ERX-H110P

Intel® 6th Generation Core™ Processor Micro ATX Motherboard With Intel® H110 Express Chipset

User's Manual

2nd Ed – 17 August 2017

FCC Statement

THIS DEVICE COMPLIES WITH PART 15 FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS:

(1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE.

(2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION.

THIS EQUIPMENT HAS BEEN TESTED AND FOUND TO COMPLY WITH THE LIMITS FOR A CLASS "A" DIGITAL DEVICE, PURSUANT TO PART 15 OF THE FCC RULES.

THESE LIMITS ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINST HARMFUL INTERFERENCE WHEN THE EQUIPMENT IS OPERATED IN A COMMERCIAL ENVIRONMENT. THIS EQUIPMENT GENERATES, USES, AND CAN RADIATE RADIO FREQUENCY ENERGY AND, IF NOT INSTALLED AND USED IN ACCORDANCE WITH THE INSTRUCTION MANUAL, MAY CAUSE HARMFUL INTERFERENCE TO RADIO COMMUNICATIONS.

OPERATION OF THIS EQUIPMENT IN A RESIDENTIAL AREA IS LIKELY TO CAUSE HARMFUL INTERFERENCE IN WHICH CASE THE USER WILL BE REQUIRED TO CORRECT THE INTERFERENCE AT HIS OWN EXPENSE.

Notice

This guide is designed for experienced users to setup the system within the shortest time. For detailed information, please always refer to the electronic user's manual.

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1. Collect all the information about the problem encountered. (For example, CPU type and speed, Avalue's products model name, hardware & BIOS revision number, other hardware and software used, etc.) Note anything abnormal and list any on-screen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information available.
3. If your product is diagnosed as defective, obtain an RMA (return material authorization) number from your dealer. This allows us to process your good return more quickly.
4. Carefully pack the defective product, a complete 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.

Content

ERX-H110P User's Manual

1. Getting Started

1.1 Safety Precautions

Warning!

Always completely disconnect the power cord from your 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 CPU card. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components in a static-dissipative surface or static-shielded bag when they are not in the chassis.

1.2 Packing List

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

- 1 x ERX-H110P motherboard
- 2 x SATA cable
- 1 x I/O Shield

If any of the above items is damaged or missing, contact your retailer.

1.3 Document Amendment History

Revision	Date	By	Comment
1st	March 2016	Avalue	Initial Release
2nd	August 2017	Avalue	Update System Specifications

1.4 Manual Objectives

This manual describes in details Avalue Technology ERX-H110P Single Board.

We have tried to include as much information as possible but we have not duplicated information that is provided in the standard IBM Technical References, unless it proved to be necessary to aid in the understanding of this board.

We strongly recommend that you study this manual carefully before attempting to set up ERX-H110P or change the standard configurations. Whilst all the necessary information is available in this manual we would recommend that unless you are confident, you contact your supplier for guidance.

Please be aware that it is possible to create configurations within the CMOS RAM that make booting impossible. If this should happen, clear the CMOS settings, (see the description of the Jumper Settings for details).

If you have any suggestions or find any errors regarding this manual and want to inform us of these, please contact our Customer Service department with the relevant details.

1.5 System Specifications

System	
CPU	Intel® 6th Generation Core™ (Skylake-S) Processor (Max. TDP at 95W) Intel® H110 Express Chipset
BIOS	Two 288-pin DDR4 2133MHz DIMM socket, supports up to 32GB Max
System Chipset	1 x Intel® I219LM Gigabit Ethernet PHY 1 x Intel® I211AT PCI-e Gigabit Ethernet Realtek ALC892 HD Audio with 6W Amplifier
I/O Chip	HDMI, DP, VGA
System Memory	3 x SATA III, 1 x SATA III or 1 x Mini PCI-e Slot support SSD by auto switch IC 1 x full size Mini PCI-e Slot with SIM card slot 1 x M.2 2230 Type A Slot 1 x PCI-e x 16 3 x PCI-e x 1 2 x USB 2.0 by pin header 1 x PS/2 KB or MS + 2 x USB2.0 Type A connector 4 x USB 3.0 at I/O 5 x RS232, 1 x RS232/422/485 Line in, Mic in, Line out 8 Bits GPIO 1 x LPT 1 x S/PIDF Onboard Infineon SLB9665 support TPM 2.0 ATX Power
Watchdog Timer	H/W Reset, 1sec. – 65535sec./min.1sec. or 1min. step
H/W Status Monitor	CPU temperature monitoring Voltages monitoring CPU fan speed control
Expansion	1 x PCI-e x 16 3 x PCI-e x 1 3 x SATA III 1 x SATA III or 1 x Mini PCI-e Slot support SSD by auto switch IC 1 x full size Mini PCI-e Slot with SIM card slot 1 x M.2 2230 Type A Slot
Display	
Chipset	Intel® H110 Express chipset
Resolution	VGA: 2048 x 1536 @ 60 Hz HDMI: 3840 x 2160 @ 30 Hz, 2560 x 1600@ 30 Hz

	(Note: This resolution is actual test result. Intel resolution: 4096x2160@24Hz)
	DP: 4096 x 2304@30 Hz
Multiple Display	Dual Display
Audio	
Audio Codec	Realtek ALC892 HD Audio Decoding Controller
Ethernet	
LAN Chip	1 x Intel® I219LM Gigabit Ethernet PHY
	1 x Intel® I211AT co-lay I210AT PCI-e Gigabit Ethernet
Internal I/O Connectors	
Internal I/O Connector	Storage:
	- 1 x SATA III or 1 x full size Mini PCI-e support mSATA by BIOS selection
	- 3 x SATA III
	1 x full size Mini PCI-e Slot with SIM card slot
	1 x M.2 2230 Type A Slot
	COM 1 Pin9 power selection:
	- 1 x 2 x 3 pin, pitch 2.00mm connector for COM 1 support RS232 with Pin 9,+5V/+12V/RI
	COM 2:
	- 1 x 2 x 3 pin, pitch 2.00mm connector for COM 2 support RS232 with Pin 9,+5V/+12V/RI
	- 1 x 2 x 3 pin, pitch 2.00mm connector for COM 2 support RS422/485 connector, Pin 5 with +5V
	COM 2: - 1 x 2 x 5 pin, pitch 2.00mm connector for COM2 support RS-232 connector
	COM 3 ~ 6.
	- 4 x 2 x 5 pin, pitch 2.00mm connector for COM 3~6: support RS-232 connector
	-4 x 2 x 3 pin, pitch 2.00mm connector for COM 3~6 support RS232 with Pin 9,+5V/+12V/RI
	2 x USB 2.0 by pin header
	USB Wake up by BIOS Setting
	1 x 1 x 4 pin, pitch 2.54mm CPU fan connector with smart fan function supported
	1 x 1 x 4 pin, pitch 2.54mm System fan connector with smart fan function supported
	1 x 1 x 3 pin, pitch 2.54mm System fan connector
	1 x 2 x 5 pin, pitch 2.54mm connector for front panel
	1 x 2 x 10 pin, pitch 2.54mm connector for Auxiliary panel
	1 x 4 pin, pitch 2.54mm connector for Speaker Buzzer
	1 x 2 x 5 pin, pitch 2.54mm connector for front Audio
	1 x 4 pin, pitch wafer 2.00mm connector for 6W x 2 Speaker
	1 x 1 x 4 pin, pitch 2.54mm connector for S/PDIF
	1 x 1 x 3pin, pitch 2.54mm connector for COMS Clear

