User Manual

AIMB-232

Intel® Core™ 6th / 7th Gen ULT
Mini-ITX with DP++/HDMI/LVDS
2 COM, miniPCIe, and Dual LAN

ADVANTECH
Enabling an Intelligent Planet

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A Message to the Customer

Advantech Customer Services

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

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

Technical Support

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

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

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

Declaration of Conformity

FCC Class B

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

Operation is subject to the following two conditions:

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

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

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

Memory Compatibility

Test Item	Description							Result	Remark
Brand	Size	Speed	Type	ECC	Vendor PN	Memory	Advantech PN		
Advantech	16 GB	2133	DDR4	N	AQD-SD4U16N21-SE	SEC 546 K4A8G08 5WB BCPB	AQD-SD4U16N21-SE	PASS	
ATP	4 GB	2133	DDR4	N	A4G04QA8 BLPBME	40A77 D9RGQ	N/A	PASS	
ADATA	4 GB	2133	DDR4	N	AD4S2133 W4G15-BHYM	H5AN4G8N MFR TFC	N/A	PASS	
Advantech	8 GB	2133	DDR4	N	AQD-SD4U8GN21-SG	SEC 552 BCPB K4A4G085 WD	AQD-SD4U8GN 21-SG	PASS	
ATP	8 GB	2133	DDR4	N	A4G08QE8 BLPBME	40A77 D9RGQ	N/A	PASS	
Transcend	16 GB	2133	DDR4	N	TS2GSH64 V1B	SEC 546 K4A8G08 5WB BCRC	N/A	PASS	

Ordering Information

Order Number	CPU	Display	GbE	TPM	Storage	USB	PCIe/PCI
AIMB-232G2-U7A1E	i7-6600u	HDMI,DP ++,LVDS/ eDP (optional)	2	Yes (optional)	2 x SATA III 1 x mSATA	6 x USB 3.0, 4 x USB 2.0	2 x Full-size Mini-PCIe
AIMB-232G2-U5A1E	i5-6300u					6 x USB 3.0, 4 x USB 2.0	
AIMB-232G2-U3A1E	i3-6100u					6 x USB 3.0, 4 x USB 2.0	
AIMB-232G2-U0A1E	Celeron 3955u					4 x USB 3.0, 4 x USB 2.0	

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-232 Intel$^®$ Core™ 6th and 7th Gen ULT 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-232 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-232, check it for signs of shipping damage. (For example, damaged box, scratches, dents, etc.) If it is damaged or it fails to meet specifications, notify our service department or your local sales representative immediately. Also, notify the carrier and retain the shipping carton and packing material for inspection by the carrier. After inspection, we will make arrangements to repair or replace the unit.

Contents

Chapter   **1**

General Information

1.1 Introduction

AIMB-232 is designed with the Intel® Skylake & Kabylake ULT Dual Core processors 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 processors up to 3 MB L3 cache and DDR3L SO-DIMM 1600 up to 16GB. Multiple I/O connectivity includes 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 features:** The AIMB-232 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 1356 14nm Processor ULT Dual Core I7/ i5/ i3/ Celeron processor
- **BIOS:** AMI uEFI 16 Mbit SPI BIOS
- **System chipset:** Intel® Sunrise Point LP
- **SATA hard disk drive interface:**
  – Two on-board SATA connectors with data transmission rate up to 600 MB
- **mSATA Interface:** Supports mSATA slot (Celeron sku does not support it)

1.3.2 Memory

- **RAM:** Up to 32 GB in 2 slots 260-pin SODIMM sockets. Supports dual channel DDR4 2133 MHz SDRAM

1.3.3 Input/Output

- **Serial ports:** Two serial ports, support RS-232 +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:** For Core i sku, supports up to eight USB ports with transmission rates of up to 625 MB, including 2 x USB 2.0 & 6 x USB 3.0. The Celeron sku, supports 4 x USB2.0 & 4 x USB 3.0
- **GPIO connector:** 8-bit general purpose Input/Output

1.3.4 Graphics

- **Controller:** Embedded in processor, Support DirectX 11.2, OpenGL 5.0, OpenCL 2.1, full HW accelerated video decoding for AVC/VC1/MPEG2/HEVC/VP8/JPEG
- **LVDS:** Chrontel CH7511 single channel 24-bit/ dual channel 48-bit LVDS, Max 1920 x 1200 @ 60 Hz
- **HDMI:** Supports HDMI 1.4/2.0 for HD video playback max resolution up to 4096x2160@60Hz on HDMI
- **Display port:** Supports Display port up to resolution 4096 x 2304@60Hz

:

> *Note!*   *Triple independent displays need to use HDMI2.0+DP+LVDS (or 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 I219LM GbE PHY; LAN2: Intel I211AT GbE (co-lay intel I210IT)

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-232 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+JFP2	Front Panel Header
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 0V/12V selector for LVDS1 connector (Default none, 0V)
JCOM1/JCOM2	COM1 5V/12V selector (Default 1-2, RI)
COM1/COM2	RS-232
CPUFAN1/SYSFAN1	FAN control by DC or PWM mode selection (Default 2-3)

Table 1.2: Connectors	
Label	**Function**
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)
HDMI	HDMI connector
DP1	DP++ connector
EDP1	eDP connector (Optional)
COM1, 2	Serial port connector (RS232)
KBMS1	PS/2 Keyboard and Mouse connector
CPUFAN1	CPU FAN 2.54mm 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
SATA1	Serial ATA data connector 1
SATA2	Serial ATA data connector 2
SATA_PWR1	Serial ATA power connector 1
SATA_PWR2	Serial ATA power connector 2
DIMMA1	Memory connector channel
DIMMB1	Memory connector channel
LPC1	Low Pin Count Header
GPIO1	GPIO header

Table 1.2: Connectors	
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
EDP1	eDP connector
HDMI1	HDMI connector
DP1	Display Port connector
MINI_PCIE1	Full-sized Mini PCI Express x 1 slot / mSATA X 1 Slot
MINI_PCIE2	Full-sized Mini PCI Express x 1 / SIM card holder x1

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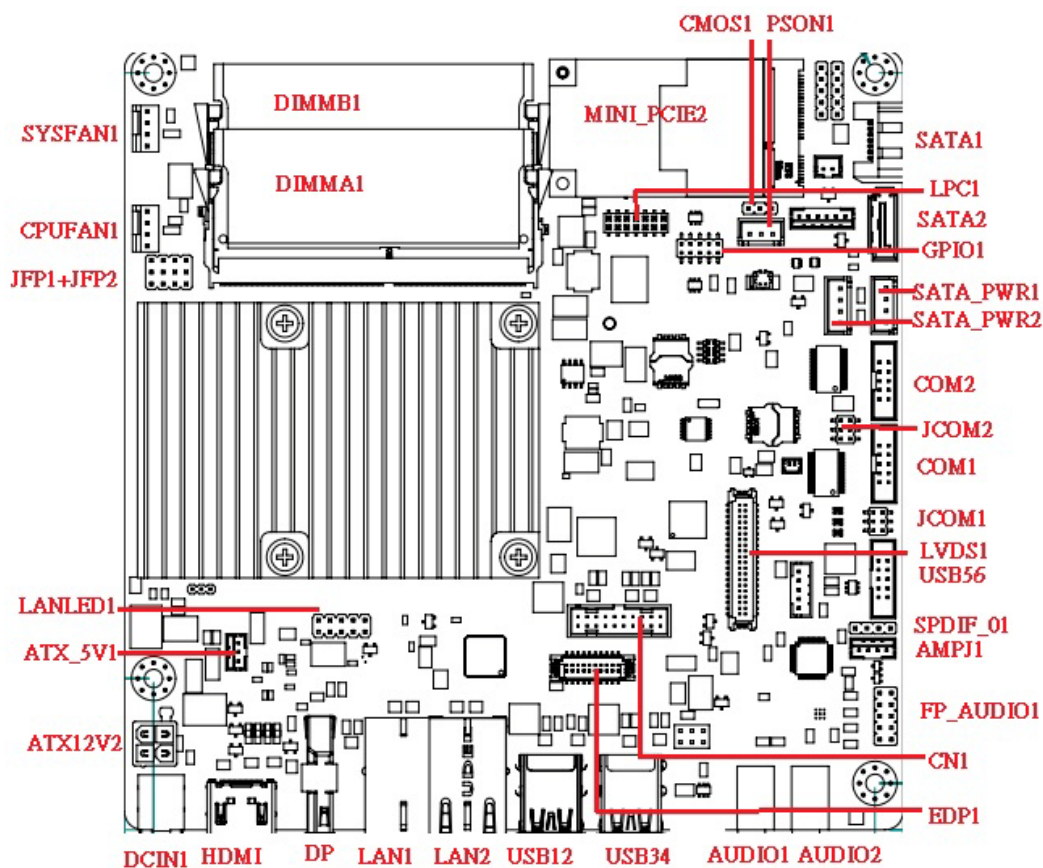
Figure 1.1 Jumper and Connector Location

1.6 AIMB-232 Board Diagram
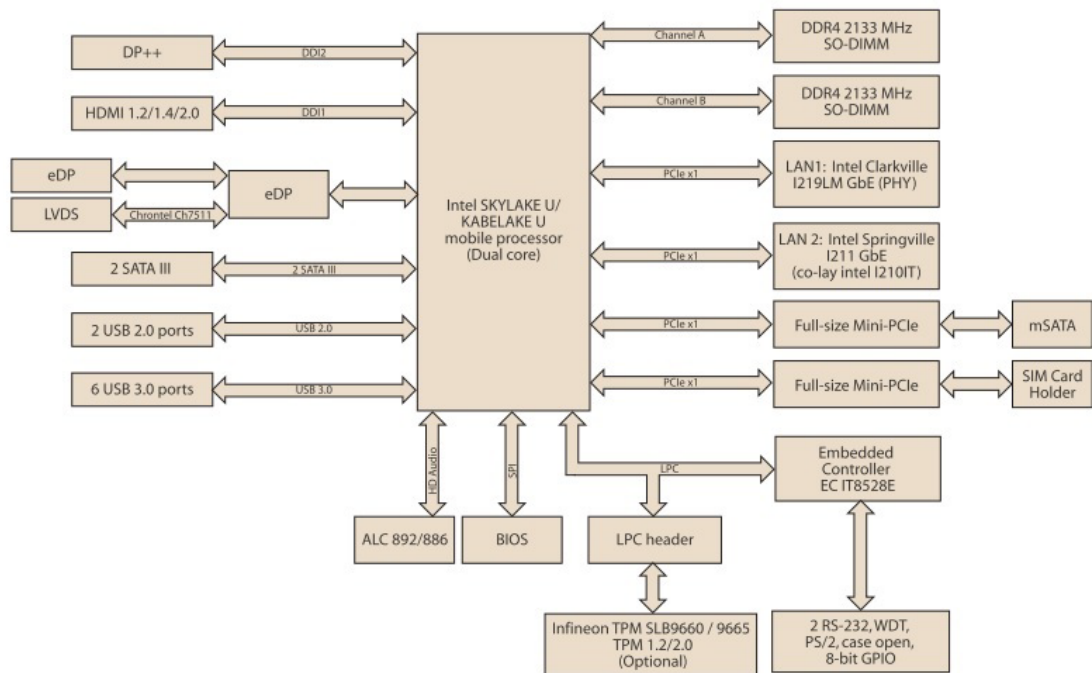
Figure 1.2 AIMB-232 Board Diagram

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-232 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 / JLVDS2: LCD Power 3.3 V/5 V/ 12 V Selector

Table 1.4: JLVDS1/JLVDS2: LCD Power 3.3 V/5 V/ 12 V Selector	
Closed Pins	**Result**
JLVDS1	
3-4	Jumper for 12 V LVDS panel
4-6	Jumper for 3.3 V LVDS panel*
2-4	Jumper for 5 V LVDS panel

*Default
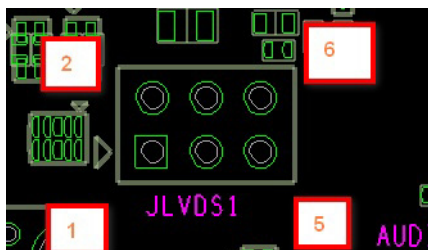
1.8.4 PSON1: ATX, AT Mode Selector

Table 1.5: PSON1: ATX, AT Mode Selector	
Closed Pins	**Result**
1-2	AT Mode
2-3*	ATX Mode

*Default

1

AT Mode
1-2 closed

1
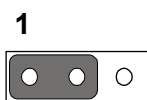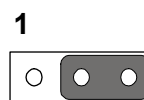
ATX Mode
2-3 closed

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

Table 1.6: 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)
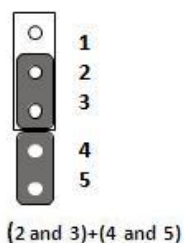
1.9 System Memory

The AIMB-232 has two sockets for a 260-pin DDR4 SODIMM. DRAM is available in capacities of 1 GB, 2 GB, 4 GB, 8 GB and 16 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, 8GB and 16GB. AIMB-232 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-232 supports a CPU with one of the following built-in full speed L3 caches:

4 MB for Intel Core i7-6600u, i7-7600u

3 MB for Intel Core i5-6300u,i5-7300u,i3-6100u,i3-7100u

2 MB for Intel Celeron 3955u, Celeron 3965u

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, CN1)

The AIMB-232 provides up to six USB ports. Six USB3.0 on the real side, two USB3.0 and two USB2.0 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-232 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.

