

User Manual

AIMB-242

**Intel® Xeon® E3/Core™ i7/i5/i3
BGA1440 Mini-ITX with Dual DP/
HDMI/LVDS (or eDP), 2 COM,
Dual LAN, DDR4, PCIe x 16, 8
USB 3.0 & 1 USB 2.0 and 2
SATAIII**

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



CPU Compatibility

CPU Family	Core Stepping	Power	Freq (GHz)	Mfg. Tech	HT	Smart cache (L3)	Package Type	Result	Supports Model
Intel Xeon E3-1515M v5	QS	45W	2.8 GHz	14nm	Y	8MB	BGA 1440	PASS	WG2
Intel i7-6820EQ	QS	45W	2.8 GHz	14nm	Y	8MB	BGA 1440	PASS	QG2
Intel i7-6822EQ	QS	25W	2.0 GHz	14nm	Y	8MB	BGA 1440	PASS	QG2
Intel i5-6440EQ	QS	45W	2.7 GHz	14nm	Y	6MB	BGA 1440	PASS	QG2

Memory Compatibility

Category	Speed	Capacity	Vendor	Module_PN	Chip_PN	ADVANTECH P/N	ECC	Result	Remark
DDR4	2133	16GB	Advantech	AQD-SD4U16N21-SE	SEC 546 K4A8G08 5WB BCPB	AQD-SD4U16N21-SE	N	PASS	
DDR4	2133	4GB	ATP	A4G04QA8BLP BME	40A77 D9RGQ	N/A	N	PASS	
DDR4	2133	4GB	ADATA	AD4S2133W4G 15-BHYM	H5AN4G8NMFR TFC	N/A	N	PASS	
DDR4	2133	4GB	Transcend	TS512MSH64V 1H	SEC 501 BCPB K4A4G085WD	AQD-SD4U4GN21-SG	N	PASS	
DDR4	2133	8GB	Advantech	AQD-SD4U8GN21-SG	SEC 552 BCPB K4A4G085WD	AQD-SD4U8GN21-SG	N	PASS	
DDR4	2133	8GB	ATP	A4G08QE8BLP BME	40A77 D9RGQ	N/A	N	PASS	
DDR4	2133	8GB	ADATA	AD4S2133W8G 15-BHYM	H5AN4G8NMFR TFC	N/A	N	PASS	
DDR4	2133	8GB	Transcend	TS1GSH64V1H	SEC 449 BCPB K4A4G085WD	AQD-SD4U8GN21-SG	N	PASS	
DDR4	2133	16GB	ADATA	AD4S2133316G 16-BSSB	SEC 525 K4A8G08 5WB BCPB	N/A	N	PASS	
DDR4	2133	16GB	Transcend	TS2GSH64V1B	SEC 546 K4A8G08 5WB BCRC	N/A	N	PASS	
DDR4	2133	16GB	Apacer	78.D2GF2.4010 B	SEC 534 K4A8G08 5WB BCRC	N/A	N	PASS	

Ordering Information

P/N	Chipset	CPU	ECC	DP	DVI-D	LVDS /EDP	HDMI 2.0	GbE LAN	COM	SATAIII	USB3.0 /2.0	M.2	MiniPCIe	PCIe x16	TPM	AMP
AIMB-242QG2-H7A1E	QM170	i7-6820EQ	NO	2	0	1/(1)	1	2	2	2	8/1	1	2 (F/S+H/S)	1	(1)	(1)
AIMB-242QG2-M7A1E	QM170	i7-6822EQ	NO	2	0	1/(1)	1	2	2	2	8/1	1	2 (F/S+H/S)	1	(1)	(1)
AIMB-242QG2-H5A1E	QM170	i5-6440EQ	NO	2	0	1/(1)	1	2	2	2	8/1	1	2 (F/S+H/S)	1	(1)	(1)
AIMB-242WG2-HEA1E	CM236	E3-1515Mv5	YES	2	0	1/(1)	1	2	2	2	8/1	1	2 (F/S+H/S)	1	(1)	(1)

*() BOM options available on MP version.

Initial Inspection

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

- 1 x AIMB-242 Intel BGA 1440 Xeon E3 & Core i7/i5/i3 Mini-ITX Motherboard
- 1 x SATA HDD cable
- 1 x COM port cable
- 1 x I/O port bracket
- 1 x Startup manual
- 1 x Warranty card
- 1 x CPU cooler

If any of these items are missing or damaged, contact your distributor or sales representative immediately. We have carefully inspected the AIMB-242 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-242, check it for signs of shipping damage. (For example, damaged box, scratches, dents, etc.) If it is damaged or it fails to meet the specifications, notify our service department or your local sales representative immediately. Also notify the carrier. Retain the shipping carton and packing material for inspection by the carrier. After inspection, we will make arrangements to repair or replace the unit.

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Chapter 1

General Information

1.1 Introduction

AIMB-242 is designed with the Intel QM170/CM236 for industrial applications that require both performance computing and enhanced power management capabilities. The motherboard supports Xeon E3-1515Mv5 2.8 GHz / Core i7-6820EQ 2.8 GHz/ Core i7-6822EQ 2.0 GHz/ Core i5-6440EQ 2.7 GHz up to 8 MB SmartCache and DDR4 2133 MHz up to 32GB, per slot up to 16 GB. A rich I/O connectivity of 2 serial ports, 8 USB 3.0, 1 USB 2.0, dual GbE LAN, 2 SATA III ports.

1.2 Features

- **Rich I/O connectivity:** Dual GbE LAN via PCIe x1 bus, 1 x PCIe x16 slot (Gen 3), 1 x full-size MiniPCIe (co-lay mSATA), 1 x half-size MiniPCIe, 1 x M.2 (B key), 8 USB 3.0, 1 USB 2.0.
- **Standard Mini-ITX form factor with industrial features:** The AIMB-242 is a full featured Mini-ITX motherboard with balanced expandability and performance.
- **Wide selection of storage devices:** SATAIII HDD, customers benefit from the flexibility of using the most suitable storage device for larger capacity.
- **Optimized integrated graphic solution:** With Intel® Flexible Display Interface, it supports versatile display options and 32-bit 3D graphics engine.

1.3 Specifications

1.3.1 System

- **CPU:** Intel 6th generation Xeon E3 and Core i7/i5/i3 processor
- **BIOS:** AMI EFI 128 Mbit SPI BIOS
- **System chipset:** Intel® QM170/CM236
- **SATA hard disk drive interface:** 2 on-board SATA connectors with data transmission rate up to 600 MB

1.3.2 Memory

- **RAM:** Up to 32 GB in 2 slots 260-pin DIMM sockets. Supports dual-channel DDR4 2133MHz SDRAM.
 - AIMB-242QG2 supports non-ECC unbuffered DIMMs and do not support any memory configuration that mixes non-ECC with ECC unbuffered DIMMs.
 - AIMB-242WG2 supports ECC buffered DIMMs.

Note! *Due to the inherent limitations of PC architecture, the system may not fully detect 32 GB RAM when 32 GB RAM is installed.*



1.3.3 Input/Output

- **PCIe slot:** 1 PCIe x16 expansion slot, 1 full-size MiniPCIe, 1 half-size MiniPCIe
- **Serial port:** Two serial ports, one is RS-232/422/485 and one is RS-232. One DB-9 connector located in rear panel is RS-232.
- **Keyboard and PS/2 mouse connector:** One 6-pin mini-DIN connector
- **USB port:** Supports 1 USB 2.0 port with transmission rates up to 480 Mbps and 8 USB 3.0 ports with transmission rates up to 5 Gbps.

Note!  Under Window 7 OS, all of USB 2.0/3.0 ports are not workable before XHCI driver is installed. Suggest to use PS/2 keyboard & mouse for XHCI driver install first.

- **GPIO:** AIMB-242 supports 8-bit GPIO for general purpose control application.

1.3.4 Graphics

- **Controller:** Intel® HD Graphics
- **Display memory:** 1 GB maximum shared memory with 2GB and above system memory installed
- **HDMI:** HDMI 2.0 up to resolution 4096 x 2160 @ 60 Hz
- **Display Port:** Supports DP++ up to resolution 4096 x 2304 @ 60 Hz
- **LVDS:** dual channel 24-bit up to 1920 x 1200 @ 60Hz
- **eDP:** Supports max resolution 4096 x 2304 @ 60 Hz. (co-lay LVDS)
- **Triple Display:** DP+DP+LVDS(or eDP), DP+DP+HDMI, DP+HDMI+LVDS(or eDP)

1.3.5 Ethernet LAN

- Supports dual 10/100/1000 Mbps Ethernet port (s) via PCI Express x1 bus which provides 985 MB/s data transmission rate
- **Controller:** LAN1: Intel I219LM; LAN2: Intel I211AT

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)
- **Storage temperature:** -40 ~ 85° C (-40 ~ 185° F)
- **Humidity:** 5 ~ 95% non-condensing
- **Power supply voltage:** +3.3 V, +5 V, +12 V, -12 V, +5VSB
- **Power consumption:**
Core i7-6820EQ 2.8GHz 2pcs 16GB DDR4 2133MHz, +5V @ 1.61A, +3.3V @ 0.92A, +12V @ 4.64A, -12V @ 0.73A, +5VSB @ 0.74A
Measure the maximum current value which system under maximum load (CPU: Top speed, RAM & Graphic: Full loading)
- **Board size:** 170 x 170 mm
- **Board weight:** 0.365 kg

1.4 Jumpers and Connectors

Connectors on the AIMB-242 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
JCMOS1	CMOS Clear Jumper
JFP1+JFP2	Power Switch/HDD LED/SMBUS/Speaker Pin Header
JFP3	Power LED and Keyboard Lock Pin Header
JWDT1+JOBS1	Watchdog Timer Output and OBS Beep
PSON1	ATX/AT Mode Selection
JLVDS1	LVDS Panel Voltage Selection
JCOM1	COM1 RI# pin RI#/5V/12V Select
VCON1	LVDS VESA, JEIDA format selection pin header
JVBR1	LVDS1 backlight control

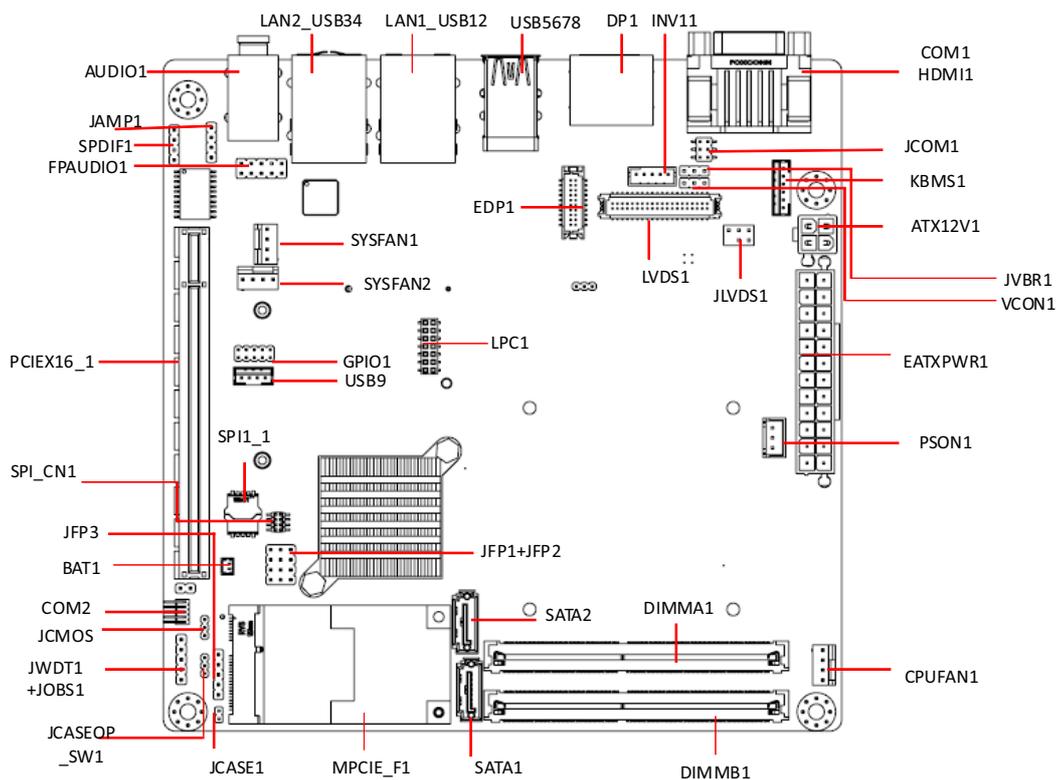
Table 1.2: Connectors

Label	Function
SATA1 ~ SATA2	SATA Signal Connector
MPCIE_F1	MINIPCIE and mSATA Connector
MPCIE_H1	MINIPCIE Connector
M.2_1	Next Generation Form Factor (M.2 B Key) Connector
HDMI1	HDMI Connector
DP1	DP Connector
LVDS1	LVDS Panel Connector
INV1	eDP/LVDS Backlight Inverter Power Connector
EDP1 (BOM option)	Embedded Display Port Connector
USB5678	USB 3.0 Connector
USB9	USB 2.0 Pin Header
LAN1_USB12, LAN2_USB34	RJ45+USB 3.0 Stack Connector
PCIEX16_1	PCI-E x16 Slot
SPDIF1	HD Digital Audio Interface
AUDIO1,FPAUDIO1	HD Analog Audio Interface
JAMP1(BOM Option)	Audio Amplifier Output Connector
GPIO1	General Purpose I/O Pin Header
SPI1	SPI BIOS Flash Socket
SPI_CN1	SPI Programming Pin Header
LPC1	Low Pin Count Header
JCASE1	Case-Open Detect Connector
KBMS1	PS/2 Keyboard & Mouse Connector
COM1, COM2	COM Port
CPUFAN1	CPU FAN Power Connector

Table 1.2: Connectors

SYSFAN1, SYSFAN2	SYSTEM FAN Power Connector
ATX12V1	ATX 12V Power Supply Connector
BAT1	Battery Connector
CPU1	CPU Socket
DIMMA1, DIMMB1	DDR4 SO-DIMM Socket

1.5 Board layout: Jumper and Connector Locations



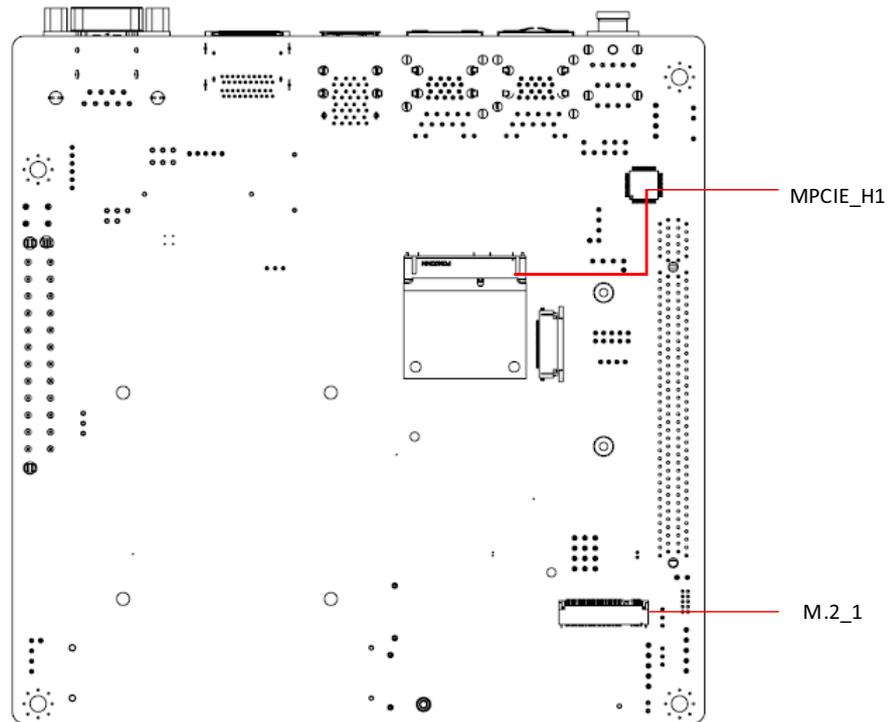


Figure 1.1 Jumper and Connector Location



Figure 1.2 I/O Connectors

1.6 AIMB-242 Board Diagram

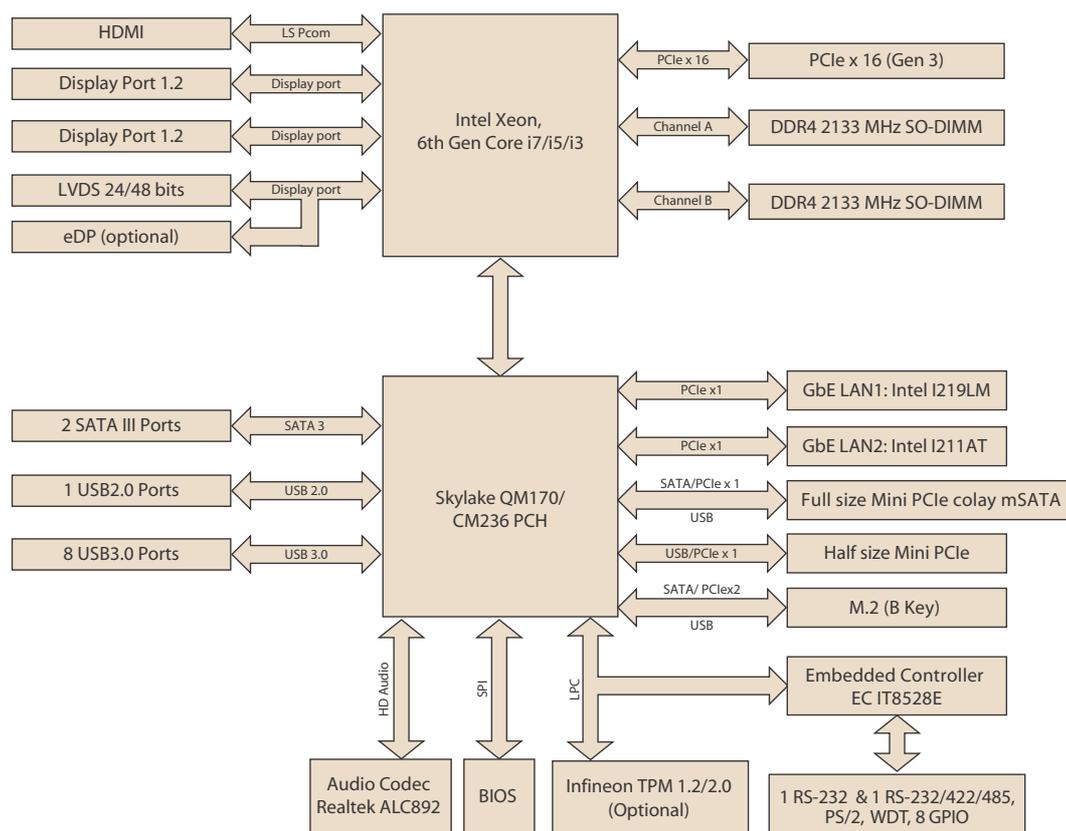


Figure 1.3 AIMB-242 Block Diagram

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 (JCMOS1)

The AIMB-242 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 JCMOS1 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: JCMOS1

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

* Default

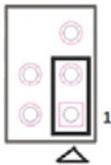
1.8.3 JLVDS1: LVDS1 panel POWER 3.3V/5V/12V Selection

Table 1.4: JLVDS1: LVDS1 Power 3.3 V/5 V/ 12 V Selector

Closed Pins	Result
JLVDS1*, 1-3	Jumper for +3.3 V
JLVDS1, 3-5	Jumper for +V5
JLVDS1, 3-4	Jumper for +12 V

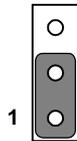
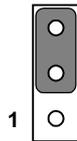
*Default

Table 1.5: LVDS Panel Voltage Selection (JLVDS1)

Function	Jumper Setting
Set LVDS Panel as +5V (3-5)	
Set LVDS Panel as +3.3V (Default) (1-3)	
Set LVDS Panel as +12V (3-4)	

1.8.4 JVBR1:LVDS1 backlight control

Table 1.6: JVBR1: LVDS backlight control

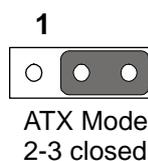
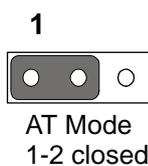
Function	Jumper Setting
DC mode (1-2)	
PWM mode (2-3) (Default)	

1.8.5 PSON1: ATX, AT Mode Selector

Table 1.7: PSON1: ATX, AT Mode Selector

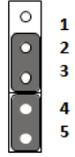
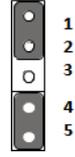
Closed Pins	Result
1-2	AT Mode
2-3*	ATX Mode

*Default



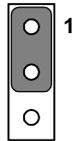
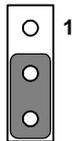
1.8.6 JWDT1+JOBS1: Watchdog Timer Output and OBS Beep

Table 1.8: JWDT1+JOBS1: Watchdog Timer Output and OBS Beep

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

1.8.7 VCON1: JEIDA/VESA Selection

Table 1.9: VCON1: JEIDA/VESA selection

Function	Jumper Setting
Pull high to +3.3 V (Default) (JEIDA or VESA base on panel definition)	
Pull down to GND (JEIDA or VESA base on panel definition)	

1.8.8 JCASE1: Case Open Sensor

The AIMB-242 motherboard contains a jumper that provides a chassis open sensor. The buzzer on the motherboard beeps when the case is opened.

1.8.9 JCASEOP_SW1: Case Open Selection Pin Header

Table 1.10: JCASEOP_SW1: Case Open Selection Pin Header

Closed Pins	Result
1-2	Normal Mode
2-3*	Normal Open (Default)

*Default

1



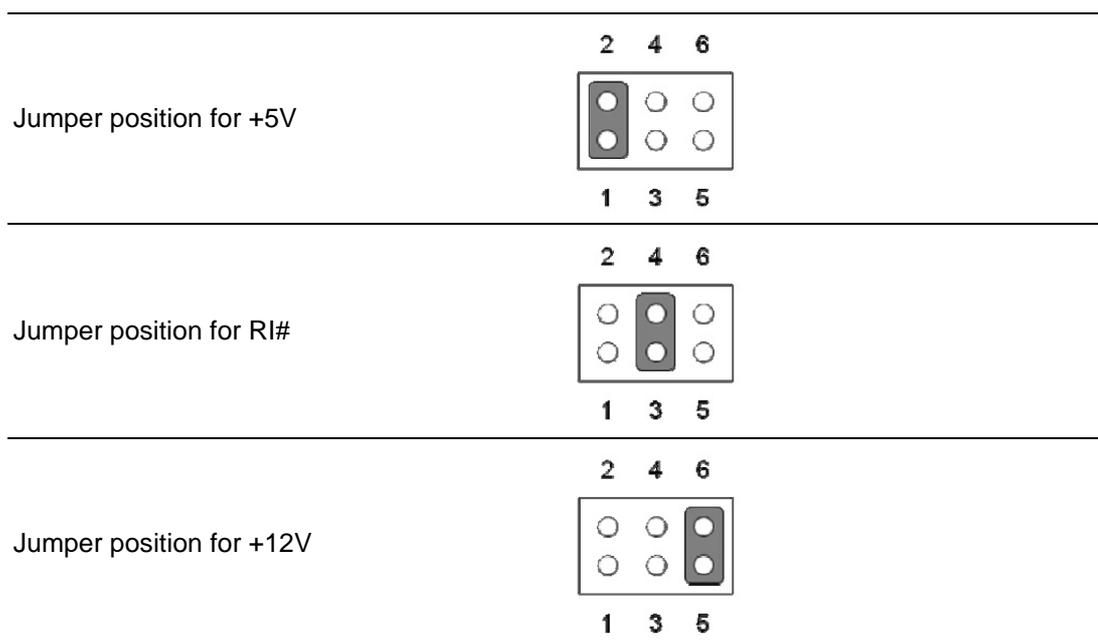
Normal Close
1-2 closed

1



Normal Open (Default)
2-3 closed

1.8.10 JCOM1: COM1_RI# Pin RI# / 5V / 12V



1.9 System Memory

AIMB-242 has two 260-pin memory sockets for 2133 MHz memory modules with maximum capacity of 32 GB (Maximum 16 GB for each DIMM). AIMB-242QG2 supports only non-ECC DDR4 memory modules and do not support registered DIMMs (RDIMMs). AIMB-242WG2 can support ECC DDR4 memory module.

1.10 Memory Installation Procedures

To install DIMMs, first make sure the two handles of the DIMM socket are in the “open” position, i.e., the handles lean outward. Slowly slide the DIMM module along the plastic guides on both ends of the socket. Then firmly but gently (avoid pushing down too hard) press the DIMM 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 DIMM 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-242 supports a CPU with one of the following built-in full speed Smart-Cache:

8MB for Intel Xeon E3-1515Mv5 (WG2 SKU)

8MB for Intel Core i7-6820EQ (QG2 SKU)

8MB for Intel Core i7-6822EQ (QG2 SKU)

6MB for Intel Core i5-6440EQ (QG2 SKU)

1.12 Processor

The AIMB-242 is designed for BGA1440, Intel Xeon and Intel Core i7/Core i5/Core i3 processor.

Chapter 2

Connecting
Peripherals

2.1 Introduction

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

2.2 USB Ports (LAN1_USB12/LAN2_USB34/USB5678/USB9)

The AIMB-242 provides up to 9 USB ports. The USB interface complies with USB Specification Rev 2.0 supporting transmission rates up to 480 Mbps and Rev 3.0 supporting transmission rate up to 5 Gbps and is fuse protected. The USB interface can be disabled in the system BIOS setup.

The AIMB-242 is equipped with two high-performance 1000 Mbps Ethernet LAN adapters, both of which are supported by all major network operating systems. The RJ-45 jacks on the rear panel provides convenient LAN connection.

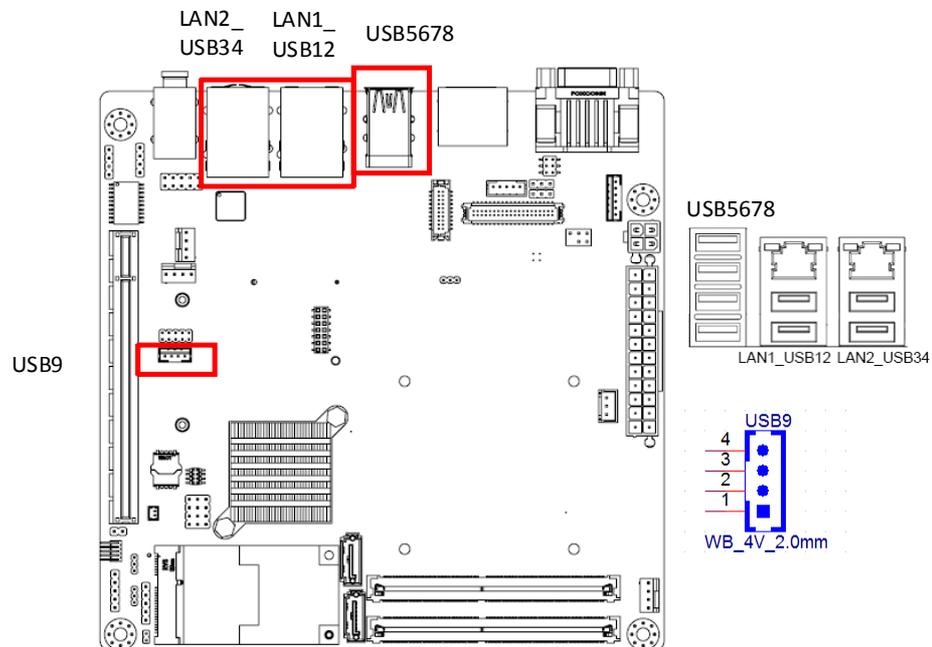
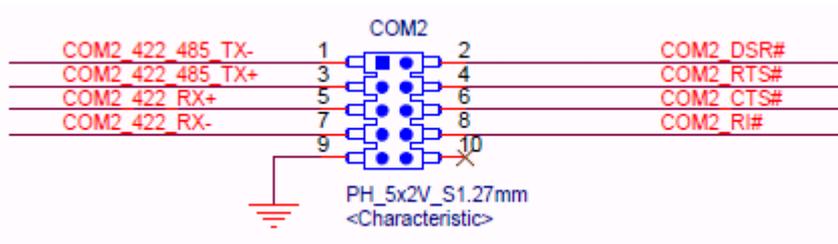
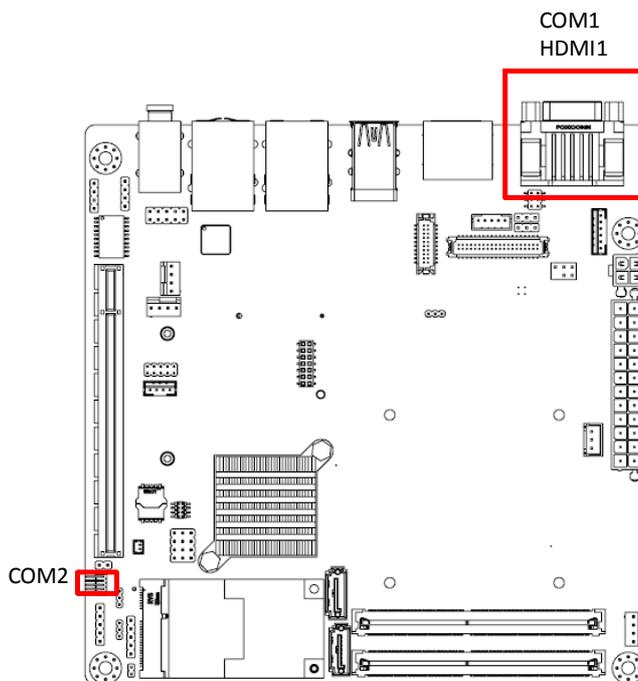


Table 2.1: LAN LED Indicator

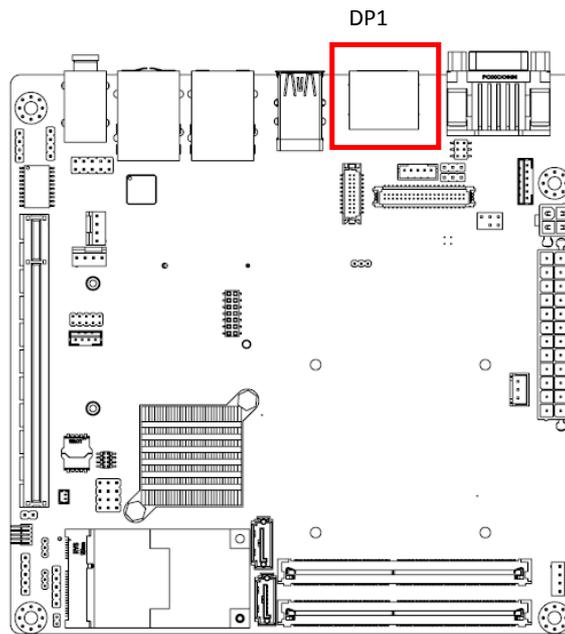
LAN Mode	LAN Indicator	
LAN1 indicator	LED1 (Right)	off for mal-link; Link (On) / Active (Flash)
	LED2 (Left)	100 Mbps (On) / 10 Mbps (Off); Color: Orange
	LED2 (Left)	1000 Mbps (On); Color: Green
LAN2 indicator	LED1 (Right)	off for mal-link; Link (On) / Active (Flash)
	LED2 (Left)	100 Mbps (On) / 10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

2.3 Serial Ports + HDMI port (COM1+HDMI1, COM2)

AIMB-242 supports two serial ports, COM1 supports RS-232 function, COM2 supports RS-232/422/485 function by BIOS selection. These ports can connect to serial devices, such as a mouse or a printer, or to a communications network. The IRQ and address ranges for both ports are fixed. However, if you want to disable the port or change these parameters later, you can do this in the system BIOS setup. Different devices implement the RS-232 standards in different ways. If you have problems with a serial device, be sure to check the pin assignments for the connector.

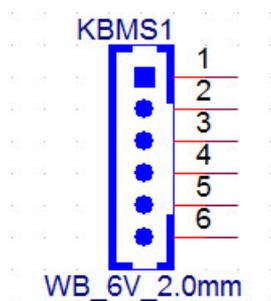
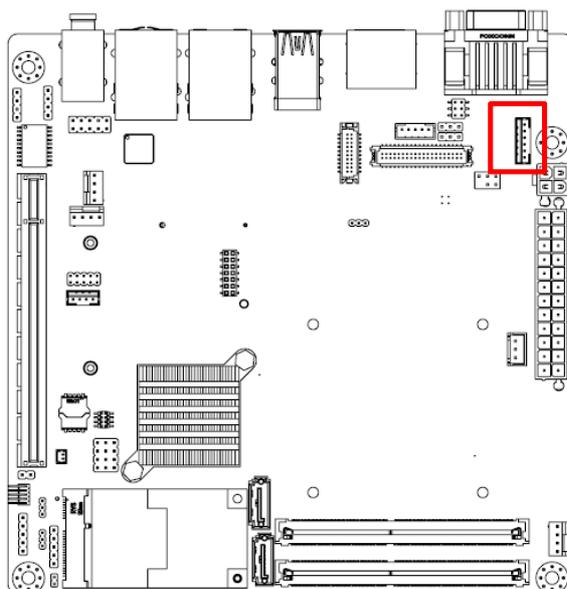


2.4 Display Port (DP1)



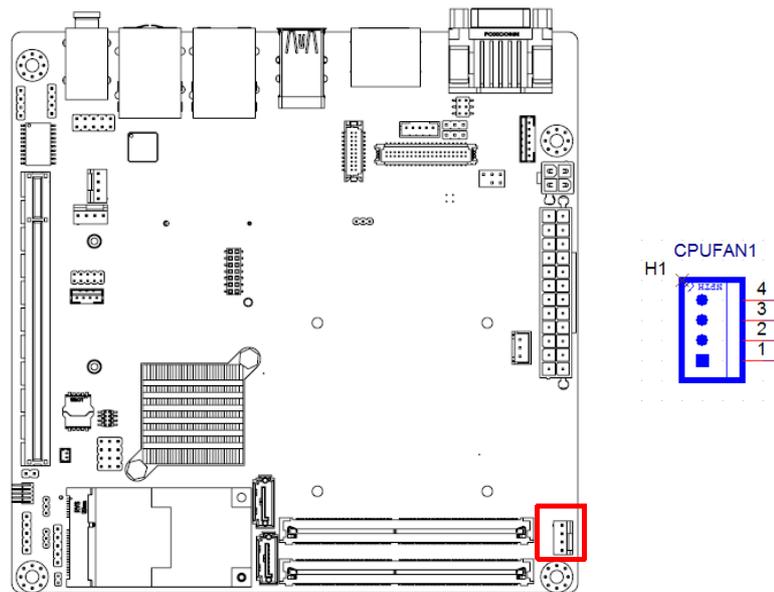
AIMB-242 has two external DP connectors to supports the Display Port with max resolution support to 4096 x 2304 @ 60 Hz.

2.5 PS/2 Keyboard and Mouse Connector



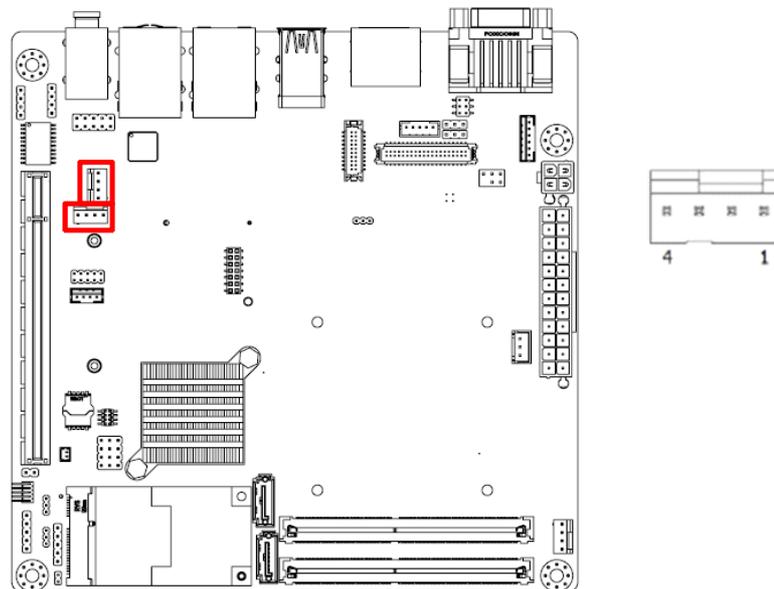
6-pin mini-DIN connectors (KBMS1) is for supporting the PS/2 keyboard and PS/2 mouse by a cable P/N 1703060191.

2.6 CPU Fan Connector (CPUFAN1)



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

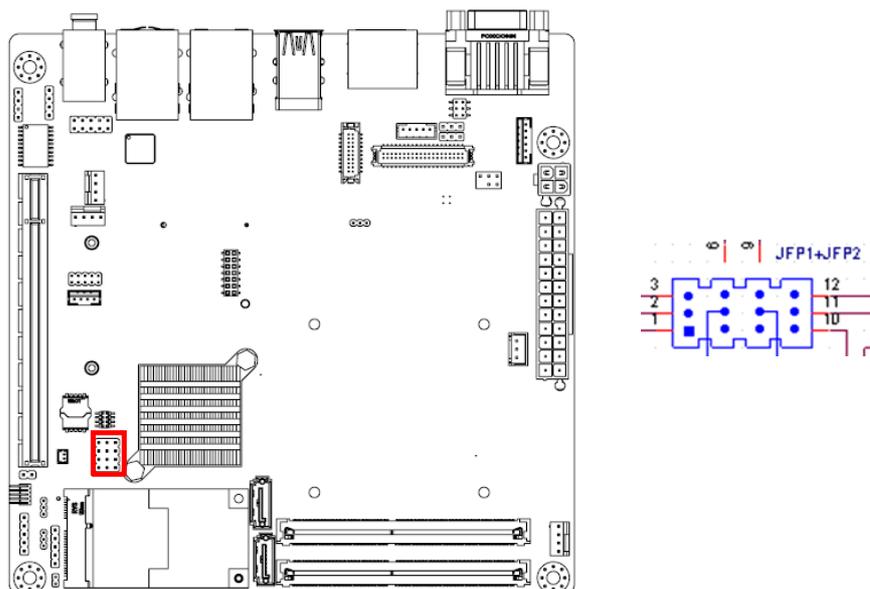
2.7 System FAN Connector (SYSFAN1/2)



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

2.8 Front Panel Connectors (JFP1+JFP2)

There are several headers for monitoring and controlling the AIMB-242.



2.8.1 ATX soft power switch (JFP1/PWR_SW)

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

2.8.2 Reset (JFP1/RESET)

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

2.8.3 HDD LED (JFP1/HDDLED)

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

2.8.4 External speaker (JFP1/SPEAKER)

JFP2/SPEAKER is a 4-pin connector for an external speaker. If there is no external speaker, the AIMB-242 provides an onboard buzzer as an alternative. To enable the buzzer, set pins 7 & 10 as closed.

