

User Manual

AIMB-205

**Intel® Core™ i7/i5/i3/Pentium/
Celeron LGA1151 Mini-ITX with
CRT/DVI-D/DP++/LVDS(or eDP),
8 COM & 14 USB, Dual LAN, PCIe
x16**

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Enabling an Intelligent Planet

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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

Processor Number	Max_TDP	Code Name	Cores/Threads	Lithography
i7-7700	65W	Kabylake	4C/8T	14nm
i5-7500	65W	Kabylake	4C/4T	14nm
i3-7100	51W	Kabylake	2C/4T	14nm
G4560	54W	Kabylake	2C/4T	14nm
G3930	51W	Kabylake	2C/2T	14nm
i7-7700T	35W	Kabylake	4C/8T	14nm
i5-7500T	35W	Kabylake	4C/4T	14nm
i7-6700	65W	Skylake	4C/8T	14nm
i5-6600	65W	Skylake	4C/4T	14nm
i5-6600	65W	Skylake	4C/4T	14nm
i5-6500	65W	Skylake	4C/4T	14nm
i5-6400	65W	Skylake	4C/4T	14nm
G4400	54W	Skylake	2C/2T	14nm
i3-6300	51W	Skylake	2C/4T	14nm
i3-6100	51W	Skylake	2C/4T	14nm
i7-6700TE	35W	Skylake	4C/8T	14nm
i5-6600T	35W	Skylake	4C/4T	14nm
i5-6500TE	35W	Skylake	4C/8T	14nm
i3-6100TE	35W	Skylake	2C/4T	14nm
G4400TE	35W	Skylake	2C/2T	14nm
i3-6300T	35W	Skylake	2C/4T	14nm

Memory Compatibility

Category	Speed	Capacity	Vendor	Module_PN	Chip_PN	ADVANTECH P/N	ECC
DDR4	2133	16GB	Advantech	AQD-SD4U16N21-SE	SEC 546 K4A8G08 5WB BCPB	AQD-SD4U16N21-SE	N
DDR4	2133	4GB	ATP	A4G04QA8BLPB ME	40A77 D9RGQ	N/A	N
DDR4	2133	8GB	Advantech	AQD-SD4U8GN21-SG	SEC 552 BCPB K4A4G085WD	AQD-SD4U8GN21-SG	N
DDR4	2133	16GB	Transcend	TS2GSH64V1B	SEC 546 K4A8G08 5WB BCRC	NA	N
DDR4	2400	16GB	ADATA	AD4S2400J4G1 7-BHYA	H5ANG8NAFR	AQD-SD4U16N24-HE	N
DDR4	2400	8GB	ADATA	ADS240038G17- BHYA	H5AN8G8NAFR	AQD-SD4U8GN24-HE	N
DDR4	2400	16GB	Advantech	AQD-SD4U16N24-HE	H5AN8G8NAFR UHC	AQD-SD4U16N24-HE	N

Ordering Information

P/N	Chipset	DP++	VGA	DVI-D	LVDS/ eDP	GbE LAN	COM	SATAIII	USB3.0 /2.0	M.2	miniPCIE	TPM	AMP	PCIex 16
AIMB-205G2-00A1E	H110	1	1	1	1/(1)	2	8	2	4/6+(4)	1, M.2 B key	1 F/S, colay mSATA	(1)	1	1

* () is not populated when MP

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1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandise authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Initial Inspection

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

- 1 x AIMB-205 Intel Core™ i7/i5/i3 LGA1151 Mini-ITX motherboard
- 1 x SATA HDD cable
- 2 x Serial port cable
- 1 x I/O port bracket
- 1 x Startup manual
- 1 x Warranty card

If any of these items are missing or damaged, contact your distributor or sales representative immediately. We have carefully inspected the AIMB-205 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-205, 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-205 is designed with the Intel® H110 PCH for industrial applications that require both performance computing and enhanced power management capabilities. The motherboard supports Intel desktop Core i7/i5/i3/Pentium/Celeron processor up to 8 MB L3 cache and 2 DDR4 2400MHz SO-DIMM, up to 32 GB. A rich I/O connectivity of 8 serial ports, 14 USB, dual GbE LAN, 2 SATA, 1 miniPCIe and 1 NGFF (M.2_B Key) Connector.

1.2 Features

- **Rich I/O connectivity:** 8 serial ports, 4 USB 3.0, 10 USB 2.0 (USB11/12/13/14 is BOM optional), 2 SATAIII, 1 MINIPCIe colay with MSATA, 1 M.2 NGFF connector, Dual GbE LAN and 1 PCIe16
- **Standard Mini-ITX form factor with industrial feature:** The AIMB-205 is a full-featured Mini-ITX motherboard with balanced expandability and performance
- **Wide selection of storage devices:** SATA HDD, mSATA, M.2 (B key), customers benefit from the flexibility of using the most suitable storage device for larger capacity
- **Optimized integrated graphic solution:** With Intel® Graphics Flexible, it supports versatile display options and 32/64 bit 3D graphics engine

1.3 Specifications

1.3.1 System

- **CPU:** LGA1151 Intel desktop Core i7/i5/i3/Pentium/Celeron processors compliant
- **BIOS:** AMI EFI 128 Mbit SPI BIOS
- **System chipset:** Intel® H110
- **SATA hard disk drive interface:**
 - Two on-board SATA connector with data transmission rate up to 600 MB

1.3.2 Memory

- **RAM:** 2 x 260-pins SODIMM socket support dual channel DDR4 2400MHz SDRAM, up to 32GB Max.

Note! *KBL-S processor supports memory up to DDR4 2400MHz SDRAM;
SKL-S processor supports memory up to DDR4 2133MHz SDRAM only*



1.3.3 Input/Output

- **PCI bus:** 1 PCIe x16 slot
- **Serial ports:** Eight serial ports, 7 x RS-232 & 1 x RS-232/422/485
- **Keyboard and PS/2 mouse connector:** Supports one standard PS/2 keyboard, one standard PS/2 mouse
- **USB port:** Supports four USB 3.0 port with a transmission rate of up to 5Gbps and ten USB 2.0 ports with transmission rates of up to 480 Mbps. (USB11/12/13/14 is BOM optional)

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 connector:** 8-bit general purpose Input/Output

1.3.4 Graphics

- **Controller:** Intel® HD graphics
- **Display memory:** 1 GB maximum shared memory with 2GB and above system memory installed
- **VGA:** Supports VGA up to resolution 1920 x 1200 @ 60Hz
- **LVDS:** Supports dual channel 24-bit up to 1920 x 1200
- **DVI-D:** Supports max. resolution 1920 x 1200 @ 60Hz
- **Displayport1.2:** Supports DP++ up to 4096 x 2160 @ 60Hz
- **eDP:** Supports up to resolution 4096 x 2160 @ 60Hz (eDP is BOM optional)

1.3.5 Ethernet LAN

- Supports dual 10/100/1000 Mbps Ethernet port (s) via PCI Express x1 bus which provides 500 MB/s data transmission rate
- **Controller:** LAN1: Realtek RTL8111G; LAN2: Realtek RTL8111G

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:** +5V, +3.3V, +12V, -12V, 5VSB
- **Power consumption:**
Intel Corei7-7700 3.6GHz, 2pcs 16GB DDR4 2133MHz SDRAM, +5V @ 1.92A, +3.3V @ 1.42A, +12V @ 7.53A, -12V @ 0.01A, 5VSB @ 0.43A
Measure the maximum current value which system under maximum load (CPU: Top speed, RAM & Graphic: Full loading)
- **Board size:** 170 mm x 170 mm (6.69" x 6.69")
- **Board weight:** 0.365 kg

1.4 Jumpers and Connectors

Connectors on the AIMB-205 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: Connector and Header List

	Description	Part Reference
1	Keyboard & Mouse connector	KBMS1
2	Universal Serial Bus Port 7/8/9/10	USB78910
3	Digital Visual Interface connector	DVI1
4	Video Graphics Array connector	VGA1
5	Voltage selection for JLVDS connector	JLVDS1
6	Embedded DisplayPort (BOM optional)	EDP1
7	LVDS VESA, JEIDA format selection pin header	JLVDS_VCON1
8	Low-Voltage Differential Signaling Interface	LVDS1
9	DisplayPort1	DP1
10	Universal Serial Bus Port # 5 / 6	USB56
11	RJ45 + USB3.0 stack connector	LAN1_USB12
12	RJ45 + USB3.0 stack connector	LAN2_USB34
13	HD Audio Interface (Analog)	AUDIO1
14	Amplifier connector	AMP1
15	Front panel audio header	FPAUD1
16	HD Audio interface (Digital) connector	SPDIF1
17	ATX 4 Pin main power connector	ATX12V1
18	PCI Express x16 slot	PCIEX16_1
19	CPU SOCKET LGA1151 H4	CPU1
20	System Fan #1 connector /System Fan #2 connector	SYSFAN1/SYSFAN2
21	DDR4 SO-DIMM socket A1/ DDR4 SO-DIMM socket B1	DIMMA1/ DIMMB1
22	Case Open connector	JCASE1
23	Case Open selection pin header	JCASEOP_SW1
24	CMOS Mode selection	JCMOS1
25	PWRBTN#/ RESET#/HDD LED/ Serial bus from HW monitor IC/Internal Buzzer / External Speaker header	JFP1
26	CPU FAN connector	CPUFAN1
27	Power LED and keyboard lock pin header	JFP2
28	SPI Pin Header	SPI_CN1
29	MINIPCIE, mSATA connector	MINI-PCIE1
30	NGFF M.2 B-Key connector for 2242 module	M.2_2
31	ATX 20pin power connector	ATXPWR1
32	SPI BIOS flash socket	SPI1
33	Universal Serial Bus Port 11/12/13/14 (BOM optional)	USB1112 & USB1314
34	COM5/6/7/8 box header	COM5678
35	AT/ATX Mode selection	PSON1
36	8-bits General Purpose I/O pin header	GPIO1
37	Low pin count interface connector	LPC1

38	COM1/2/3/4 box header	COM1234
39	Watchdog timer output and OBS beep	JWDT1+JOBS1
40	EDP/LVDS Backlight inverter power connector	INV1
41	CMOS battery connector	BAT1
42	COM1 RI# selection pin header	JSETCOM1_V1
43	Serial ATA interface connector	SATA1 ~ SATA2

Table 1.2: Jumper List

Label	Function
CMOS1	CMOS Clear Jumper
JFP1	Power Switch/HDD LED/SMBUS/Speaker Pin Header
JFP2	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

1.5 Board layout: Jumper and Connector Locations

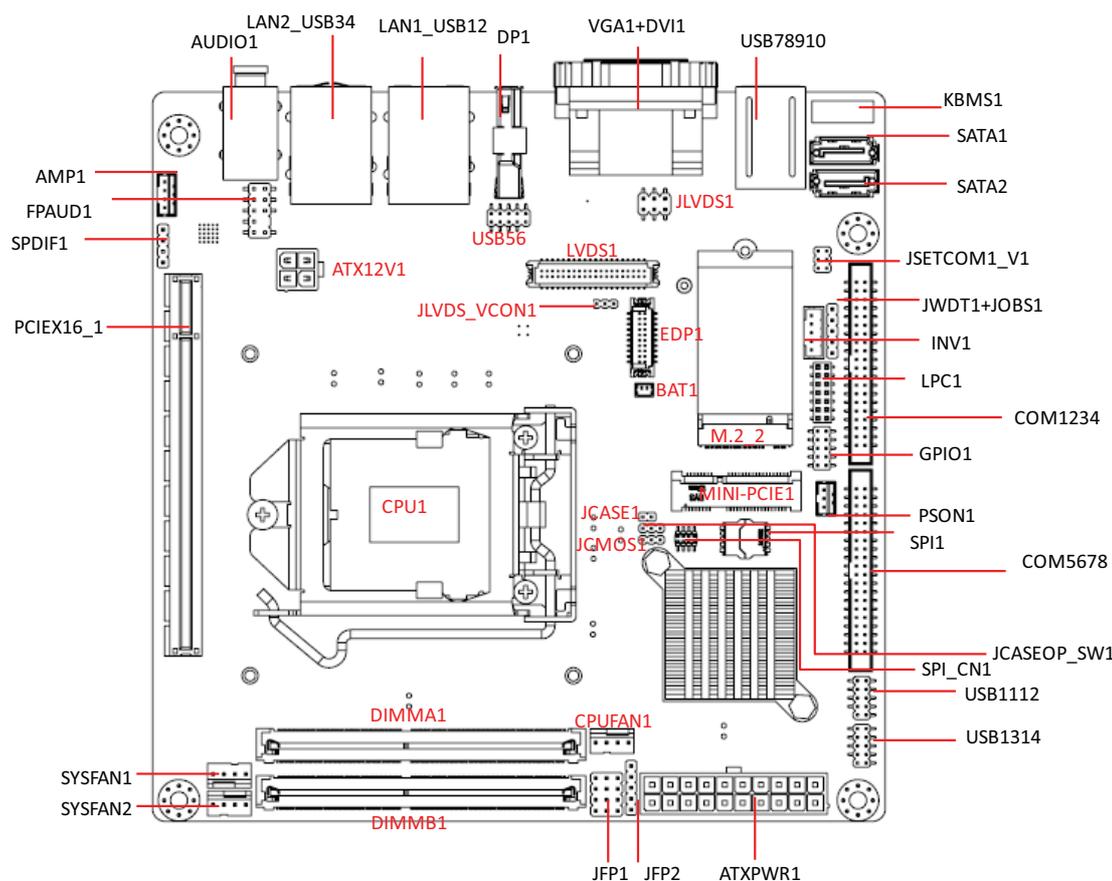


Figure 1.1 Jumper and Connector Location (Top Side)

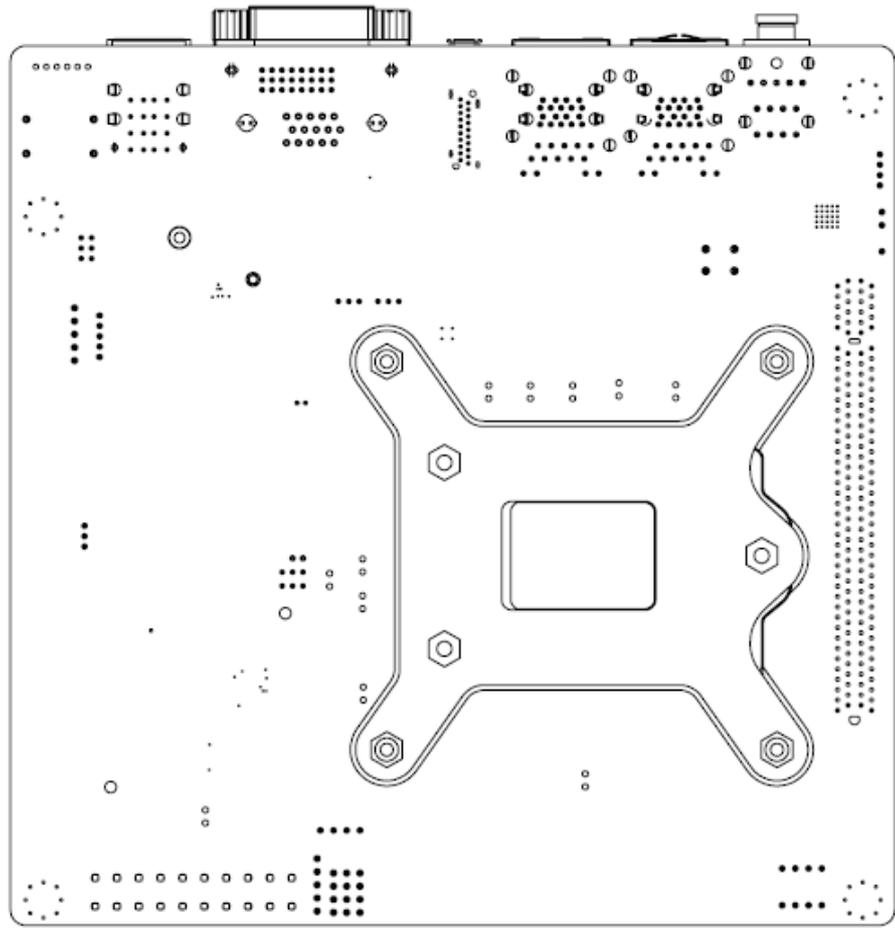


Figure 1.2 Jumper and Connector Location (Bottom Side)

1.6 AIMB-205 Board Diagram

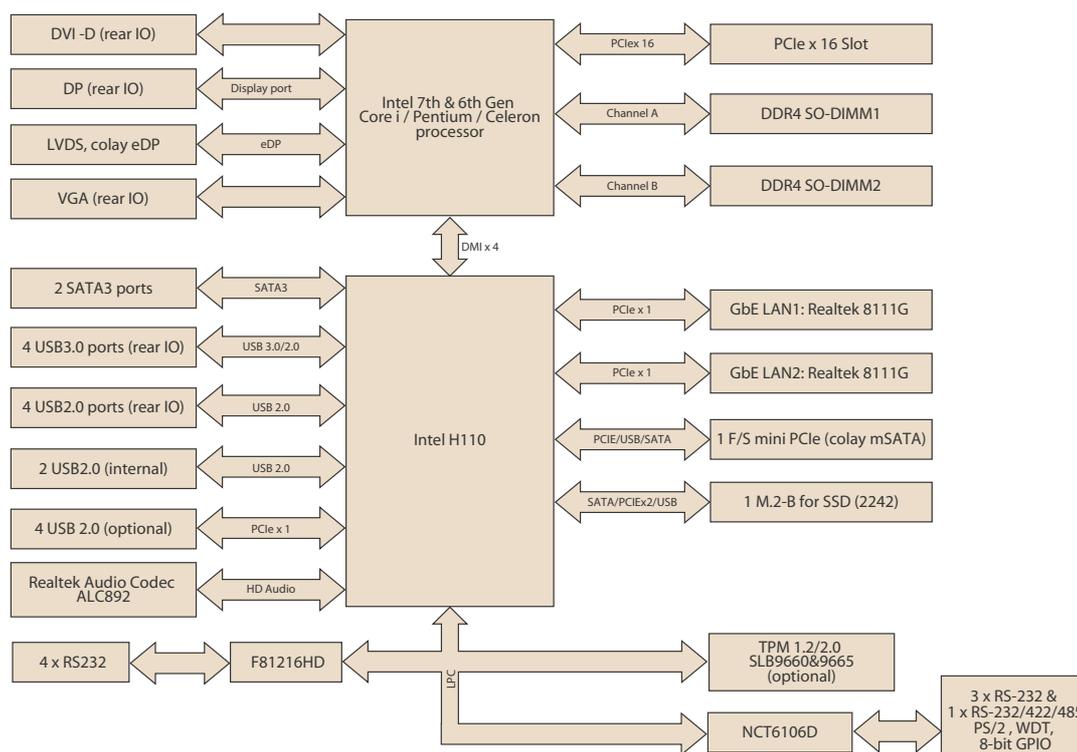


Figure 1.3 AIMB-205 Board Diagram

1.7 Safety Precautions

Warning! Always completely disconnect the power cord from chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.



Caution! Always ground yourself to remove any static charge before touching the motherboard. Modern electronic devices are very sensitive to electrostatic discharges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis.



Caution! The computer is provided with a battery-powered real-time clock circuit. There is a danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent type recommended by the manufacturer. Discard used batteries according to manufacturer's instructions.



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



1.8 Jumper Settings

This section provides instructions on how to configure your motherboard by setting the jumpers. It also includes the motherboards's default settings and your options for each jumper.

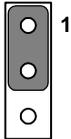
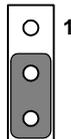
1.8.1 How to Set Jumpers

You can configure your motherboard to match the needs of your application by setting the jumpers. A jumper is a metal bridge that closes an electrical circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” (or turn ON) a jumper, you connect the pins with the clip. To “open” (or turn OFF) a jumper, you remove the clip. Sometimes a jumper consists of a set of three pins, labeled 1, 2, and 3. In this case you connect either pins 1 and 2, or 2 and 3. A pair of needle-nose pliers may be useful when setting jumpers.

1.8.2 CMOS Clear (JCMOS1)

The AIMB-205 motherboard contains a jumper that can erase CMOS data and reset the system BIOS information. Normally this jumper should be set with pins 1-2 closed. If you want to reset the CMOS data, set CMOS1 to 2-3 closed for just a few seconds, and then move the jumper back to 1-2 closed. This procedure will reset the CMOS to its default setting.

Table 1.3: CMOS1

Function	Jumper Setting
*Keep CMOS data	 <p>1-2 closed</p>
Clear CMOS data	 <p>2-3 closed</p>

* Default

1.8.3 Power Switch/HDD LED/SMBUS/Speaker Pin Header (JFP1)

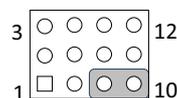


Table 1.4: Power Switch/HDD LED/SMBUS/Speaker Pin Header (JFP1)

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

1.8.4 Power LED and Keyboard Lock Pin Header (JFP2)

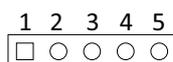


Table 1.5: Power LED and Keyboard Lock Pin Header (JFP2)

Pin	Signal
1	LED Power
2	NC
3	GND
4	Keyboard LOCK#
5	GND

1.8.5 Watchdog Timer Output and OBS Beep (JWDT1+JOBS1)

Table 1.6: Watchdog Timer Output and OBS Beep (JWDT1+JOBS1)

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

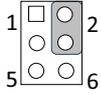
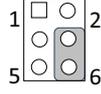
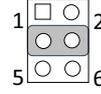
1.8.6 ATX/AT Mode Selection (PSON1)

Table 1.7: ATX/AT Mode Selection (PSON1)

Function	Jumper Setting
AT Mode	 1-2 closed
ATX Mode (Default)	 2-3 closed

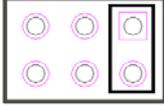
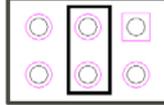
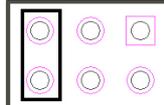
1.8.7 LVDS/eDP Panel Voltage Selection (JLVDS1)

Table 1.8: LVDS/eDP Panel Voltage Selection (JLVDS1)

Function	Jumper Setting
Jumper position for 5V	 JLVD51 (2-4)
Jumper position for 3.3V (Default)	 JLVD51 (4-6)
Jumper position for 12V	 JLVD51 (3-4)

1.8.8 COM1 RI# Pin RI#/5V/12V Select (JSETCOM1_V1)

Table 1.9: COM1 RI# Pin RI#/5V/12V Select (JSETCOM1_V1)

Function	Jumper Setting
Jumper position for RI#(Default)	 1 and 2
Jumper position for 5V	 3 and 4
Jumper position for 12V	 5 and 6

1.9 System Memory

AIMB-205 has two sockets for a 260 pins DDR4 SO-DIMM. This socket uses a 1.2 V unbuffered double data rate synchronous DRAM (DDR SDRAM). DRAM is available in capacities of 4GB, 8GB and 16GB. The sockets can be filled in any combination with SODIMMs of any size, giving a total memory size between 4GB, 8GB, 16GB, and up to max 32GB. AIMB-205 does NOT support ECC (error checking and correction).

1.10 Memory Installation Procedures

To install SODIMMs, first make sure the two handles of the SODIMM socket are in the “open” position, i.e., the handles lean outward. Slowly slide the SODIMM module along the plastic guides on both ends of the socket. Then firmly but gently (avoid pushing down too hard) press the SODIMM module well down into the socket, until you hear a click when the two handles have automatically locked the memory module into the correct position of the SODIMM socket. To remove the memory module, just push both handles outward, and the memory module will be ejected by the mechanism.

1.11 Cache Memory

The AIMB-205 supports a CPU with one of the following built-in full speed Last Level Cache:

8MB for Intel Core i7-7700 / i7-7700T / i7-6700 / i7-6700TE

6MB for Intel Core i5-7500 / i5-7500T / i5-6500 / i5-6500TE

4MB for Intel Core i3-7101 / i3-7101TE / i3-6100 / i3-6100TE

3MB for Pentium G4400 / G4400TE

2MB for Celeron G3900 / G3900TE

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

1.12 Processor Installation

The AIMB-205 is designed to supported Intel 7th & 6th Gen LGA1151, Core i7/Core i5/Core i3, Pentium, Celeron processor.

Chapter 2

Connecting
Peripherals

2.1 Introduction

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

2.2 USB Ports (LAN1_USB12/LAN2_USB34/USB56/USB78/USB910)

The AIMB-205 provides up to 14 USB ports. Four USB3.0 and four USB2.0 on the rear side and six USB2.0 pin header on the board. The USB interface complies with the USB specification revision 2.0 that supports transmission rates of up to 480 Mbps, revision 3.0 that supports transmission rates of up to 5 Gbps, and is also fuse protected. Furthermore, the USB interface can be disabled in the system BIOS setup menu.

The AIMB-205 is equipped with two high-performance 1000 Mbps Ethernet LAN adapter, which are supported by all major network operating systems. The RJ-45 jacks on the rear panel provides for convenient LAN connection.

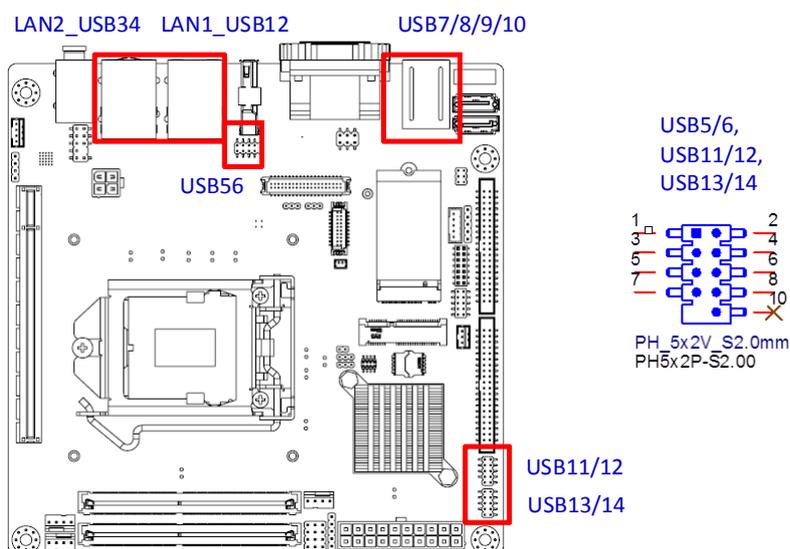
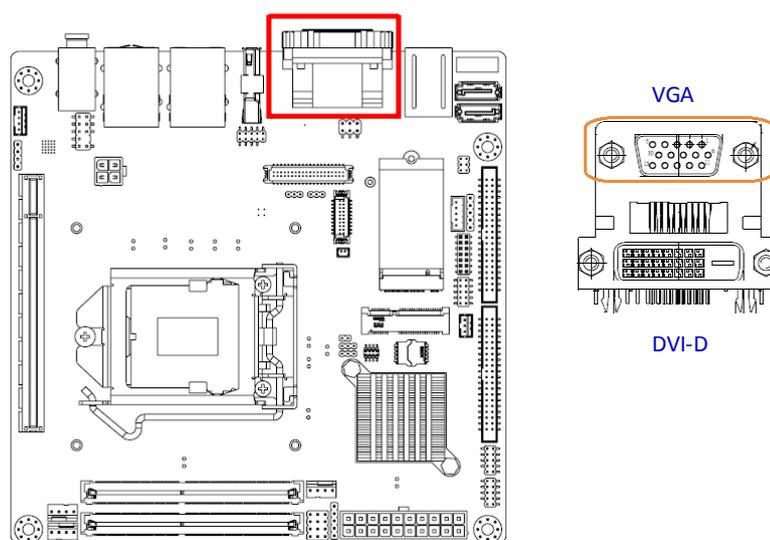


Table 2.1: LAN LED Indicator

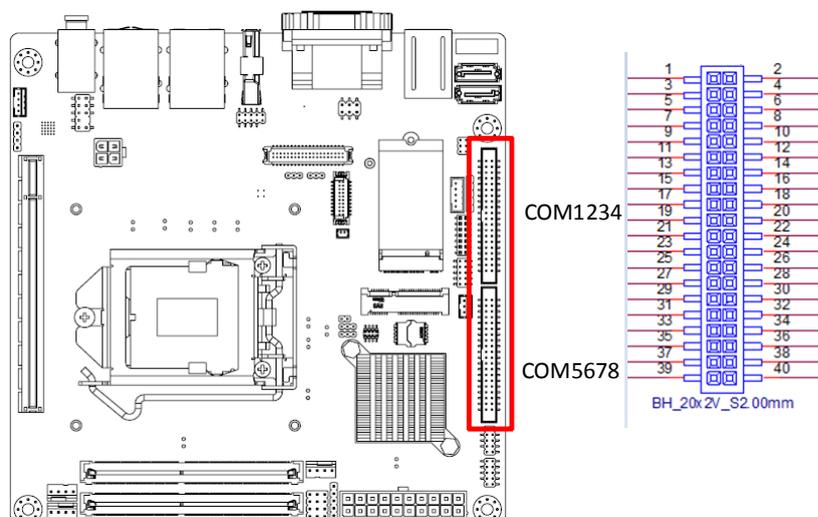
LAN Mode	LAN Indicator	
LAN1 indicator	LED1 (Right)	off for mal-link; Link (On) / Active (Flash)
	LED2 (Left)	100 Mbps (On) / 10 Mbps (Off); Color: Orange (10/100 Mbps)
	LED2 (Left)	1000 Mbps (On); Color: Green (1000 Mbps)
LAN2 indicator	LED1 (Right)	off for mal-link; Link (On) / Active (Flash)
	LED2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

2.3 VGA + DVI-D Connector (VGA1 + DVI1)



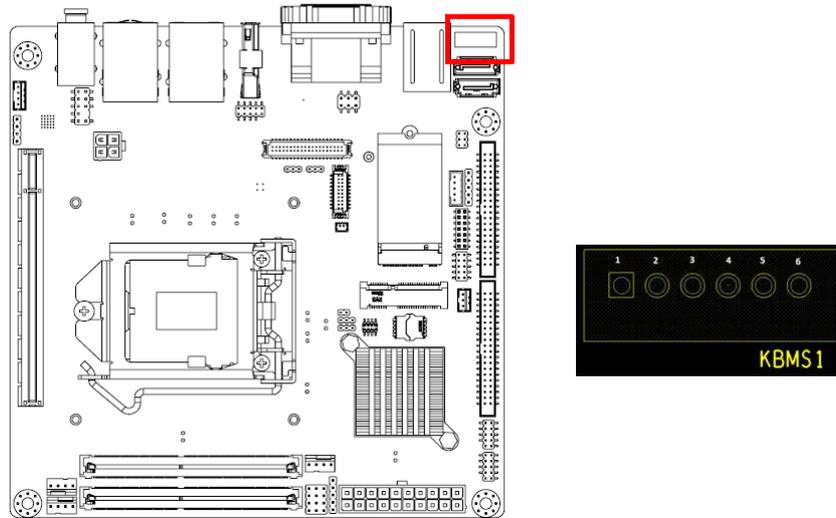
The AIMB-205 includes VGA interface that can drive conventional VGA displays. VGA1 is a standard 15-pin D-SUB connector commonly used for VGA.

2.4 Serial Ports (COM1~COM8)



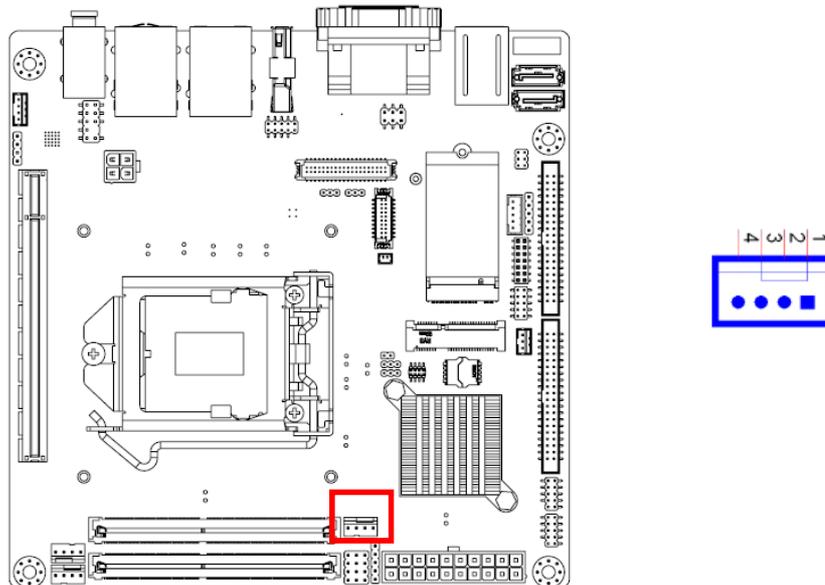
AIMB-205 supports eight serial ports, COM1, COM3~8 support RS-232 function, COM2 supports RS-232/422/485 function by BIOS selection. These ports can connect to serial devices, such as a mouse or a printer, or to a communications network. The IRQ and address ranges for these ports are fixed. However, if you want to disable the port or change these parameters later, you can do this in the system BIOS setup. Different devices implement the RS-232 standards in different ways. If you have problems with a serial device, be sure to check the pin assignments for the connector.

2.5 PS/2 Keyboard and Mouse Connector (KBMS1)



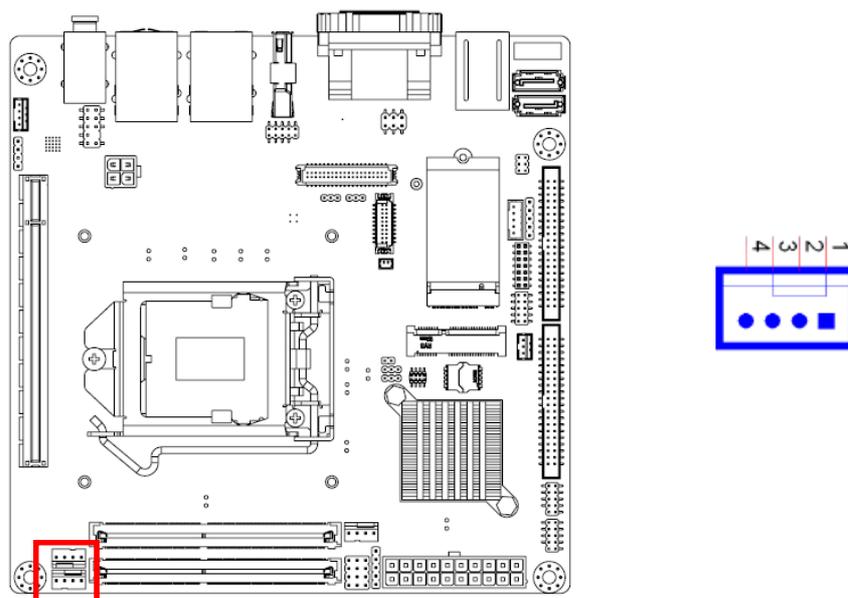
On board 6-pin wafer box connector, supports one standard PS/2 keyboard, one standard PS/2 mouse.

2.6 CPU Fan Connector (CPU_FAN1)



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

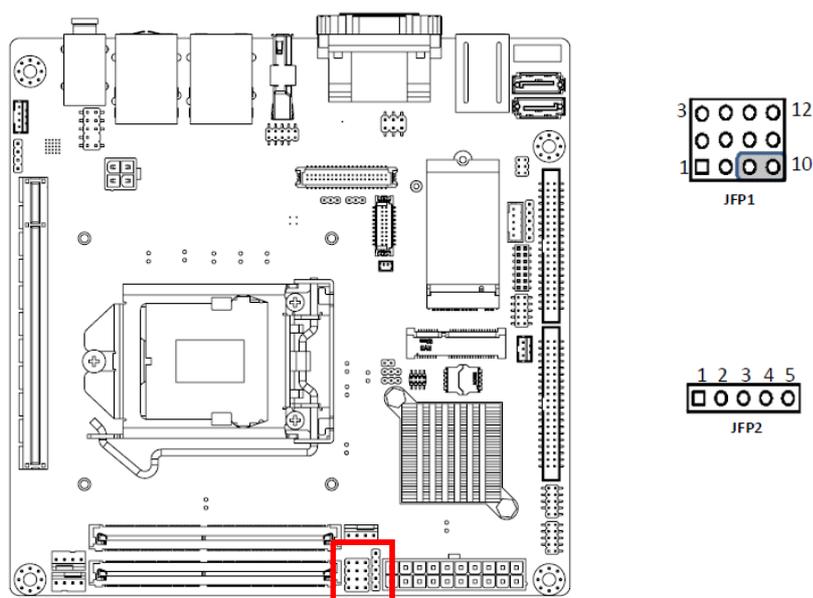
2.7 System FAN Connector (SYSFAN1/2)



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

2.8 Power Switch/HDD LED/SMBUS/Speaker Pin Header (JFP1) & Power LED and Keyboard Lock Pin Header (JFP2)

There are several headers for monitoring and controlling the AIMB-205.



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)

JFP1/SPEAKER is a 4-pin connector for an external speaker. If there is no external speaker, the AIMB-205 provides an onboard buzzer as an alternative. To enable the buzzer, set pins 7 & 10 as closed.

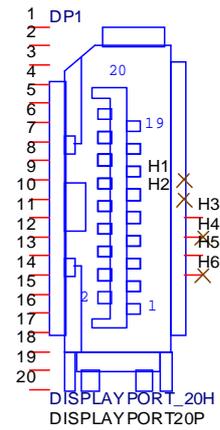
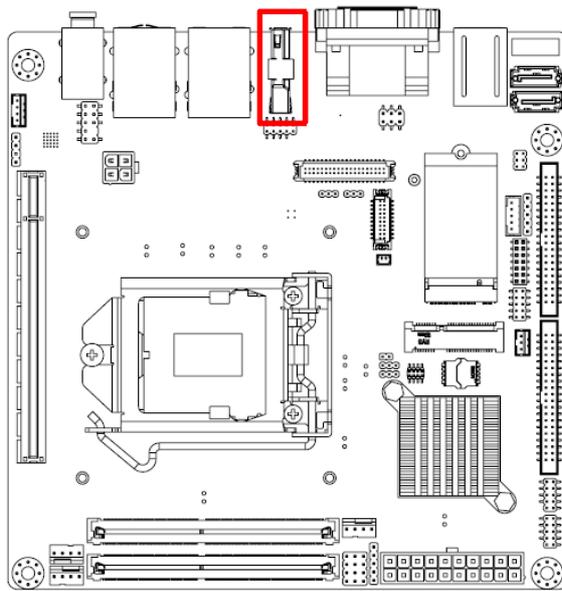
2.8.5 Power LED and keyboard lock connector (JFP2/PWR_LED & KEY LOCK)

(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:

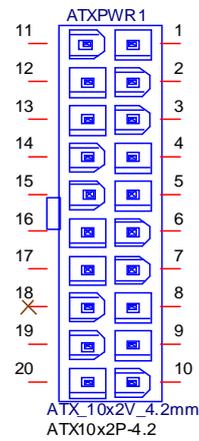
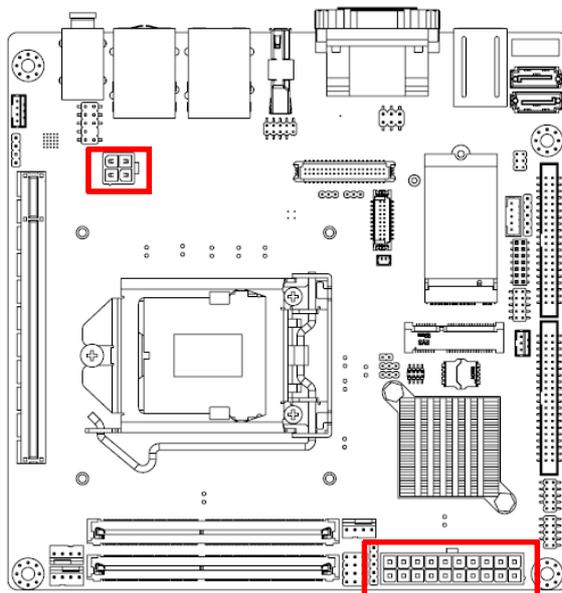
Table 2.2: ATX power supply LED status (No support for AT power)

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
System Suspend (S3)	Fast Flashes	NA	NA
System Suspend (S4)	Slow Flashes	NA	NA

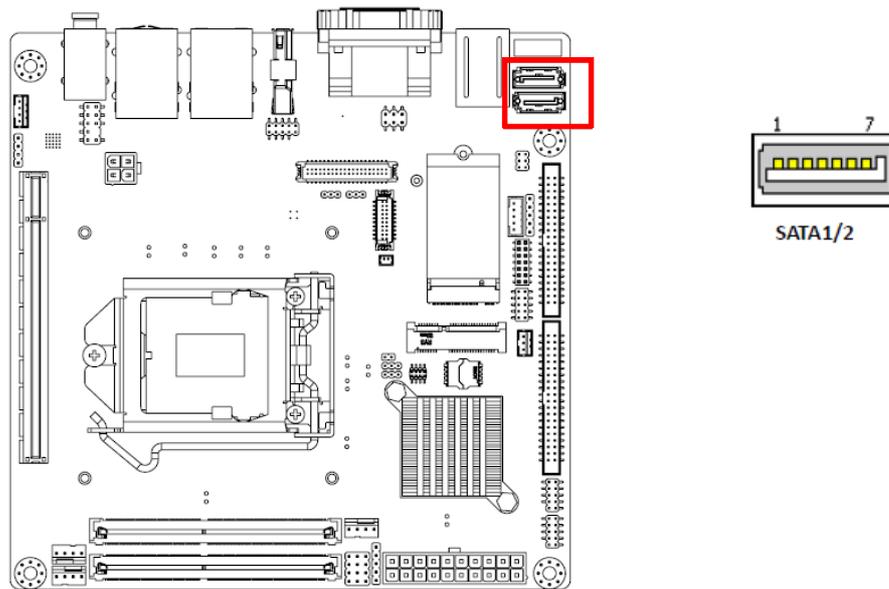
2.9 Display Port Connector (DP1)



2.10 ATX 12V Power Supply Connector (ATX12V1) & ATX Power Supply Connector (ATXPWR1)



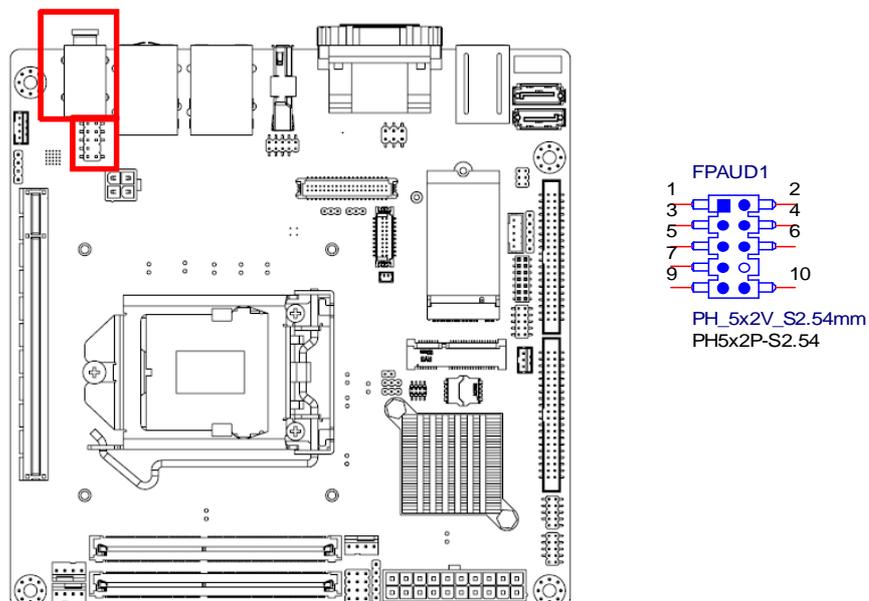
2.11 SATA Signal Connector (SATA1 ~ SATA2)



AIMB-205 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 HD Analog Audio Interface (AUDIO1, FPAUD1)

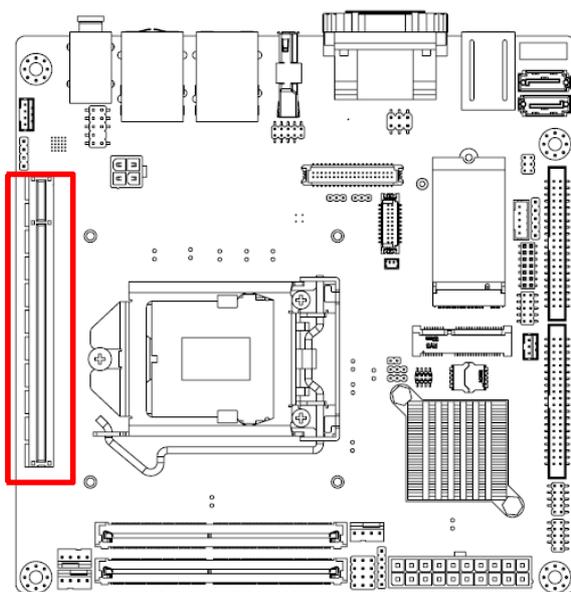
Front headphone connector (FPAUD1) is for a chassis-mounted front panel audio I/O module that supports HD Audio (optional). Connect this connector with the front panel audio I/O module cable.