LAN1 LAN2 USB12 USB34
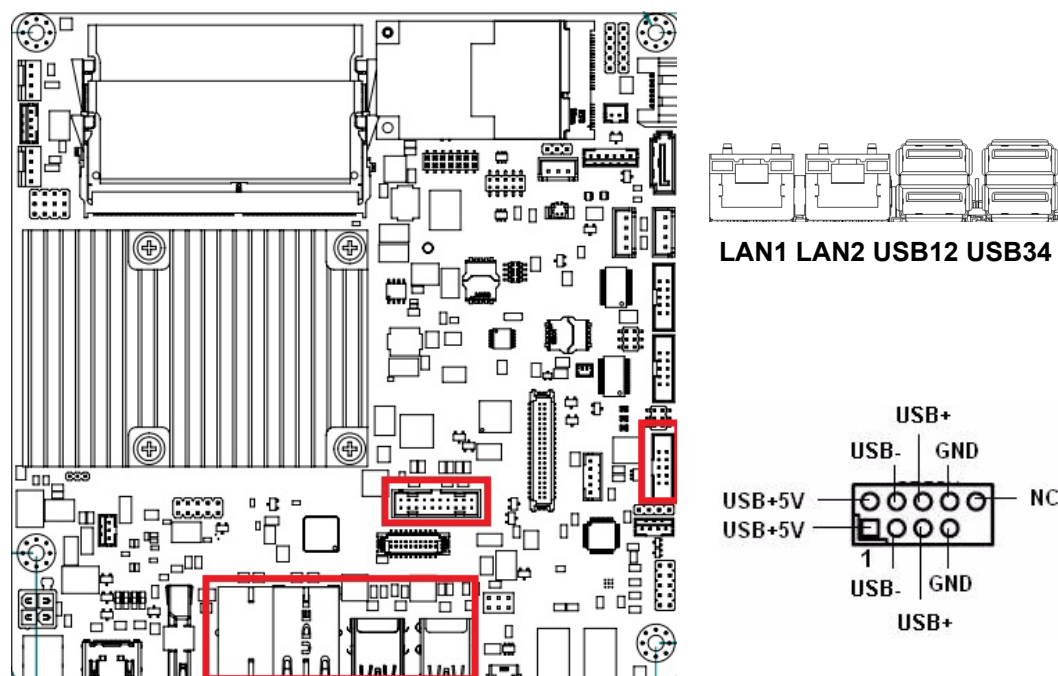
Table 2.1: LAN LED Indicator		
LAN Mode	**LAN Indicator**	
LAN1 indicator	LED1 (Right)	off for mal-link; Link (On) / Active (Flash)
	LED2 (Left)	100 Mbps (On) / 10 Mbps (Off)
	LED2 (Left)	1000 Mbps (On)
LAN2 indicator	LED1 (Right)	off for mal-link; Link (On) / Active (Flash)
	LED2 (Left)	100 Mbps (On) / 10 Mbps (Off)
	LED2 (Left)	1000 Mbps (On)

Front Panel LAN LED(LANLED1)

2.3 HDMI and DP++ Connector (HDMI1/DP1)
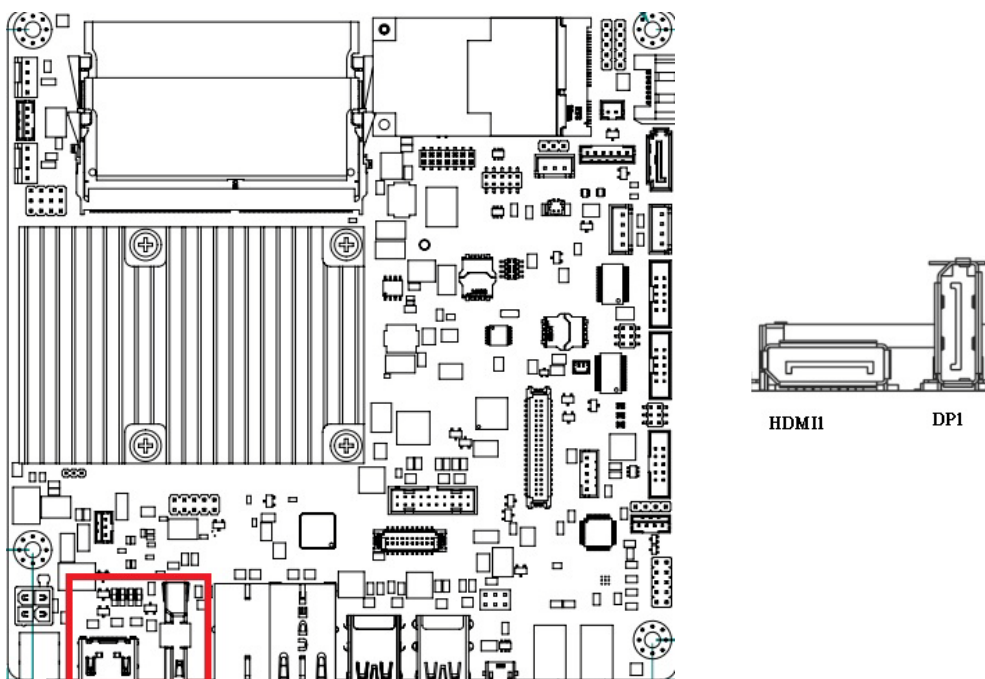
The AIMB-232 includes HDMI and DP++ interface that can drive conventional HDMI and DP++ displays. DP-HDMI1 is include DP and HDMI connector.

2.4 Serial Ports (COM1~COM2)

COM1/COM2
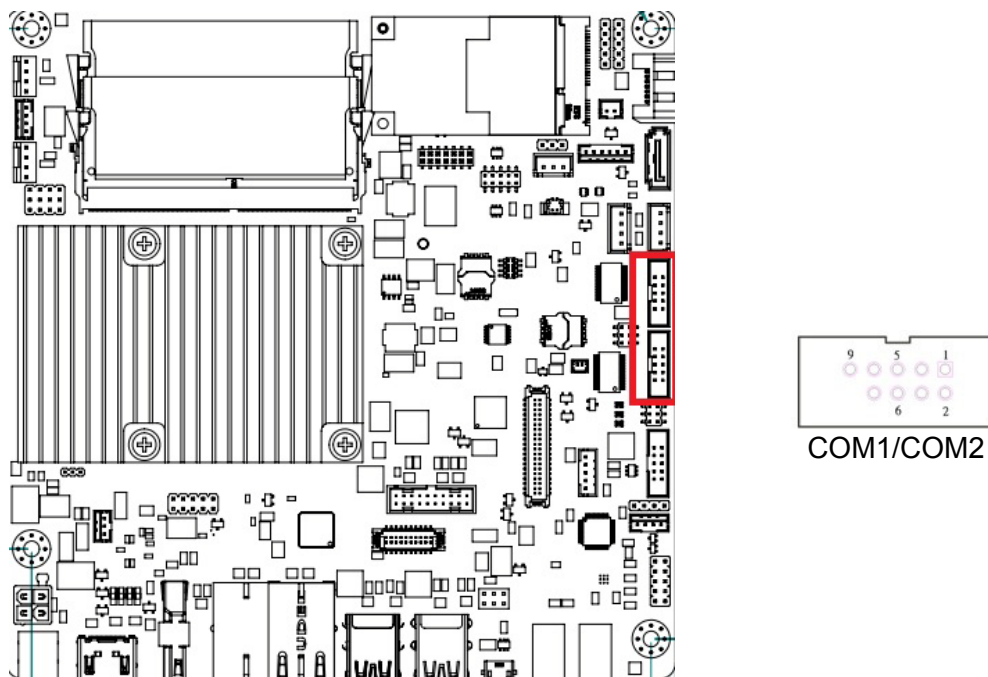
AIMB-232 supports two serial ports, and supports RS-232 with 5V/12V via jumper selecting.

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/JCOM2
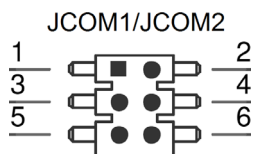
Pin	Signal Name	Pin	Signal Name
1	Ring Indicator(OUT)	2	Ring Indicator(CNT)
3	Ring Indicator(CNT)	4	+V5
5	+V12	6	Ring Indicator(CNT)

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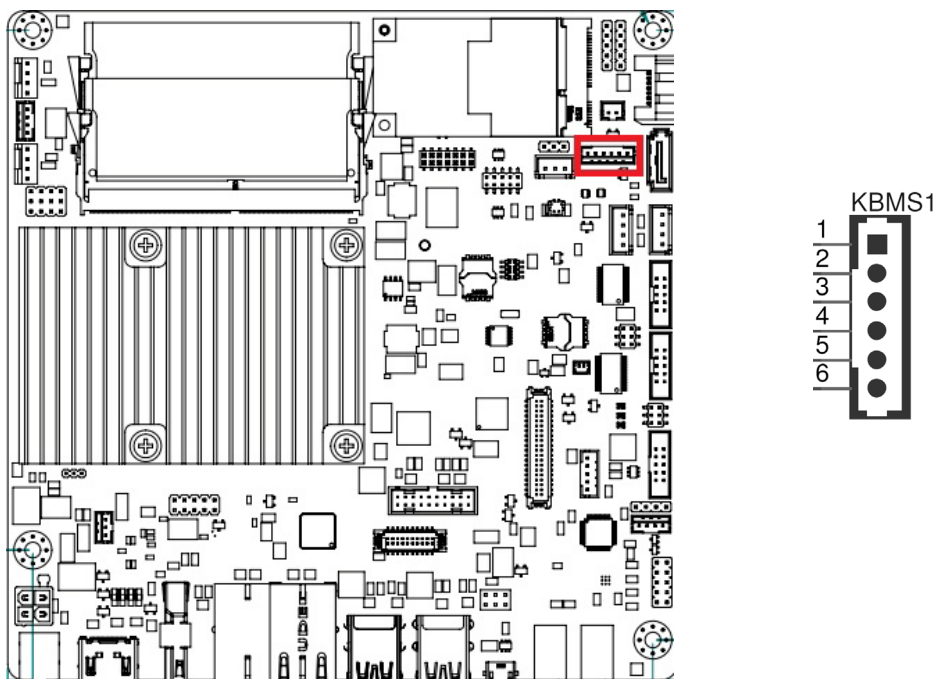
6-pin wafer box connectors (KBMS1) on the motherboard provide connection to a PS/2 keyboard and a PS/2 mouse, respectively.

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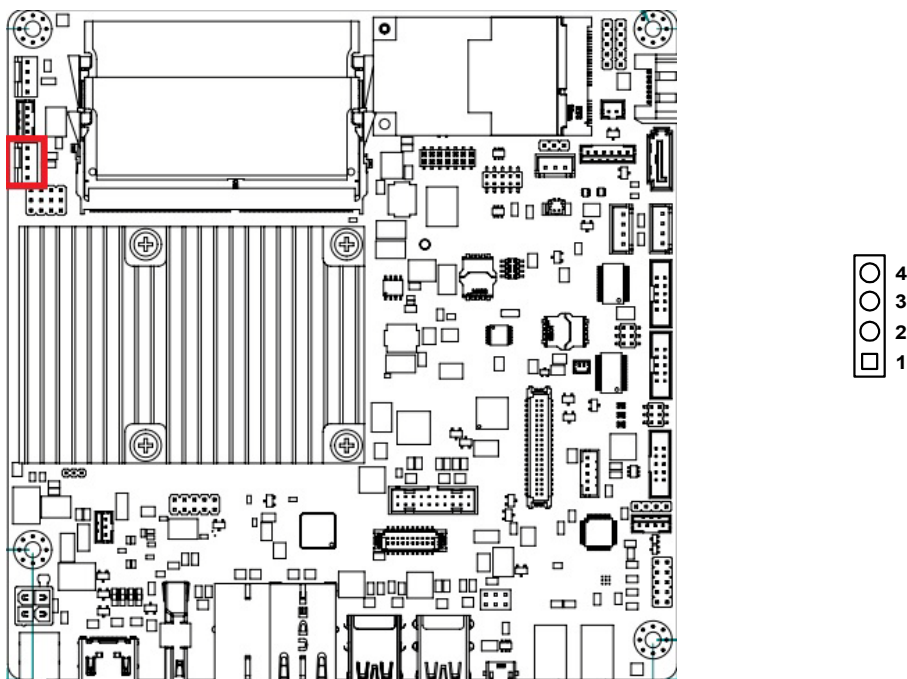
If a fan is used, this connector supports cooling fans of 500 mA (6 W) or less.

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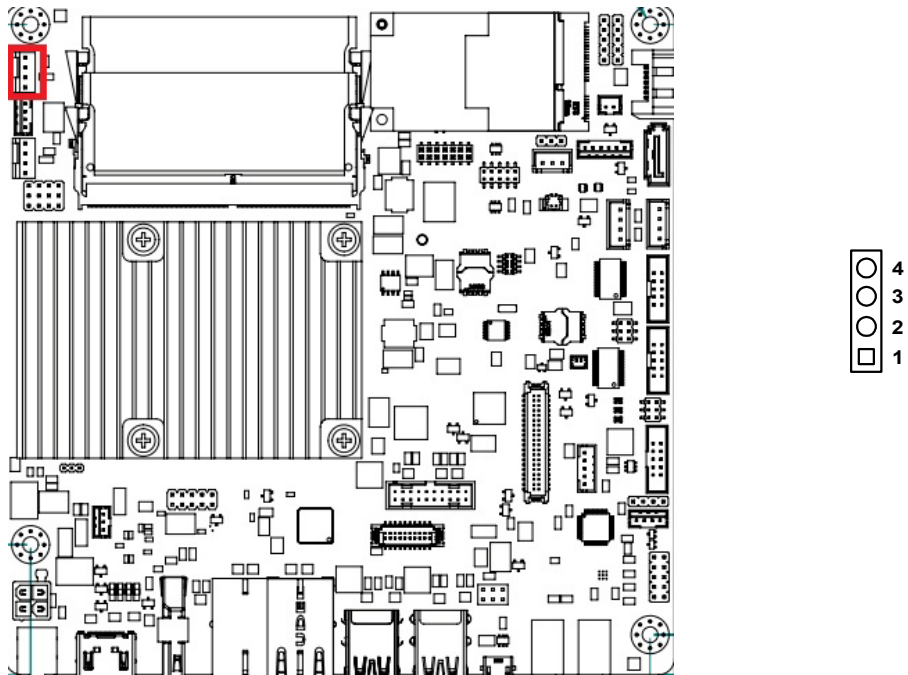
If a fan is used, this connector supports cooling fans of 500 mA (6 W) or less.

2.8 Front Panel Connectors (JFP1/JFP2)

There are several headers for monitoring and controlling the AIMB-232.
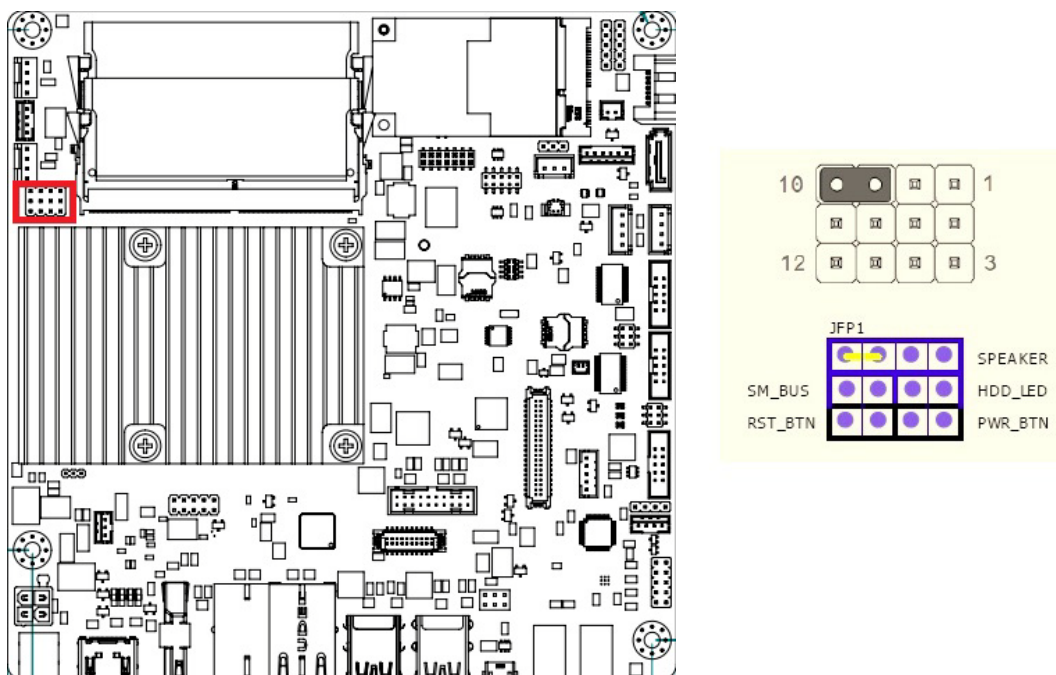
2.8.1 ATX soft power switch ((JFP1/PWR_BTN))

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-232 provides an onboard buzzer as an alternative. To enable the buzzer, set pins 7 & 10 as closed.