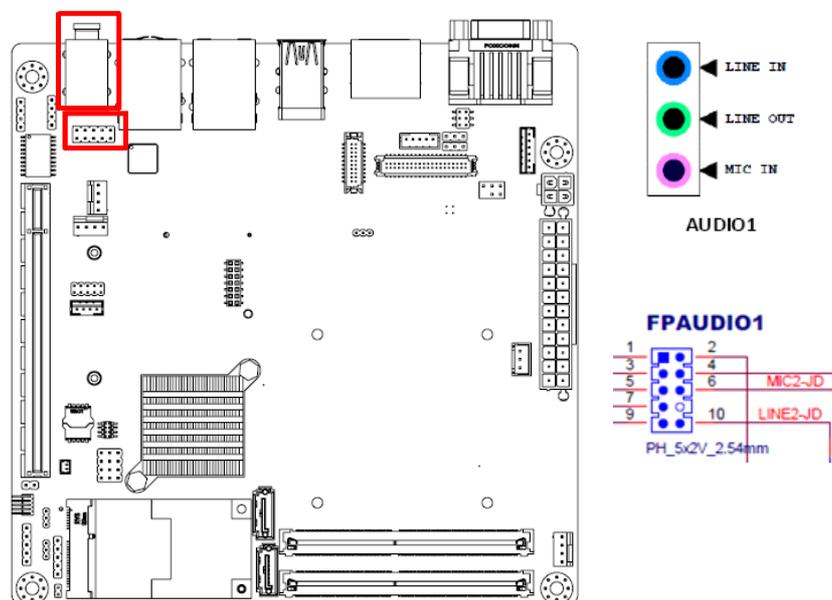
2.8.5 Power LED and keyboard lock connector (JFP2/PWR_LED & KEY LOCK)

(JFP2/PWR_LED & KEY LOCK) is a 5-pin connector for the power on LED and Key Lock function. Refer to Appendix B for detailed information on the pin assignments. The Power LED cable should be connected to pin 1-3. The key lock button cable should be connected to pin 4-5. There are 3 modes for the power supply connection. The first is “ATX power mode”; the system turns on/off by a momentary power button. The second is “AT Power Mode”; the system turns on/off via the power supply switch. The third is another “AT Power Mode” which makes use of the front panel power switch. The power LED status is indicated in the following table:

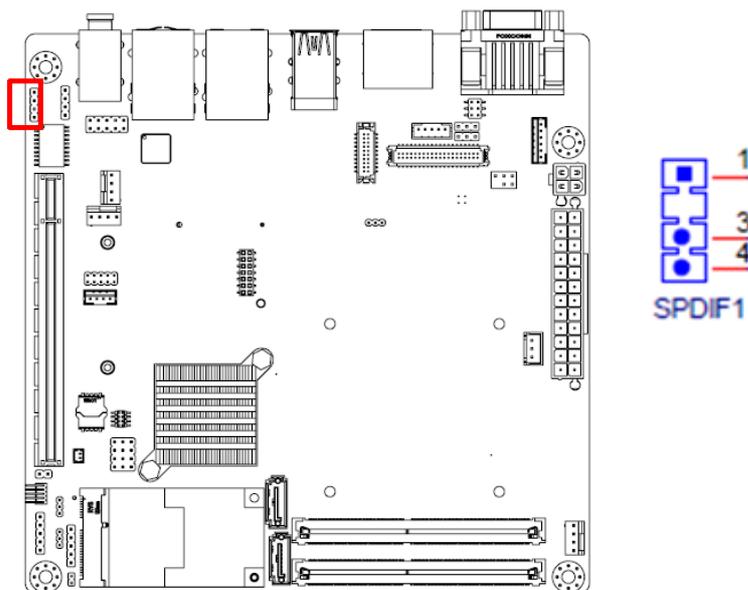
Table 2.2: ATX Power Supply LED Status (No support for AT power)

Power mode	LED (ATX Power Mode) (On/off by momentary button)	LED (AT power Mode) (On/off by switching power supply)	LED (AT power Mode) (On/off by front panel switch)
PSON1 (on back plane) jumper setting	pins 2-3 closed	pins 1-2 closed	Connect pins 1 & 2 to panel switch via cable
System On	On	On	On
System Off	Off (Windows 7) Slow Flashes (Window 8)	Off	Off
S3	Fast flashes	N/A	N/A
S4	Slow flashes	N/A	N/A

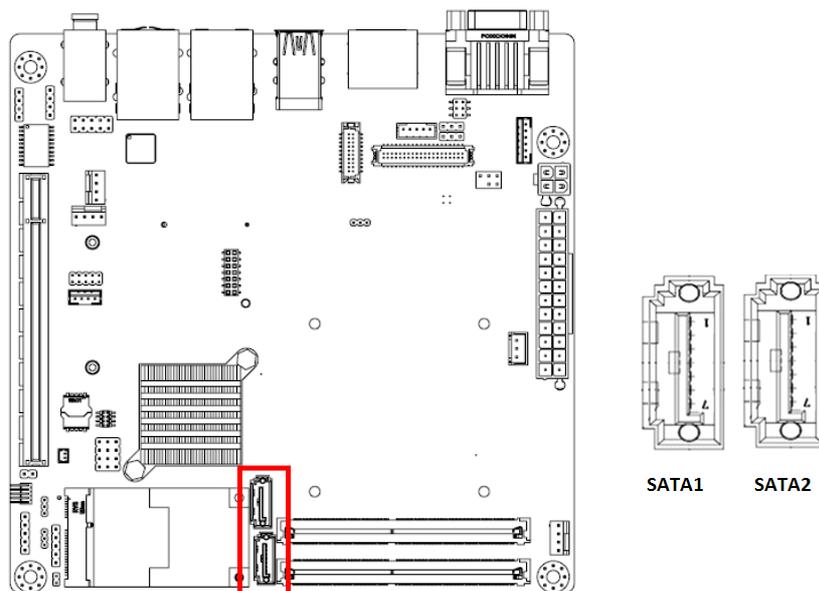
2.9 HD Analog Audio Interface (AUDIO1, FPAUDIO1)



2.10 Digital Audio Connector (SPDIF_OUT1)

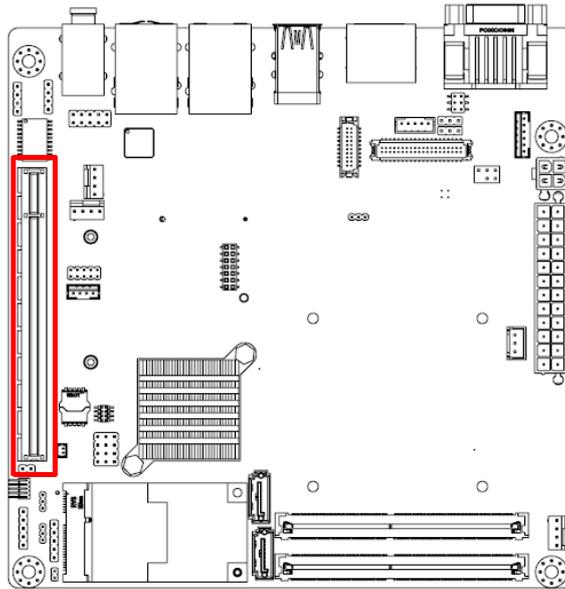


2.11 Serial ATA Interface (SATA1, SATA2)



AIMB-242 features a high performance Serial ATA III interface (up to 600 MB/s) which eases hard drive cabling with thin, space-saving cables.

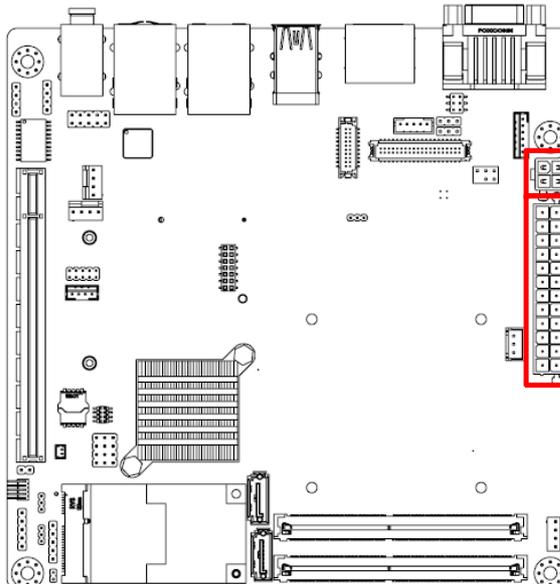
2.12 PCI Express x16 Slot



AIMB-242 provides a PCIe x16 slot to install add-on cards when their applications require higher graphic performance than the CPU embedded graphics controller can provide.

2.13 ATX Power Connector (EATXPWR1, ATX12V1)

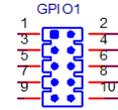
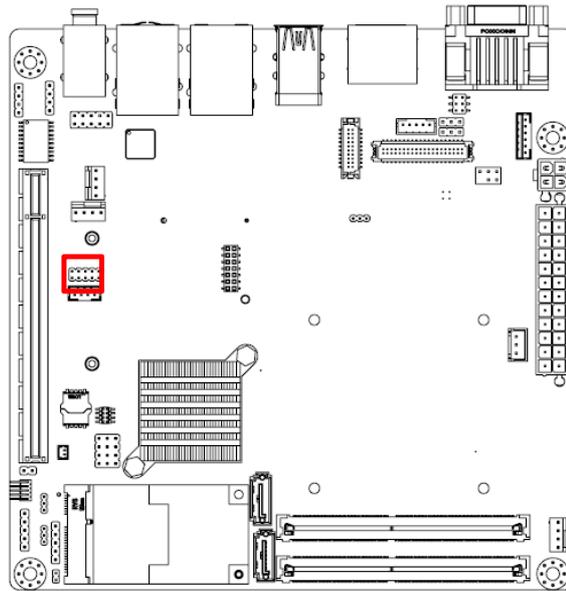
This connector is for an ATX power supply. The plugs from the power supply are designed to fit these connectors in only one direction. Determine the proper orientation and push down firmly until the connectors mate completely.



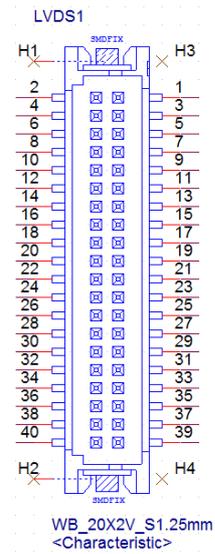
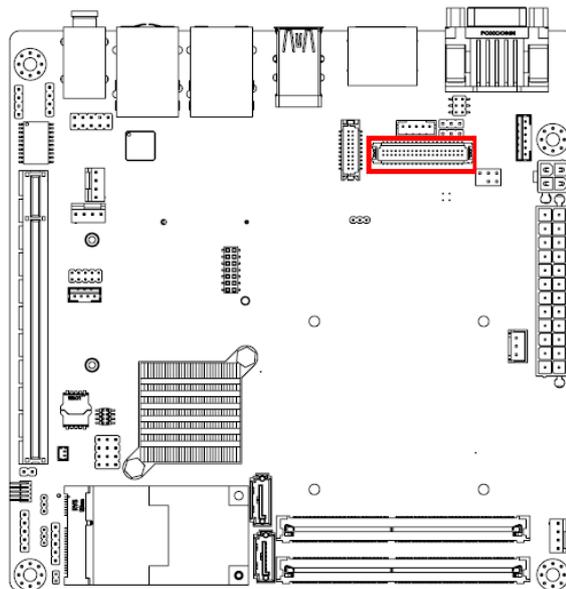
- Note!**
1. Please connect the ATX12V1 connector with the PSU ATX 12V 4-pin connector.
 2. For a fully configured system, we recommend that you use a power supply unit (PSU) that complies with ATX 12 V Specification 2.0 (or later version).



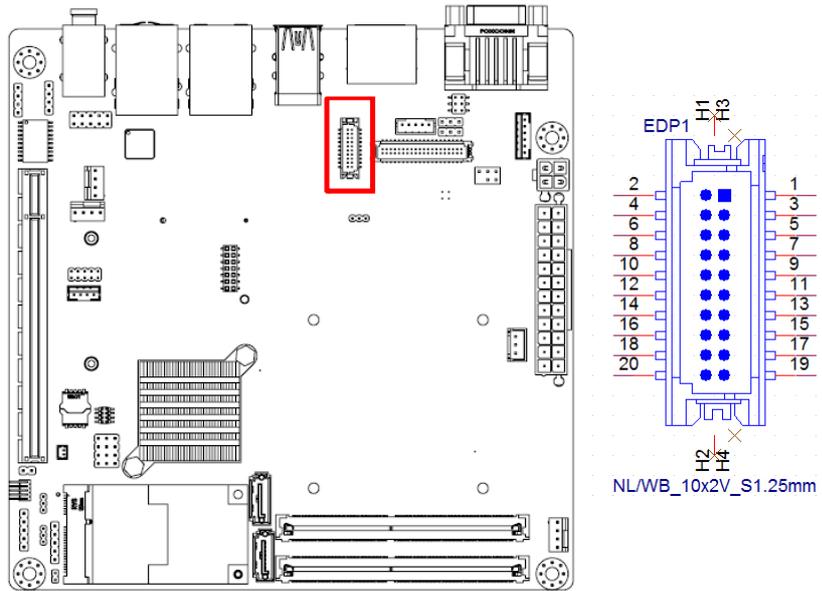
2.14 General purpose I/O Connector (GPIO1)



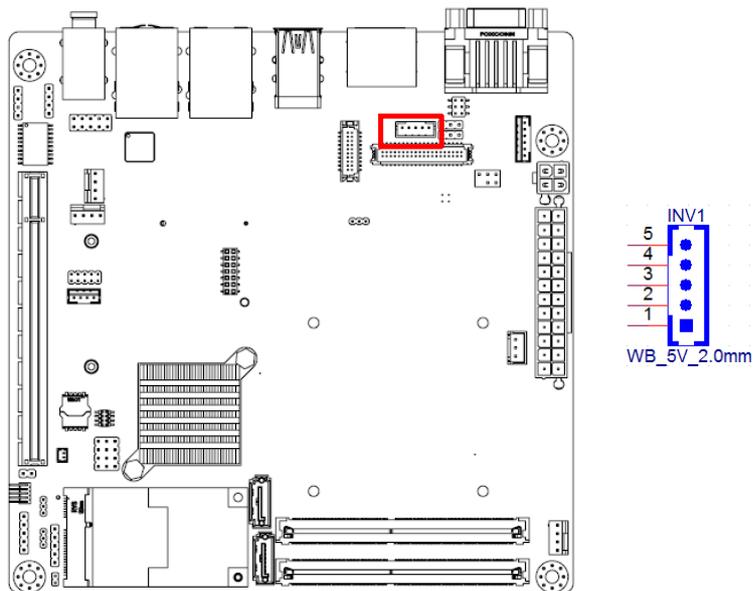
2.15 LVDS Connector (LVDS1)



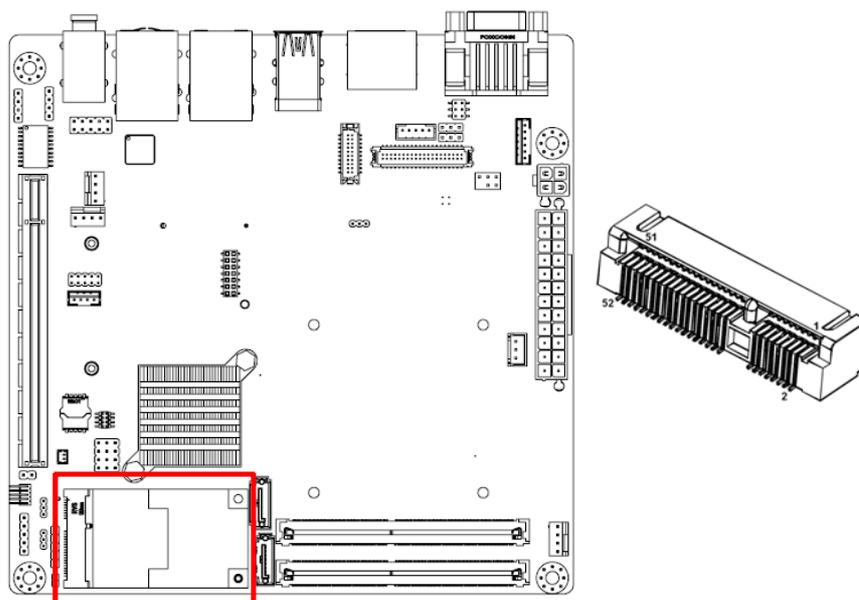
2.16 eDP Connector (eDP1), BOM optional



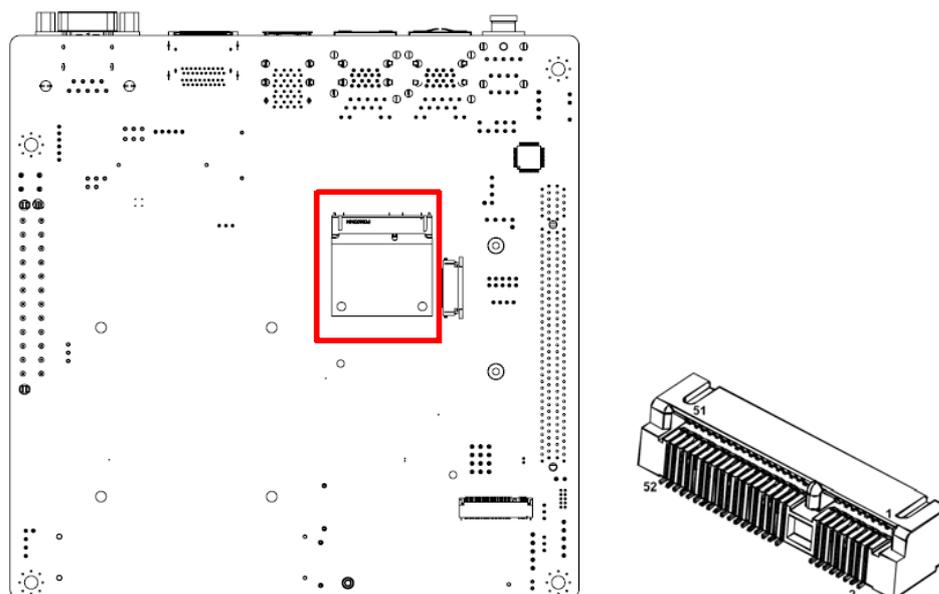
2.17 LVDS Backlight Inverter Power Connector(INV1)



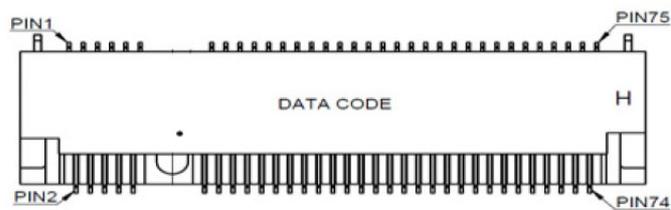
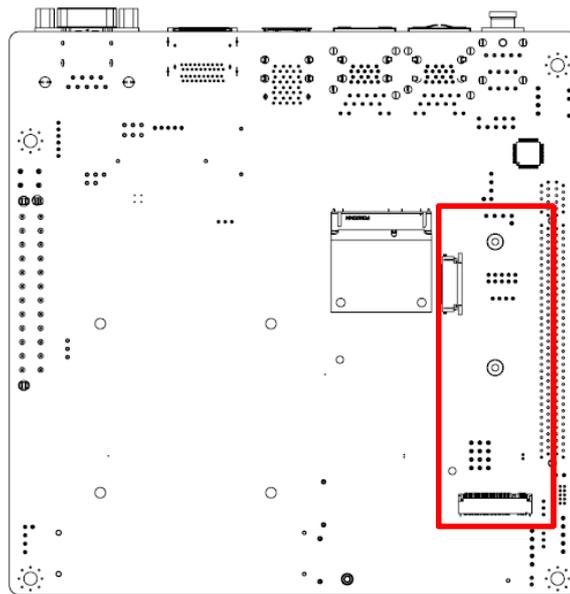
2.18 MINIPCIE and mSATA Connector (MPCIE_F1)



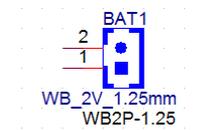
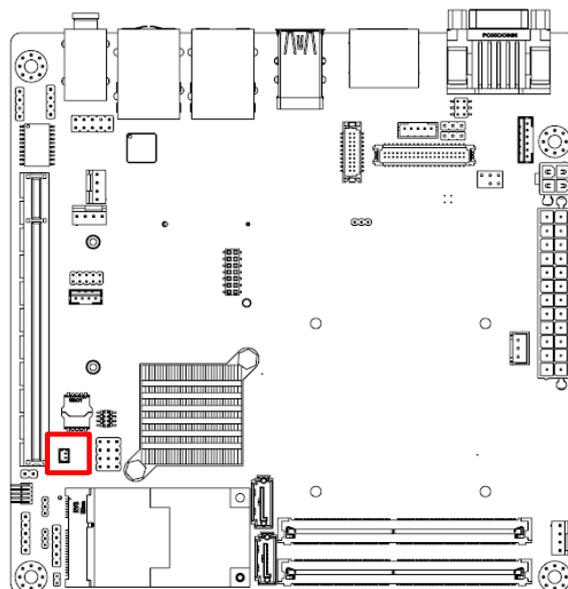
2.19 MINIPCIE Connector (MPCIE_H1)



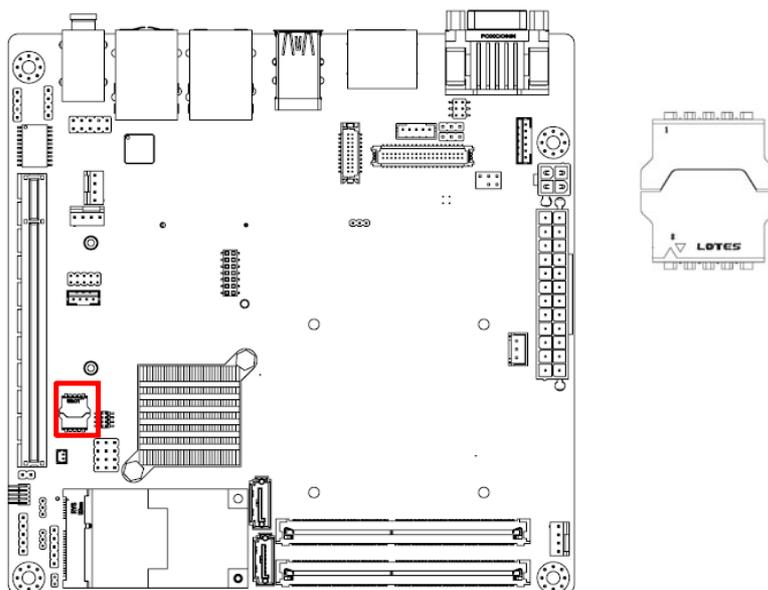
2.20 Next Generation Form Factor (M.2_1)



2.21 Battery Holder (BAT1)

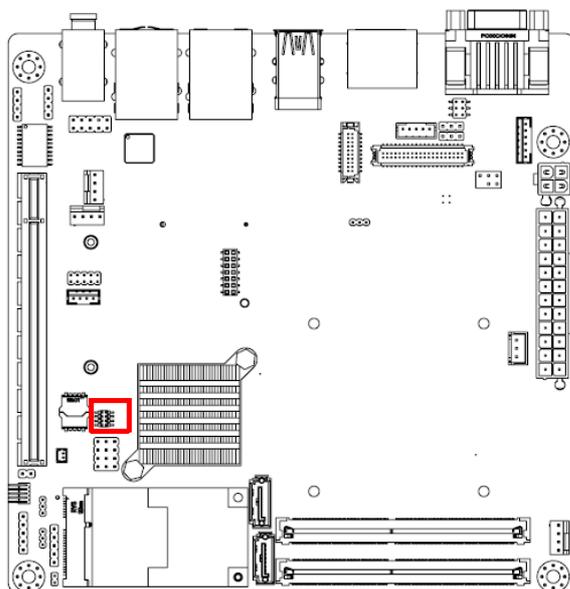


2.22 SPI BIOS Flash Socket (SPI1_1)

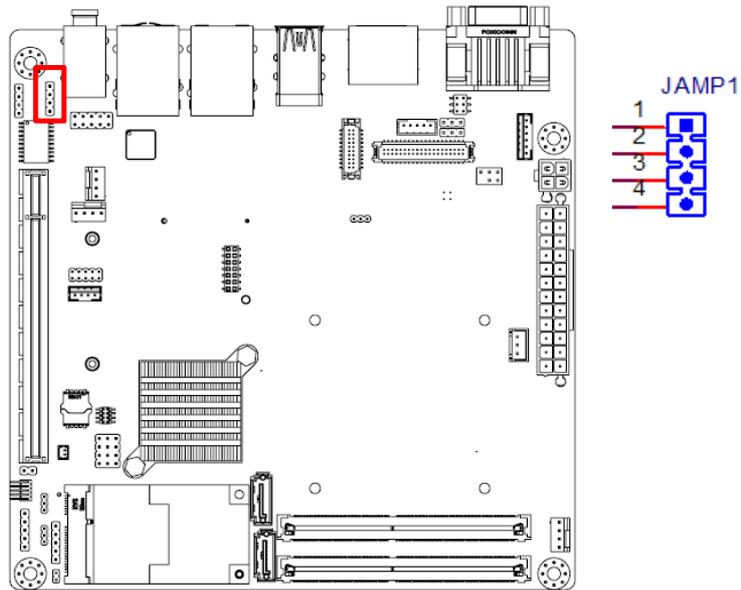


2.23 SPI Programming Pin Header (SPI_CN1)

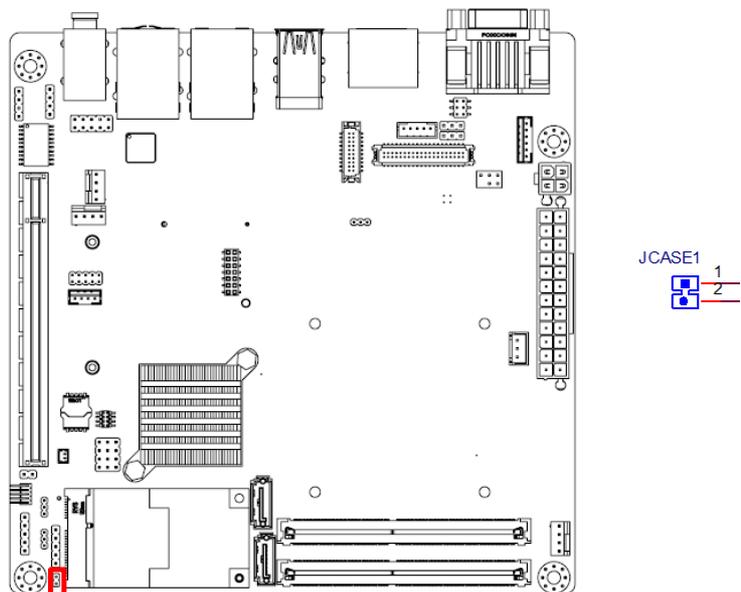
The SPI flash card pin header may be used to flash BIOS if the AIMB-242 cannot power on.



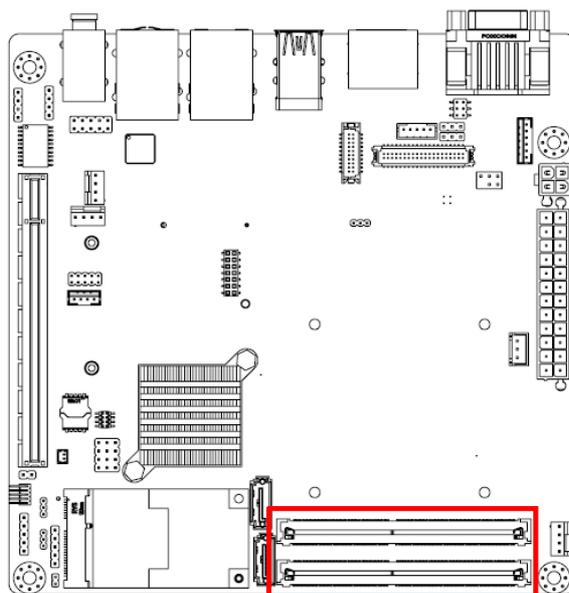
2.24 Audio Amplifier Output Connector (JAMP1), BOM optional



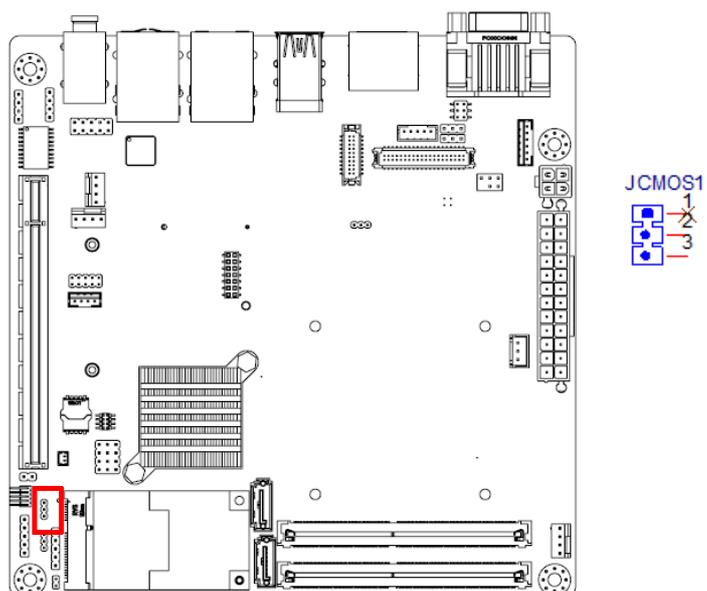
2.25 Case-Open Detect Connector (JCASE1)



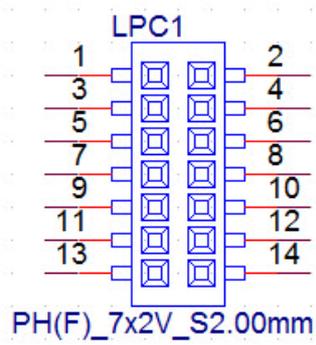
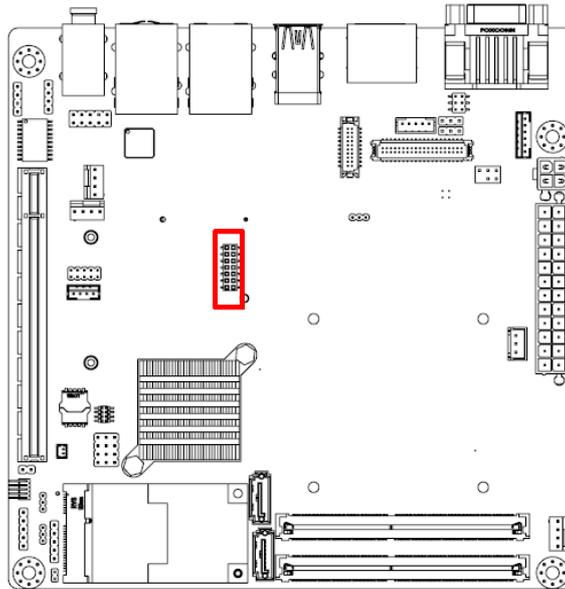
2.26 DDR4 SO-DIMM Socket (DIMMA1, DIMMB1)



2.27 JCMOS1



2.28 Low Pin Count Header (LPC1)



Chapter 3

BIOS Operation

3.1 Introduction

AMI BIOS has been integrated into many motherboards, and has been very popular for over a decade. With the AMI BIOS Setup program, you can modify BIOS settings to control the special features of your computer. The Setup program uses a number of menus for making changes. This chapter describes the basic navigation of the AIMB-242 setup screens.

3.2 BIOS Setup

The AIMB-242 Series system has AMI BIOS built in, with a SETUP utility that allows users to configure required settings or to activate certain system features.

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

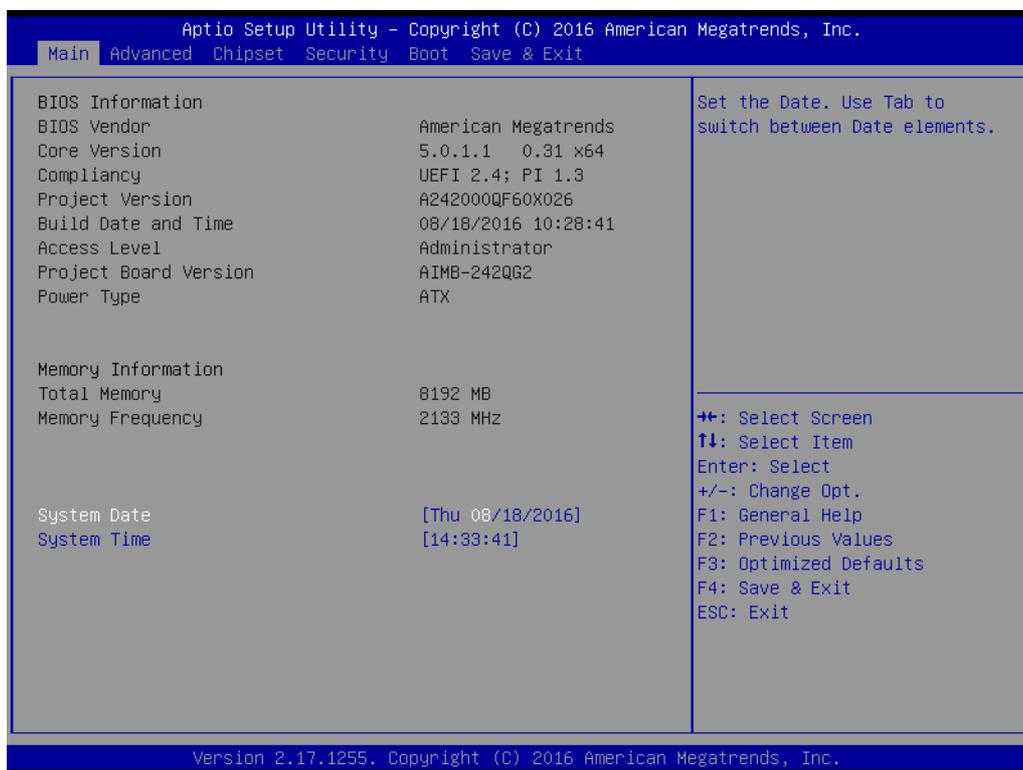
When the power is turned on, press the or <Esc> button during the BIOS POST (Power-On Self Test) to access the CMOS SETUP screen.

Control Keys

< ← >> → >	Select Screen
< ↑ >> ↓ >	Select Item
<Enter>	Select
<+/->	Change Opt
<F1>	General help
<F2>	Previous Values
<F3>	Optimized Defaults
<F4>	Save & Exit
<Esc>	Exit

3.2.1 Main Menu

Press 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.

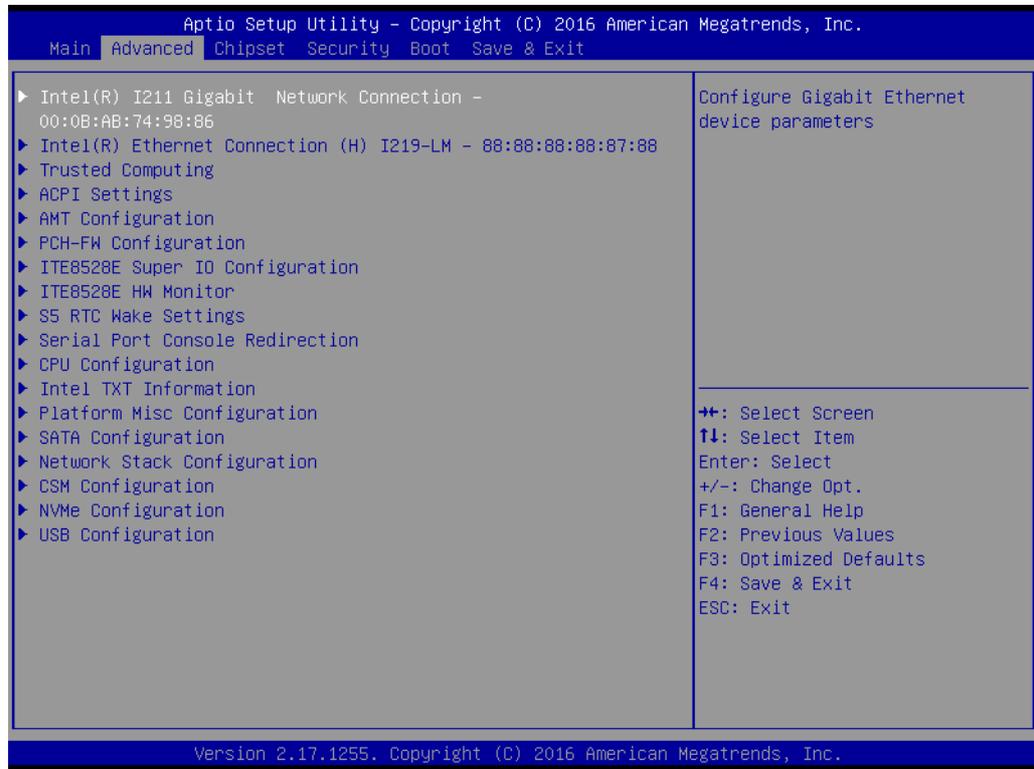
Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

■ System time / System date

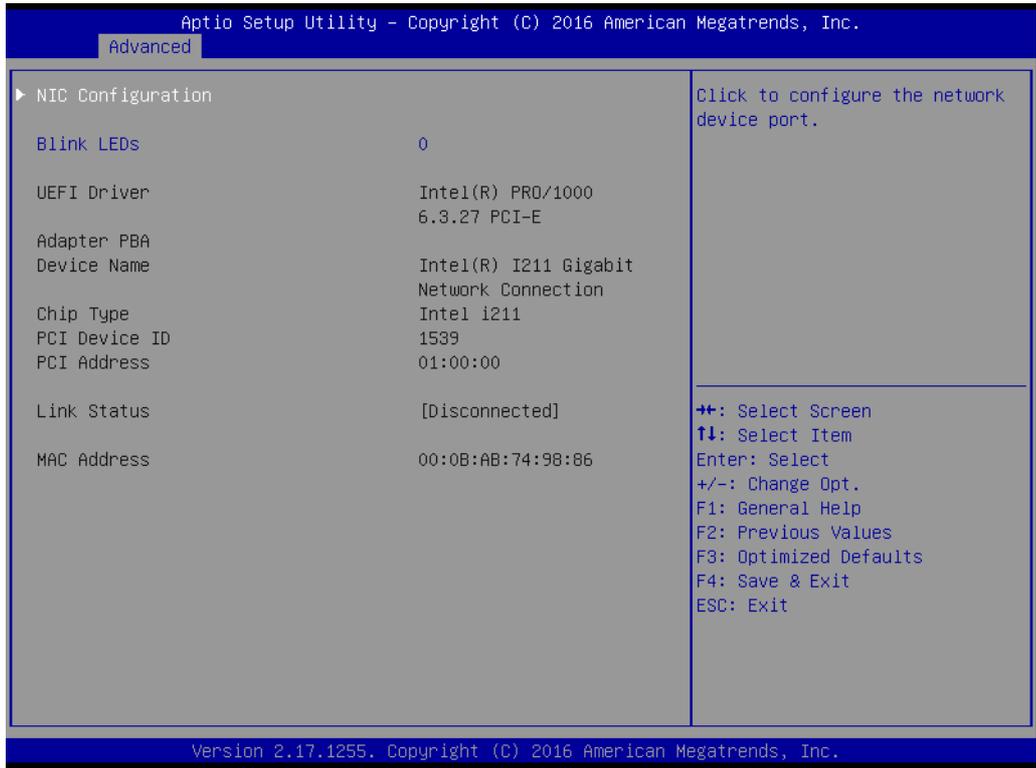
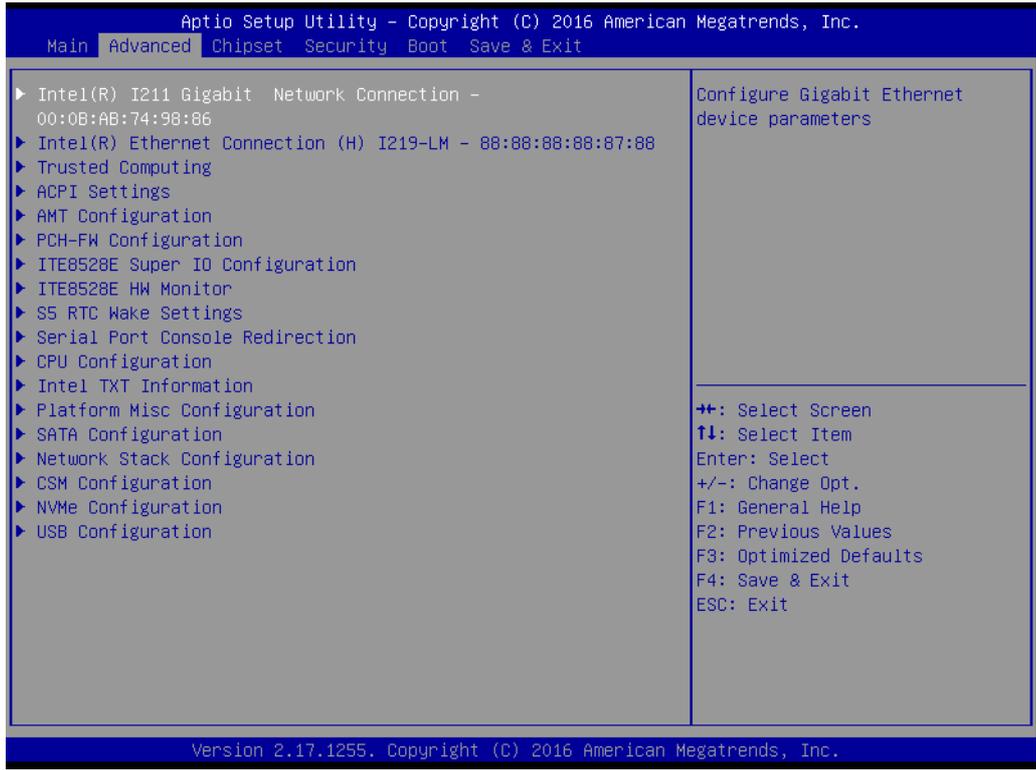
Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time must be entered in HH:MM:SS format.