	1 x horizontal type battery connector
	Co-lay 1 x 2 Pin Pitch 1.25mm horizontal type battery connector
	1 x 2 x 6 pin, pitch 2.00mm connector for 8 bits GPIO
	1 x 2 x 3 pin, pitch 2.00mm connector for SGPIO (Only support C236 PCH platform)
	1 x 5 pin, pitch 2.54mm connector for SMBus
	1 x 2 x 4 pin, pitch 2.00mm connector for BIOS SPI
	1 x 2 x 5 pin, pitch 2.0mm connector for LPC
	Onboard buzzer
	1 x 2 x 13 pin, pitch 2.54mm connector for LPT
	1 x 1 x 6 pin, pitch 2.5mm BOX connector for KB/Mouse
	1 x 1 x 3 pin pitch 2.00mm connector for AT/ATX jumper
	1 x 2 x 12 pin ATX power connector
	1 x 2 x 4 pin ATX 12V power connector
Rear I/O Connectors	
Rear Side External I/O Connector	2 x RJ-45 with Dual deck USB3.0 connector 1 x VGA 1 x DP 1 x HDMI COM1 support RS-232 DB9 connector, Pin 9 with / +5V&+12V/RI Supported 1 x Line-out ,1 x Mic-In,1 x Line-in PS/2 KB or MS + 2 x USB2.0 Type A connector
Mechanical & Environmental	
Power Requirement	+12V/+5V/5VSB/+3.3V/-12V
ACPI	Single power ATX Support S0, S3, S4, S5
Power Type	ATX mode
Operating Temp.	0 ~ 60°C (32 ~ 140°F)
Storage Temp.	-40 ~ 75°C
Operating Humidity	0% ~ 90% relative humidity, non-condensing
Size (L x W)	243.84mm x 243.84mm
Weight	0.60 kg

Note:

1. The Windows 7 & Windows 8 must be Setup USB 3.0 driver.

2. Specifications are subject to change without notice.

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1.6 Architecture Overview—Block Diagram

The following block diagram shows the architecture and main components of ERX-H110P.
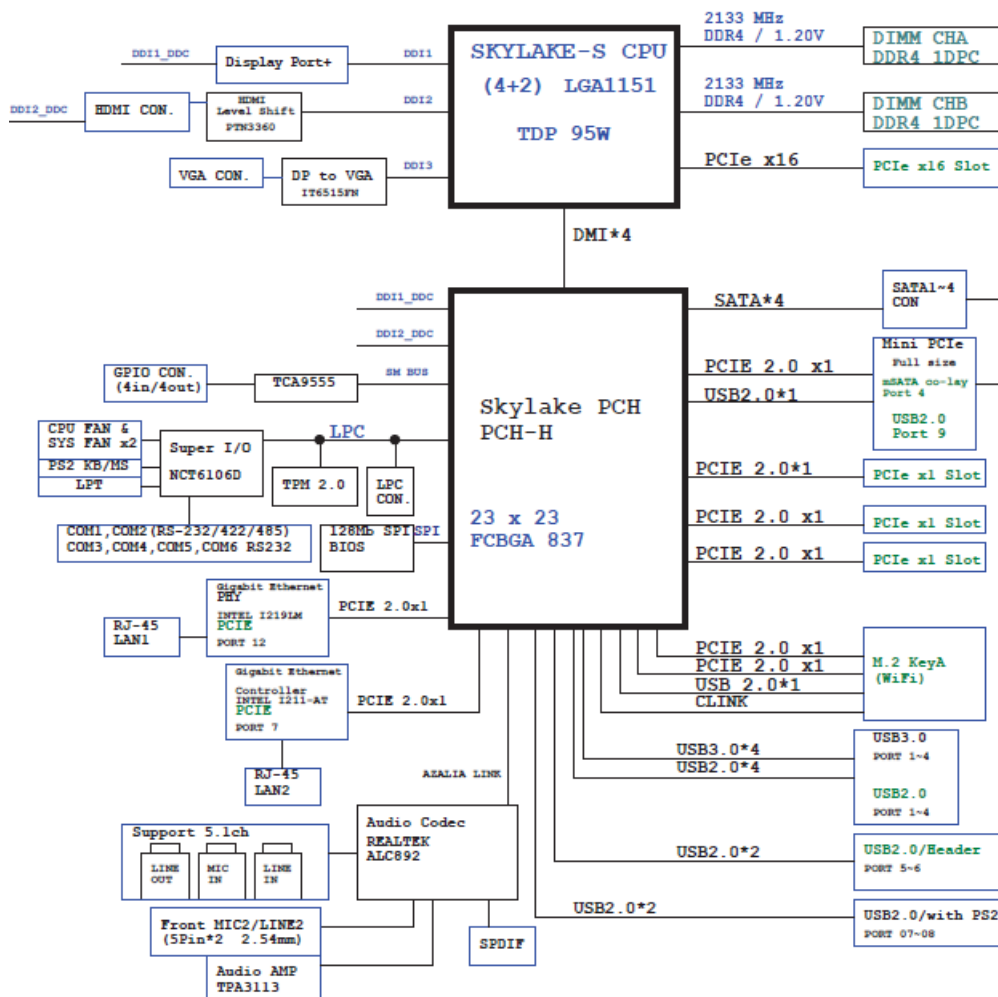
2. Hardware Configuration