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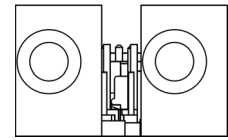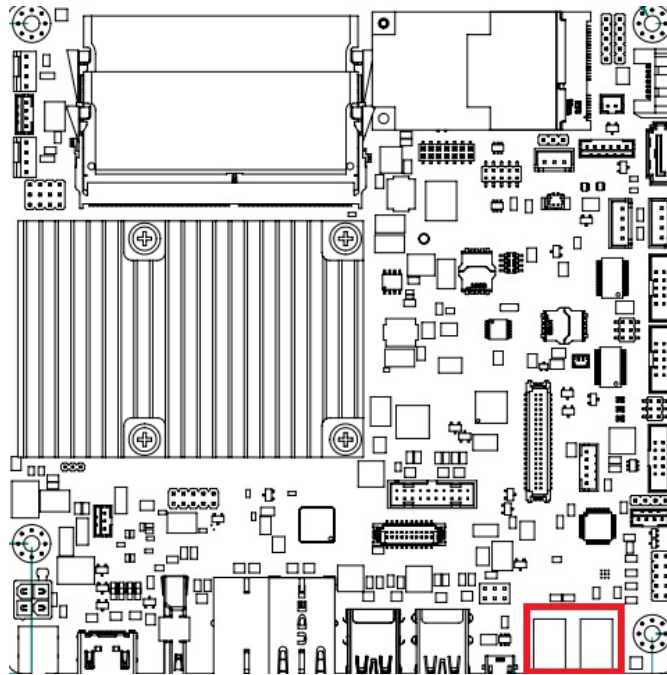
Line Out   Mic In

2.10 Digital Audio Connector (SPDIF_O1)

1   5V
     NA
     SPDIF-OUT
     GND
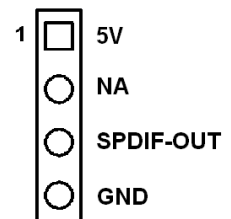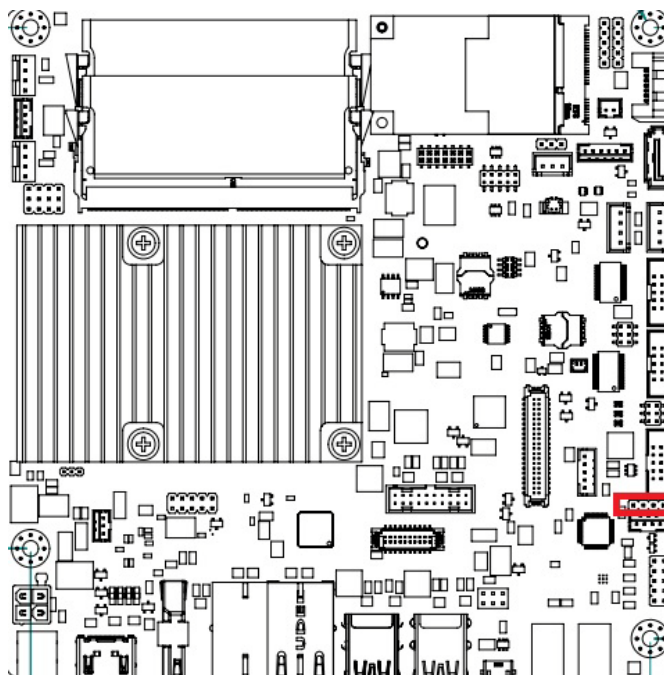
2.11 Serial ATA Interface (SATA1~SATA2/ SATA_PWR1 ~ SATA_PWR2)
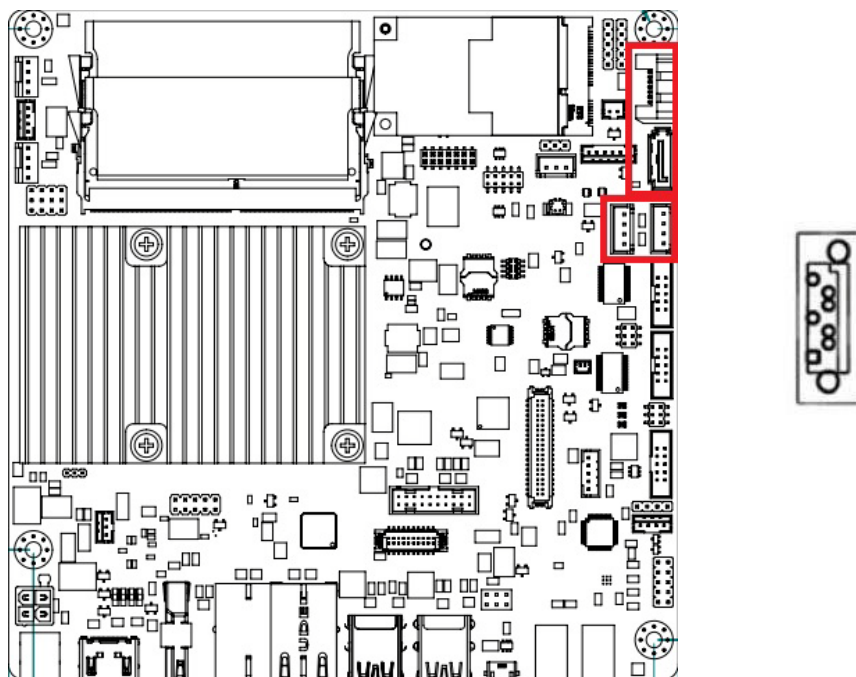
AIMB-232 features a high performance Serial ATA interface (up to 300 MB/s) and Serial ATA III interface (up to 600 MB/s) which eases hard drive cabling with thin, space-saving cables.

2.12 SATA power connector(SATA_PWR1~2)

Pin	Signal
1	5V
2	GND
3	GND
4	12V
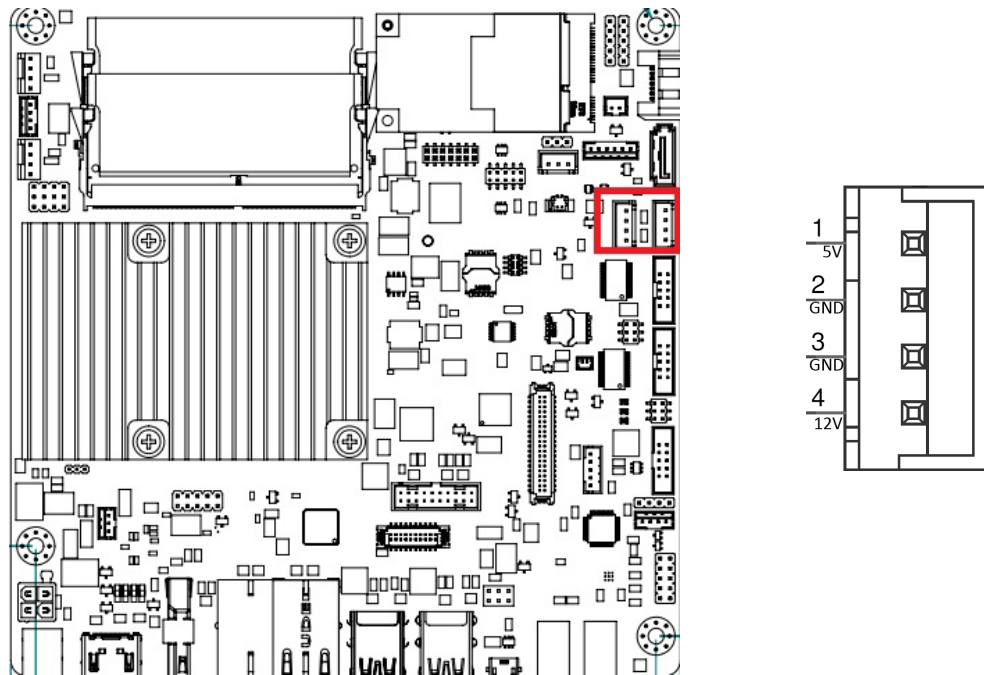
2.13 Full Size Mini PCI Express Slot
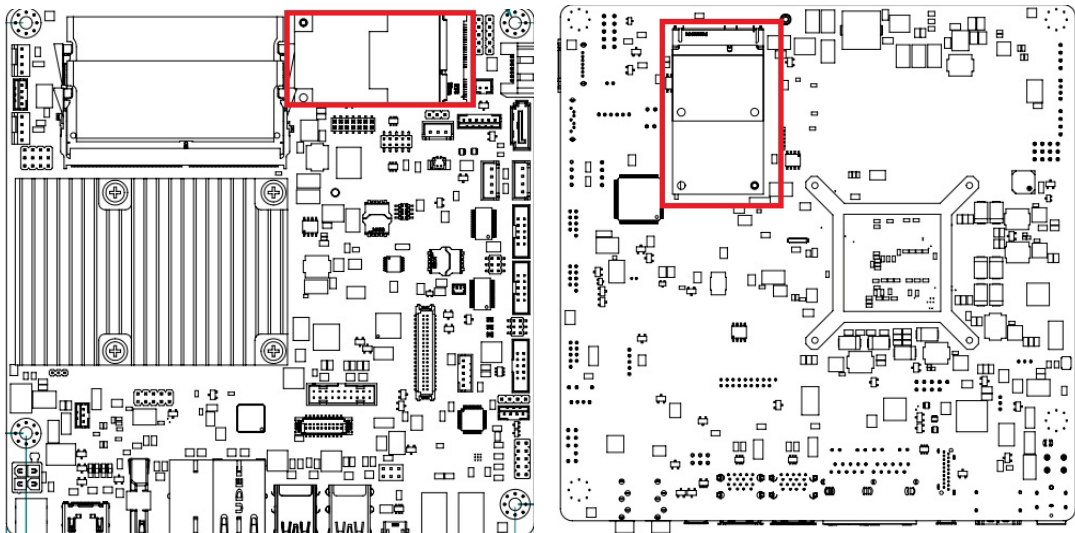
The AIMB-232 provides 2 full size Mini PCI express slot (Co-lay mSATA) (Back side)/ SIM card hold (Top side).

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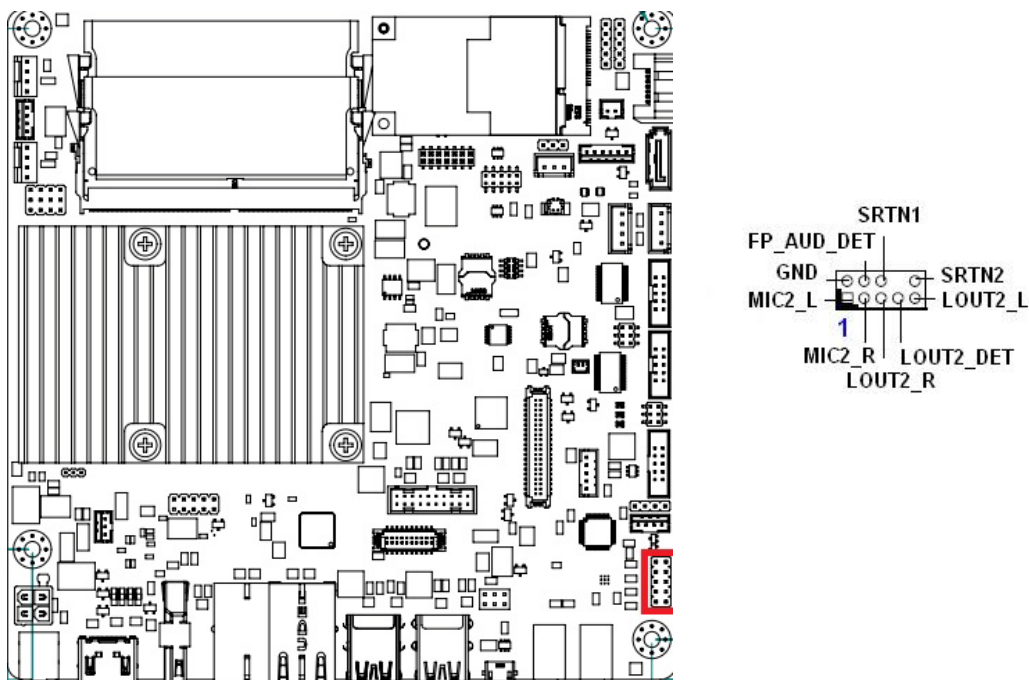
> **Note!** For motherboards with the optional HD Audio feature, we recommend that you connect a high-definition front panel audio module to this connector to take advantage of the motherboard's high definition audio capability.

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.

DCIN1

1	+12V
2	GND

CPU_+12V   CPU_+12V

4   3
2   1

AGND   AGND

5VSB INPUT CON

ATX_5V1

1	5V SB IN
2	GND
3	PS_ON#
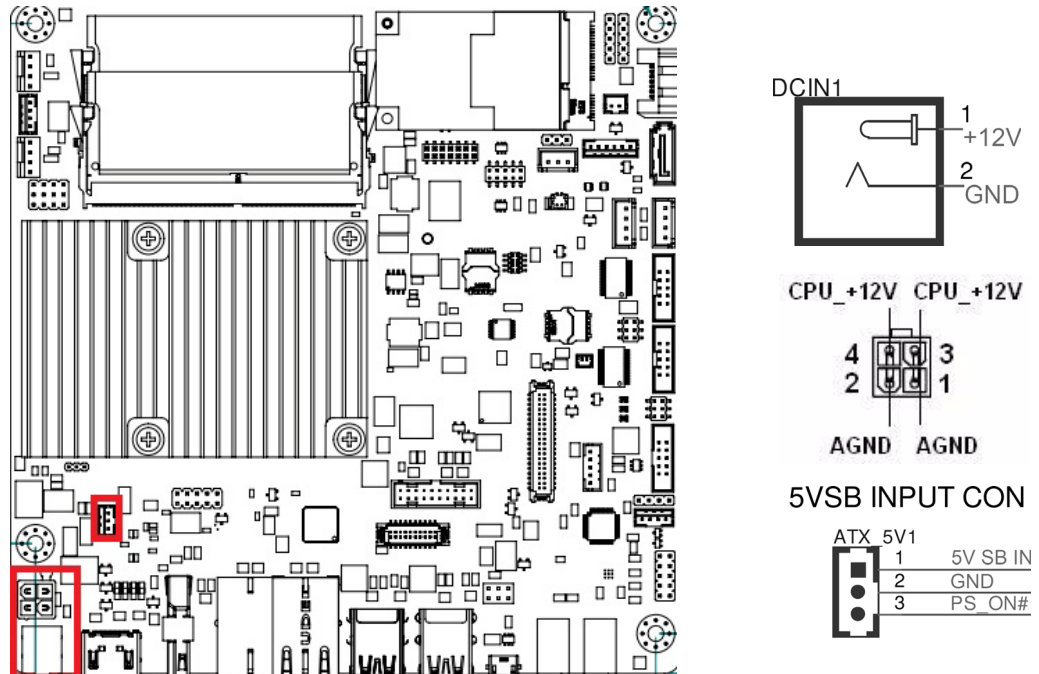
Note!

1. 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 is for operation system shutdown command, if you use ATX12V1 input, you can power shutdown the system.

PSON1 is for AT/ATX mode selection(PSON1)

3   2   1
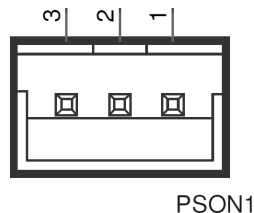
PSON1

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-232 cannot power on.