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

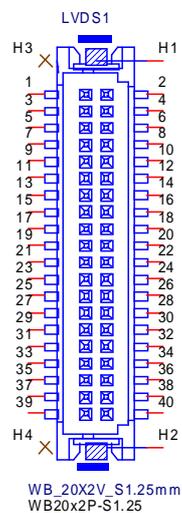
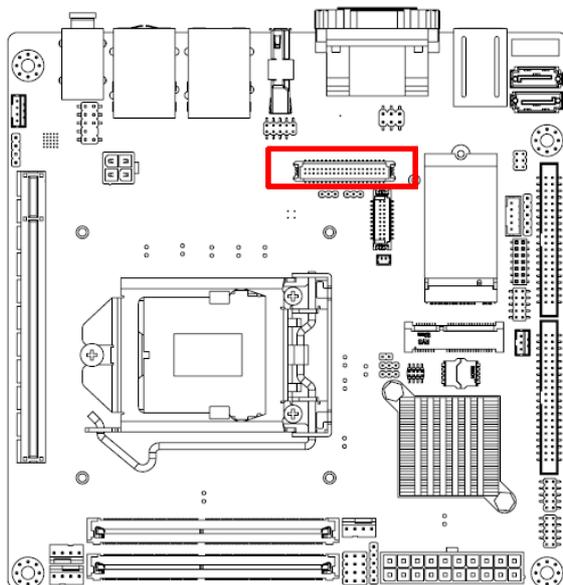


2.13 PCI-E x16 Slot (PCIEX16_1)



AIMB-205 provides 1 x PCI express x16 slot.

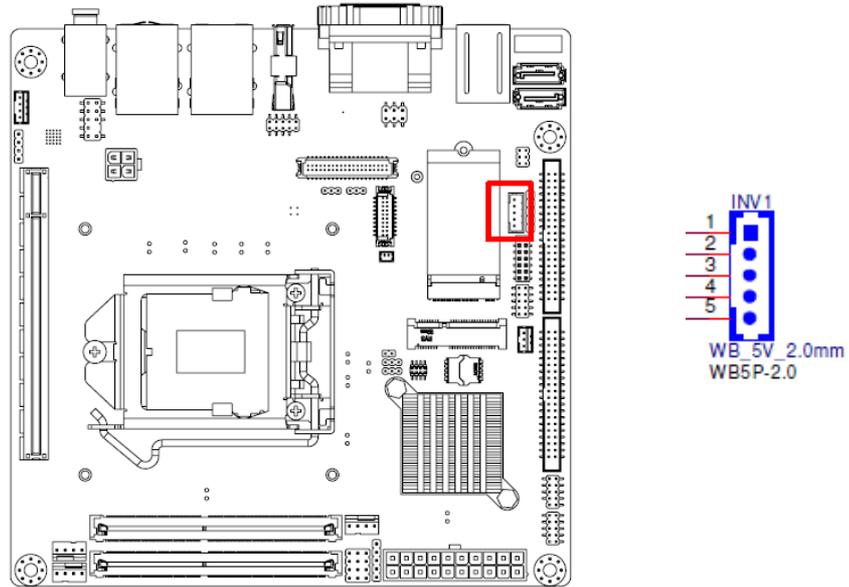
2.14 LVDS Panel Connector (LVDS1)



LVDS1

Pin 3 : GND →
Panel connected.

2.15 LVDS/eDP Backlight Inverter Power Connector (INV1)



Note!



■ **Signal Description**

Signal

VR

ENBKL

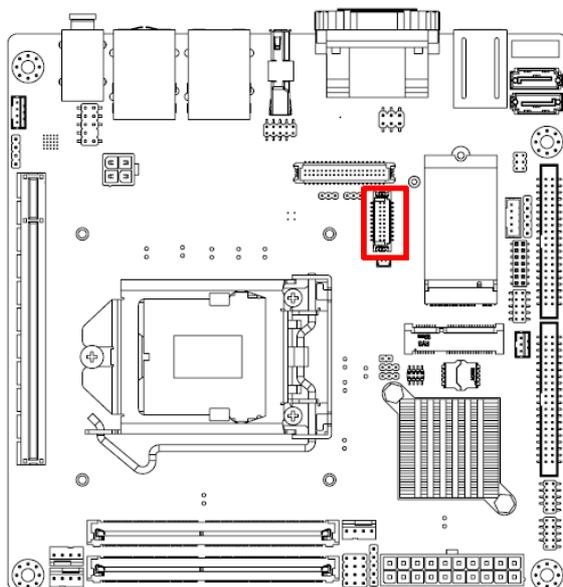
Signal Description

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

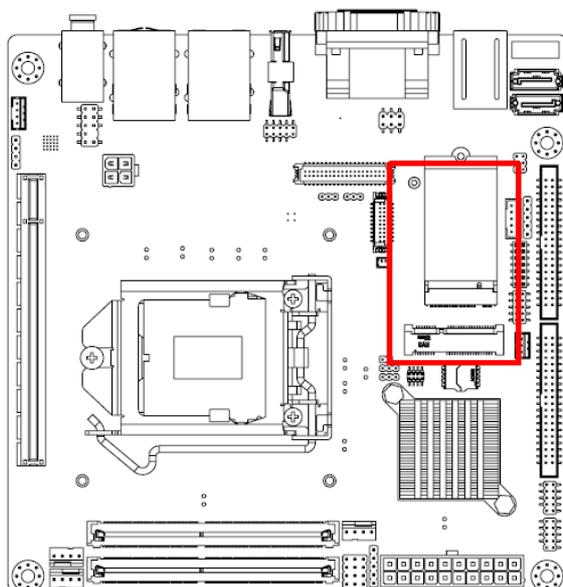
(Recommended: $4.7\text{ K}\Omega$, $>1/16\text{ W}$)

LCD backlight ON/OFF control signal)

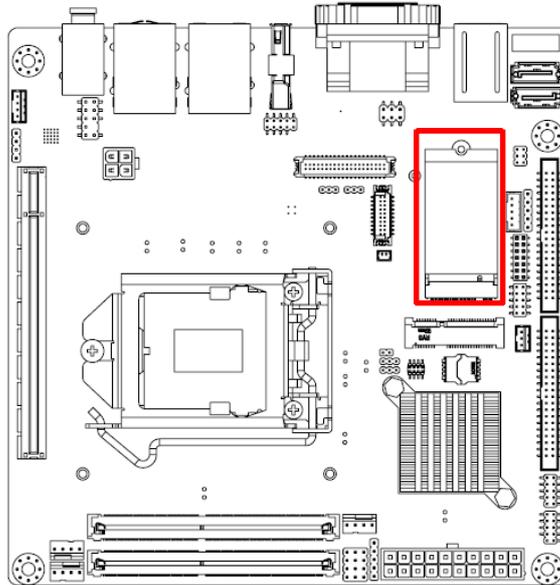
2.16 Embedded Display Port Connector (EDP1), BOM optional



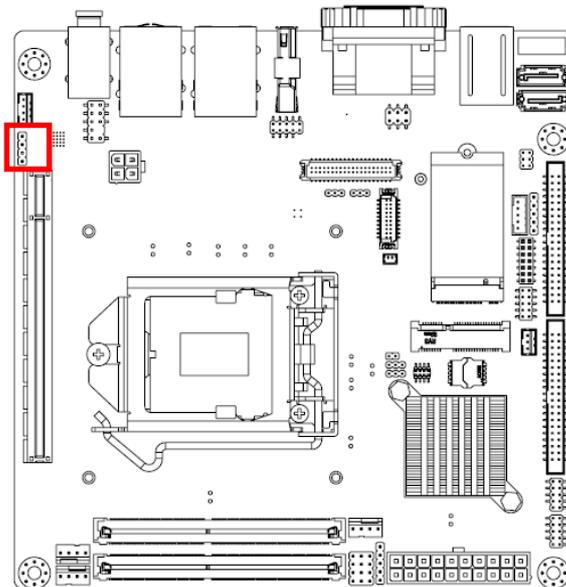
2.17 MINIPCIE and mSATA Connector (MINIPCIE1)



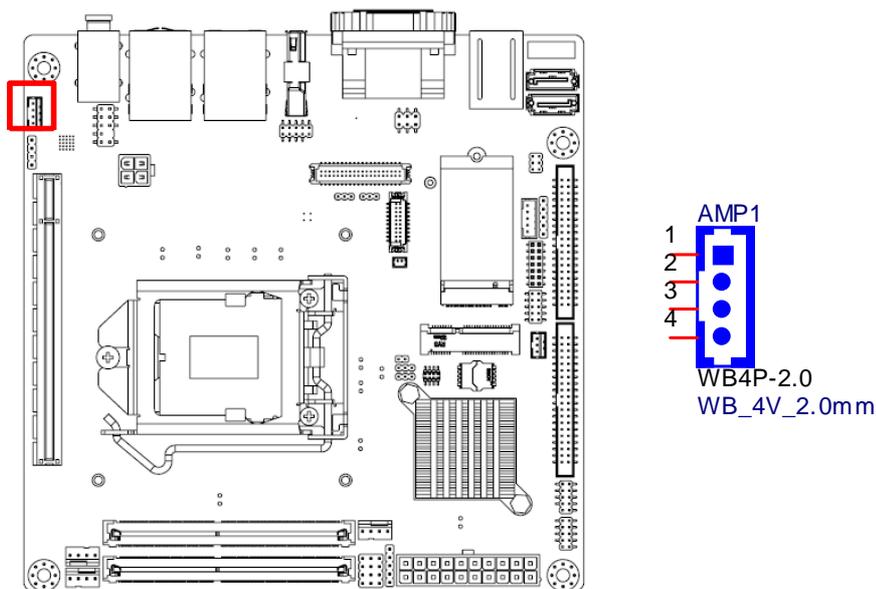
2.18 NGFF M.2 B-Key connector for 2242 module (M.2_2)



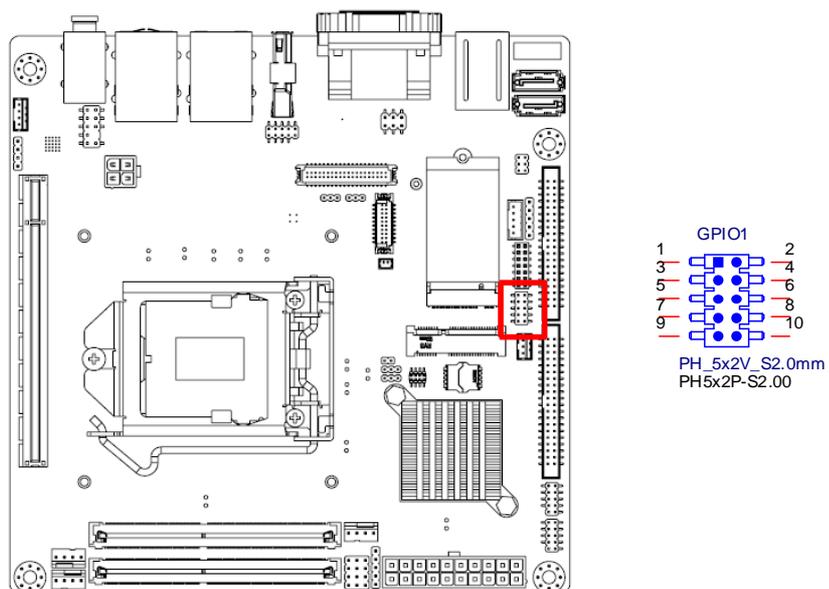
2.19 HD Digital Audio Interface (SPDIF1)



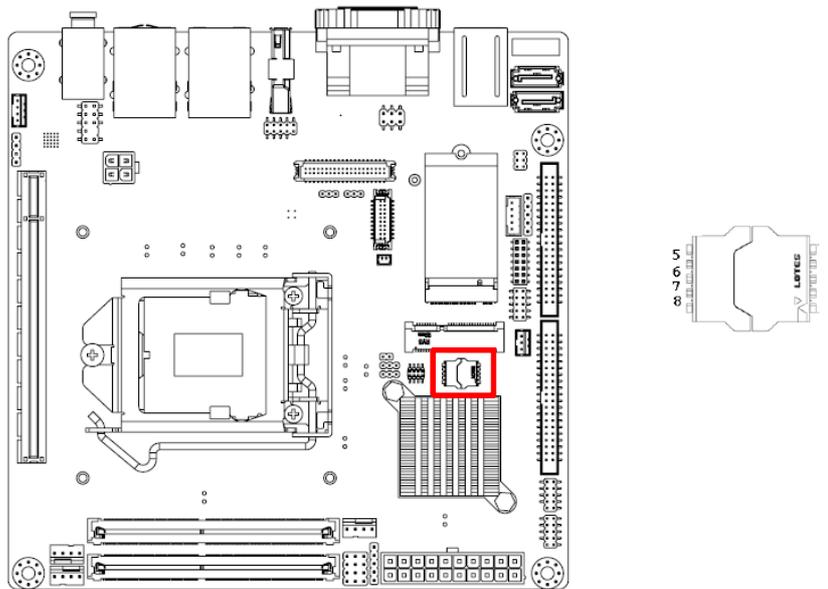
2.20 Audio Amplifier Output Connector (AMP1)



2.21 General Purpose I/O Pin Header (GPIO1)

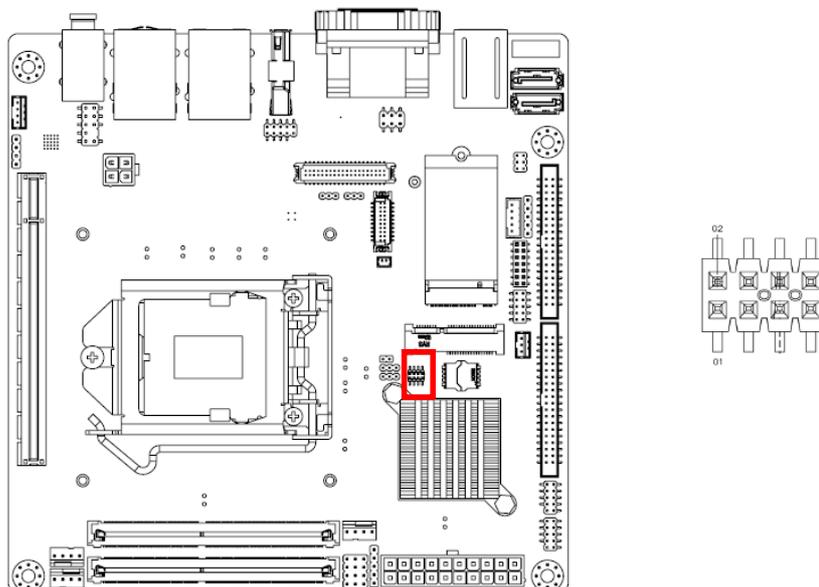


2.22 SPI BIOS Flash Socket (SPI1)

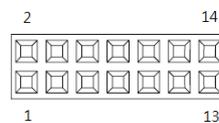
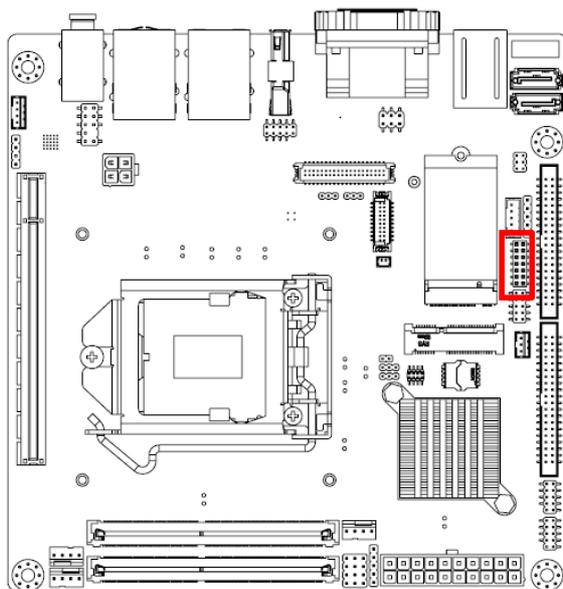


2.23 SPI Programming Pin Header (SPI_CN1)

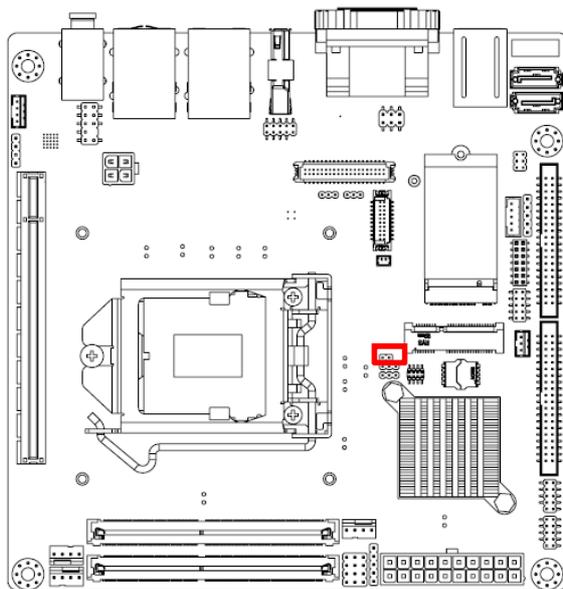
The SPI flash card pin header may be used to flash BIOS if the AIMB-205 cannot power on.



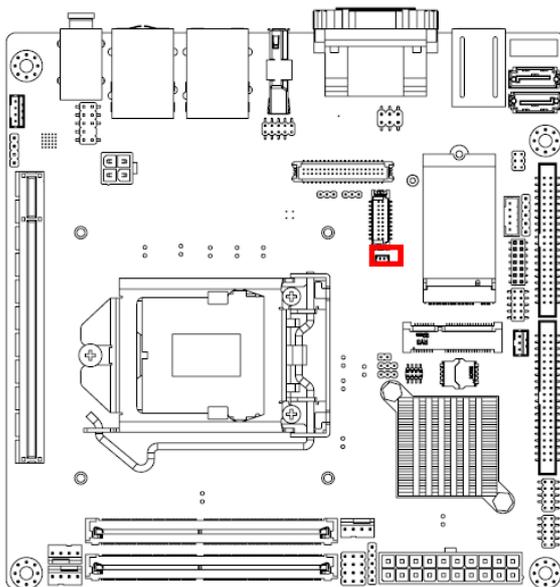
2.24 Low Pin Count Header (LPC1)



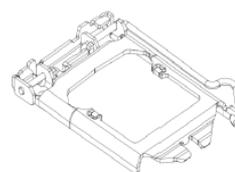
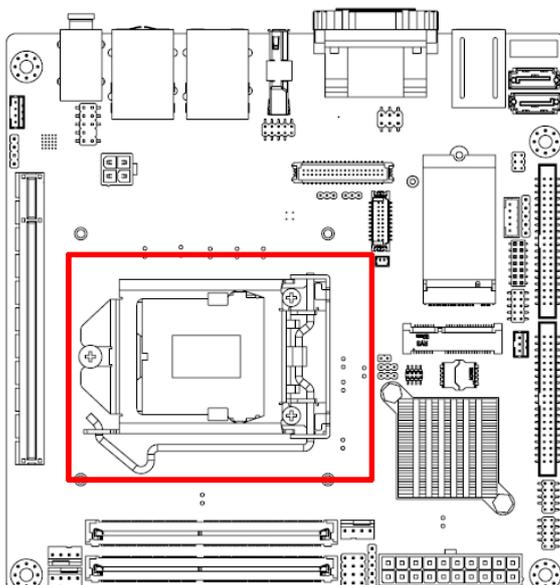
2.25 Case-Open Detect Connector (JCASE1)



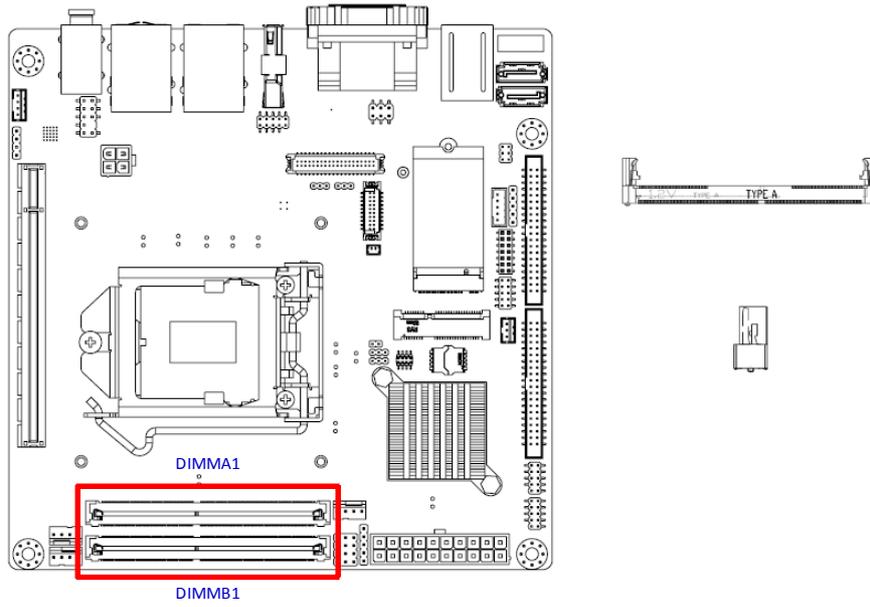
2.26 Battery Holder (BAT1)



2.27 CPU Socket (CPU1)



2.28 DDR4 SO-DIMM Socket (DIMMA1, DIMMB1)



Chapter 3

BIOS Operation

3.1 Introduction

With the AMI BIOS Setup program, you can modify BIOS settings and control the special features of your computer. The Setup program uses a number of menus for making changes and turning special features on or off. This chapter describes the basic navigation of the AIMB-205 setup screens.

3.2 BIOS Setup

The AIMB-205 Series is equipped with built-in AMI BIOS and a CMOS Setup Utility that allows users to configure specific settings or activate certain system features. The CMOS Setup Utility saves the configuration in the CMOS RAM of the motherboard.

When the system power is turned off, the battery on the board supplies the necessary power to preserve the CMOS RAM.

When the power is turned on, press the button during the BIOS power-on self-test (POST) to access the CMOS Setup Utility screen.

Control Keys

< ↑ >< ↓ >< ← >< → >	Move select item
<Enter>	Select item
<Esc>	Main Menu - Quit without saving changes to the CMOS Sub Menu - Exit current page and return to the Main Menu
<Page Up/+>	Increase the numeric value or make changes
<Page Down/->	Decrease the numeric value or make changes
<F1>	General help, for Setup Sub Menu
<F2>	Item help
<F5>	Load previous values
<F7>	Load setup defaults
<F10>	Save all CMOS changes

3.2.1 Main Menu

Press to enter the AMI BIOS CMOS Setup Utility, the Main Menu will appear on the screen. Use the arrow keys to select items and press <Enter> to access the submenu.

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.



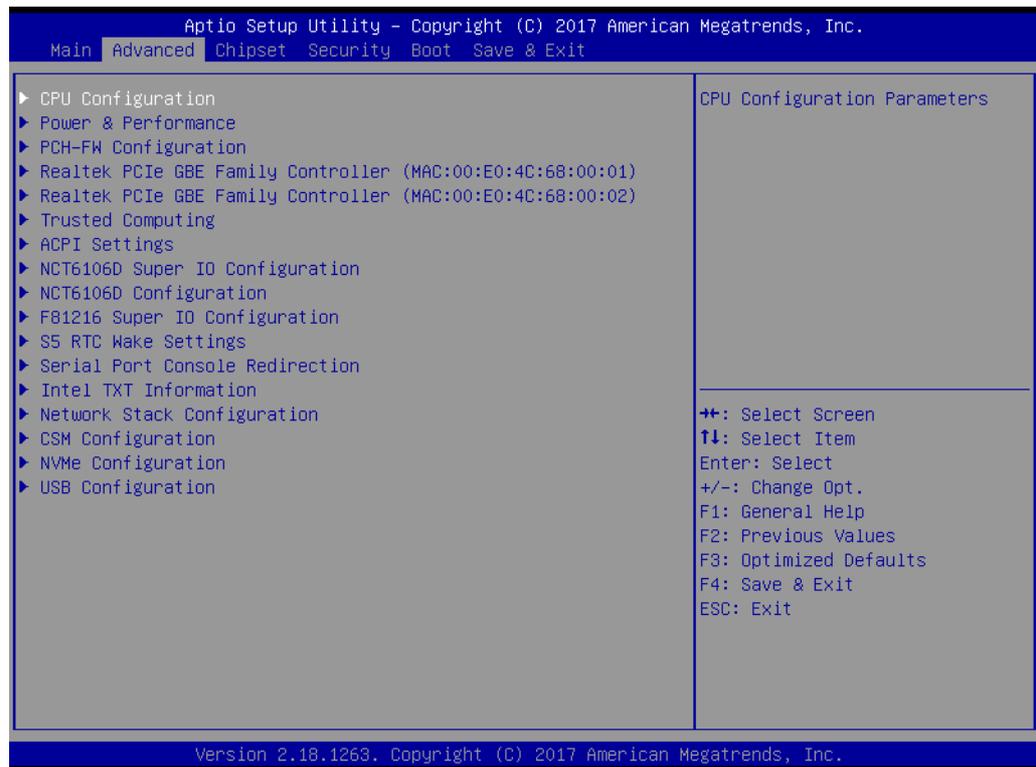
■ System Time/System Date

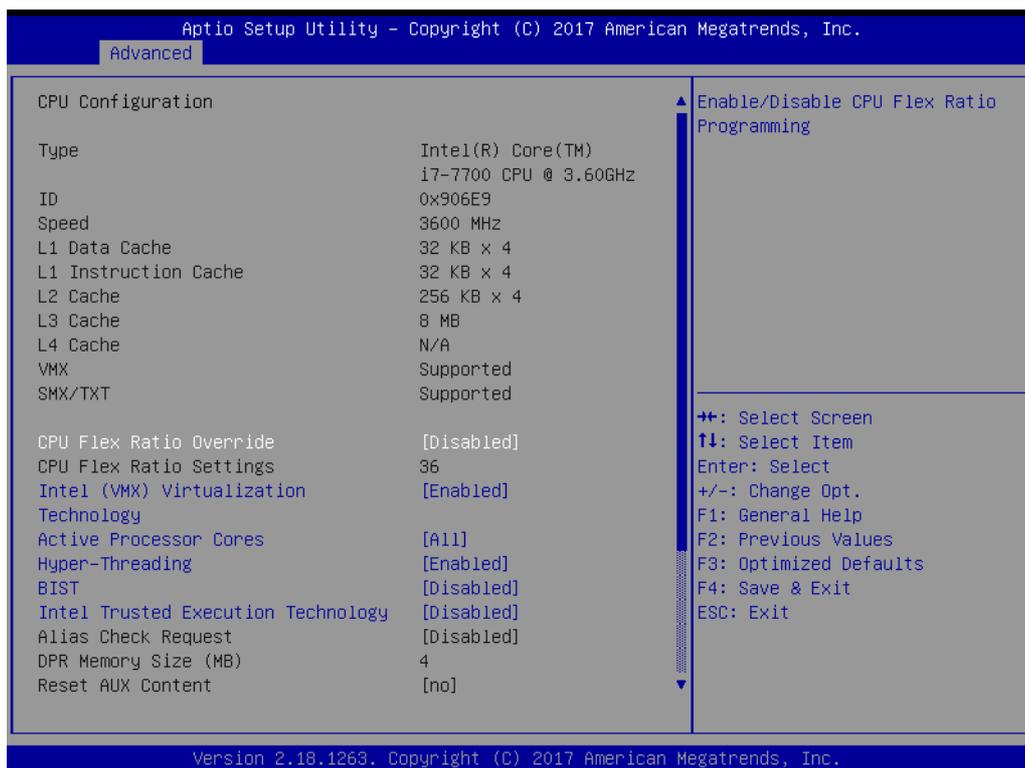
Use this option to change the system time and date. Highlight the System Time or System Date using the <Arrow> keys. Enter new values via the keyboard. Press the <Tab> or <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time must be entered in HH:MM:SS format.

3.2.2 Advanced BIOS Features

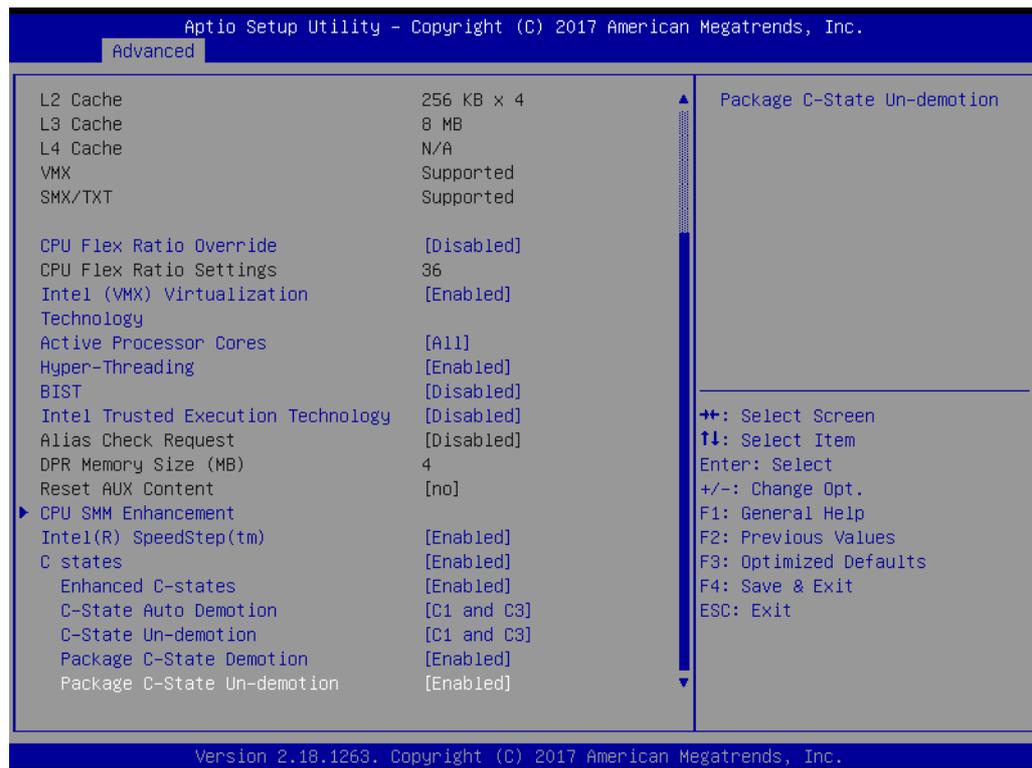
Select the Advanced tab from the AIMB-205 Setup menu to enter the Advanced BIOS Setup page. Users can select any item in the left frame of the screen, such as CPU Configuration, to access the submenu for that item. Select an Advanced BIOS Setup option by highlighting the text using the <Arrow> keys. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup menu screen is shown below. The submenus are described in the following pages.

3.2.2.1 CPU Configuration



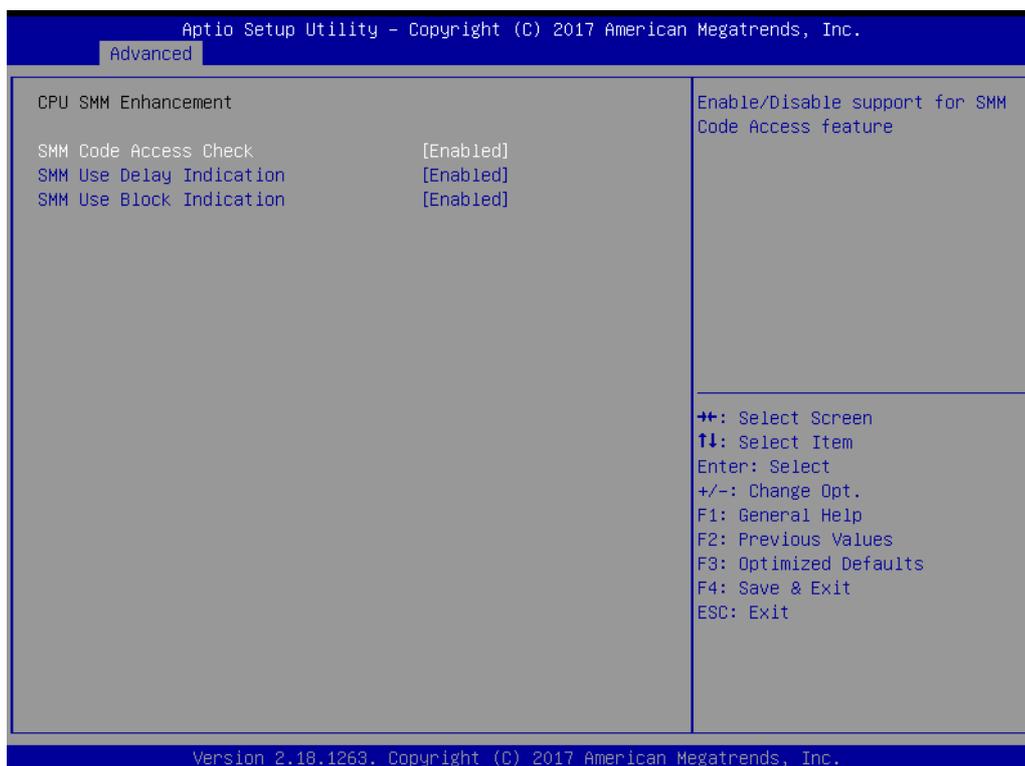
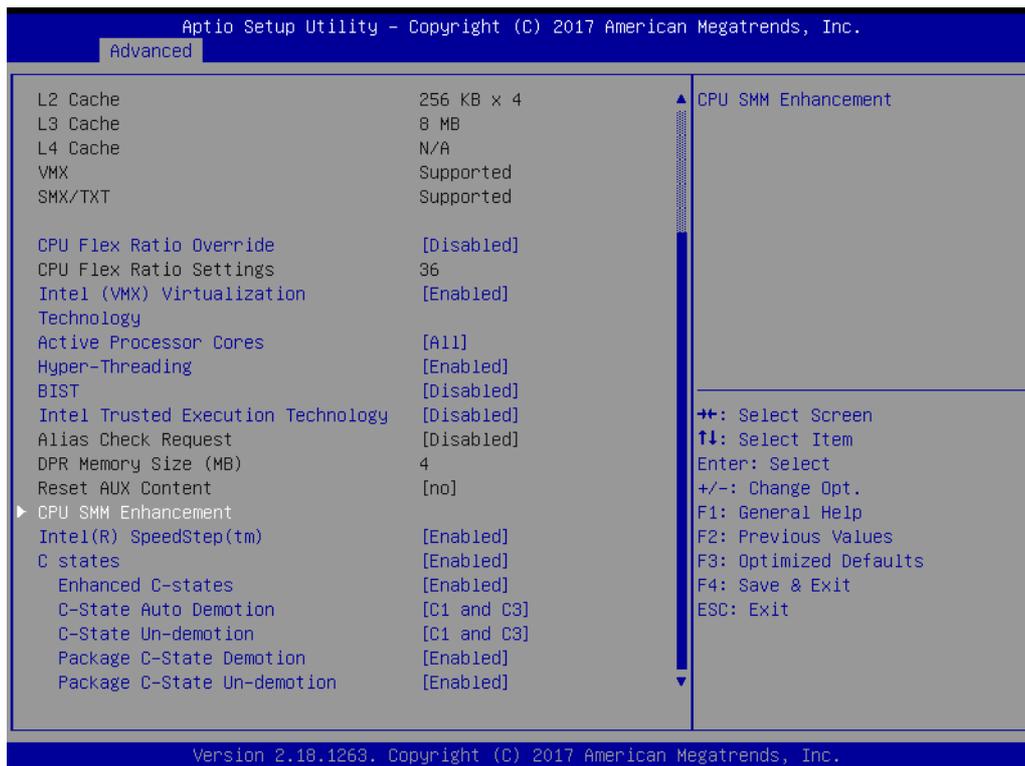


- **CPU Flex Ratio Override [Disabled]**
Enable/Disable CPU Flex Ratio Programming
- **Intel (VMX) Virtualization [Enabled]**
Enable or disable Intel virtualization technology
- **Active Processor Cores [All]**
Number of cores to enable in each processor package
- **Hyper-Threading [Enabled]**
Enable/Disable Hyper-Threading
- **BIST [Disabled]**
Enable/Disable BIST
- **Intel Trusted Execution Technology [Disabled]**
Enable/Disable Intel Trusted Execution Technology
- **Alias Check Request [Disabled]**
Enable/Disable Alias Check Request
- **Reset AUX Content [no]**



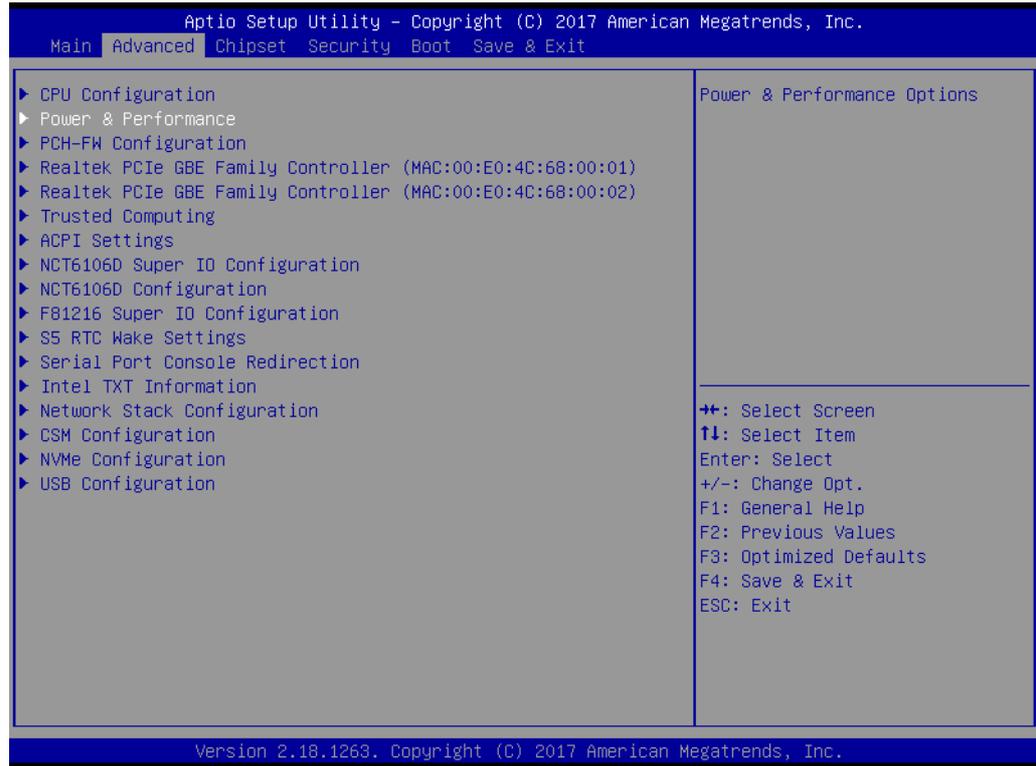
- **Intel SpeedStep (tm) [Enabled]**
Allows more than two frequency ranges to be supported.
- **C states [Enabled]**
Enable or disable CPU C states
- **Enhanced C-states [Enabled]**
Enable or disable enhanced C1E
- **C-State Auto Demotion [C1 and C3]**
Configure C-State Auto Demotion
- **C-State Un-Demotion [C1 and C3]**
Configure C-State Un-demotion
- **Package C state demotion [Enabled]**
Enable or disable package c state demotion
- **Package C state undemotion [Enabled]**
Enable or disable package c state undemotion

CPU SMM Enhancement



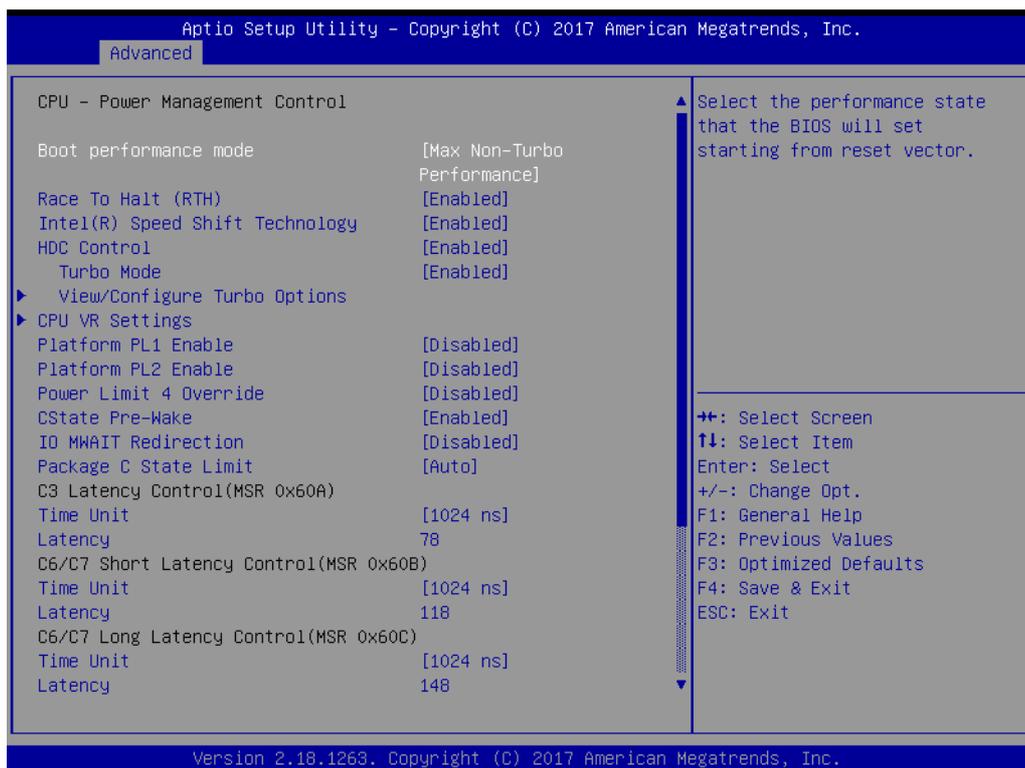
- SMM Code Access Check [Enabled]
- SMM Use Delay Indication [Enabled]
- SMM Use Block Indication [Enabled]

