power supply)
3	GND		

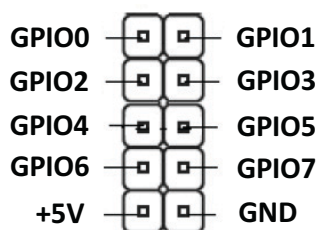
## A.17 HD Audio Interface (FP\_AUDIO1)



**Table A.17: 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

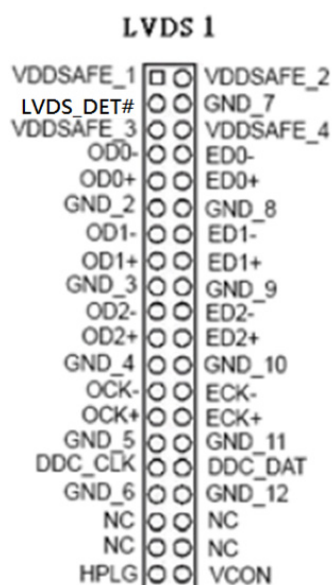
## A.18 GPIO Pin Header (GPIO1)



**Table A.18: GPIO Pin Header (GPIO1)**

Pin	Signal	Pin	Signal
1	GPIO0	2	GPIO1
3	GPIO2	4	GPIO3
5	GPIO4	6	GPIO5
7	GPIO6	8	GPIO7
9	+5V	10	GND

## A.19 LVDS Connector: LVDS1



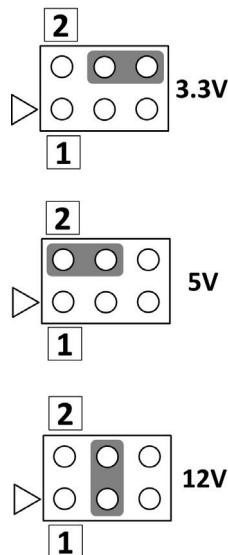
**Table A.19: LVDS1 Connector**

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+
17	GND_3	18	GND_9

**Table A.19: LVDS1 Connector**

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.20 LVDS Power Jumper (JLVDS1)



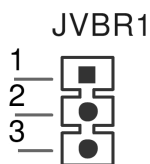
## A.21 LVDS Inverter (INV1)

**Table A.20: LVDS Power Jumper**

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



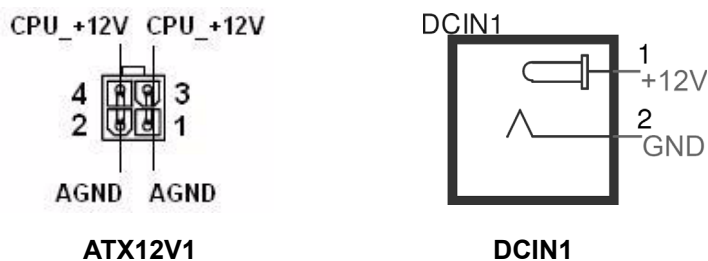
## A.22 LVDS Backlight control (JVBR1)



**Table A.21: LVDS Backlight control(JVBR1)**

Pin	Signal
1-2*	EC control
2-3	NC

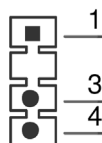
## A.23 ATX12V/12V DC IN (ATX12V1/DCIN1)



**Table A.22: ATX 12 V connector (ATX12V1)**

Pin	Signal	Pin	Signal
1	aGND	2	aGND
3	CPU_+12V	4	CPU_+12V

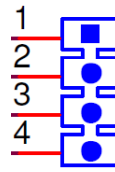
## A.24 HD Digital Audio Interface (SPDIF\_OUT1)



**Table A.23: HD Digital Audio Interface (SPDIF\_OUT1)**

Pin	Signal
1	+5V
3	SPDIF Out
4	GND

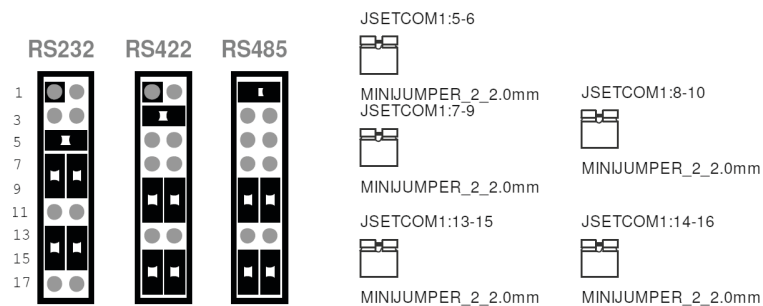
## A.25 Amplifier Audio Output (AMPJ1)



**Table A.24: Amplifier Audio Output (AMPJ1)**

Pin	Signal	Pin	Signal
1	AMP_L-	2	AMP_L+
3	AMP_R-	4	AMP_R+

## A.26 COM1 Protocols Selection (JSETCOM1)



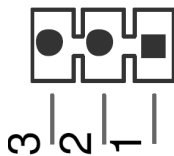
**Table A.25: COM1 Protocol Selection (JSETCOM1)**

RS-232*	5-6	7-9	8-10
	13-15	14-16	
RS-422	3-4	9-11	10-12
	15-17	16-18	
RS-485	1-2	9-11	10-12
	15-17	16-18	

**Note!** Without H/W auto flow control.



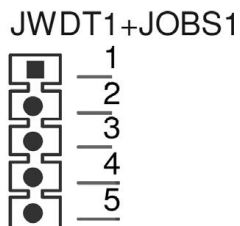
## A.27 COM1 RS422/485 Master or Slave Selection (COM1\_S1~S4)



**Table A.26: COM1 RS422/485 Master or Slave Selection (COM1\_S1~S4)**

COM1_S1	1-2*	slave
	2-3	master
COM1_S2	1-2*	slave
	2-3	master
COM1_S3	1-2*	slave
	2-3	master
COM1_S4	1-2*	slave
	2-3	master

## A.28 Watch dog and Open chassis alarm (JWDT1+JOBS1)



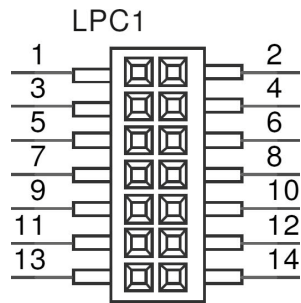
**Table A.27: Watchdog and Open Chassis Alarm (JWDT1+JOBS1)**

Pin	Signal	Pin	Signal
1	NC	4	EC_Beep
2	WG	5	Beep
3	Reset		

JWDT1+JOBS1: 2-3 WDT control by EC\*

4-5 Alarm by EC\*

## A.29 Low Pin Count Bus (LPC1)



**Table A.28: Low Pin Count Bus (LPC1)**

Pin	Signal	Pin	Signal
1	CLK24M	8	GND
2	LPC_AD1	9	LPC_AD2
3	80PORT_RST	10	LPC1_SMB_CLK
4	LPC_AD0	11	SERIRQ
5	LPC_FRAME	12	LPC1_SMB_DAT
6	+3.3V	13	+5VSB
7	LPC_AD3	14	+5V



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