F_SPI_MISO

F_SPI_CS#

+3V ROM

NC

F_SPK_MOSI GND

F_SPI_CLK
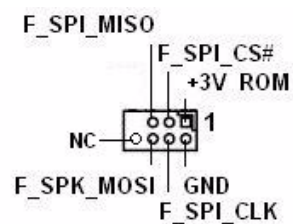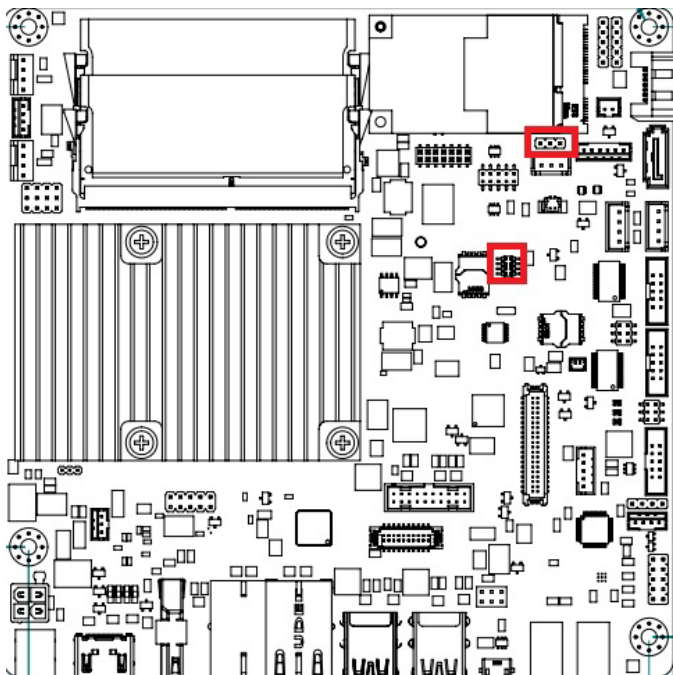
Clean CMOS(CMOS1)

Clean CMOS and reset RTC

CMOS1

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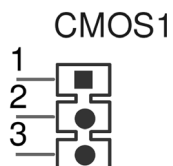
CMOS1: 1-2 Keep CMOS data*
         3-4 Clean CMOS

2.17 LCD Inverter Connector (INV1)
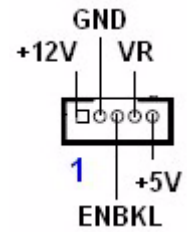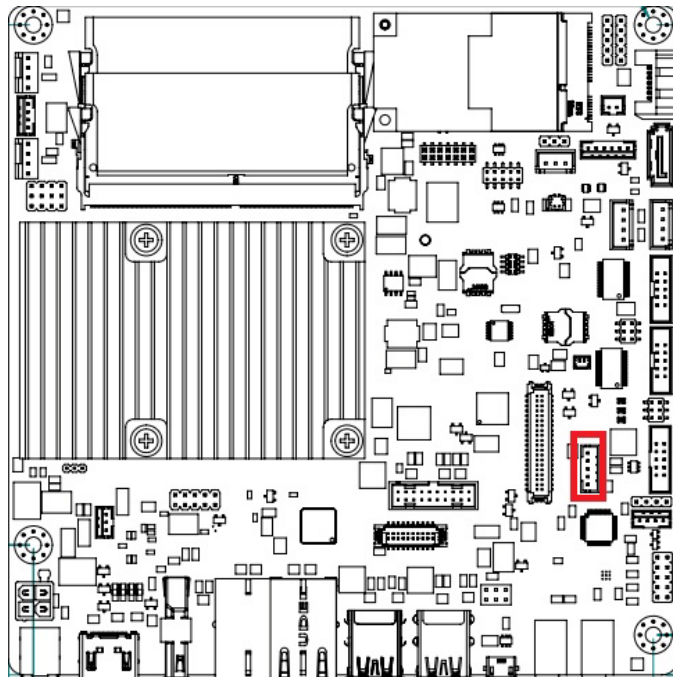
Note! ■ **Signal Description**

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

2.18 LVDS Connector (LVDS1)
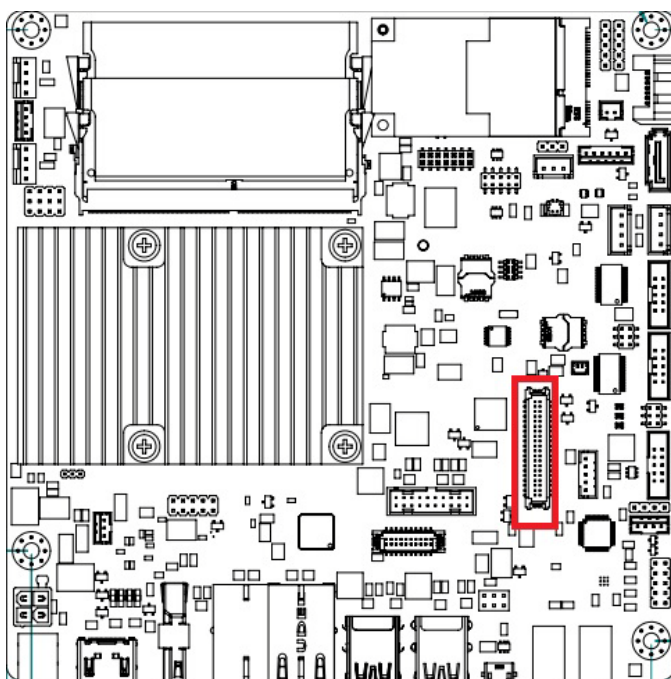
2.19 General Purpose I/O Connector (GPIO1)
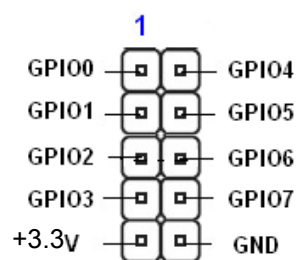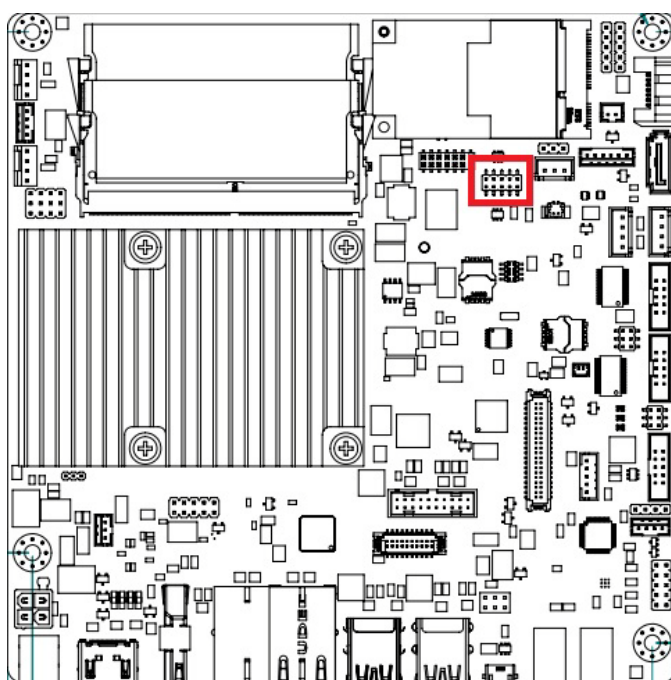
Chapter **3**

BIOS Operation

3.1 Introduction

With the AMI BIOS Setup program, you can modify the 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-232 setup screens.

3.2 BIOS Setup

The AIMB-232 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) 2017 American Megatrends, Inc.
      Main  Advanced  Chipset  Security  Boot  Save & Exit

      BIOS Information                                          Set the Date. Use Tab to
      BIOS Vendor                    American Megatrends        switch between Date elements.
      Core Version                   5.0.1.1   0.31 x64
      Compliancy                     UEFI 2.4; PI 1.3
      Project Version                A2320000F60X018
      Build Date and Time            02/21/2017 16:01:18
      Access Level                   Administrator
      Project Board Version          AIMB-232G2
      Power Type                     ATX


      Memory Information
      Total Memory                   4096 MB
      Memory Frequency               2133 MHz
                                                               ++: Select Screen
                                                               ↑↓: Select Item
                                                               Enter: Select
                                                               +/-: Change Opt.
      System Date                    [Sun 10/18/2116]          F1: General Help
      System Time                    [02:44:28]                F2: Previous Values
                                                               F3: Optimized Defaults
                                                               F4: Save & Exit
                                                               ESC: Exit