3.2.2.2 Power & Performance

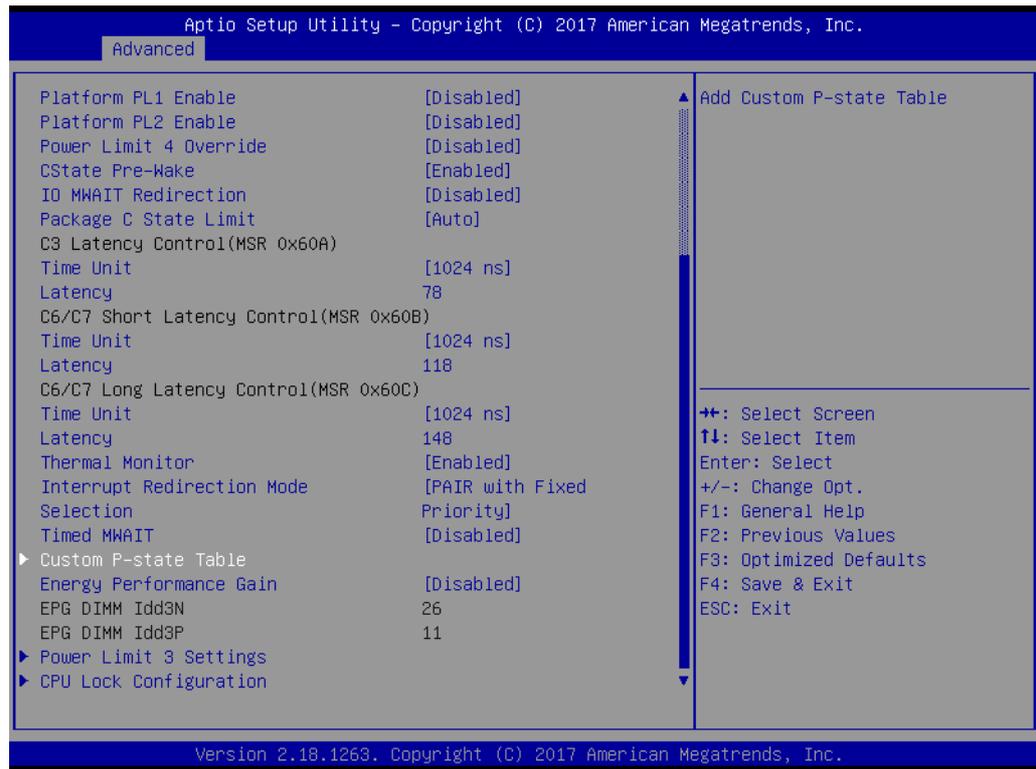


CPU - Power Management Control



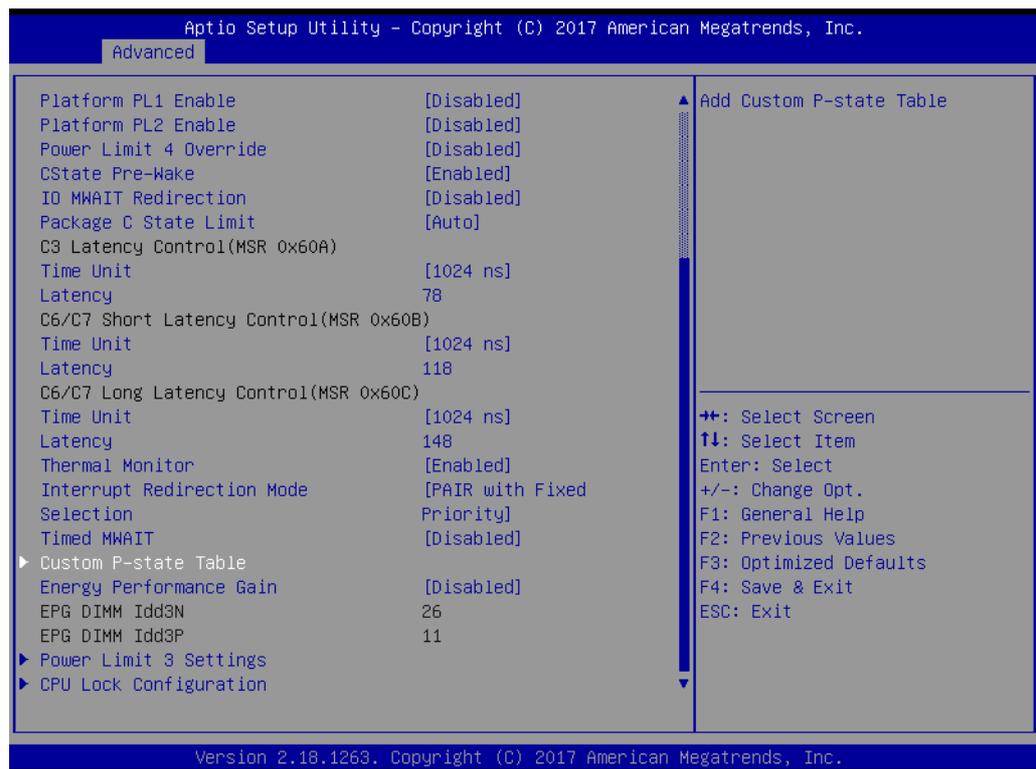


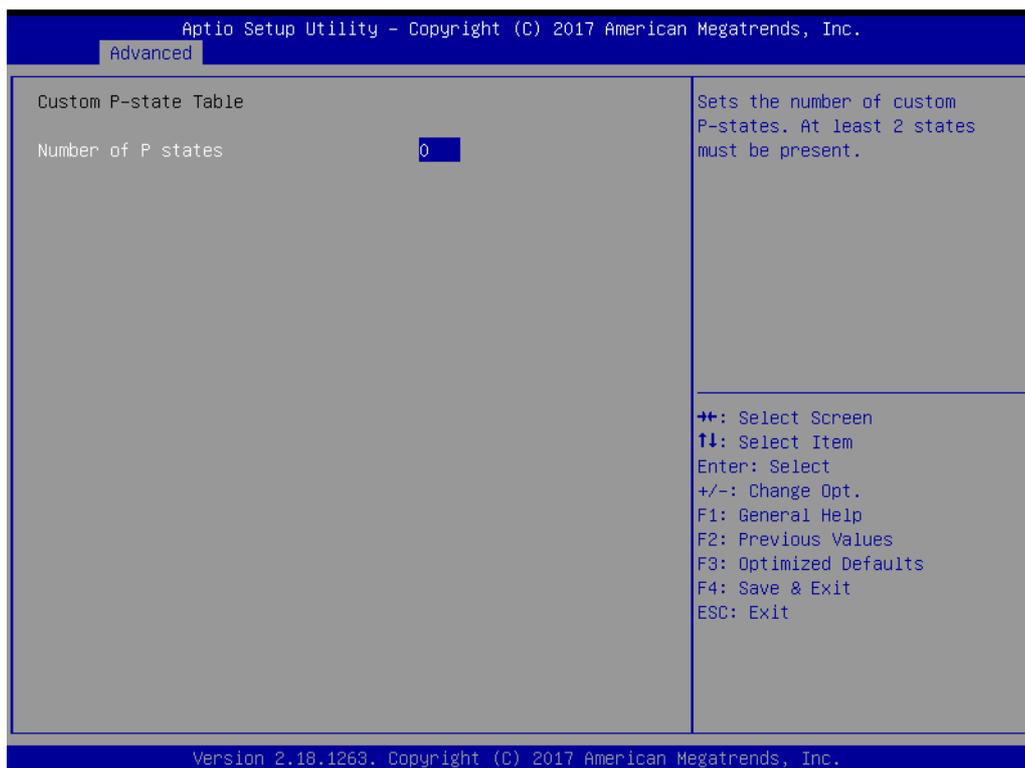
- **Boot performance mode [Max Non-Turo Performance]**
- **Race to Halt (RTH) [Enabled]**
- **Intel(R) Speed Shift Technology [Enabled]**
- **HDC Control [Enabled]**
- **Turbo Mode [Enabled]**
- **Platform PL1 Enable [Disabled]**
- **Platform PL2 Enable [Disabled]**
- **Power Limit 4 Override [Disabled]**
- **CState Pre-Wake [Enabled]**
- **IO MWAIT Redirection [Disabled]**
- **Package C State Limit [Auto]**
- **C3 Latency Control (MSR 0x60A)**
- **Time Unit [1024 ns]**
- **C6/C7 Short Latency Control (MSR 0x60B)**
- **Time Unit [1024 ns]**
- **C6/C7 Long Latency Control (MSR 0x60C)**
- **Time Unit [1024 ns]**



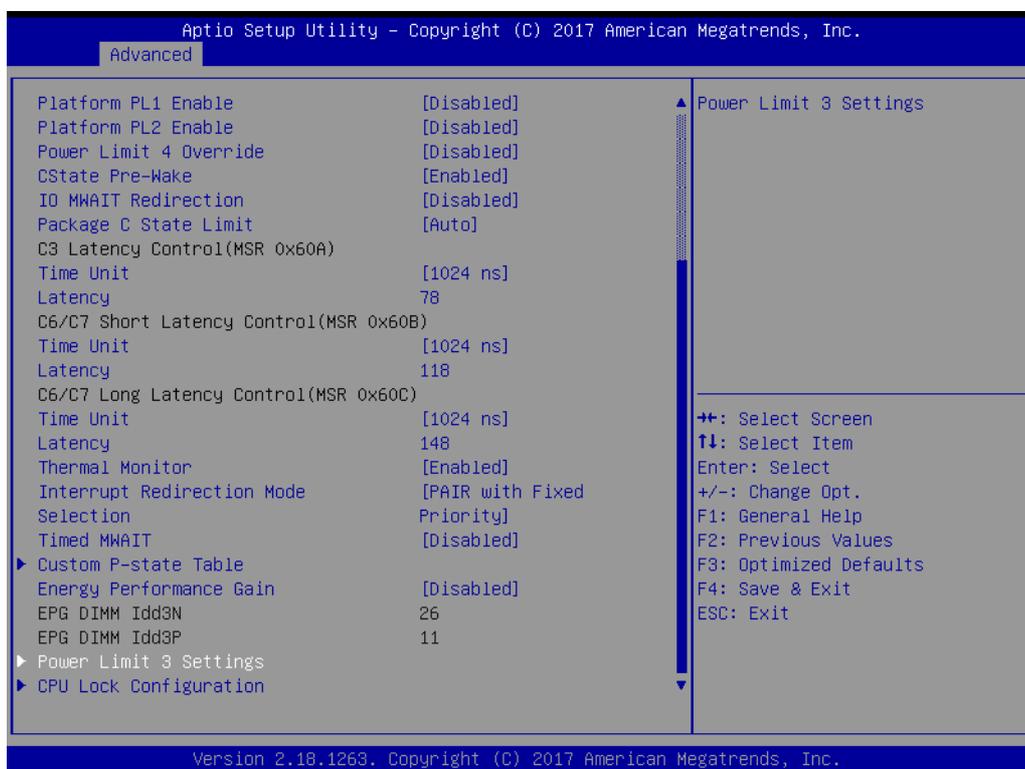
- Thermal Monitor [Enabled]
- Interrupt Redirection Mode Selection [PAIR with Fixed Priority]
- Timed MWAIT [Disabled]
- Energy Performance Gain [Disabled]

Custom P-state Table





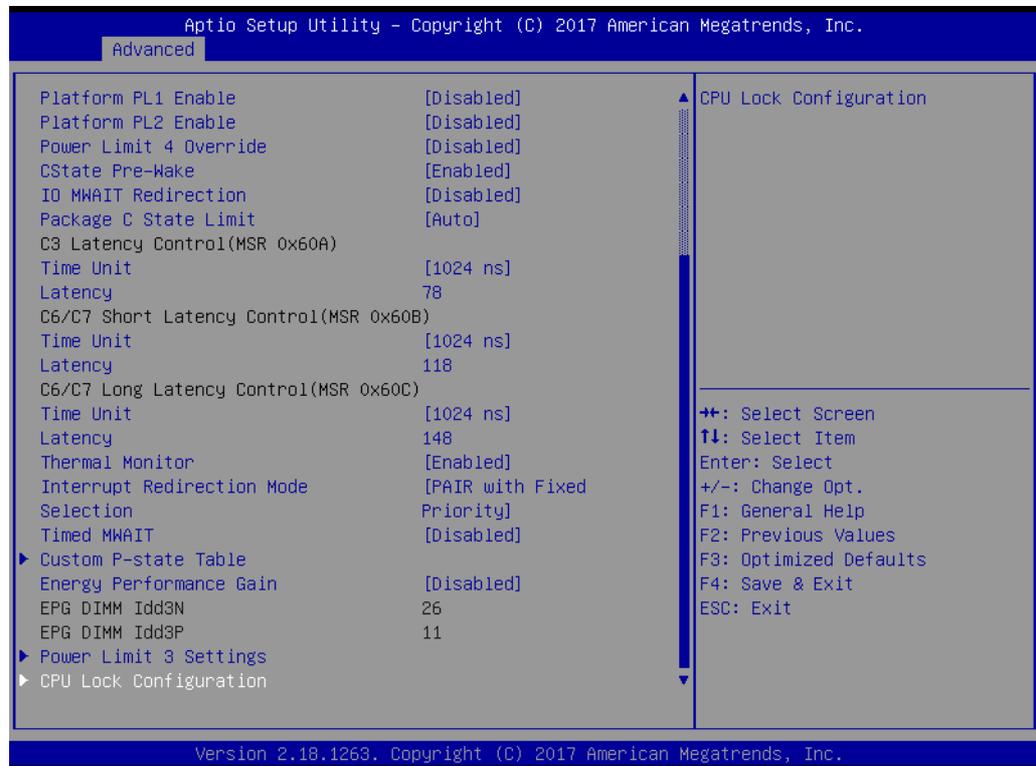
Power Limit 3 Settings

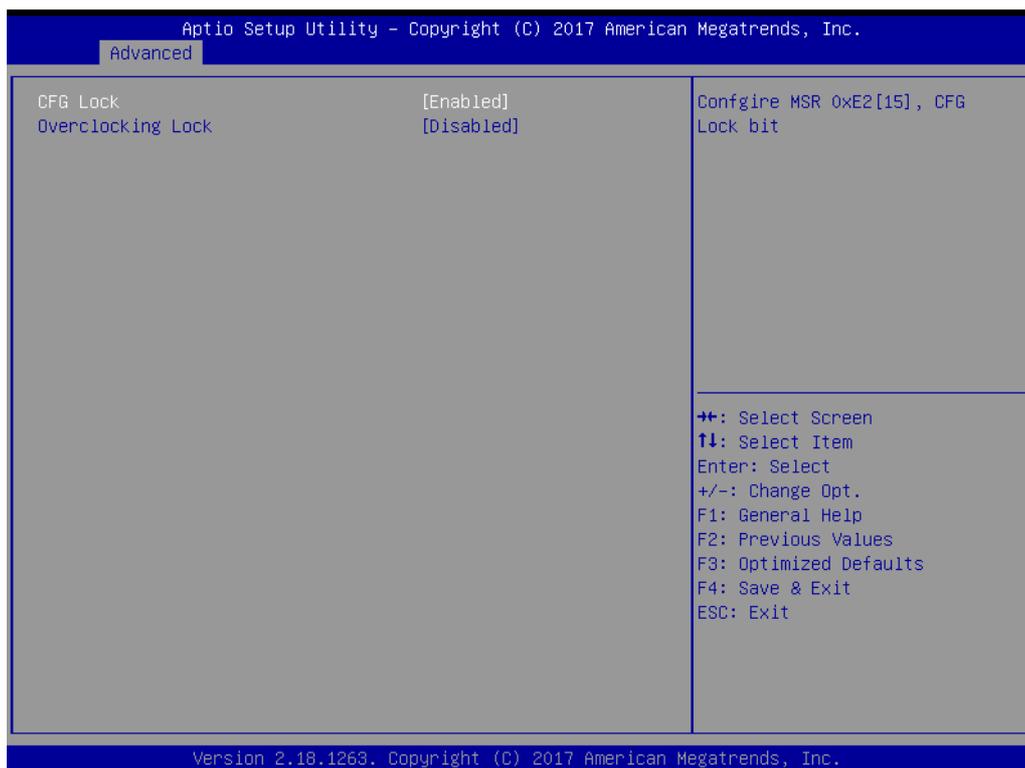




■ **Power Limit 3 Override [Disabled]**

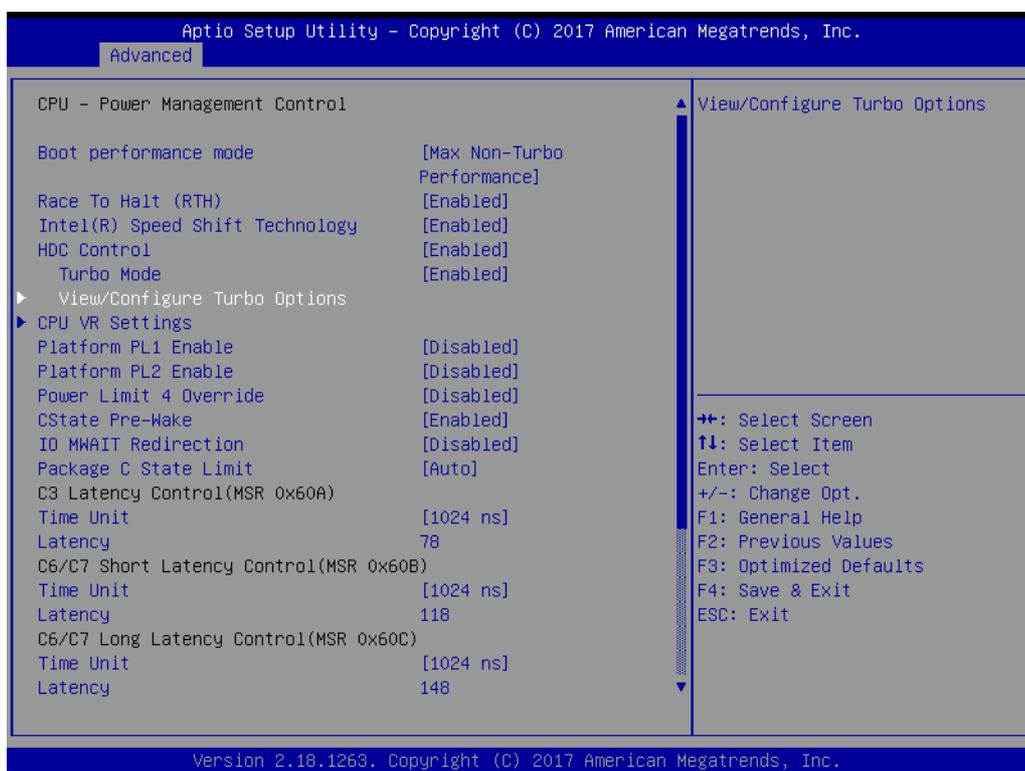
CPU Lock Configuration





- **CFG Lock [Enabled]**
- **Overclocking Lock [Disabled]**

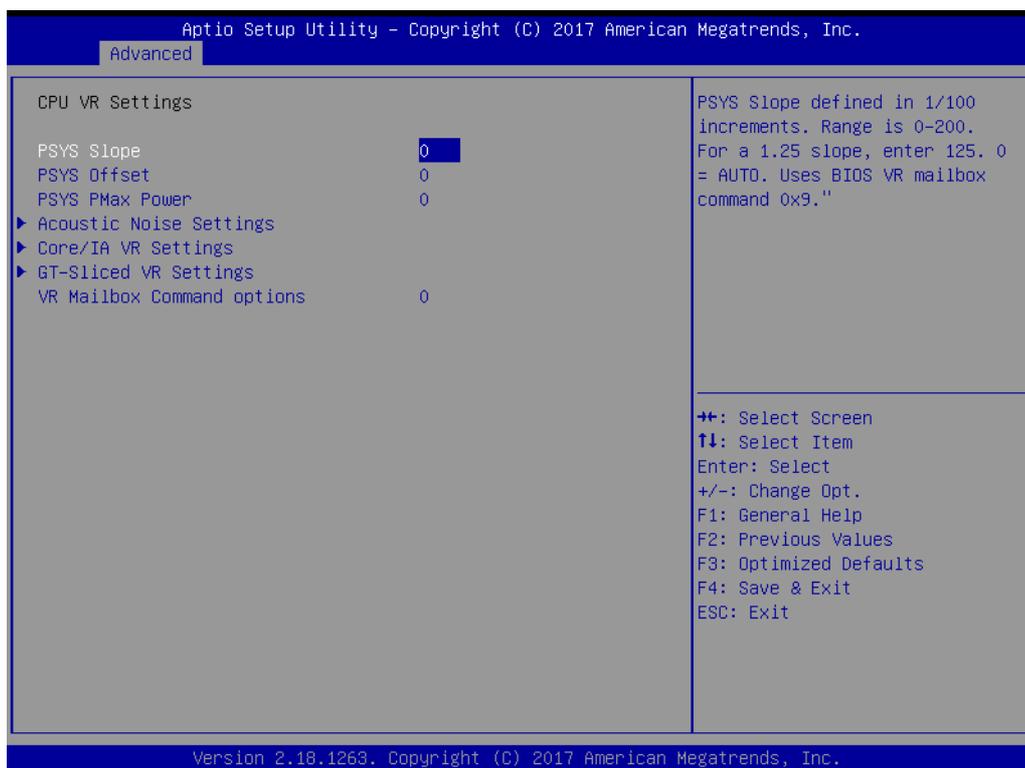
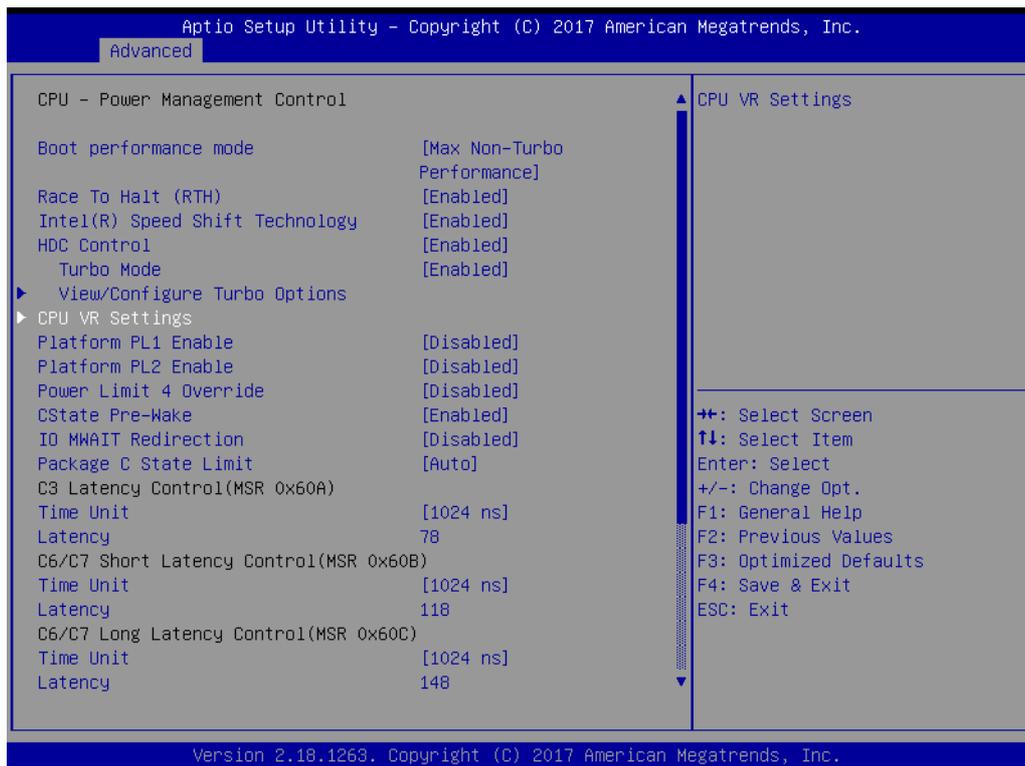
View/Configure Turbo Options





- **Energy Efficient P-state [Enabled]**
- **Package Power Limit MSR Lock [Disabled]**
- **Power Limit 1 Override [Disabled]**
- **Power Limit 2 Override [Enabled]**
- **Energy Efficient Turbo [Enabled]**

CPU VR Settings



Acoustic Noise Settings

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

Advanced

CPU VR Settings		Configure Acoustic Noise Settings for IA, GT and SA domains
PSYS Slope	0	
PSYS Offset	0	
PSYS PMax Power	0	
▶ Acoustic Noise Settings		
▶ Core/IA VR Settings		
▶ GT-Sliced VR Settings		
VR Mailbox Command options	0	

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

Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.

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

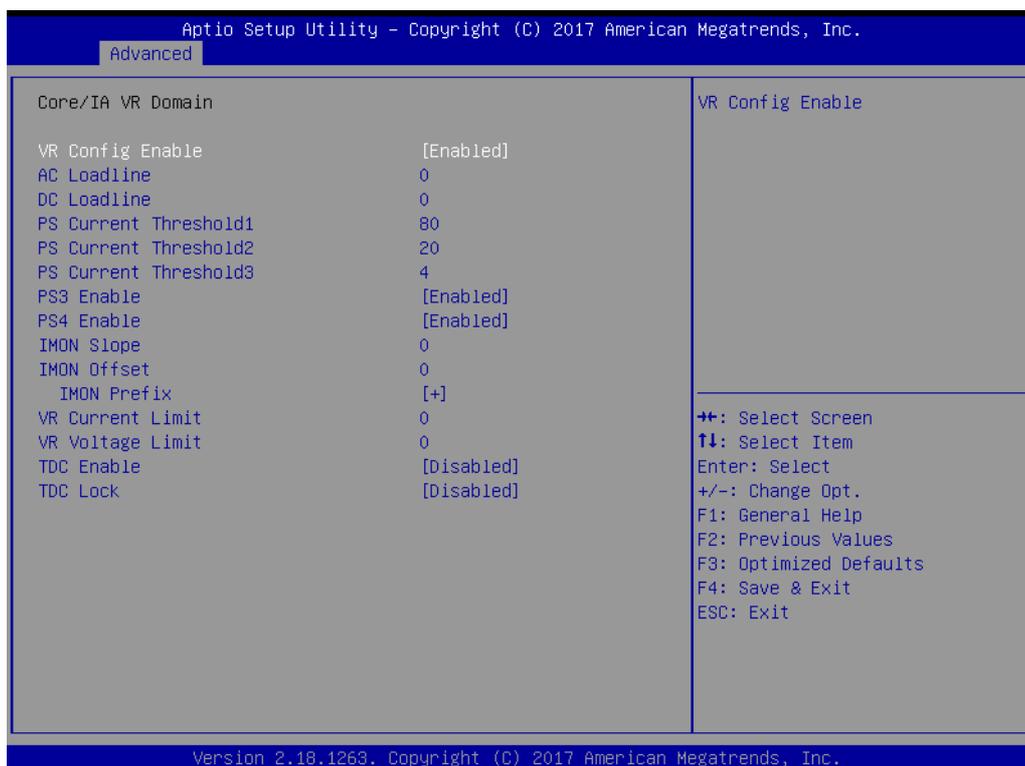
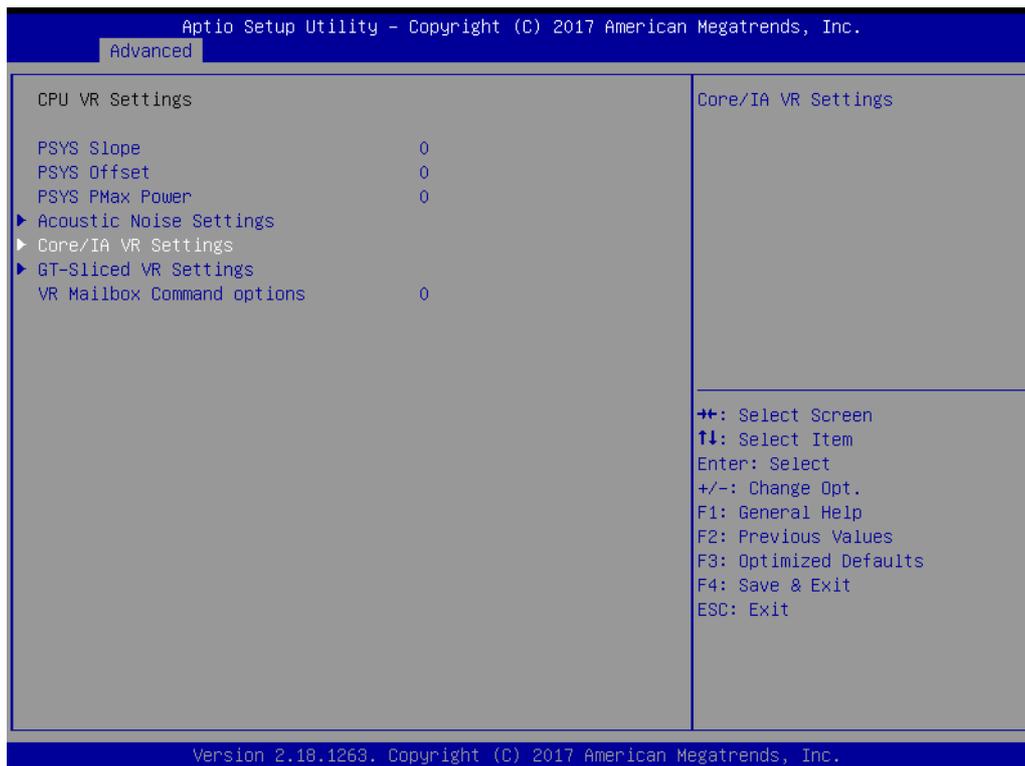
Advanced

Acoustic Noise Settings		Enabling this option will help mitigate acoustic noise on certain SKUs when the CPU is in deeper C state
Acoustic Noise Mitigation	[Disabled]	
IA VR Domain		
Disable Fast PKG C State Ramp for IA Domain	[FALSE]	
Slow Slew Rate for IA Domain	[Fast/2]	
GT VR Domain		
Disable Fast PKG C State Ramp for GT Domain	[FALSE]	
Slow Slew Rate for GT Domain	[Fast/2]	
SA VR Domain		
Disable Fast PKG C State Ramp for SA Domain	[FALSE]	
Slow Slew Rate for SA Domain	[Fast/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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Core/IA VR Settings



GT-Sliced VR Settings

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Advanced

CPU VR Settings	GT-Sliced VR Settings
PSYS Slope	0
PSYS Offset	0
PSYS PMax Power	0
▶ Acoustic Noise Settings	
▶ Core/IA VR Settings	
▶ GT-Sliced VR Settings	
VR Mailbox Command options	0

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

Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.

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

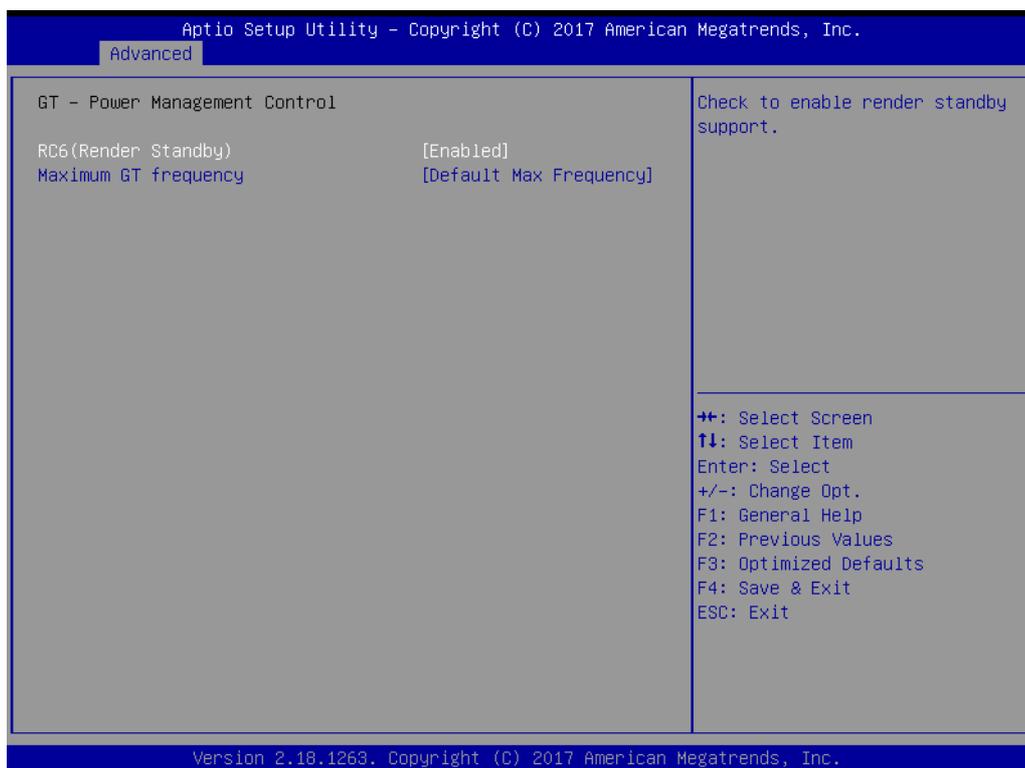
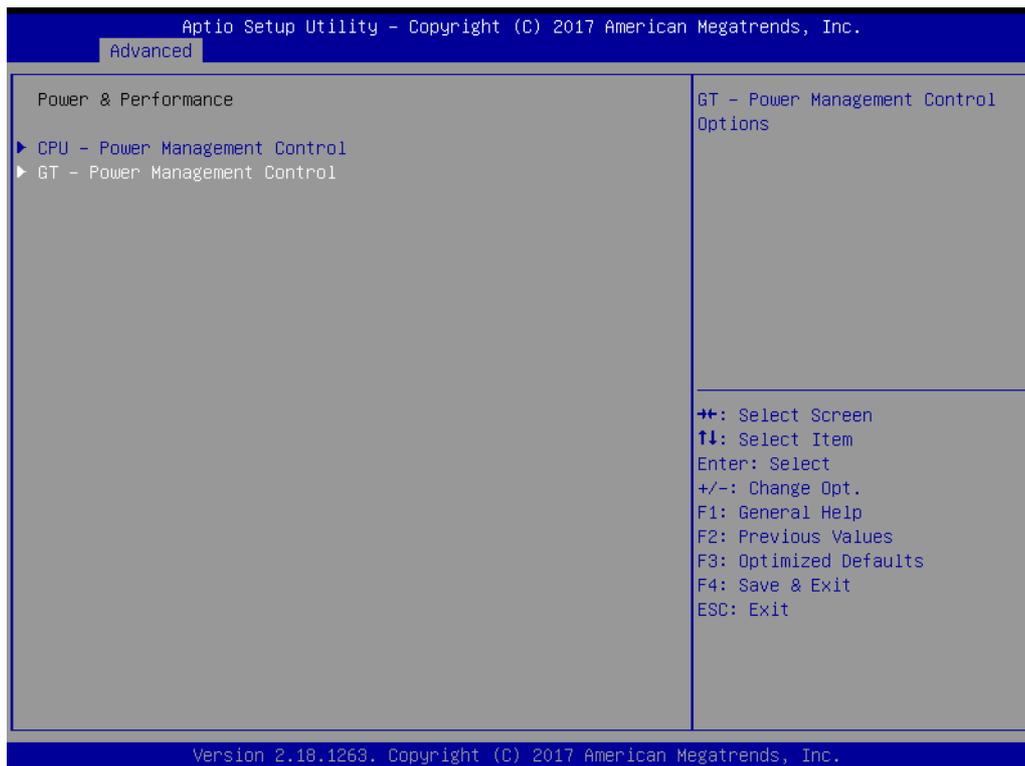
Advanced

GT-Sliced Domain	VR Config Enable
VR Config Enable	[Enabled]
AC Loadline	0
DC Loadline	0
PS Current Threshold1	80
PS Current Threshold2	20
PS Current Threshold3	4
PS3 Enable	[Enabled]
PS4 Enable	[Enabled]
IMON Slope	0
IMON Offset	0
IMON Prefix	[+]
VR Current Limit	0
VR Voltage Limit	0
TDC Enable	[Disabled]
TDC Lock	[Disabled]

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

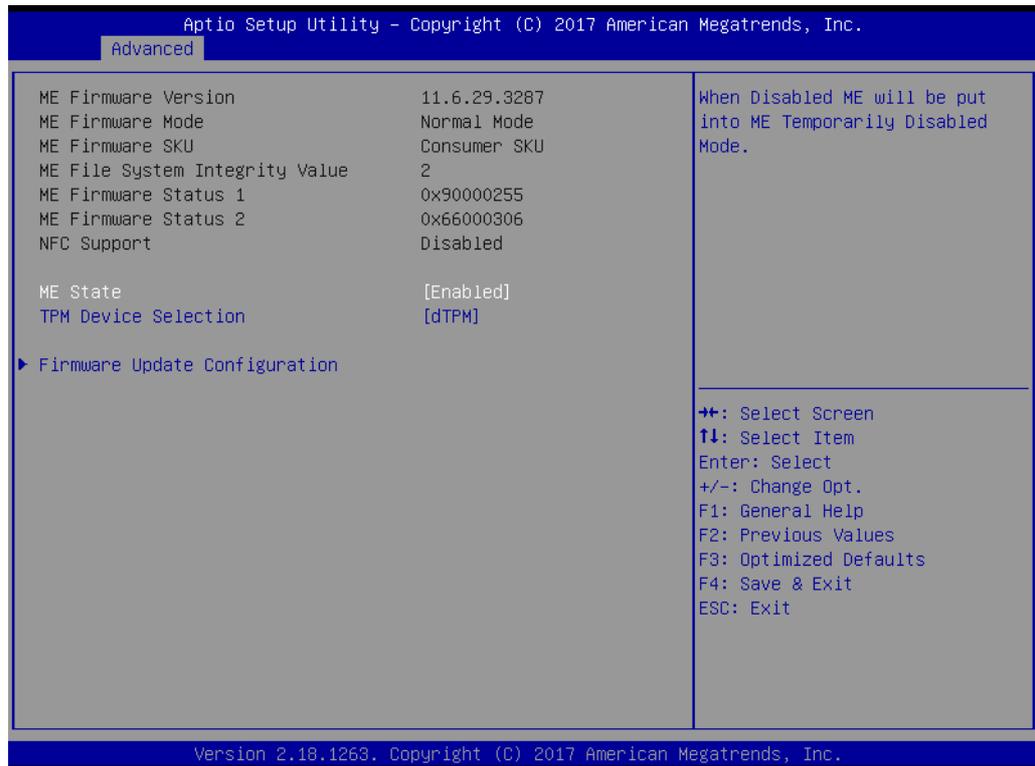
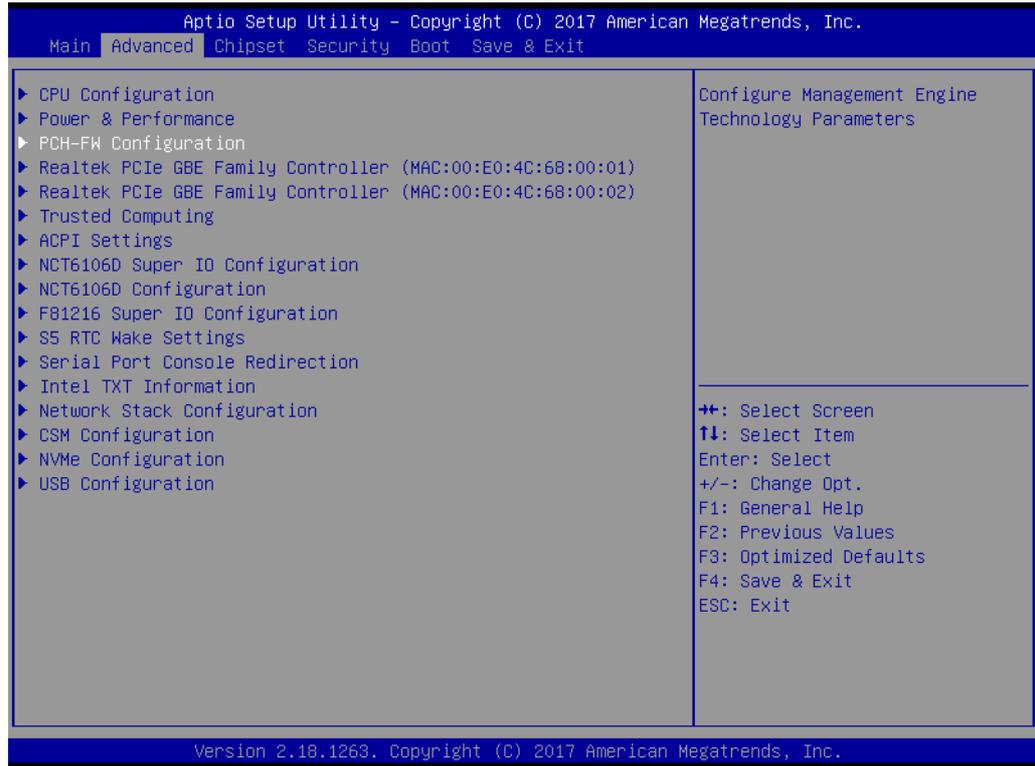
Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.