2.1 Product Overview
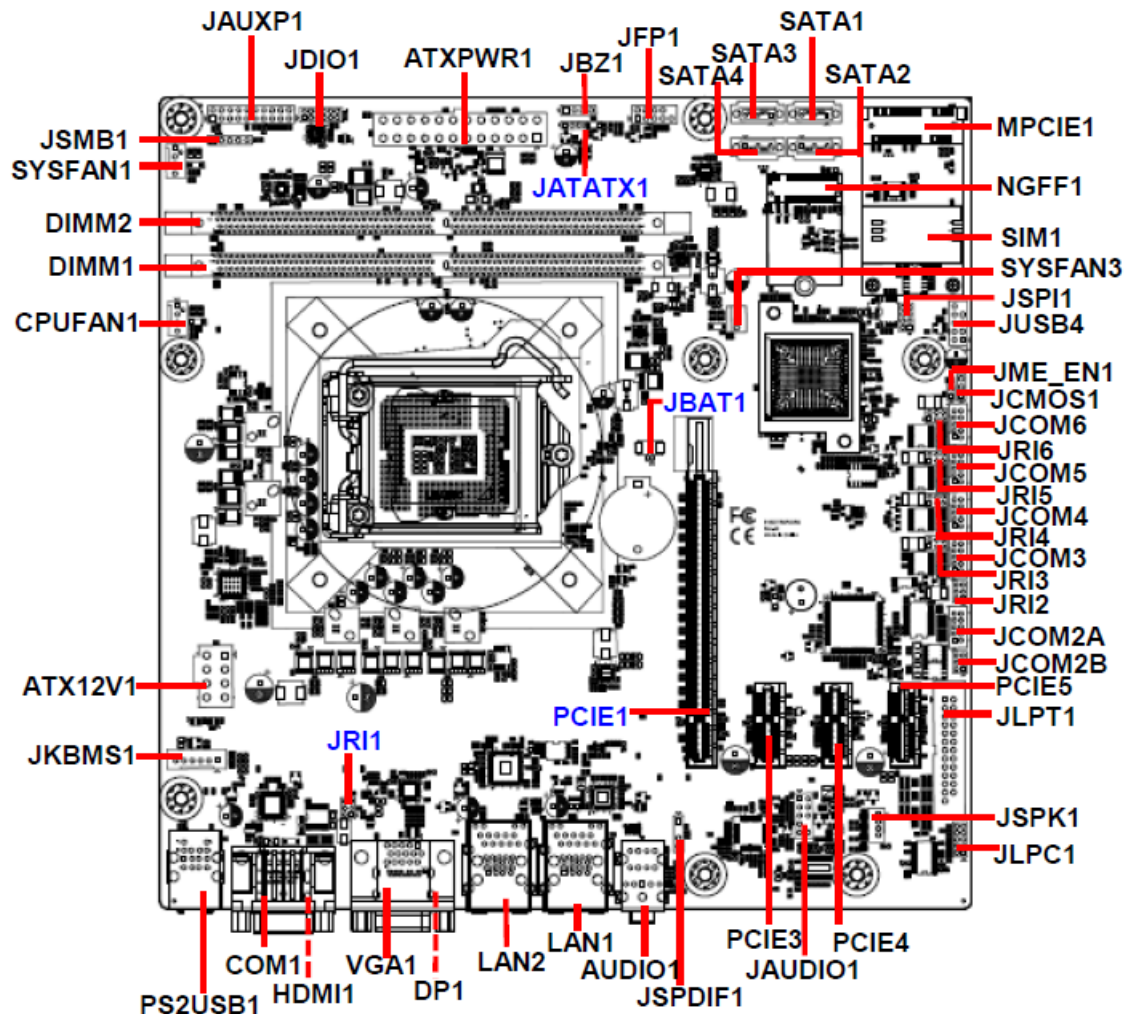
2.2 Jumper and Connector List

You can configure your board to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch.

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" a jumper you connect the pins with the clip. To "open" a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2, and 3. In this case, you would connect either two pins.
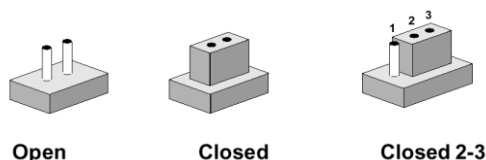
The jumper settings are schematically depicted in this manual as follows:

A pair of needle-nose pliers may be helpful when working with jumpers.

Connectors on the board are linked to external devices such as hard disk drives, a keyboard, or floppy drives. In addition, the board has a number of jumpers that allow you to configure your system to suit your application.

If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes.

The following tables list the function of each of the board's jumpers and connectors.

Jumpers

Label	Function	Note
JRI1/2/3/4/5/6	Serial port 1/2/3/4/5/6 pin9 signal select	3 x 2 header, pitch 2.00mm
JATATX1	AT/ATX Power Mode Select	3 x 1 header, pitch 2.00mm
JCMOS1	Clear CMOS	3 x 1 header, pitch 2.54mm
JME_EN1	ME update (For Flash BIOS use)	2 x 1 header, pitch 2.00 mm

Connectors

Label	Function	Note
CPUFAN1	CPU fan connector	4 x 1 wafer, pitch 2.54mm
SYSFAN1	System fan connector 1	4 x 1 wafer, pitch 2.54mm
SYSFAN3	System fan connector 2	3 x 1 wafer, pitch 2.54mm
JFP1	Front panel setting connector	5 x 2 header, pitch 2.54 mm
DIMM1/2	288-pin DDR4 DIMM socket	

AUDIO1	Line out, Mic in, Line out	
JAUDIO1	Front Audio connector	5 x 2 header, pitch 2.54 mm
JSPI1	SPI connector	4 x 2 header, pitch 2.00mm
COM1	Serial Port 1 connector	D-sub 9 pin, male
JCOM2A	Serial Port 2 connector	5 x 2 wafer, pitch 2.00mm
JCOM2B	COM2 RS485/422 connector	3 x 2 header, pitch 2.00 mm
JCOM3/4/5/6	Serial Port 3/4/5/6 connector	5 x 2 wafer, pitch 2.00mm
JDIO1	General purpose I/O connector	6 x 2 header, pitch 2.00mm
JSPK1	Amplifier connector	1 x 4 wafer, pitch 2.00 mm
PS2USB1	PS/2 keyboard or mouse connector 2 x USB 2.0 connector	
LAN1/2	2 x RJ-45 with Dual deck USB 3.0 connector	
JUSB4	USB 2.0 connector	5 x 2 header, pitch 2.54mm
JSPDIF1	Sony/Philips Digital Interface	4 x 1 header, pitch 2.54mm
JBZ1	PC Buzzer header	4 x 1 header, pitch 2.54mm
JLPC1	LPC connector	5 x 2 header, pitch 2.00mm
PCIE1	PCI-e x 16 connector	
PCIE3/4/5	3 x PCI-e x 1	
JKBMS1	PS/2 keyboard & mouse header	6 x 1 header, pitch 2.50 mm
JBAT1	Battery connector	2 x 1 wafer, pitch 1.25mm
MPCIE1	Full size Mini-PCI-e slot	
SIM1	SIM card slot	
ATXPWR1	ATX Power connector	12 x 2 wafer, pitch 4.20mm
ATX12V1	ATX 12V power connector	2 x 4 wafer, pitch 4.20mm
SATA1~4	Serial ATA III connector 1~4	
HDMI1	HDMI connector	
DP1	DP connector	
VGA1	VGA connector	
JAUXP1	Auxiliary panel connector	10 x 2 header, pitch 2.54 mm
NGFF1	M.2 2230 Type A Slot	
JLPT1	LPT connector	13 x 2 header, pitch 2.54 mm
JSMB1	SMBus connector	5 x 1 header, pitch 2.54 mm