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```

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 high-lighted 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 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-232 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.
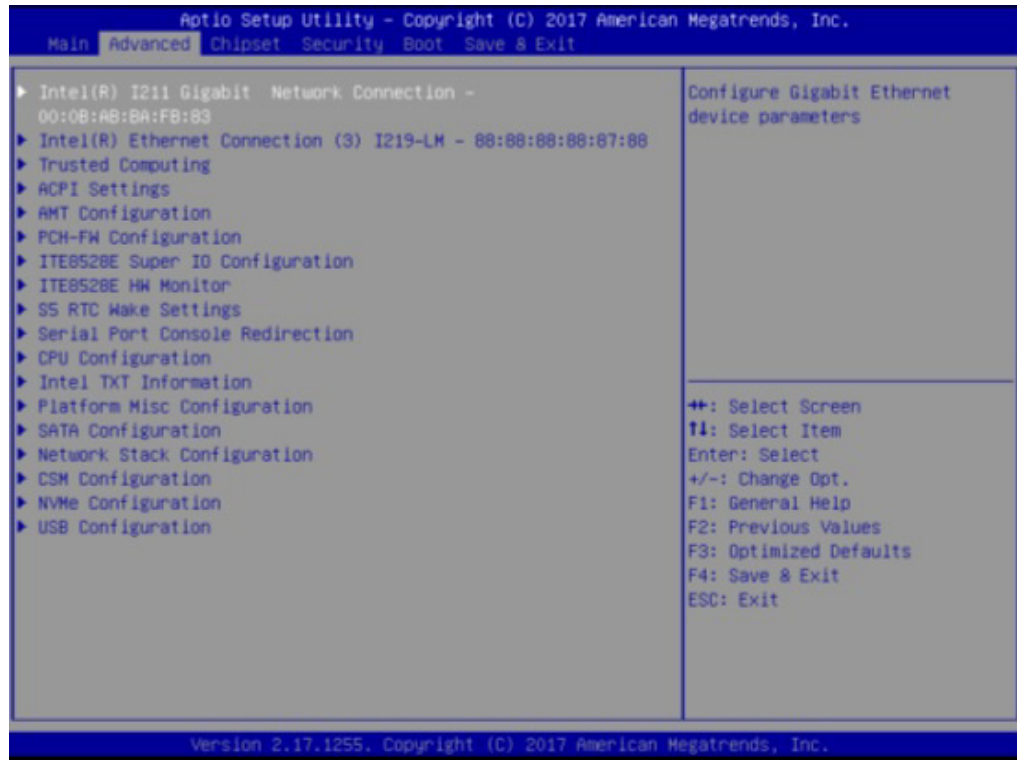
3.2.2.1 CPU Configuration
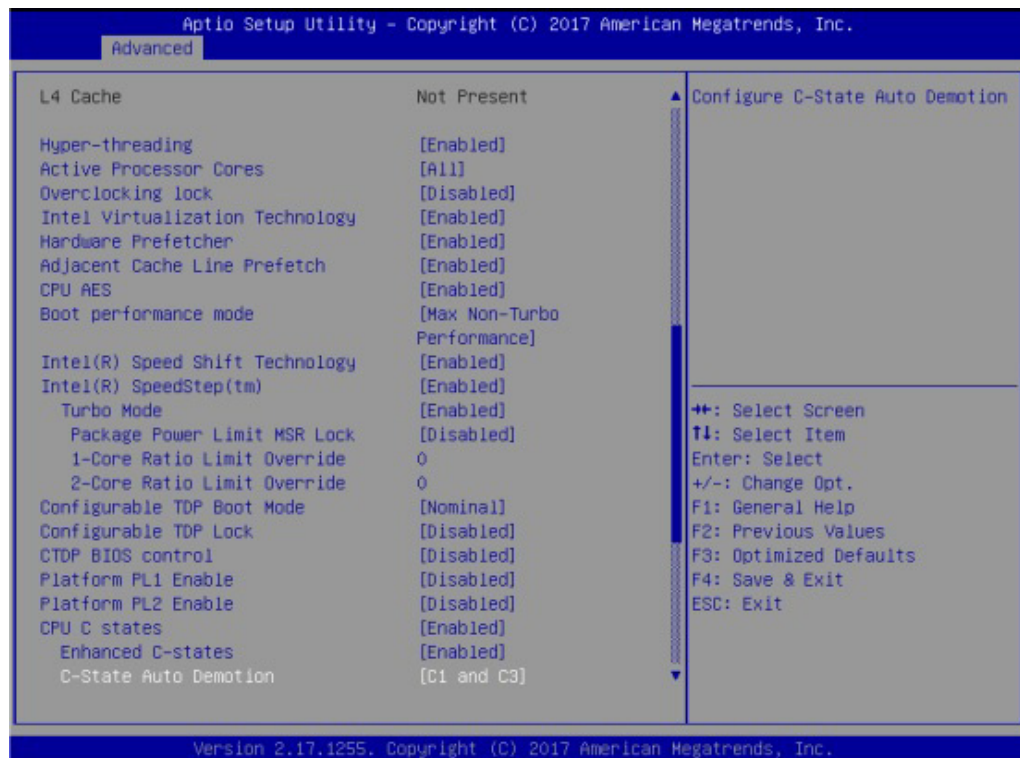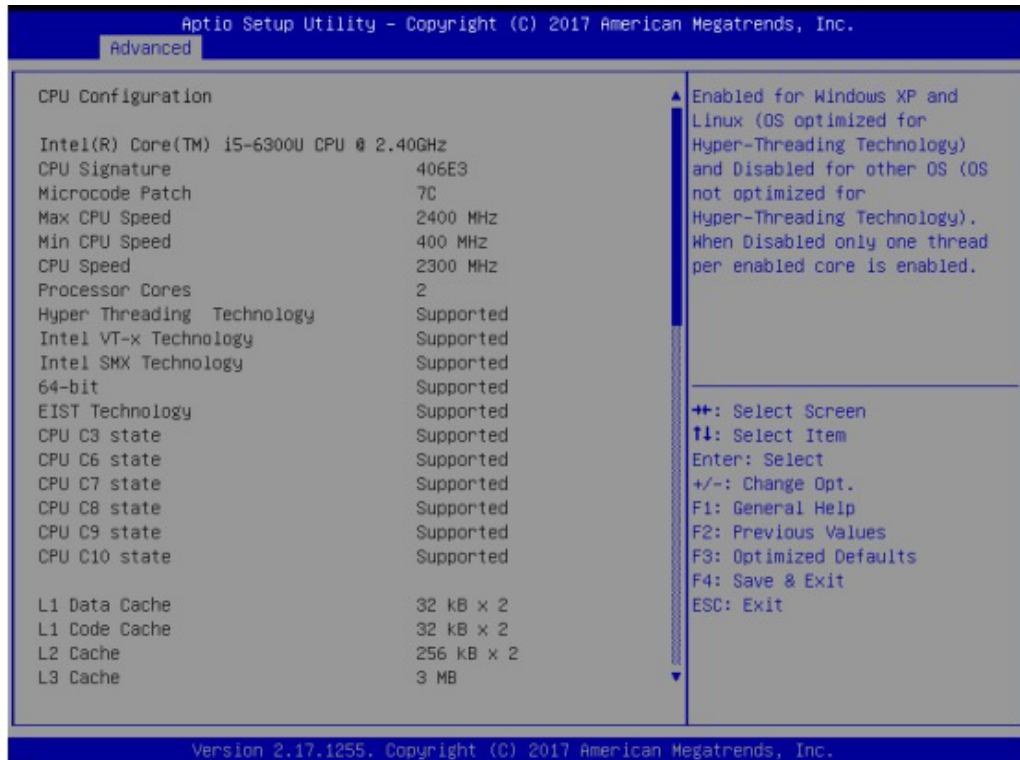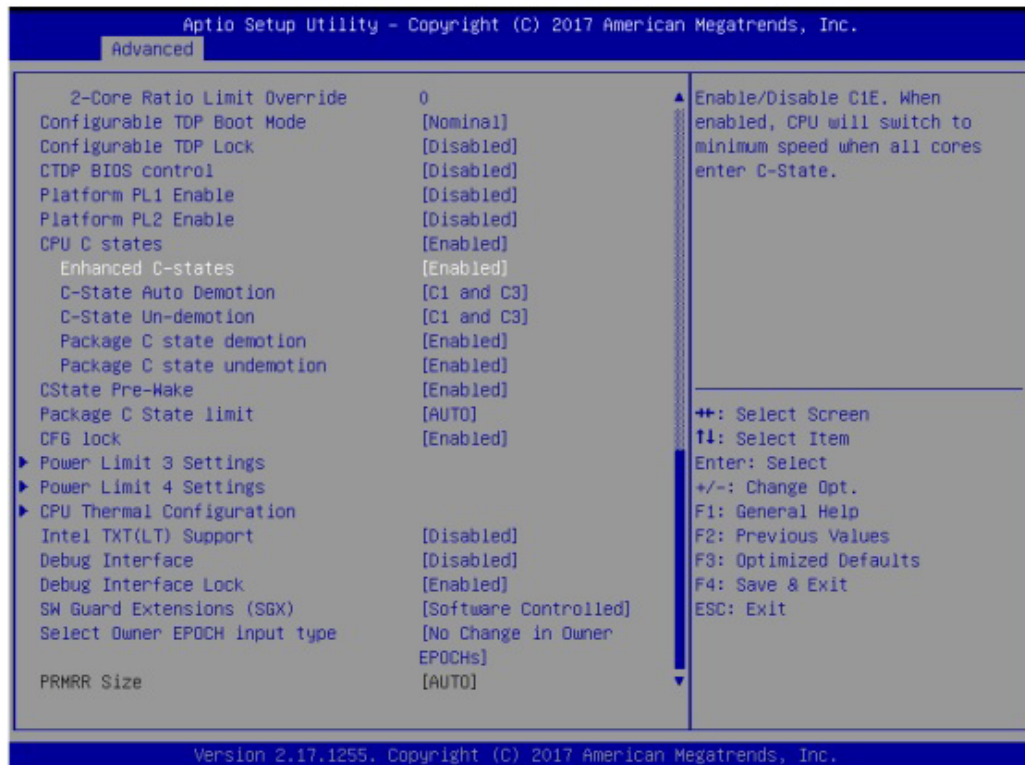
3.2.2.2 ACPI settings
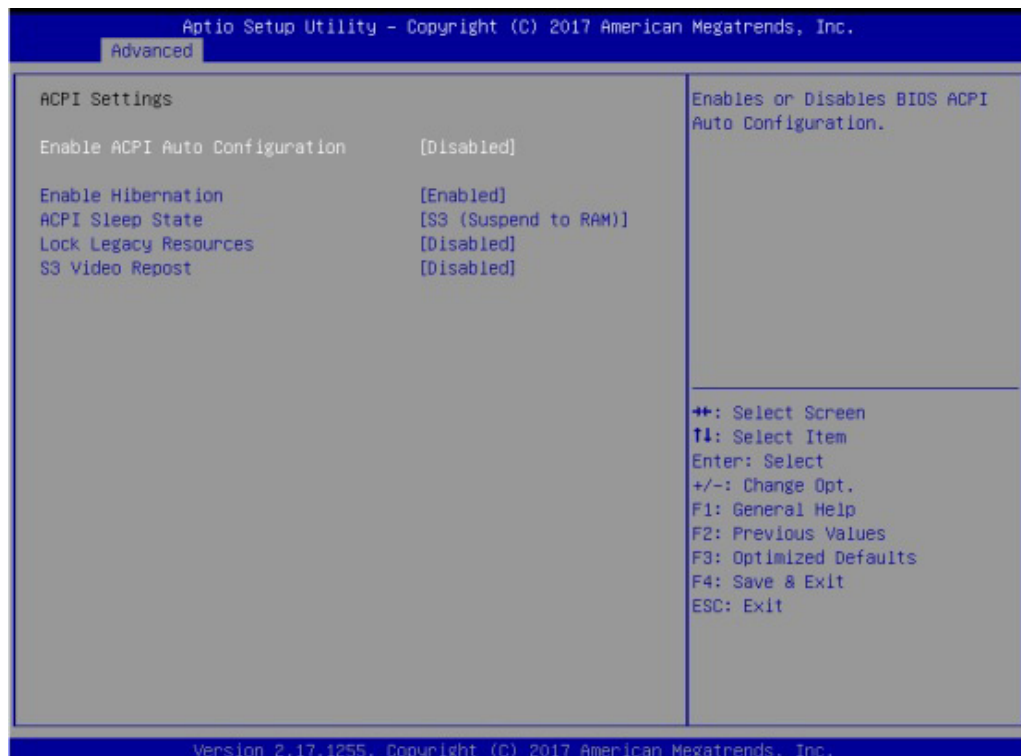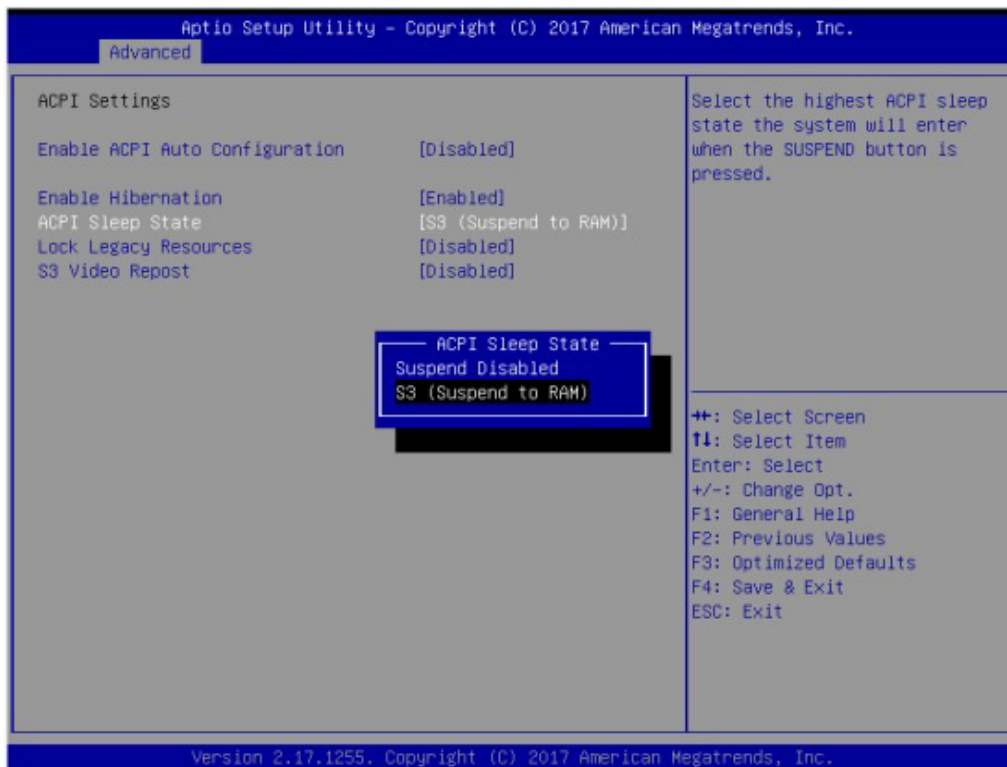
■ **Enable ACPI Auto Configuration**
Enable or disable BIOS ACPI Auto Configuration