GT - Power Management Control

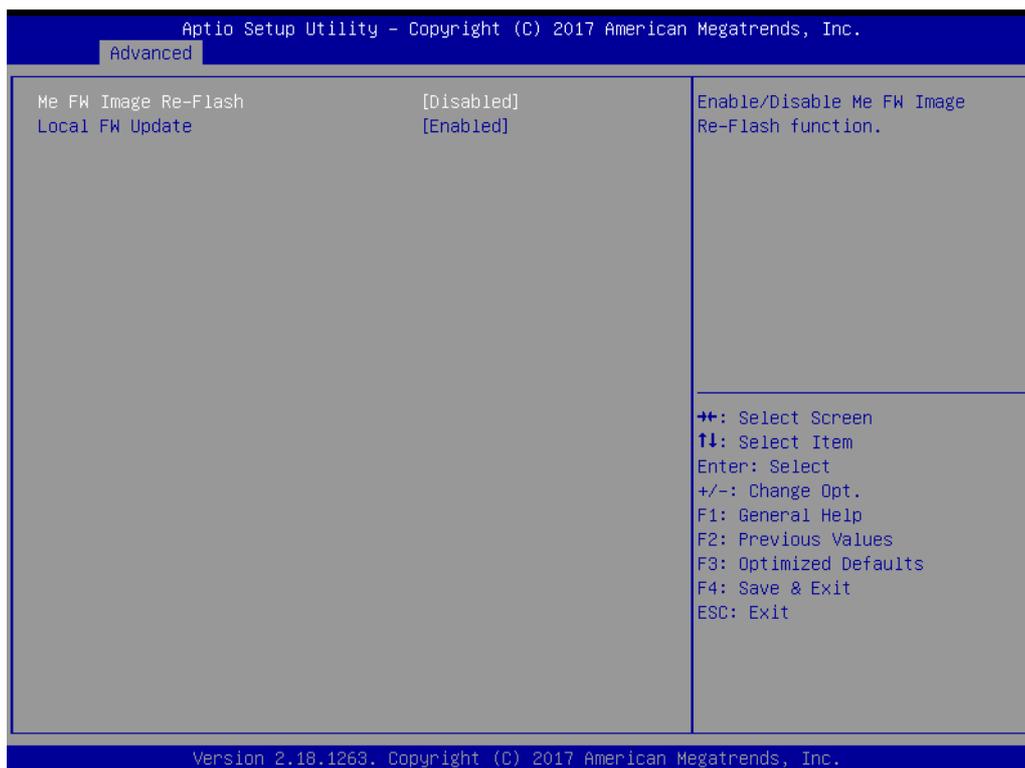


- **RC6 (Render Standby) [Enabled]**
- **Maximum GT frequency [Default Max Frequency]**

3.2.2.3 PCH-FW Configuration

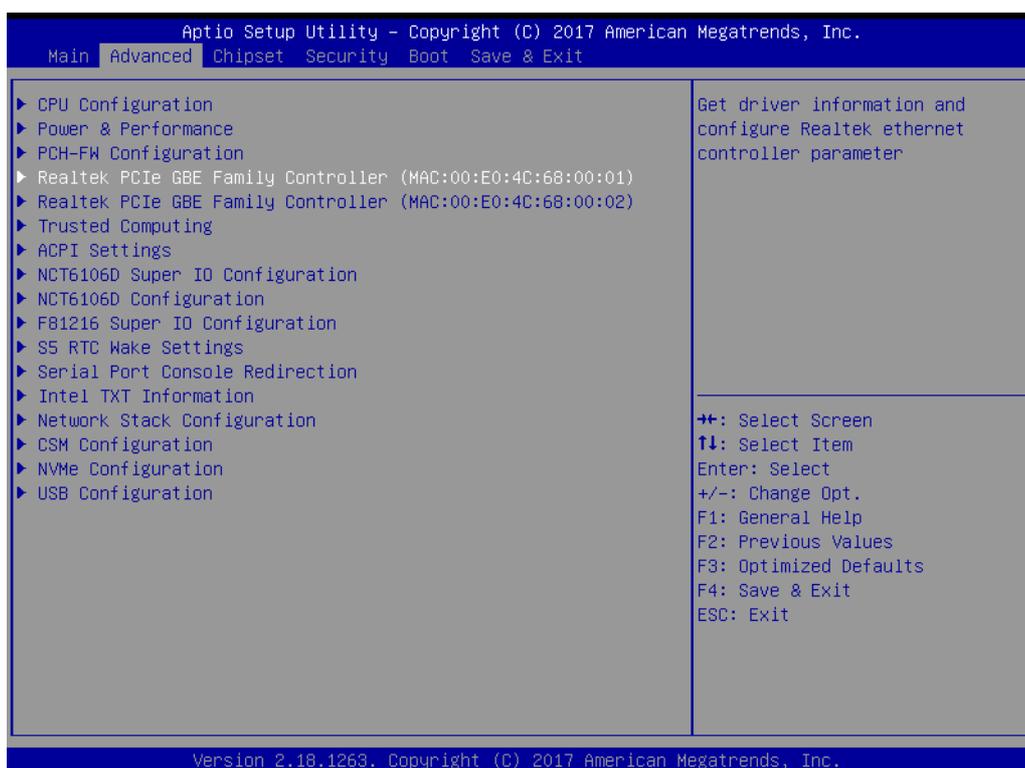


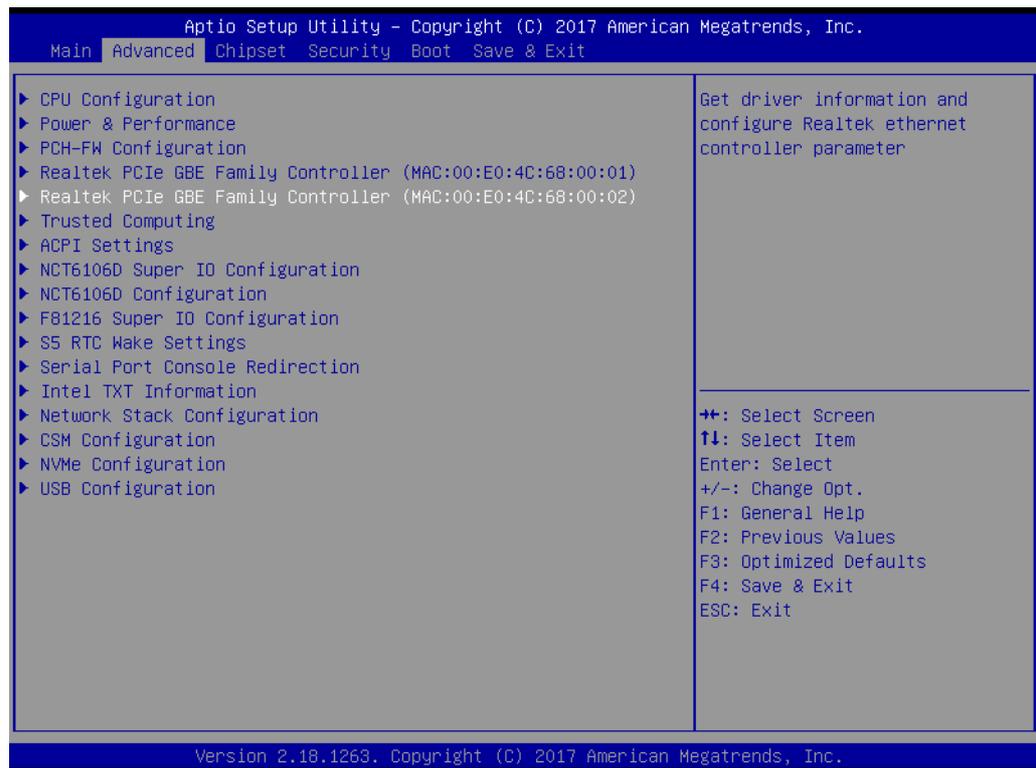
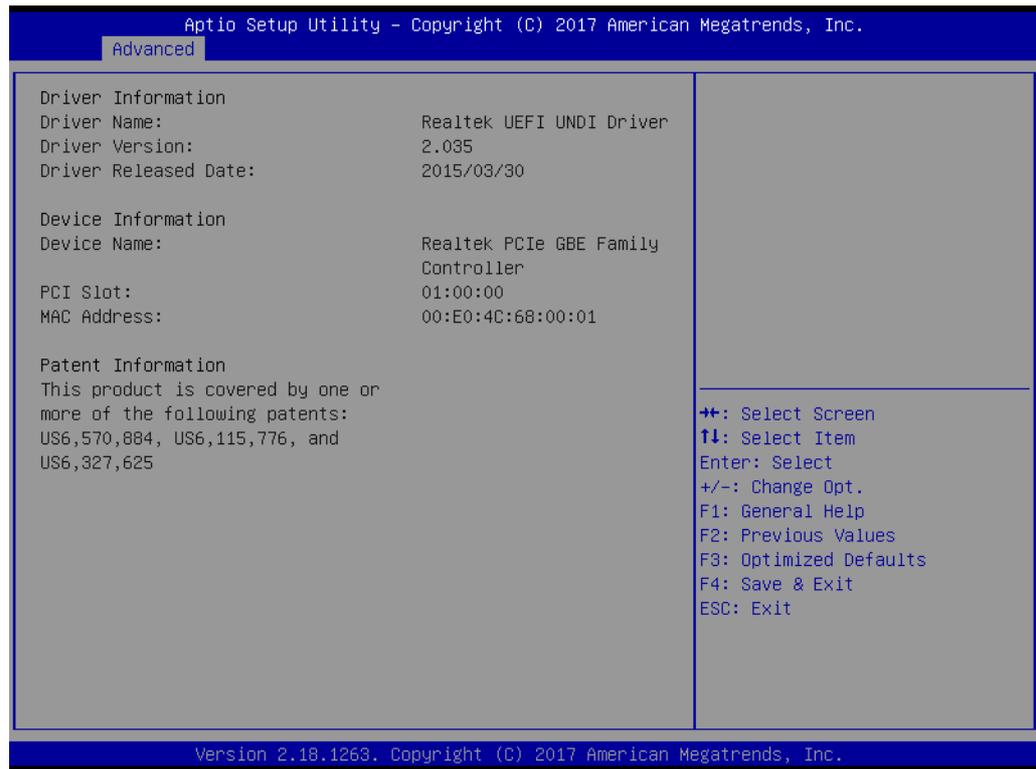
- **ME State [Enabled]**
When disabled ME will be put into ME temporarily disabled mode.
- **TPM Device Selection [dTPM]**

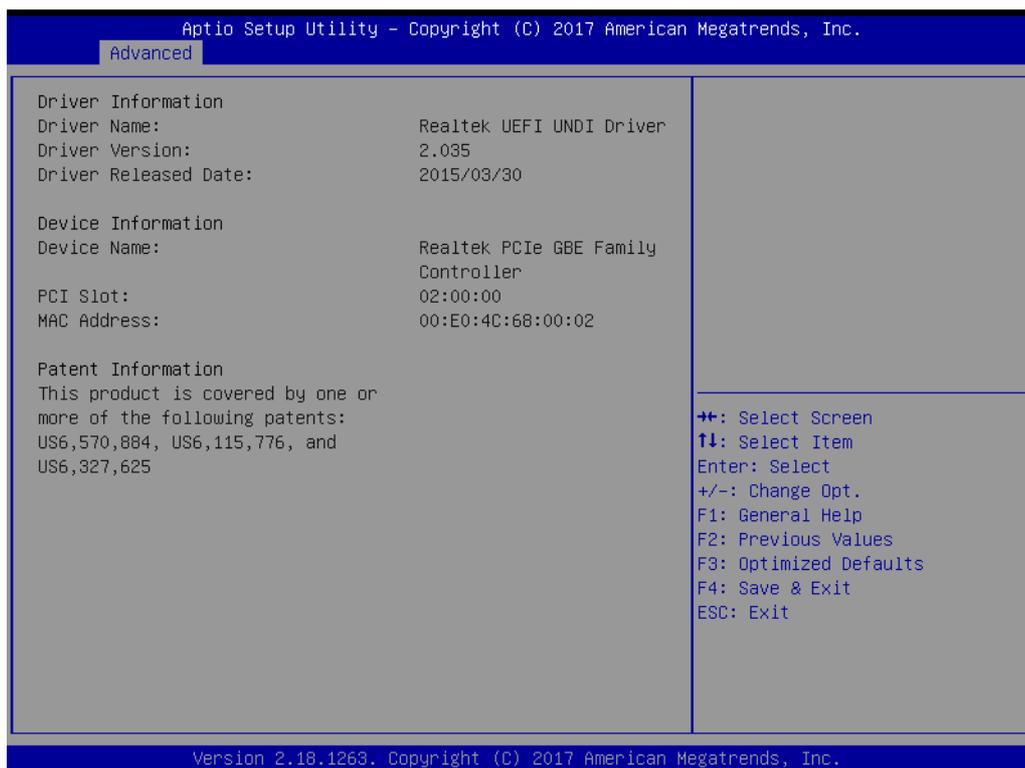


- **ME FW Image Re-Flash [Disabled]**
Enable/Disable ME FW image re-flash function.
- **Local FW Update [Enabled]**
Enable/Disable local FW update

3.2.2.4 Realtek PCIe GBE Family Controller

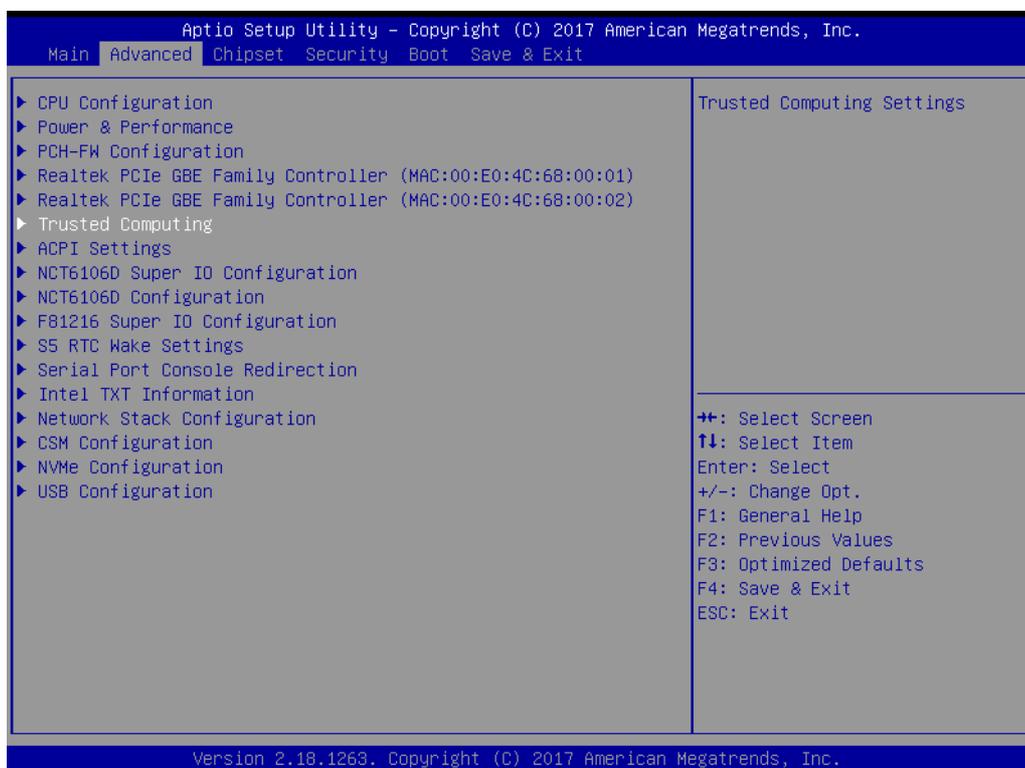






3.2.2.5 Trusted Computing

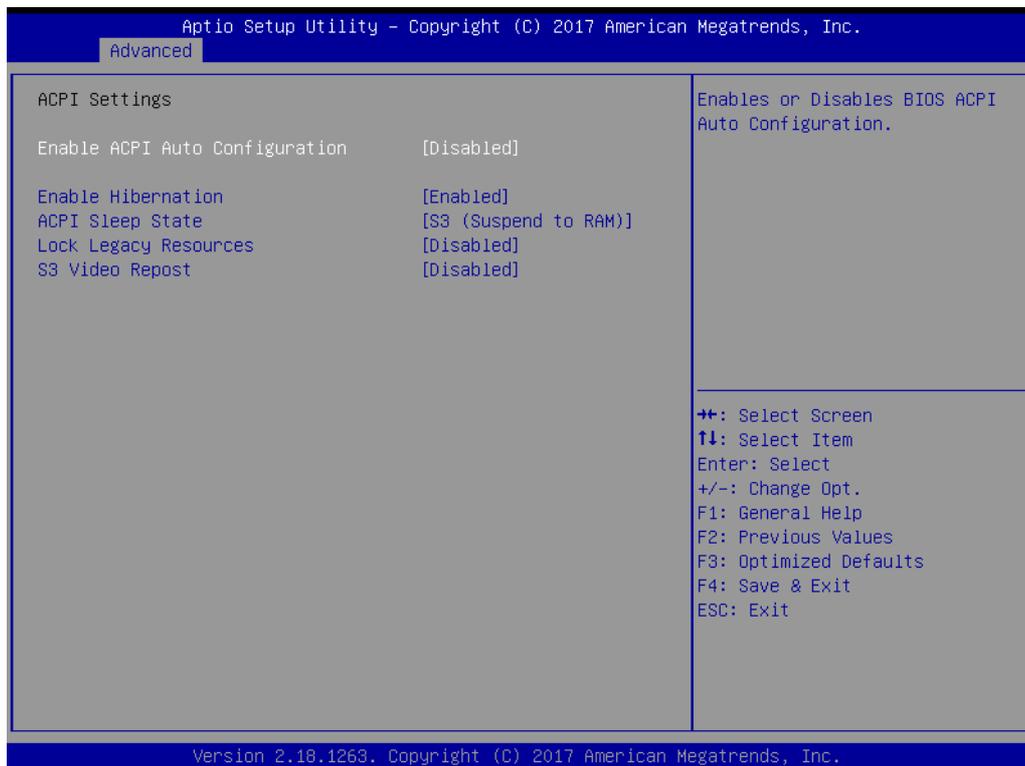
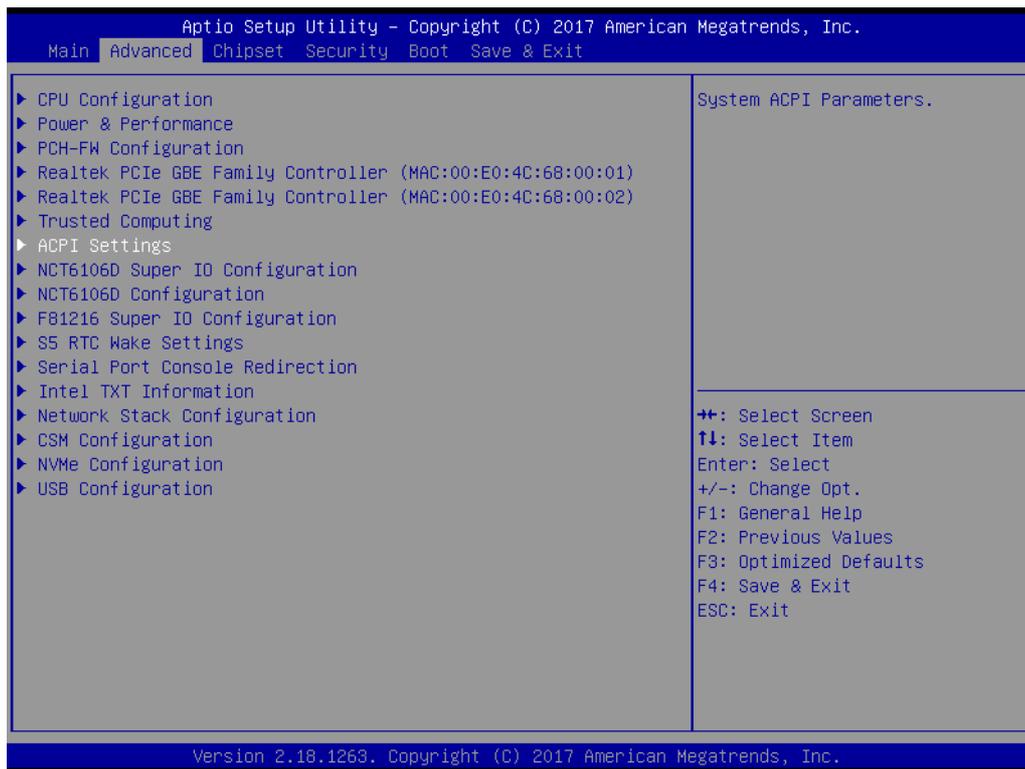
To enable/disable TPM (TPM1.2/2.0) set up in BIOS. TPM (Trusted Platform Module) is a secure key generator and key cache management component, enables protected storage of encryption keys and authentication credentials for enhanced security capabilities.





- **Security Device Support [Enabled]**
 Enable/Disable BIOS support for security device.
Note! TCG EFI Protocol and INT1A interface will not be available.
- **TPM State [Enabled]**
 Enable/Disable TPM State
Note! TPM function requests Hardware design supported and BIOS enabled in parallel.
- **Pending operation (None)**

3.2.2.6 ACPI Settings

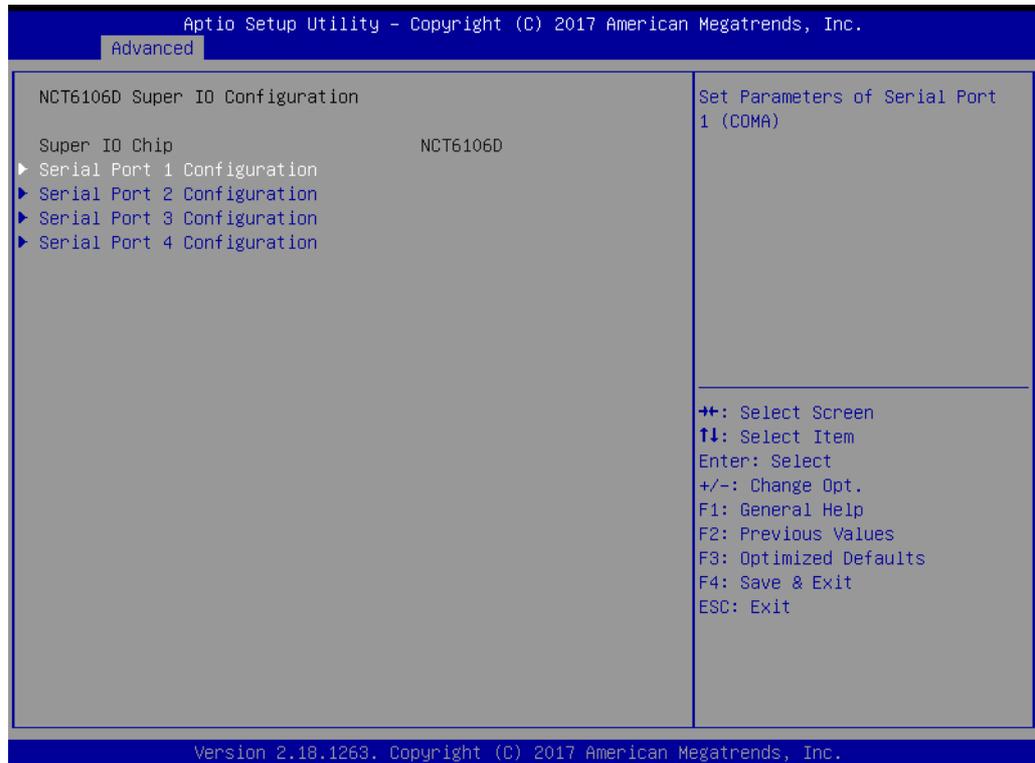
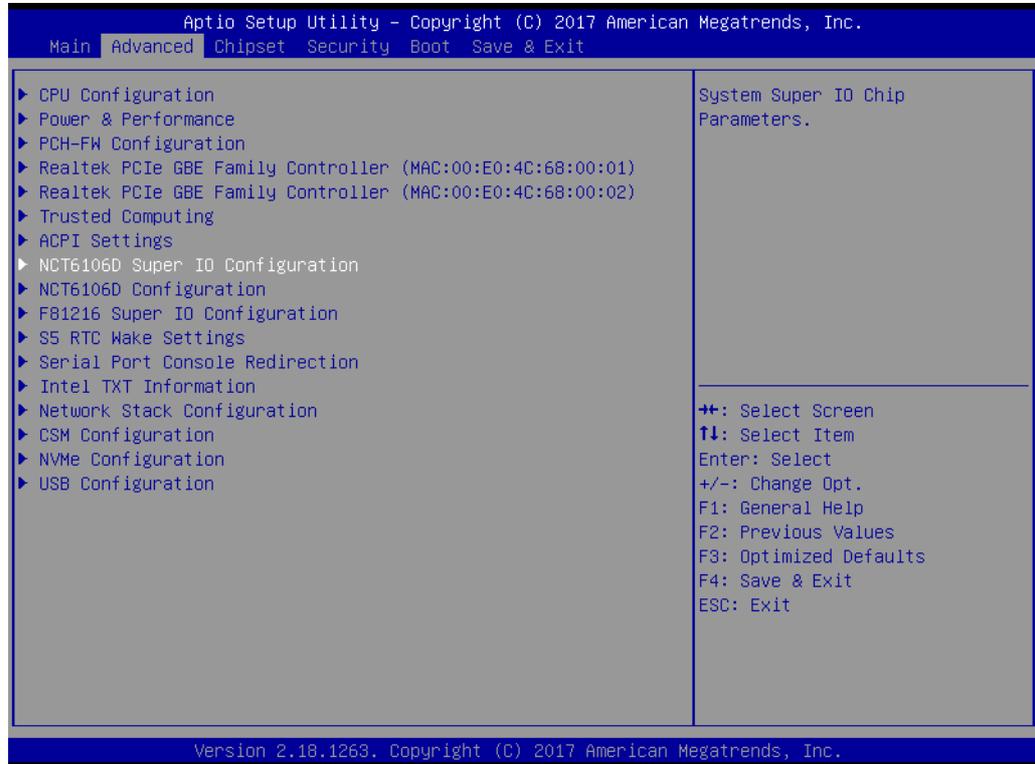


- **Enable ACPI Auto Configuration [Disabled]**
- **Enable Hibernation [Enabled]**
 Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.
- **ACPI Sleep State [S3 (Suspend to RAM)]**

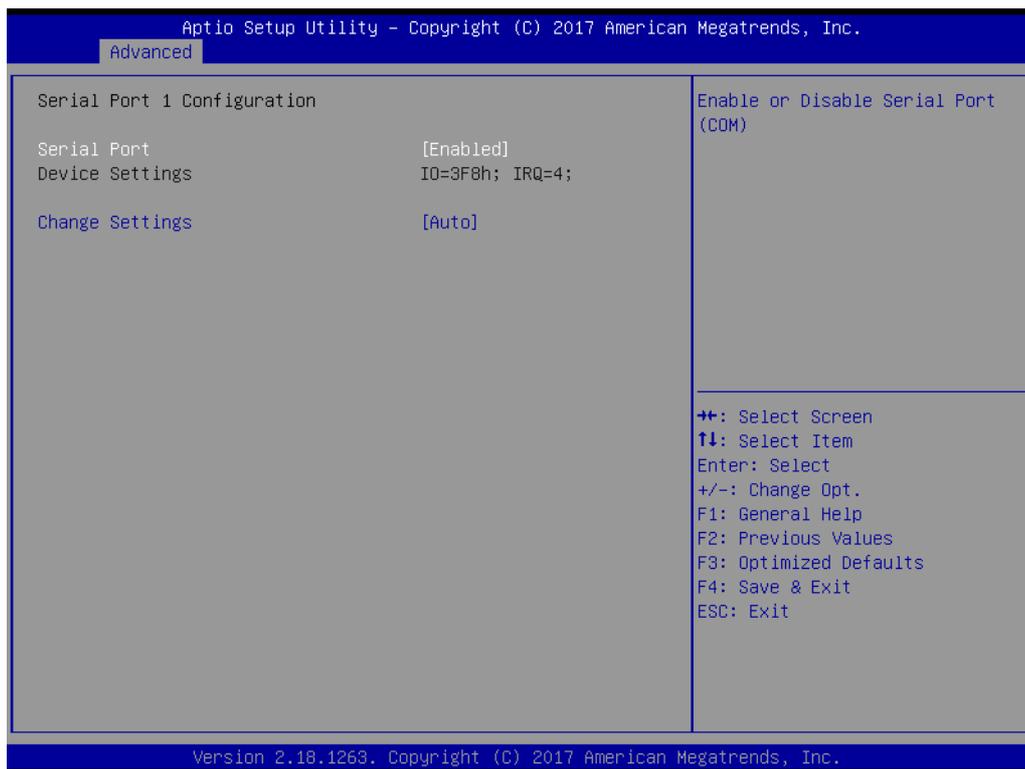
Select ACPI sleep state the system will enter when the SUSPEND button is pressed.

- **Lock Legacy Resources [Disabled]**
- **S3 Video Repost [Disabled]**

3.2.2.7 NCT6106D Super IO Configuration

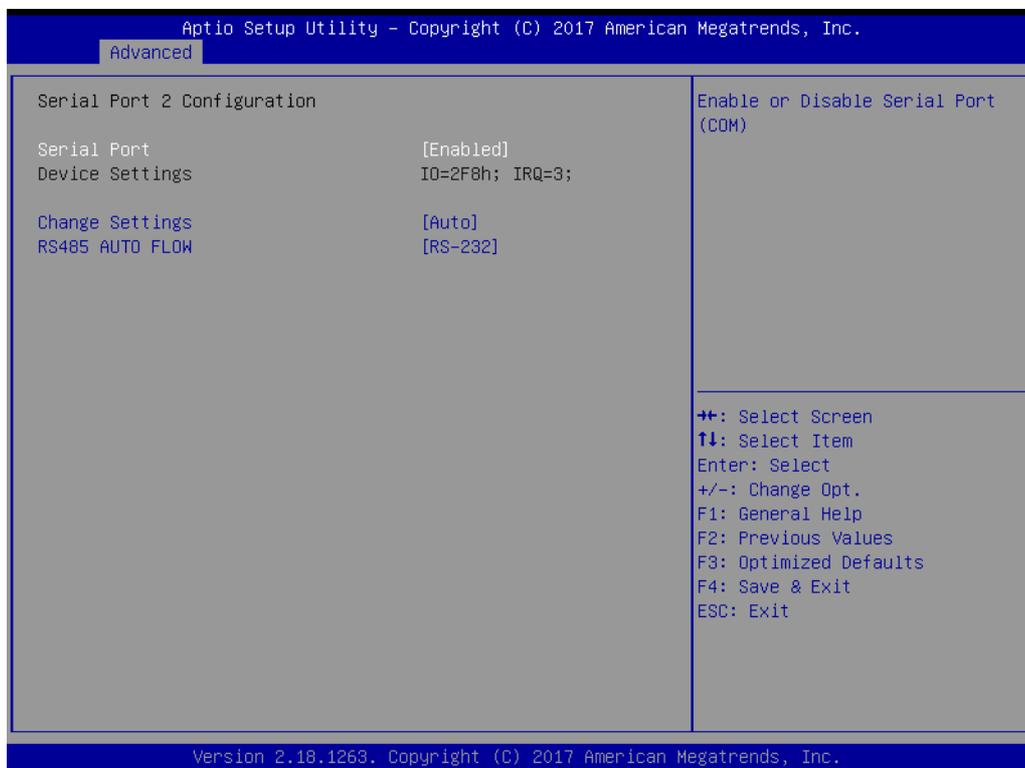


Serial Port 1 Configuration



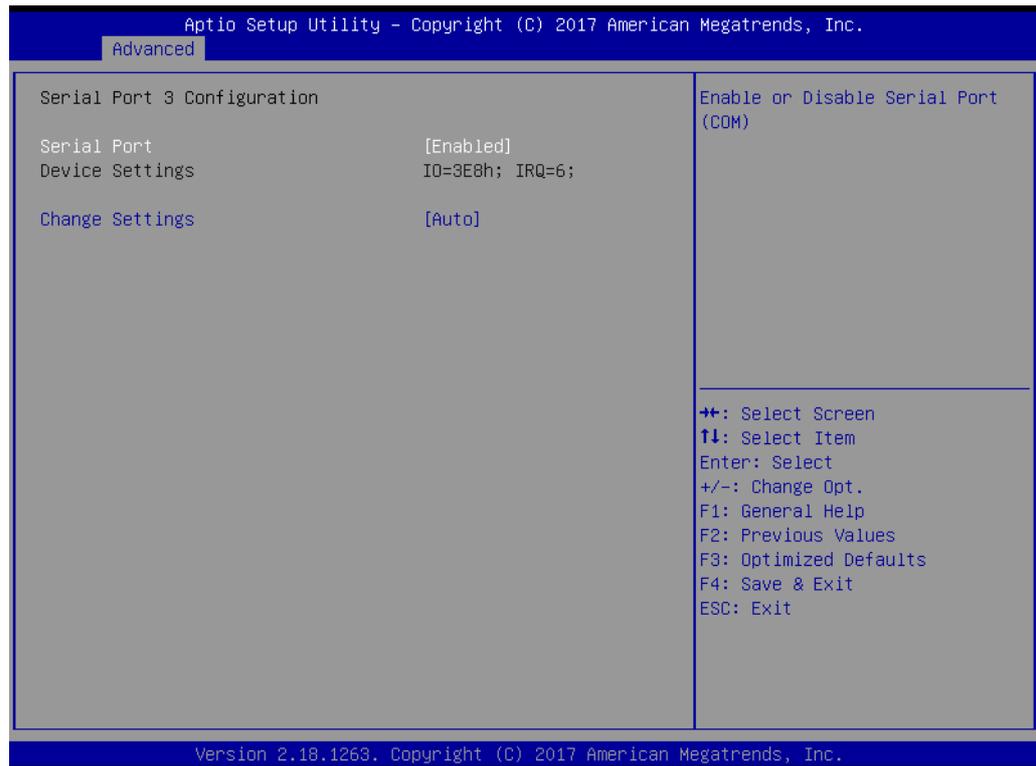
- **Serial Port [Enabled]**
- **Change Settings [Auto]**

Serial Port 2 Configuration



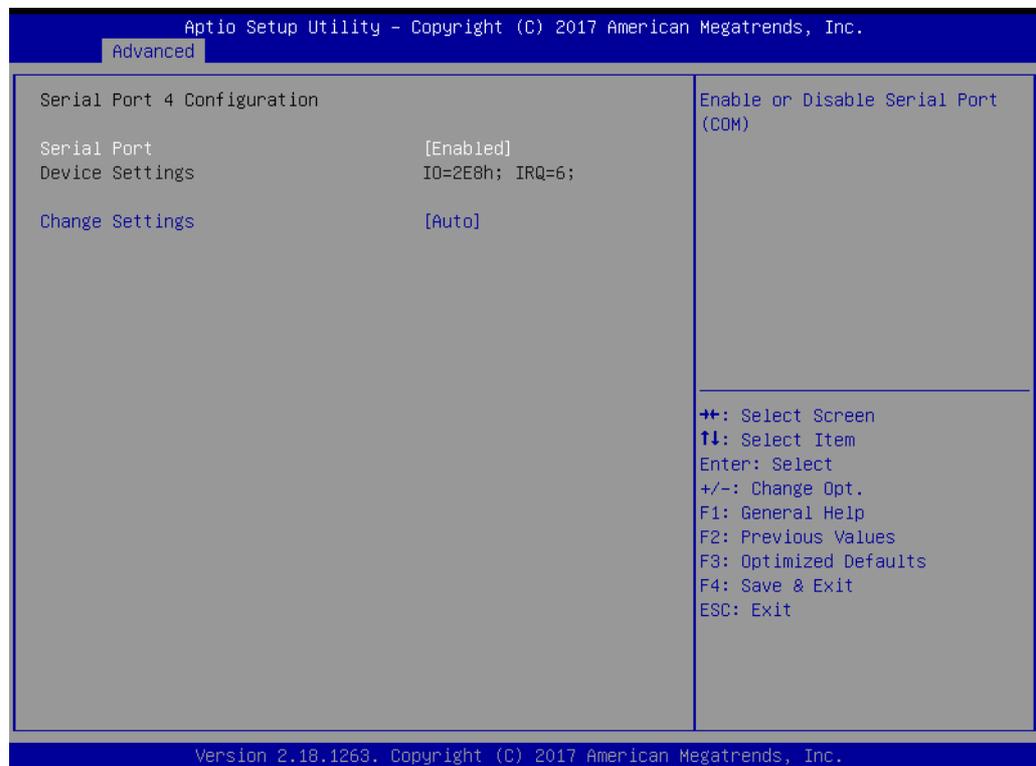
- **Serial Port [Enabled]**
- **Change Settings [Auto]**
- **RS-485 auto flow [RS232]**

Serial Port 3 Configuration



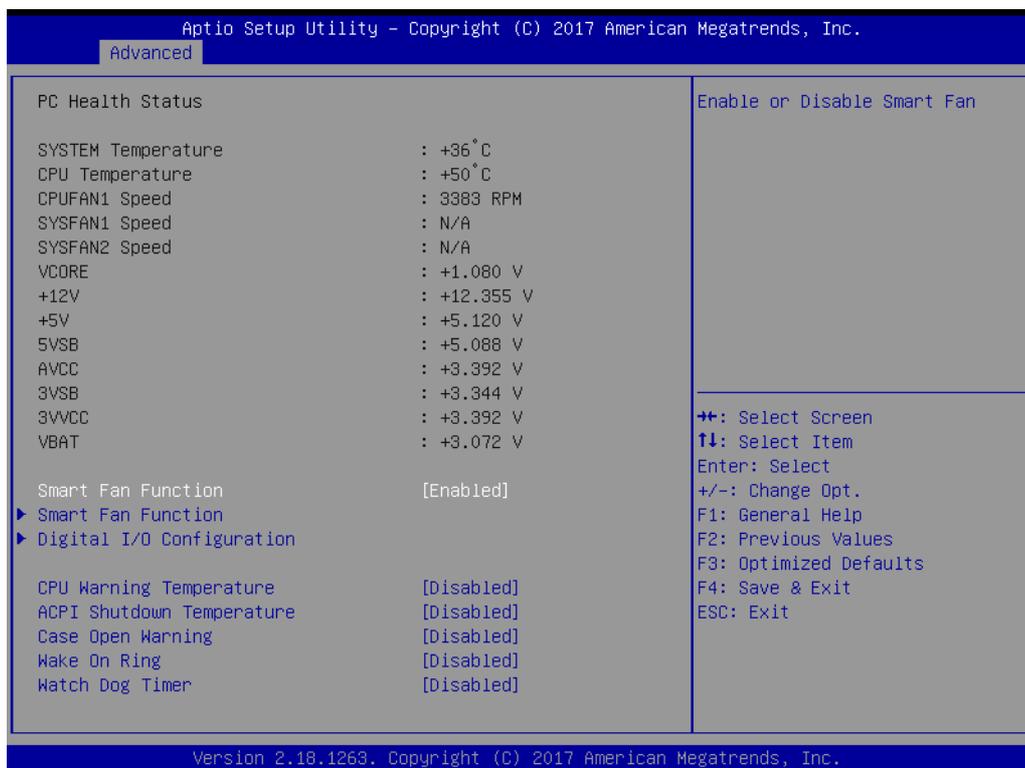
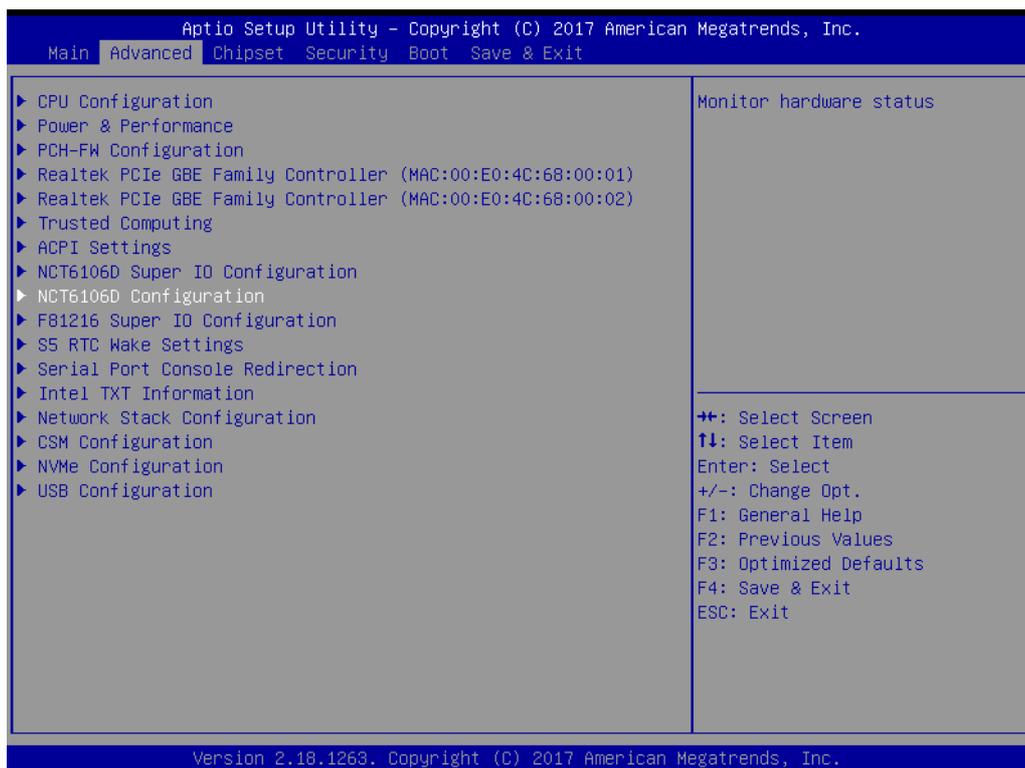
- **Serial Port [Enabled]**
- **Change Settings [Auto]**