2.3 Setting Jumpers & Connectors

2.3.1 Serial port 1/2 pin9 signal select (JRI1/2)

Ring*

+5V

+12V
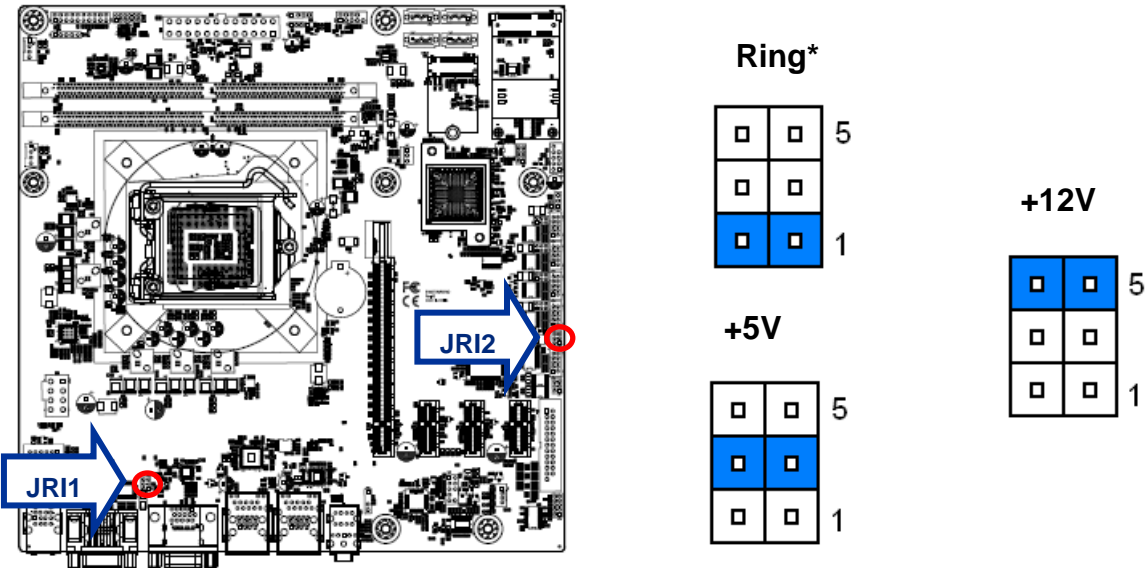
* Default

Note:

Max Current 1A.

2.3.2 Serial port 3/4/5/6 pin9 signal select (JRI3/4/5/6)

Ring*

+5V

+12V
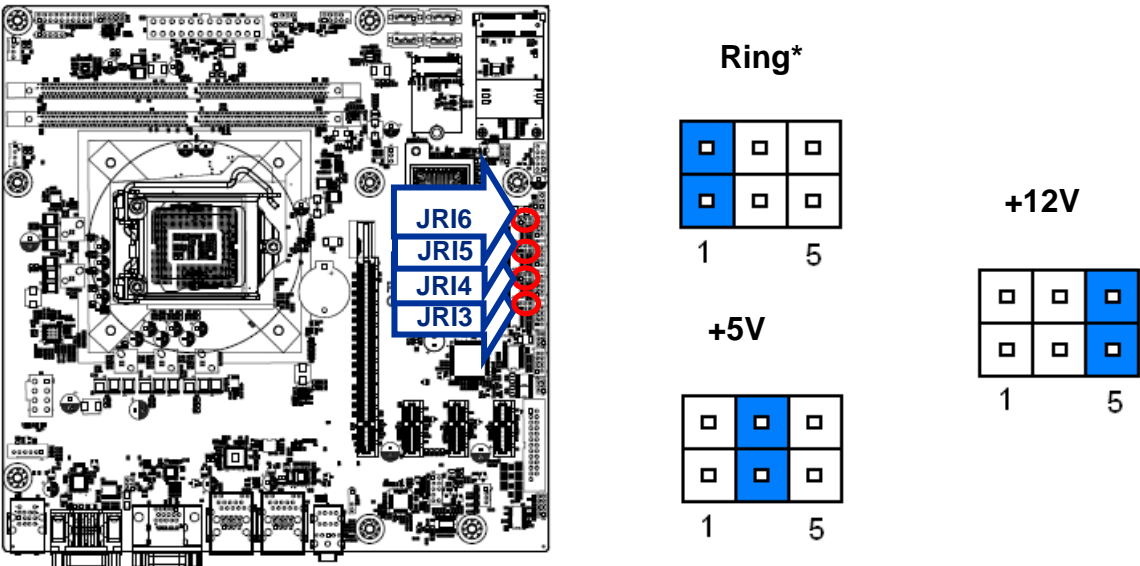
* Default

Note:

Max Current 1A.

2.3.3   AT/ATX Power Mode Select (JATATX1)
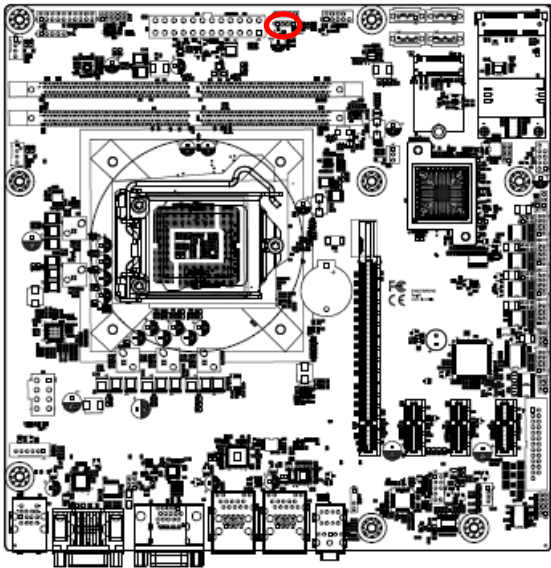
ATX*

AT
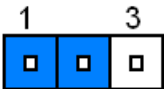
 * Default

2.3.4   Clear CMOS (JCMOS1)
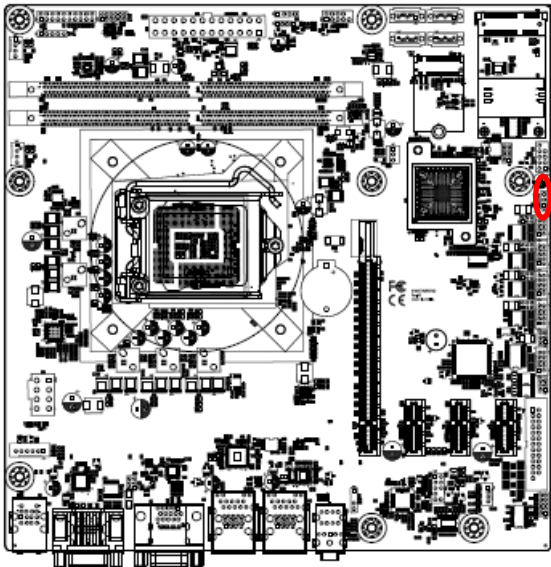
Protect*
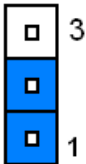
Clear CMOS
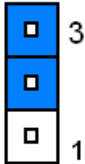
* Default

Note:

Clear CMOS must work on G3 (AC-OFF) state.

2.3.5 ME update (For Flash BIOS use) (JME_EN1)
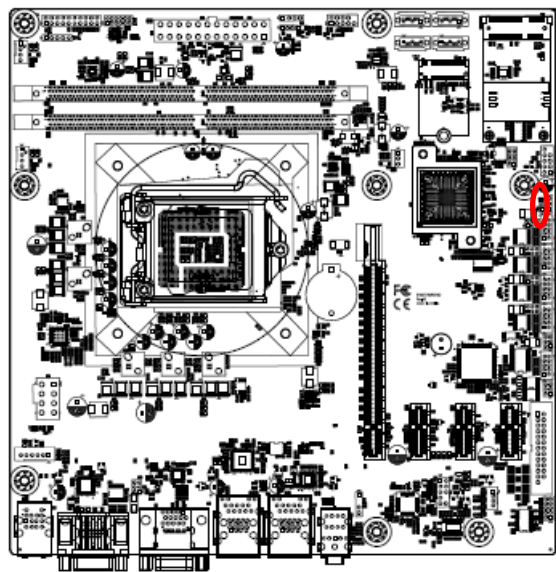
Open*
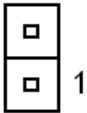
Short
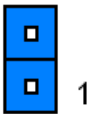
* Default