■ **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 Trusted Computing

```
             Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
  Advanced

                                                       Enables or Disables BIOS
                                                       support for security device.
  TPM20 Device Found                                   O.S. will not show Security
                                                       Device. TCG EFI protocol and
  Security Device Support           [Enable]           INT1A interface will not be
  Active PCR banks                  SHA-1              available.
  Available PCR banks               SHA-1,SHA256

  SHA-1 PCR Bank                    [Enabled]
  SHA256 PCR Bank                   [Disabled]

  Pending operation                 [None]
  Platform Hierarchy                [Enabled]
  Storage Hierarchy                 [Enabled]
  Endorsement Hierarchy             [Enabled]           ++: Select Screen
  TPM2.0 UEFI Spec Version          [1.0]               ↑↓: Select Item
  TPM 20 InterfaceType              [TIS]               Enter: Select
                                                        +/-: Change Opt.
                                                        F1: General Help
                                                        F2: Previous Values
                                                        F3: Optimized Defaults
                                                        F4: Save & Exit
                                                        ESC: Exit

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```

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

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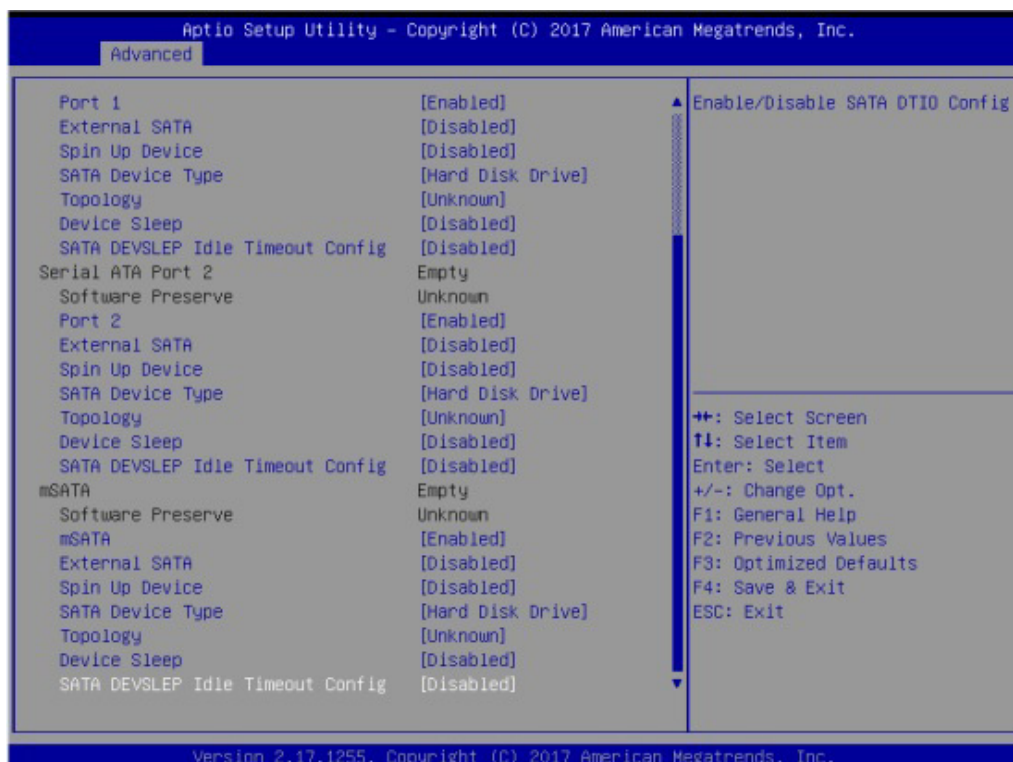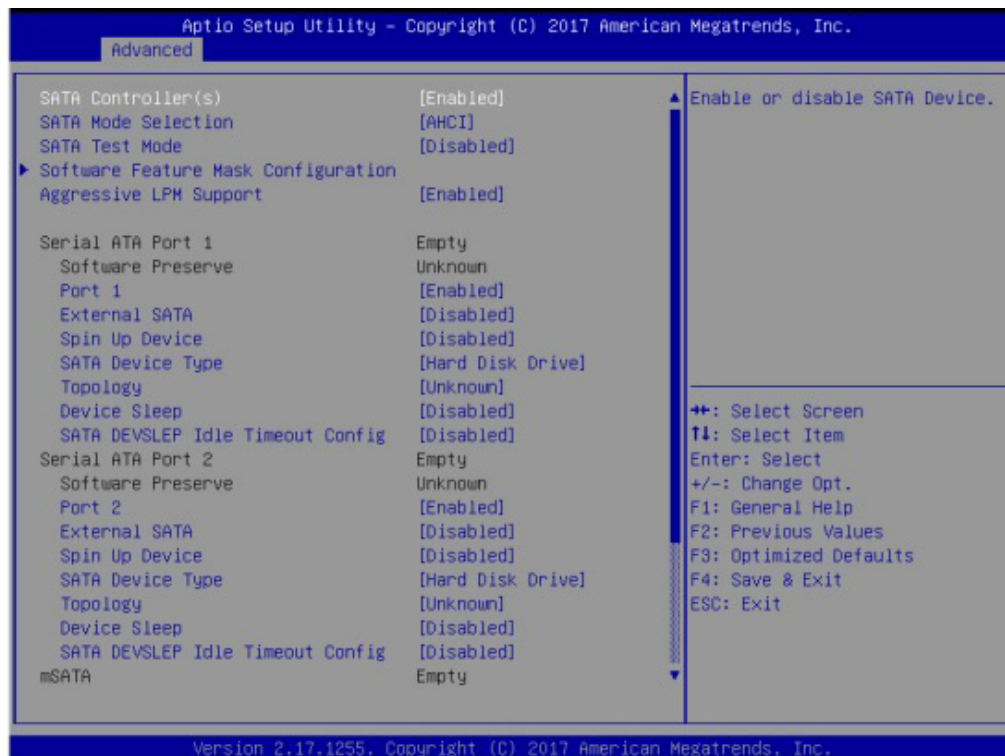
■ **SATA Controller(s)**
This item allows users to enable or disable the SATA controller(s).
■ **SATA Mode Selection**
This item allows users to select mode of SATA controller(s).

■ **Aggressive LPM Support**

This item allows users to enable or disable the Aggressive LPM Support.

■ **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.

■ **Serial ATA Port 1/2/mSATA**

This item allows users to enable or disable the SATA Port.

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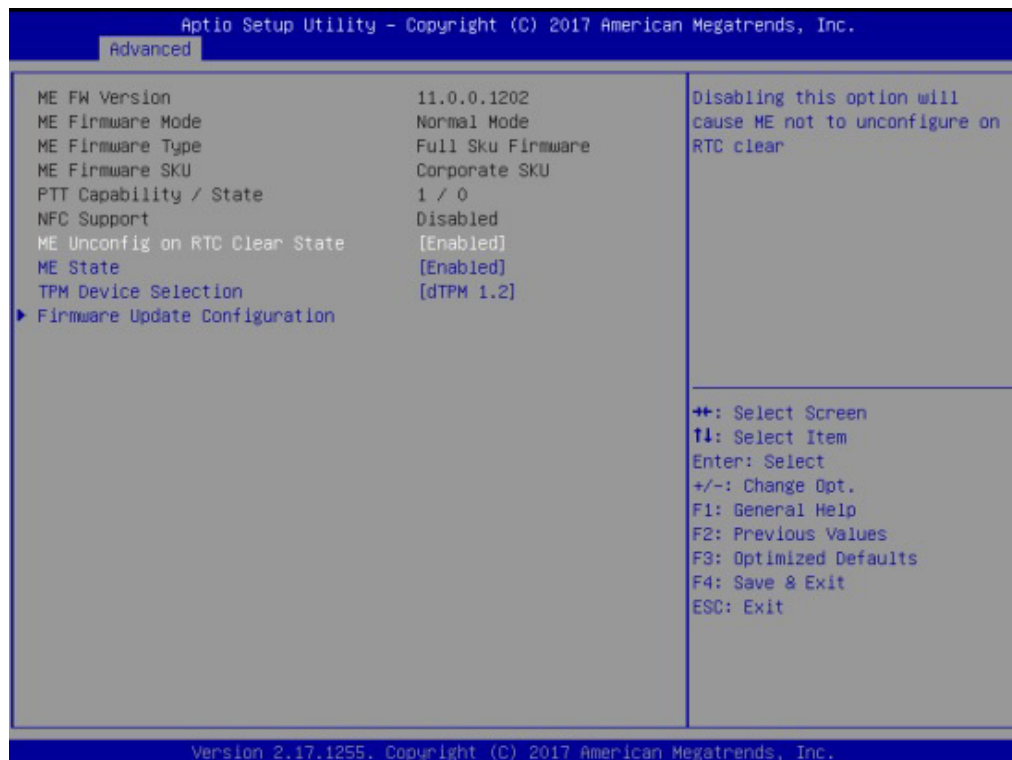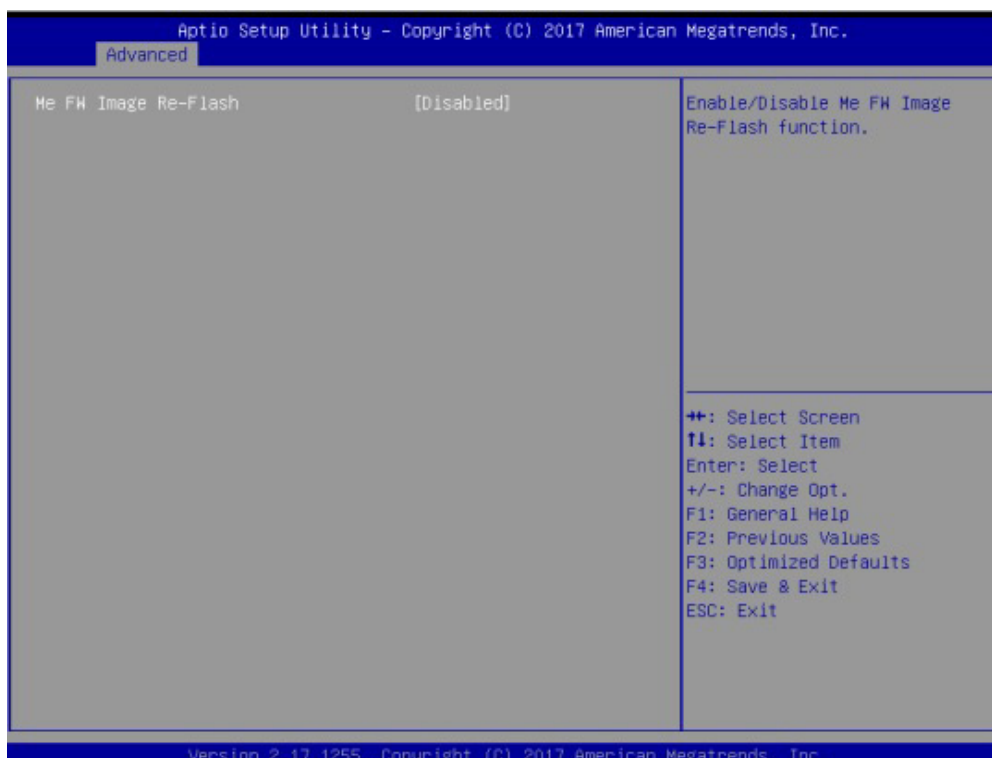
■ **Me FW Image Re-Flash**
This item allows users to enable or disable Me FW image re-flash function.

3.2.2.6 USB Configuration
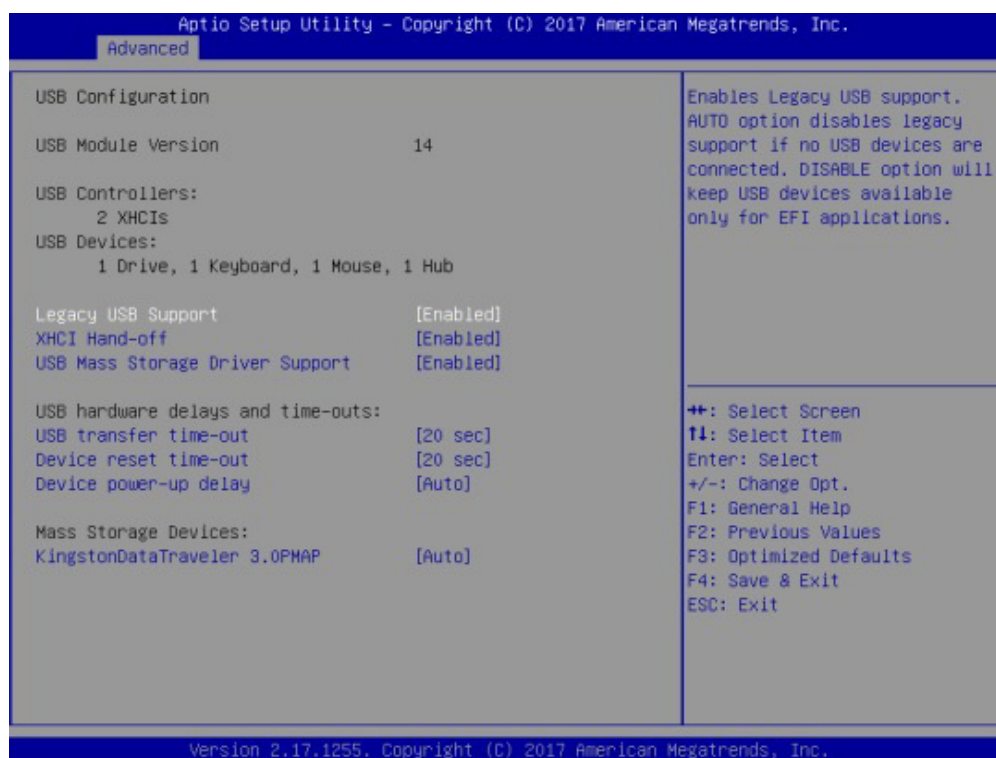
- **Legacy USB support**

  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.
- **USB transfer time-out**

  This item allows users to set the USB transfer time-out
- **Device reset time-out**

  This item allows users to set the Device reset time-out
- **Device power-up delay**

  This item allows users to set the Device power-up delay

3.2.2.7 Serial port 1/2 Configuration
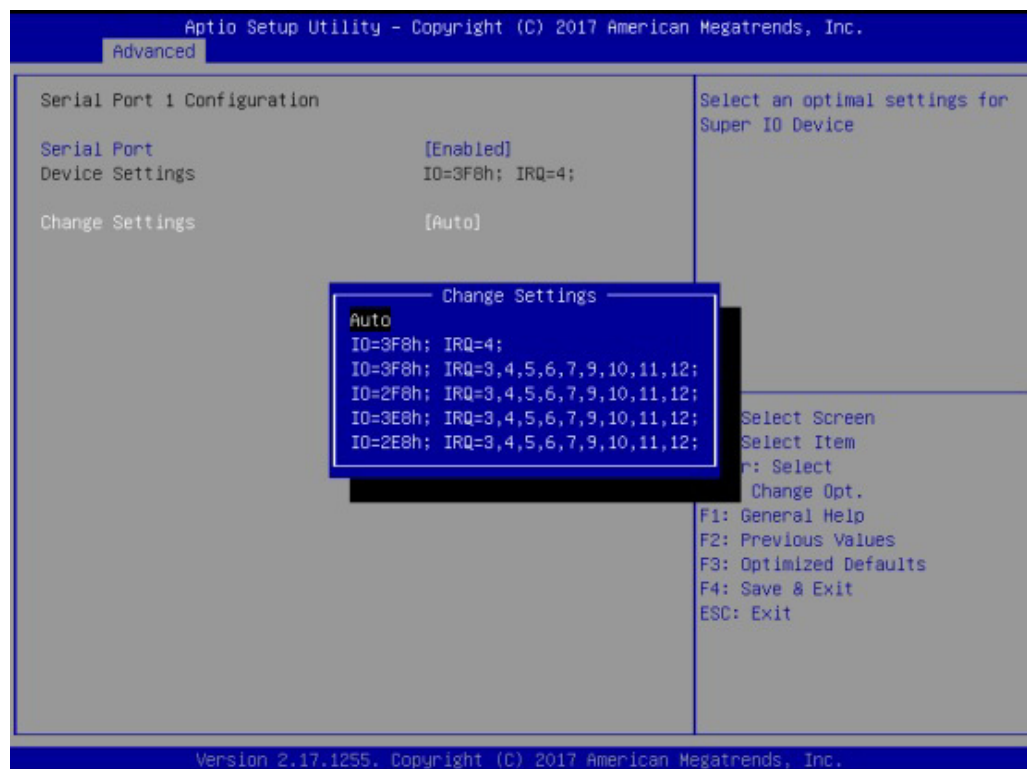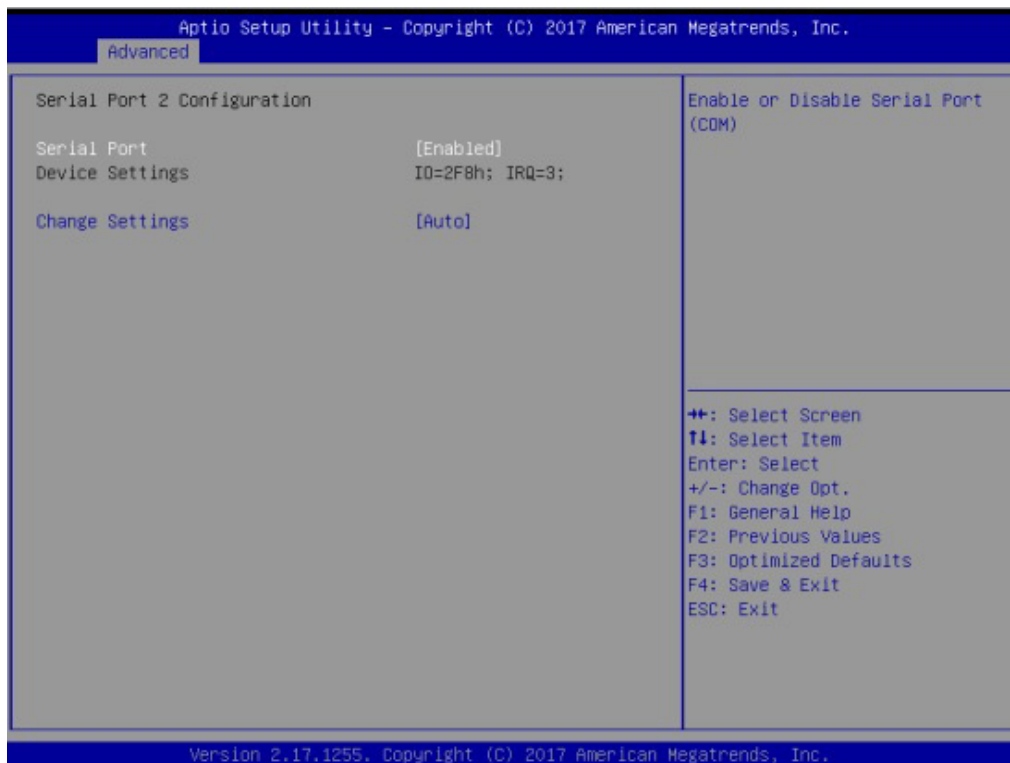
- **Serial Port**
  This item will allow users to enable or disable serial port.
- **Change Settings**
  This item allows users to change the serial port setting.
- **Device Mode**
  This item allows users to change the device mode.

3.2.2.8 PC Health Status
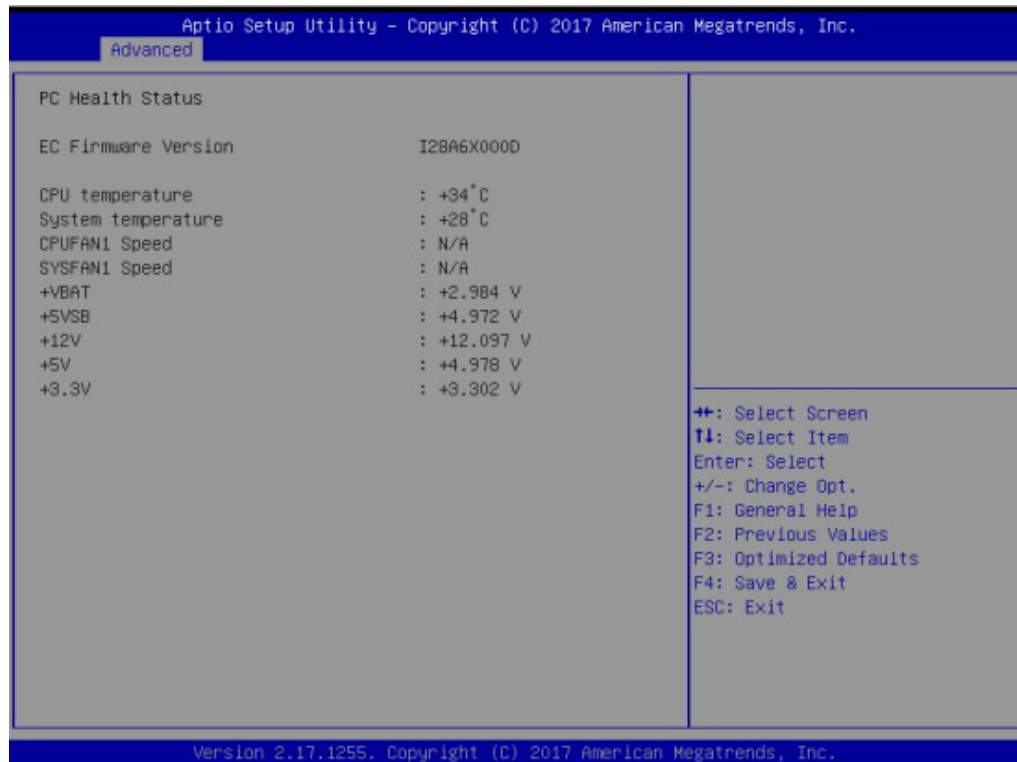
3.2.2.9 Serial Port Console Redirection
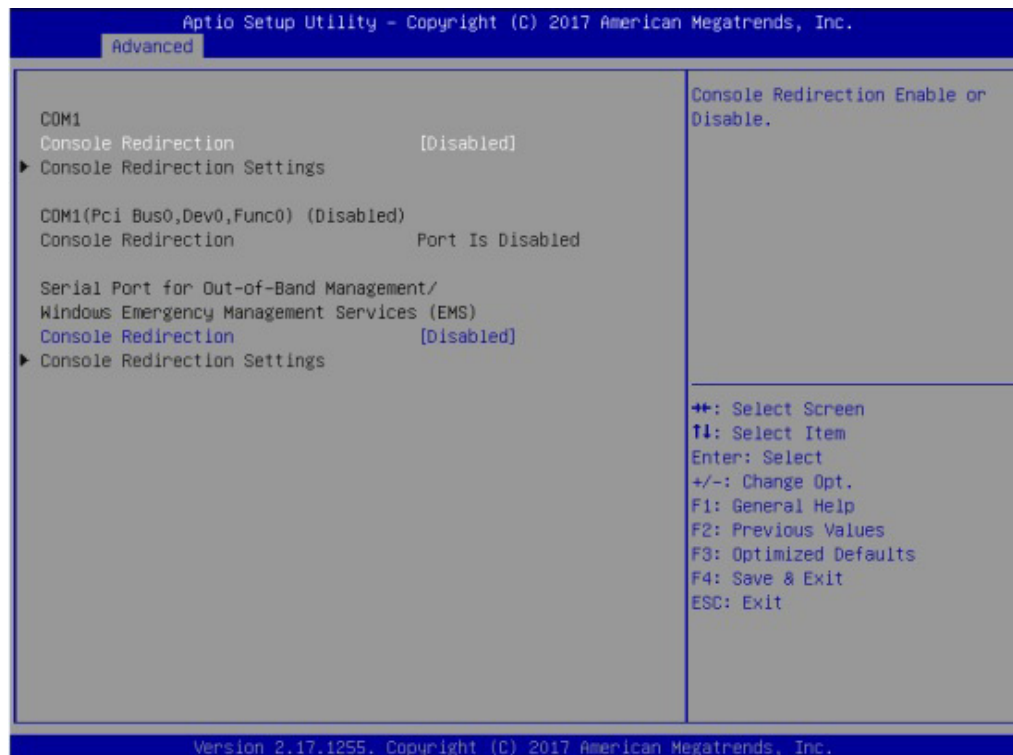
■ **Console Redirection**

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

3.2.3 Chipset