Serial Port 4 Configuration

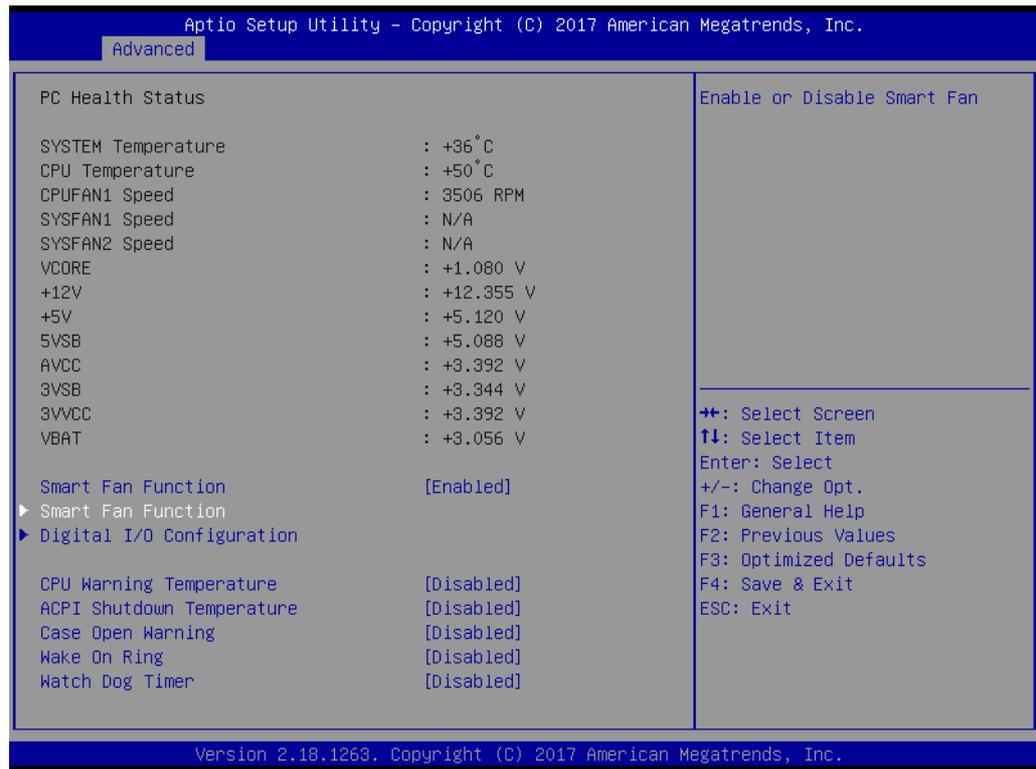


- **Serial Port [Enabled]**
- **Change Settings [Auto]**

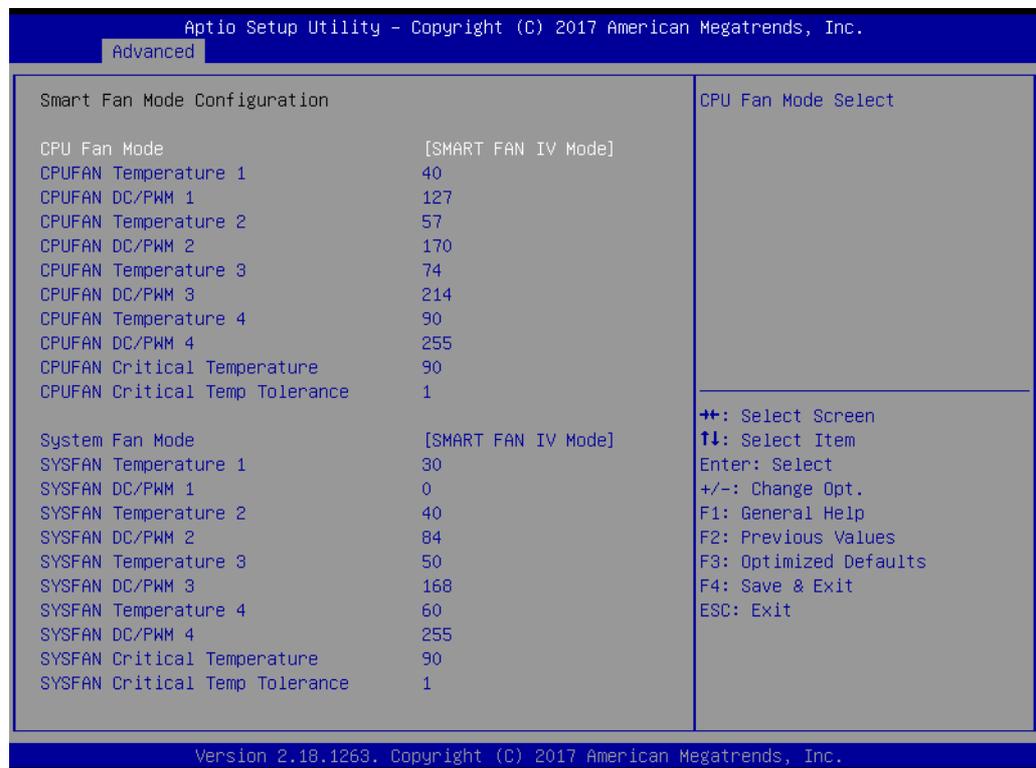
3.2.2.8 NCT6106D Configuration



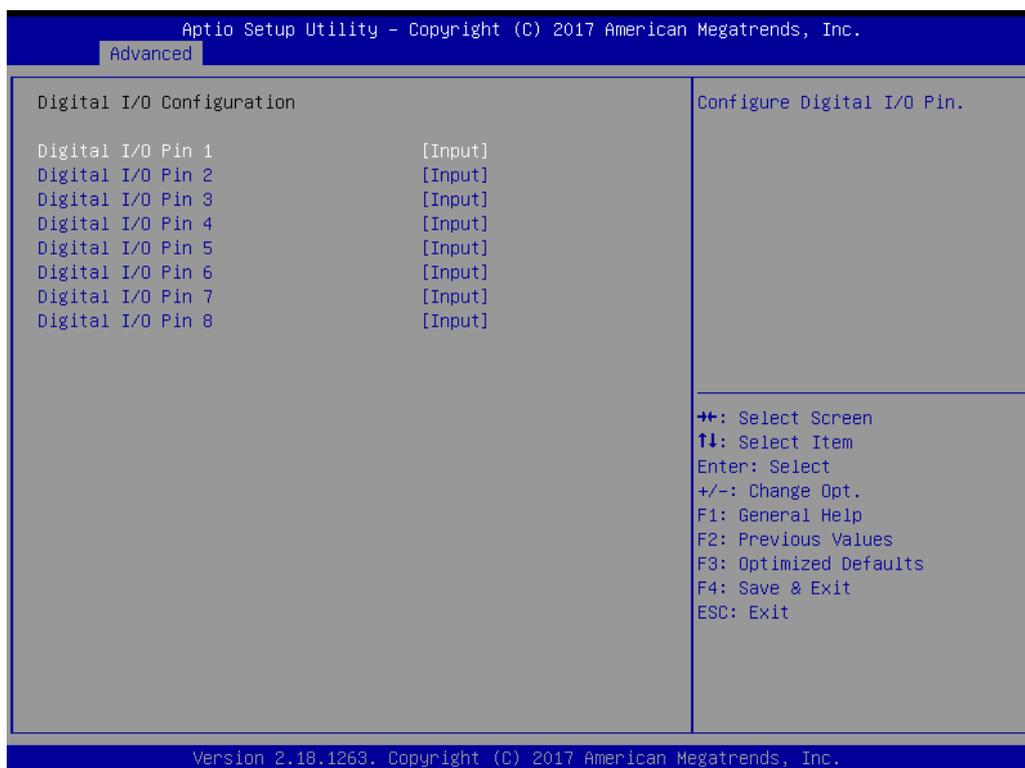
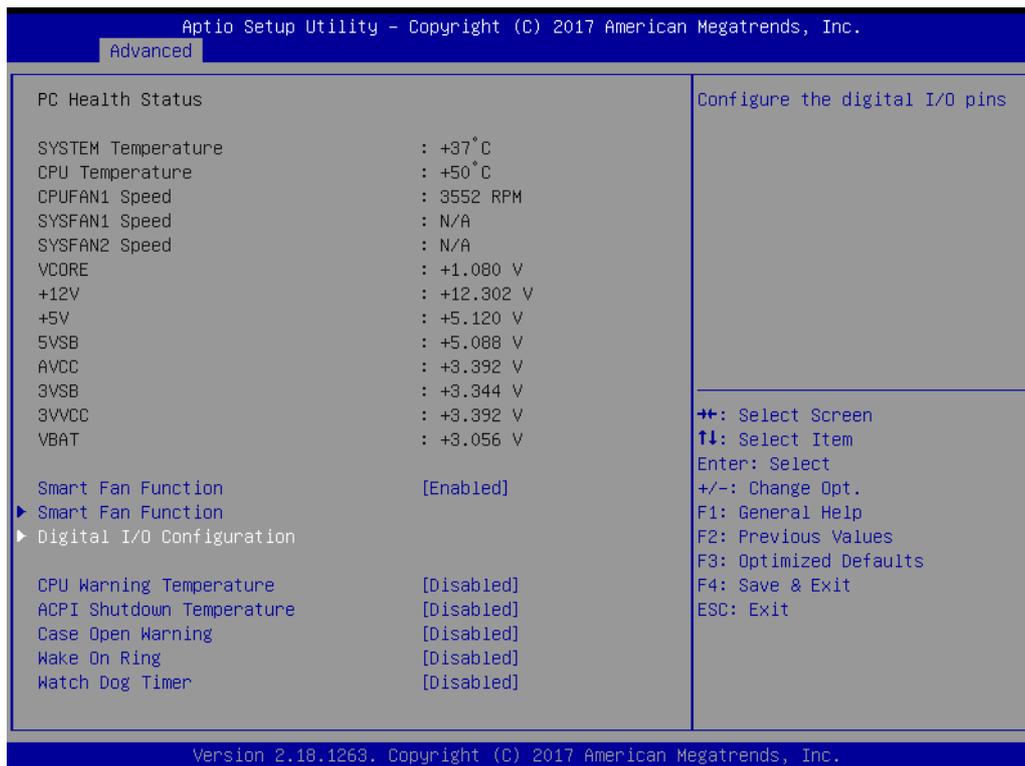
- **Smart Fan Function [Enabled]**
Enable/Disable Smart Fan



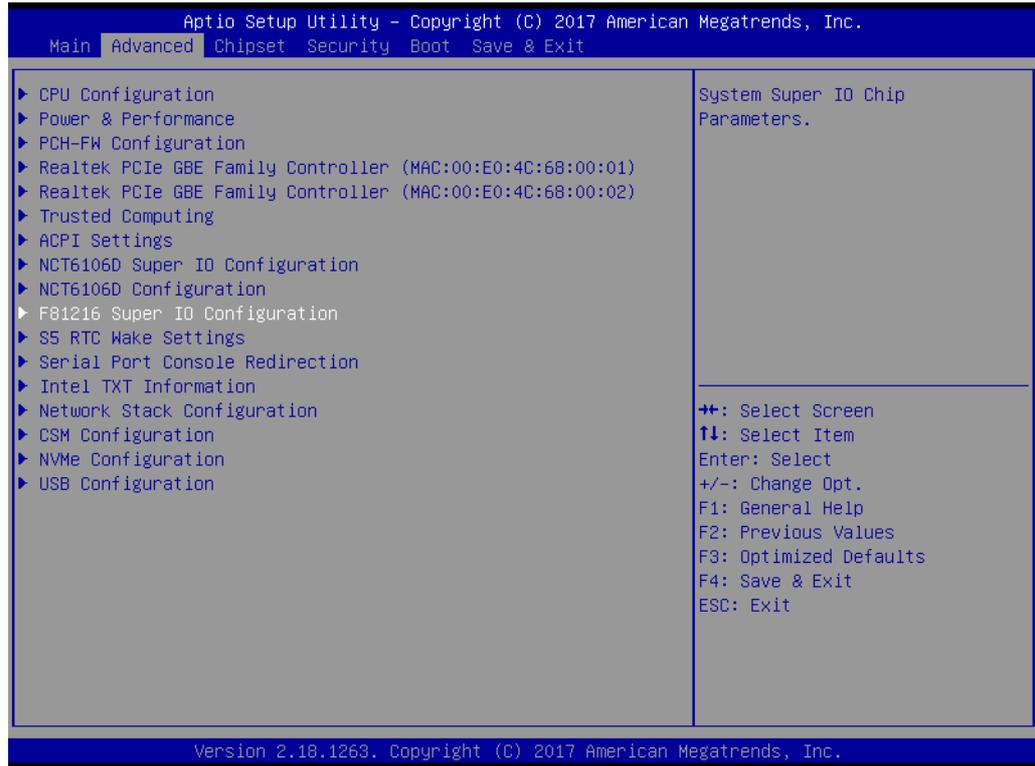
Smart Fan Mode Configuration

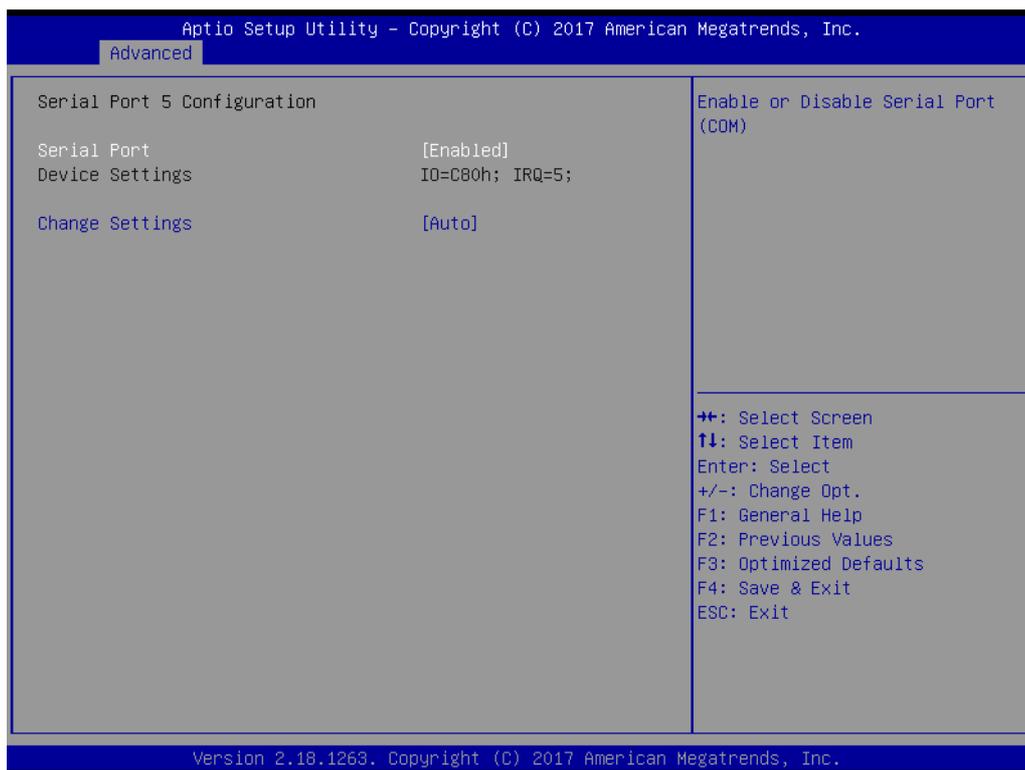


Digital I/O Configuration

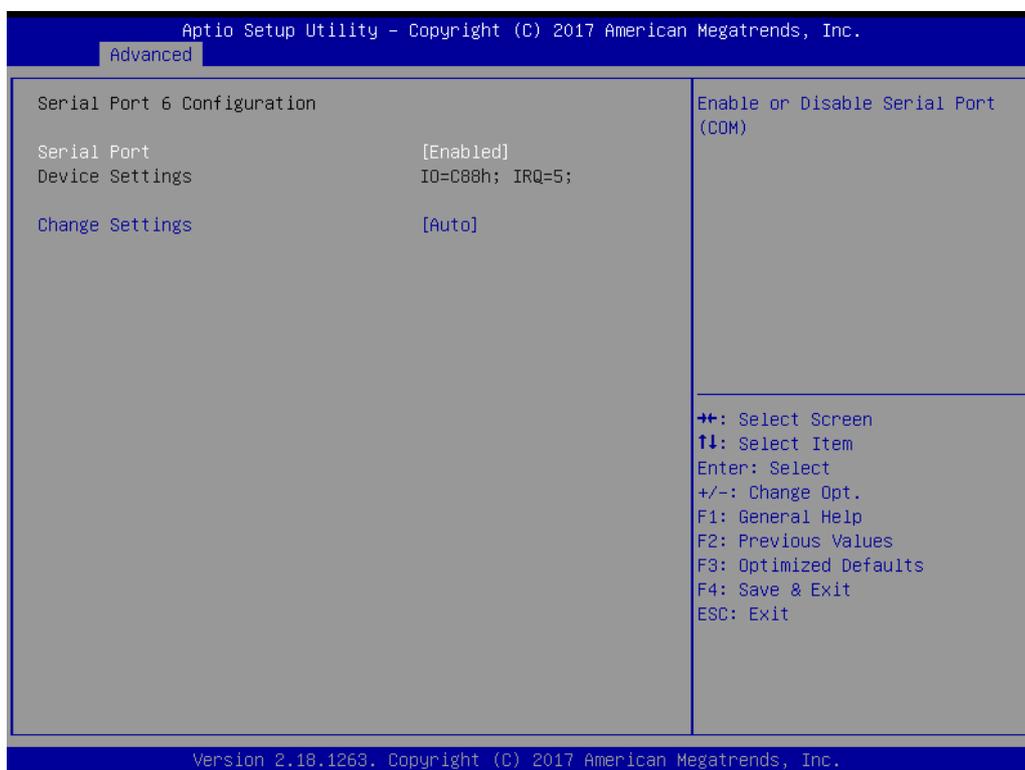


3.2.2.9 F81216 Super IO Configuration

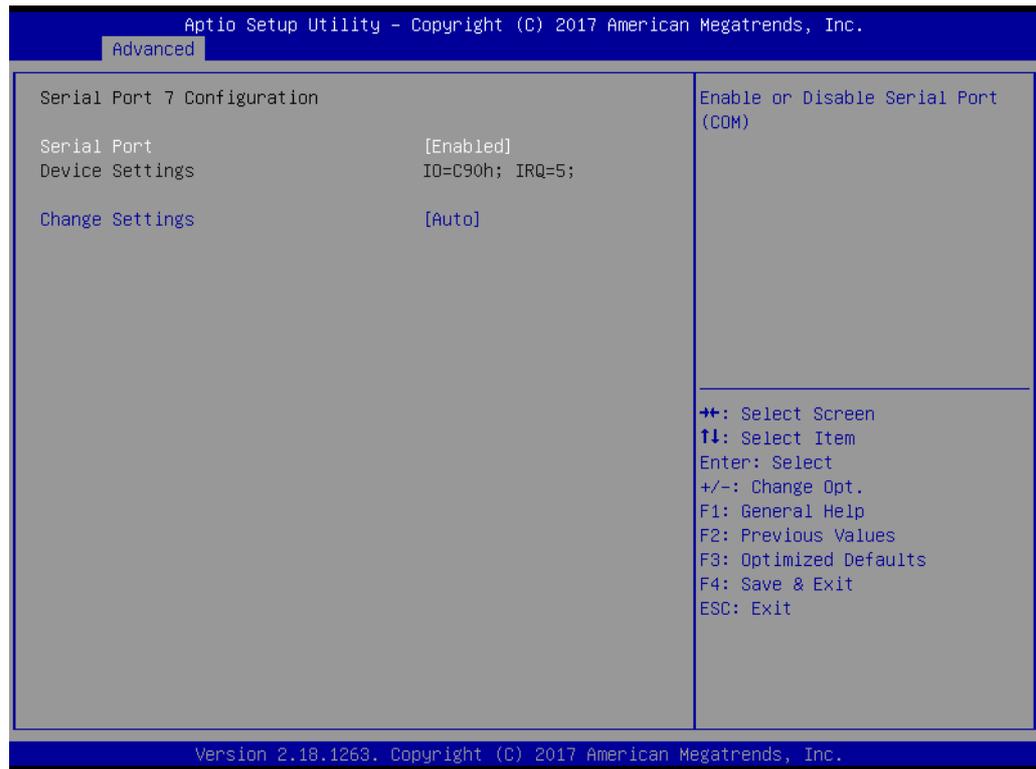




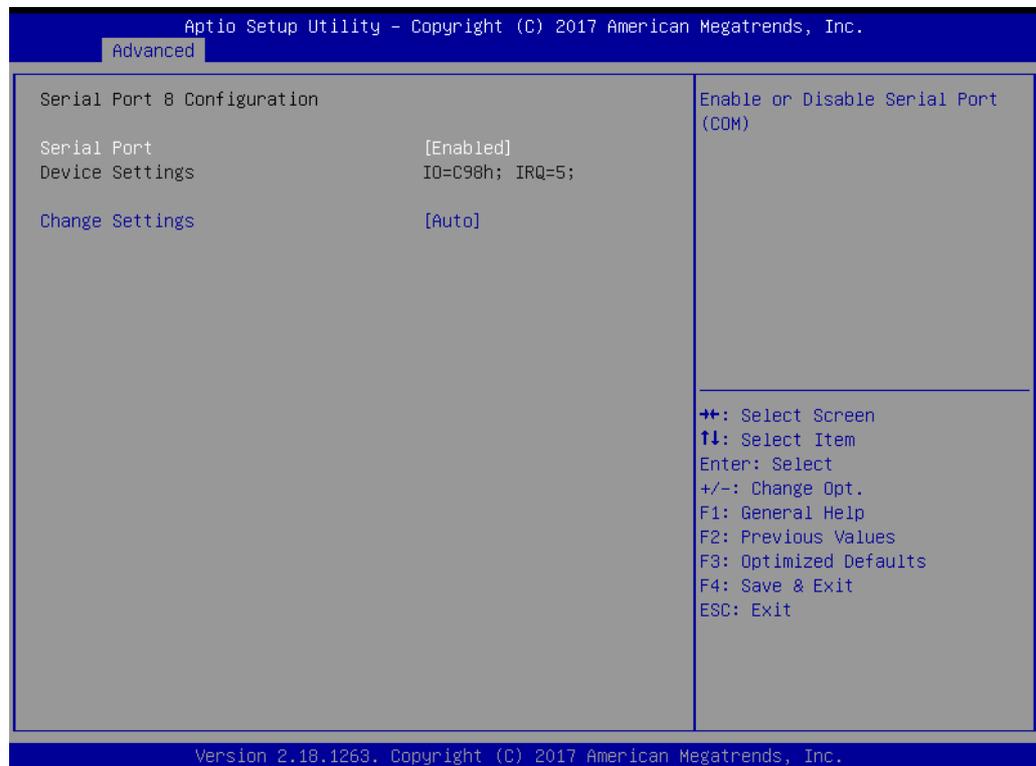
- **Serial Port [Enabled]**
- **Change Settings [Auto]**



- **Serial Port [Enabled]**
- **Change Settings [Auto]**



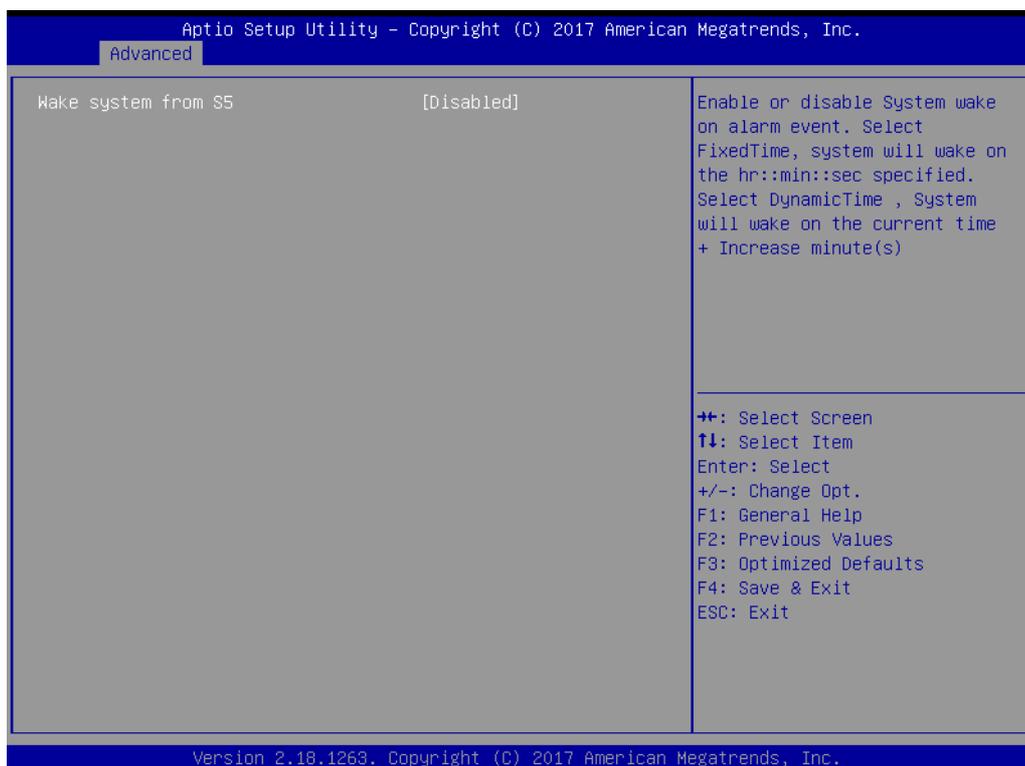
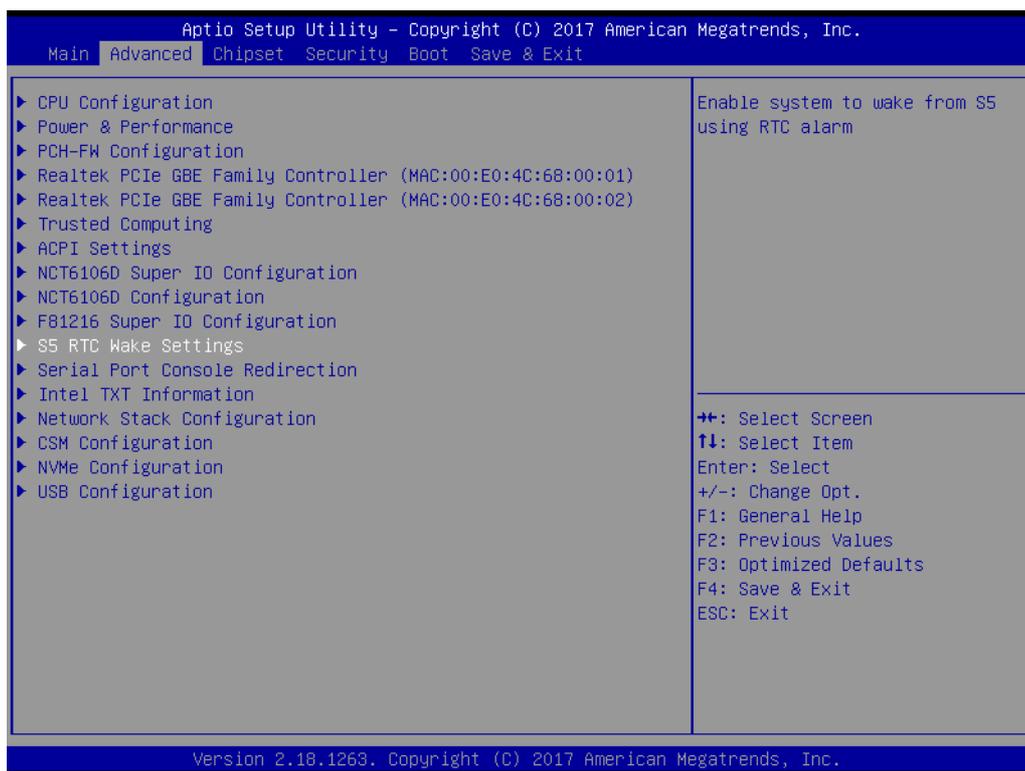
- **Serial Port [Enabled]**
- **Change Settings [Auto]**



- **Serial Port [Enabled]**
- **Change Settings [Auto]**

3.2.2.10 S5 RTC Wake Settings

The item allows you enable or disable system wake up on alarm event.

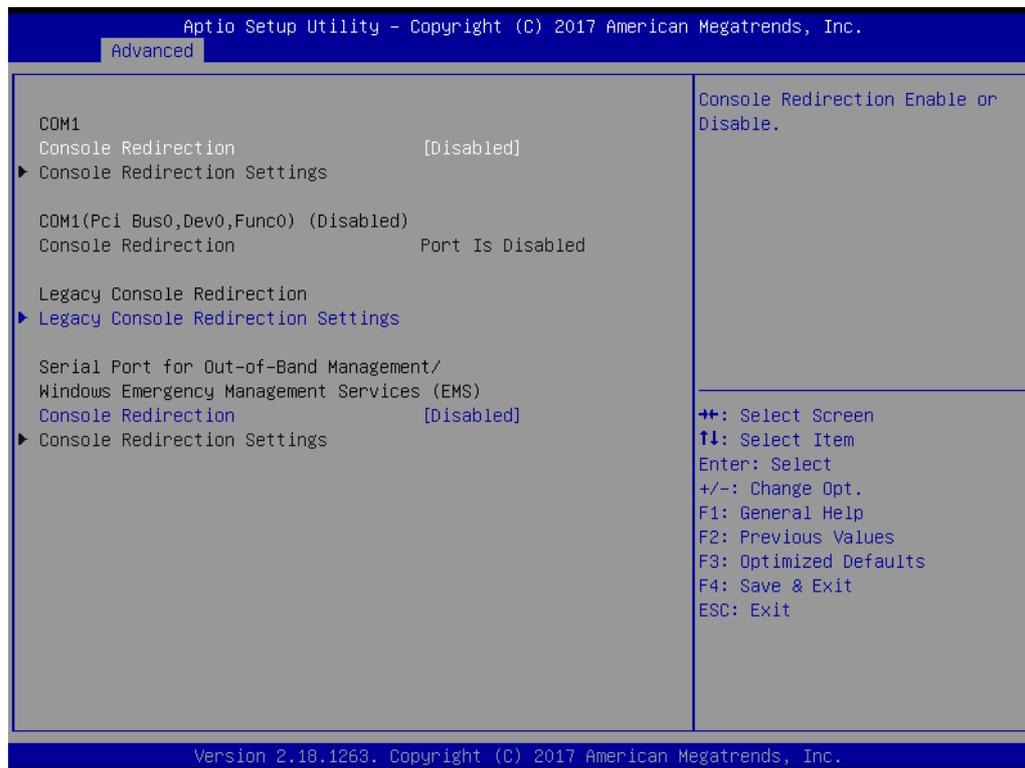
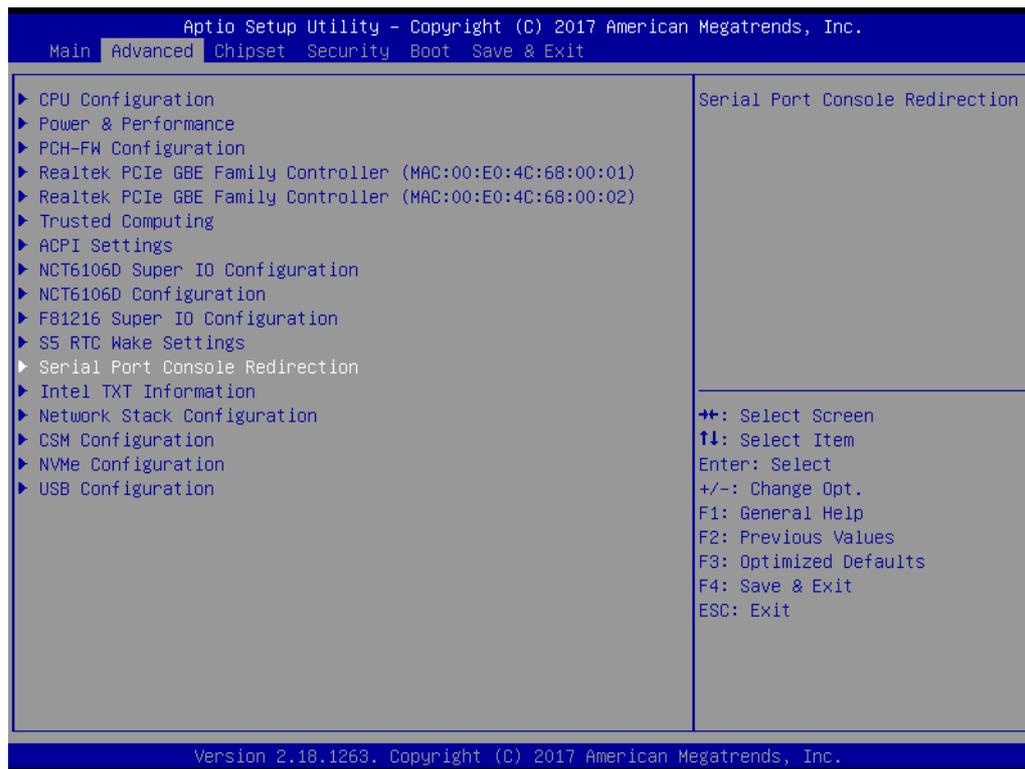


■ Wake system from S5 [Disabled]

Enable or disable system wake on alarm event.

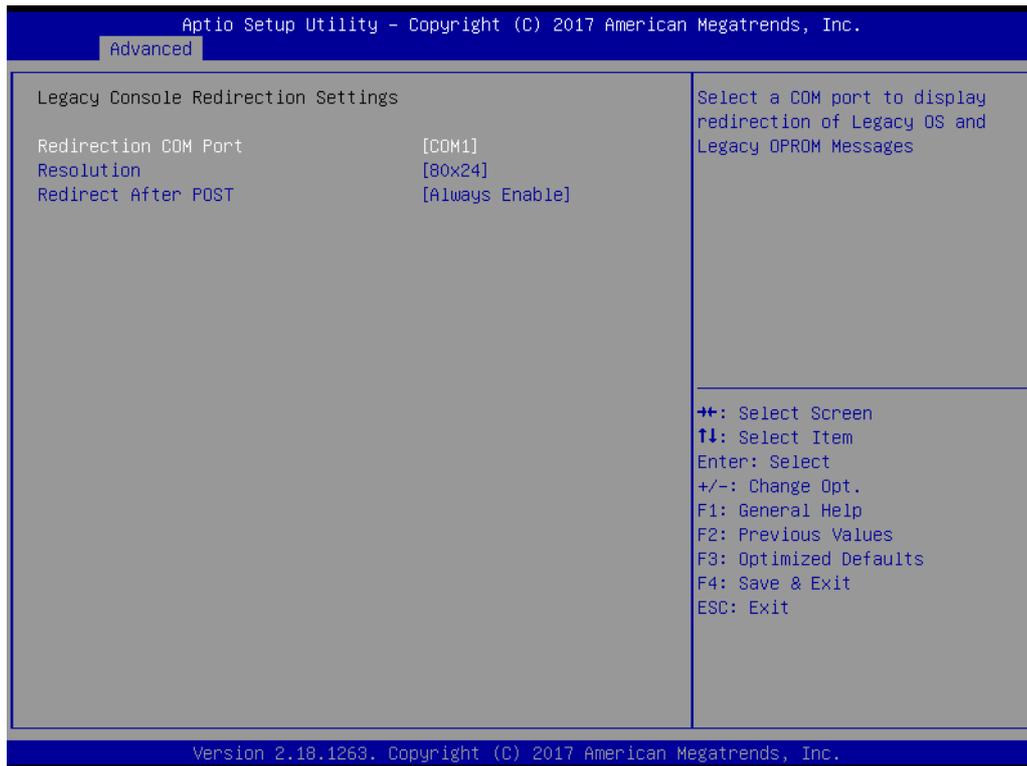
- Select FixedTime: System will wake on the specific hr::min::sec.
- Select DynamicTime: System will wake on the current time + increase minute (s)

3.2.2.11 Serial Port Console Redirection



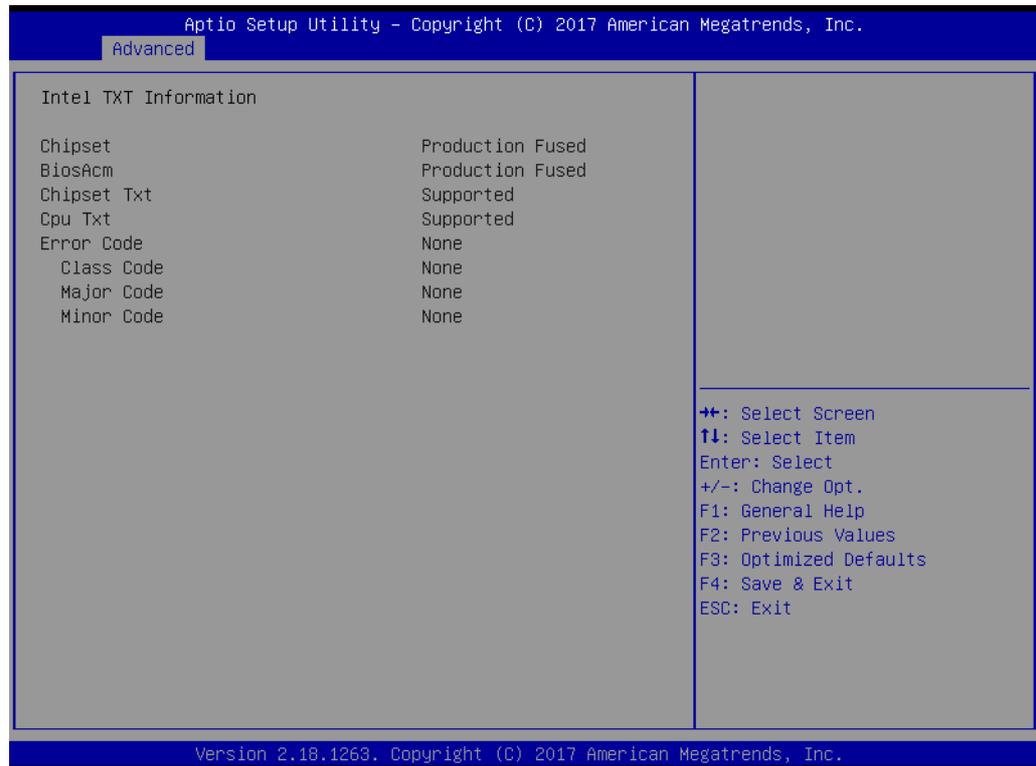
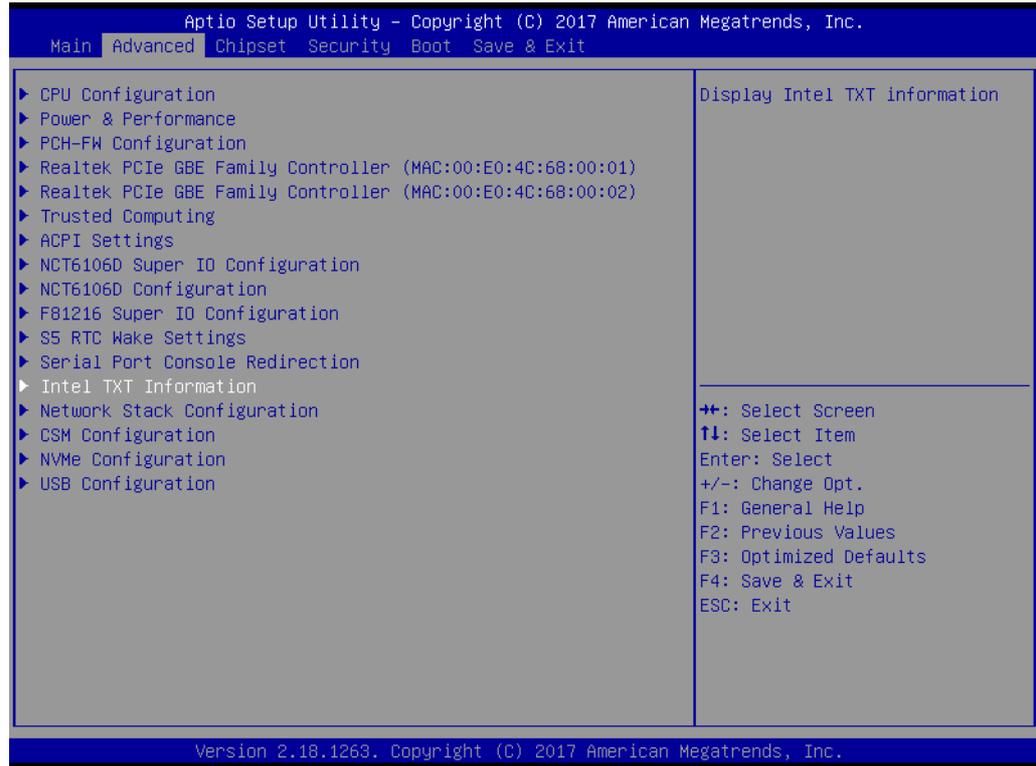
- **Console Redirection [Disabled]**
 Enable or disable the console redirection feature

Legacy Console Redirection Settings

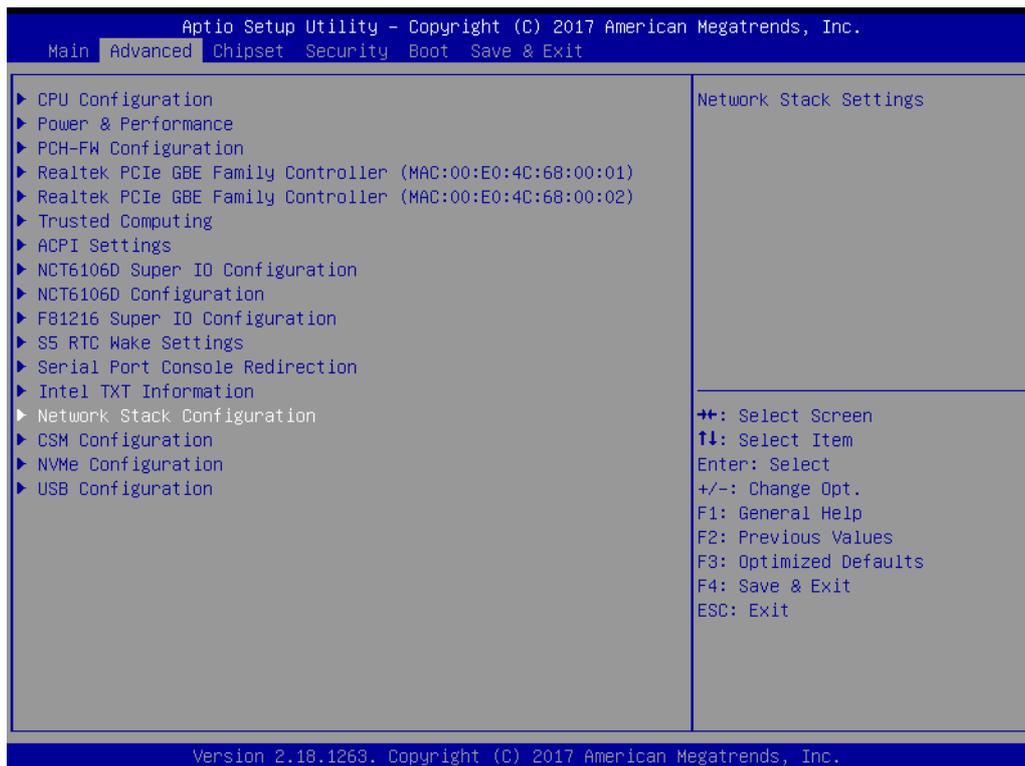


- **Redirection COM Port [COM1]**
Select a COM port to display redirection of legacy OS and legacy OPRM messages.
- **Resolution [80x24]**
- **Redirect After POST [Always enable]**