2.3.6 General purpose I/O connector (JDIO1)
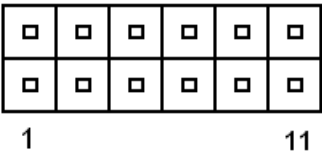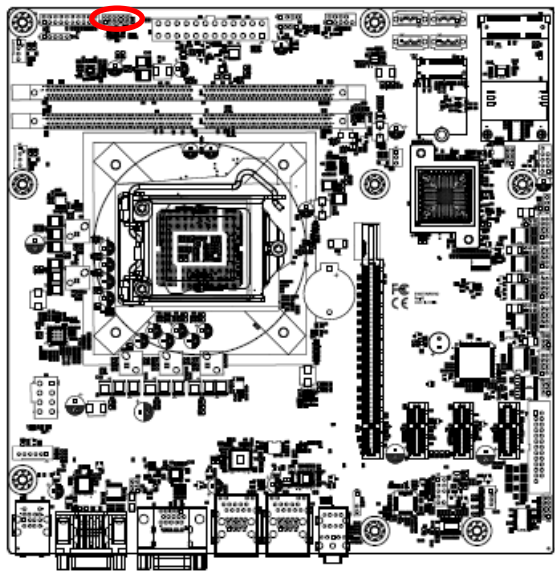
Note:

Max current 1A change as below Provide max

current 1A for +5V.

Signal	PIN	PIN	Signal
DI0	1	2	DO0
DI1	3	4	DO1
DI2	5	6	DO2
DI3	7	8	DO3
SMB_CLK_9555	9	10	SMB_DATA_9555
GND	11	12	+5V

2.3.7   Serial port 2 connector (JCOM2A)
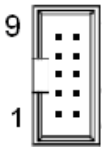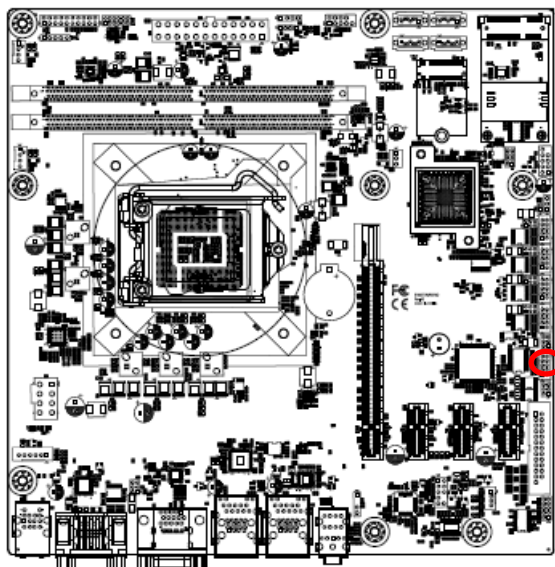
Signal	PIN	PIN	Signal
RI	9	10	NC
RTS	7	8	CTS
GND	5	6	DSR
TXD	3	4	DTR
DCD	1	2	RXD

2.3.8   COM2 RS485/422 connector (JCOM2B)
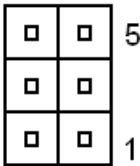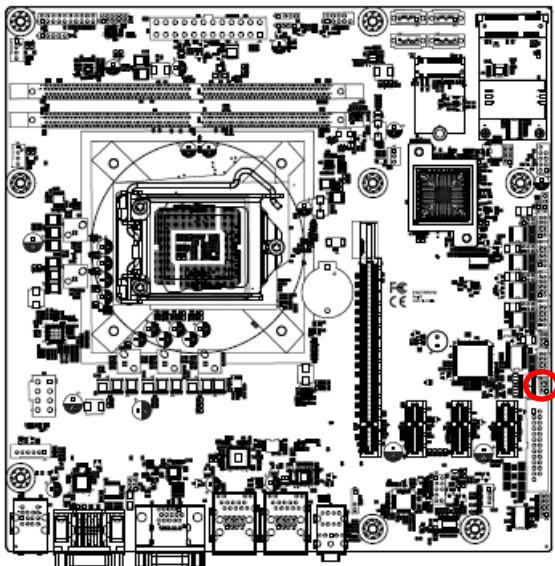
Signal	PIN	PIN	Signal
GND	6	5	+5V
422RX+	4	3	485TX+
422RX-	2	1	485TX-

Note:

Max Current 1A.

2.3.9 Serial port 3/4/5/6 connector (JCOM3/4/5/6)
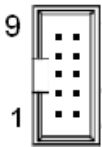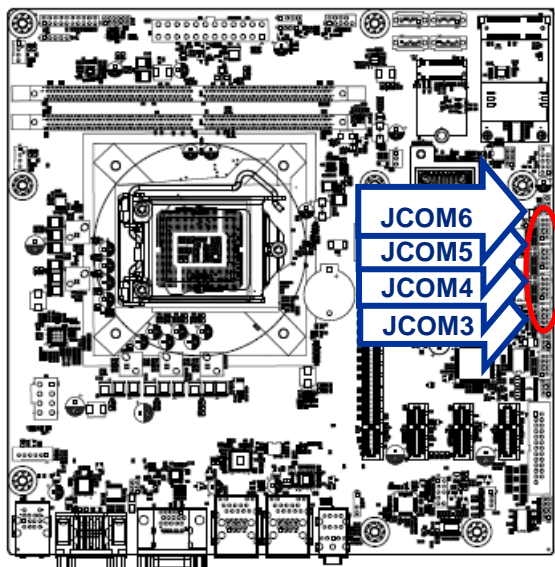
Signal	PIN	PIN	Signal
RI	9	10	NC
RTS	7	8	CTS
GND	5	6	DSR
TXD	3	4	DTR
DCD	1	2	RXD

2.3.10 Sony/Philips Digital Interface (JSPDIF1)
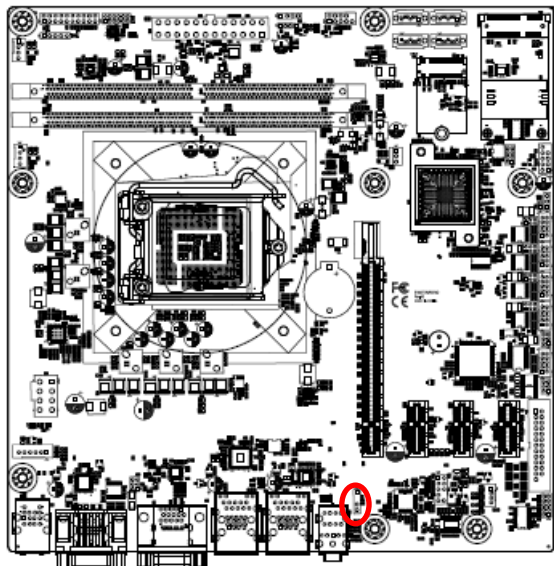
Signal	PIN
+5V	1
	2
SPDIF_O	3
GND	4