```
             Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
               Chipset

 Intel PCH RC Version           1.9.0.0                   Specify what state to go to
 Intel PCH SKU Name             PCH-LP Mobile (U)         when power is re-applied after
                                Premium SKU               a power failure (G3 state).
 Intel PCH Rev ID               21/C1

 ▶ PCI Express Configuration
 ▶ USB Configuration
 ▶ BIOS Security Configuration
 ▶ HD Audio Configuration

   LAN1 Control                 ┌──── State After G3 ────┐
   LAN2 Control                 │ Power On               │
                                │ Power Off              │
   PCIE Wake                    │ Last State             │    →←: Select Screen
   Deep Sleep                   └────────────────────────┘    ↑↓: Select Item
   High Precision Timer                                       Enter: Select
   State After G3                    [Power Off]              +/-: Change Opt.
   PCIE Device Initial Delay         0                        F1: General Help
                                                              F2: Previous Values
                                                              F3: Optimized Defaults
                                                              F4: Save & Exit
                                                              ESC: Exit

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```

■ **PCI Express Configuration**
   Details of PCI Express items.
■ **USB Configuration**
   Details of USB items.
■ **LAN controller**
   Enables or disables the LAN1/2 controller.
■ **PCIE Wake**
   Enables or disables LAN1/2 wake up from sleep state.

3.2.3.1 PCI Express Configuration

```
            Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
              Chipset

  PCI Express Configuration                                    Enable or disable PCI Express
                                                               Clock Gating for each root
  PCI Express Clock Gating        [Enabled]                    port.
  DMI Link ASPM Control           [Enabled]
  Peer Memory Write Enable        [Disabled]
  PCIe-USB Glitch W/A             [Disabled]
  PCIe function swap              [Enabled]
▶ PCI Express Gen3 Eq Lanes

  PCIE Port 4 is assigned to LAN
▶ Mini PCI express 1
▶ Mini PCI express 2
                                                               ←→: 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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```

■ **DMI Link ASPM Control**
This item allows users to enable or disable the DMI Link ASPM control.

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

3.2.3.2 USB Configuration

```
            Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
             Chipset

 USB Configuration                                     Precondition work on USB host
                                                       controller and root ports for
 USB Precondition              [Disabled]              faster enumeration.

 xDCI Support                  [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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```

■ **USB Precondition**
This item allows user to enable or disable USB pre-condition.

■ **XDCI Mode**
This item allows user to enable or disable XDCI Mode.

3.2.3.3 HD Audio Configuration
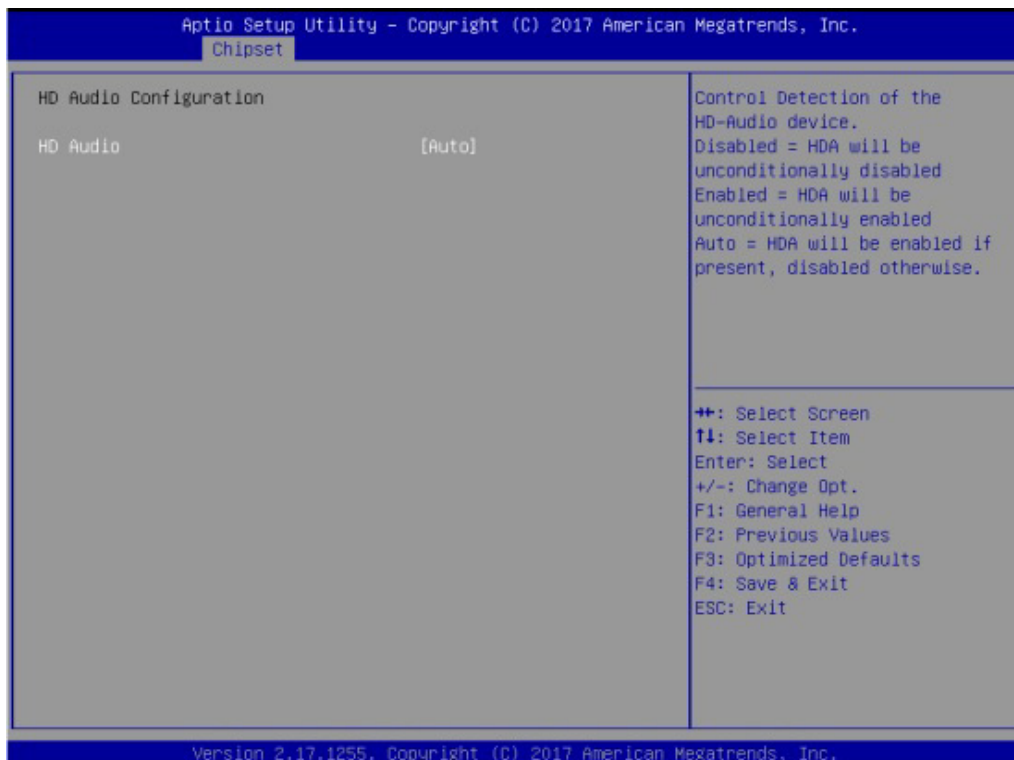
■ **HD Audio**

This item allows user to enable or disable azalea device.

3.2.3.4 System Agent (SA) Configuration
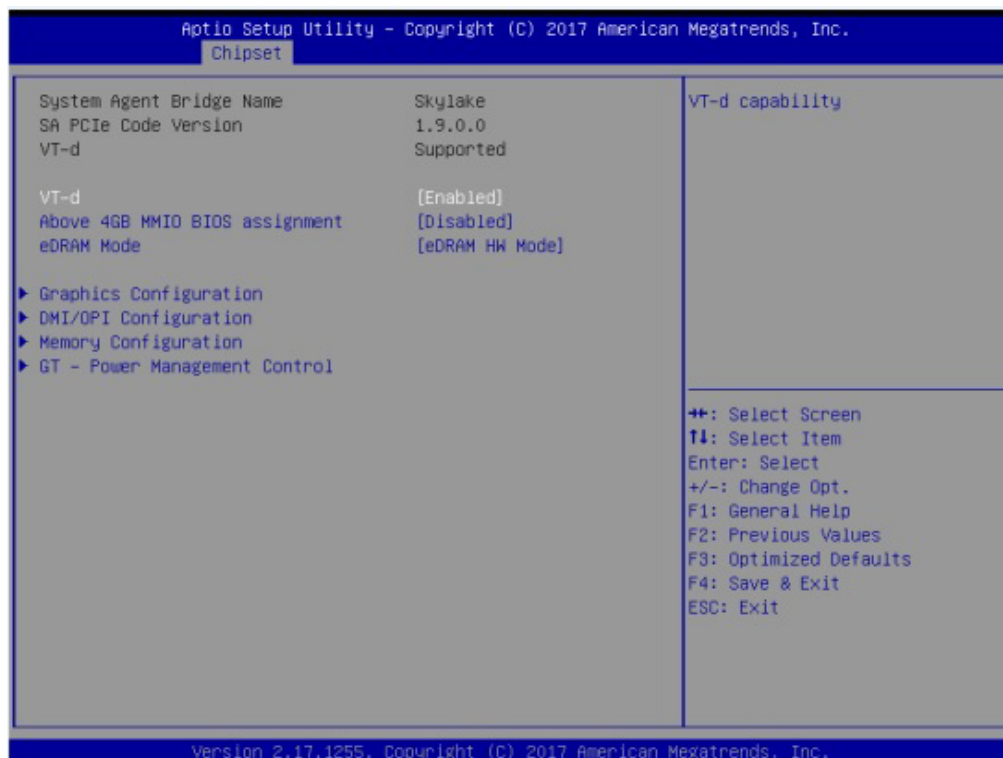
■ **VT-d**

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

3.2.3.5 Graphic Configuration

```
          Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
          Chipset

Graphics Configuration                                    Graphics turbo IMON current
                                                          values supported (14-31)
Graphics Turbo IMON Current        31

Skip Scaning of External Gfx Card  [Disabled]
Primary Display                    [Auto]
Internal Graphics                  [Auto]
GTT Size                           [8MB]
Aperture Size                      [256MB]
DVMT Pre-Allocated                 [32M]
DVMT Total Gfx Mem                 [256M]
Gfx Low Power Mode                 [Enabled]
VDD Enable                         [Enabled]            →←: Select Screen
PM Support                         [Enabled]            ↑↓: Select Item
PAVP Enable                        [Enabled]            Enter: Select
Cdynmax Clamping Enable            [Enabled]            +/-: Change Opt.
Cd Clock Frequency                 [675 Mhz]            F1: General Help
▶ LCD Control                                            F2: Previous Values
                                                        F3: Optimized Defaults
                                                        F4: Save & Exit
                                                        ESC: Exit

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```

■ **Graphics Turbo IMON Current**
   This item allows users to select which Graphics Turbo IMON Current.

■ **Internal Graphics**
   This item allows users to enable or disable IGD.

■ **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.

3.2.3.6 LCD Control

```
                Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
                 Chipset

  LCD Control

  LVDS Panel Type                    [Disabled]
  LVDS Backlight Control PWM         100
  LVDS Backlight Signal Control      [LINEAR]
  Backlight Enable Polarity          [Native]




                                              ↔: 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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```

■ **LVDS Panel Type**
   Select LVDS Panel type.

3.2.4 Boot

```
            Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
     Main  Advanced  Chipset  Security  Boot  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
  Quiet Boot                        [Disabled]            waiting.

  Boot Option Priorities
  Boot Option #1                    [UEFI:
                                    KingstonDataTraveler
                                    3.0PMAP, Partition 1]


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


            Version 2.17.1255. Copyright (C) 2017 American Megatrends, Inc.
```
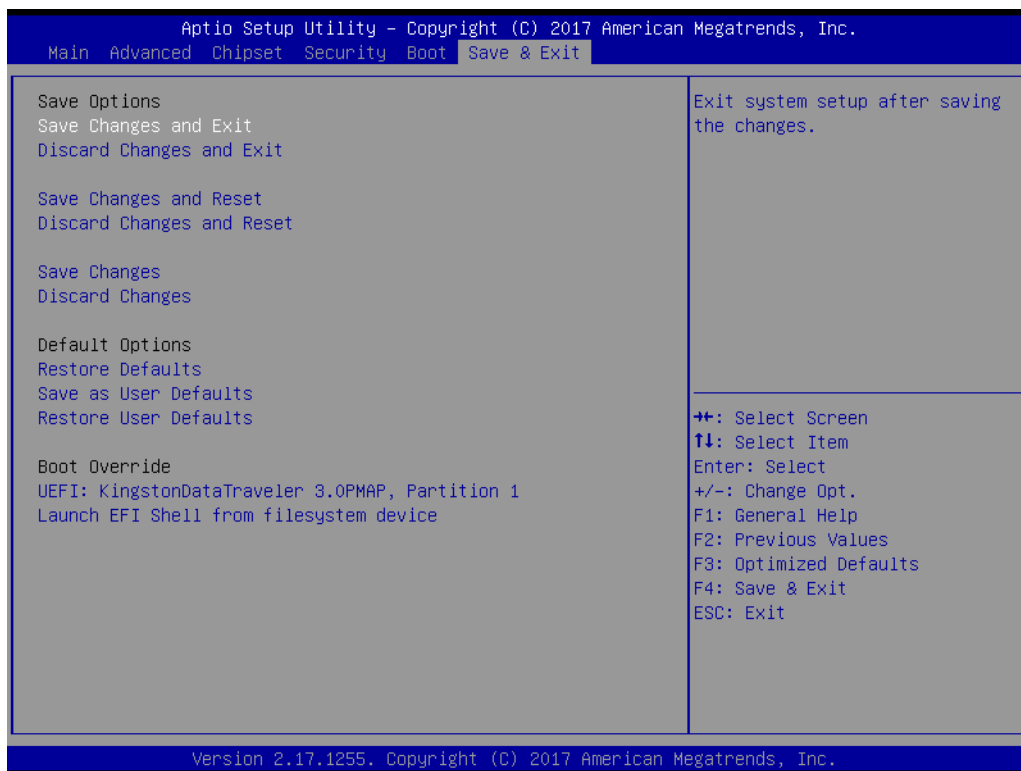
- ■ **Setup Prompt Timeout**
  This item allows you to change number of seconds to wait for setup activation key.
- ■ **Bootup NumLock State**
  Select the Power-on state for Numlock.
- ■ **Quiet Boot**
  If this option is set to Disabled, the BIOS display normal POST messages. If Enabled, an OEM Logo is shown instead of POST messages.
- ■ **Boot Option Priorities**
  Set the system boot order.