3.2.2.12 Intel TXT Information

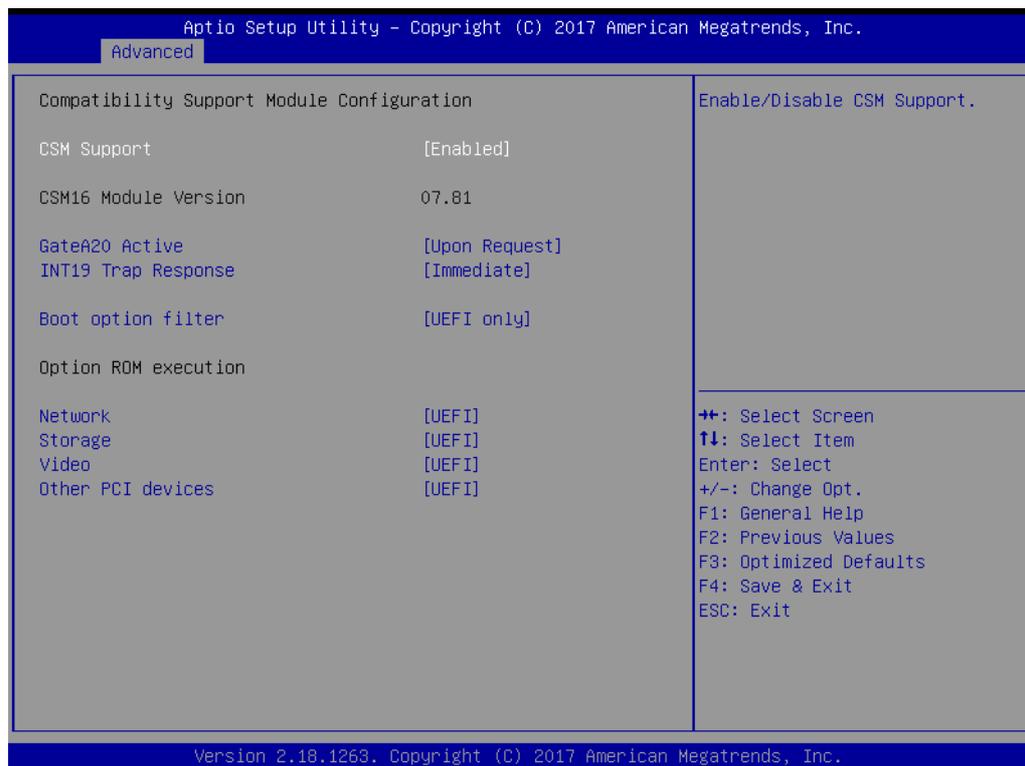
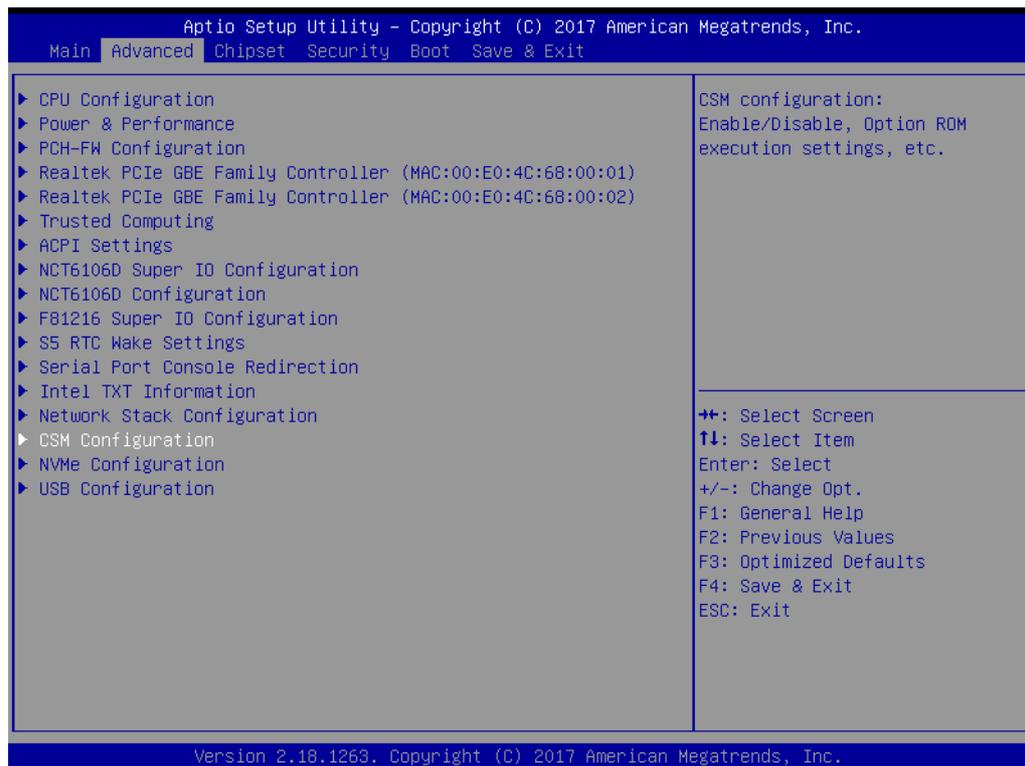


3.2.2.13 Network Stack Configuration



- **Network Stack [Disabled]**
 Enable / Disable UEFI Network Stack

3.2.2.14 CSM Configuration



- **CSM Support [Enabled]**
- **GateA20 Active [Upon request]**
- **INT19 Trap Response [Immediate]**
- **Boot option filter [UEFI only]**

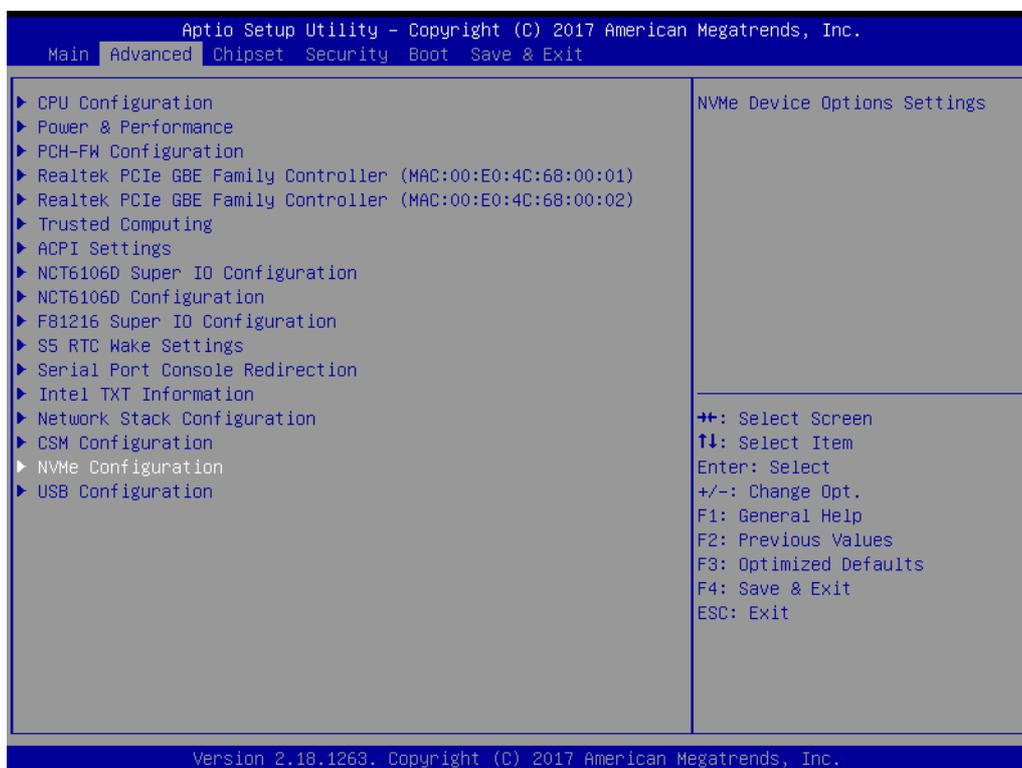
- **Option ROM execution**
 - Network [UEFI]
 - Storage [UEFI]
 - Video [UEFI]
 - Other PCI device [UEFI]

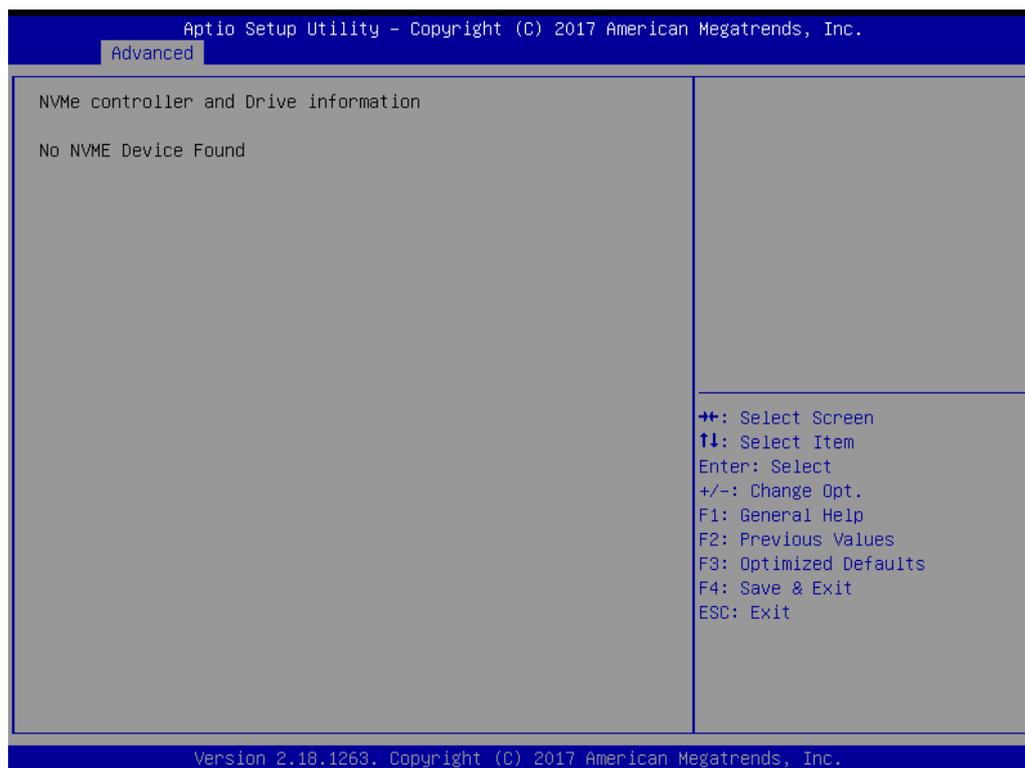
Note! If your HDD or other boot device is installed as Legacy mode, it may cause blue screen situation. There are 2 ways to solve this:



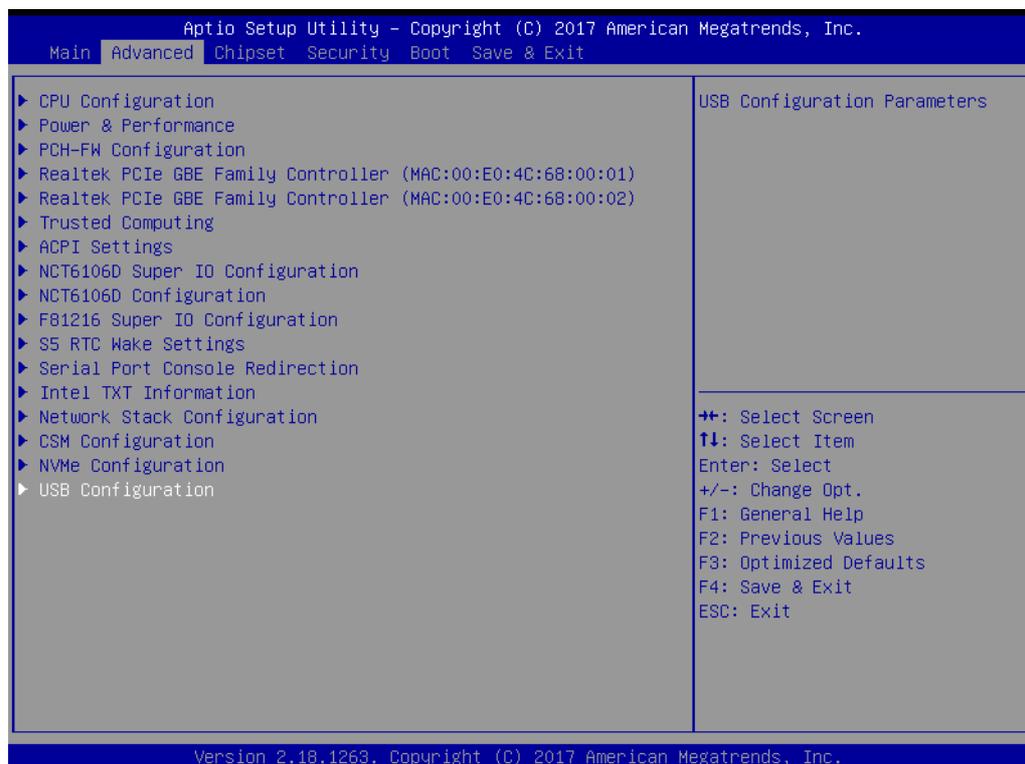
1. Re-install your OS as UEFI Mode
2. Change all of settings above as "Legacy"
 - Boot option filter -> Legacy Only
 - Network -> Legacy
 - Storage -> Legacy
 - Video -> Legacy
 - Other PCI devices -> Legacy

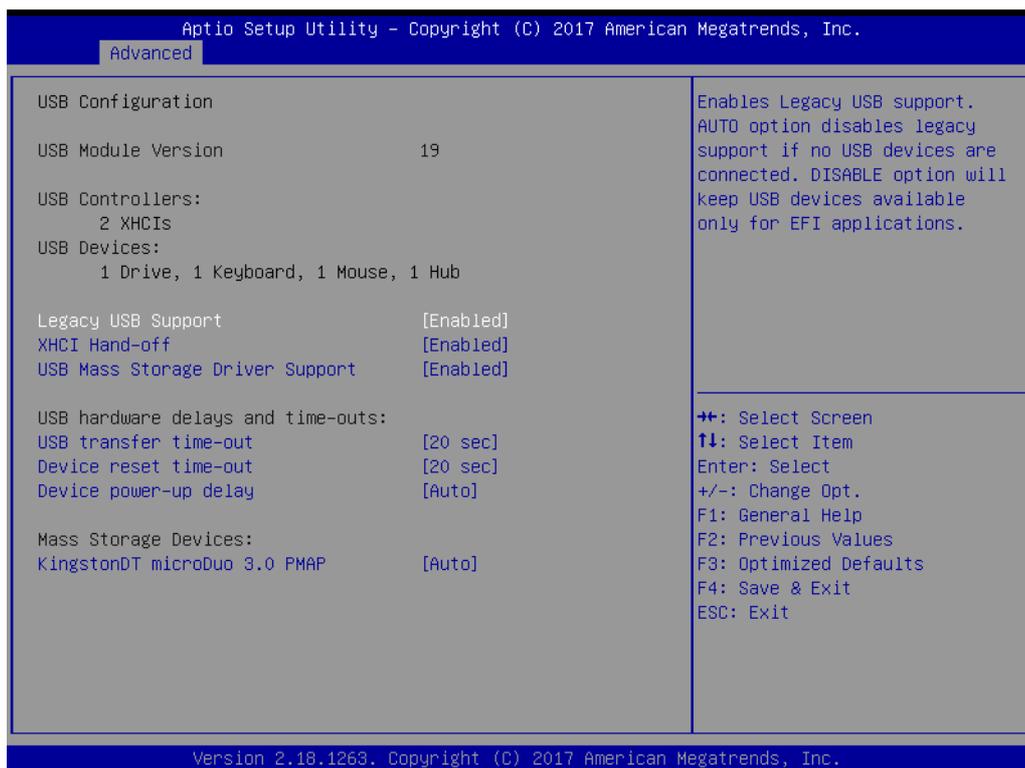
3.2.2.15 NVMe Configuration





3.2.2.16 USB Configuration

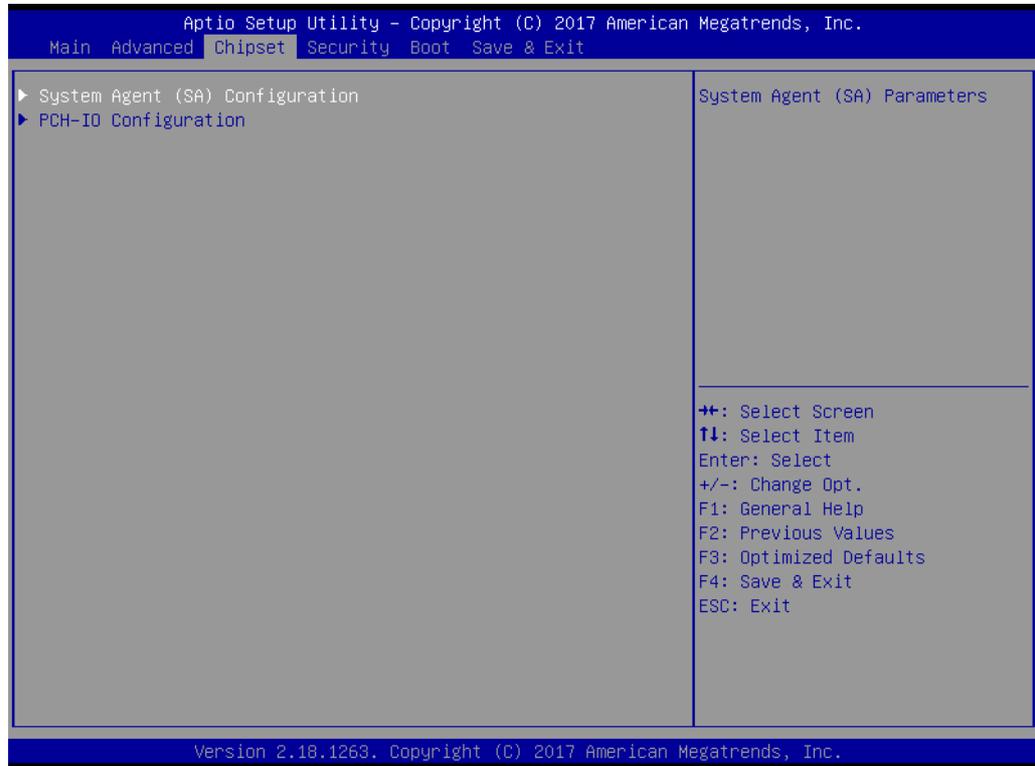




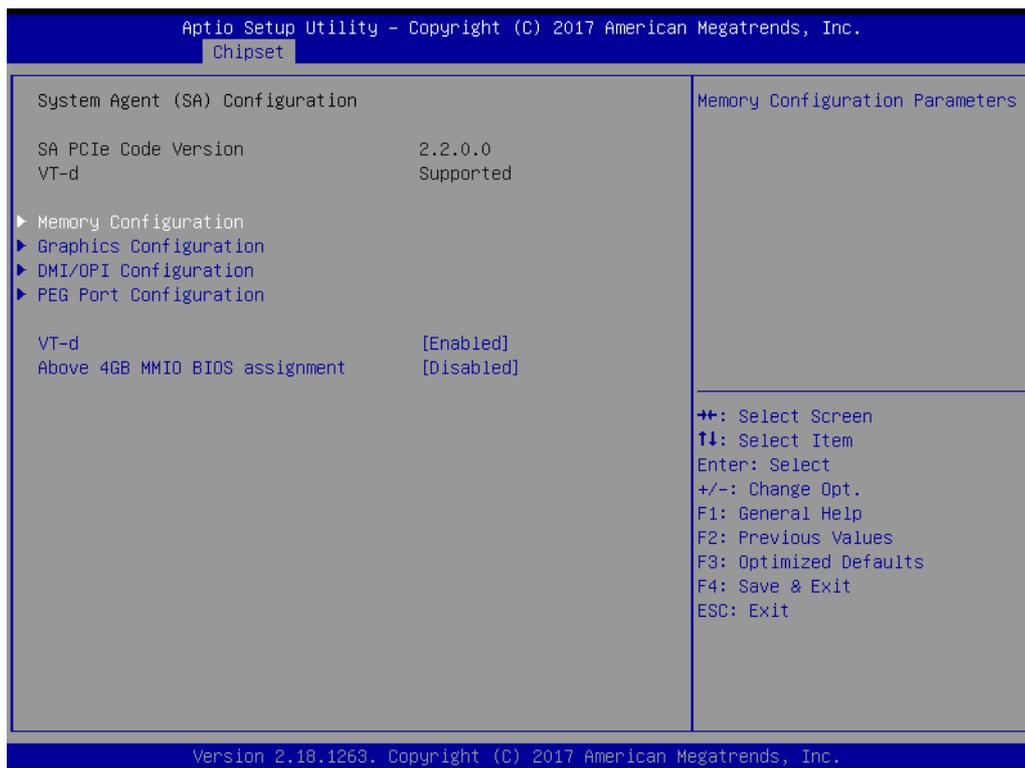
- **Legacy USB Support [Enabled]**
Enables support for legacy USB. Auto option disables legacy support if no USB devices are connected.
- **XHCI Hand-off [Enabled]**
- **USB Mass Storage Driver Support [Enabled]**
- **USB transfer time-out [20 sec]**
- **Device reset time-out [20 sec]**
- **Device power-up delay [Auto]**
- **Mass Storage Devices [Auto]**
Auto detect the USB device you connected and shows USB mass storage device information.

3.2.3 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.

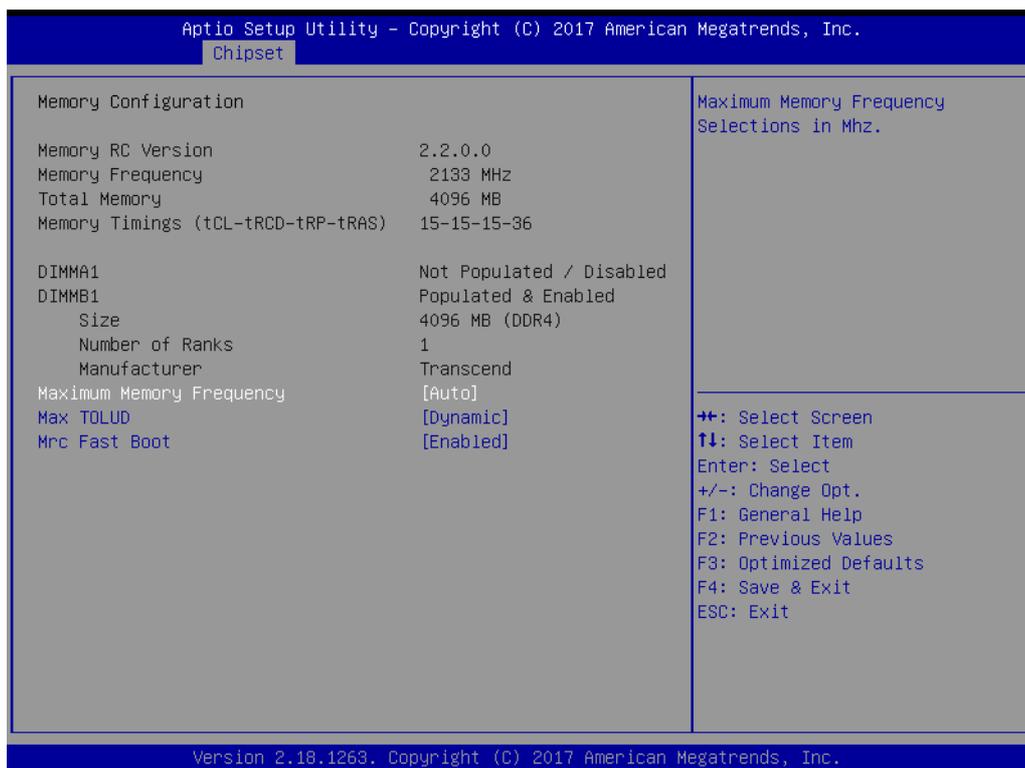


3.2.3.1 System Agent (SA) Configuration



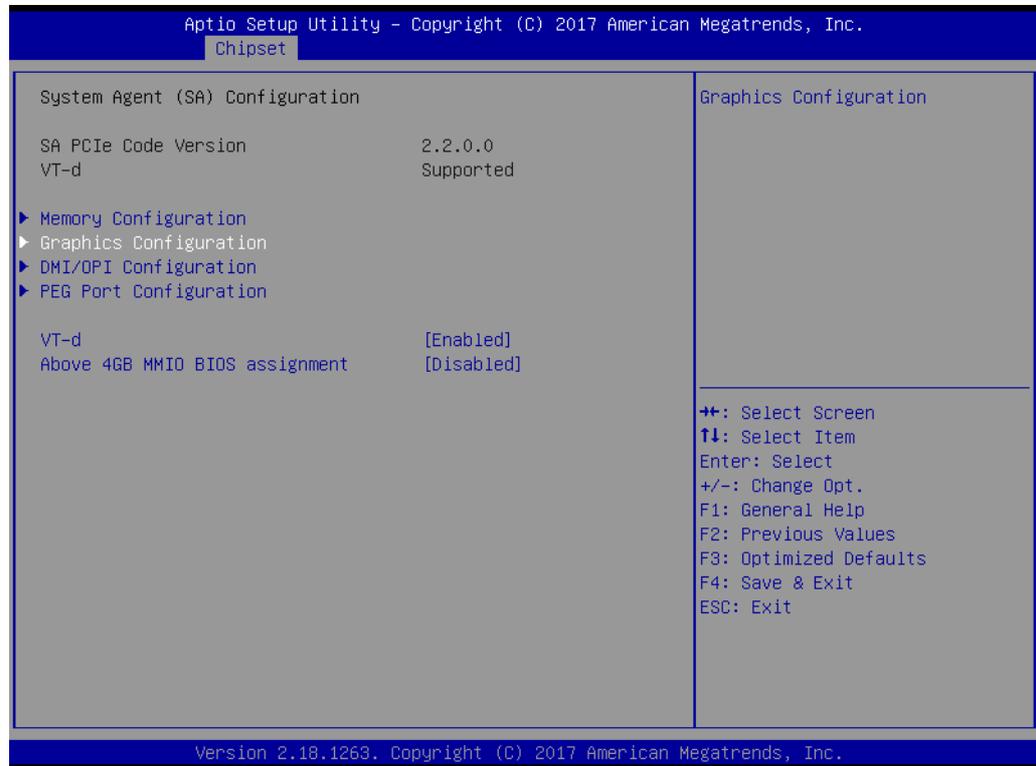
- **VT-d [Enabled]**
Disable or enable VT-d capability.
- **Above 4GB MMIO BIOS assignment [Disabled]**

Memory Configuration



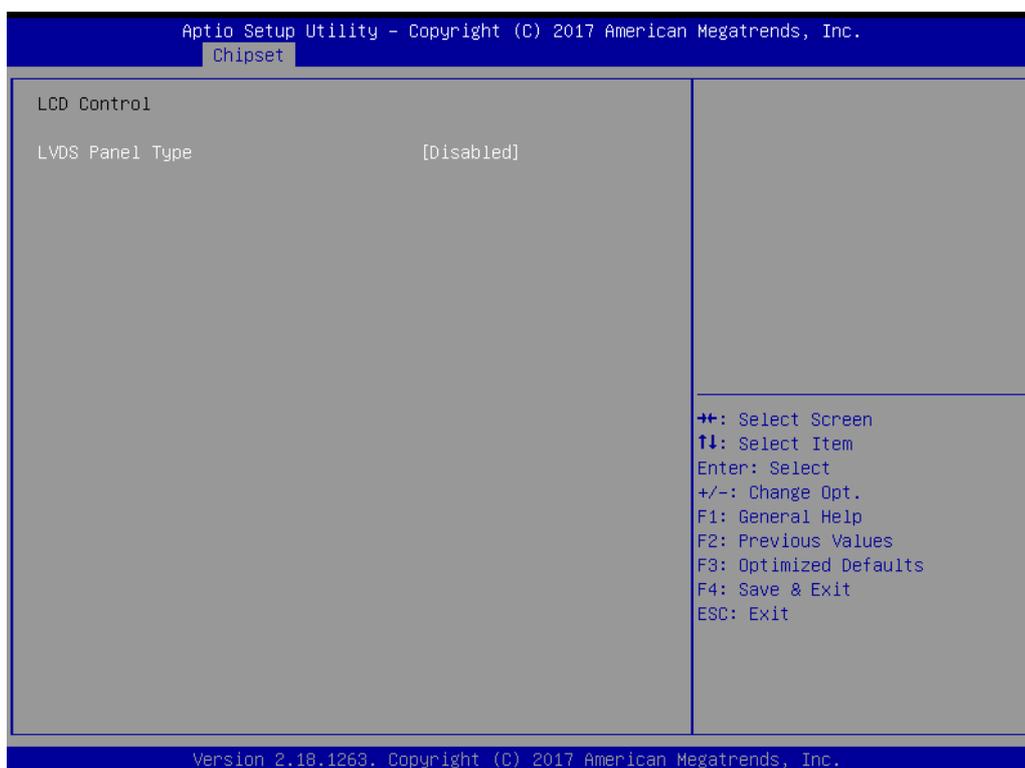
- **Maximum Memory Frequency (Auto)**
- **Max TOLUD (Dynamic)**
- **Mrc Fast Boot [Enabled]**

Graphics Configuration



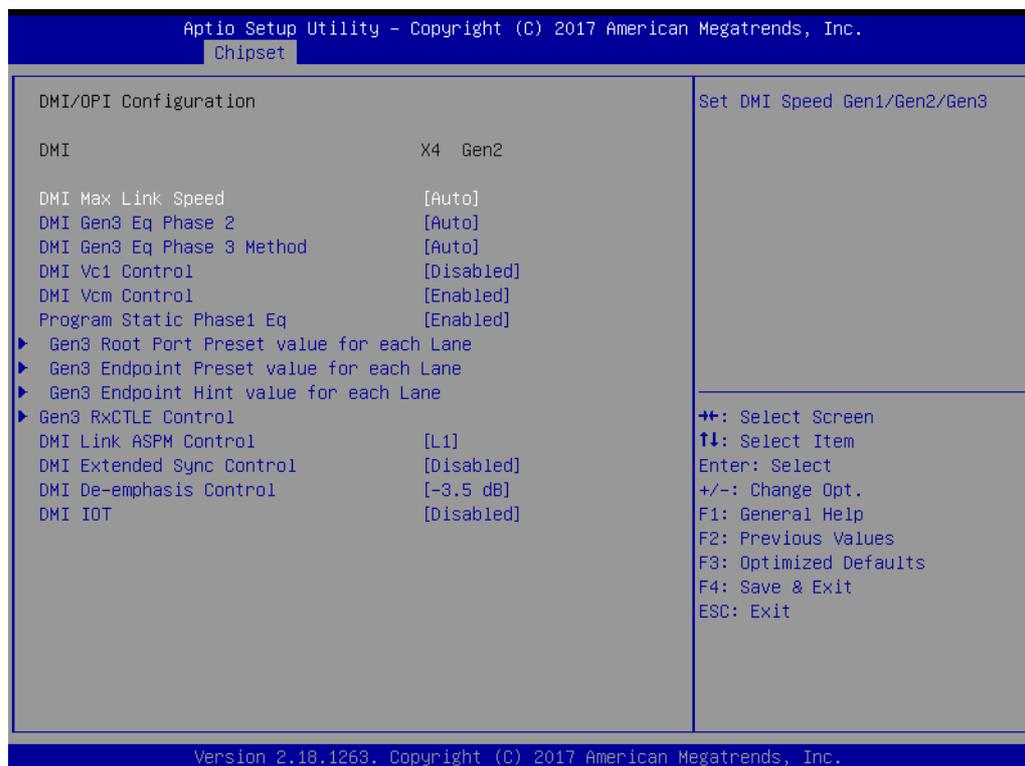
- **Graphics Turbo IMON Current [31]**
Graphics turbo IMON Current values supported (14-31).
- **Primary Display [Auto]**
Select which of IGFX/PEG/PCI Graphics device should be Primary Display
- **Internal Graphics [Auto]**
Keep IGD enabled based on the setup options.
- **GTT Size [8MB]**
- **Aperture Size [256MB]**
- **DVMT Pre-Allocated [32M]**
Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.
- **DVMT Total Gfx Mem [256M]**
Select DVMT5.0 Total Graphic Memory size used by the Internal Graphics Device.
- **PAVP Enable [Enabled]**

LCD Control



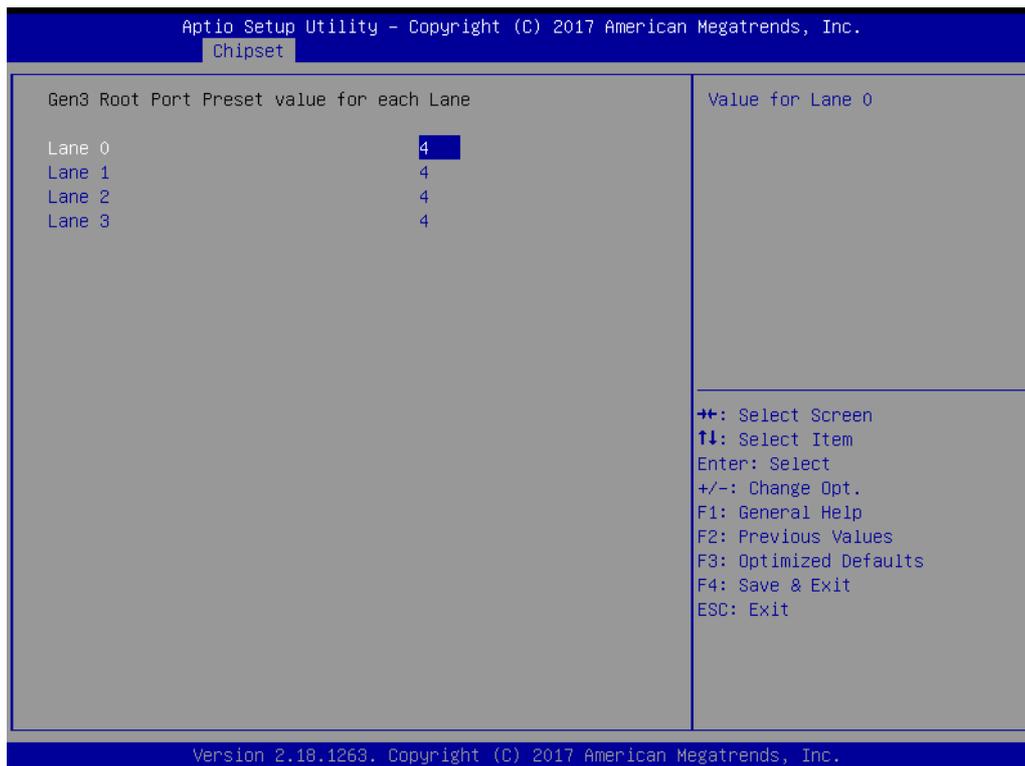
- **LVDS Panel Type [Disabled]**

DMI/ OPI Configuration



- **DMI Max Link Speed [Auto]**
Set DMI Speed at Gen1/ Gen2/ Gen3.

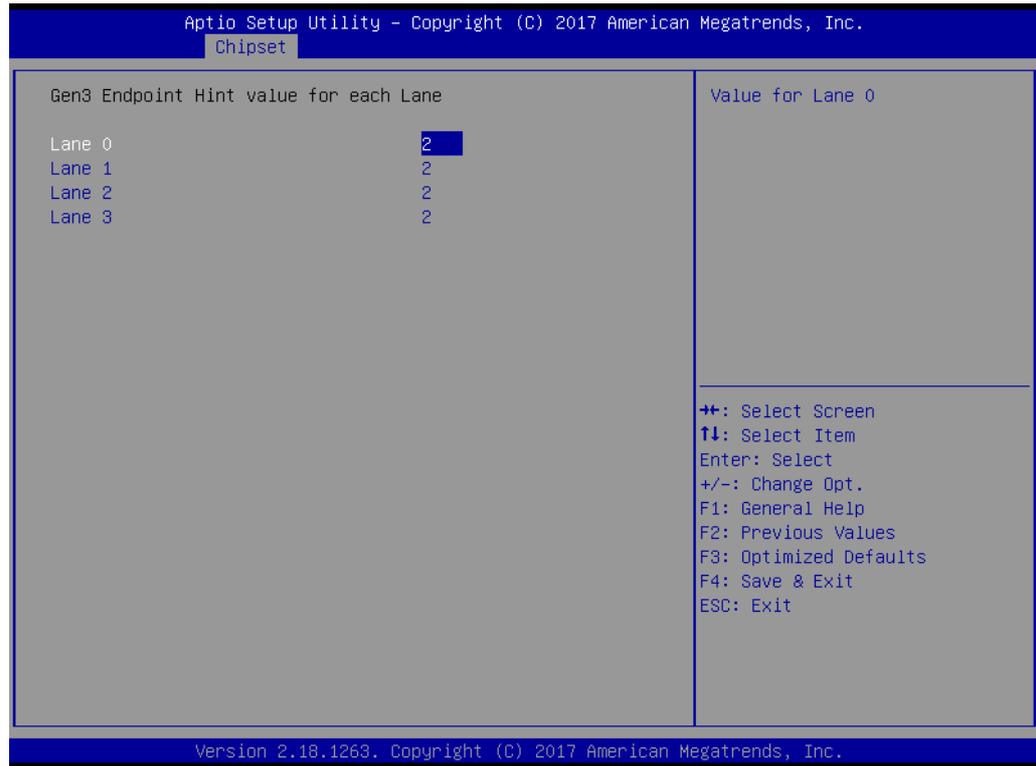
Gen3 Root Port Preset value for each Lane



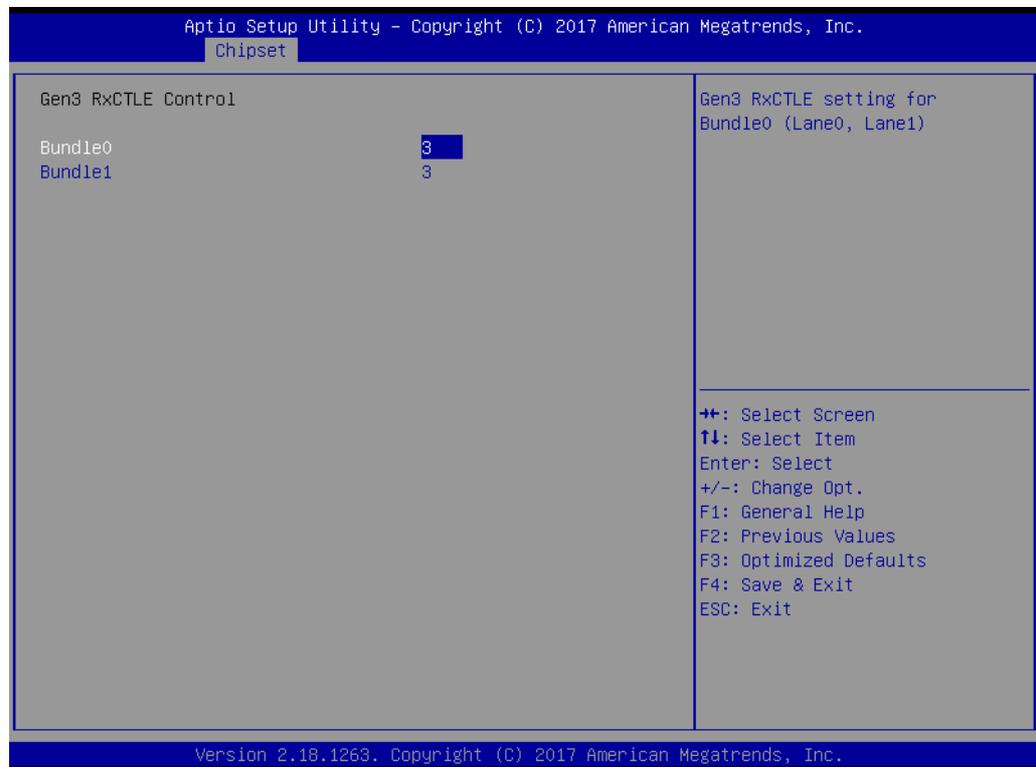
Gen3 Endpoint Preset value for each Lane



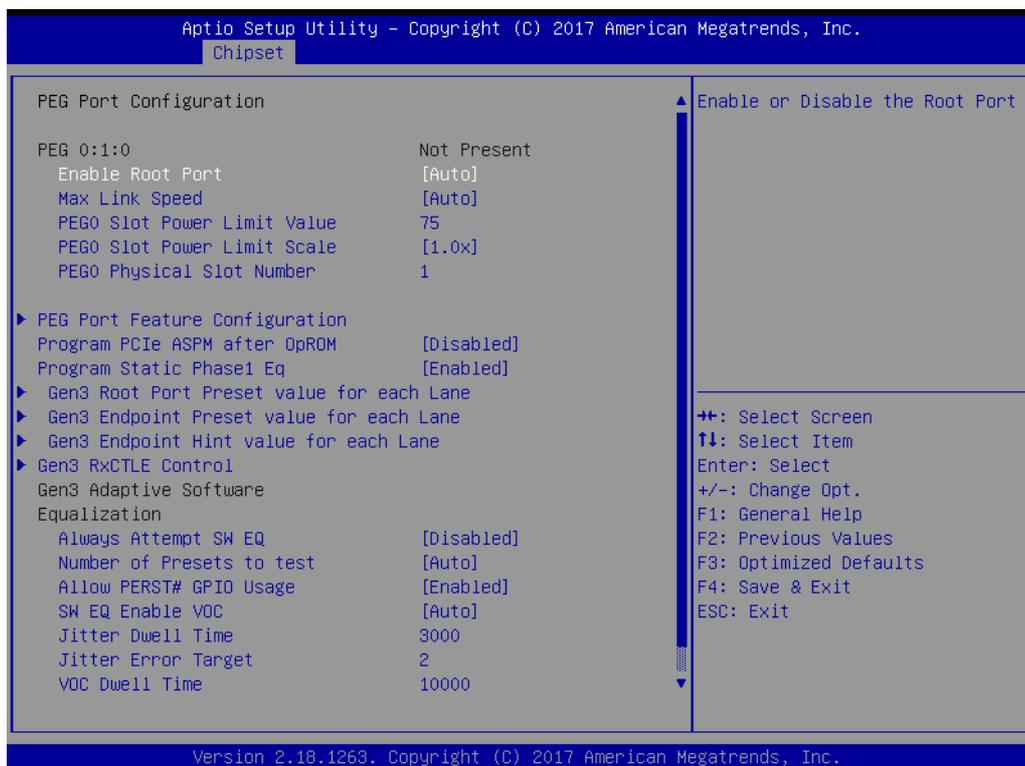
Gen3 Endpoint Hint value for each Lane



Gen 3 RxCLTE Control



PEG Port Configuration



- **Enable Root Port [Auto]**
- **Max Link Speed [Auto]**
- **PEG0 Slot Power Limit Scale [1.0x]**
- **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]**

Gen3 Root Port Preset value for each Lane

The screenshot shows the 'Chipset' menu in the Aptio Setup Utility. The 'Gen3 Root Port Preset value for each Lane' is set to 7 for all lanes from 0 to 15. The 'Value for Lane 0' is also 7. The interface includes a legend for navigation keys: ++ for Select Screen, ↑↓ for Select Item, Enter for Select, +/- for Change Opt., F1 for General Help, F2 for Previous Values, F3 for Optimized Defaults, F4 for Save & Exit, and ESC for Exit.

Gen3 Root Port Preset value for each Lane		Value for Lane 0
Lane 0	7	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

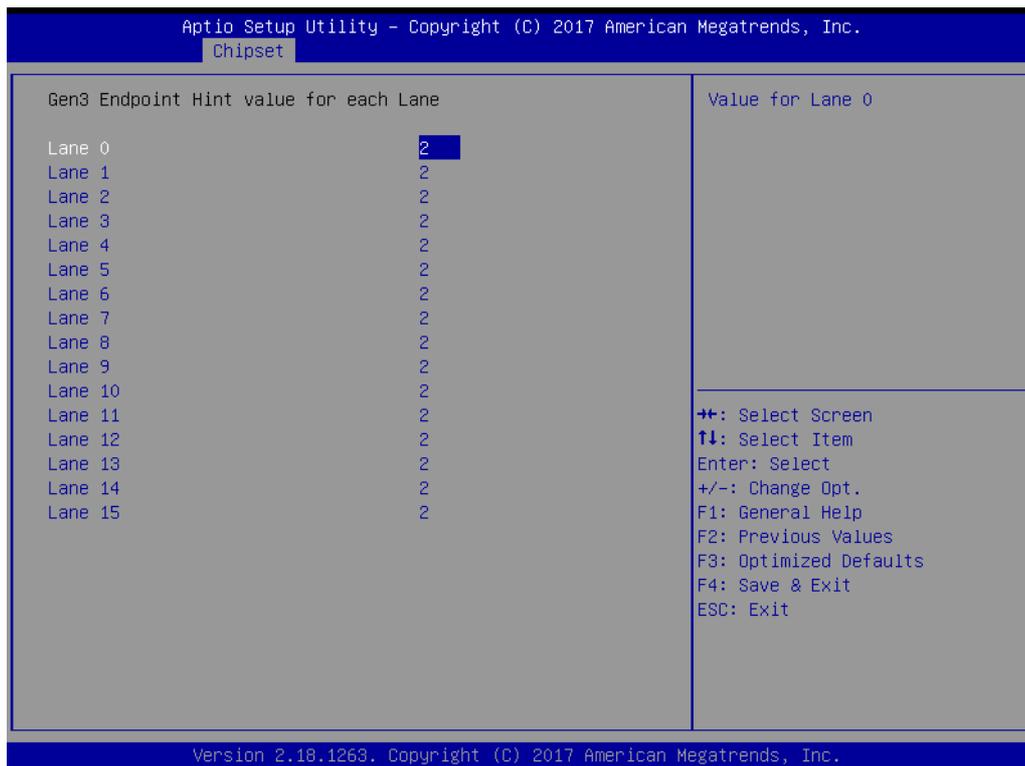
The screenshot shows the 'Chipset' menu in the Aptio Setup Utility. The 'Gen3 Endpoint Preset value for each Lane' is set to 7 for all lanes from 0 to 15. The 'Value for Lane 0' is also 7. The interface includes a legend for navigation keys: ++ for Select Screen, ↑↓ for Select Item, Enter for Select, +/- for Change Opt., F1 for General Help, F2 for Previous Values, F3 for Optimized Defaults, F4 for Save & Exit, and ESC for Exit.