2.3.11   ATX Power connector (ATXPWR1)
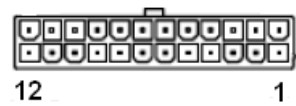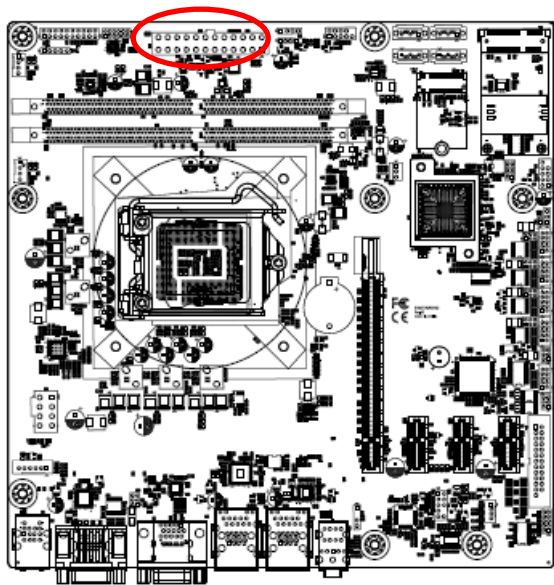
Signal	PIN	PIN	Signal
+3.3V	1	13	+3.3V
+3.3V	2	14	-12V
GND	3	15	GND
+5V	4	16	ATX_PSON#
GND	5	17	GND
+5V	6	18	GND
GND	7	19	GND
ATX_PWRGD	8	20	-5V
+V5SB	9	21	+5V
+12V	10	22	+5V
+12V	11	23	+5V
+3.3V	12	24	GND

2.3.12   ATX 12V power connector (ATX12V1)
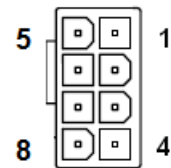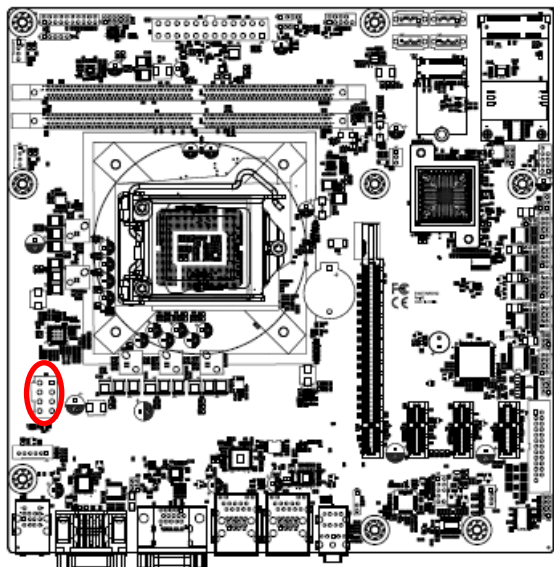
Signal	PIN	PIN	Signal
+12V	5	1	GND
+12V	6	2	GND
+12V	7	3	GND
+12V	8	4	GND

2.3.13   USB 2.0 connector (JUSB4)
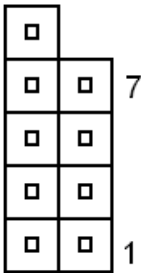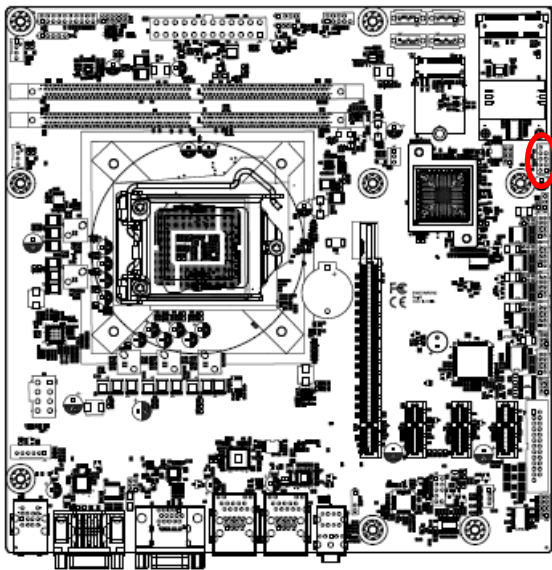
Signal	PIN	PIN	Signal
NC	10		
GND	8	7	GND
USB_R_DP5	6	5	USB_R_DP6
USB_R_DN5	4	3	USB_R_DN6
USBVCC_56	2	1	USBVCC56

2.3.14   Battery connector (JBAT1)
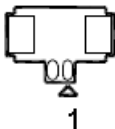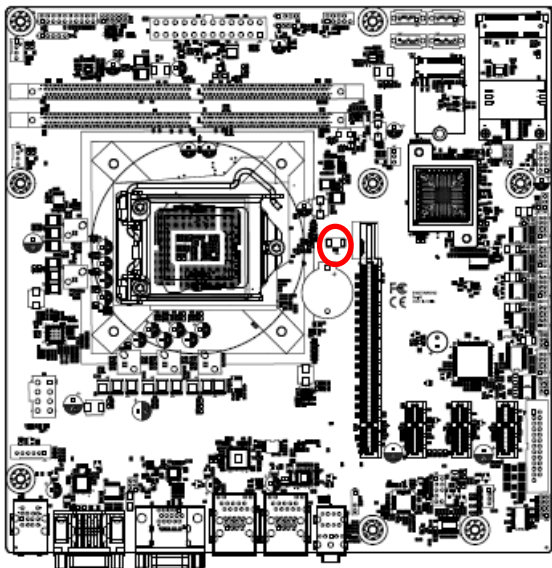
Signal	PIN
RTC_VBAT_1	1
GND	2

Note:

This connector is reserved for change battery.

2.3.15 Front Audio connector (JAUDIO1)
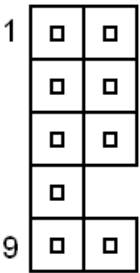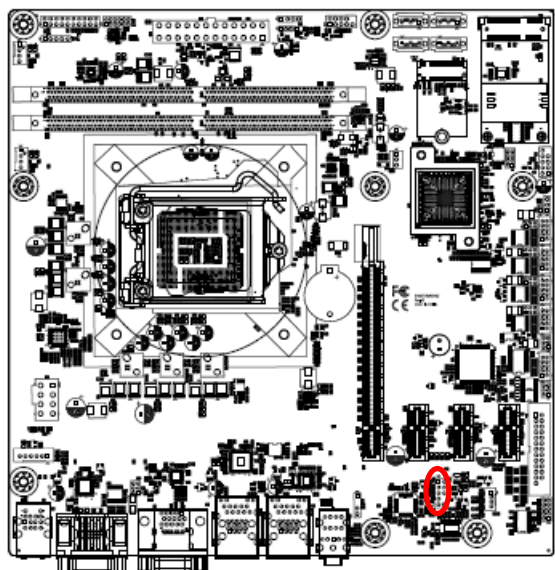
Signal	PIN	PIN	Signal
MIC2_L	1	2	GND
MIC2_R	3	4	ACZ_DET#_R
LINE2_RIN	5	6	MIC2_JD
GND	7		
LINE2_LIN	9	10	LINE2_JD

2.3.15.1 Signal Description –Audio connector (JAUDIO1)

Signal	Signal Description
LINE2_JD	AUDIO IN (LINE_RIN/LIN)sense pin
MIC2_JD	MIC IN (MIC_RIN/LIN) sense pin