3.2.2 Advanced BIOS Features

Select the Advanced tab from the AIMB-242 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 Intel® I211 Gigabit Network Connection



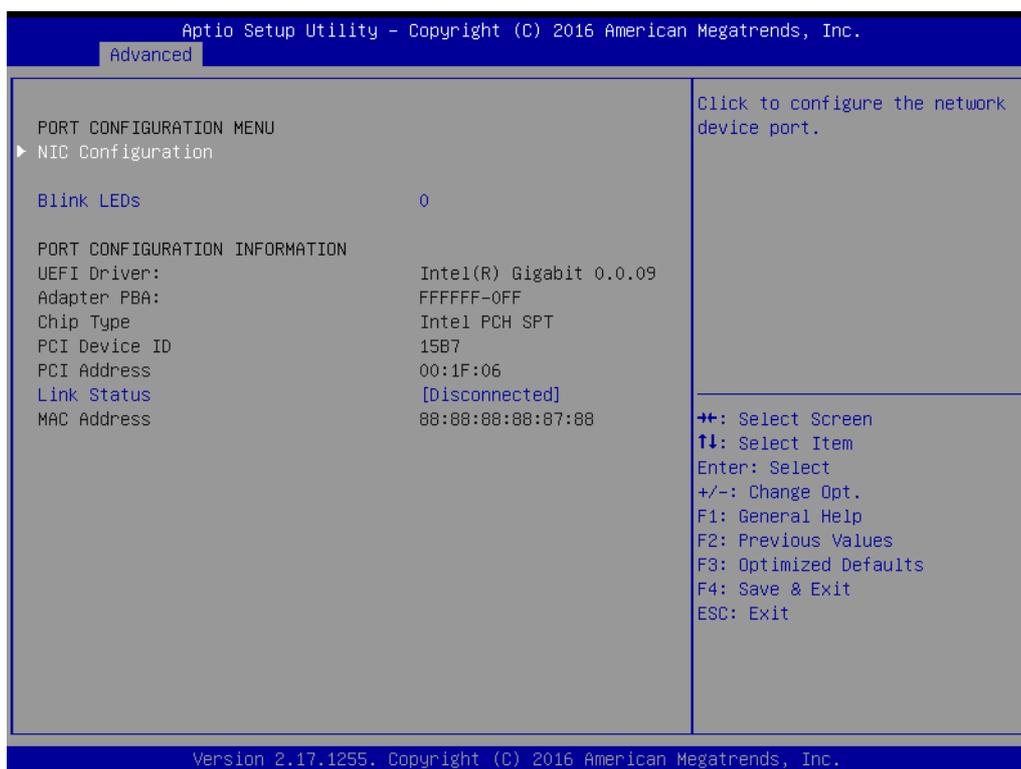
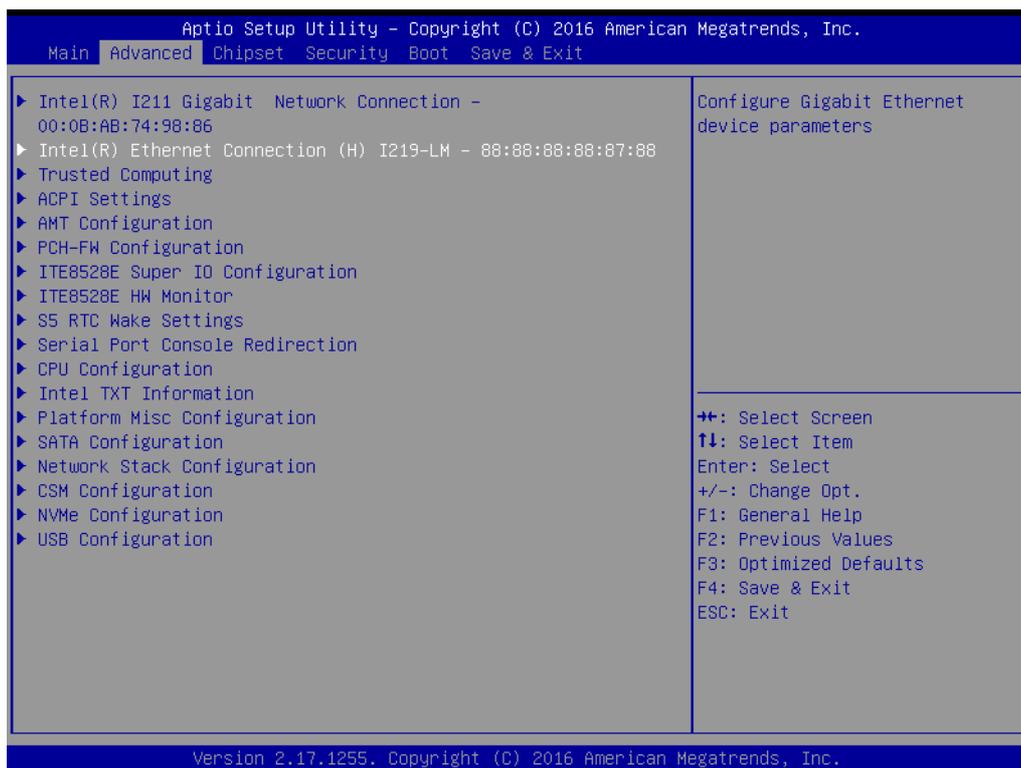
■ NIC Configuration

Click to configure the network device port.



- Link Speed
Specifies the port speed used for the selected boot protocol.
- Wake On LAN
Enabled or disabled Wake On LAN.

3.2.2.2 Intel® Ethernet Connection I219LM

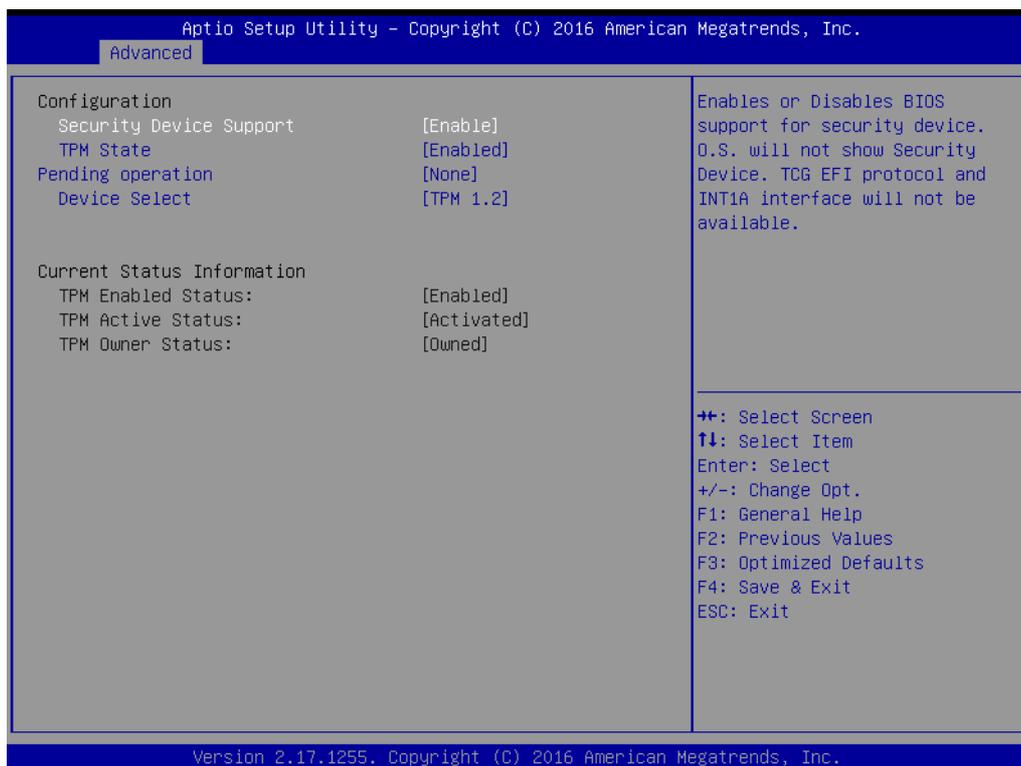
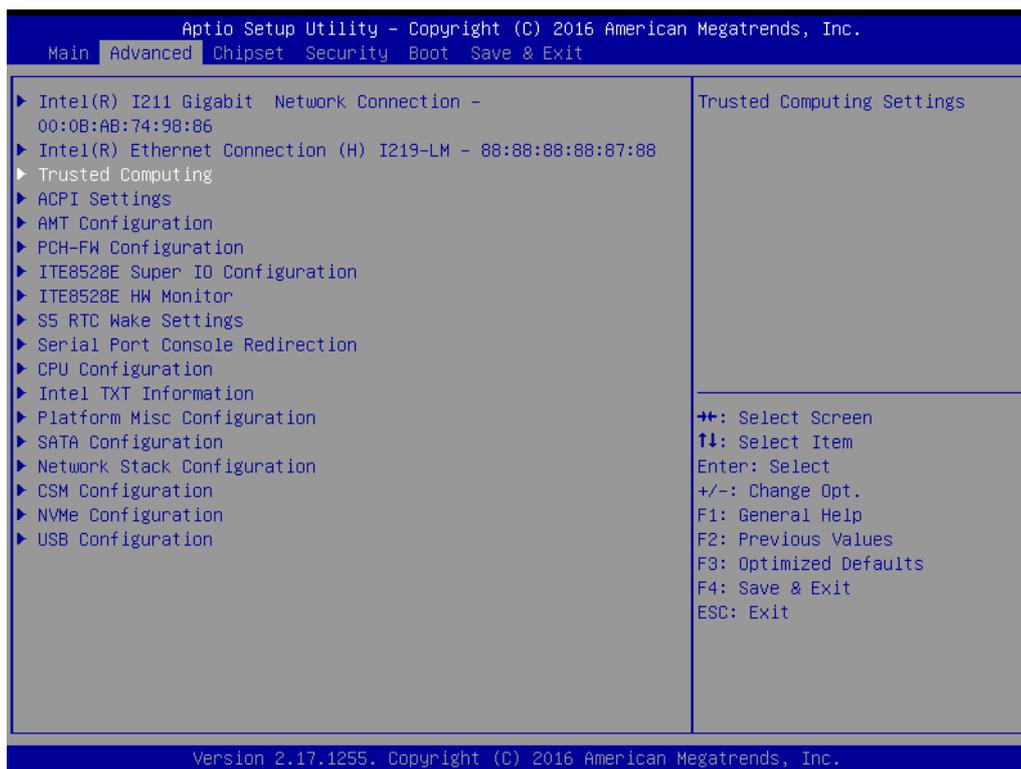


- **NIC Configuration**
Click to configure the network device port.



- Link Speed
Specifies the port speed used for the selected boot protocol.

3.2.2.3 Trusted Computing

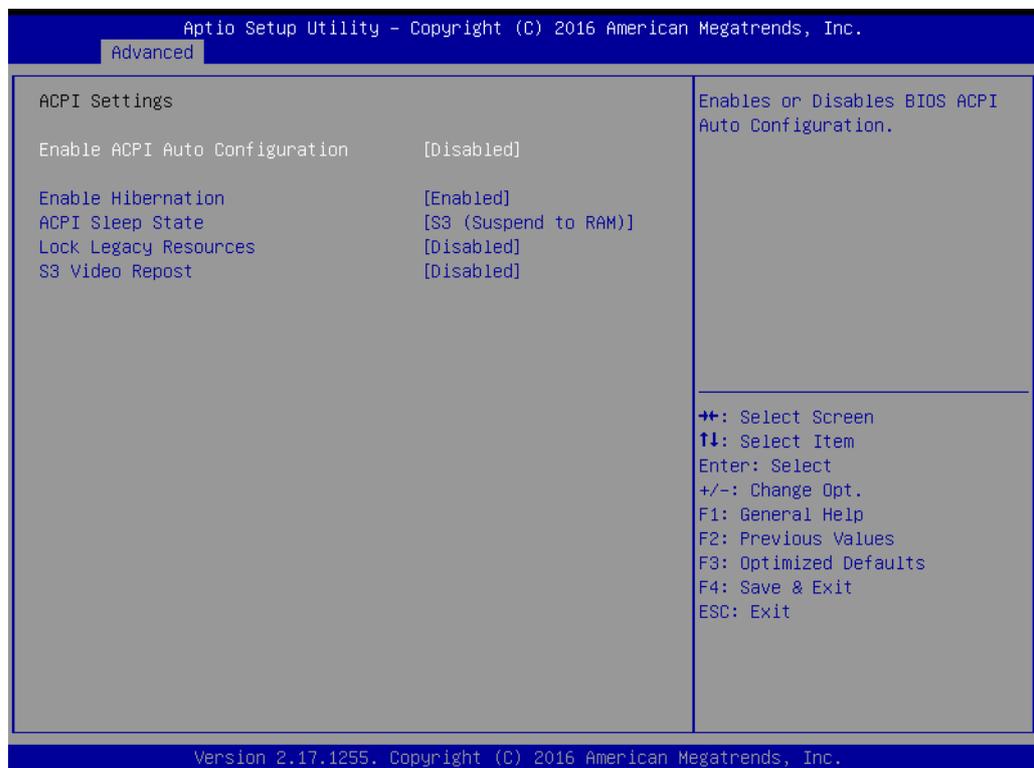
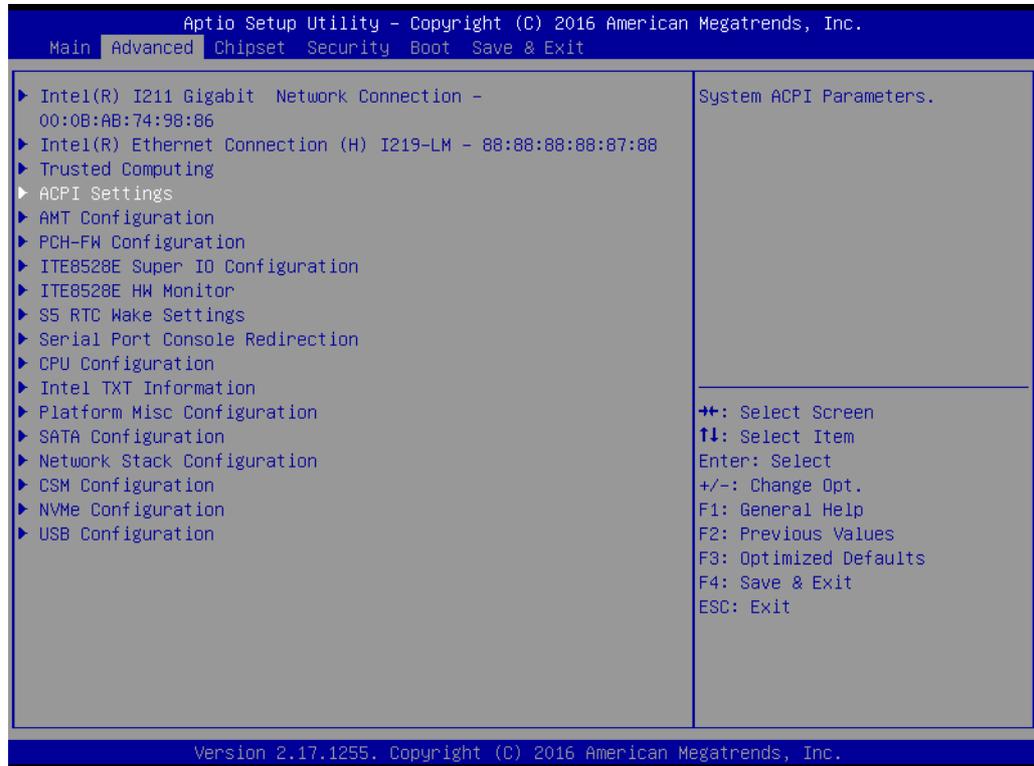


- **Security Device Support**
Enable or Disable BIOS support for security device.
- **TPM State**
Enable or disable security device.
- **Pending operation**
Schedule an operation for the security device.

- **Device Select**

TPM 1.2 will restrict support to TPM 1.2 devices, TPM 2.0 will restrict support to TPM 2.0 devices, Auto will support both with the default set to TPM 2.0 devices if not found, TPM 1.2 devices will be enumerated.

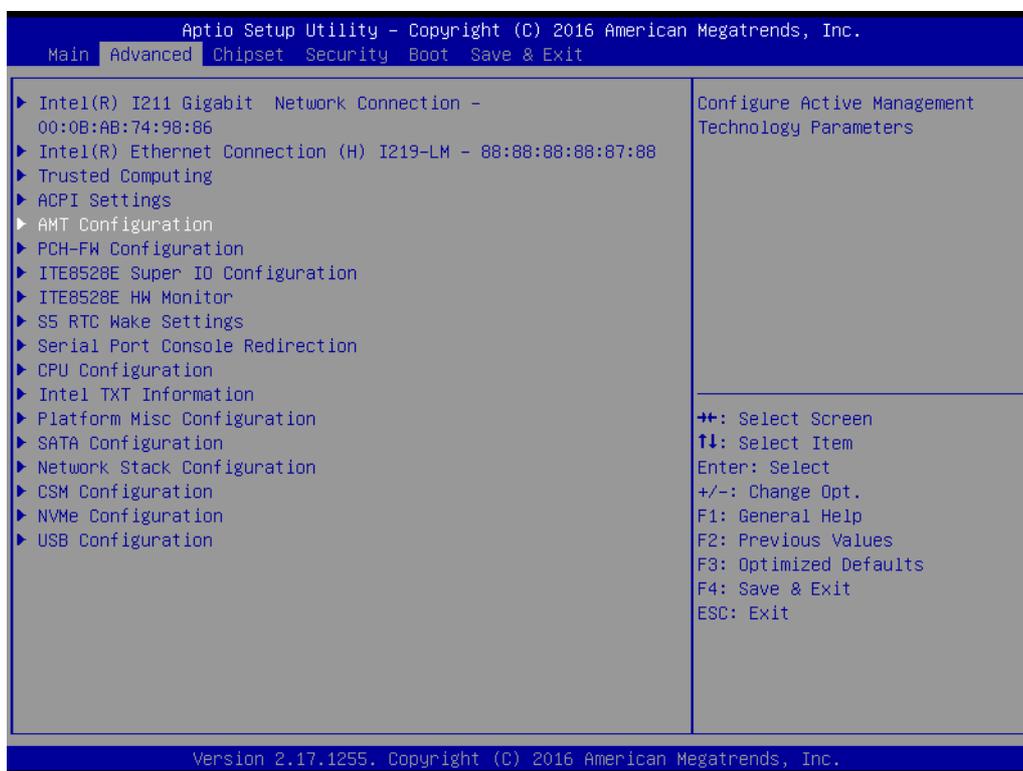
3.2.2.4 ACPI Settings

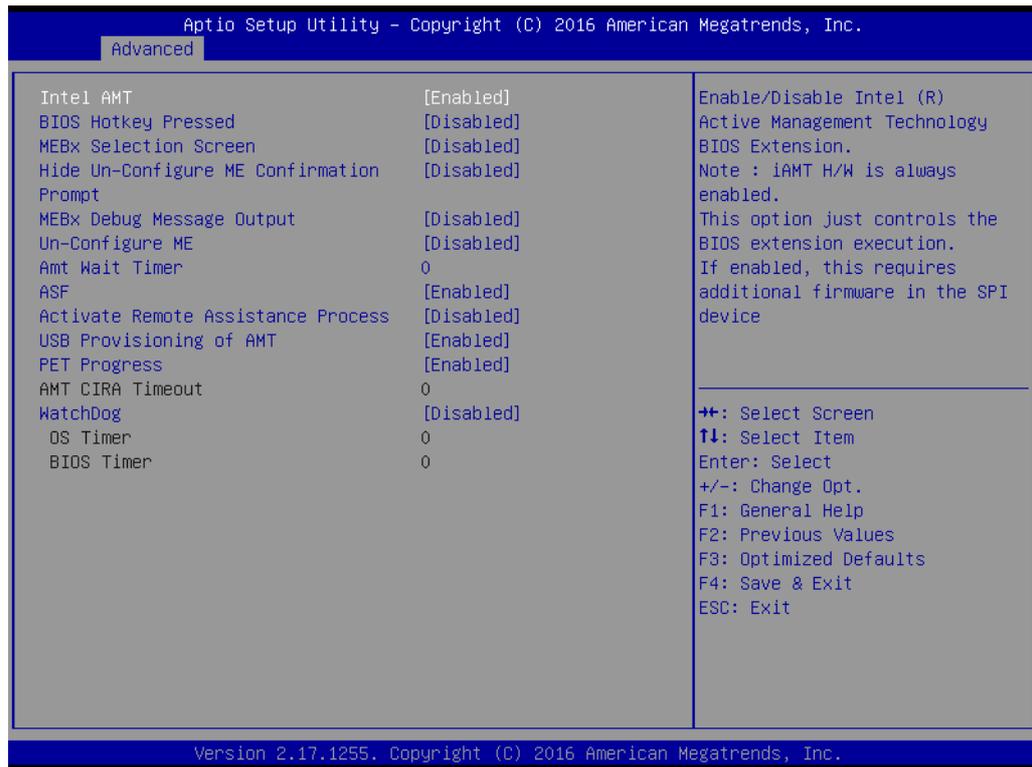


ACPI Settings

- **Enable ACPI Auto Configuration**
Enable or Disable ACPI Auto Configuration
- **Enable Hibernation**
Enable or Disable system ability to hibernate (OS/S4 Sleep state). This option may be not effective with some OS.
- **ACPI Sleep State**
Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.
- **Lock Legacy Resources**
Enable or disable lock of legacy resources.
- **S3 Video Repost**
Enable or Disable S3 video repost

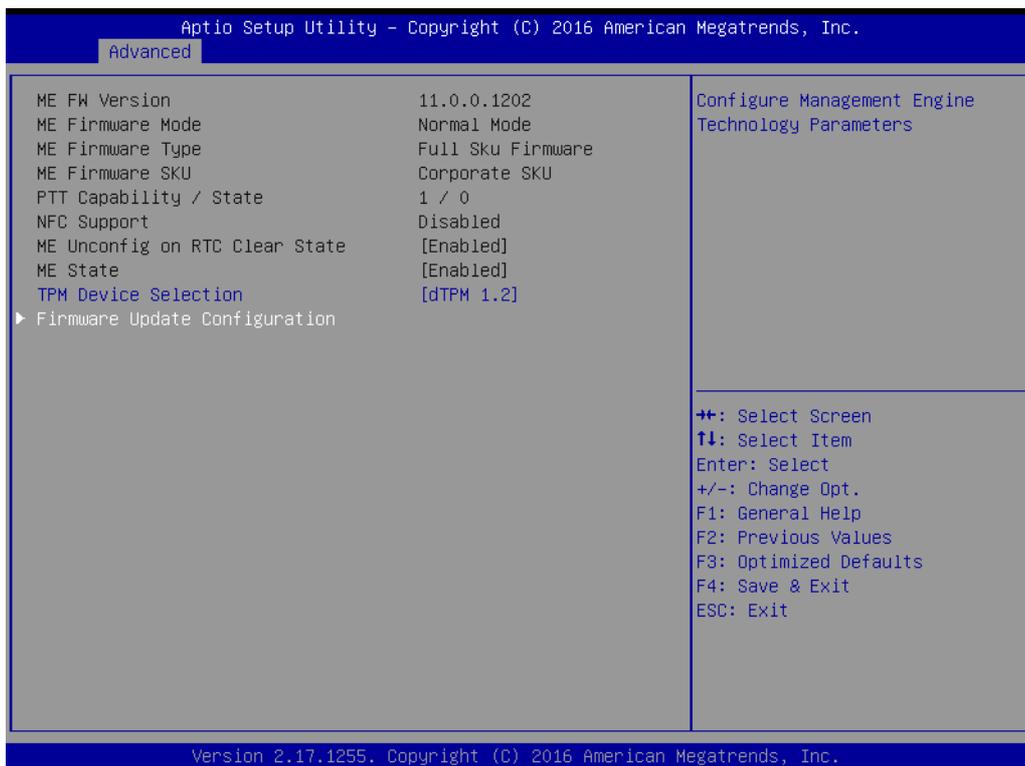
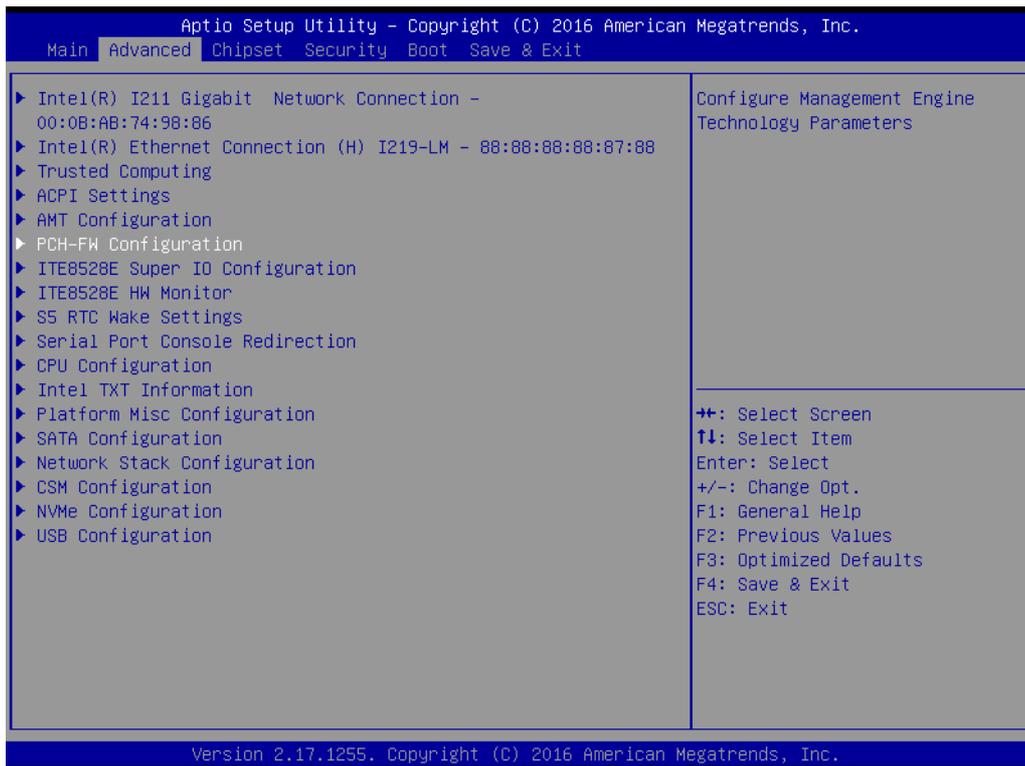
3.2.2.5 AMT Configuration





- **Intel AMT**
Enable or disable Intel Active Management Technology BIOS Extension.
Note: iAMT H/W is always enabled. This option just controls the BIOS extension execution. If enabled, this requires additional firmware in the SPI device.
- **BIOS Hotkey Pressed**
Enable or disable BIOS hotkey pressed
- **NEBx Selection Screen**
Enable or disable NEBx selection screen
- **Hide un-Configure ME Confirmation Prompt**
Hide un-configure ME without password confirmation prompt
- **MEBx Debug Message Output**
Enable MEBx debug message output
- **Un-configure ME**
Un-configure ME without password
- **ASF**
Enable or disable Alert specification format
- **Active Remote Assistance Process**
Trigger CIRA boot
- **USB provisioning of AMT**
Enable or disable of AMT USB provisioning
- **PET Progress**
Enable or disable PET Progress
- **WatchDog**
Enable or disable watchdog timer

3.2.2.6 PCH-FW Configuration

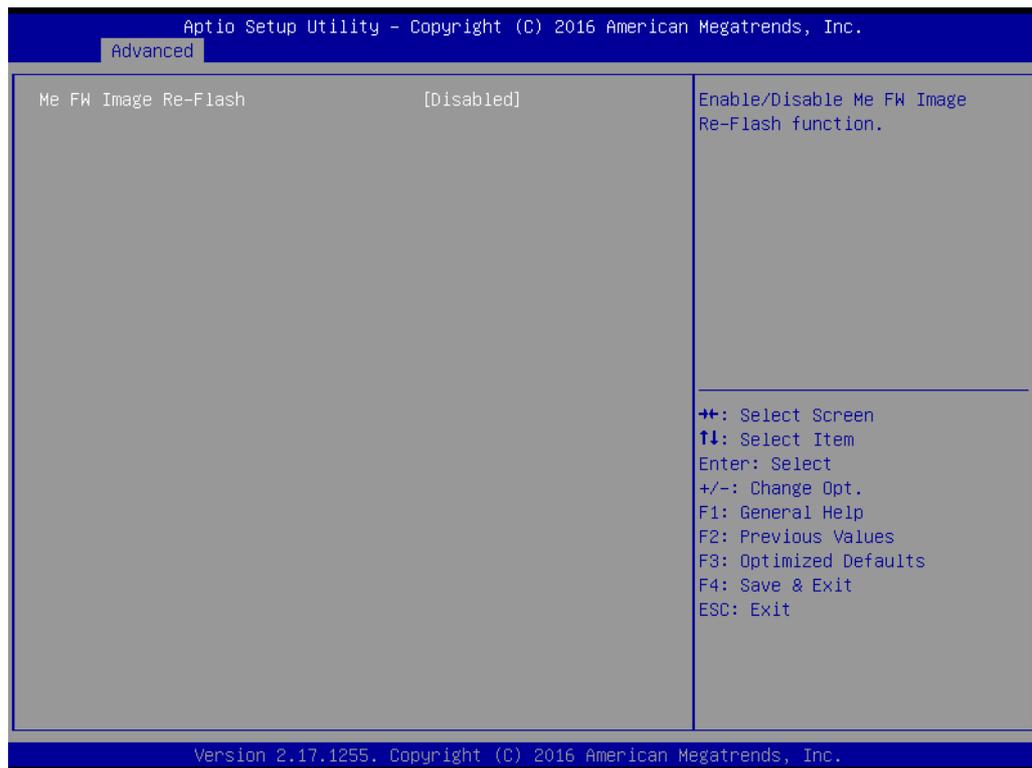


■ TPM Device Selection

Selects TPM device: PTT or dTPM.

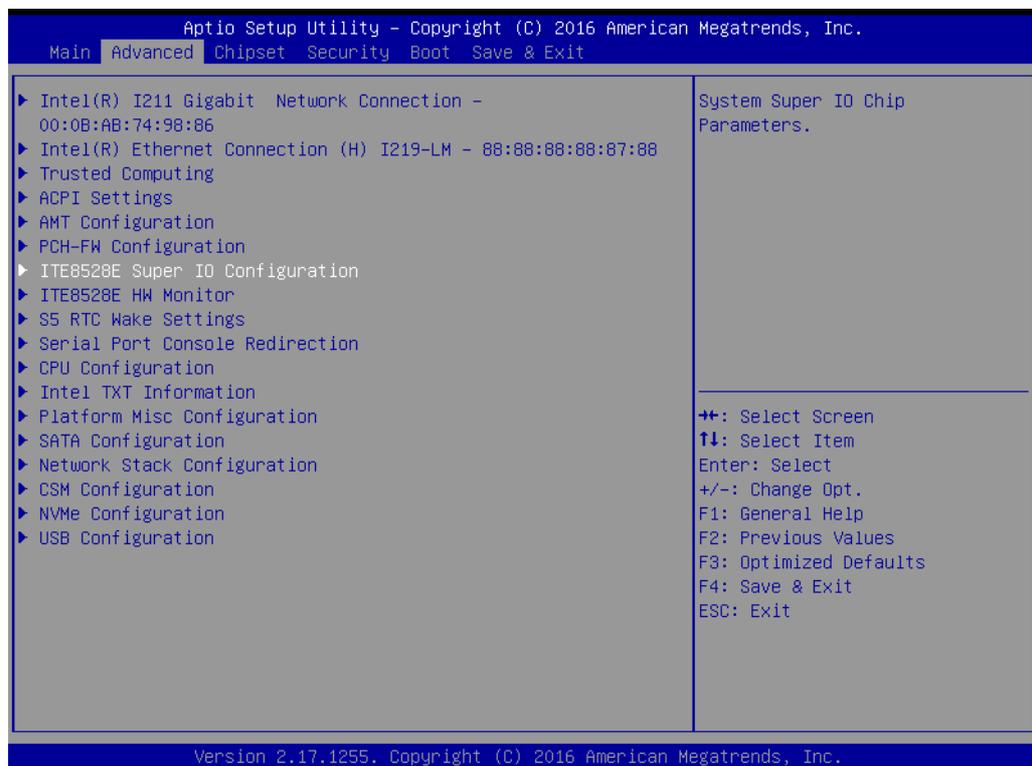
PTT- Enables PTT in SkuMgr dTPM 1.2- Disables PTT in SkuMgr warning !
 PTT/dTPM will be disabled and all data saved on it will be lost.

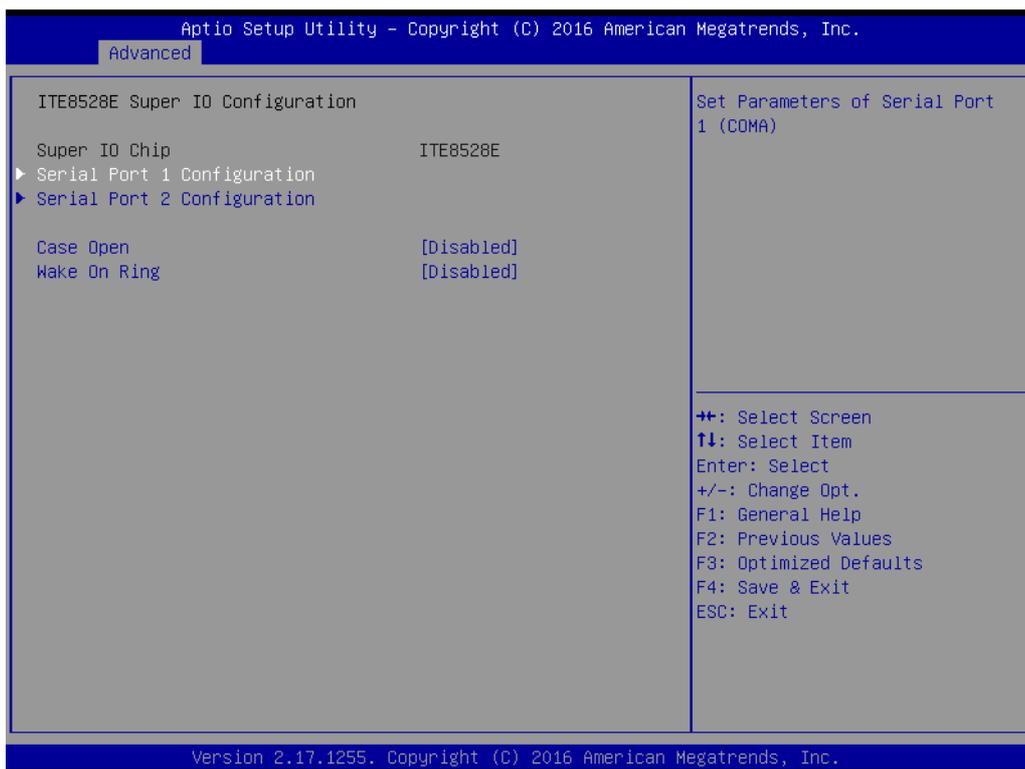
Firmware update Configuration



- **ME FW Image Re-Flash**
Enable or disable ME FW image re-flash function.