Gen3 Endpoint Preset value for each Lane		Value for Lane 0
Lane 0	7	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	

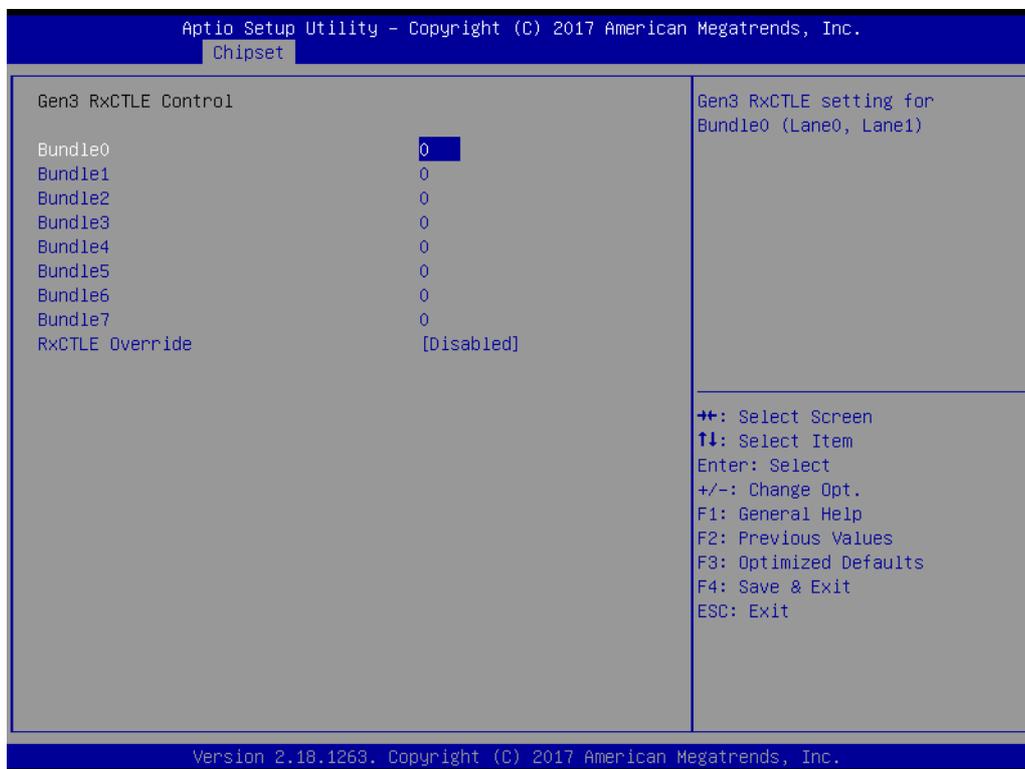
++: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

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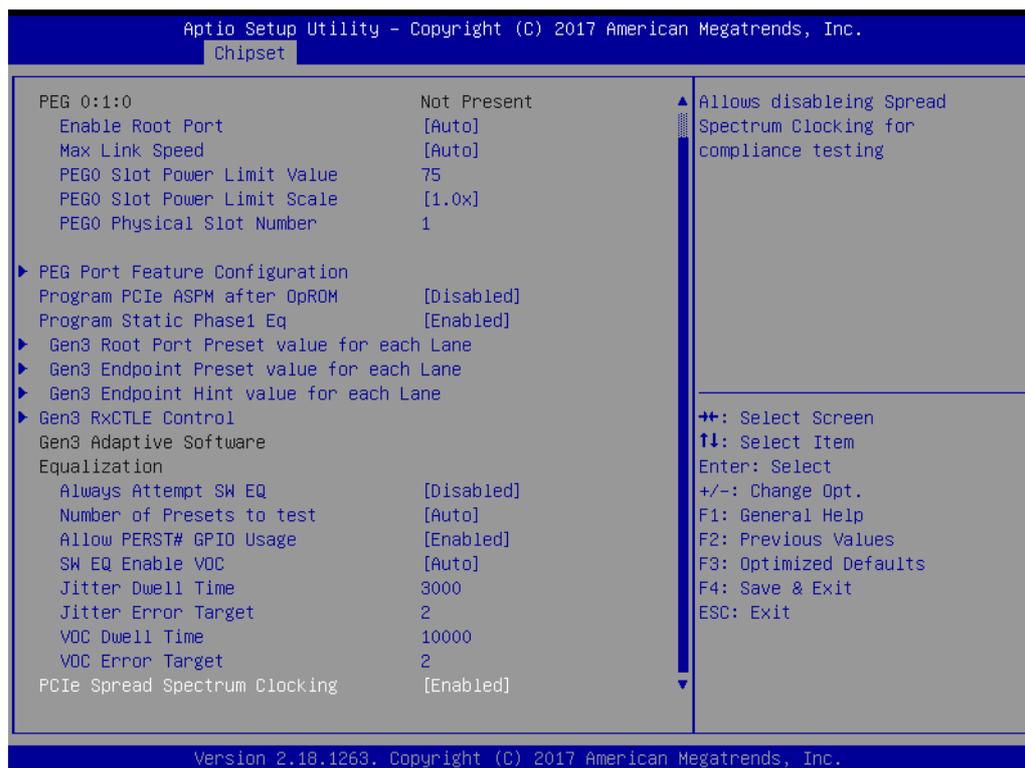
Gen3 Endpoint Hint value for each Lane



Gen3 RxCTLE Control



- RxCTLE Override [Disabled]



- **PCIe Spread Spectrum Clocking [Enabled]**
Allows disabling spread spectrum clocking for compliance testing.

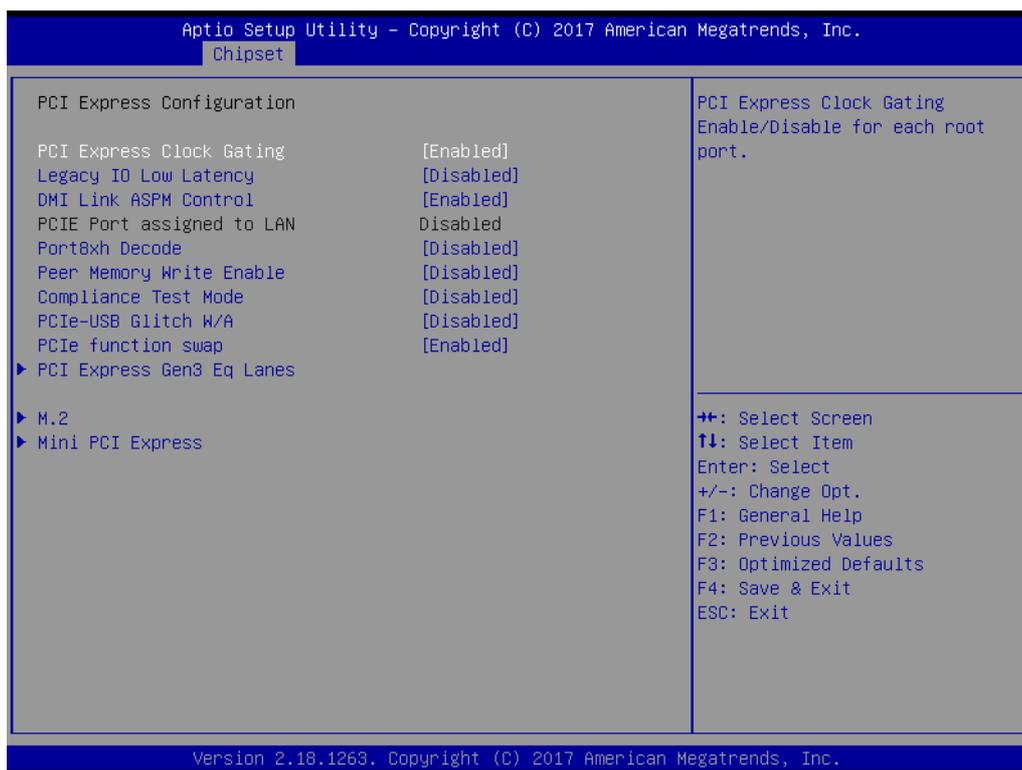
PCH-IO Configuration



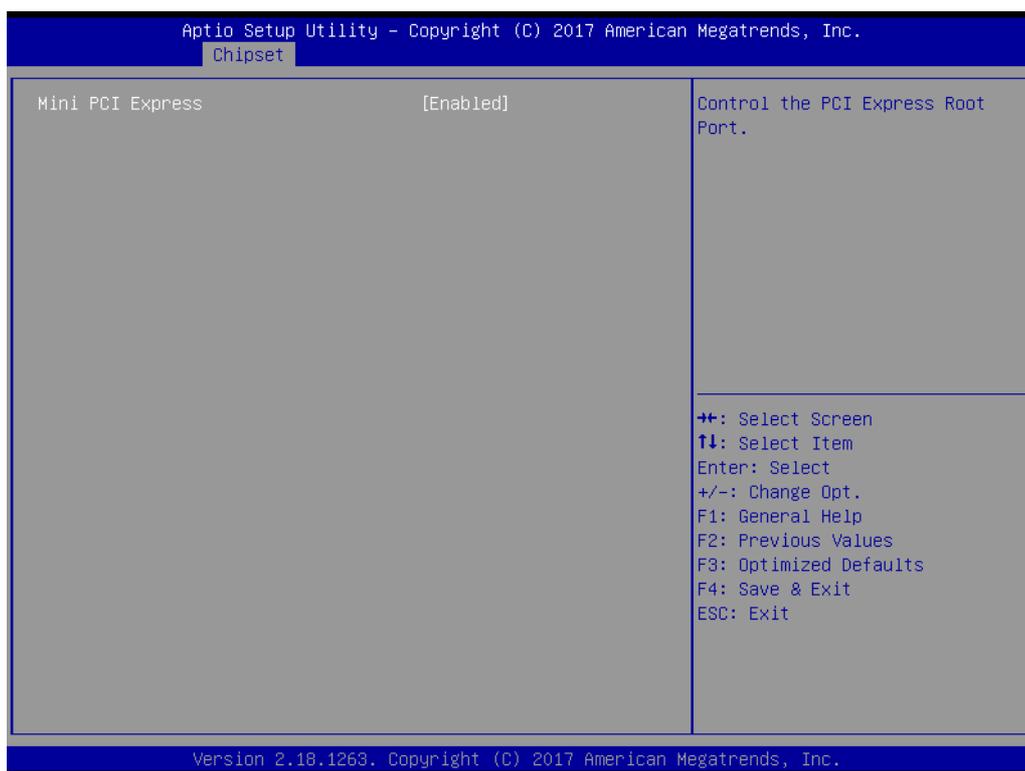
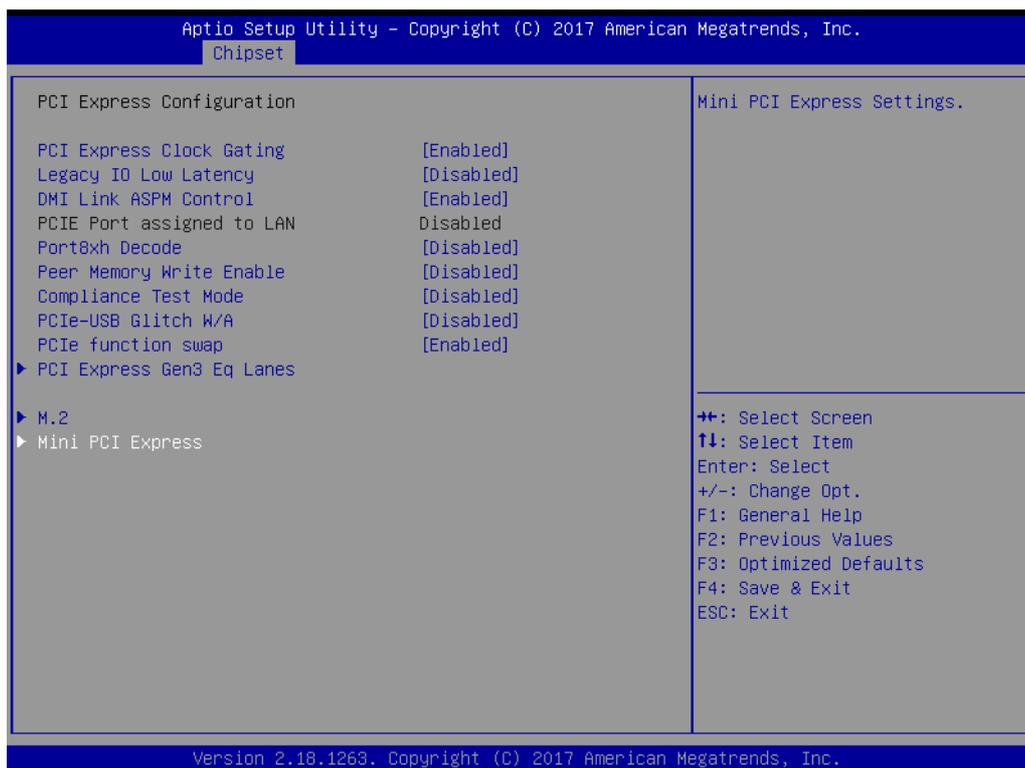
- **LAN1 Control [Enabled]**
Enable or disable the LAN 1 controller.

- **LAN 2 controller [Enabled]**
Enable or disable the LAN 2 controller.
- **PCIE Wake [Disabled]**
Enable or disable PCIE Wake feature.
- **Deep Sx [Disabled]**
Enable or disable the Deep Sleep function.
- **Start After G3 [Power Off]**

PCI Express Configuration

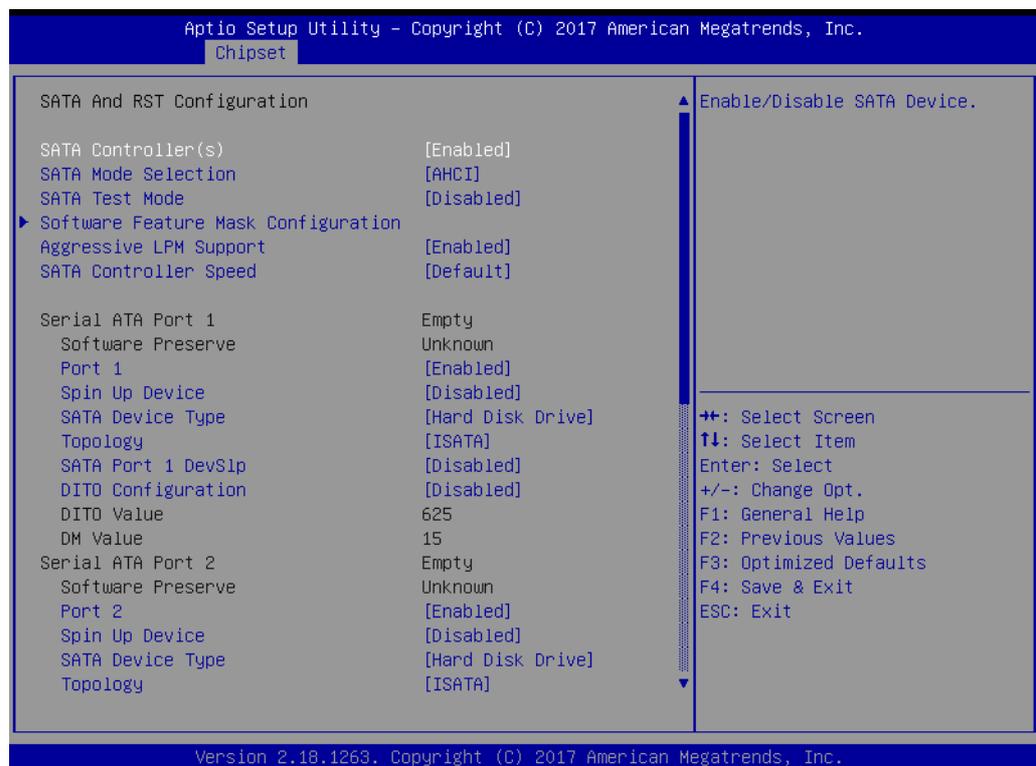
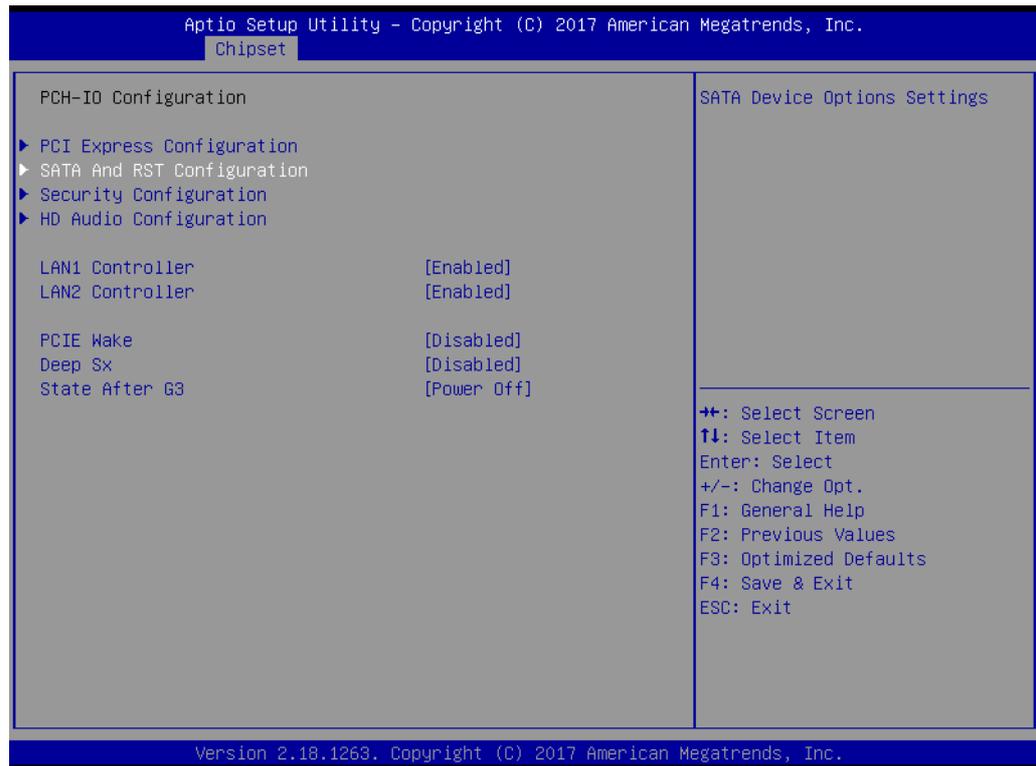


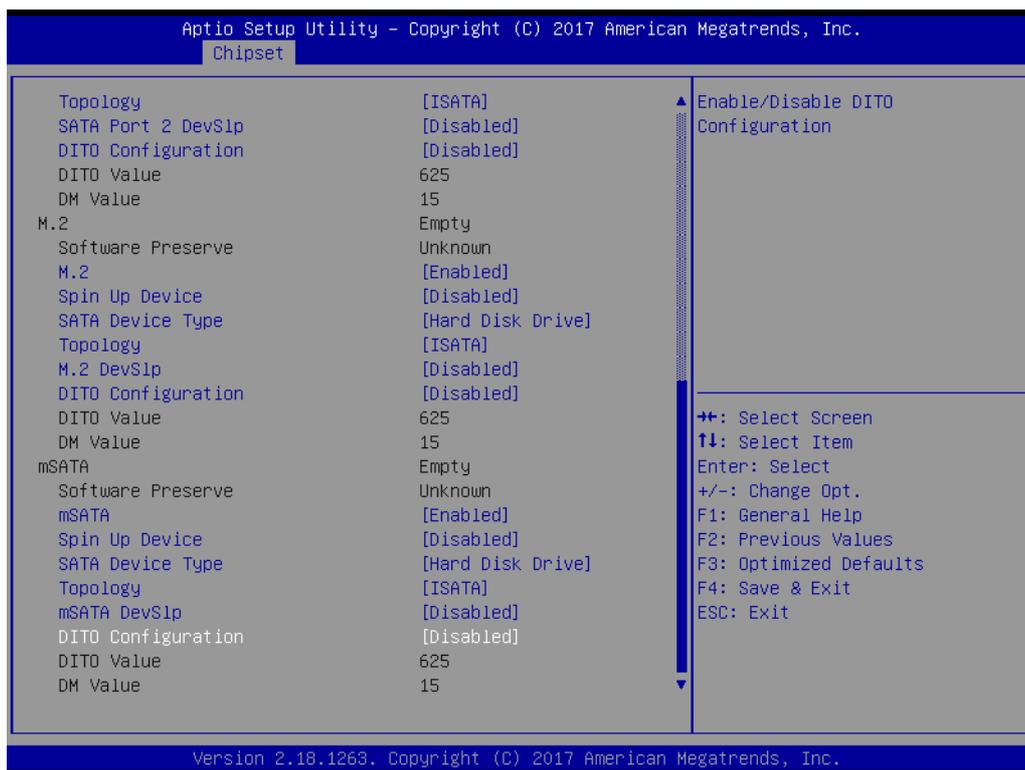
- **PCI Express Clock Gating [Enabled]**
- **Legacy IO Low Latency [Disabled]**
- **DMI Link ASPM Control [Enabled]**
- **Port8xh Decode [Disabled]**
- **Peer Memory Write Enable [Disabled]**
- **Compliance Test Mode [Disabled]**
- **PCIe-USB Glitch W/A [Disabled]**
- **PCIe function swap [Enabled]**



■ **Mini PCI Express [Enabled]**

SATA And RST Configuration





- **SATA Controller(s) [Enabled]**
- **SATA Mode Selection [AHCI]**
- **SATA Test Mode [Disabled]**
- **Aggressive LPM Support [Enabled]**
- **SATA Controller Speed [Default]**

Serial ATA Port 1

- **Port 1 [Enabled]**
- **Spin Up Device [Disabled]**
- **SATA Device Type [Hard Disk Drive]**
- **Topology [ISATA]**
- **SATA Port 1 DevSlp [Disabled]**
- **DIT0 Configuration [Disabled]**

Serial ATA Port 2

- **Port 2 [Enabled]**
- **Spin Up Device [Disabled]**
- **SATA Device Type [Hard Disk Drive]**
- **Topology [ISATA]**
- **SATA Port 2 DevSlp [Disabled]**
- **DIT0 Configuration [Disabled]**

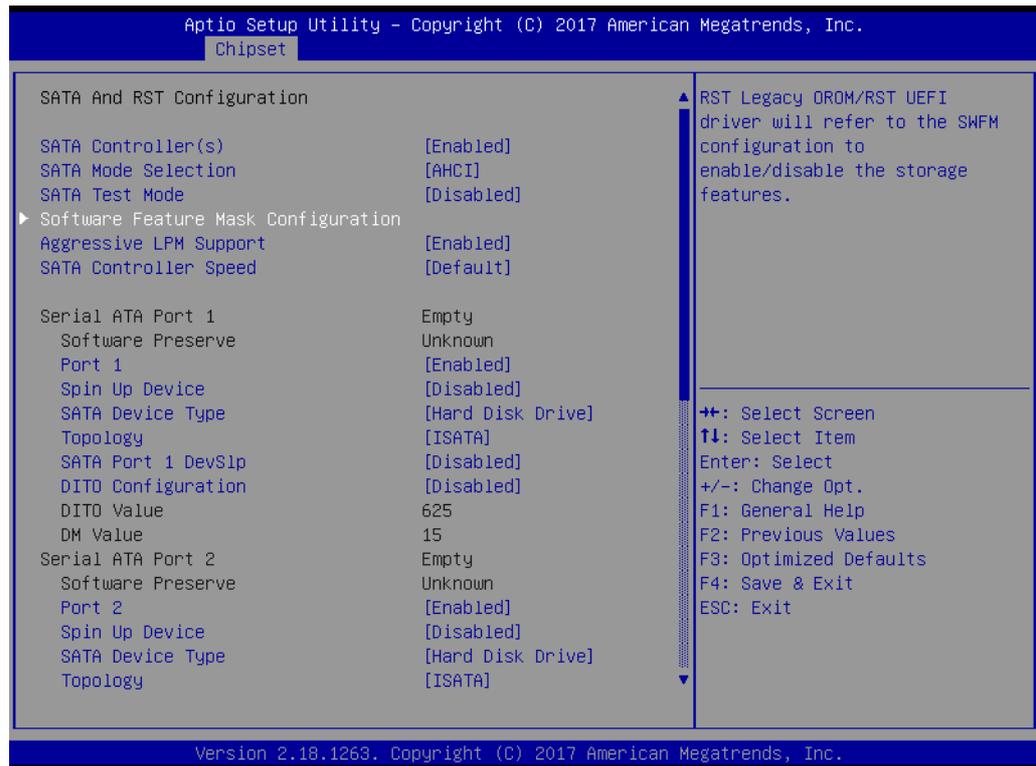
M.2

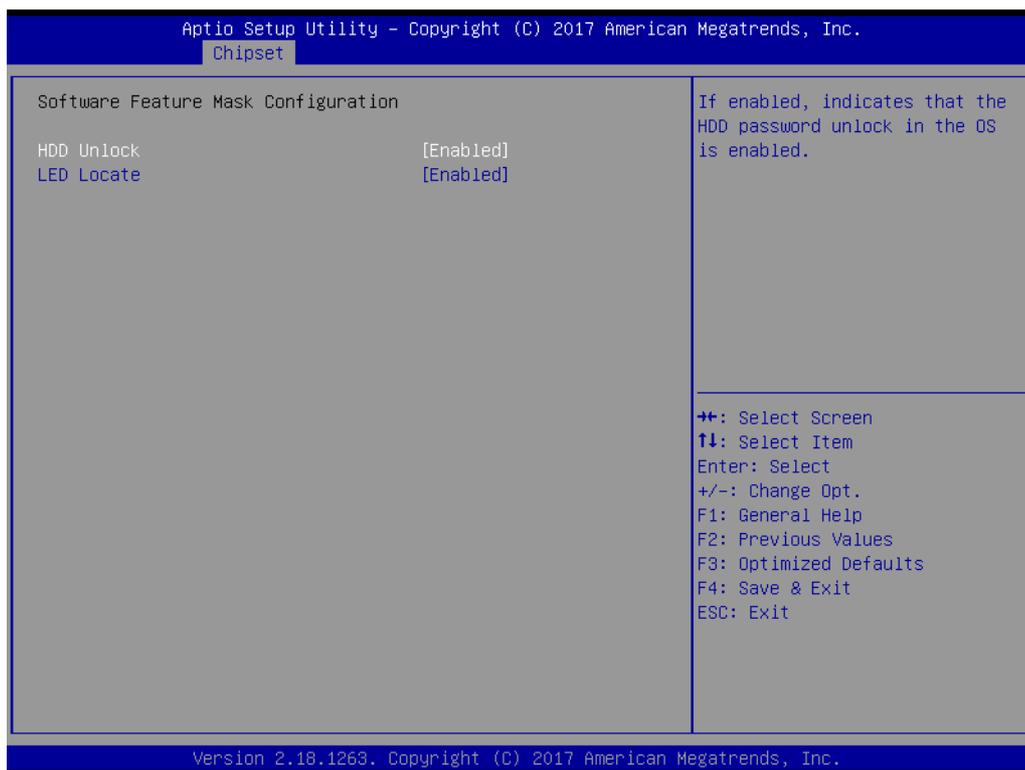
- **M.2 [Enabled]**
- **Spin Up Device [Disabled]**
- **SATA Device Type [Hard Disk Drive]**
- **Topology [ISATA]**
- **M.2 DevSlp [Disabled]**
- **DIT0 Configuration [Disabled]**

mSATA

- mSATA [Enabled]
- Spin Up Device [Disabled]
- SATA Device Type [Hard Disk Drive]
- Topology [ISATA]
- mSATA DevSlp [Disabled]
- DIT0 Configuration [Disabled]

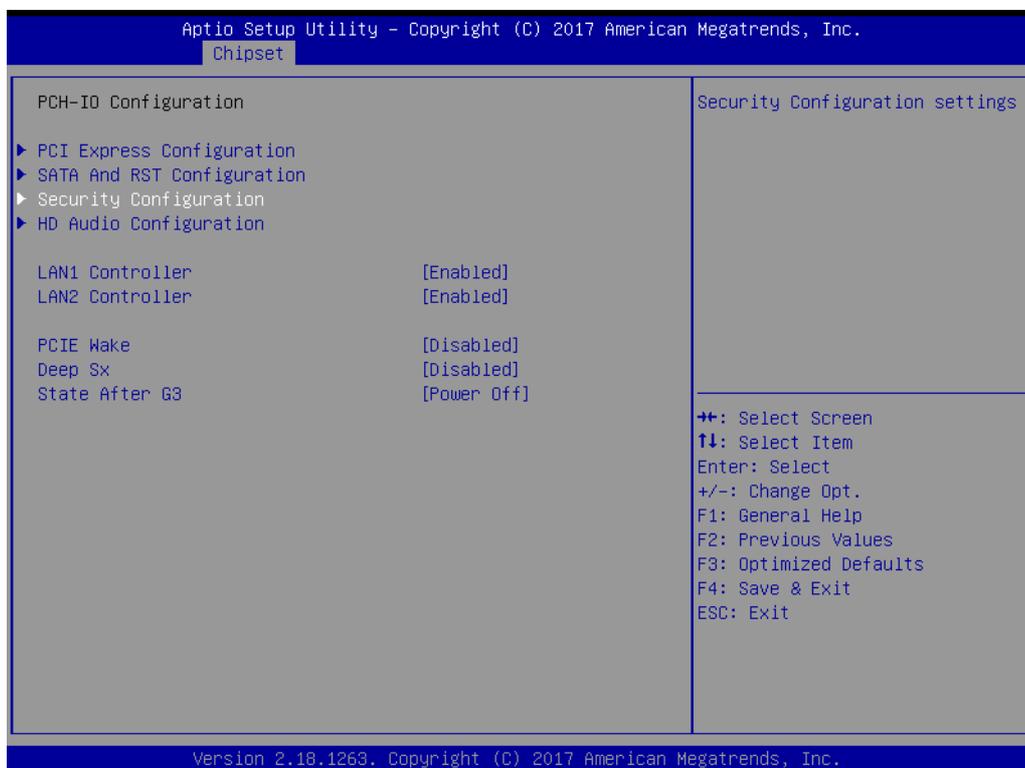
Software Feature Mask Configuration

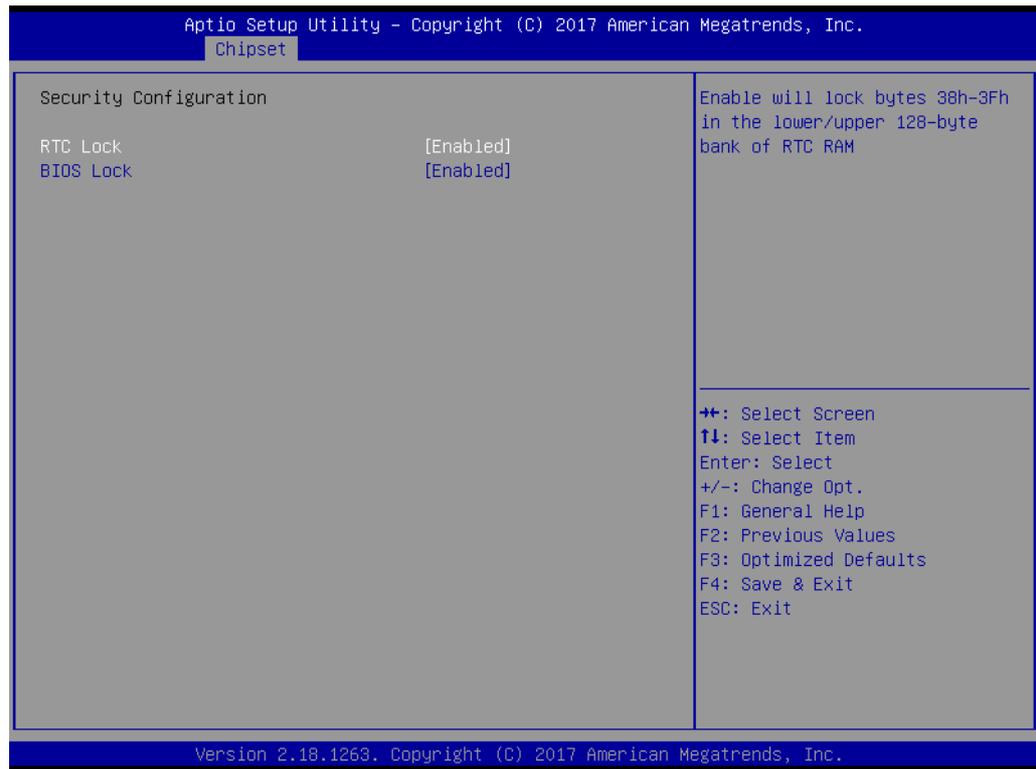




- **HDD Unlock [Enabled]**
- **LED Locate [Enabled]**

Security Configuration





- **RTC Lock [Enabled]**
- **BIOS Lock [Enabled]**

HD Audio Configuration





■ HD Audio [Auto]

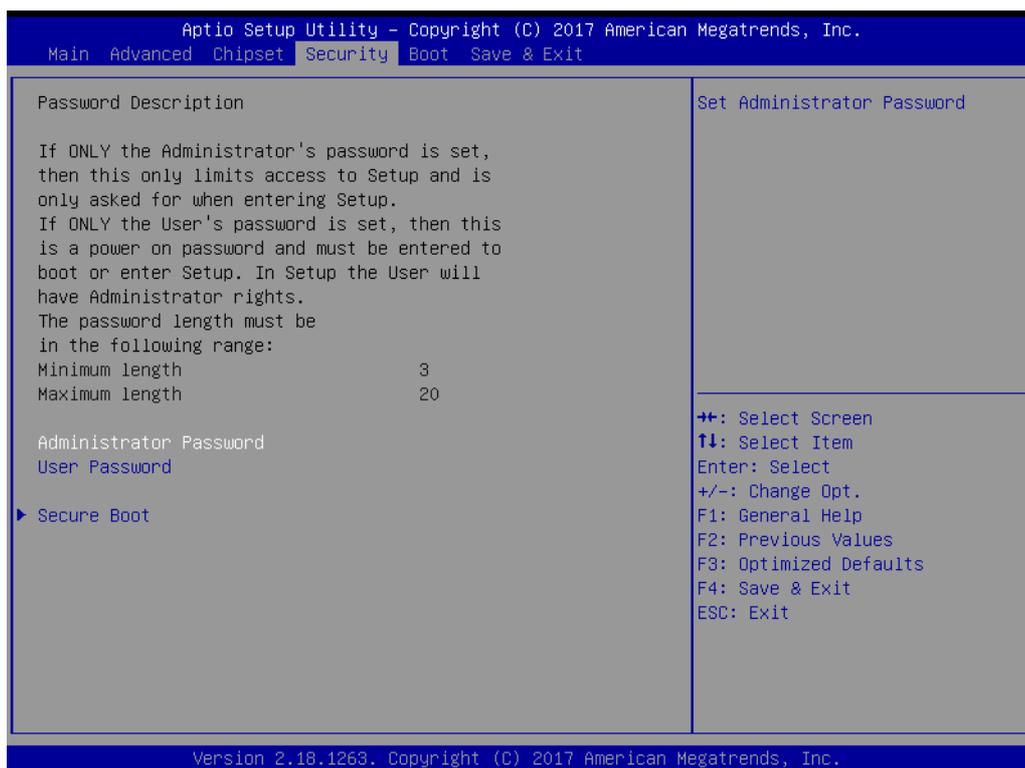
This item is to control detection of the HD-Audio device.

[Disabled] = HAD will be unconditionally disabled.

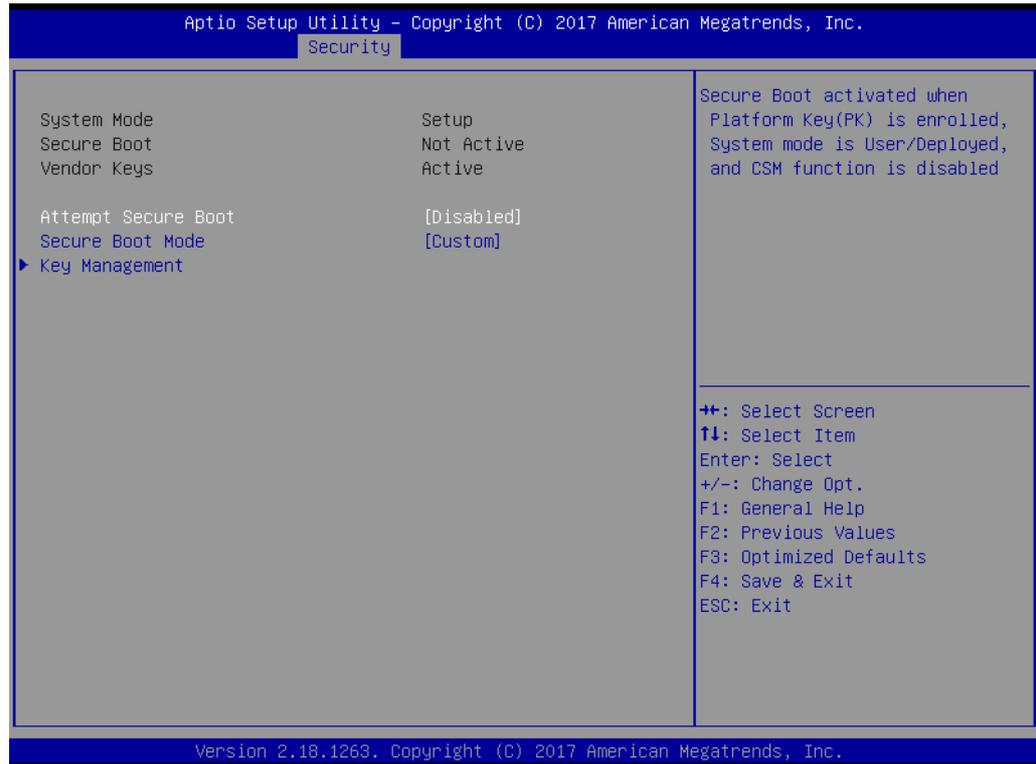
[Enabled] = HAD will be unconditionally enabled.

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

3.2.4 Security

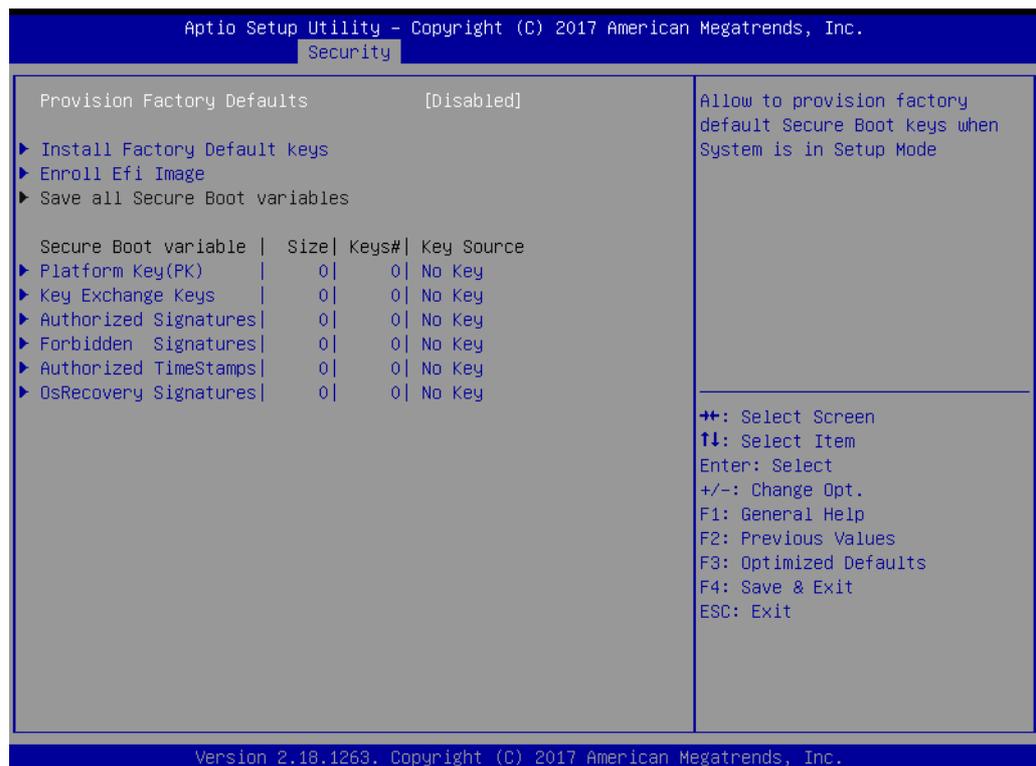


Secure Boot



- **Attempt Secure Boot [Disabled]**
Secure Boot activated when platform key (PK) is enrolled, system mode is user/ deployed, and CSM function is disabled
- **Secure Boot Mode [Custom]**

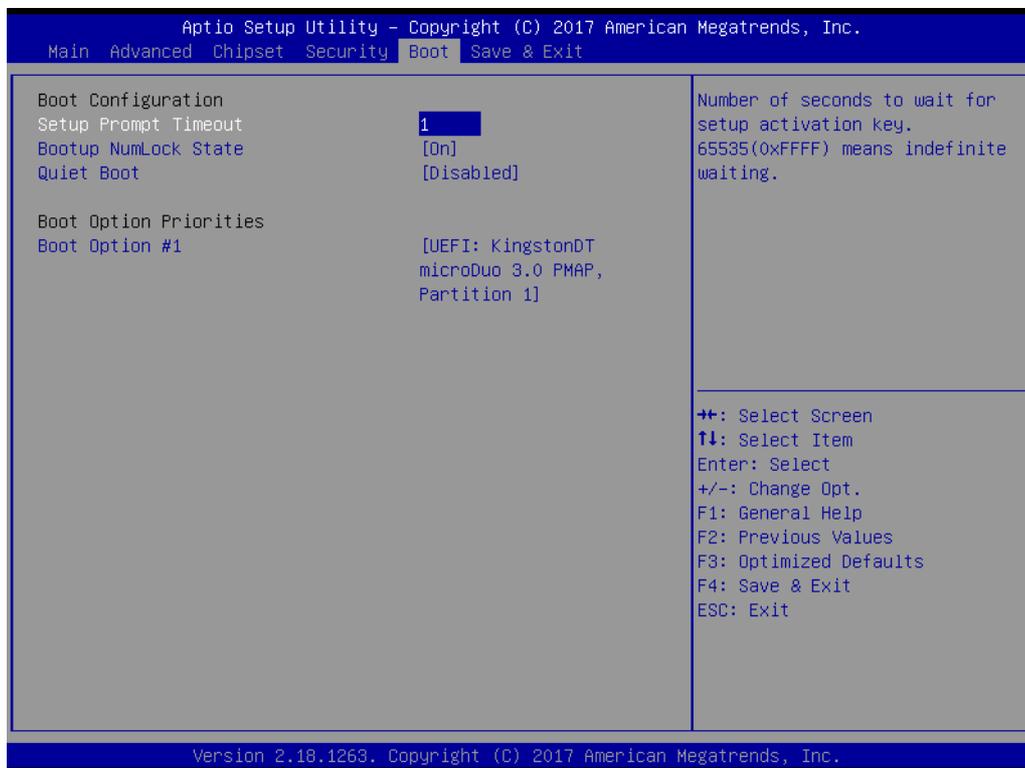
Key Management



- **Provision Factory Defaults [Disabled]**

Allow to provision factory default secure boot keys when system is in setup mode.