2.3.16 LPC connector (JLPC1)
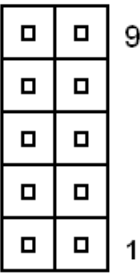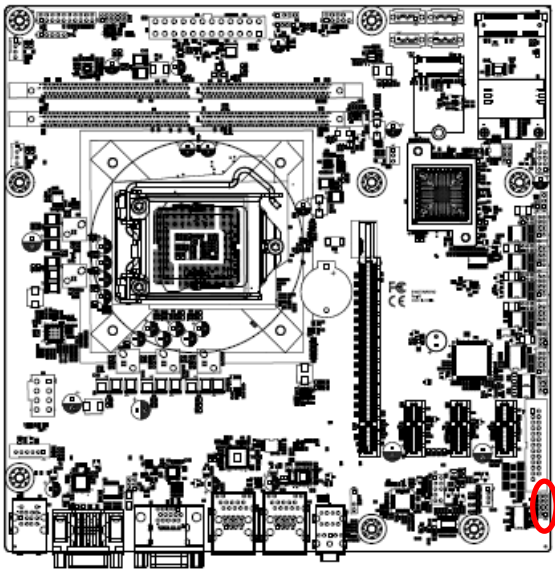
Signal	PIN	PIN	Signal
GND	10	9	LPC_SERIRQ_R
LPC_CLK	8	7	LPC_AD3_R
LPC_FRAME#_R	6	5	LPC_AD2_R
BUF_PLT_RST#	4	3	LPC_AD1_R
+3.3V	2	1	LPC_AD0_R

2.3.17 SPI connector (JSPI1)
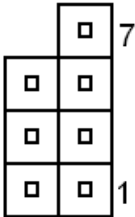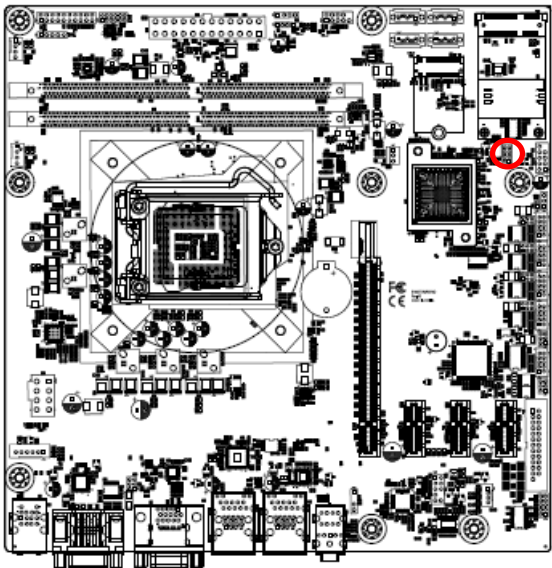
Signal	PIN	PIN	Signal
		7	SSPI_HOLD#0
SSPI_SI_R	6	5	SSPI_SO_R
SSPI_SCLK_R	4	3	SSPI_CS0#_R
GND	2	1	+3.3V

2.3.18 Amplifier connector (JSPK1)
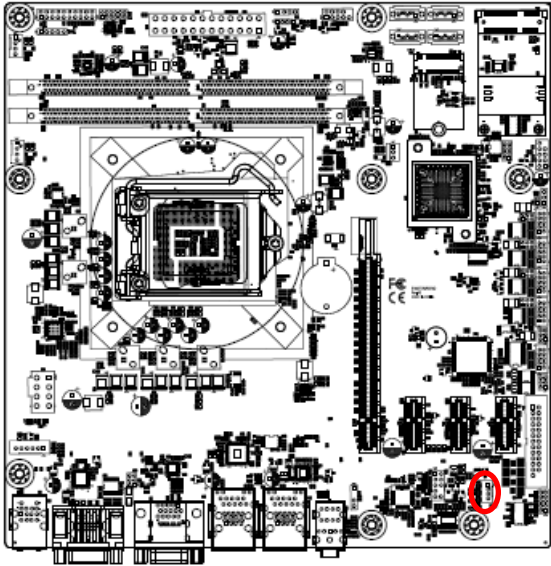
Signal	PIN
SPK_L+	1
SPK_L-	2
SPK_R+	3
SPK_R-	4

Note:

Support 6W x 2 speakers. Mapping Connector PHR-4.

2.3.19   Front panel setting connector (JFP1)
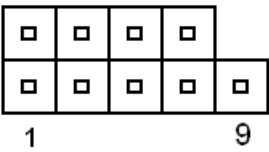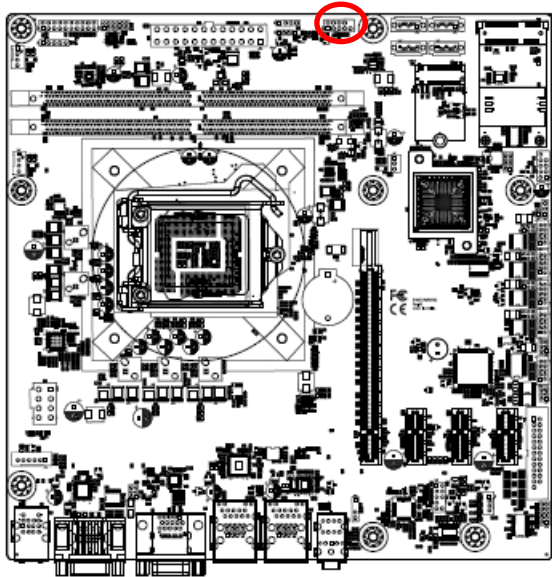
Signal	PIN	PIN	Signal
HDD_LED+	1	2	PWR_LED+
HDD_LED-	3	4	PWE_LED-
RSET_BTN#	5	6	PWRBTN#
GND	7	8	GND
NC	9		

2.3.20   CPU fan connector (CPUFAN1)
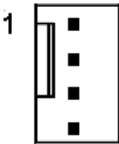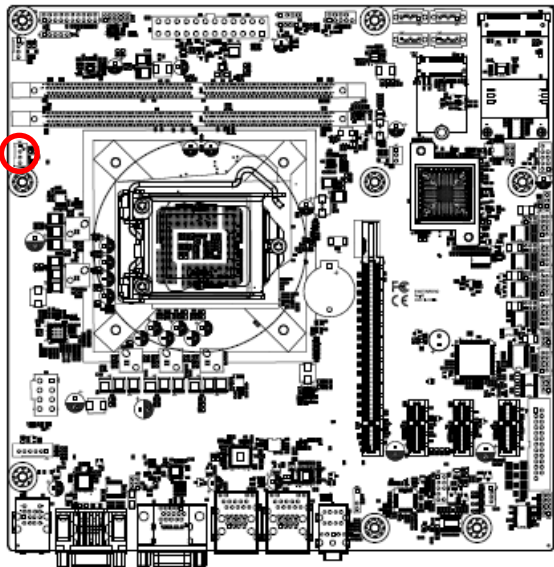
Signal	PIN
GND	1
+12V	2
CPUFANIN	3
CPUFANOUT	4