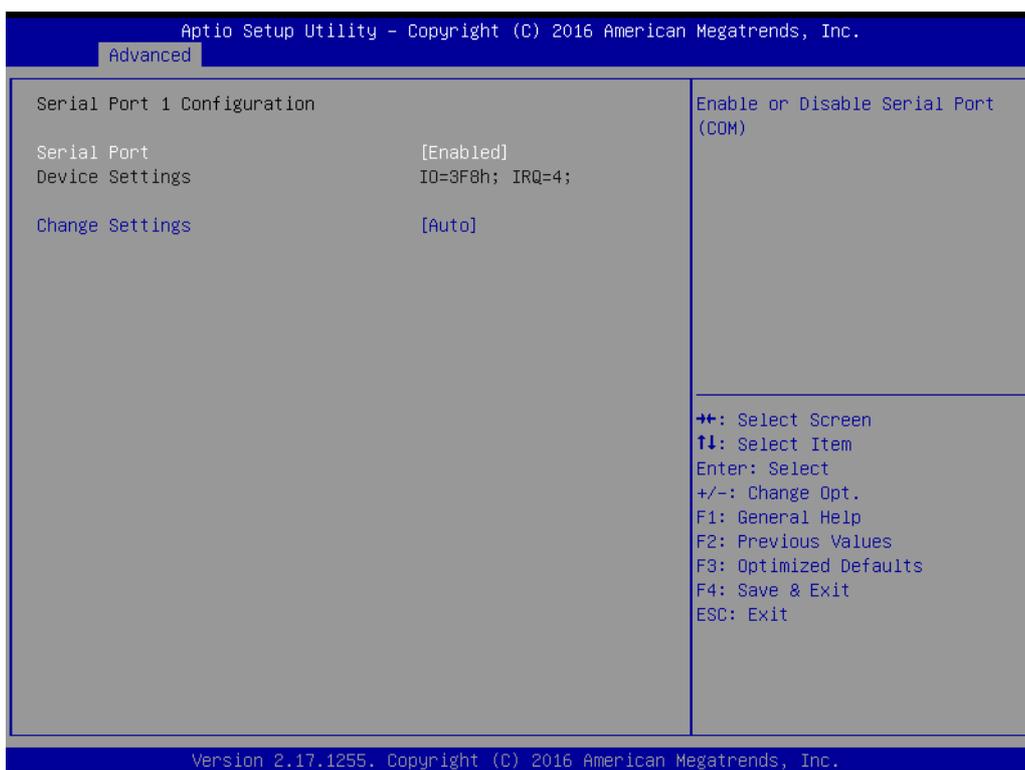
3.2.2.7 ITE8528E Super IO Configuration





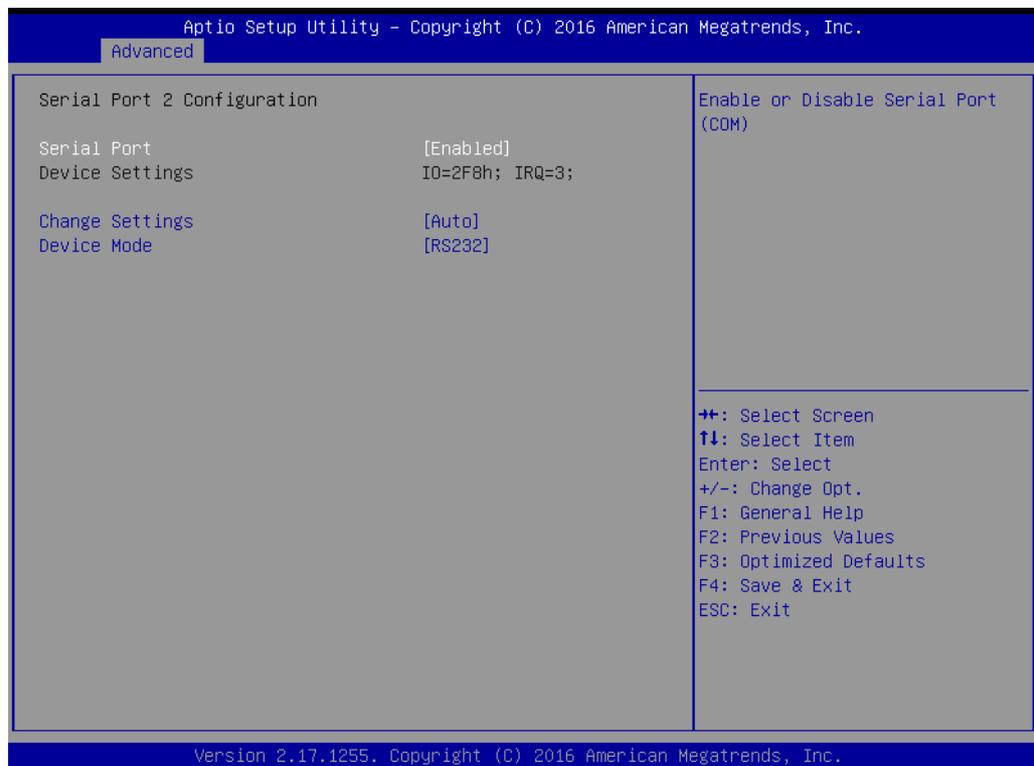
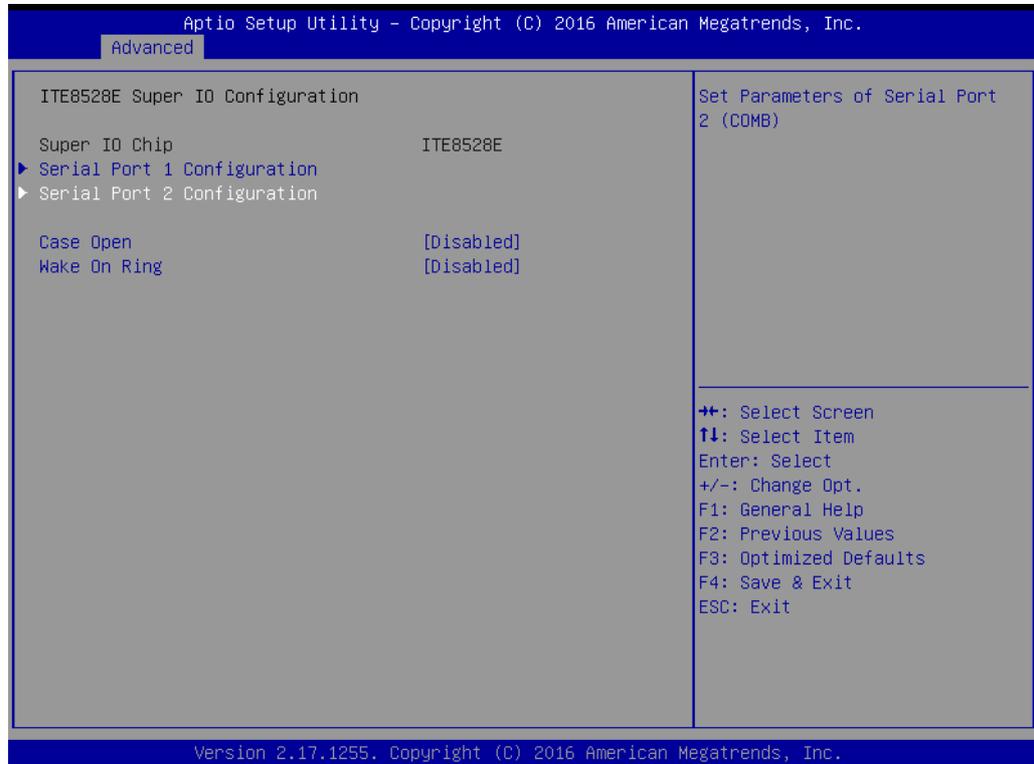
- **Case open**
Enable or disable case open function
- **Wake on Ring**
Enable or disable wake on Ring.

Serial Port 1 Configuration



- **Serial Port**
Enable or disable serial port 1
- **Change Settings**
Select an optimal settings for super IO device.

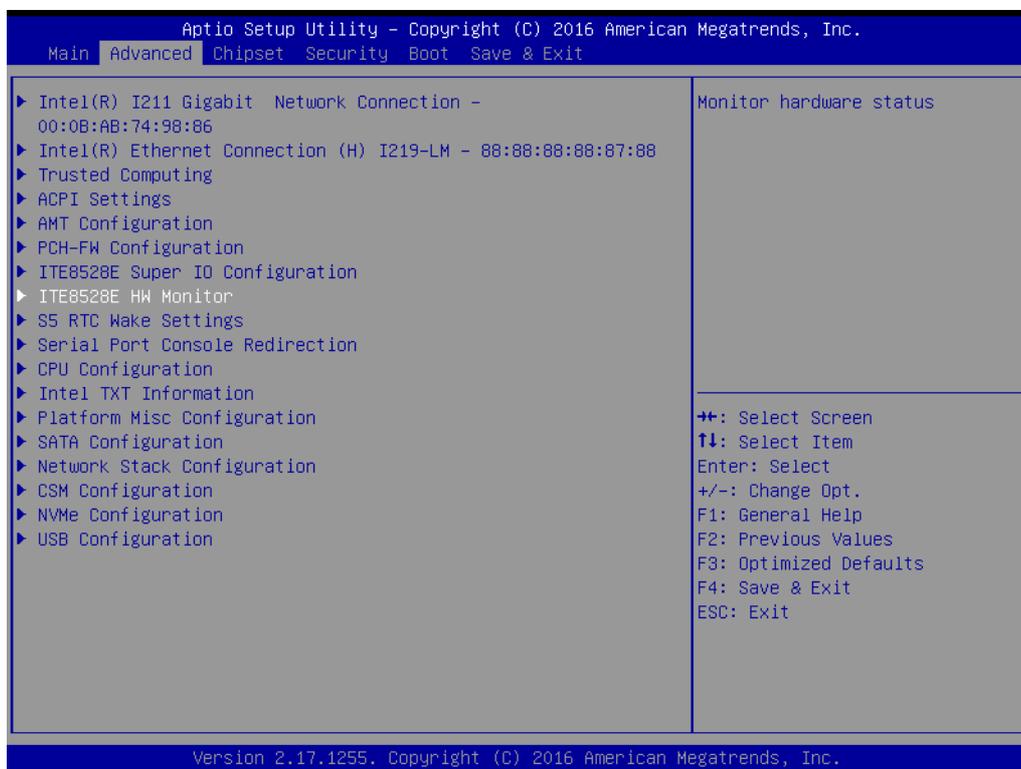
Serial Port 2 Configuration



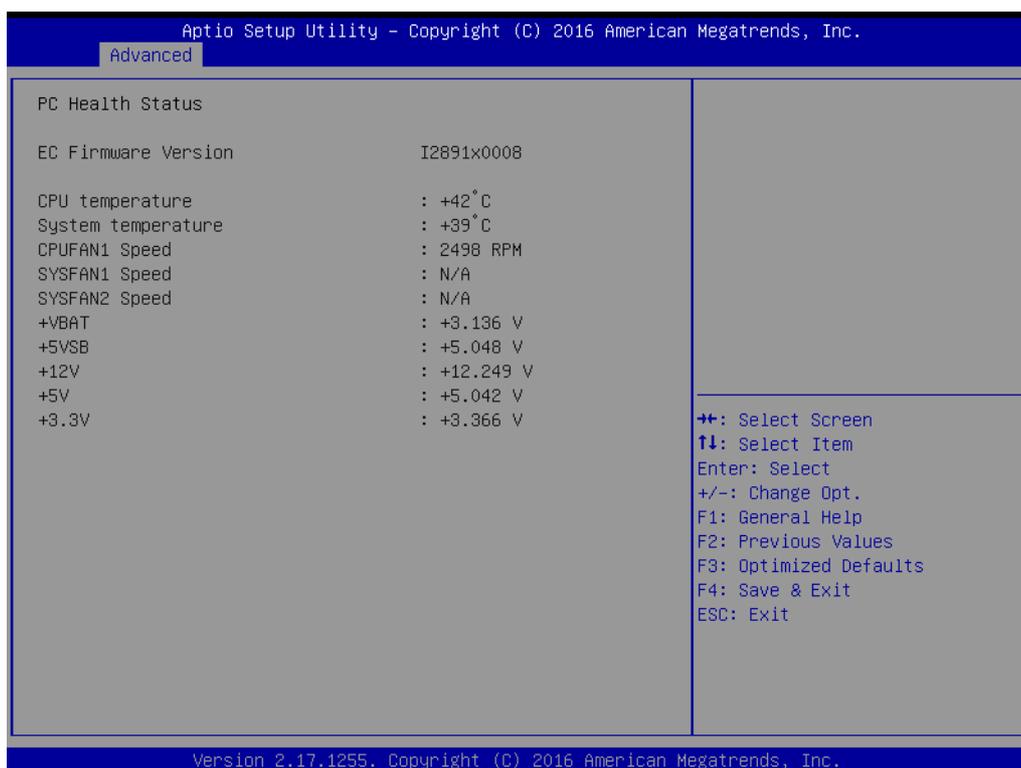
- **Serial Port**
Enable or disable serial port 2.

- **Change Settings**
Select an optimal settings for super IO device.
- **Device Mode**
Device Mode Select

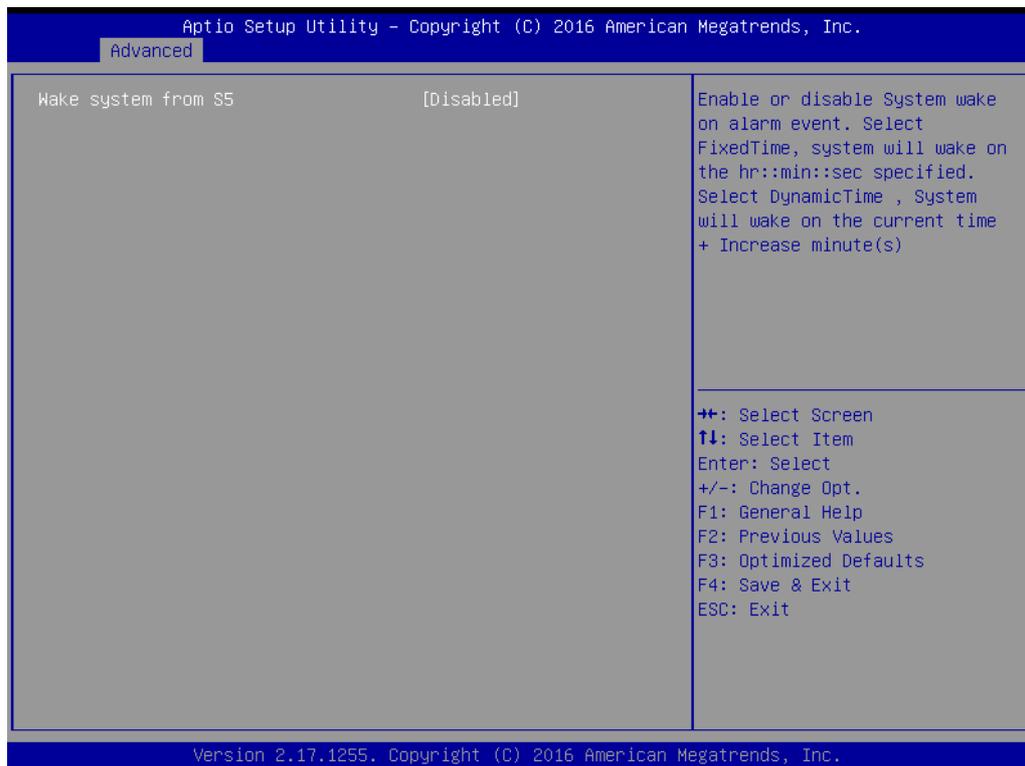
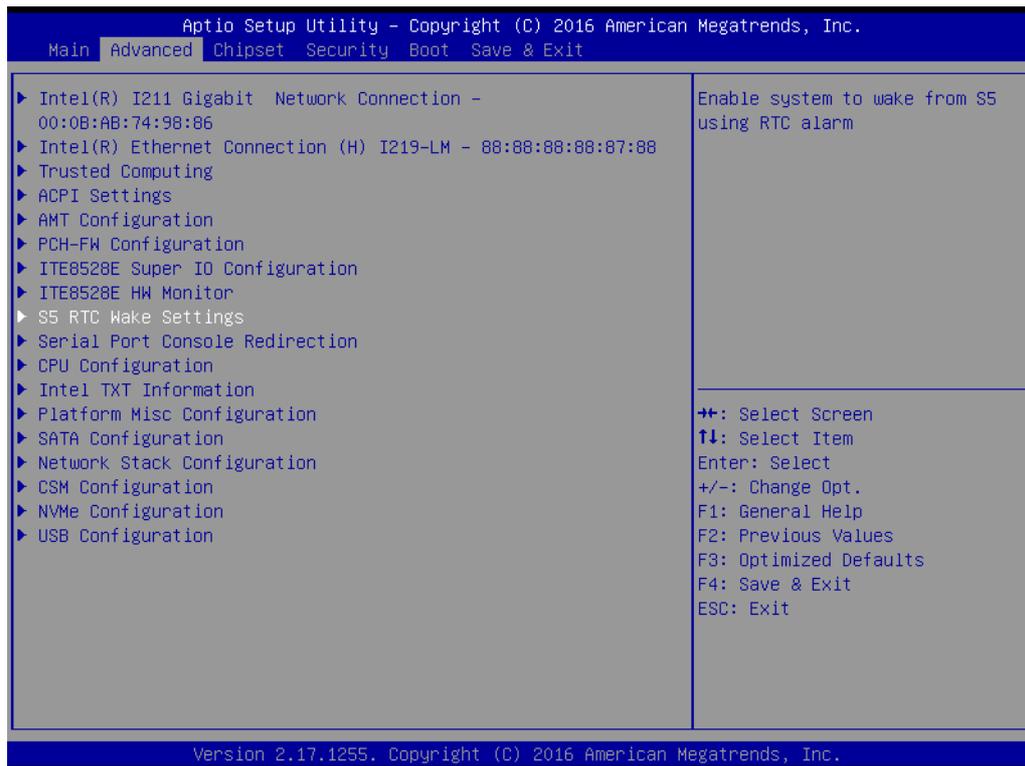
3.2.2.8 ITE8528E HW Monitor



PC Health Status



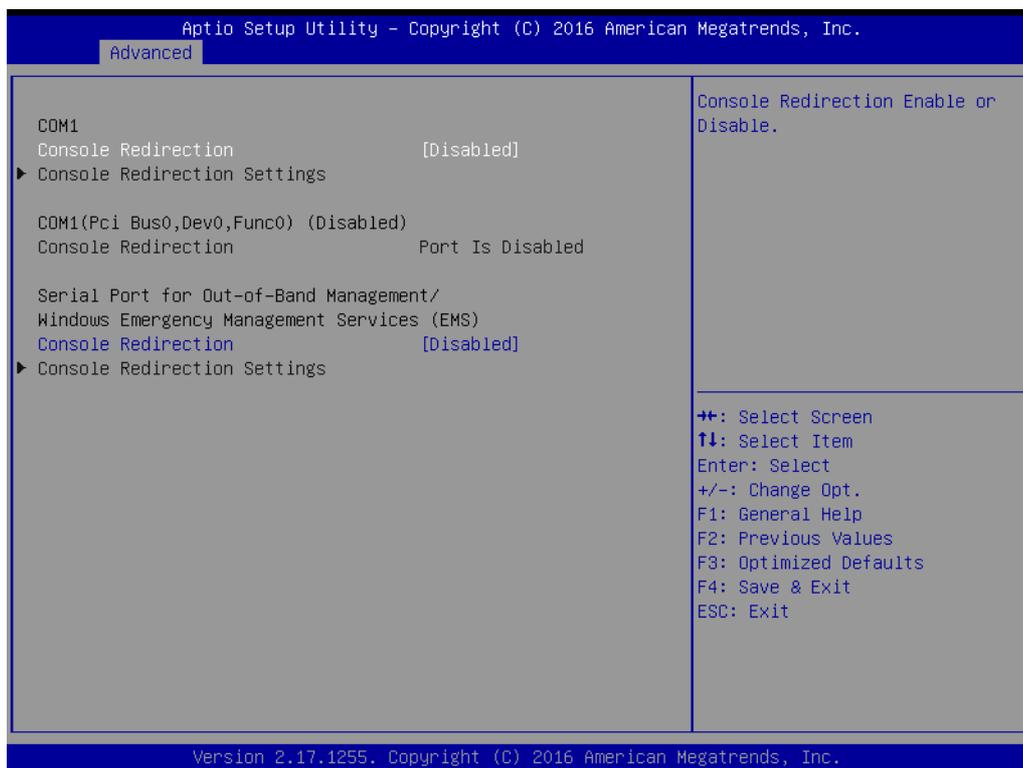
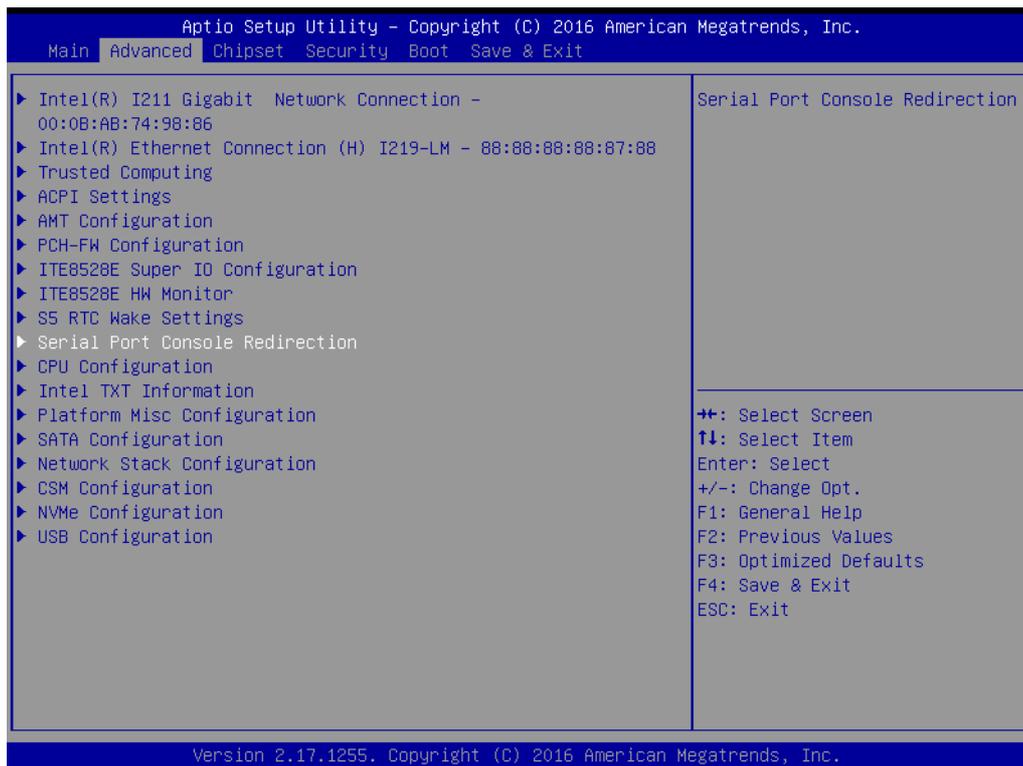
3.2.2.9 S5 RTC Wake Settings



■ **Wake system from S5**

Enable or disable system wake on alarm event. Select FixedTime, system will wake on the hr::min::sec specified. Select DynamicTime, system will wake on the current time + Increase minute(s)

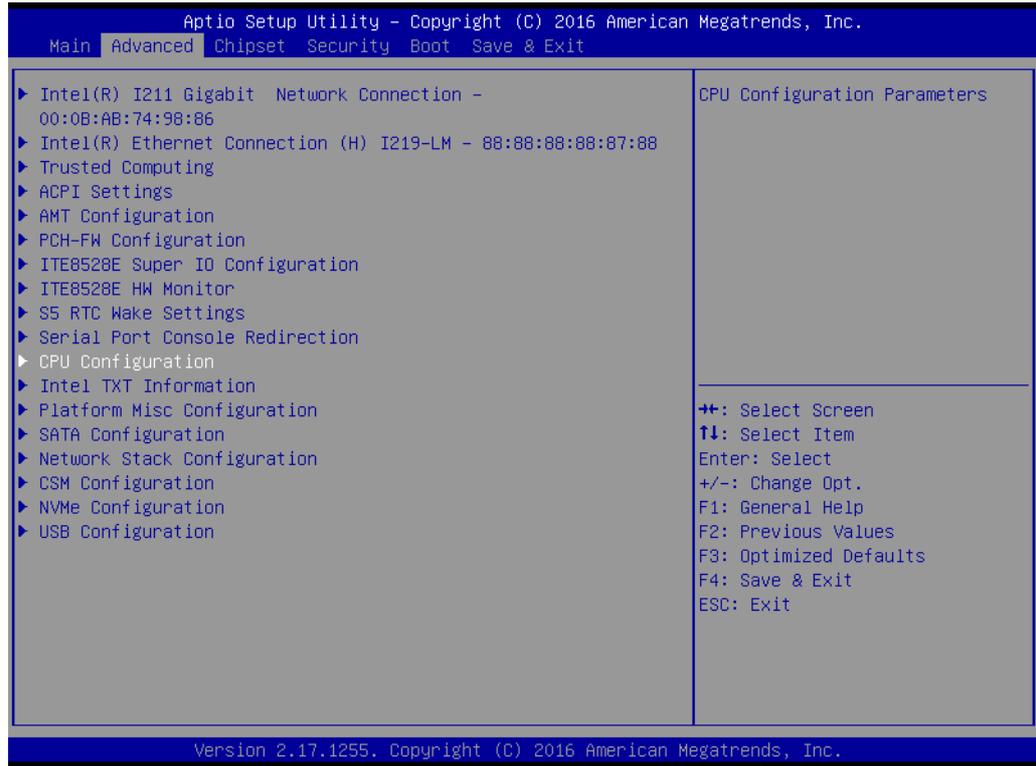
3.2.2.10 Serial Port Console Redirection



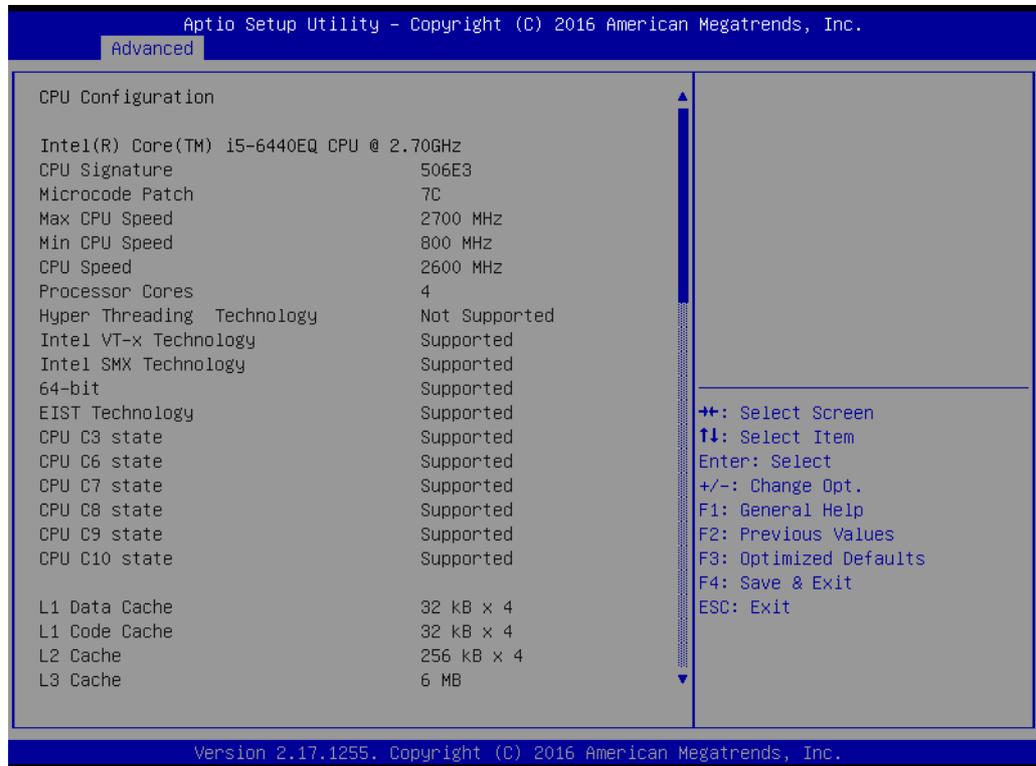
■ Console Redirection

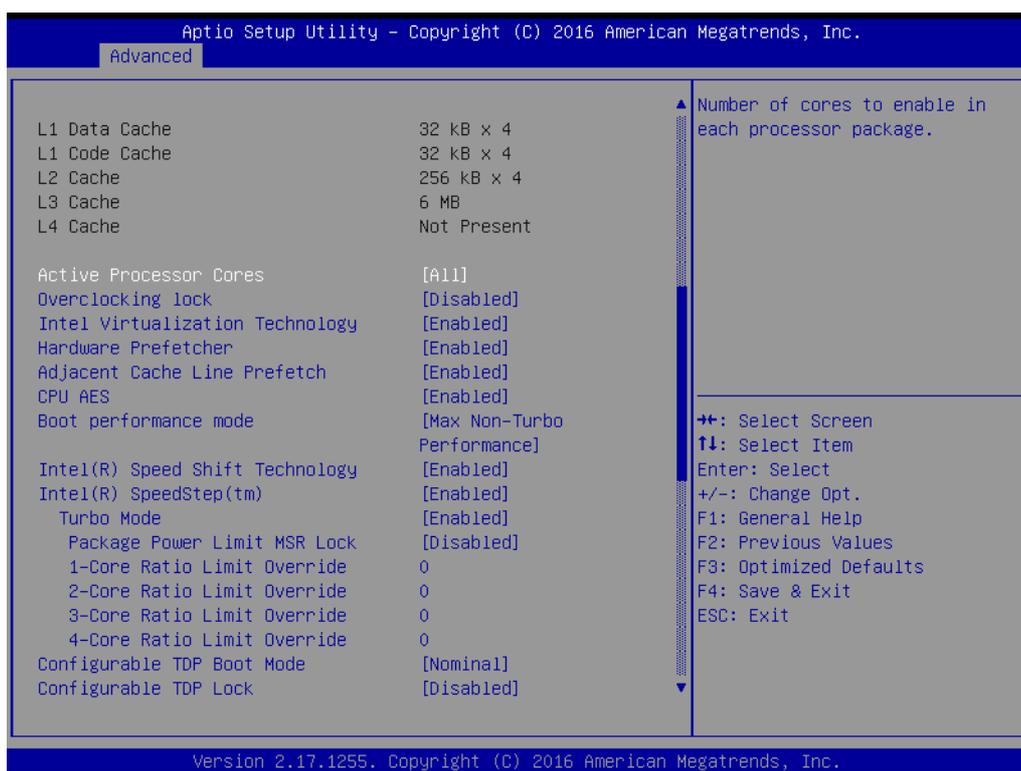
This item allows users to enable or disable console redirection.

3.2.2.11 CPU Configuration

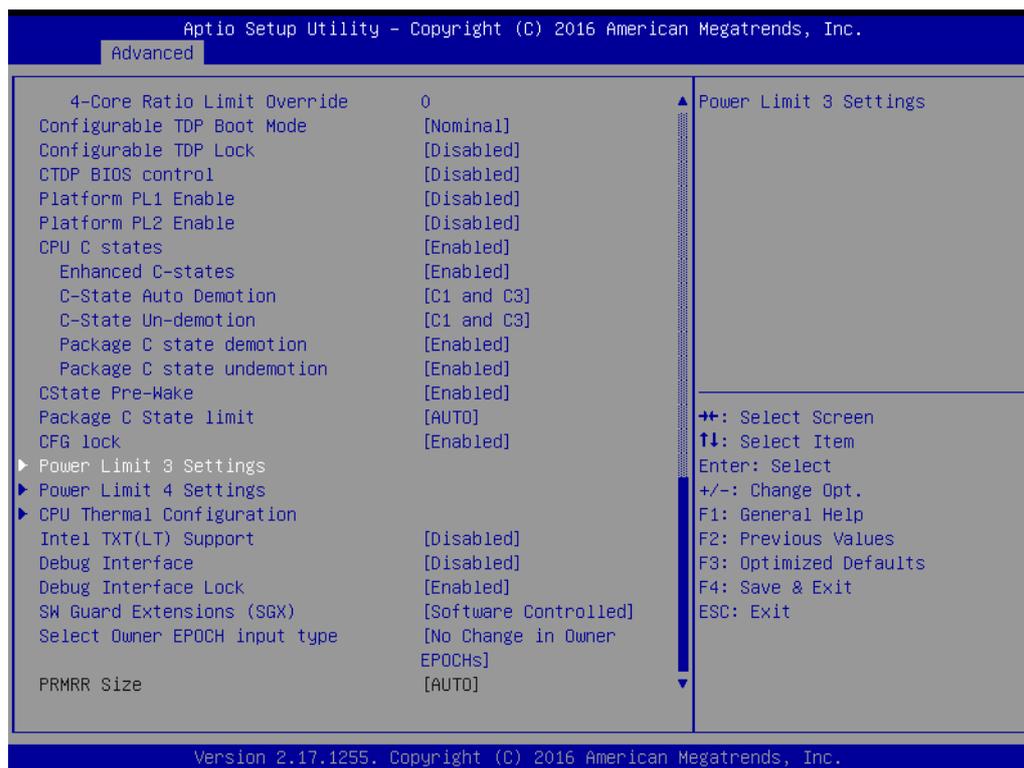


This page shows AIMB-242 CPU Configuration





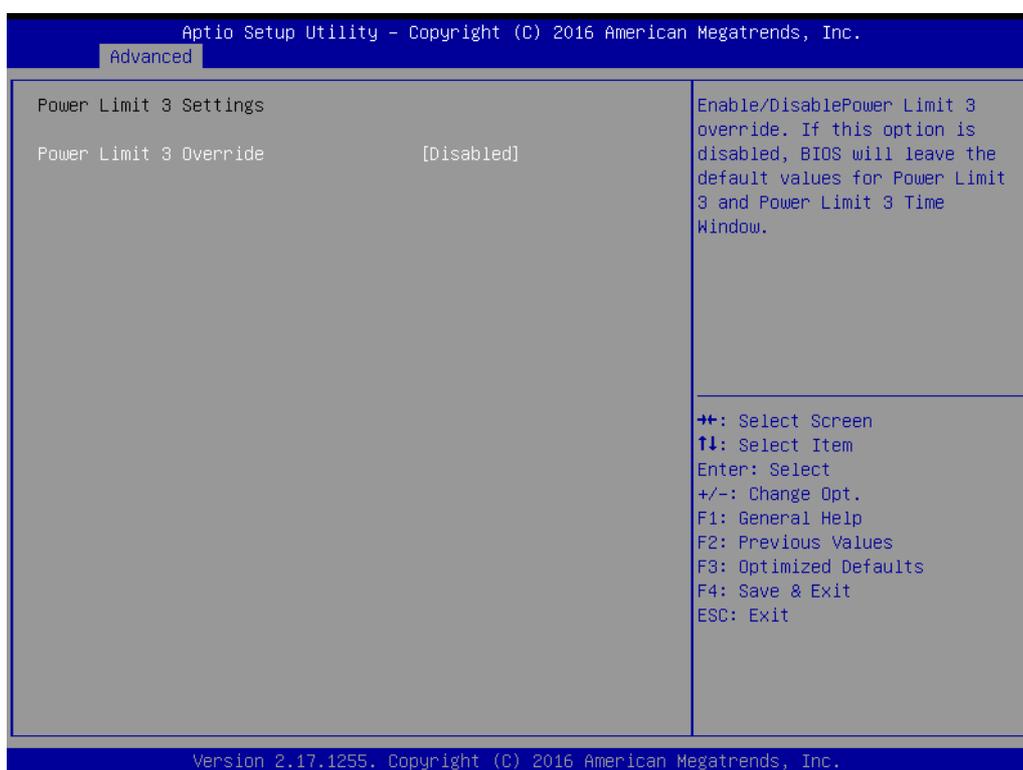
- **Active Processor Cores**
Number of cores to enable in each processor package
- **Overclocking lock**
FLEX_RATIO (194) MSR
- **Intel Virtualization Technology**
Enable or disable Intel virtualization technology
- **Hardware Prefetcher**
To turn on/off the MLC streamer prefetcher
- **Adjacent Cache Line Prefetch**
To turn on/off prefetching of adjacent cache lines.
- **CPU AES**
Enable or disable CPU Advanced Encryption standard instructions
- **Boot Performance Mode**
Select the performance state that the BIOS will set before OS handoff.
- **Intel Speed Shift Technology**
Enable or disable Intel speed shift technology
- **Intel SpeedStep (tm)**
Allows more than two frequency ranges to be supported.
- **Turbo Mode**
Enable or disable turbo mode
- **Package Power Limit MSR Lock**
Enable or disable locking of package power limit settings.
- **Configure TDP Boot Mode**
Configurable TDP Mode as Nominal/Up/Down/Deactivate TDP selection. Deactivate option will set MST to Nominal and MMIO to zero.
- **Configure TDP Lock**
Enable or disable configure TDP lock.