3.2.5 Security
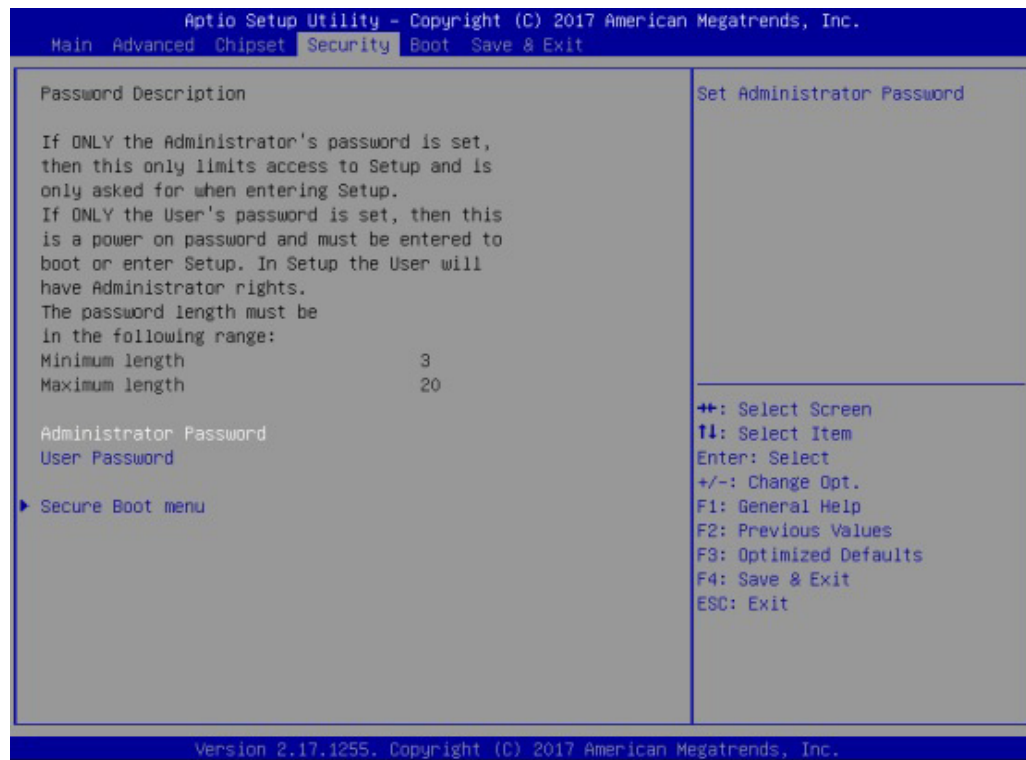
Select Security Setup from the AIMB-230 Setup main BIOS setup menu. All Security Setup options, such as password protection and virus protection are described in this section. To access the sub menu for the following items, select the item and press<Enter>: Change Administrator / User Password.

3.2.6 Save & Exit


```
              Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
        Main  Advanced  Chipset  Security  Boot  Save & Exit

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

       Save Changes and Reset
       Discard Changes and Reset

       Save Changes
       Discard Changes

       Default Options
       Restore Defaults
       Save as User Defaults                                     ←→: Select Screen
       Restore User Defaults                                     ↑↓: Select Item
                                                                 Enter: Select
       Boot Override                                             +/-: Change Opt.
       UEFI: KingstonDataTraveler 3.0PMAP, Partition 1           F1: General Help
       Launch EFI Shell from filesystem device                  F2: Previous Values
                                                                 F3: Optimized Defaults
                                                                 F4: Save & Exit
                                                                 ESC: Exit

              Version 2.17.1255. Copyright (C) 2017 American Megatrends, Inc.
```

■ **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

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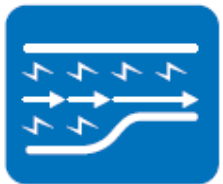
Refers to a series of methods for reducing power consumption in computers by lowering the clock frequency. This API allows the user to adjust the clock from 87.5% to 12.5%.

4.2.2 Software Utility

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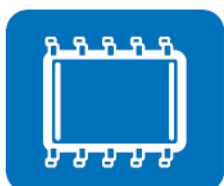
The BIOS Flash utility allows customers to update the flash ROM BIOS version, or use it to back up current BIOS by copying it from the flash chip to a file on customers' disk. The BIOS Flash utility also provides a command line version and an API for fast implementation into customized applications.

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's also easy to copy. Embedded Security ID utility provides reliable security functions for customers to secure their application data within the 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-232 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
- 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 (64bit)*
- *Windows 10(64bit)*

5.3 Windows Driver Setup

You can download driver from Advantech website.

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

> **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.

You can download driver from Advantech website.

Chapter   **7**

LAN Configuration

7.1 Introduction

The AIMB-232 has dual Gigabit Ethernet LANs via dedicated PCI Express x1 lanes Intel I219LM GbE PHY (LAN1) and Intel I211AT GbE(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-232's Intel I219LM GbE PHY (LAN1) and Intel I211AT GbE(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.

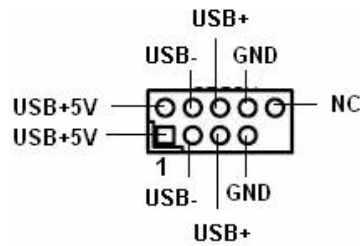# Appendix A

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 HDMI Connector (HDMI1)
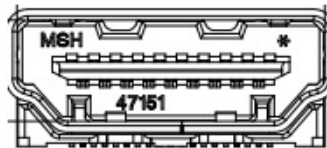
Table A.2: HDMI Connector (HDMI1)			
Pin	**Signal**	**Pin**	**Signal**
1	DP2-	11	GND
2	GND	12	Clock+
3	DP2+	13	NC
4	DP1-	14	NC
5	GND	15	HDMI_CLK
6	DP1+	16	HDMI_DATA
7	DP0-	17	GND
8	GND	18	+5V
9	DP0+	19	HDMI_HPD
10	Clokc-		
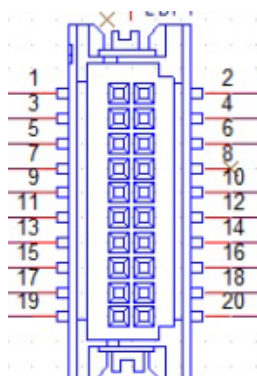
A.3 DP Connector

Table A.3: DP Connector			
Pin	**Signal**	**Pin**	**Signal**
1	Ground	2	Ground
3	Edp_txn0	4	Edp_txn3
5	Edp_txp0	6	Edp_txt3
7	Ground	8	
9	Edp_txn1	10	Ground
11	Edp_txp1	12	Edp_auxn
13	Ground	14	Edp_auxp
15	Edp_txn2	16	Ground
17	Edp_txp2	18	Edp_hpd
19	Edp power	20	Edp power

A.4 SPI_CN1: SPI Fresh Card Pin Connector
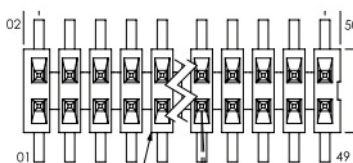
Table A.4: SPI_CN1:SPI Fresh Card Pin Connector			
Pin	**Signal**	**Pin**	**Signal**
1	SPI_CS#	2	VCC3
3	SPI_MISO	4	NC
5	NC	6	SPI_CLK
7	GND	8	SPI_MOSI

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

KBMS1

1
2
3
4
5
6
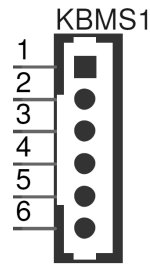
Table A.5: PS/2 Keyboard and Mouse Connector (KBMS1)			
Pin	**Signal**	**Pin**	**Signal**
1	KB_CLK	4	GND
2	KB_DAT	5	VCC_KBMS
3	MS_DAT	6	MS_CLK

A.6 CPU Fan Power Connector (CPUFAN1)

4
3
2
1
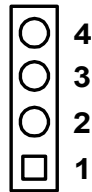
Table A.6: CPU Fan Power Connector (CPUFAN1)	
Pin	**Signal**
1	GND
2	CPU FAN VCC
3	DETECT
4	CPU PWM

A.7 System Fan Power Connector (SYS_FAN1)
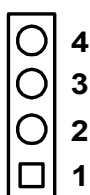
Table A.7: System Fan Power Connector (SYSFAN1)	
Pin	**Signal**
1	GND
2	SYS FAN VCC
3	DETECT
4	SYS FAN PWM

A.8 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.
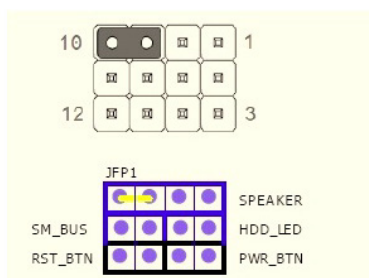

Table A.8: Power Switch/Reset Switch/HDD LED/SMBus/Speaker (JFP1/ JFP2)			
Pin	**Signal**	**Pin**	**Signal**
1	+5V	7	Speaker 3
2	+3.3V	8	SMB_DAT
3	Power Switch+	9	Reset Switch+
4	NC	10	Speaker 4
5	HDD LED	11	SMB_CLK
6	GND	12	GND

A.9 USB/LAN Ports (LAN1/LAN2/USB12/USB34)
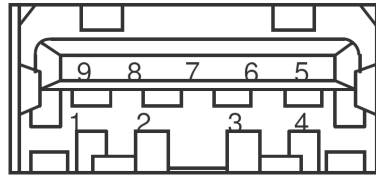
Table A.9: USB Port			
Pin	Signal	Pin	Signal
1	VCC	6	USB3_RX+
2	USB2_D-	7	GND
3	USB2_D+	8	USB3_TX-
4	GND	9	USB3_TX+
5	USB3_RX-		

Table A.10: 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.10 Line Out, Mic In Connector (AUDIO1/AUDIO2)
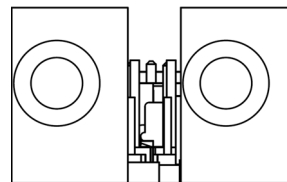
Line Out   Mic In

A.11 Serial ATA (SATA1 ~ 2)

Table A.11: 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.12 AT/ATX Mode (PSON1)

Pin	Signal	Pin	Signal
Table A.12: AT/ATX Mode (PSON1)			
1	#PSON_SIO (to super IO)	2	#PSON (to power supply)
3	GND		

A.13 HD Audio Interface (FP_AUDIO1)
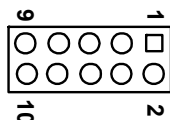
Pin	Signal	Pin	Signal
Table A.13: AC-97 Audio Interface (FPAUD1)			
1	MIC2_L	2	GND
3	MIC2_R	4	FP_AUD_DET
5	LOUT2_R	6	SRTN1
7	LOUT2_DET	8	KEY
9	LOUT2_L	10	SRTN2

A.14 GPIO Pin Header (GPIO1)
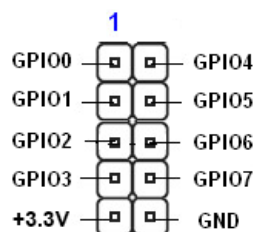
Pin	Signal	Pin	Signal
Table A.14: GPIO Pin Header (GPIO1)			
1	GPIO0	2	GPIO4
3	GPIO1	4	GPIO5
5	GPIO2	6	GPIO6
7	GPIO3	8	GPIO7
9	+3.3V	10	GND

A.15 LVDS Connector: LVDS1

Table A.15: LVDS Connector: LVDS1			
Pin	Signal	Pin	Signal
1	VDD_LVDS	2	VDD_LVDS
3	GND	4	GND
5	VDD_LVDS	6	VDD_LVDS
7	LVDS_L0_N	8	LVDS_U0_N
9	LVDS_L0_P	10	LVDS_U0_P
11	GND	12	GND
13	LVDS_L1_N	14	LVDS_U1_N
15	LVDS_L1_P	16	LVDS_U1_P
17	GND	18	GND
19	LVDS_L2_N	20	LVDS_U2_N
21	LVDS_L2_P	22	LVDS_U2_P
23	GND	24	GND
25	LVDS_CLKL_N	26	LVDS_CLKU_N
27	LVDS_CLKL_P	28	LVDS_CLKU_P
29	GND	30	GND
31	LVDS_CH7511_DDC _CLK	32	LVDS_CH7511_DDC _DATA
33	GND	34	GND
35	LVDS_L3_N	36	LVDS_U3_N
37	LVDS_L3_P	38	LVDS_U3_P
39	LVDS_BL_EN	40	VCON

A.16 LVDS Inverter (INV1)

Pin	Signal
Table A.16: LVDS Power Jumper	
1	+12V
2	GND
3	BL_EN
4	BL_CLT
5	+5V

A.17 ATX12V/12V DC IN (ATX12V1/DCIN1)

ATX12V1   **DCIN1**
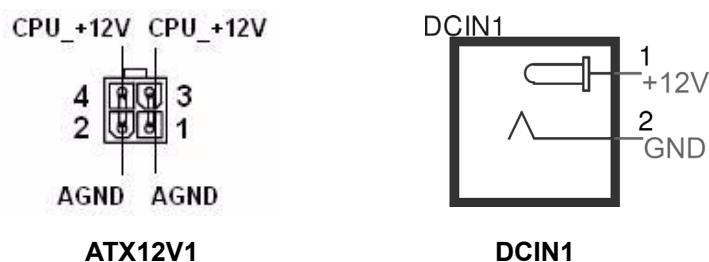
Pin	Signal	Pin	Signal
Table A.17: ATX 12 V connector (ATX12V1)			
1	aGND	2	aGND
3	CPU_+12V	4	CPU_+12V

A.18 HD Digital Audio Interface (SPDIF_O1)
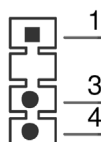
Pin	Signal
Table A.18: HD Digital Audio Interface (SPDIF_OUT1)	
1	+5V
3	SPDIF Out
4	GND

A.19 Amplifier Audio Output (AMPJ1)
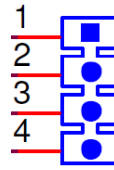
Table A.19: Amplifier Audio Output (AMPJ1)			
Pin	Signal	Pin	Signal
1	AMP_L-	2	AMP_L+
3	AMP_R-	4	AMP_R+

A.20 COM1/COM2 Box Header (COM1/COM2)
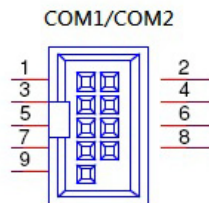
Table A.20: COM1/COM2 Box Header (COM1/COM2)			
Pin	Signal	Pin	Signal
1	DCD#	2	DSR#
3	RXD	4	RTS#
5	TXD	6	CTS#
7	DTR#	8	RI#
9	GND		

A.21 Watch dog and Open chassis alarm (JWDT1+JOBS1)

JWDT1+JOBS1

```
1
2
3
4
5
```
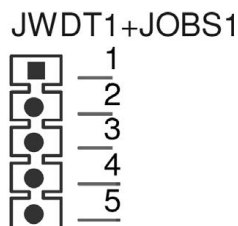
Table A.21: Watchdog and Open Chassis Alarm (JWDT1+JOBS1)

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.22 Low Pin Count Bus (LPC1)
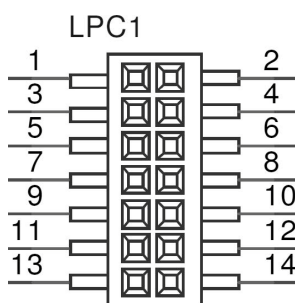
LPC1

Table A.22: 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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