3.2.5 Boot



- **Setup Prompt Timeout [1]**

User the <+> and <-> keys to adjust the number of seconds to wait for setup activation key.

- **Bootup NumLock State [On]**

On or Off power on state for the NumLock

- **Quiet Boot [Disabled]**

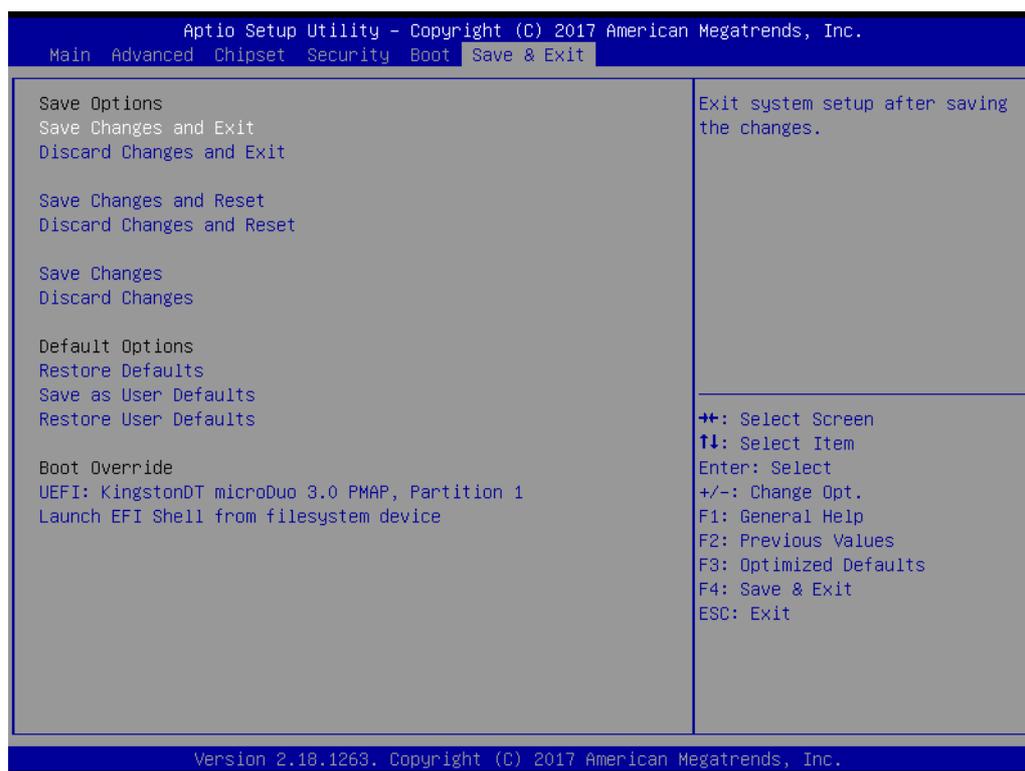
If this option is set as disabled, the BIOS displays normal POST messages.

If set as enabled, an OEM logo is shown instead of POST messages.

- **Boot Option Priorities**

Choose boot priority from boot device

3.2.6 Save and 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?
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] or [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] or [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] or [Cancel]
2. Select Ok to discard changes and reset. Discard Changes
Select Discard Changes from the Exit menu and press <Enter>.

- **Restore Default**

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.

- **Boot Override**

Shows the boot device types on the system.

Chapter 4

Software Introduction
& Service

4.1 Introduction

The mission of Advantech Embedded Software Services is to "Enhance quality of life with Advantech platforms and Microsoft® Windows® embedded technology." We enable Windows® Embedded software products on Advantech platforms to more effectively support the embedded computing community. Customers are freed from the hassle of dealing with multiple vendors (hardware suppliers, system integrators, embedded OS distributors) for projects. Our goal is to make Windows® Embedded Software solutions easily and widely available to the embedded computing community.

4.2 Value-Added Software Services

Software API: An interface that defines the ways by which an application program may request services from libraries and/or operating systems. Provides not only the underlying drivers required but also a rich set of user-friendly, intelligent and integrated interfaces, which speeds development, enhances security and offers add-on value for Advantech platforms. It plays the role of catalyst between developer and solution, and makes Advantech embedded platforms easier and simpler to adopt and operate with customer applications.

4.2.1 Software API

4.2.1.1 Control

GPIO



General Purpose Input/Output is a flexible parallel interface that allows a variety of custom connections. It allows users to monitor the level of signal input or set the output status to switch on/off the device. Our API also provide Programmable GPIO, which allows developers to dynamically set the GPIO input or output status.

SMBus



SMBus is the System Management Bus defined by Intel Corporation in 1995. It is used in personal computers and servers for low-speed system management communications. The SMBus API allows a developer to interface a embedded system environment and transfer serial messages using the SMBus protocols, allowing multiple simultaneous device control.

4.2.1.2 Display

Brightness Control



The Brightness Control API allows a developer to access embedded devices and easily control brightness.

Backlight



The Backlight API allows a developer to control the backlight (screen) on/off in embedded devices.

4.2.1.3 Monitor

Watchdog



A watchdog timer (WDT) is a device that performs a specific operation after a certain period of time if something goes wrong and the system does not recover on its own. A watchdog timer can be programmed to perform a warm boot (restarting the system) after a certain number of seconds.

Hardware Monitor



The Hardware Monitor (HWM) API is a system health supervision API that inspects certain condition indexes, such as fan speed, temperature and voltage.

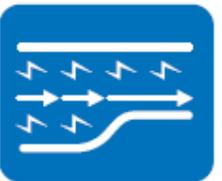
4.2.1.4 Power Saving

CPU Speed



Makes use of Intel SpeedStep technology to save power consumption. The system will automatically adjust the CPU speed depending on the system loading.

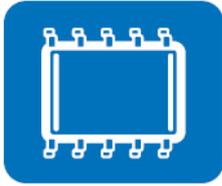
System Throttling



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

4.2.2 Software Utility

BIOS Flash



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

Embedded Security ID



The embedded application is the most important property of a system integrator. It contains valuable intellectual property, design knowledge and innovation, but it is easy to copy! Embedded Security ID utility provides reliable security functions for customers to secure their application data within the embedded BIOS.

Monitoring



The Monitoring is a utility for customer to monitor the system health, like voltage, CPU and system temperature and fan speed. These items are important to a device, if the critical errors occur and are not solved immediately, permanent damage may be caused.

Chapter 5

Chipset Software
Installation Utility

5.1 Before You Begin

To facilitate the installation of the enhanced display drivers and utility software, read the instructions in this chapter carefully. The drivers for the AIMB-205 are located on Advantech support website: <http://support.advantech.com/Support/>. The driver on the support website will guide and link you to the utilities and drivers under a Windows system. Updates are provided via Service Packs from Microsoft*.

Note! *The driver files on the website are compressed. Do not attempt to install the drivers by copying the files manually. You must download the files and decompress them first. Also, please use the supplied SETUP program to install the drivers.*



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

5.2 Introduction

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

- Core PCI PnP services
- Serial ATA interface support
- USB 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)

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 Win8.1 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.*



Download USB 3.0 driver from website to your computer. Click “ USB 3.0” folder and chose Win7 or Win8.1 for the driver installation.

Win 8.1 Driver for AIMB-205(64bits)

Solution : Win 8.1 Driver for AIMB-205 (64 bits)

Download File	Released Date	Download Site	
AIMB-205_Chipset_Win8.1(64 bits).zip	2017-07-27	Primary	Secondary
AIMB-205_Graphic_Win8.1(64 bits).zip	2017-07-27	Primary	Secondary
AIMB-205_LAN_Win8.1(64 bits).zip	2017-07-27	Primary	Secondary
AIMB-205_Intel ME_AMT_Win8.1(64 bits).zip	2017-07-27	Primary	Secondary
AIMB-205_Intel RAID_AHCI_Win8.1(64 bits).zip	2017-07-27	Primary	Secondary
AIMB-205_USB3.0_Win8.1(64 bits).zip	2017-07-27	Primary	Secondary
AIMB-205_Intel Serial IO_Win8.1(64 bits).zip	2017-07-27	Primary	Secondary

Chapter 7

VGA Setup

7.1 Introduction

The 6th Gen Intel Core i processors are embedded with an integrated graphics controller. You need to install the VGA driver to enable the function.

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

7.2 Windows 7/8.1/10 VGA Driver Installation

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



Download the driver from website on your computer. Navigate to the "Graphics" folder and click "setup.exe" to complete the installation of the drivers for Windows 7, Windows 8.1 and Windows 10.

Win 8.1 Driver for AIMB-205(64bits)

Solution : Win 8.1 Driver for AIMB-205 (64 bits)

Download File	Released Date	Download Site	
AIMB-205_Chipset_Win8.1(64 bits).zip	2017-07-27	Primary	Secondary
AIMB-205_Graphic_Win8.1(64 bits).zip	2017-07-27	Primary	Secondary
AIMB-205_LAN_Win8.1(64 bits).zip	2017-07-27	Primary	Secondary
AIMB-205_Intel ME_AMT_Win8.1(64 bits).zip	2017-07-27	Primary	Secondary
AIMB-205_Intel RAID_AHCI_Win8.1(64 bits).zip	2017-07-27	Primary	Secondary
AIMB-205_USB3.0_Win8.1(64 bits).zip	2017-07-27	Primary	Secondary
AIMB-205_Intel Serial IO_Win8.1(64 bits).zip	2017-07-27	Primary	Secondary

Chapter 8

LAN Configuration

8.1 Introduction

The AIMB-205 has dual Gigabit Ethernet LANs via dedicated PCI Express x1 lanes (Realtek 8111G (LAN1) and Realtek 8111G (LAN2)) that offer bandwidth of up to 500 MB/sec, eliminating the bottleneck of network data flow and incorporating Gigabit Ethernet at 1000 Mbps.

8.2 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

8.3 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-205's Realtek 8111G (LAN1) and Realtek 8111G (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.

8.4 Windows® 7/8.1/10 Driver Setup (Realtek 8111G)

Download the driver from support website on your computer and decompressed the file. Select the "Autorun" then navigate to the directory for your OS.

Win 8.1 Driver for AIMB-205(64bits)

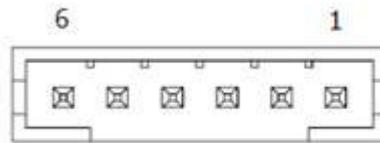
Solution : Win 8.1 Driver for AIMB-205 (64 bits)

Download File	Released Date	Download Site	
AIMB-205_Chipset_Win8.1(64 bits).zip	2017-07-27	Primary	Secondary
AIMB-205_Graphic_Win8.1(64 bits).zip	2017-07-27	Primary	Secondary
AIMB-205_LAN_Win8.1(64 bits).zip	2017-07-27	Primary	Secondary
AIMB-205_Intel ME_AMT_Win8.1(64 bits).zip	2017-07-27	Primary	Secondary
AIMB-205_Intel RAID_AHCI_Win8.1(64 bits).zip	2017-07-27	Primary	Secondary
AIMB-205_USB3.0_Win8.1(64 bits).zip	2017-07-27	Primary	Secondary
AIMB-205_Intel Serial IO_Win8.1(64 bits).zip	2017-07-27	Primary	Secondary

Appendix **A**

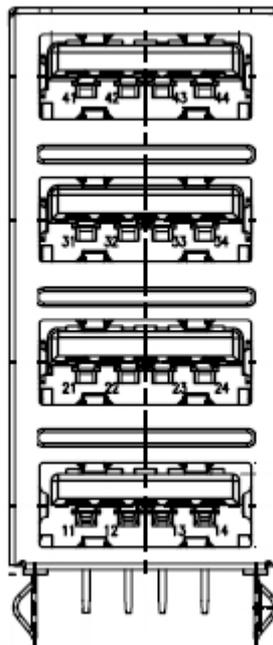
I/O Pin Assignments

A.1 Keyboard & Mouse connector (KBMS1)



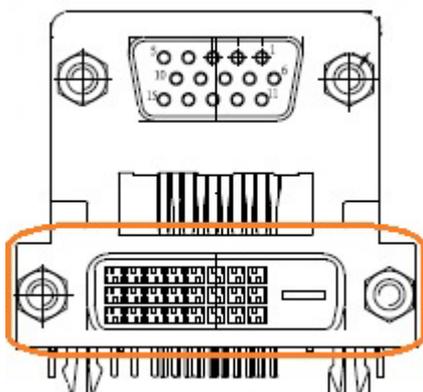
Pin	Signal
1	KB_CLK#
2	KB_DAT#
3	MS_CLK#
4	GND
5	VCC (+5VSB)
6	MS_DAT#

A.2 Universal Serial Bus Port 7/8/9/10 (USB78910)



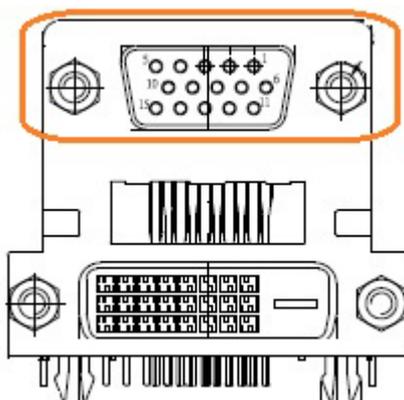
Pin	Signal	Pin	Signal
41	VBUS	21	VBUS
42	USB_D7-	22	USB_D9-
43	USB_D7+	23	USB_D9+
44	GND	24	GND
31	VBUS	11	VBUS
32	USB_D8-	12	USB_D10-
33	USB_D8+	13	USB_D10+
34	GND	14	GND

A.3 Digital Visual Interface connector (DVI1)



Pin	Signal	Pin	Signal
1	TMDS D2-	13	GND
2	TMDS D2+	14	VCC (+5V)
3	GND	15	GND
4	GND	16	Hot plug detect
5	GND	17	TMDS D0-
6	DDC CLK	18	TMDS D0+
7	DDC DAT	19	GND
8	NC	20	GND
9	TMDS D1-	21	GND
10	TMDS D1+	22	GND
11	GND	23	TMDS CLK+
12	GND	24	TMDS CLK-

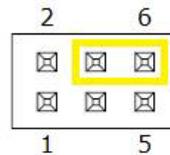
A.4 Video Graphics Array connector (VGA1)



Pin	Signal	Pin	Signal
1	RED	9	VCC (+5V)
2	GREEN	10	GND

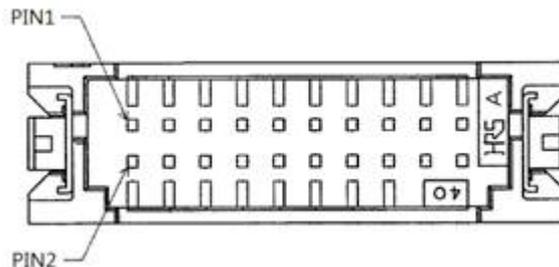
3	BLUE	11	N/A
4	N/A	12	DDC DAT
5	GND	13	HSYNC
6	Advantech define	14	VSYNC
7	GND	15	DDC CLK
8	GND		

A.5 Voltage selector for JLVDS1 connector (JLVDS1)



Pin	Signal	Pin	Signal
1	NC	2	+5V
3	+12V	4	VDD_LVDS1
5	NC	6	+3.3V

A.6 Embedded DisplayPort (EDP1), BOM optional



Pin	Signal	Pin	Signal
1	GND	2	GND
3	ML0-	4	ML3-
5	ML0+	6	ML3+
7	GND	8	NC
9	ML1-	10	GND
11	ML1+	12	AUX-
13	GND	14	AUX+
15	NC	16	GND
17	NC	18	Hot plug detect
19	EDP Power (*)	20	EDP Power (*)

(*) Depends on JEDP1 Jump Setting

A.7 LVDS VCON pull HI/pull Low selection (JLVDS_VCON1)

Pin	Signal
1	+V3.3
2	Option
3	GND

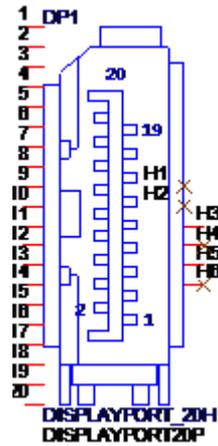
A.8 LVDS Panel Connector (LVDS1)



Pin	Signal	Pin	Signal
1	VDD	21	A2P
2	VDD	22	A6P
3	DET#	23	GND
4	GND	24	GND
5	VDD	25	CLK1N
6	VDD	26	CLK2N
7	A0N	27	CLK1P
8	A4N	28	CLK2P
9	A0P	29	GND
10	A4P	30	GND
11	GND	31	SCD
12	GND	32	SDD
13	A1N	33	GND
14	A5N	34	GND
15	A1P	35	A3N
16	A5P	36	A7N
17	GND	37	A3P
18	GND	38	A7P

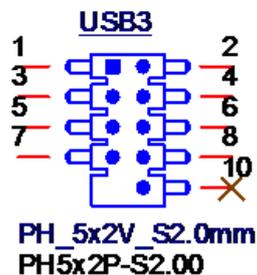
19	A2N	39	ENBKL
20	A6N	40	VCON

A.9 DisplayPort1(DP1)



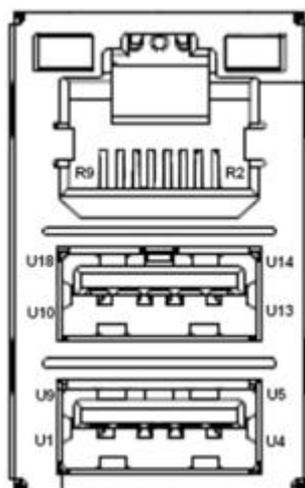
Pin	Signal	Pin	Signal
1	DP1_0+	11	GND
2	GND	12	DP1_3-
3	DP1_0-	13	DP1_AUX_EN#
4	DP1_1+	14	GND
5	GND	15	DP1_AUX+
6	DP1_1-	16	GND
7	DP1_2+	17	DP1_AUX-
8	GND	18	Hot plug detect
9	DP1_2-	19	GND
10	DP1_3+	20	DP_PWR (+3.3V)

A.10 Dual USB2.0 pin header (USB56)



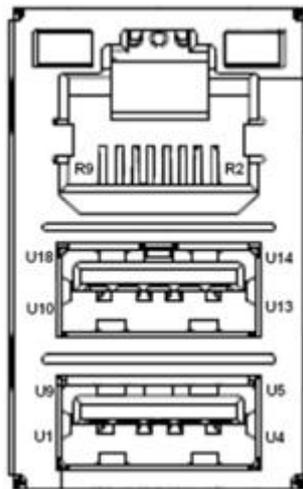
Pin	Signal	Pin	Signal
1	+USBV56	2	+USBV56
3	USB_D6--	4	USB2_DN3_HUB
5	USB_D6+	6	USB2_DP3_HUB
7	GND	8	GND
9	Key	10	N/A

A.11 RJ45 + USB3.0 stack connector (LAN1_USB12)



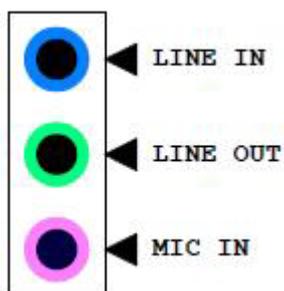
Pin	Signal	Pin	Signal
U1	+USBV1	U10	+USBV1
U2	USB_D1-	U11	USB_D2-
U3	USB_D1+	U12	USB_D2+
U4	GND	U13	GND
U5	USB3X1_z_RX-	U14	USB3X2_z_RX-
U6	USB3X1_z_RX+	U15	USB3X2_z_RX+
U7	GND	U16	GND
U8	USB3X1_z_TX-	U17	USB3X2_z_TX-
U9	USB3X1_z_TX+	U18	USB3X2_z_TX+
Pin	Signal	Pin	Signal
R2	LAN1_MDI_0+	R6	LAN1_MDI_2+
R3	LAN1_MDI_0-	R7	LAN1_MDI_2-
R4	LAN1_MDI_1+	R8	LAN1_MDI_3+
R5	LAN1_MDI_1-	R9	LAN1_MDI_3-

A.12 RJ45 + USB3.0 stack connector (LAN2_USB34)



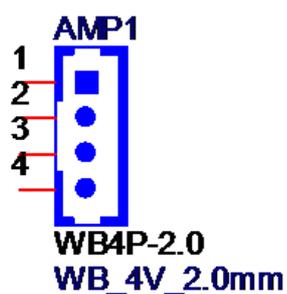
Pin	Signal	Pin	Signal
U1	+USBV2	U10	+USBV2
U2	USB_D3-	U11	USB_D4-
U3	USB_D3+	U12	USB_D4+
U4	GND	U13	GND
U5	USB3X3_z_RX- -	U14	USB3X4_z_RX-
U6	USB3X3_z_RX+	U15	USB3X4_z_RX+
U7	GND	U16	GND
U8	USB3X3_z_TX-	U17	USB3X4_z_TX-
U9	USB3X3_z_TX+	U18	USB3X4_z_TX+
Pin	Signal	Pin	Signal
R2	LAN2_MDI_0+	R6	LAN2_MDI_2+
R3	LAN2_MDI_0-	R7	LAN2_MDI_2-
R4	LAN2_MDI_1+	R8	LAN2_MDI_3+
R5	LAN2_MDI_1-	R9	LAN2_MDI_3-

A.13 HD Audio Interface (AUDIO1)



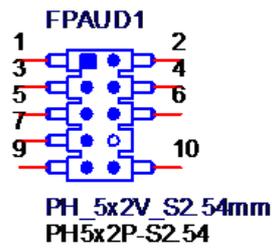
Pin	Signal
1	MIC IN
2	LINE OUT
3	LINE IN

A.14 Amplifier connector (AMP1)



Pin	Signal
1	SPK_R+
2	SPK_R-
3	SPK_L-
4	SPK_L+

A.15 Front panel audio pin header (FPAUD1)



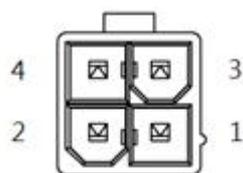
Pin	Signal	Pin	Signal
1	A_z_MIC2-L	2	GND
3	A_z_MIC2-R	4	AFP_PRESEN#
5	A_z_LINE2-R	6	A_MIC2-JD
7	SENSE	8	KEY
9	A_z_LINE2-L	10	A_LINE2-JD

A.16 HD Audio interface (SPDIF1)



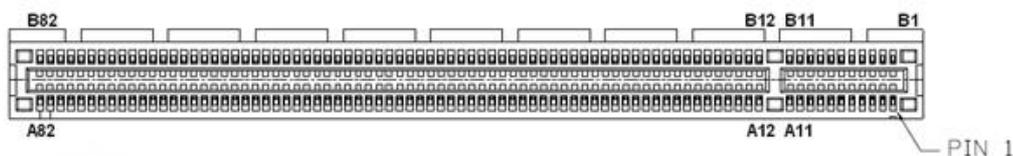
Pin	Signal
1	+5V
2	KEY
3	SPDIF OUT
4	GND

A.17 ATX 4 Pin main power connector (ATX12V1)



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

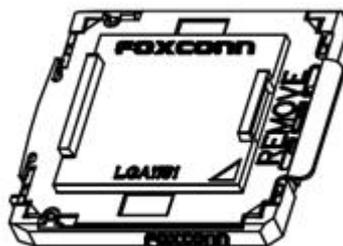
A.18 PCI-Express x16 slot (PCIEX16_1)



Pin	Signal	Pin	Signal
B1	+12V	A1	PRSNT1#
B2	+12V	A2	+12V
B3	+12V	A3	+12V
B4	GND	A4	GND
B5	SMB_CLK	A5	Reserved
B6	SMB_DATA	A6	Reserved
B7	GND	A7	Reserved
B8	+3.3V	A8	Reserved
B9	Reserved	A9	+3.3V
B10	+3.3VAUX	A10	+3.3V
B11	WAKE#	A11	PWRGD
B12	Reserved	A12	GND
B13	GND	A13	REFCLK+
B14	TX0+	A14	REFCLK-
B15	TX0-	A15	GND
B16	GND	A16	RX0+
B17	Reserved	A17	RX0-
B18	DETECT#	A18	GND
B19	TX1+	A19	Advantech define
B20	TX1-	A20	GND
B21	GND	A21	RX1+
B22	GND	A22	RX1-
B23	TX2+	A23	GND
B24	TX2-	A24	GND
B25	GND	A25	RX2+
B26	GND	A26	RX2-
B27	TX3+	A27	GND
B28	TX3-	A28	GND
B29	GND	A29	RX3+
B30	Reserved	A30	RX3-
B31	Reserved	A31	GND
B32	GND	A32	Advantech define
B33	TX4+	A33	Reserved
B34	TX4-	A34	GND
B35	GND	A35	RX4+
B36	GND	A36	RX4-
B37	TX5+	A37	GND
B38	TX5-	A38	GND
B39	GND	A39	RX5+

B40	GND	A40	RX5-
B41	TX6+	A41	GND
B42	TX6-	A42	GND
B43	GND	A43	RX6+
B44	GND	A44	RX6-
B45	TX7+	A45	GND
B46	TX7-	A46	GND
B47	GND	A47	RX7+
B48	Reserved	A48	RX7-
B49	GND	A49	GND
B50	TX8+	A50	Reserved
B51	TX8-	A51	GND
B52	GND	A52	RX8+
B53	GND	A53	RX8-
B54	TX9+	A54	GND
B55	TX9-	A55	GND
B56	GND	A56	RX9+
B57	GND	A57	RX9-
B58	TX10+	A58	GND
B59	TX10-	A59	GND
B60	GND	A60	RX10+
B61	GND	A61	RX10-
B62	TX11+	A62	GND
B63	TX11-	A63	GND
B64	GND	A64	RX11+
B65	GND	A65	RX11-
B66	TX12+	A66	GND
B67	TX12-	A67	GND
B68	GND	A68	RX12+
B69	GND	A69	RX12-
B70	TX13+	A70	GND
B71	TX13-	A71	GND
B72	GND	A72	RX13+
B73	GND	A73	RX13-
B74	TX14+	A74	GND
B75	TX14-	A75	GND
B76	GND	A76	RX14+
B77	GND	A77	RX14-
B78	TX15+	A78	GND
B79	TX15-	A79	GND
B80	GND	A80	RX15+
B81	Reserved	A81	RX15-
B82	Reserved	A82	GND

A.19 CPU SOCKET LGA1151 H4 (CPU1)

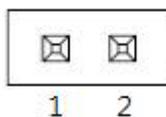


A.20 System Fan #1/#2 connector (SYSFAN1/ SYSFAN2)



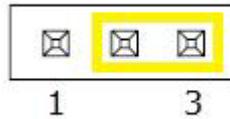
Pin	Signal(SYSFAN1)
1	GND
2	SYSFAN1_VCC
3	SYSFAN1_SPEED
4	SYSFAN1_PWM
Pin	Signal(SYSFAN2)
1	GND
2	SYSFAN2_VCC
3	SYSFAN2_SPEED
4	SYSFAN2_PWM

A.21 Case Open connector (JCASE1)



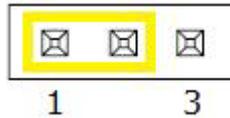
Pin	Signal
1	Case Open
2	GND

A.22 Case Open selection pin header (JCASEOP_SW1)



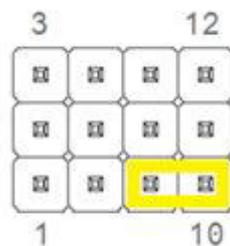
Pin	Signal
1	CASEOP#(Normal Open)
2	HWM_CASEOP#
3	CASEOP (Normal Close)

A.23 CMOS Mode selection (JCMOS1)



Pin	Signal
1	N/A
2	RTC RESET#
3	GND

A.24 Power switch/HDD LED/SMBus/Speaker pin header (JFP1)



Pin	Signal	Pin	Signal
1	+5V	2	HDD LED+
3	Power Button+	4	SPK_P2
5	HDD LED-	6	Power Button-
7	SPK_P3	8	SMB_DATA
9	System Reset+	10	SPK_P4
11	SMB_CLK	12	System Reset-

A.25 CPU FAN connector (CPUFAN1)



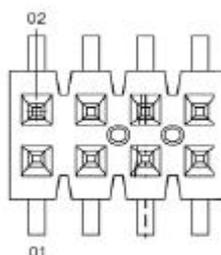
Pin	Signal
1	GND
2	CPU FAN VCC
3	CPU FAN SPEED
4	CPU FAN PWM

A.26 Power LED and keyboard lock pin header (JFP2)



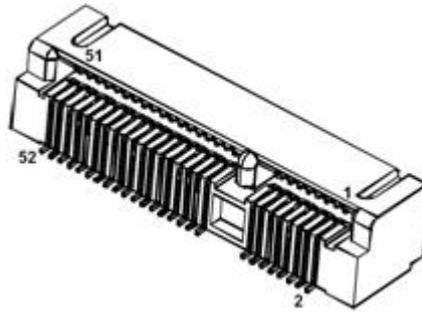
Pin	Signal
1	LED Power
2	NC
3	GND
4	Keyboard Lock
5	GND

A.27 SPI Pin Header (SPI_CN1)



Pin	Signal	Pin	Signal
1	SPI_SKT_CS#0_R	2	+V3.3_SPI
3	SPI_SKT_MISO_R	4	NC
5	NC	6	SPI_SKT_CLK_R
7	GND	8	SPI_SKT_MOSI_R

A.28 MINIPCI-E, mSATA connector (MINIPCI-E1)



MINIPCI-E:

Pin	Signal	Pin	Signal
1	WAKE#	2	+3.3Vaux
3	Reserved	4	GND
5	Reserved	6	+1.5V
7	CLKREQ#	8	Reserved
9	GND	10	Reserved
11	REFCLK-	12	Reserved
13	REFCLK+	14	Reserved
15	GND	16	Reserved
17	Reserved	18	GND
19	Reserved	20	DISABLE#
21	DETECT#	22	RESET#
23	PCIE_RX+	24	+3.3Vaux
25	PCIE_RX-	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PCIE_TX-	32	SMB_DATA
33	PCIE_TX+	34	GND
35	GND	36	USB_D-
37	GND	38	USB_D+
39	+3.3Vaux	40	GND
41	+3.3Vaux	42	Reserved
43	V1.2_DETECT#	44	LED_WLAN#
45	Reserved	46	Reserved
47	Reserved	48	+1.5V
49	Reserved	50	GND
51	MSATA_DETECT#	52	+3.3Vaux

mSATA:

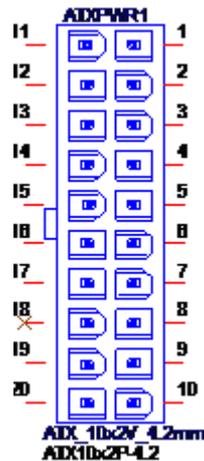
Pin	Signal	Pin	Signal
1	Reserved	2	+3.3V
3	Reserved	4	GND
5	Reserved	6	+1.5V
7	Reserved	8	Reserved
9	GND	10	Reserved
11	Reserved	12	Reserved
13	Reserved	14	Reserved
15	GND	16	Reserved
17	Reserved	18	GND
19	Reserved	20	Reserved
21	DETECT#	22	Reserved
23	RX+	24	+3.3V
25	RX-	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	TX-	32	SMB_DATA
33	TX+	34	GND
35	GND	36	Reserved
37	GND	38	Reserved
39	+3.3V	40	GND
41	+3.3V	42	Reserved
43	Reserved	44	Reserved
45	Reserved	46	Reserved
47	Reserved	48	+1.5V
49	Reserved	50	GND
51	MSATA_DETECT#	52	+3.3V

A.29 NGFF M.2 B-Key connector for 2242 module (M.2_2)

Pin	Signal	Pin	Signal
1	M.2_CONFIG_3	2	+V3.3_M.2
3	SSD_SATA_PCIE	4	+V3.3_M.2
5	GND	6	M.2_POWER_OFF#_R
7	USB2_HUB_DP2	8	M.2_W_DISABLE1#_R
9	USB2_HUB_DN2	10	LED
11	GND	20	Reserved
21	M.2_CONFIG_0	22	Reserved
23	M.2_PCIE_WAKE#	24	Reserved
25	M.2_SAR_DPR	26	M.2_GNSS_DISABLE#_R
27	GND	28	Reserved
29	PCIE2X2_z_RX-	30	Reserved
31	PCIE2X2_z_RX+	32	Reserved
33	GND	34	Reserved
35	PCIE2X2_z_TX-	36	Reserved

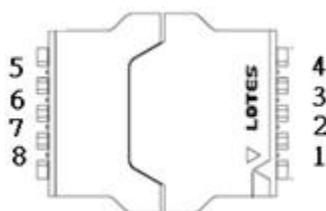
37	PCIE2X2_z_TX+	38	Reserved
39	GND	40	M.2_ISH_SCL_R
41	M.2_PCIE_SATA_RX-	42	M.2_ISH_SDA_R
43	M.2_PCIE_SATA_RX+	44	Reserved
45	GND	46	Reserved
47	M.2_PCIE_SATA_TX-	48	Reserved
49	M.2_PCIE_SATA_TX+	50	M.2_PLTRST#
51	GND	52	M.2_CKR_REQ9#_R
53	CLK100M_M.2-	54	M.2_PCIE_WAKE#
55	CLK100M_M.2+	56	M.2_SMB_CLK_MAIN
57	GND	58	M.2_SMB_DATA_MAIN
59	Reserved	60	Reserved
61	Reserved	62	Reserved
63	Reserved	64	Reserved
65	Reserved	66	Reserved
67	M.2_RESET#_R	68	PCH_SUSCLK
69	M.2_CONFIG_1	70	+V3.3_M.2
71	Reserved	72	+V3.3_M.2
73	Reserved	74	+V3.3_M.2
75	M.2_CONFIG_2		

A.30 ATX 20pin power connector (ATXPWR1)



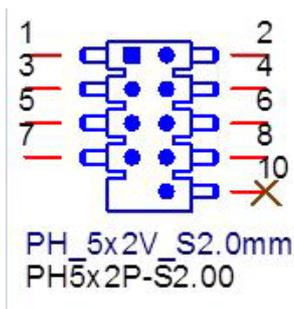
Pin	Signal	Pin	Signal
1	+3.3V	11	+3.3V
2	+3.3V	12	-12V
3	GND	13	GND
4	+5V	14	PSON#
5	GND	15	GND
6	+5V	16	GND
7	GND	17	GND
8	PWROK	18	reserved
9	+5VSB	19	+5V
10	+12V	20	+5V

A.31 SPI BIOS flash socket (SPI1)

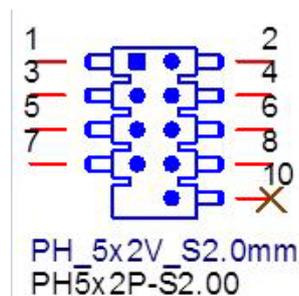


Pin	Signal	Pin	Signal
1	CS#	5	MOSI
2	MISO	6	SCLK
3	WP# / IO2	7	HOLD# / IO3
4	GND	8	+3.3V

A.32 Dual USB2.0 pin header (USB11/12 & USB13/14, BOM optional)



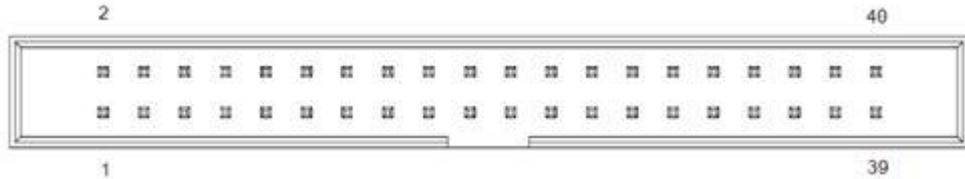
Pin	Signal	Pin	Signal
1	+USBPCIE_V2	2	+USBPCIE_V2
3	USBPCIE_Z_P4-	4	USBPCIE_Z_P3-
5	USBPCIE_Z_P4+	6	USBPCIE_Z_P3+
7	GND	8	GND
9	Key	10	N/A



Pin	Signal	Pin	Signal
1	+USBPCIE_V1	2	+USBPCIE_V1

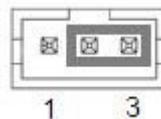
3	USBPCIE_Z_P2-	4	USBPCIE_Z_P1-
5	USBPCIE_Z_P2+	6	USBPCIE_Z_P1+
7	GND	8	GND
9	Key	10	N/A

A.33 COM5 ~ COM7 box header (COM5678)



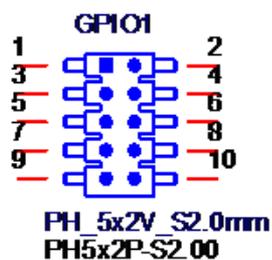
Pin	Signal	Pin	Signal
1	DCD# [5]	2	DSR# [5]
3	RXD [5]	4	RST# [5]
5	TXD [5]	6	CTS# [5]
7	DTR# [5]	8	RI# [5]
9	GND	10	GND
11	DCD# [6]	12	DSR# [6]
13	RXD [6]	14	RST# [6]
15	TXD [6]	16	CTS# [6]
17	DTR# [6]	18	RI# [6]
19	GND	20	GND
21	DCD# [7]	22	DSR# [7]
23	RXD [7]	24	RST# [7]
25	TXD [7]	26	CTS# [7]
27	DTR# [7]	28	RI# [7]
29	GND	30	GND
31	DCD# [8]	32	DSR# [8]
33	RXD [8]	34	RST# [8]
35	TXD [8]	36	CTS# [8]
37	DTR# [8]	38	RI# [8]
39	GND	40	GND

A.34 AT/ATX Mode selection (PSON1)



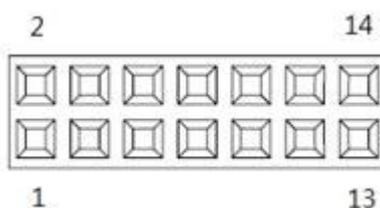
Pin	Signal
1	AT
2	+3.3V
3	ATX

A.35 8-bits General Purpose I/O pin header (GPIO1)



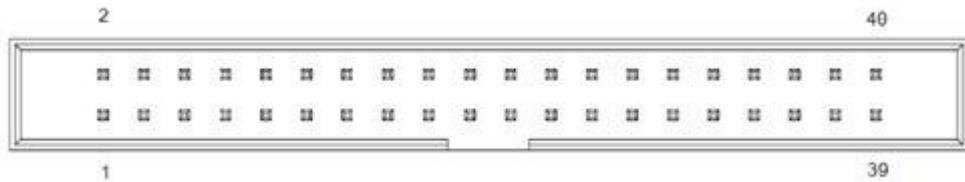
Pin	Signal	Pin	Signal
1	GPIO0	2	GPIO4
3	GPIO1	4	GPIO5
5	GPIO2	6	GPIO6
7	GPIO3	8	GPIO7
9	+V5_DUAL	10	GND

A.36 Low pin count interface connector (LPC1)



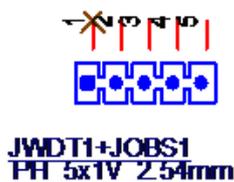
Pin	Signal	Pin	Signal
1	CLK (24MHz)	2	AD1
3	RESET#	4	AD0
5	FRAME#	6	+3.3V
7	AD3	8	GND
9	AD2	10	SMB CLK
11	SERIRQ	12	SMB DAT
13	+V5_DUAL	14	+5V

A.37 COM1 ~ COM4 box header (COM1234)



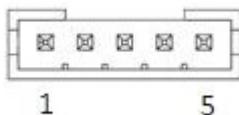
Pin	Signal	Pin	Signal
1	DCD# [1]	2	DSR# [1]
3	RXD [1]	4	RST# [1]
5	TXD [1]	6	CTS# [1]
7	DTR# [1]	8	RI# [1]
9	GND	10	GND
11	DCD# [2]	12	DSR# [2]
13	RXD [2]	14	RST# [2]
15	TXD [2]	16	CTS# [2]
17	DTR# [2]	18	RI# [2]
19	GND	20	GND
21	DCD# [3]	22	DSR# [3]
23	RXD [3]	24	RST# [3]
25	TXD [3]	26	CTS# [3]
27	DTR# [3]	28	RI# [3]
29	GND	30	GND
31	DCD# [4]	32	DSR# [4]
33	RXD [4]	34	RST# [4]
35	TXD [4]	36	CTS# [4]
37	DTR# [4]	38	RI# [4]
39	GND	40	GND

A.38 Watchdog timer output and OBS beep (JWDT1+JOBS1)



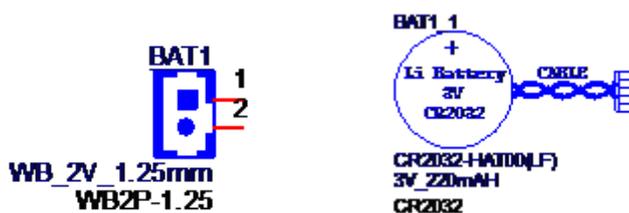
Pin	Signal	Pin	Signal
1	NC	2	SIO_WG#
3	FP_SYS_RESET#	4	SIO_ERR_BEEP
5	SIO_OBS_BEEP		

A.39 EDP/LVDS Backlight inverter power connector (INV1)



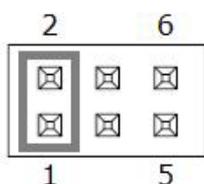
Pin	Signal
1	+12V
2	GND
3	BKL EN
4	BKL CTRL
5	+5V

A.40 CMOS battery connector (BAT1)



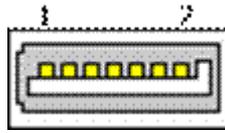
Pin	Signal
1	+VBAT
2	GND

A.41 COM1 RI# selection pin header (JSETCOM1_V1)



Pin	Signal	Pin	Signal
1	RI# [1]	2	Advantech define
3	Advantech define	4	+5V
5	+12V	6	Advantech define

A.42 Serial ATA interface connector (SATA1 / SATA2)



Pin	Signal
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

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