- **CTDP BIOS control**
Enable or disable CTDP BIOS control
- **Platform PL1 Enable**
Enable or disable platform PL1 enable
- **Platform PL2 Enable**
Enable or disable platform PL2 enable
- **CPU C states**
Enable or disable CPU C states
- **Enhanced C-states**
Enable or disable enhanced C1E
- **C-State Auto Demotion**
Configure C-State Auto Demotion
- **C-State Un-Demotion**
Configure C-State Un-demotion
- **Package C state demotion**
Enable or disable package c state demotion
- **Package C state undemotion**
Enable or disable package c state undemotion
- **CState Pre-Wake**
Enable or disable CState pre-wake
- **Package C State limit**
Package C State limit
- **CFG Lock**
Enable or disable CFG Lock.
- **Intel TXT(LT) Support**
Enable or disable Intel TXT support

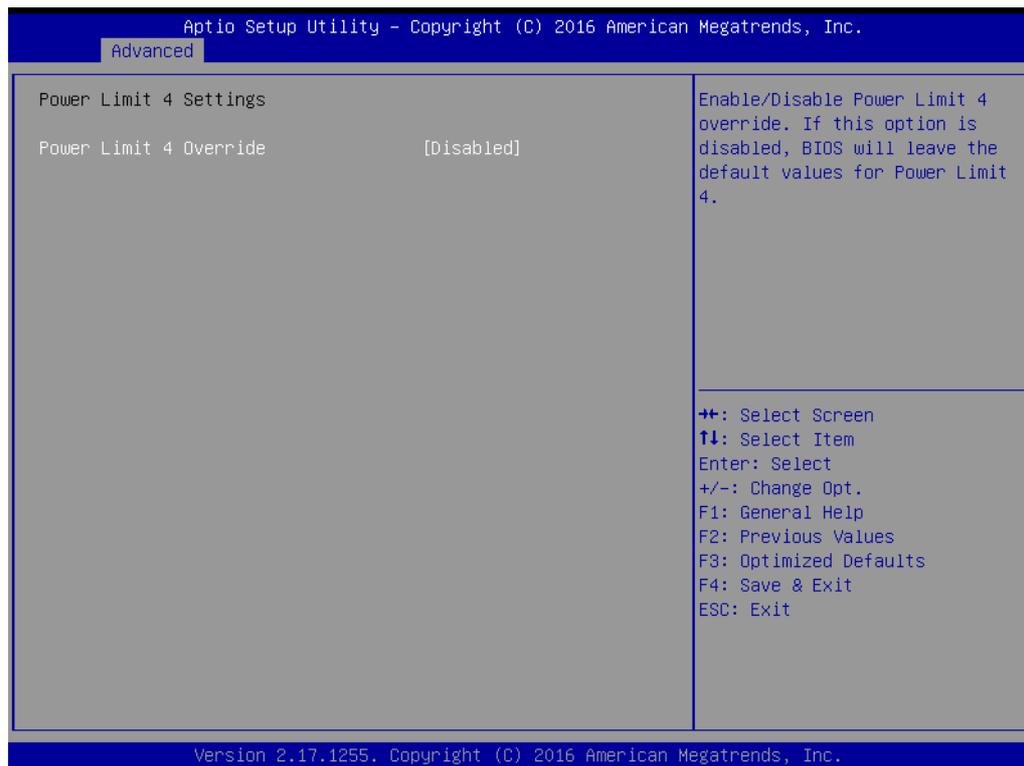
- **Debug interface**
Enable or disable CPU debug feature
- **Debug interface lock**
Lock CPU debug feature setting
- **SW Guard Extensions (SGX)**
Enable/disable Software guard extensions (SGX)
- **Select Owner EPOCH input type**
There are three owner EPOCH modes (Each EPOCH is 64bit): no change in owner epoch, change to new random owner epoch and manually entered by user. After the user enters epoch values manually, the values will not be visible, for security reason.

Power Limit 3 Settings



- **Power Limit 3 Override**
Enable or disable power limit 3 override. If this option is disabled, BIOS will leave the default values for power limit 3 and power limit 3 time window.

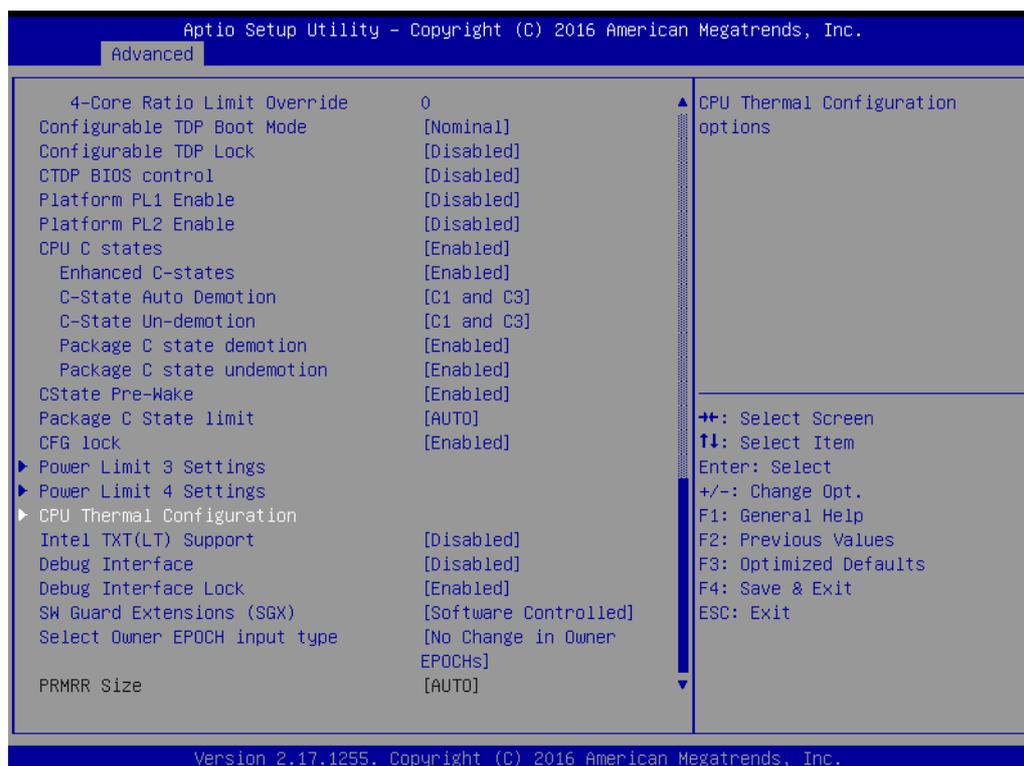
Power Limit 4 Settings

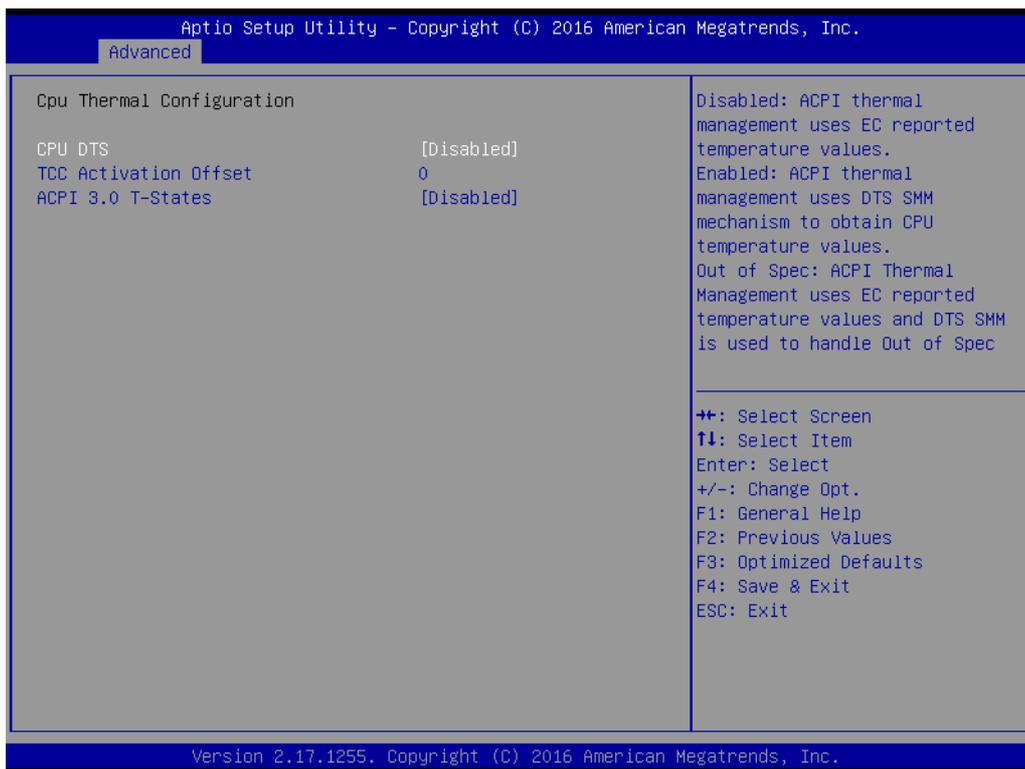


■ Power Limit 4 Override

Enable or disable power limit 4 override. If this option is disabled, BIOS will leave the default values for power limit 4.

CPU Thermal Configuration





- **CPU DTS**

Disabled: ACPI thermal management uses EC reported temperature values.

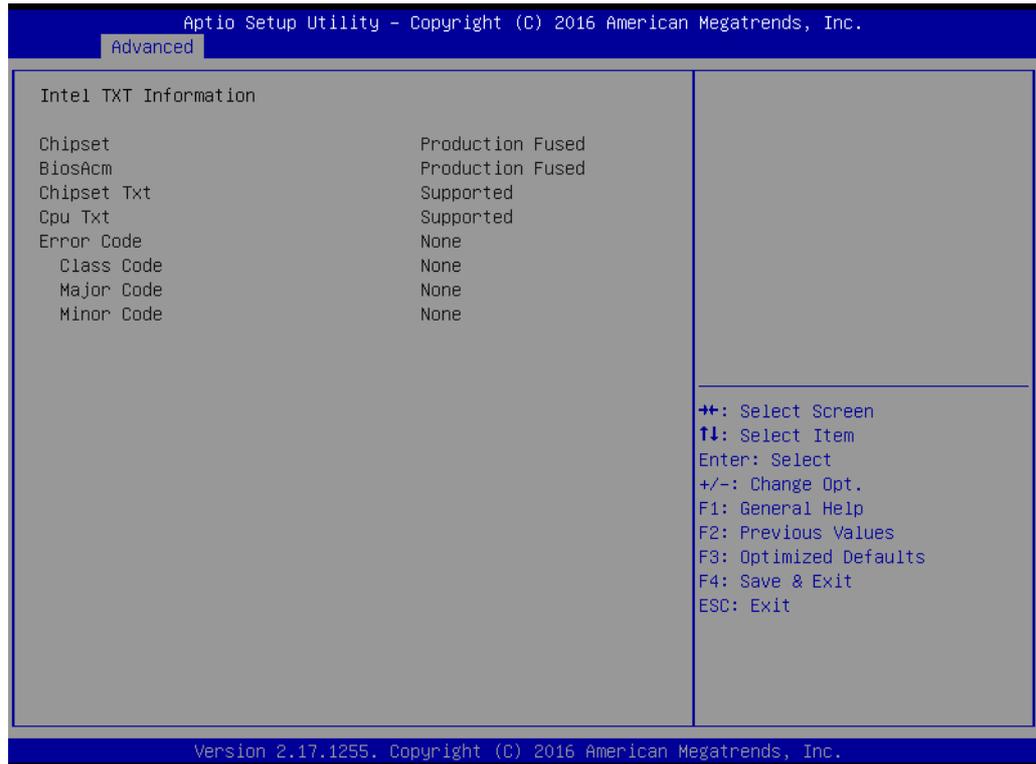
Enabled: ACPI thermal management uses DTS SMM mechanism to obtain CPU temperature values.

Out of spec: ACPI thermal management uses EC reported temperature values and DTS SMM is used to handle Out of Spec.

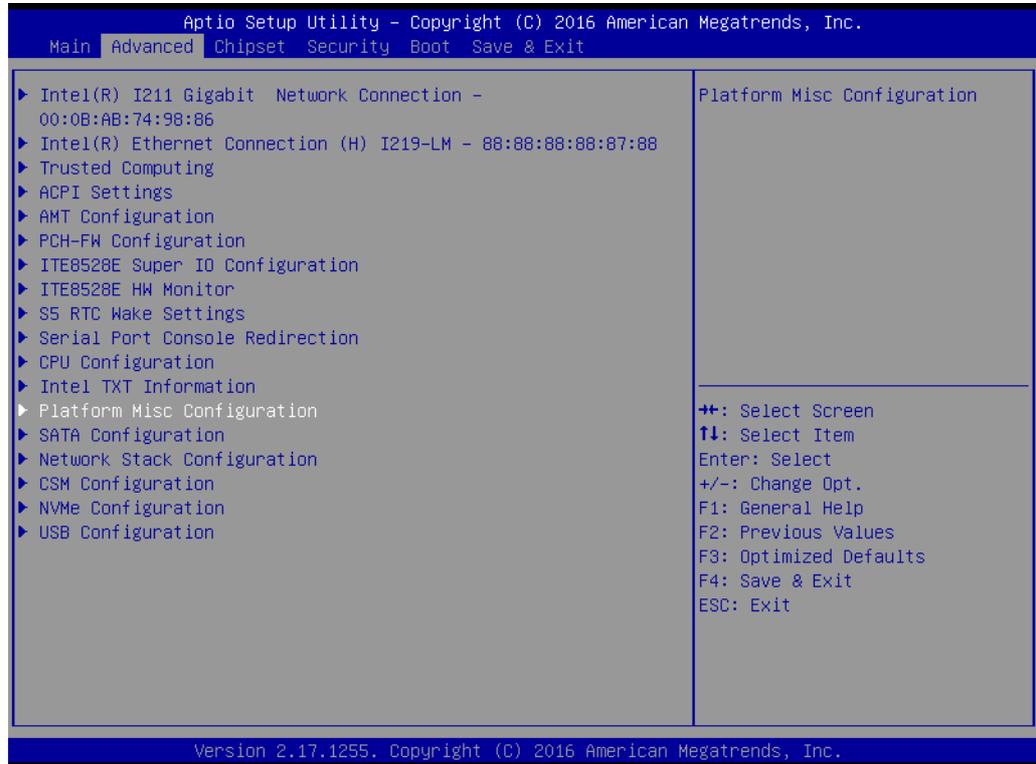
- **ACPI 3.0 T-States**

Enable or disable ACPI 3.0 T-states

3.2.2.12 Intel TXT Information



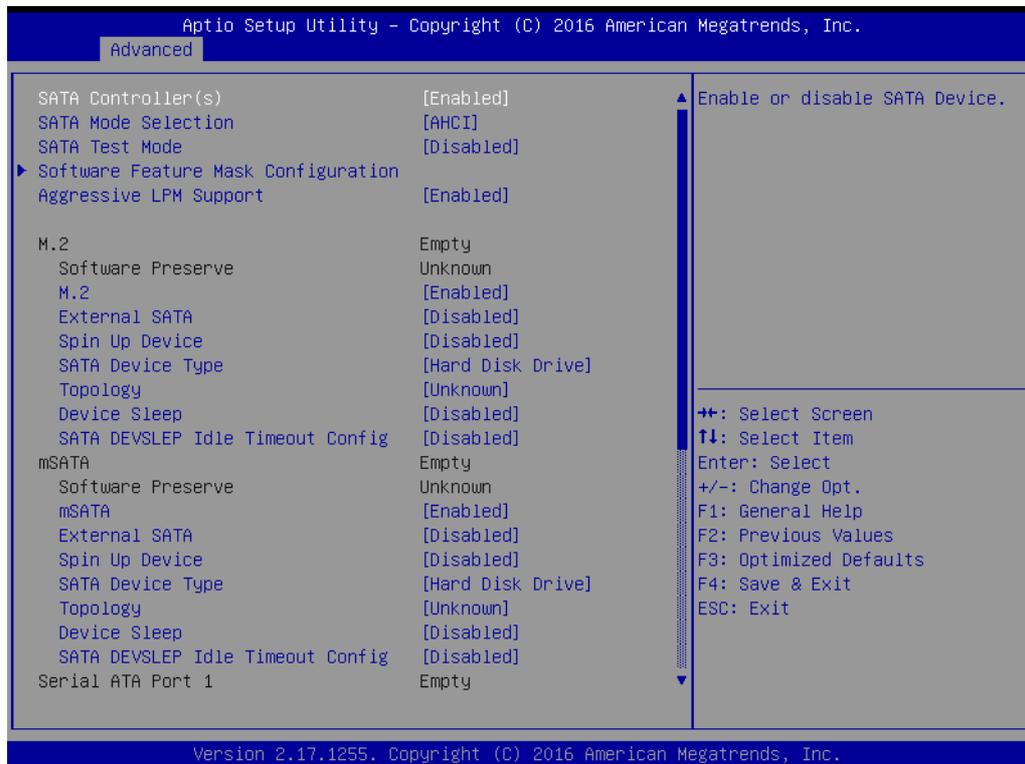
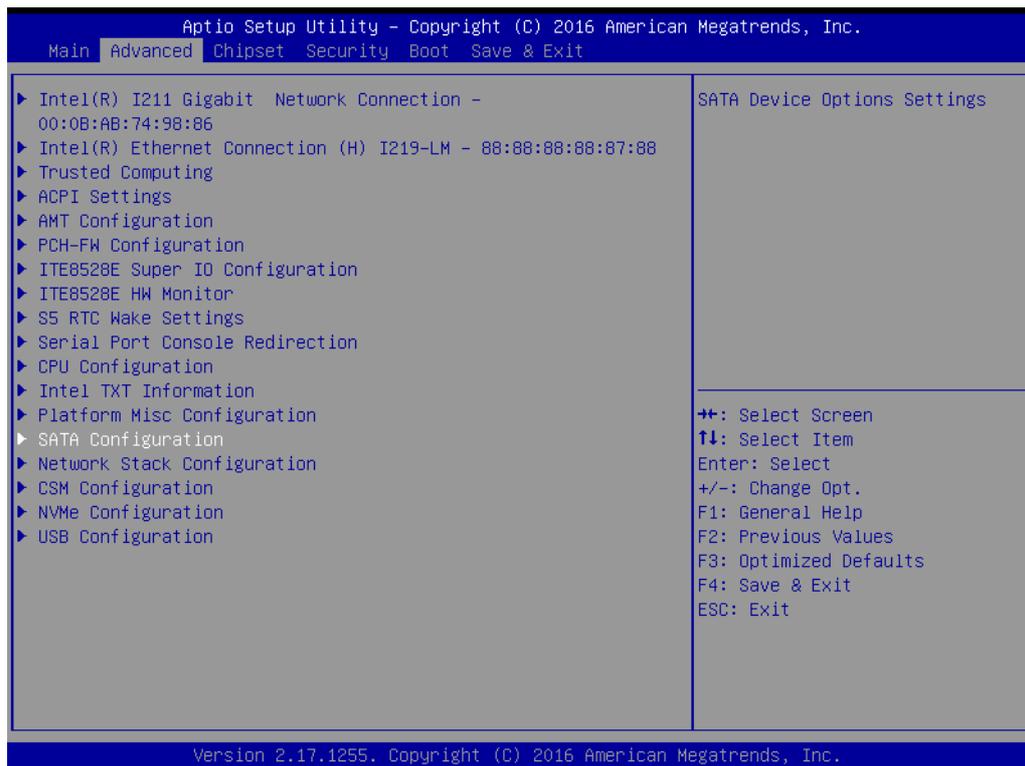
3.2.2.13 Platform Misc Configuration





- **Native PCIE enable**
PCI Express Native support enable/disable. This feature is only available in Vista.
- **Native ASPM**
On enable, Vista will control the ASPM support for the device. If disabled, the BIOS will.
- **BDAT ACPI Table Support**
Enable support for the BDAT ACPI table

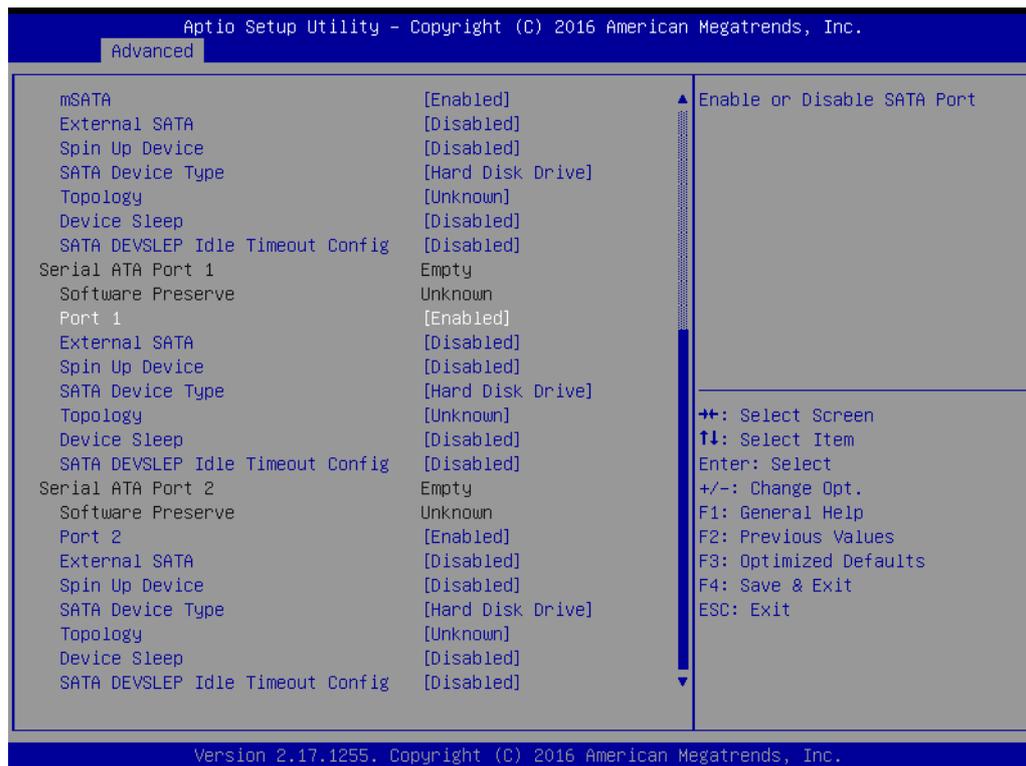
3.2.2.14 SATA Configuration



- **SATA Controller**
This item allows users to enable or disable the SATA device.
- **SATA Mode Selection**
Determines how SATA controllers operate.
- **SATA Test Mode**

- This item allows users to enable or disable the SATA test mode

 - **Aggressive LPM Support**
Enable PCH to aggressively enter link power state.
 - **M.2**
This item allows users to enable or disable the M.2 device.
 - **External SATA**
External SATA support
 - **Spin Up Device**
On an edge detect from 0 to 1, the PCH starts a COMRESET initialization sequence to the device.
 - **SATA Device Type**
Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.
 - **Topology**
Identify the SATA Topology if it is default or ISATA or Flex or DirectConnect or M2.
 - **Device Sleep**
msata for RTD3
 - **SATA DEVSLEP Idle Timeout Config**
Enable or disable SATA DTIO config
 - **mSATA**
This item allows users to enable or disable the mSATA device
 - **External SATA**
External SATA support
 - **Spin Up Device**
On an edge detect from 0 to 1, the PCH starts a COMRESET initialization sequence to the device.
 - **SATA Device Type**
Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.
 - **Topology**
Identify the SATA Topology if it is default or ISATA or Flex or DirectConnect or M2.
 - **Device Sleep**
msata for RTD3
 - **SATA DEVSLEP Idle Timeout Config**
Enable or disable SATA DTIO config



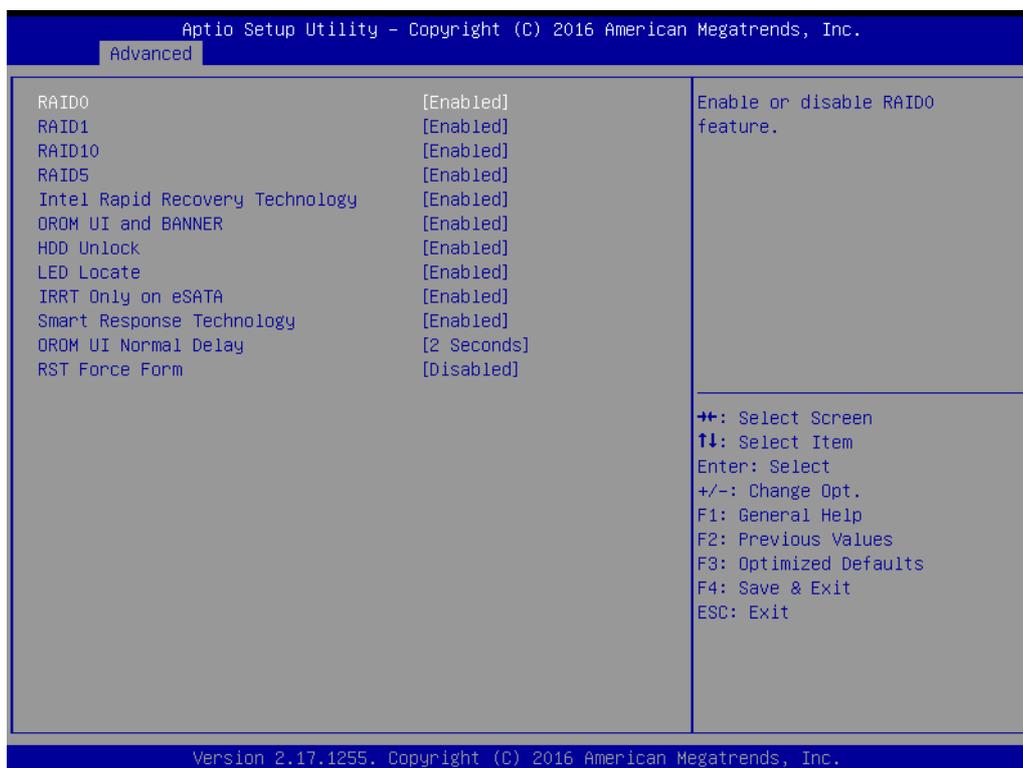
- **Port 1**
This item allows users to enable or disable SATA port.
- **External SATA**
External SATA support
- **Spin Up Device**
On an edge detect from 0 to 1, the PCH starts a COMRESET initialization sequence to the device.
- **SATA Device Type**
Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.
- **Topology**
Identify the SATA Topology if it is default or ISATA or Flex or DirectConnect or M2.
- **Device Sleep**
msata for RTD3
- **SATA DEVSLEP Idle Timeout Config**
Enable or disable SATA DTIO config
- **Port 2**
This item allows users to enable or disable SATA port..
- **External SATA**
External SATA support
- **Spin Up Device**
On an edge detect from 0 to 1, the PCH starts a COMRESET initialization sequence to the device.
- **SATA Device Type**
Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.

- **Topology**
Identify the SATA Topology if it is default or ISATA or Flex or DirectConnect or M2.
- **Device Sleep**
msata for RTD3
- **SATA DEVSLEP Idle Timeout Config**
Enable or disable SATA DTIO config

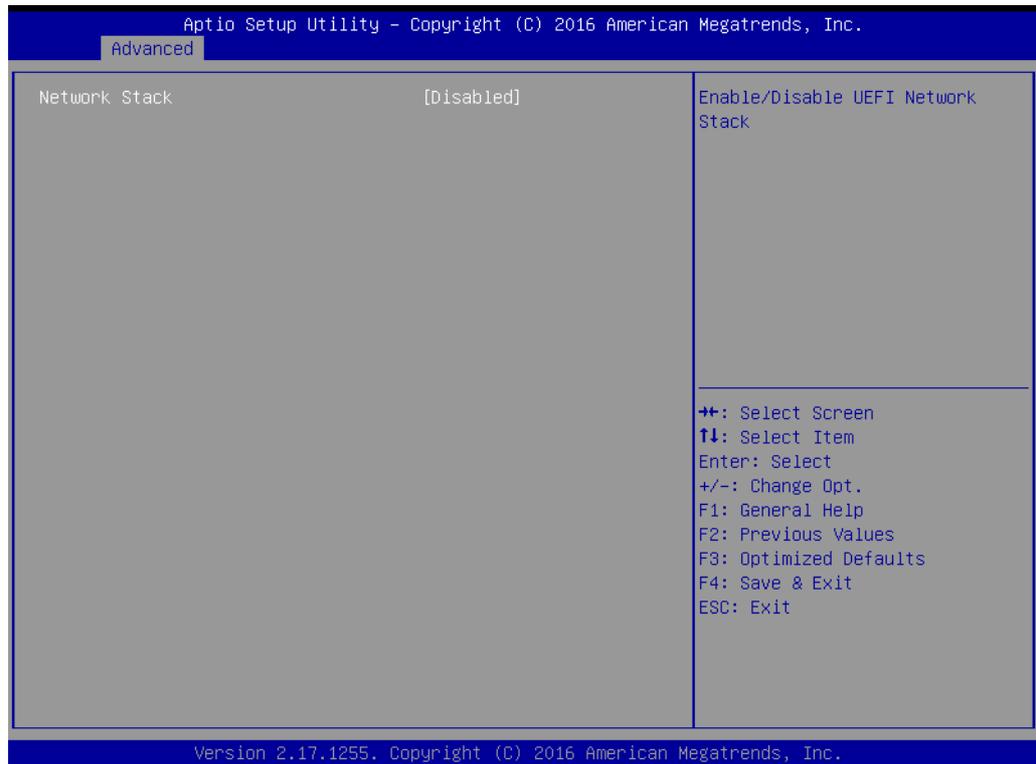
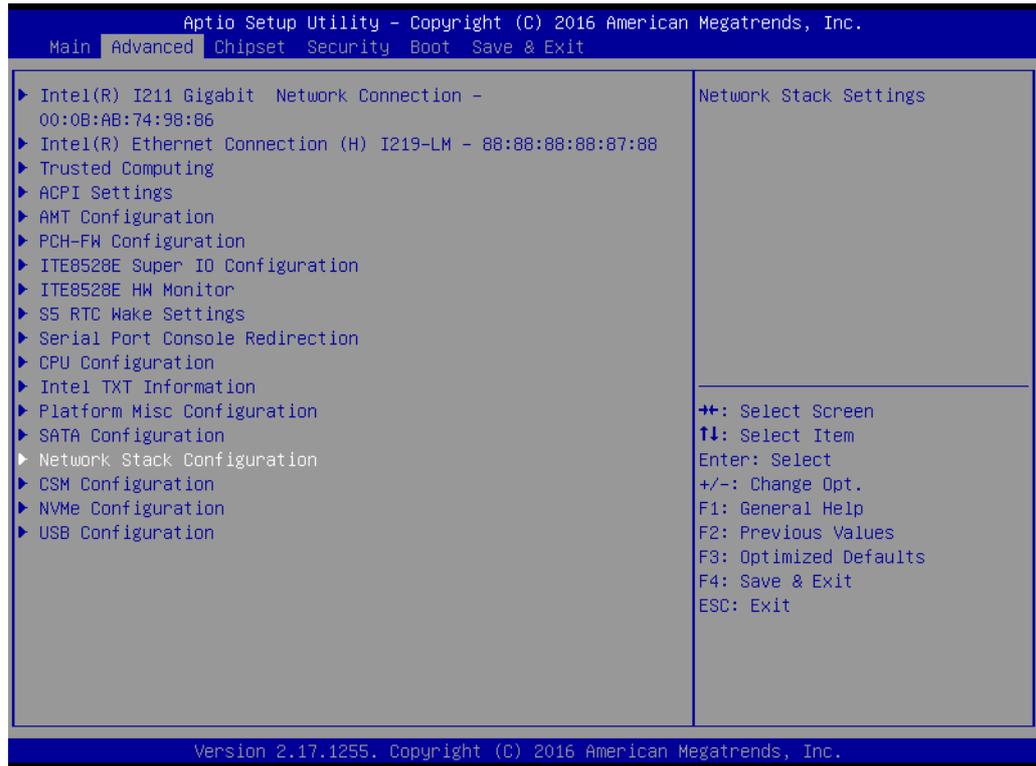
Note! *AIMB-242 M.2 B_Key supports NGFF (Next Generation Form Factor) Storage and 3G device. Not compatible with M.2 WIFI, Bluetooth device.*



Software Feature Mask Configuration

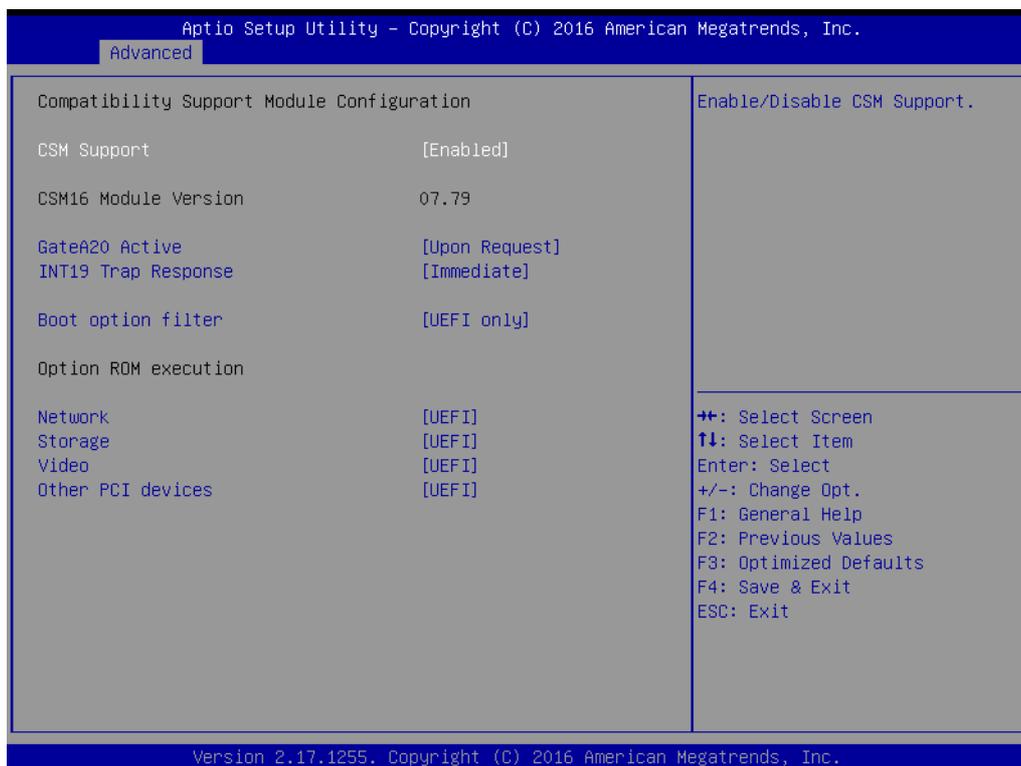
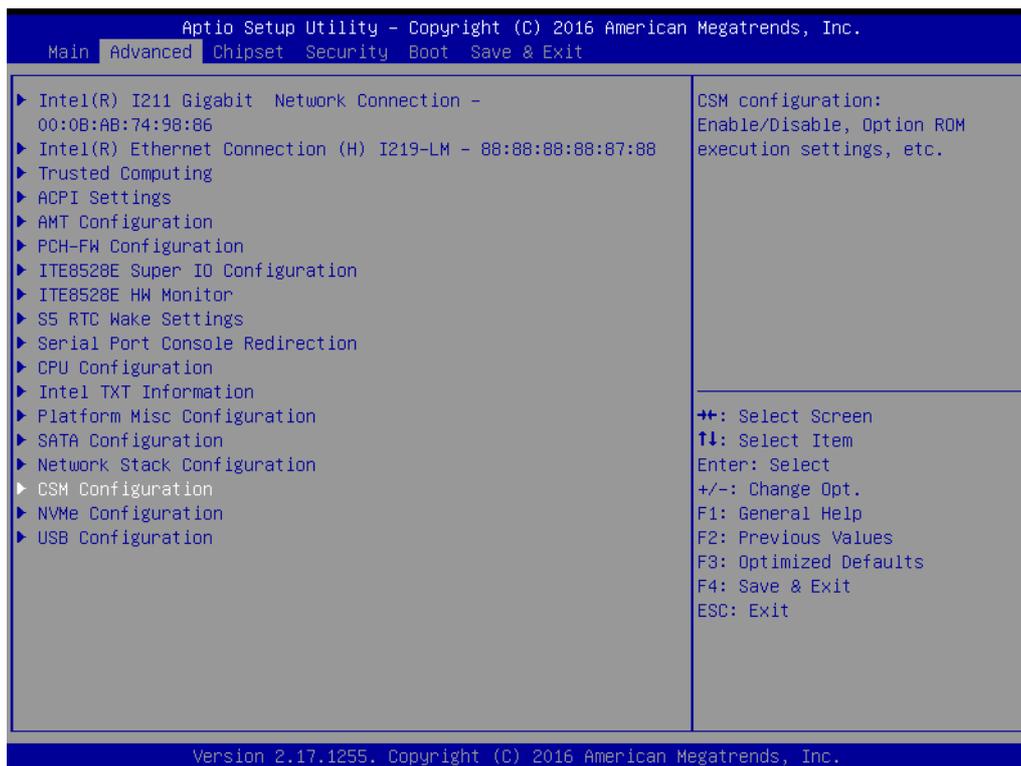


3.2.2.15 Network Stack Configuration



- **Network Stack**
Enable or Disable UEFI Network Stack

3.2.2.16 CSM Configuration



- **CSM Support**
Enable or disable CSM Support
- **GateA20 Active**
UPON REQUEST - GA20 can be disabled using BIOS services. ALWAYS - do not allow disabling GA20; this option is useful when any RT code is executed above 1MB.

- **INT19 Trap Response**

BIOS reaction on INT19 trapping by Option ROM: IMMEDIATE - execute the trap right away; POSTPONED - execute the trap during legacy boot.

- **Boot option filter**

This option controls Legacy/UEFI ROMs priority.

- **Option ROM execution**

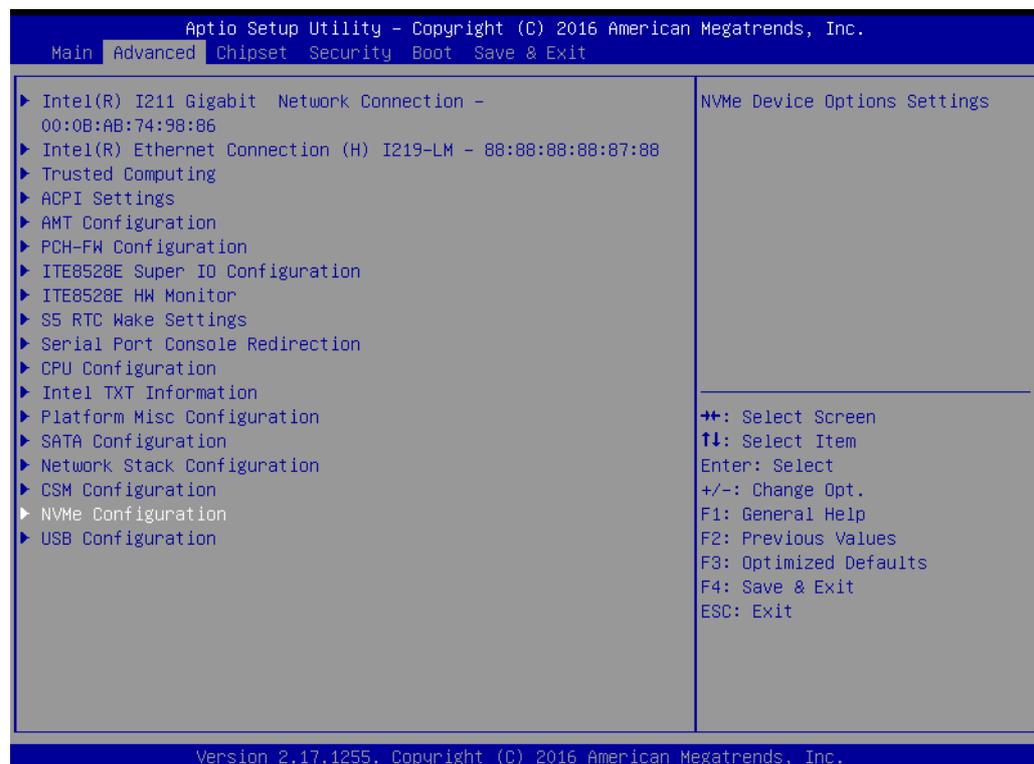
- Network [UEFI]
- Storage [UEFI]
- Video [UEFI]
- Other PCI device [UEFI]

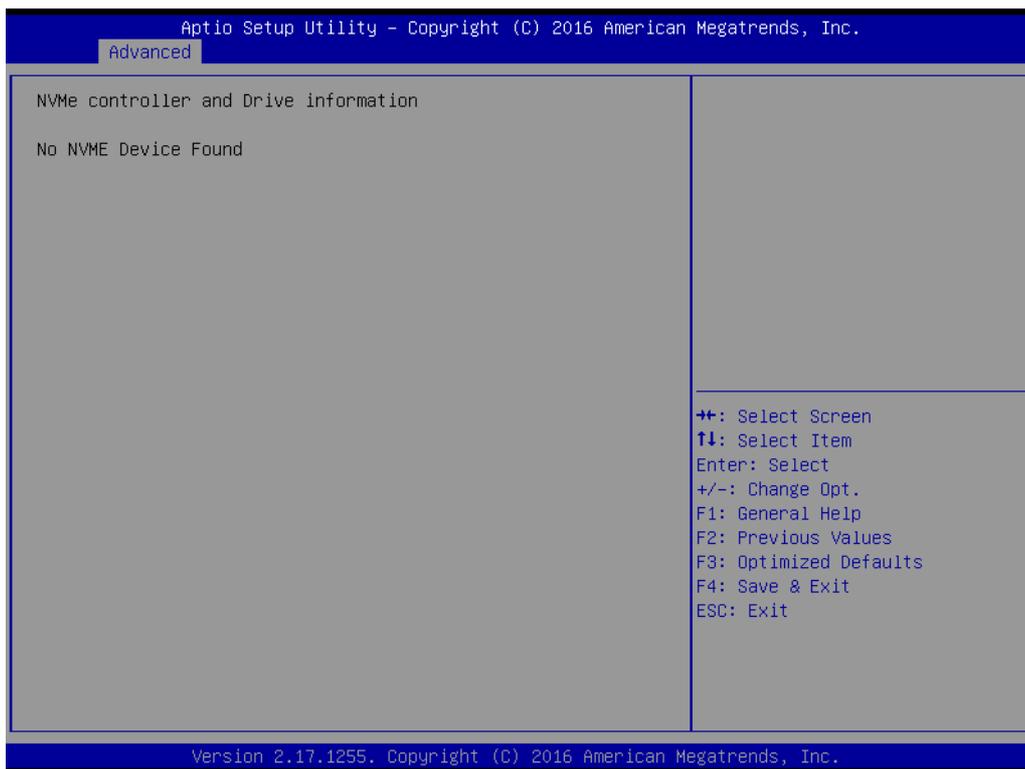
Note! *If your HDD or other boot device is installed as Legacy mode, it may cause blue screen situation. There are 2 ways to solve this:*



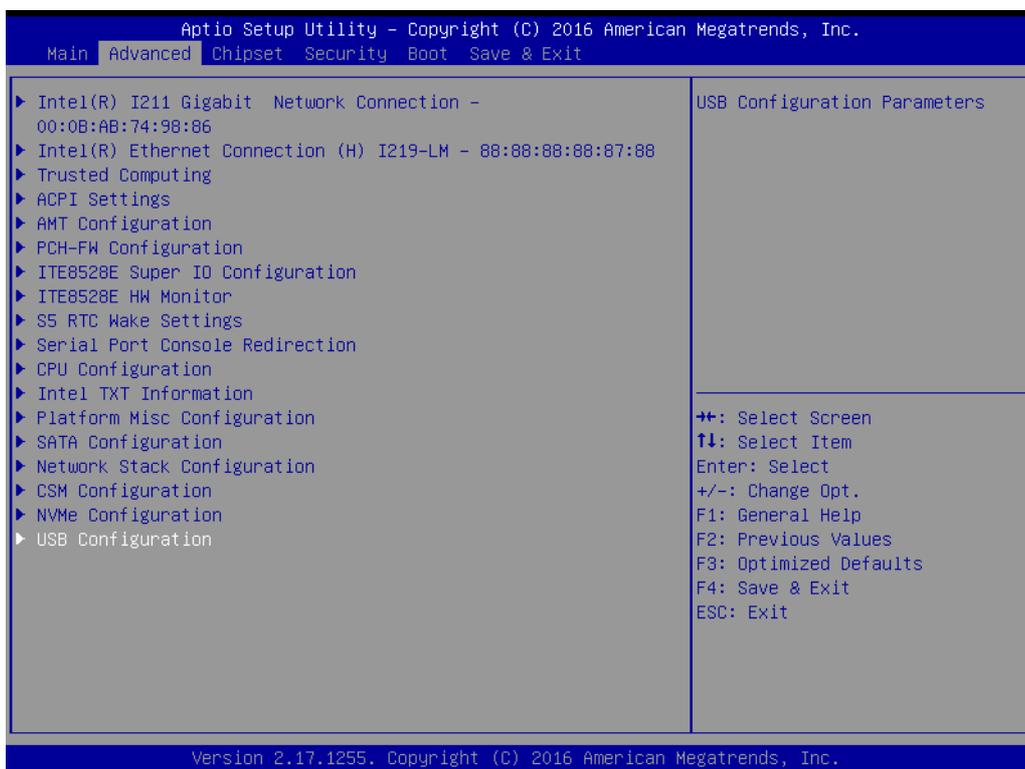
1. Re-install your OS as UEFI Mode
2. Change all of settings above as " Legacy"
 - Boot option filter ->Legacy Only
 - Network ->Legacy
 - Storage ->Legacy
 - Video ->Legacy
 - Other PCI devices ->Legacy

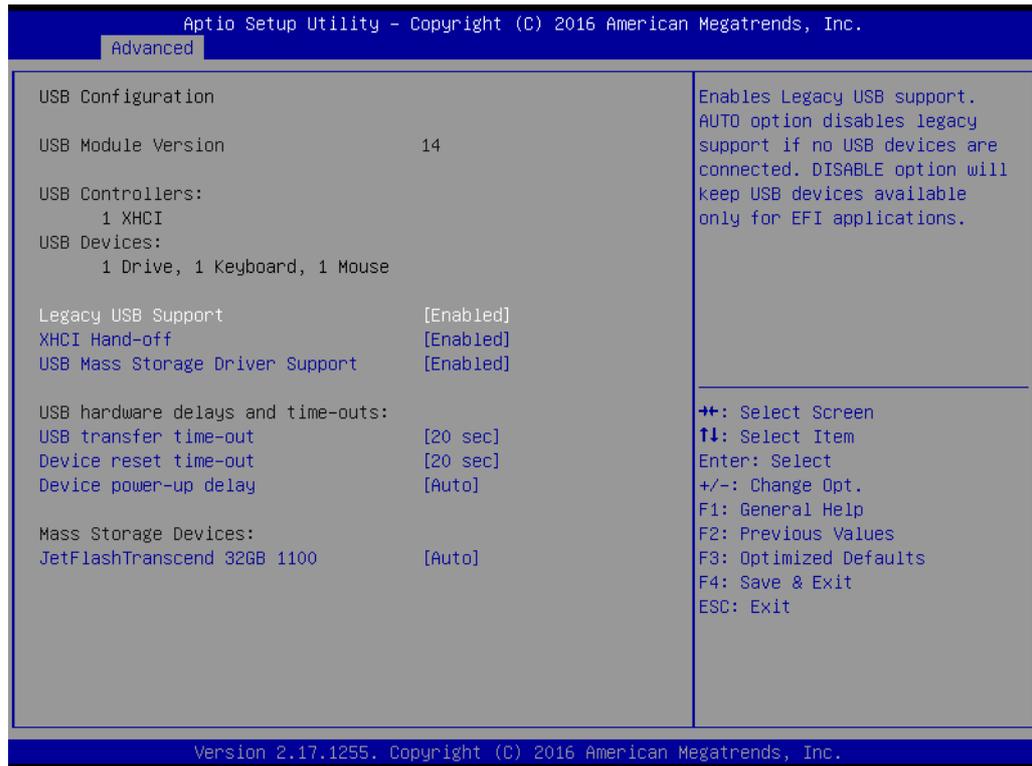
3.2.2.17 NVMe Configuration





3.2.2.18 USB Configuration

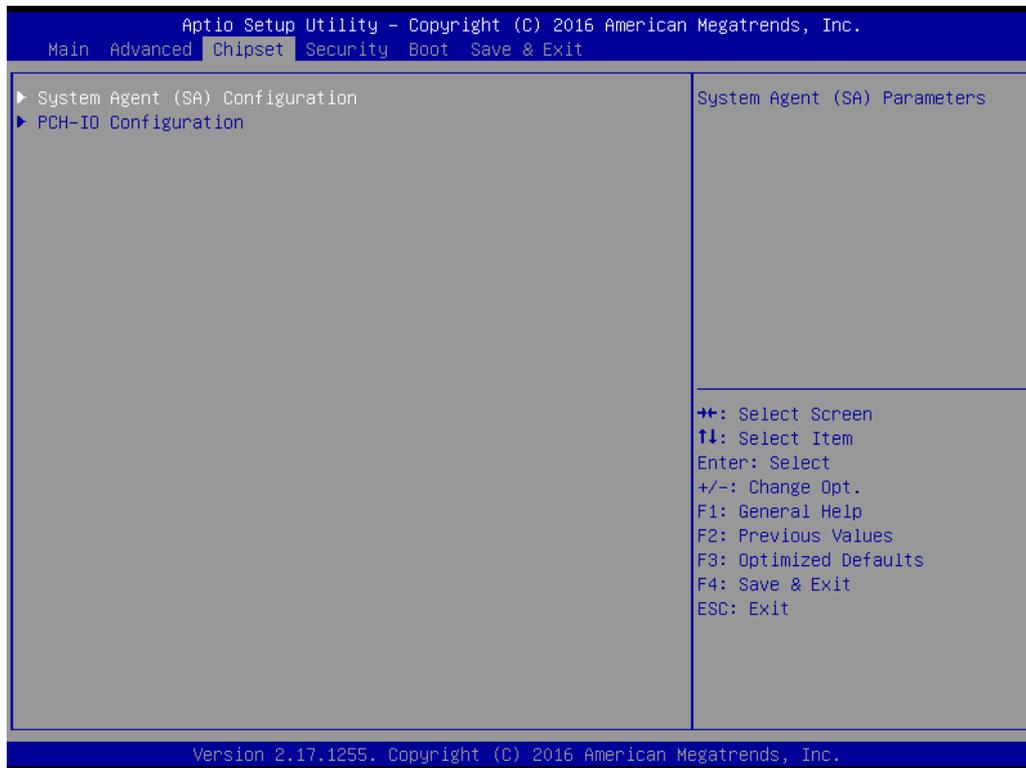




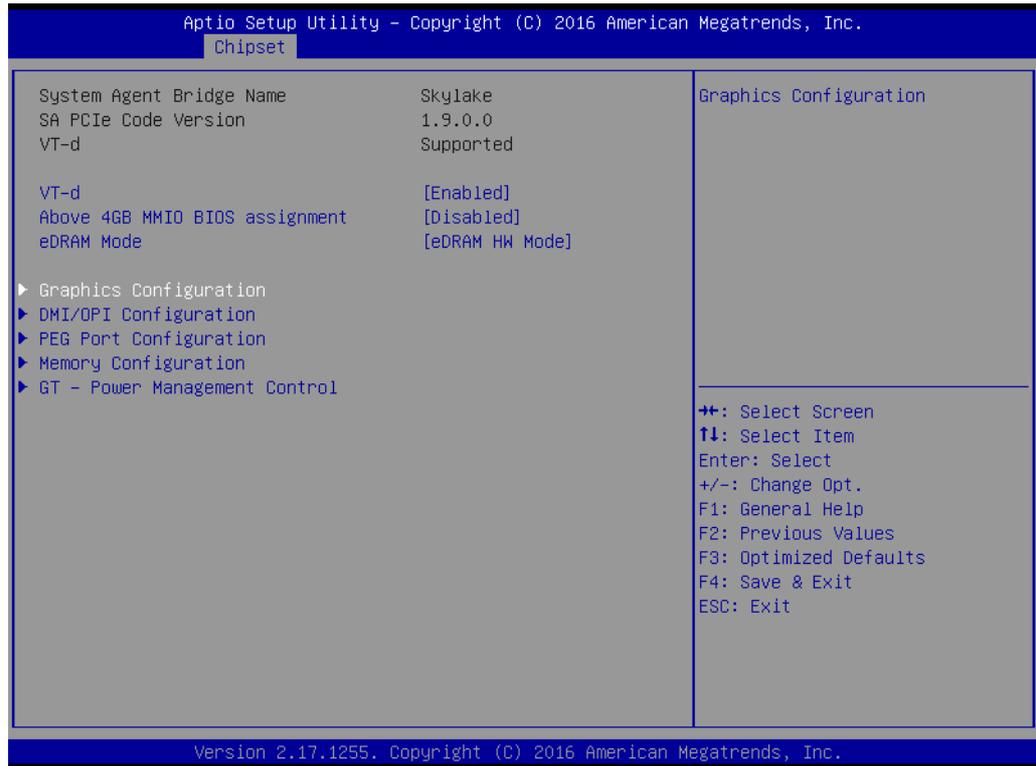
- **Legacy USB Support**
Enables support for legacy USB. Auto option disables legacy support if no USB devices are connected.
- **XHCI Hand-off**
This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
- **USB Mass Storage Driver Support**
Enable/disable USB Mass Storage Driver support.
- **USB transfer time-out**
The time-out value for Control, Bulk, and Interrupt transfers.
- **Device reset time-out**
USB mass storage device start unit command time-out
- **Device power-up delay**
Maximum time the device will take before it properly reports itself to the host controller. 'Auto' uses default value: for a Root port it is 100ms, for a hub port the delay is taken from Hub descriptor.

3.3 Chipset Configuration Setting

Select the chipset tab from the BIOS setup screen to enter the Chipset Setup screen. Users can select any item in the left frame of the screen, such as PCI express Configuration, to go to the sub menu for that item. Users can display a Chipset Setup option by highlighting it using the <Arrow> keys. All Chipset Setup options are described in this section. The Chipset Setup screens are shown below. The sub menus are described on the following pages.

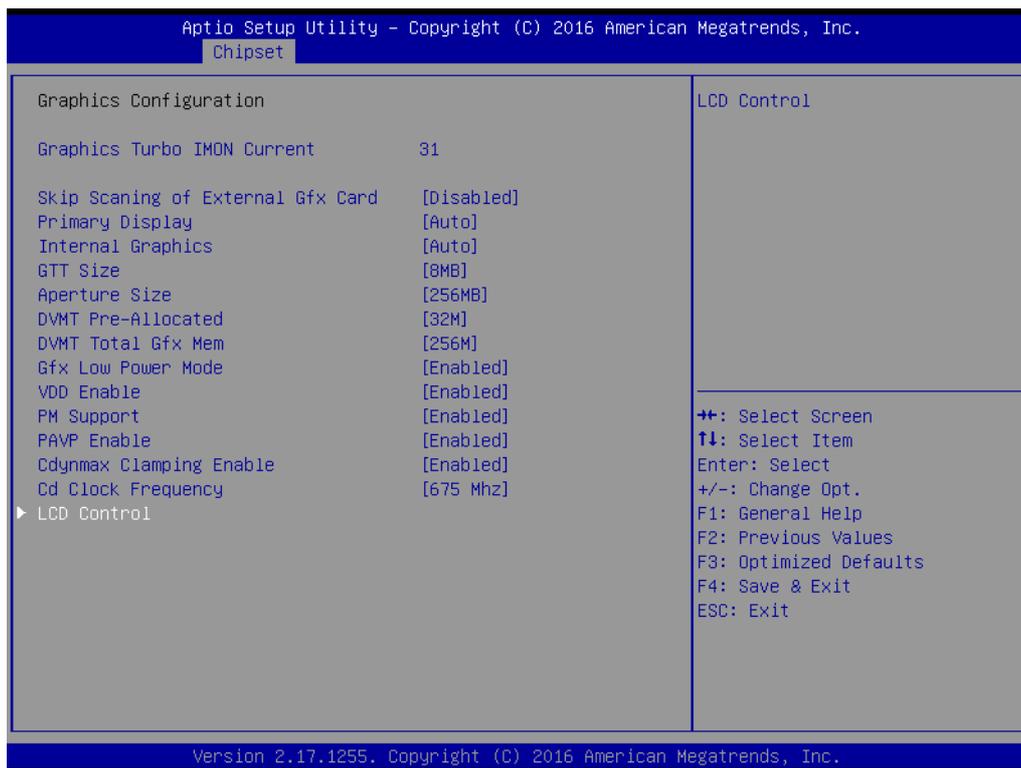


3.3.1 System Agent (SA) Configuration



- **VT-d**
Disable or enable VT-d capability.
- **Above 4GB MMIO BIOS assignment**
Enable/disable above 4GB MemoryMappedIO BIOS assignment. This is disabled automatically when Aperture size is set to 2048MB.
- **eDRAM Mode**
SW Mode eDRAM On or eDRAM Off.

Graphics Configuration



- **Graphics Turbo IMON Current**
Graphics turbo IMON Current values supported (14-31).
- **Skip Scanning of External Gfx Card**
If enable, it wil not scan for external Gfx card on PEG and PCH PCIE ports.
- **Primary Display**
Select which IGFX/PEG/PCI Graphics device should be Primary Display
- **Internal Graphics**
Keep IGFX enabled based on the setup options.
- **GTT Size**
Select the GTT Size
- **Aperture Size**
Select the Aperture size
- **DVMT Pre-Allocated**
Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.
- **DVMT Total Gfx Mem**
Select DVMT5.0 Total Graphic Memory size used by the Internal Graphics Device.
- **Gfx Low Power Mode**
Note! This option is applicable for SFF only
- **VDD Enable**
Enable/disable forcing of VDD in the BIOS
- **PM Support**
Enable/disable PM support
- **PAVP Enable**
Enable/disable PAVP

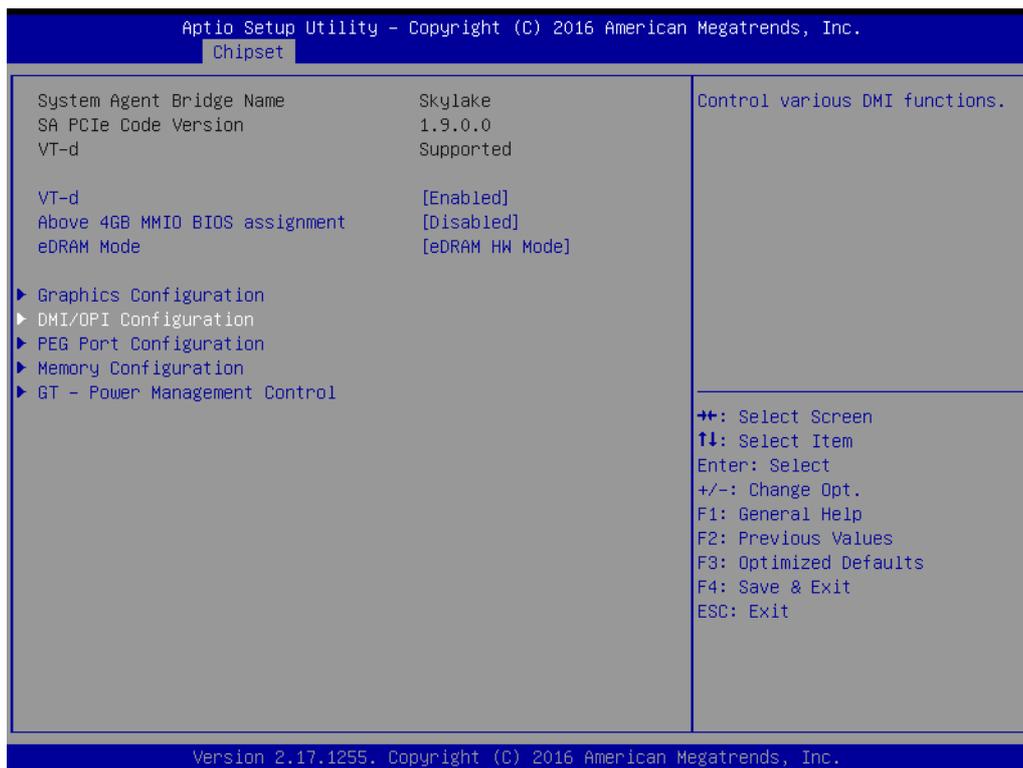
- **Cdynmax Clamping Enable**
Enable/disable Cdynmax Clamping
- **Cd Clock Frequency [675 Mhz]**
Select the highest Cd Clock frequency supported by the platform

LCD Control



- **LVDS Panel Type**
Select the LVDS panel type

DMI/ OPI Configuration



- **DMI Max Link Speed**
Set DMI Speed at Gen1/ Gen2/ Gen3.
- **DMI Gen3 Eq Phase 2**
Platform Gen3 Equalization Phase 2.
- **DMI Gen3 Eq Phase 3 Method**
Select Method for Gen3 Equalization Phase 3
- **DMI Vc1 Control**
Enable/disable DMI Vc1
- **DMI Vcm Control**
Enable/disable DMI Vcm.
- **Program Static Phase1 Eq**
Program Phase1 presets/CTLEp

Gen3 Root Port Press Value for each Lane

Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.

Chipset

<p>DMI/OPI Configuration</p> <p>DMI X4 Gen3</p> <p>DMI Max Link Speed [Auto]</p> <p>DMI Gen3 Eq Phase 2 [Auto]</p> <p>DMI Gen3 Eq Phase 3 Method [Auto]</p> <p>DMI Vc1 Control [Disabled]</p> <p>DMI Vcm Control [Enabled]</p> <p>Program Static Phase1 Eq [Enabled]</p> <p>▶ Gen3 Root Port Preset value for each Lane</p> <p>▶ Gen3 Endpoint Preset value for each Lane</p> <p>▶ Gen3 Endpoint Hint value for each Lane</p> <p>▶ Gen3 RxCTLE Control</p> <p>DMI Link ASPM Control [L1]</p> <p>DMI Extended Sync Control [Disabled]</p> <p>DMI De-emphasis Control [-3.5 dB]</p> <p>DMI IOT [Disabled]</p>	<p>Root Port preset value per lane for Gen3 Equalization</p> <hr/> <p>↔: Select Screen ↑: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</p>
---	--

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Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.

Chipset

<p>Gen3 Root Port Preset value for each Lane</p> <p>Lane 0 4</p> <p>Lane 1 4</p> <p>Lane 2 4</p> <p>Lane 3 4</p>	<p>Value for Lane 0</p> <hr/> <p>↔: Select Screen ↑: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</p>
--	---

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Gen3 Endpoint Preset value for each Lane

Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.

Chipset

DMI/OPI Configuration		Endpoint preset value per lane for Gen3 Equalization
DMI	X4 Gen3	
DMI Max Link Speed	[Auto]	
DMI Gen3 Eq Phase 2	[Auto]	
DMI Gen3 Eq Phase 3 Method	[Auto]	
DMI Vc1 Control	[Disabled]	
DMI Vcm Control	[Enabled]	
Program Static Phase1 Eq	[Enabled]	
▶ Gen3 Root Port Preset value for each Lane		
▶ Gen3 Endpoint Preset value for each Lane		
▶ Gen3 Endpoint Hint value for each Lane		
▶ Gen3 RxCTLE Control		
DMI Link ASPM Control	[L1]	
DMI Extended Sync Control	[Disabled]	
DMI De-emphasis Control	[-3.5 dB]	
DMI IOT	[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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Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.

Chipset

Gen3 Endpoint Preset value for each Lane		Value for Lane 0
Lane 0	7	
Lane 1	7	
Lane 2	7	
Lane 3	7	

++: 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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Gen3 Endpoint Hint value for each Lane

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Chipset

DMI/OPI Configuration	Endpoint Hint value per lane for Gen3 Equalization
DMI X4 Gen3	
DMI Max Link Speed [Auto]	
DMI Gen3 Eq Phase 2 [Auto]	
DMI Gen3 Eq Phase 3 Method [Auto]	
DMI Vc1 Control [Disabled]	
DMI Vcm Control [Enabled]	
Program Static Phase1 Eq [Enabled]	
▶ Gen3 Root Port Preset value for each Lane	
▶ Gen3 Endpoint Preset value for each Lane	
▶ Gen3 Endpoint Hint value for each Lane	
▶ Gen3 RxCTLE Control	
DMI Link ASPM Control [L1]	
DMI Extended Sync Control [Disabled]	
DMI De-emphasis Control [-3.5 dB]	
DMI IOT [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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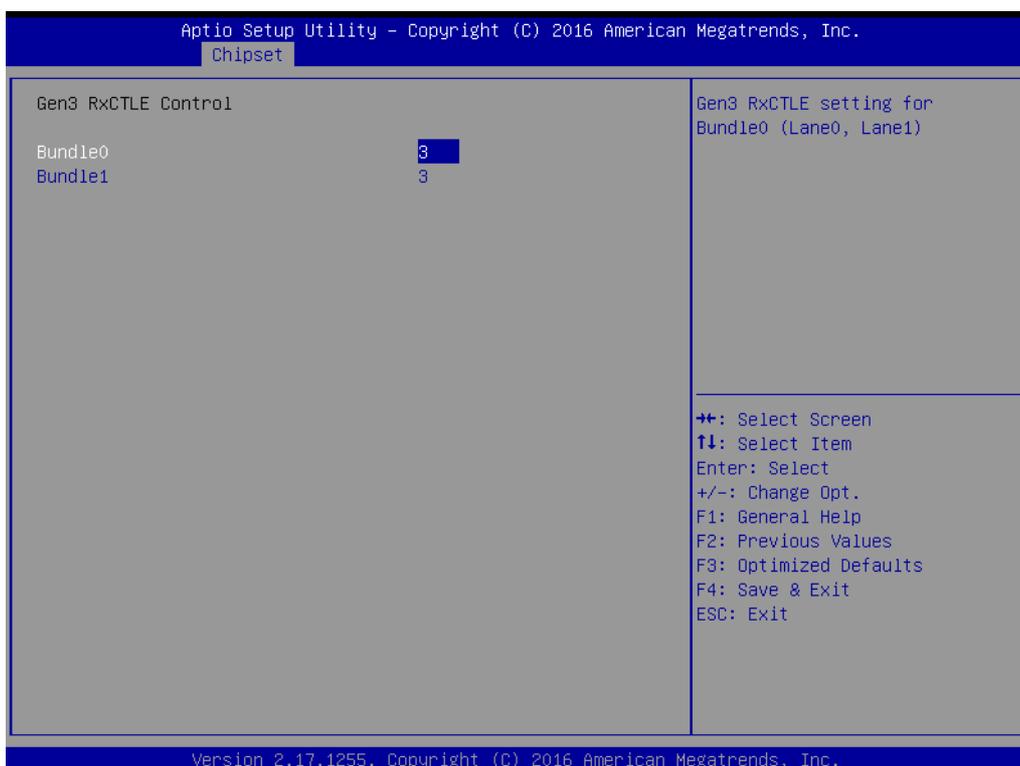
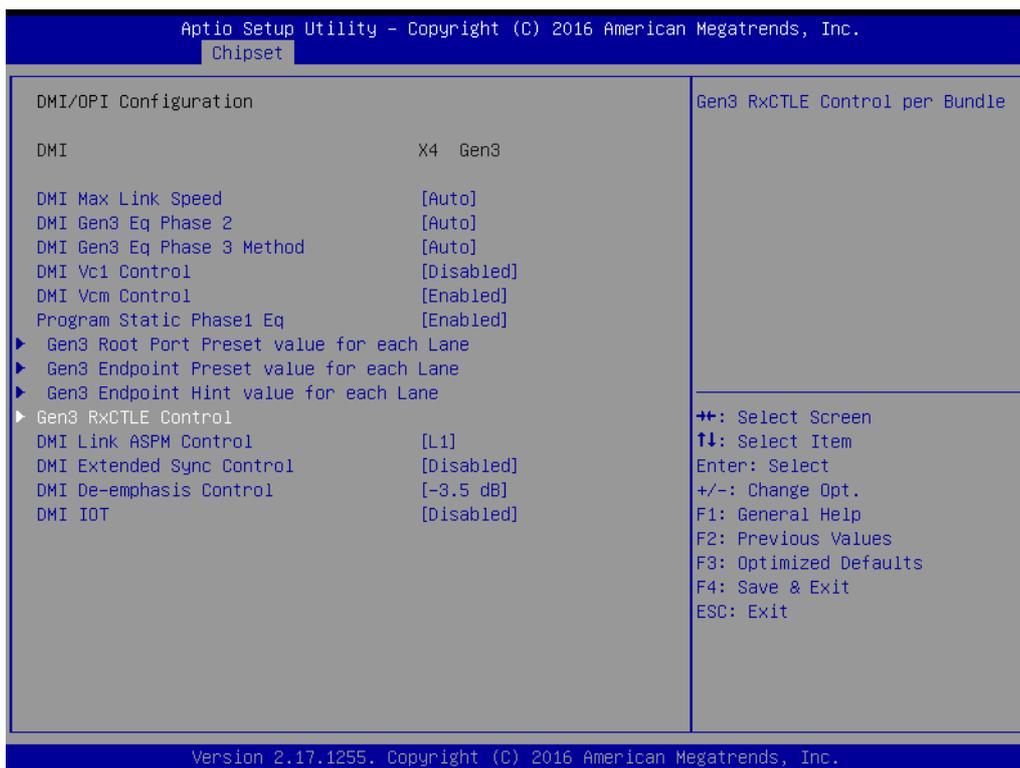
Chipset

Gen3 Endpoint Hint value for each Lane	Value for Lane 0
Lane 0 2	
Lane 1 2	
Lane 2 2	
Lane 3 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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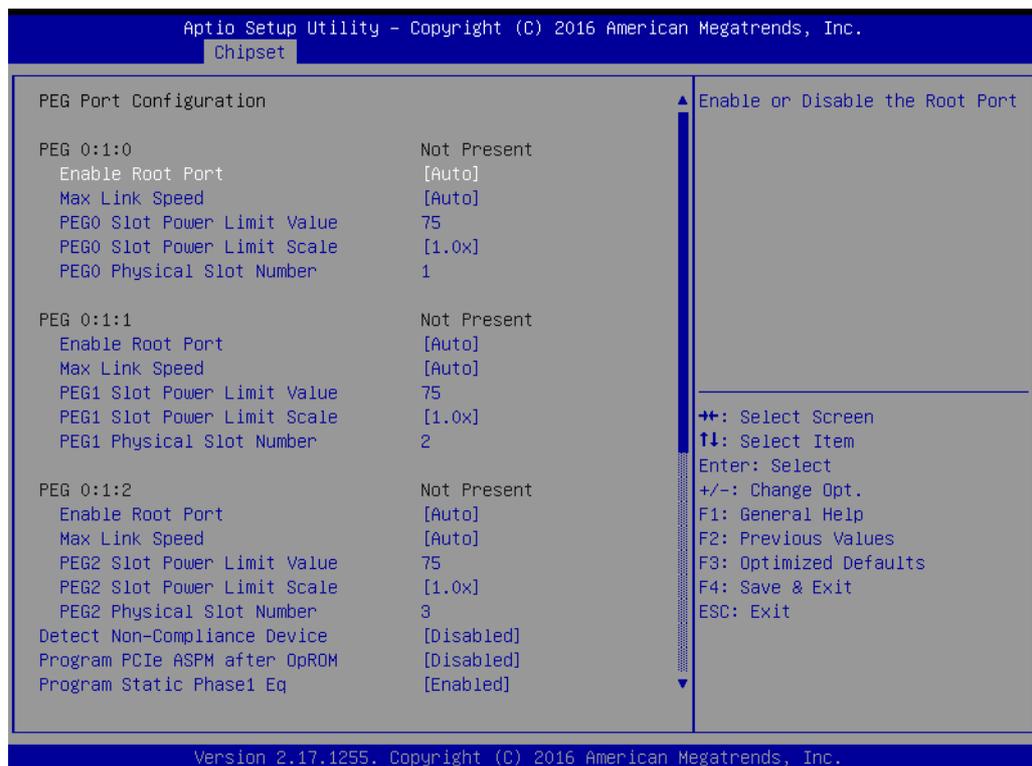
Gen 3 RxCLTE Control

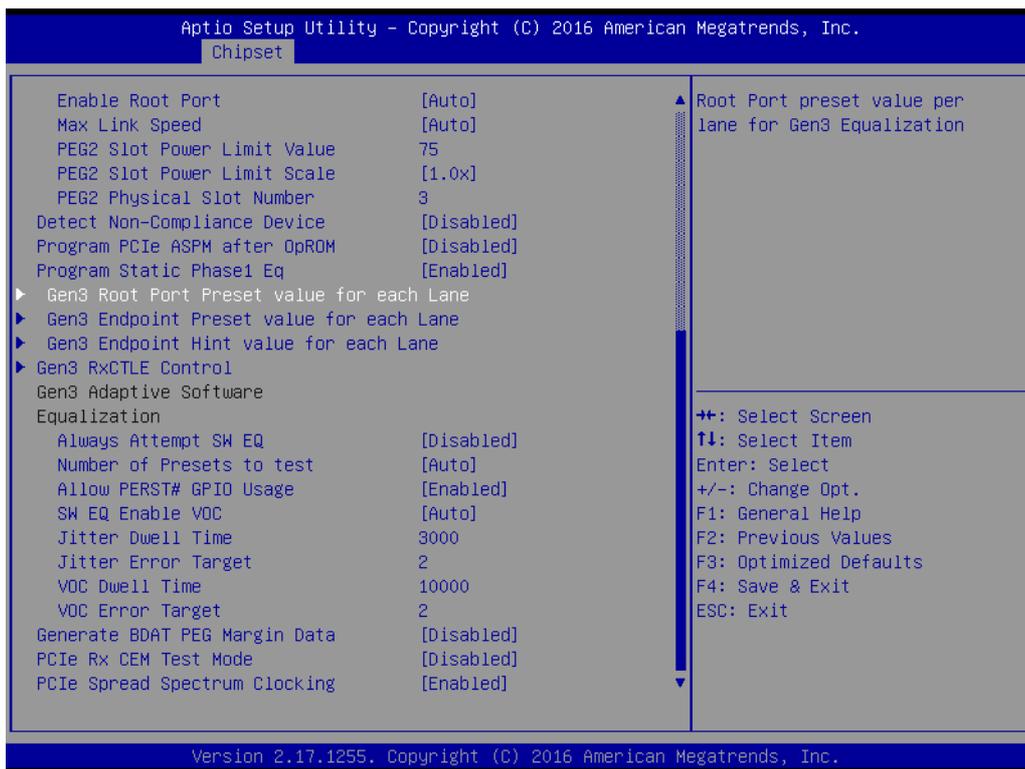


- **DMI Link ASPM Control**
Enable/disable the control of Active state power management on SA side of the DMI link.
- **DMI Extend Sync Control**
Enable DMI Extended synchronization

- **DMI De-emphasis Control**
Configure the De-emphasis control on DMI
- **DMI IOT**
Enable/disable DMI IOT.

PEG Port Configuration





- **Enable Root Port [Auto]**
- **Max Link Speed [Auto]**
- **Detect Non-Compliance Device [Disabled]**
Detect Non-Compliance PCI Express Device in PEG
- **Program PCIe ASPM after OpROM [Disabled]**
Enabled: PCIe ASPM will be programmed after OpROM.
Disabled: PCIe ASPM will be programmed before OpROM.
- **Program Static Phase1 Eq [Enabled]**
- **Always Attempt SW EQ**
Always attempt SW EQ, even it has been done once.
- **Number of Presets to test**
Choose between 7, 3, 5 and 0-9. Auto= current default for CPU.
- **Allow PERST# GPIO Usage**
Enable/disable GPIO-based resets to PEG endpoint (s) during margin search, if needed.
- **SW EQ Enable VOC**
Select Jiffer & VOC test mode (default) or Jitter only test mode. Auto will current default (Enabled)
- **Generate BDAT PEG Margin Data**
Enable to generate BDAT PCIe margin tables
- **PCIe Rx CEM Test Mode**
Enable/disable PEG Rx CEM loopback mode.
- **PCIe Spread Spectrum Clocking**
Allows disabling spread spectrum clocking for compliance testing

Gen3 Root Port Preset value for each Lane

Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.

Chipset

Gen3 Root Port Preset value for each Lane		Value for Lane 0
Lane 0	7	
Lane 1	7	
Lane 2	7	
Lane 3	7	
Lane 4	7	
Lane 5	7	
Lane 6	7	
Lane 7	7	
Lane 8	7	
Lane 9	7	
Lane 10	7	
Lane 11	7	
Lane 12	7	
Lane 13	7	
Lane 14	7	
Lane 15	7	

++: 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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Gen3 Endpoint Preset value for each Lane

Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.

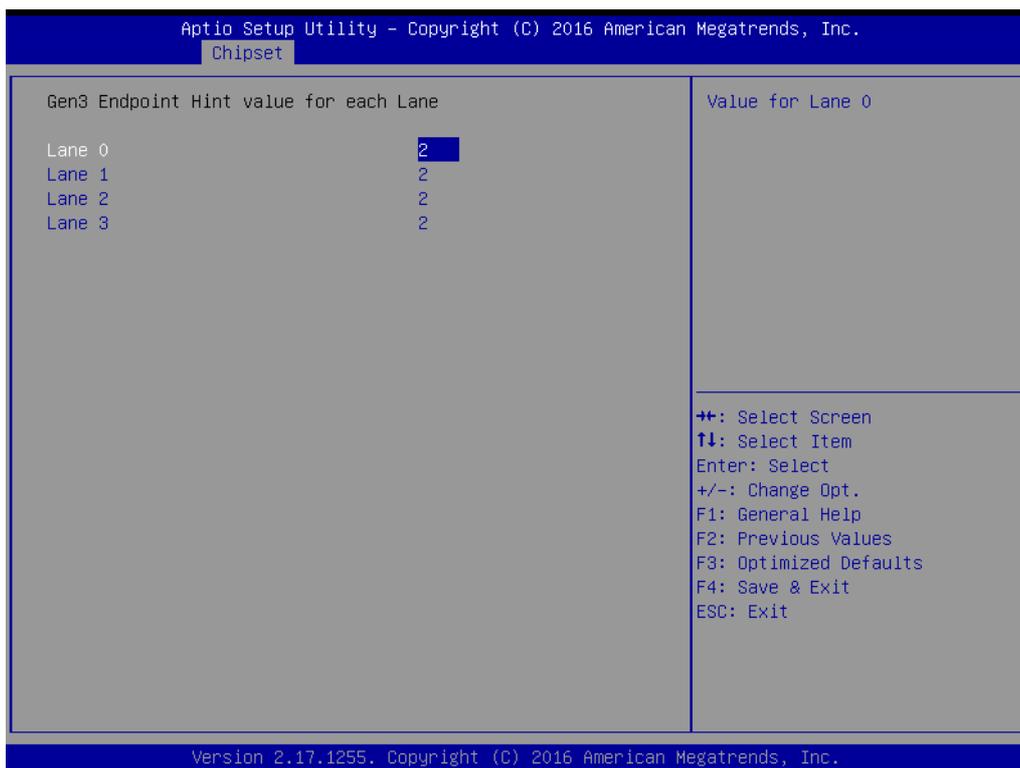
Chipset

Gen3 Endpoint Preset value for each Lane		Value for Lane 0
Lane 0	7	
Lane 1	7	
Lane 2	7	
Lane 3	7	
Lane 4	7	
Lane 5	7	
Lane 6	7	
Lane 7	7	
Lane 8	7	
Lane 9	7	
Lane 10	7	
Lane 11	7	
Lane 12	7	
Lane 13	7	
Lane 14	7	
Lane 15	7	

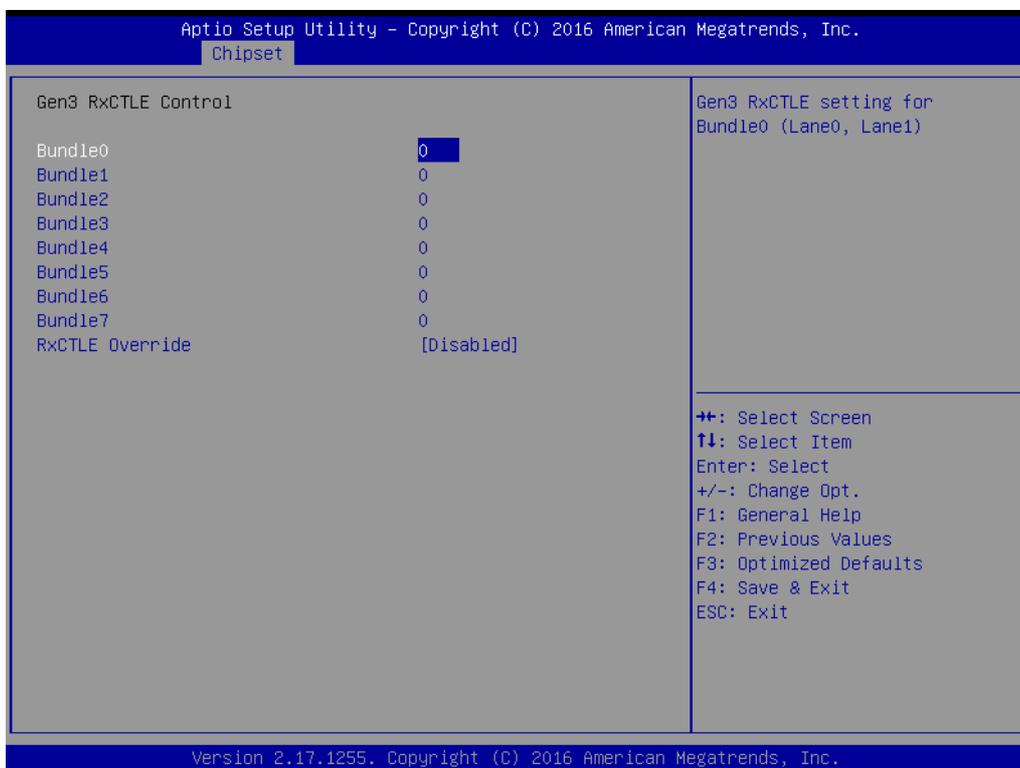
++: Select Screen
 ↑↓: Select Item
 Enter: Select
 +/-: Change Opt.
 F1: General Help
 F2: Previous Values
 F3: Optimized Defaults
 F4: Save & Exit
 ESC: Exit

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Gen3 Endpoint Hint value for each Lane



Gen3 RxCTLE Control

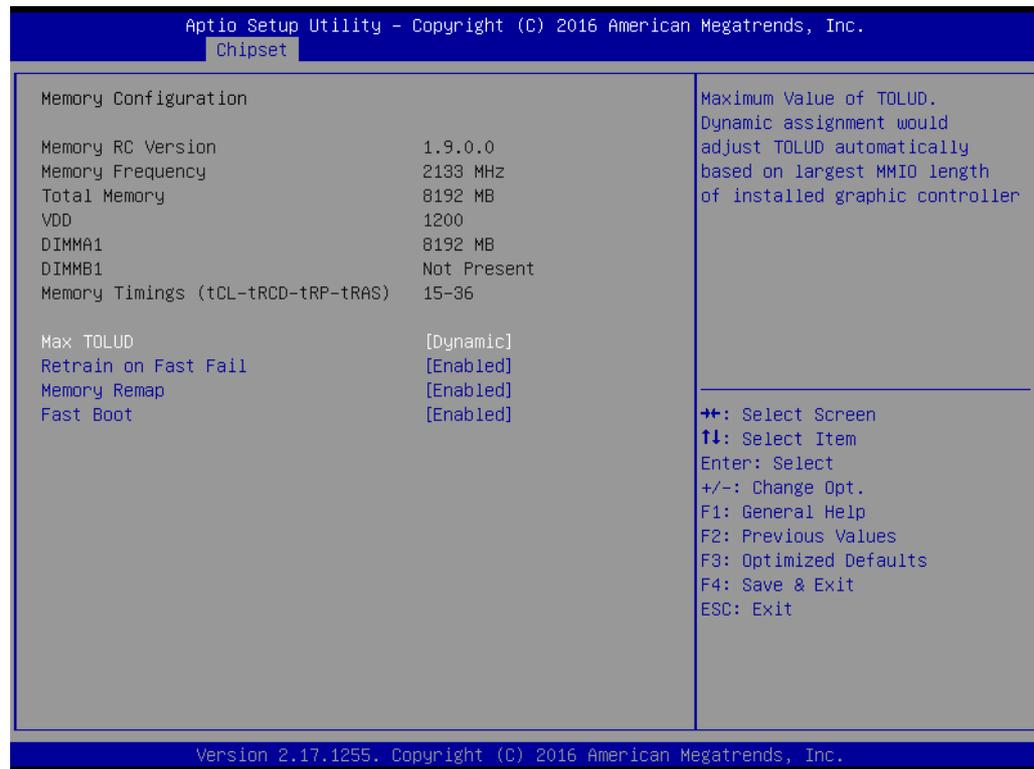


■ RxCTLE Override

When enabled, it overrides PEG's RxCTLE adaptive behavior.

- **Memory Configuration**

The item shows you memory specification included RC version, Frequency, size and voltage information etc.



- **Max TOLUD [Dynamic]**

Maximum Value of TOLUD.

Dynamic assignment would adjust TOLUD automatically based on largest MMIO length of installed graphic controller.

- **Retrain on Fast Fail**

Restart MRC in cold mode if SW MemTest fails during fast flow. Default=enabled

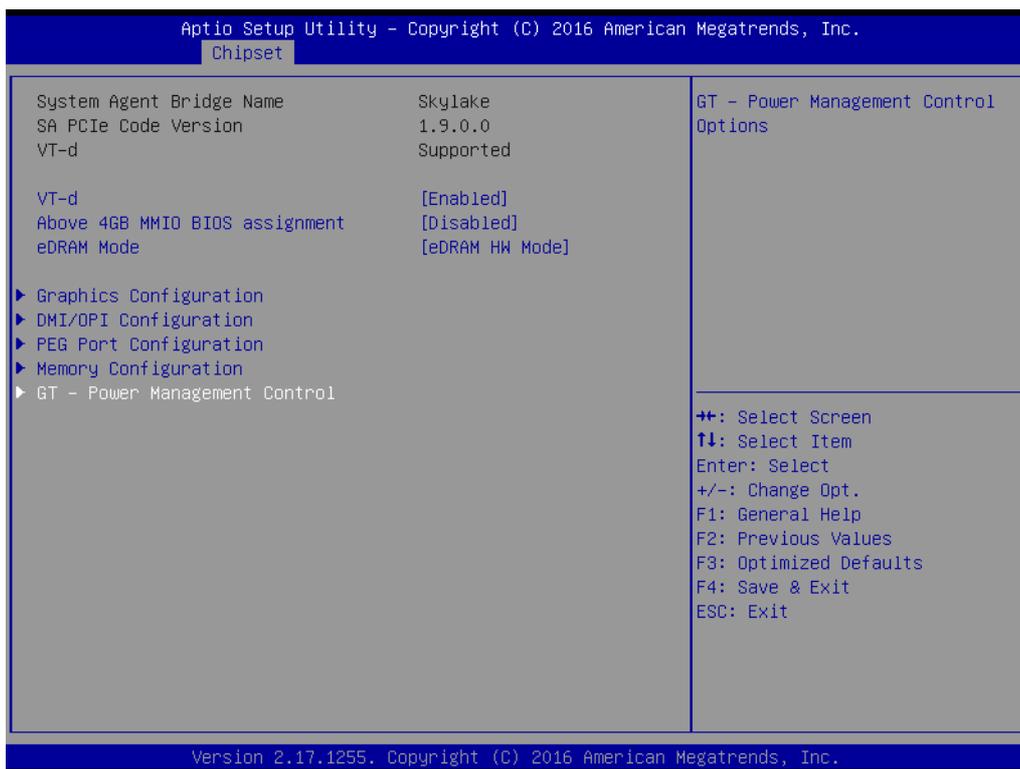
- **Memory Remap**

Enable/disable memory remap above 4GB

- **Fast Boot**

Enable/disable fast path thru the MRC.

GT- Power Management Control



- **RC6 (Render Standby) [Enabled]**
Check to enable / disable render standby supported.

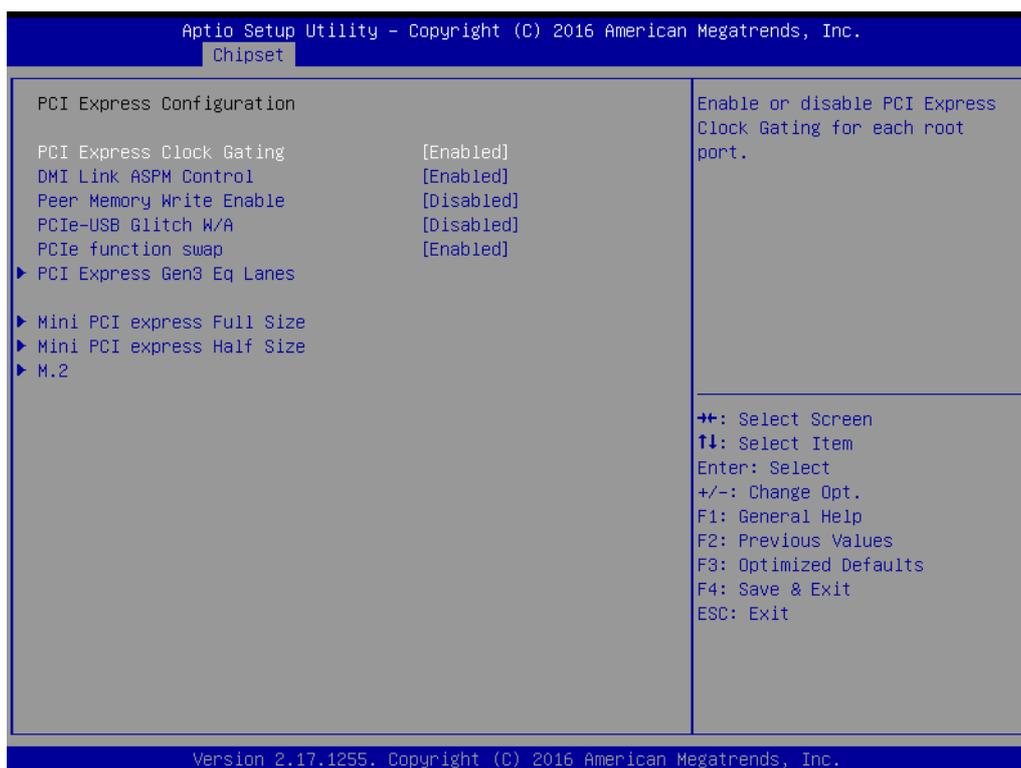
3.3.1.1 PCH-IO Configuration



- **LAN1 Control**
Enable or disable the LAN 1 controller.
- **LAN 2 controller**
Enable or disable the LAN 2 controller.
- **PCIe Wake**

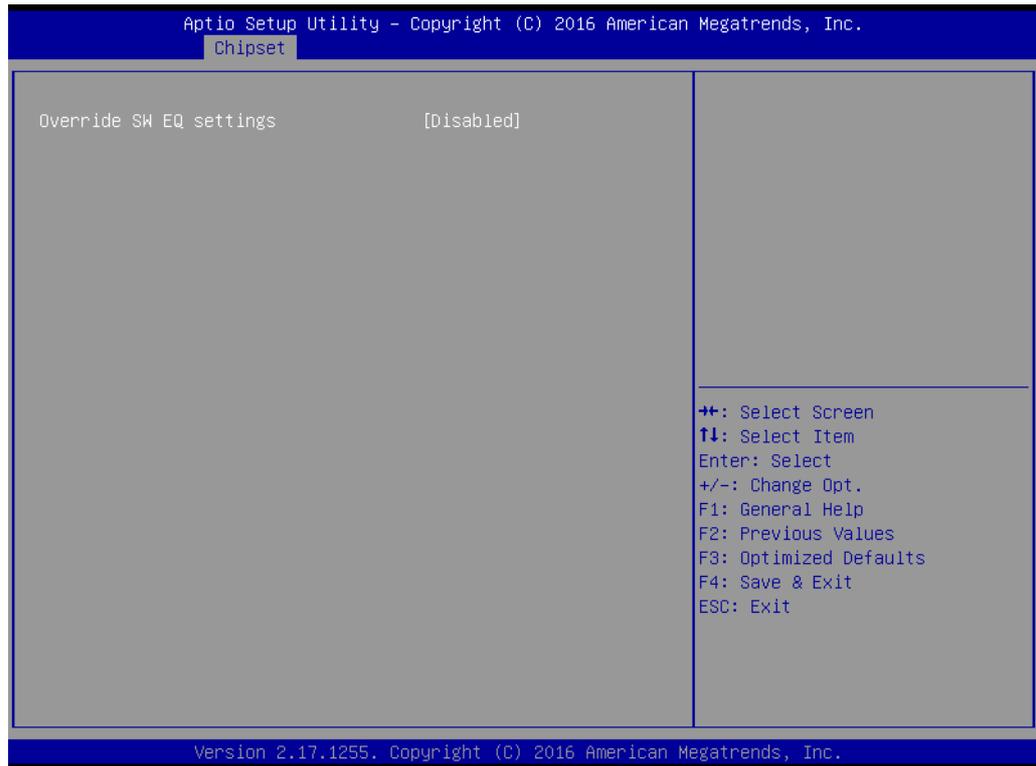
- Enable or disable PCIE Wake feature.
- **Deep Sleep**
Enable or disable the Deep Sleep function.
- **High Precision Timer**
Enable or disable the Deep Sleep function.
- **Start After G3**
Specify what state to go to when power is re-applied after a power failure (G3 state)

PCI Express Configuration

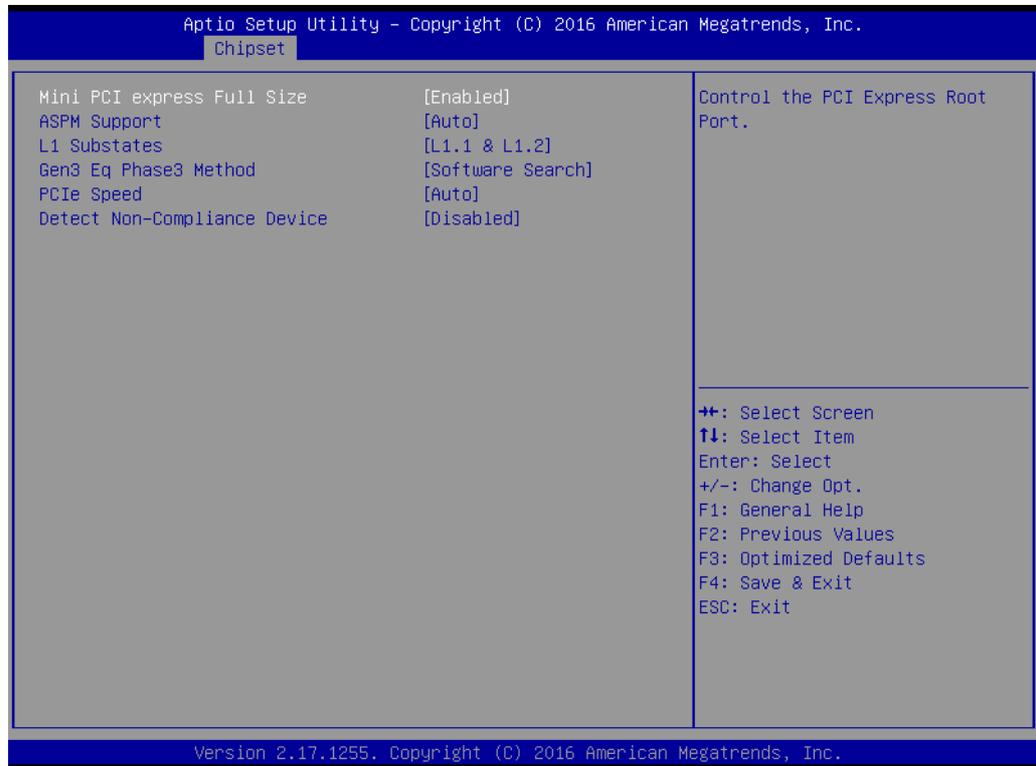


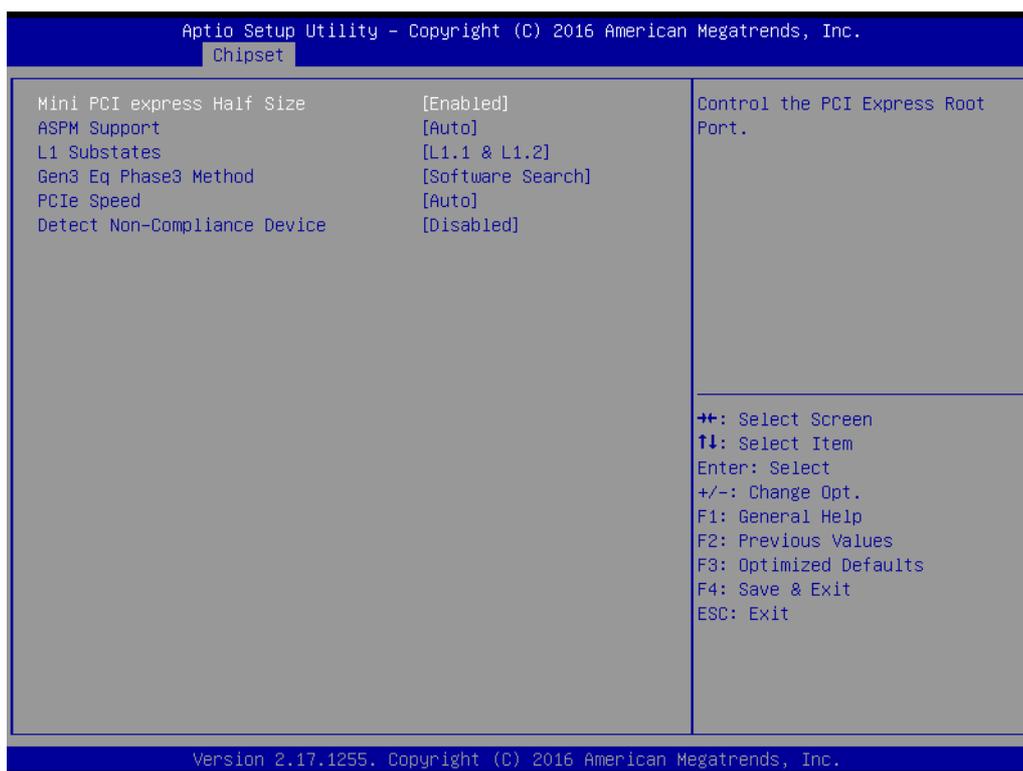
- **PCI Express Clock Gating [Enabled]**
Enable or disable PCI Express Clock Gating for each root port.
- **DMI Link ASPM Control [Enabled]**
Enable or disable the control of Active State Power Management on SA side of the DMI Link.
- **Peer Memory Write Enable**
Peer memory write enable/disable
- **PCIe-USB Glitch W/A**
PCIe-USB Glitch W/A for bad USB device(s) connected behind PCIE/PEG port.
- **PCIe function swap**
When disabled, prevents PCIE rootport function swap. If any function other than 0th is enabled, 0th will become visible.

PCI Express G3 Eq Lanes



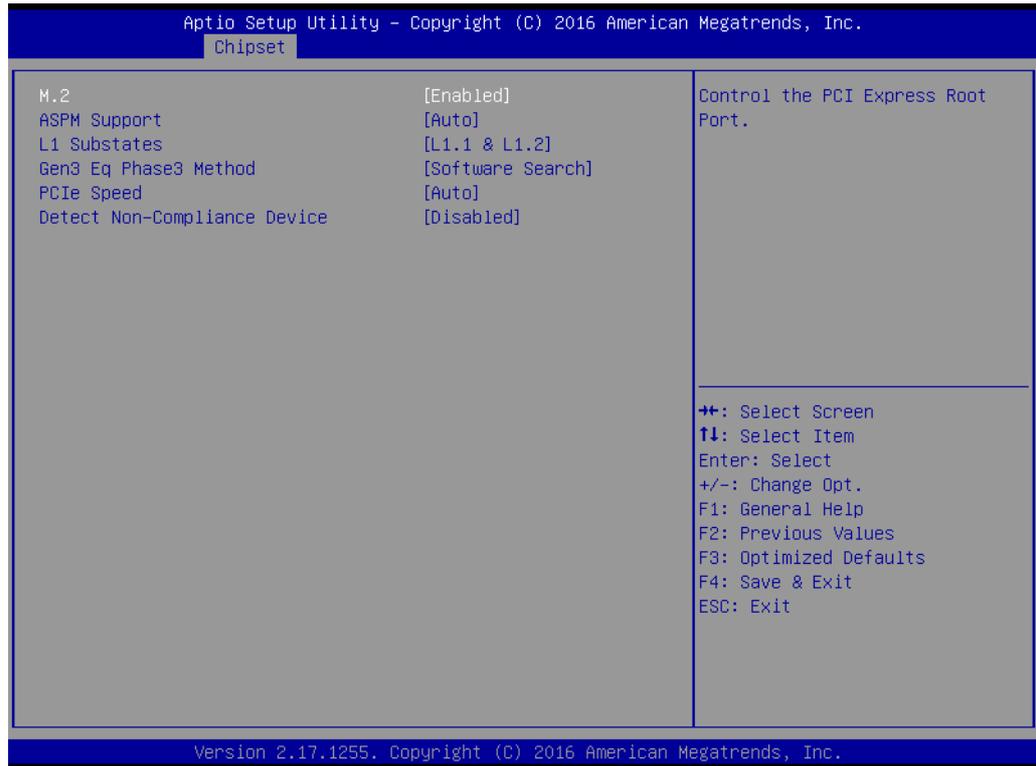
Mini PCI Express





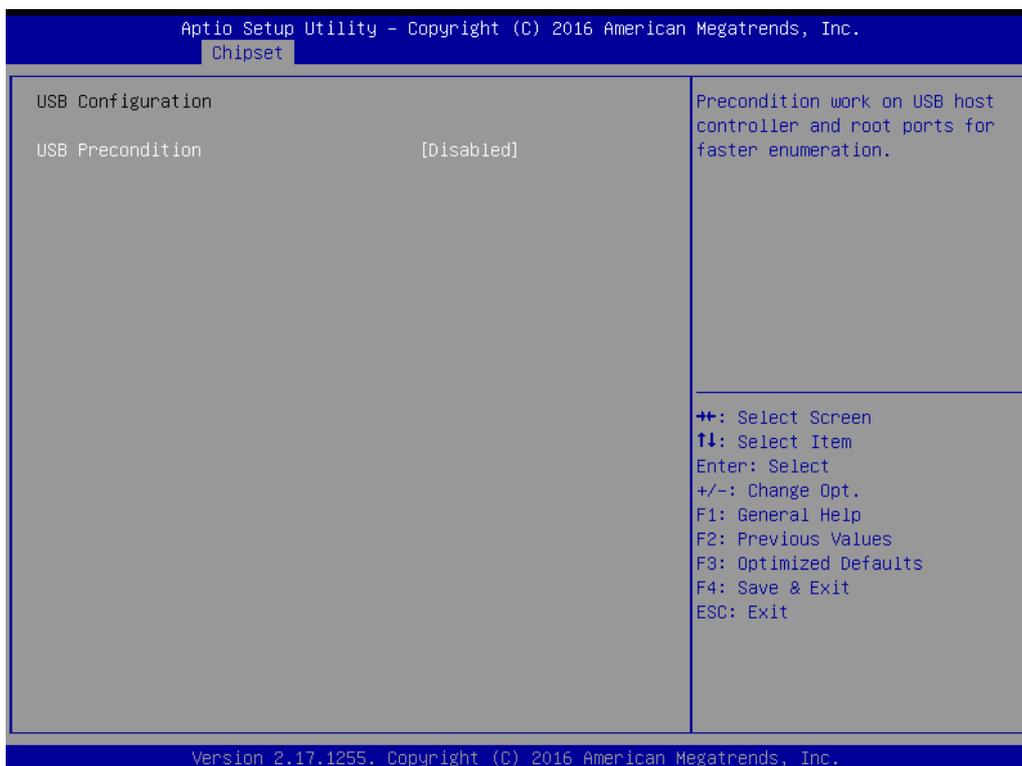
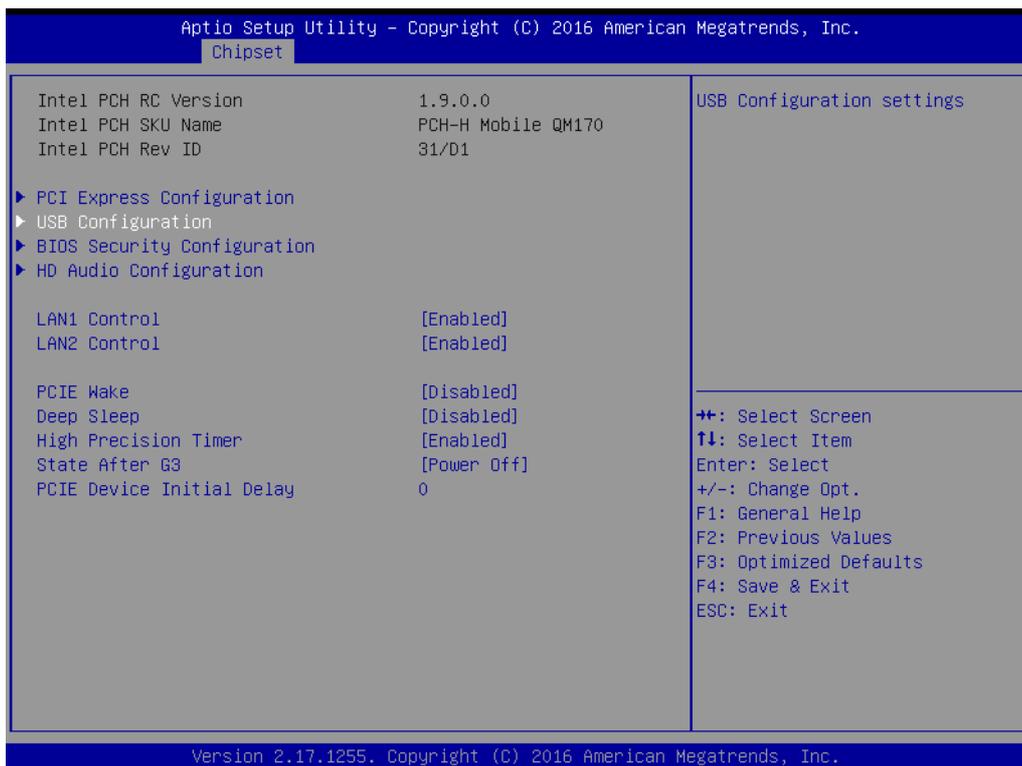
- **Mini PCI Express Full Size / Half Size**
Enable or disable PCI Express Root Port controller.
- **ASPM Support**
Set the ASPM level
- **L1 Substates**
PCI Express L1 Substates settings.
- **Gen3 Eq Phase3 Method**
PCIe Gen3 Equalization phase 3 method.
- **PCIe Speed**
Select PCI Express port speed
- **Detect Non-Compliance Device**
Detect non-compliance PCI Express device. If enable, it will take more time at POST time.

M.2



- **M.2**
Enable or disable PCI Express Root Port controller.
- **ASPM Support**
Set the ASPM level
- **L1 Substates**
PCI Express L1 Substates settings.
- **Gen3 Eq Phase3 Method**
PCIe Gen3 Equalization phase 3 method.
- **PCIe Speed**
Select PCI Express port speed
- **Detect Non-Compliance Device**
Detect non-compliance PCI Express device. If enable, it will take more time at POST time.

USB Configuration

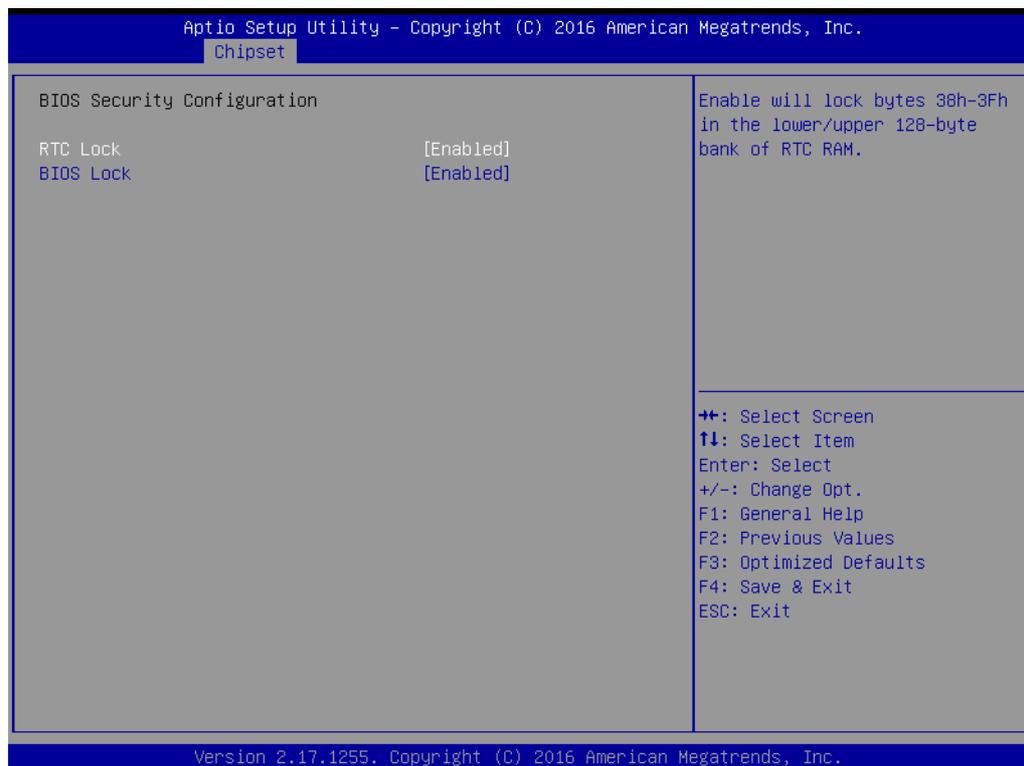
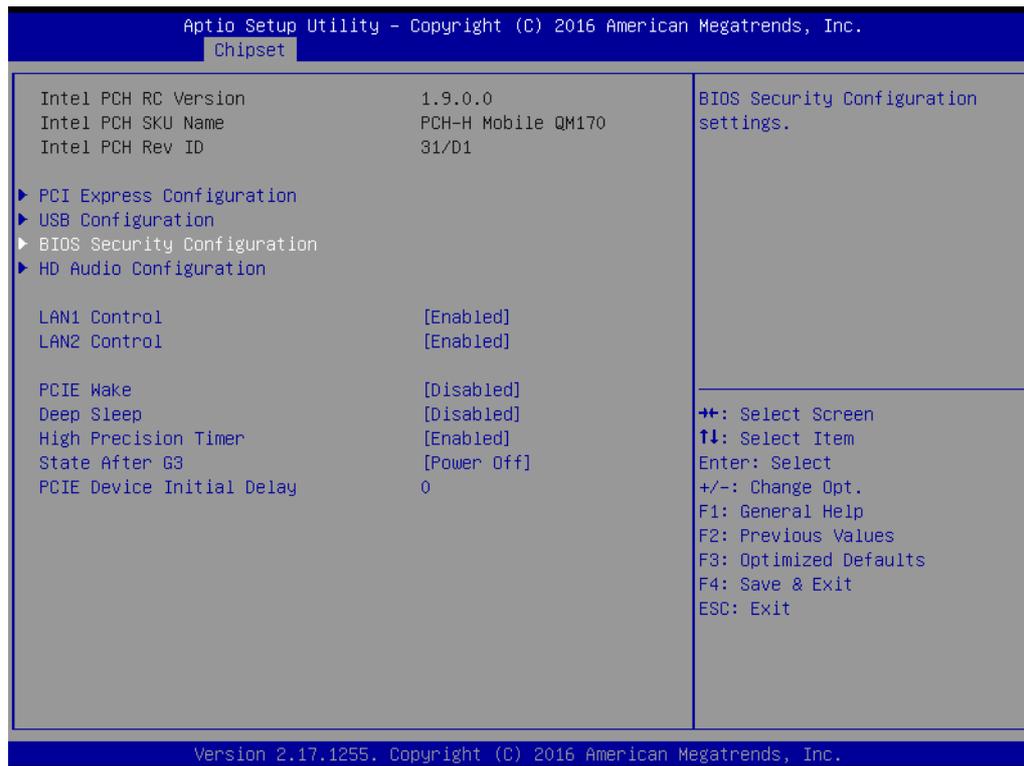


■ USB Precondition [Disabled]

Note! All of USB 2.0 & 3.0 only supported from 1 XHCI controller.

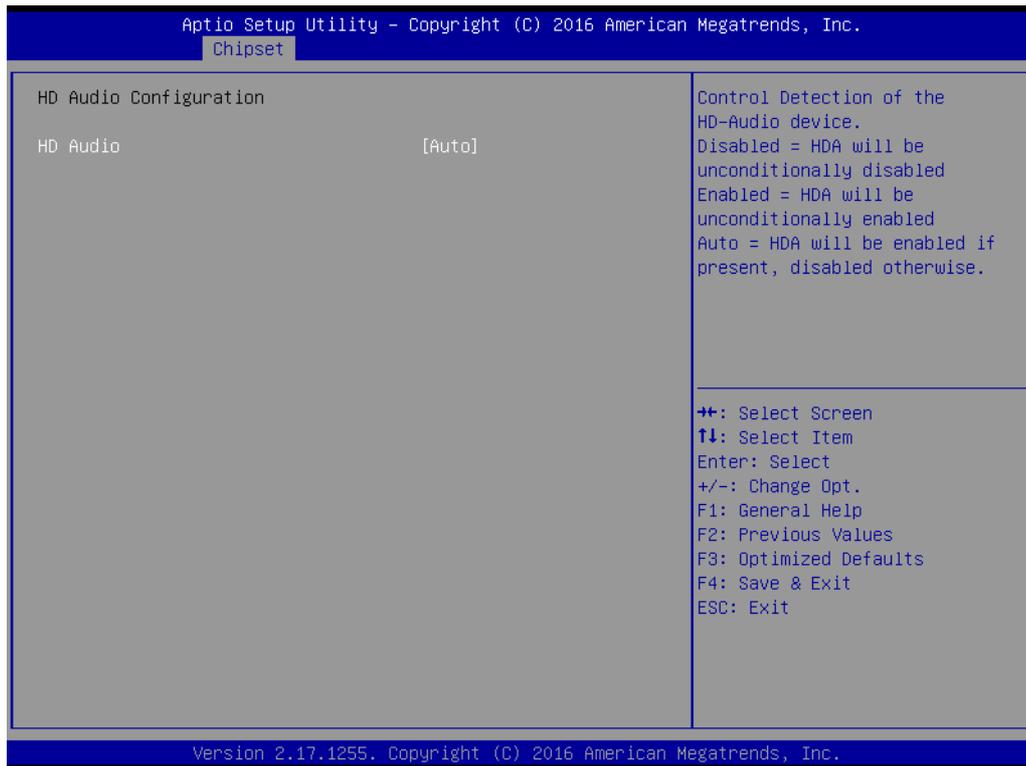


BIOS Security Configuration



- **RTC Lock**
Enable will lock bytes 38h-3Fh in the lower/upper 128 byte bank of RTC RAM.
- **BIOS Lock**
Enable/disable the PCH BIOS Lock Enable(BLE bit) feature.

HD Audio Configuration



■ HD Audio [Auto]

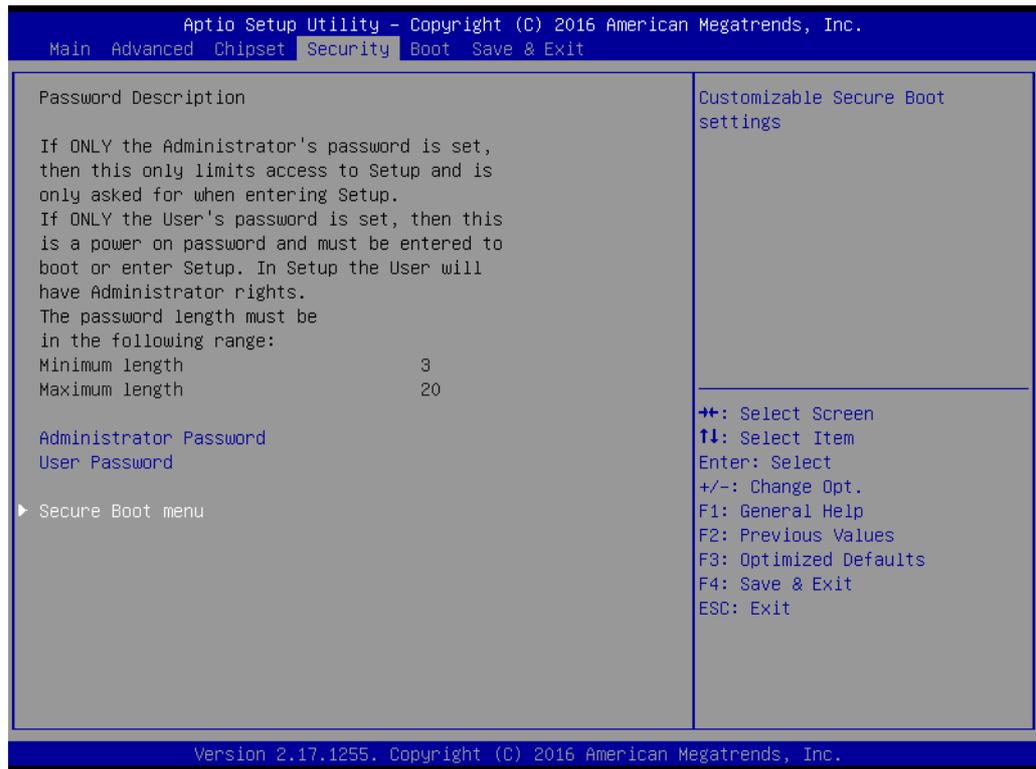
This item is to control detection of the HD-Audio device.

[Disabled] = HAD will be unconditionally disabled.

[Enabled] = HAD will be unconditionally enabled.

[Auto] = HAD will be enabled if present, disabled otherwise.

3.4 Security Setting



Secure Boot menu



■ Secure Boot

Secure Boot can be enabled if the 2 conditions below are met:

1. System is running in user mode with enrolled Platform Key (PK)

2. CSM function is disabled

- **Secure Boot Mode**
Secure Boot mode selector.

Key Management

```

Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
  Security
-----
Provision Factory Default keys      [Disabled]
▶ Enroll all Factory Default keys
▶ Save  all Secure Boot variables

Secure Boot variable | Size| Key#| Key source
▶ Platform Key(PK)   |  0|  0|
▶ Key Exchange Keys  |  0|  0|
▶ Authorized Signatures|  0|  0|
▶ Forbidden Signatures|  0|  0|
▶ Authorized TimeStamps|  0|  0|

Install factory default Secure
Boot keys when System is in
Setup Mode

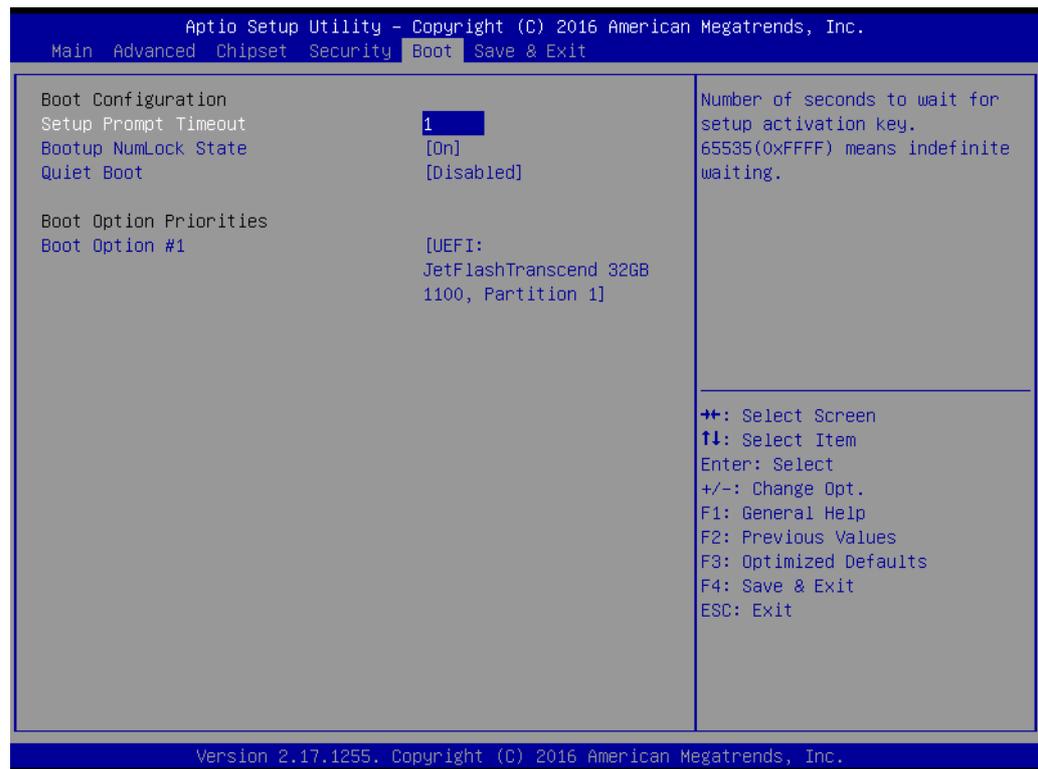
++: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

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```

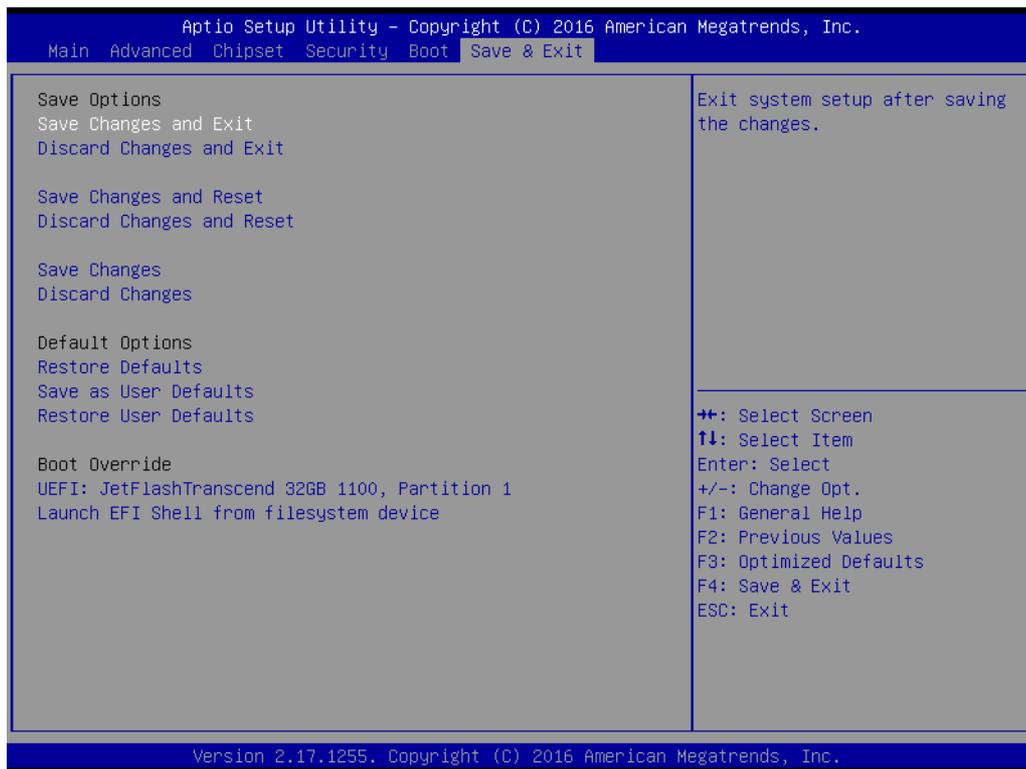
- **Provision Factory Default Keys [Disabled]**
Install factory default Secure Boot Keys when system is in setup mode.

3.5 Boot Setting



- **Setup Prompt Timeout [1]**
Use the <+> and <-> keys to adjust the number of seconds to wait for setup activation key.
- **Bootup NumLock State**
Select the keyboard NumLock state
- **Quiet Boot**
Enable/disable quiet boot option

3.6 Save & Exit Configuration



■ Save Changes and Exit

When users have completed system configuration, select this option to save changes, exit BIOS setup menu and reboot the computer to take effect all system configuration parameters.

1. Select Exit Saving Changes from the Exit menu and press <Enter>. The following message appears: Save Configuration Changes and Exit Now? [Ok] [Cancel]
2. Select [Ok] or [Cancel].

■ Discard Changes and Exit

Select this option to quit Setup without making any permanent changes to the system configuration.

1. Select Exit Discarding Changes from the Exit menu and press <Enter>. The following message appears: Discard Changes and Exit Setup Now? [Ok] [Cancel]
2. Select [Ok] to discard changes and exit. Discard Changes
Select Discard Changes from the Exit menu and press <Enter>.

■ Save Changes and Reset

When users have completed system configuration, select this option to save changes, exit BIOS setup menu and reboot the computer to take effect all system configuration parameters.

1. Select Exit Saving Changes from the Exit menu and press <Enter>. The following message appears: Save Configuration Changes and Exit Now? [Ok] [Cancel]
2. Select [Ok] or [Cancel].

■ Discard Changes and Reset

Select this option to quit Setup without making any permanent changes to the system configuration.

-
1. Select Reset Discarding Changes from the Exit menu and press <Enter>. The following message appears: Discard Changes and Exit Setup Now? [Ok] [Cancel]
 2. Select Ok to discard changes and reset. Discard Changes
Select Discard Changes from the Exit menu and press <Enter>.

■ **Restore Defaults**

The BIOS automatically configures all setup items to optimal settings when users select this option. Defaults are designed for maximum system performance, but may not work best for all computer applications. In particular, do not use the Defaults if the user's computer is experiencing system configuration problems. Select Restore Defaults from the Exit menu and press <Enter>.

■ **Save as User Default**

Save the all current settings as a user default.

■ **Restore User Default**

Restore all settings to user default values.

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 provides 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.

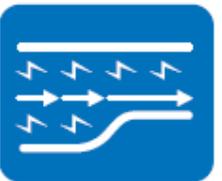
4.2.1.4 Power Saving

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.

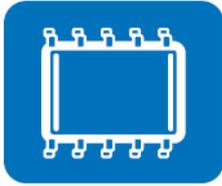
System Throttling



Refers to a series of methods for reducing power consumption in computers by lowering the clock frequency.

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 the customers' disk. The BIOS Flash utility also provides a command line version and an API for fast implementation into customized applications.

Monitoring



Monitoring is a utility for customers to monitor system health, like voltage, CPU and system temperature and fan speed. These items are important to a device, if 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 AIMB-242 are located on Advantech website. ([http://support.advantech.com/Support/.](http://support.advantech.com/Support/)) Updates are provided via Service Packs from Microsoft*.

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

5.2 Introduction

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

- Core PCI PnP services
- IDE Ultra ATA 100/66/33 and Serial ATA interface support
- 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 8.1 (64 bit)
- Windows 10 (64 bit)

5.3 Windows 8.1 Driver Setup

1. When enter the website of Advantech, then search product AIMB-242. There is "Chipset" driver inside.

Win8.1(64bit) driver for AIMB-242

Solution : Win8.1(64bit) driver for AIMB-242

Download File	Released Date	Download Site	
AIMB-242_USB3.0_Win8.1(64bit).zip	2016-08-16	Primary	Secondary
AIMB-242_RST_Win8.1(64bit).zip	2016-08-03	Primary	Secondary
AIMB-242_Audio_Win8.1(64bit).zip	2016-08-03	Primary	Secondary
AIMB-242_ME_Win8.1(64bit).zip	2016-08-03	Primary	Secondary
AIMB-242_LAN_Win8.1(64bit).zip	2016-08-03	Primary	Secondary
AIMB-242_Graphic_Win8.1(64bit).zip	2016-08-03	Primary	Secondary
AIMB-242_Chipset_Win8.1(64bit).zip	2016-08-03	Primary	Secondary

Chapter 6

USB Setup

6.1 Introduction

From 6th Gen Intel Platform, it only has XHCI USB controller for all of USB 2.0 / 3.0 ports. So, when your operation system is Win 7, you need to install USB 3.0 driver manually first. Before you install USB 3.0 driver, all of USB ports can not work properly.

So, Please make sure you connect PS/2 keyboard mouse to install the driver first.

For Win8 OS, the inbox driver enables the USB controller to work automatically. You still can download and update the WIN8.1 USB 3.0 driver from the website.

<http://support.advantech.com/Support/>

6.2 Win 7 / 8.1 USB 3.0 Driver Installation

Note! *If your operation system is Win7, please make sure you insert PS/2 keyboard mouse to install the driver first.*



When enter the website of Advantech, then search product AIMB-242. There is "USB 3.0" driver inside.

Win8.1(64bit) driver for AIMB-242

Solution : Win8.1(64bit) driver for AIMB-242

Download File	Released Date	Download Site	
AIMB-242_USB3.0_Win8.1(64bit).zip	2016-08-16	Primary	Secondary
AIMB-242_RST_Win8.1(64bit).zip	2016-08-03	Primary	Secondary
AIMB-242_Audio_Win8.1(64bit).zip	2016-08-03	Primary	Secondary
AIMB-242_ME_Win8.1(64bit).zip	2016-08-03	Primary	Secondary
AIMB-242_LAN_Win8.1(64bit).zip	2016-08-03	Primary	Secondary
AIMB-242_Graphic_Win8.1(64bit).zip	2016-08-03	Primary	Secondary
AIMB-242_Chipset_Win8.1(64bit).zip	2016-08-03	Primary	Secondary

Chapter 7

LAN Configuration

7.1 Introduction

The AIMB-242 has dual Gigabit Ethernet LANs via dedicated PCI Express x1 lanes (Intel I219LM (LAN1) and I211AT (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-242's Intel i219LM (LAN1) and i211AT (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® 8.1 Driver Setup (Intel I219LM/ Intel I211AT)

When enter the website of Advantech, then search product AIMB-242. There is "LAN" driver inside.

Win8.1(64bit) driver for AIMB-242

Solution : Win8.1(64bit) driver for AIMB-242

Download File	Released Date	Download Site
AIMB-242_USB3.0_Win8.1(64bit).zip	2016-08-16	Primary Secondary
AIMB-242_RST_Win8.1(64bit).zip	2016-08-03	Primary Secondary
AIMB-242_Audio_Win8.1(64bit).zip	2016-08-03	Primary Secondary
AIMB-242_ME_Win8.1(64bit).zip	2016-08-03	Primary Secondary
AIMB-242_LAN_Win8.1(64bit).zip	2016-08-03	Primary Secondary
AIMB-242_Graphic_Win8.1(64bit).zip	2016-08-03	Primary Secondary
AIMB-242_Chipset_Win8.1(64bit).zip	2016-08-03	Primary Secondary

Appendix **A**

Pin Assignments

A.1 Pin Assignments

Table A.1: EDP1 (BOM optional)

PIN	PIN_NAME	PIN	PIN_NAME
1	GND	11	EDP_DP1_CON
2	GND	12	EDP_AUXN_CON
3	EDP_DN0_CON	13	GND
4	EDP_DN3_CON	14	EDP_AUXP_CON
5	EDP_DP0_CON	15	EDP_DN2_CON
6	EDP_DP3_CON	16	GND
7	GND	17	EDP_DP2_CON
8	NC	18	EDP_HPD_CON
9	EDP_DN1_CON	19	VDD_LVDS
10	GND	20	VDD_LVDS

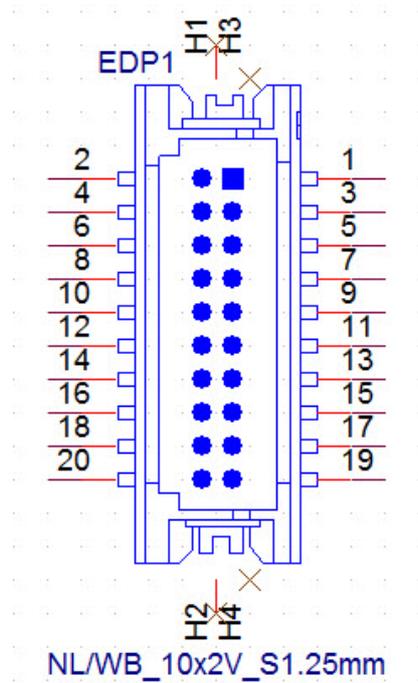
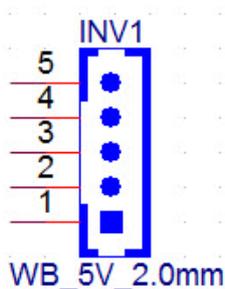


Table A.2: INV1

PIN	PIN_NAME
1	+12V
2	GND
3	BL_EN_EDP(+5V tolerance)
4	BL_CTL_EDP(+3.3V tolerance)
5	+5V

**Table A.3: LVDS1**

PIN	PIN_NAME	PIN	PIN_NAME
1	VDD_LVDS	21	LVDSA_P2
2	VDD_LVDS	22	LVDSB_P2
3	LVDS_DET#	23	GND
4	GND	24	GND
5	VDD_LVDS	25	LVDSA_CLK_N
6	VDD_LVDS	26	LVDSB_CLK_N
7	LVDSA_N0	27	LVDSA_CLK_P
8	LVDSB_N0	28	LVDSB_CLK_P
9	LVDSA_P0	29	GND
10	LVDSB_P0	30	GND
11	GND	31	LVDS_CH7511_DDC_CLK
12	GND	32	LVDS_CH7511_DDC_DATA
13	LVDSA_N1	33	GND
14	LVDSB_N1	34	GND
15	LVDSA_P1	35	LVDSA_N3
16	LVDSB_P1	36	LVDSB_N3
17	GND	37	LVDSA_P3
18	GND	38	LVDSB_P3
19	LVDSA_N2	39	LVDS_BL_EN
20	LVDSB_N2	40	VCON

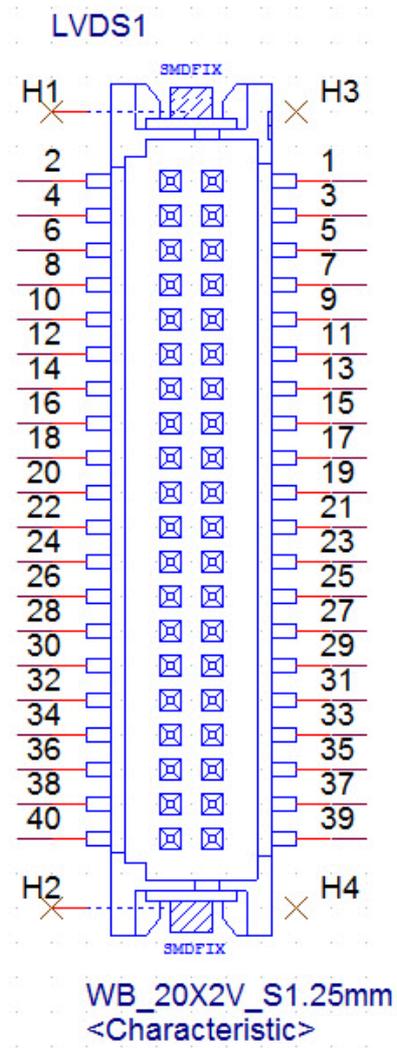


Table A.4: JAMP1 (BOM optional)

PIN	PIN_NAME
1	GND
2	AMP_SIDE-L
3	GND
4	AMP_SIDE-R

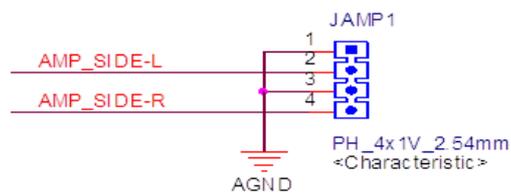


Table A.5: FPAUDIO1

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

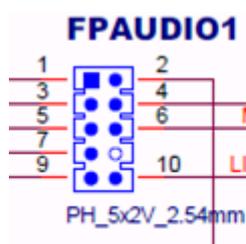


Table A.6: SPDIF1

PIN	PIN_NAME
1	+5V
2	NC
3	SPDIF_O
4	GND

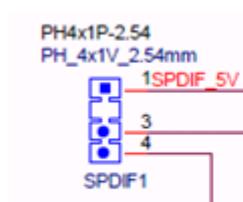
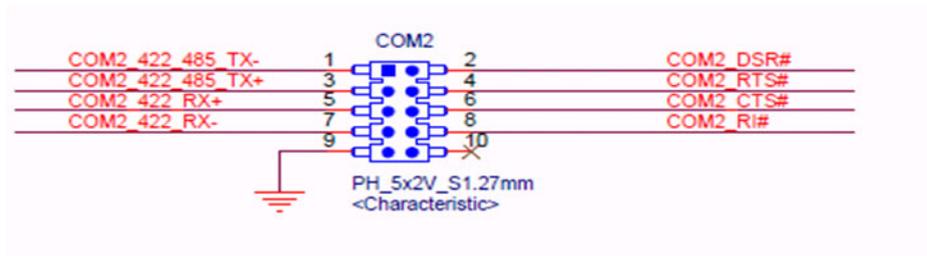


Table A.7: COM2

PIN	PIN_NAME
1	COM2_422_485_TX-(DCD#)
2	COM2_DSR#
3	COM2_422_485_TX+(RXD)
4	COM2_RTS#
5	COM2_422_RX+(TXD)
6	COM2_CTS#
7	COM2_422_RX-(DTR#)
8	COM2_RI#
9	GND

**Table A.8: USB9**

PIN	PIN_NAME
1	+USBV9
2	USB_CM_N9
3	USB_CM_P9
4	GND

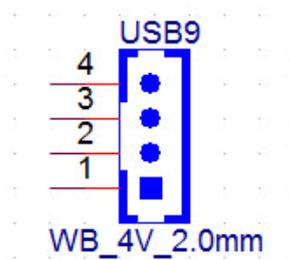


Table A.9: JFP3

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

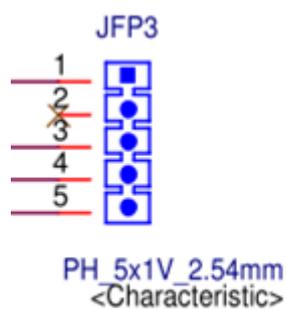


Table A.10: GPIO1

PIN	PIN_NAME
1	EC_GPIO
2	EC_GPO0
3	EC_GPI1
4	EC_GPO1
5	EC_GPI2
6	EC_GPO2
7	EC_GPI3
8	EC_GPO3
9	+5V_DUAL_GPIO
10	GND

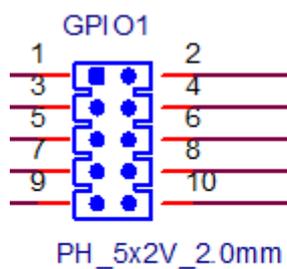


Table A.11: CPUFAN1,SYSFAN1,SYSFAN2

PIN	PIN_NAME
1	GND
2	VCC
3	FEEDBACK
4	PWM

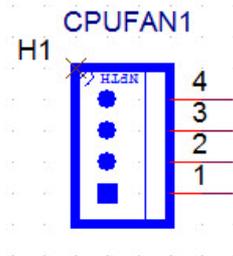


Table A.12: JFP1+JFP2

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

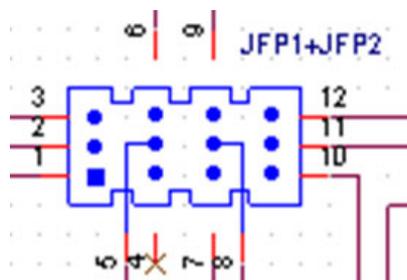
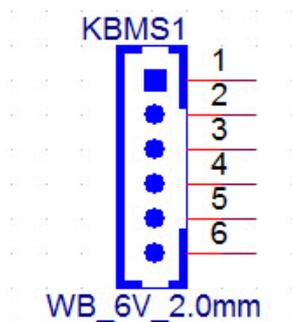


Table A.13: KBMS1

PIN	PIN_NAME
1	Keyboard_CLK
2	Keyboard_DAT
3	Mouse_CLK
4	GND
5	VCC_KBMS
6	Mouse_DAT



A.2 Connectors

Table A.14: HDMI1

PIN	PIN_NAME	PIN	PIN_NAME
1	HDMI_CON_DP2	11	GND
2	GND	12	HDMI_CON_CLKN
3	HDMI_CON_DN2	13	HDMI_CON_CEC
4	HDMI_CON_DP1	14	NC
5	GND	15	HDMI1_SCL
6	HDMI_CON_DN1	16	HDMI1_SDA
7	HDMI_CON_DP0	17	GND
8	GND	18	+5V_HDMI
9	HDMI_CON_DN0	19	HDMI1_HPD_C
10	HDMI_CON_CLKP		

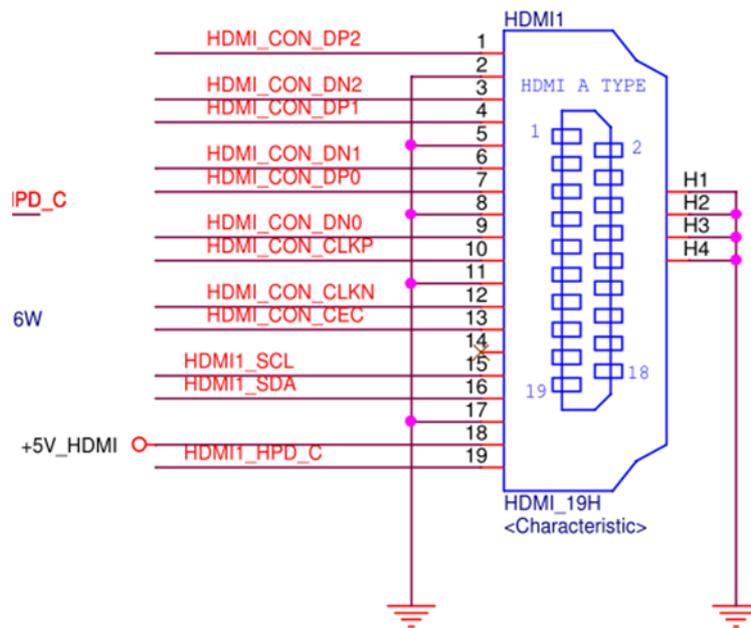


Table A.15: DP1

PIN	PIN_NAME	PIN	PIN_NAME
1	DP1_CON_DP0	11	GND
2	GND	12	DP1_CON_DN3
3	DP1_CON_DN0	13	DP1_AUX_EN#
4	DP1_CON_DP1	14	GND
5	GND	15	DP1_AUXP_CON
6	DP1_CON_DN1	16	GND
7	DP1_CON_DP2	17	DP1_AUXN_CON
8	GND	18	DP1_HPD
9	DP1_CON_DN2	19	GND
10	DP1_CON_DP3	20	+3.3V_DP1

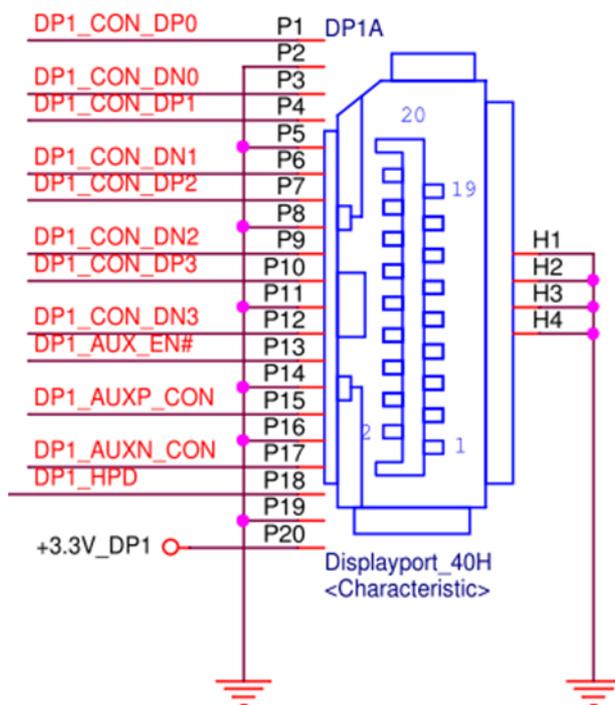


Table A.16: SATA1/2

PIN	PIN_NAME
1	GND
2	SATA_TX_C_P2
3	SATA_TX_C_N2
4	GND
5	SATA_RX_C_N2
6	SATA_RX_C_P2
7	GND

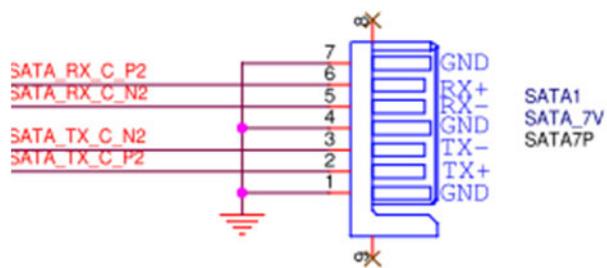
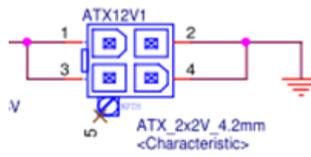


Table A.17: ATX12V1

PIN	PIN_NAME
1	+12V_4P
2	GND
3	+12V_4P
4	GND

**Table A.18: EATXPWR1**

PIN	PIN_NAME	PIN	PIN_NAME
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PSON
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	POK	20	-5V
9	+5VA	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	GND

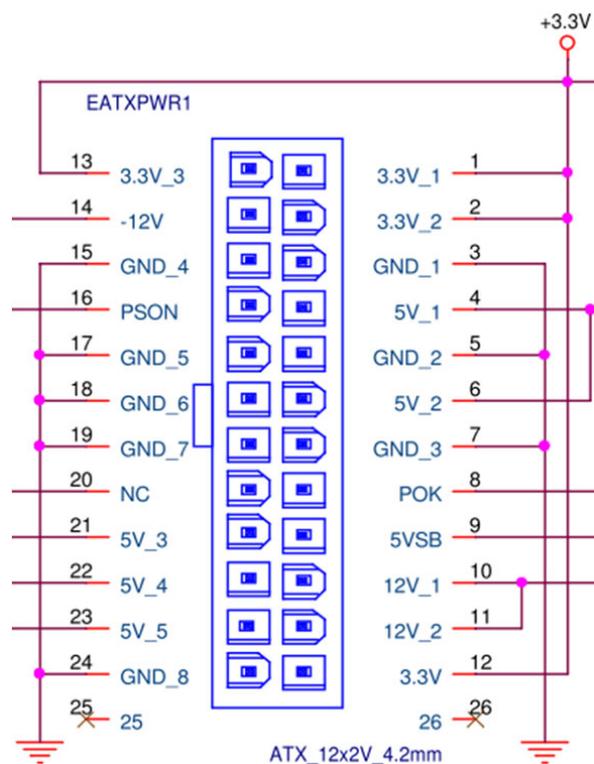


Table A.19: MPCIE_F1

PIN	PIN_NAME	PIN	PIN_NAME
1	PCIE_WAKE#	27	GND
2	+3.3V_PIN43	28	+1.5V_MC1
3	NC	29	GND
4	GND	30	SMBCLK_RESUME
5	NC	31	MPCIE_MSATA_TX_N
6	+1.5V_MC1	32	SMBDATA_RESUME
7	CKREQ_MINICARD_F#	33	MPCIE_MSATA_TX_P
8	NC	34	GND
9	GND	35	GND
10	NC	36	USB_N10
11	CLK_100M_Mini_F_N	37	GND
12	NC	38	USB_P10
13	CLK_100M_Mini_F_P	39	+3.3V_PIN43
14	NC	40	GND
15	GND	41	+3.3V_PIN43
16	NC	42	NC
17	NC	43	PCIE1.1#_1.0MSATA_SEL
18	GND	44	NC
19	NC	45	NC
20	MINIPCIE1_DIS#	46	NC
21	MINIPCIE1_DET#	47	NC
22	PLTRST_LPC#	48	NC
23	MPCIE_MSATA_RX_P	49	NC
24	+3.3V_PIN51	50	GND

Table A.20: MPCIE_H1

PIN	PIN_NAME	PIN	PIN_NAME
1	PCIE_WAKE#	27	GND
2	+3.3V_A_MC2	28	+1.5V_MC2
3	NC	29	GND
4	GND	30	SMBCLK_RESUME
5	NC	31	PCIE1_TX_N11
6	+1.5V_MC2	32	SMBDATA_RESUME
7	NC	33	PCIE1_TX_P11
8	NC	34	GND
9	GND	35	GND
10	NC	36	USB_N11
11	CLK_100M_Mini_H_N	37	GND
12	NC	38	USB_P11
13	CLK_100M_Mini_H_P	39	+3.3V_A_MC2
14	NC	40	GND
15	GND	41	+3.3V_A_MC2
16	NC	42	NC
17	NC	43	GND
18	GND	44	NC
19	NC	45	NC
20	MINIPCIE1_W_DISABLE#	46	NC
21	MINIPCIE2_DET#	47	NC
22	PLTRST_LPC#	48	+1.5V_MC2
23	PCIE1_RX_N11	49	NC
24	+3.3V_A_MC2	50	GND
25	PCIE1_RX_P11	51	NC
26	GND	52	+3.3V_A_MC2

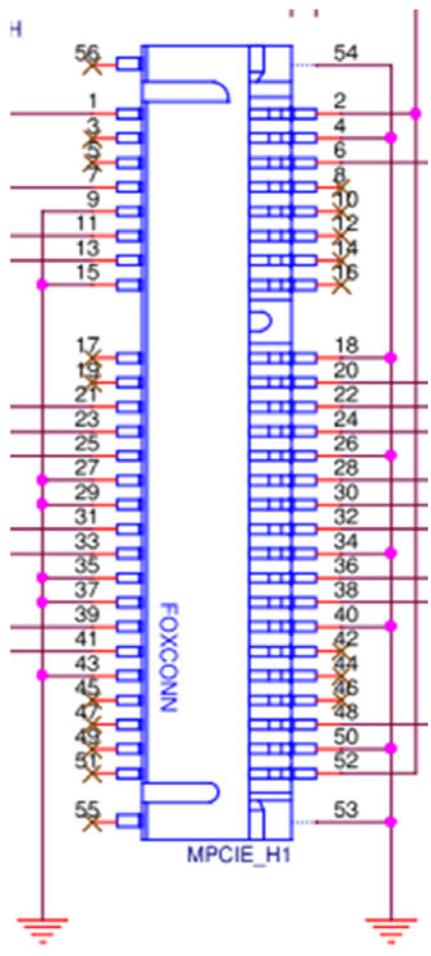


Table A.21: M.2_1

PIN	PIN_NAME	PIN	PIN_NAME
1	M.2_CONFIG_3	43	PCIE_SATA_RX_R_N0
2	+3.3V_M.2	44	NC
3	GND	45	GND
4	+3.3V_M.2	46	NC
5	GND	47	PCIE_SATA_TX_C_N0
6	M.2_POWER_OFF#	48	NC
7	USB_P12	49	PCIE_SATA_TX_C_P0
8	M.2_W_DISABLE1#	50	M.2_PLTRST#
9	USB_N12	51	GND
10	M.2_LED#	52	M.2_CKR_REQ13#
11	GND	53	CLK_100M_M.2_N
20	NC	54	M.2_PCIE_WAKE#
21	M.2_CONFIG_0	55	CLK_100M_M.2_P
22	NC	56	M.2_SMB_CLK_MAIN
23	M.2_PCIE_WAKE#	57	GND
24	NC	58	M.2_SMB_DATA_MAIN
25	M.2_SAR_DPR	59	NC
26	M.2_GNSS_DISABLE#	60	NC
27	GND	61	NC
28	NC	62	NC
29	USB3_PCIE1_RX_R_N3	63	NC
30	NC	64	NC
31	USB3_PCIE1_RX_R_P3	65	NC
32	NC	66	NC
33	GND	67	M.2_RESET#_R
34	NC	68	PCH_SUSCLK
35	USB3_PCIE1_TX_C_N3	69	M.2_CONFIG_1
36	NC	70	+3.3V_M.2
37	USB3_PCIE1_TX_C_P3	71	GND
38	NC	72	+3.3V_M.2
39	GND	73	GND
40	M.2_ISH_SCL	74	+3.3V_M.2
41	PCIE_SATA_RX_R_P0	75	M.2_CONFIG_2
42	M.2_ISH_SDA		

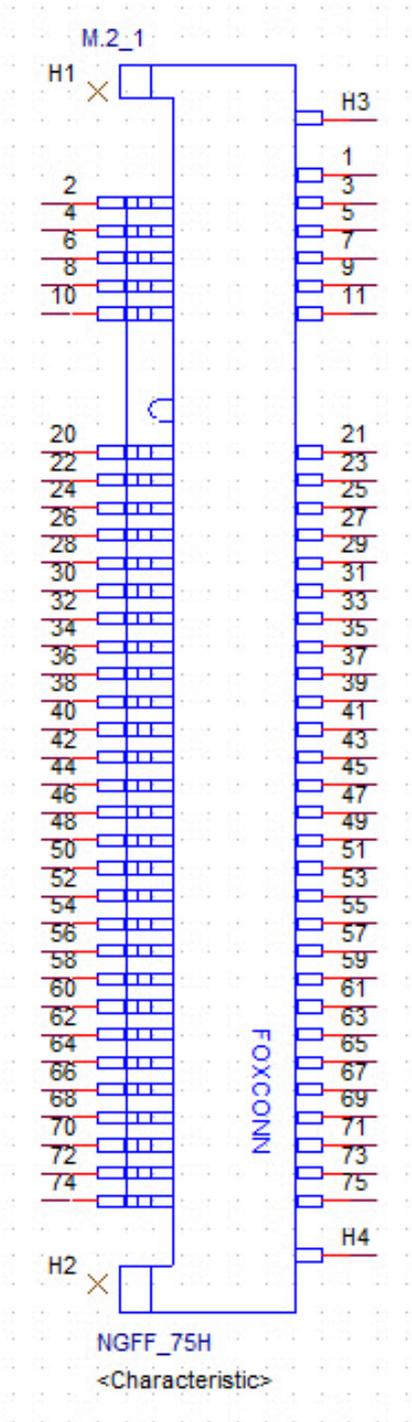


Table A.22: BAT1

PIN	PIN_NAME
1	+VBAT
2	GND

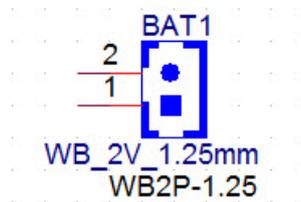


Table A.23: LPC1

PIN	PIN_NAME
1	CLK24M_PCH_eSPI_LPC1
2	LPC_AD1
3	PLTRST_LPC#
4	LPC_AD0
5	LPC_FRAME#
6	+3.3V
7	LPC_AD3
8	GND
9	LPC_AD2
10	LPC1_SMB_CLK
11	SERIRQ
12	LPC1_SMB_DAT
13	+5V_DUAL
14	+5V

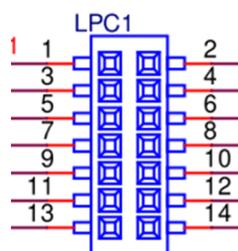
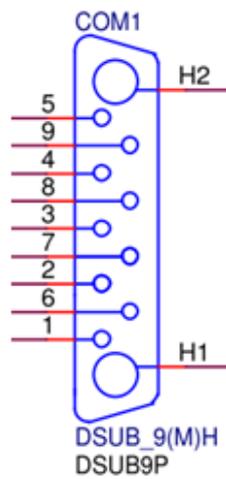


Table A.24: COM1

PIN	PIN_NAME
1	COM1_DCD#
2	COM1_SIN
3	COM1_SOUT
4	COM1_DTR#
5	GND
6	COM1_DSR#
7	COM1_RTS#
8	COM1_CTS#
9	COM1_RRI1#



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