2.3.21   System fan connector 1 (SYSFAN1)
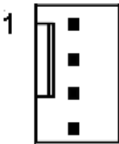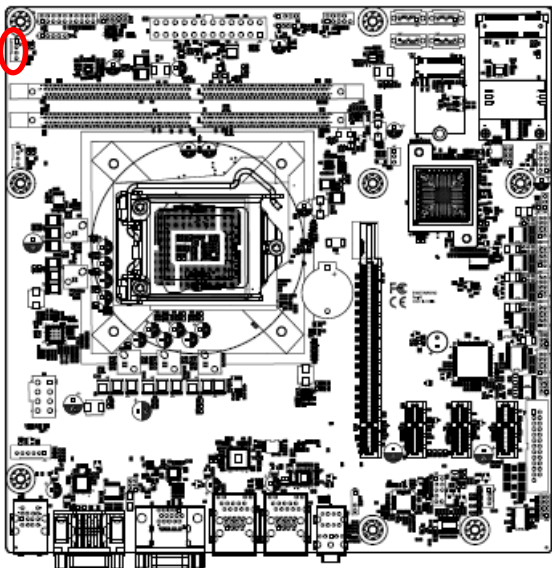
Signal	PIN
GND	1
+12V	2
SYSFANIN1	3
SYSFANOUT1	4

2.3.22   System fan connector 2 (SYSFAN3)
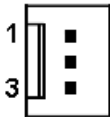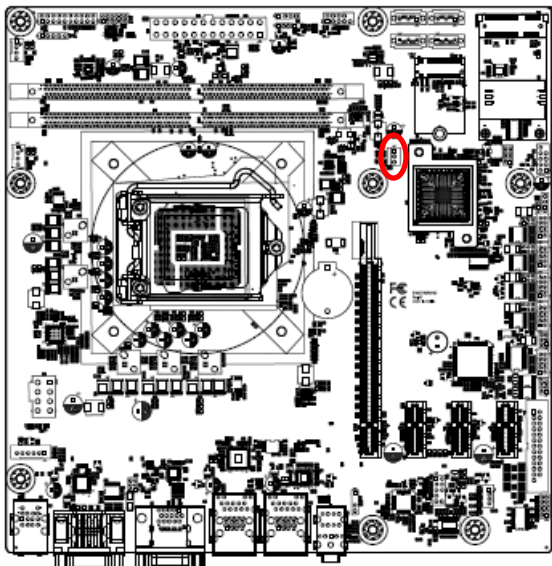
Signal	PIN
GND	1
+12V	2
SYS_FAN_IN_2	3

2.3.23   PS/2 keyboard & mouse header (JKBMS1)
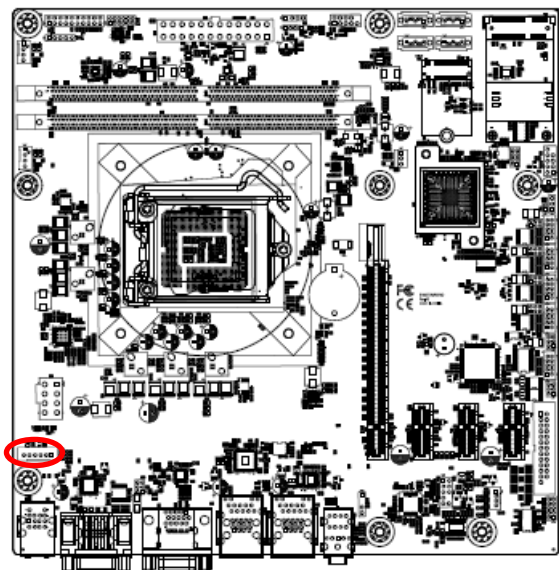
Signal	PIN
KBCK	1
KBDT	2
MSDT	3
GND	4
+5V	5
MSCK	6

2.3.24   SMBus connector (JSMB1)
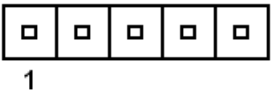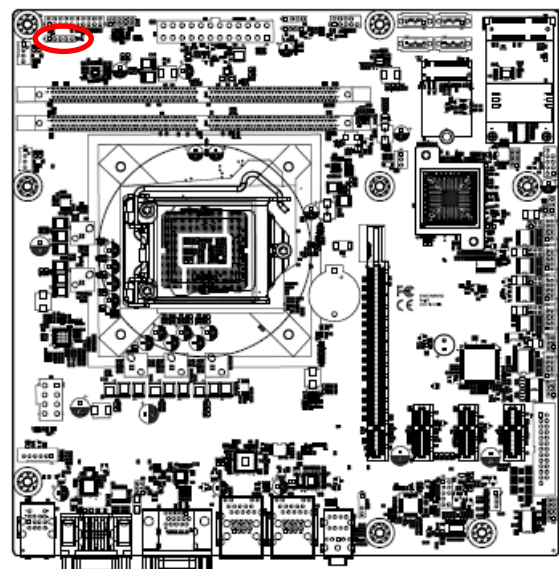
Signal	PIN
SMB_CLK_MAIN	1
SMB_DATA_MAIN	2
SMB_ALERT#_MAIN	3
GND	4
+3.3V	5

2.3.25   Auxiliary panel connector (JAUXP1)
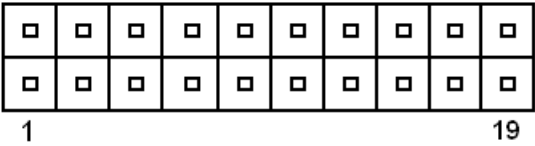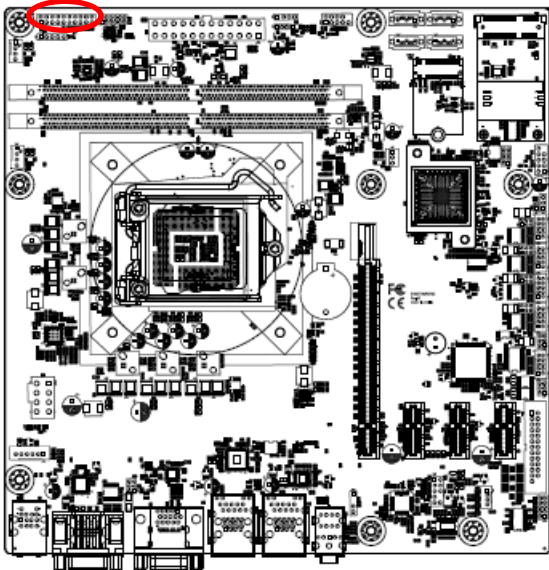
Signal	PIN	PIN	Signal
+5V	1	2	NC
NC	3	4	SMB_CLK_MAIN
CASEOPEN#	5	6	NC
GND	7	8	GND
ERROR_LED	9	10	SMB_DATA_MAIN
ERROR_LED#	11	12	+5V
FRONT_LAN1_ACT	13	14	FRONT_LAN1_LINK100#
GND	15	16	FRONT_LAN1_LINK1000#
FRONT_LAN2_ACT	17	18	FRONT_LAN2_LINK100#
GND	19	20	FRONT_LAN2_LINK1000#

2.3.26   PC Buzzer header (JBZ1)
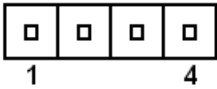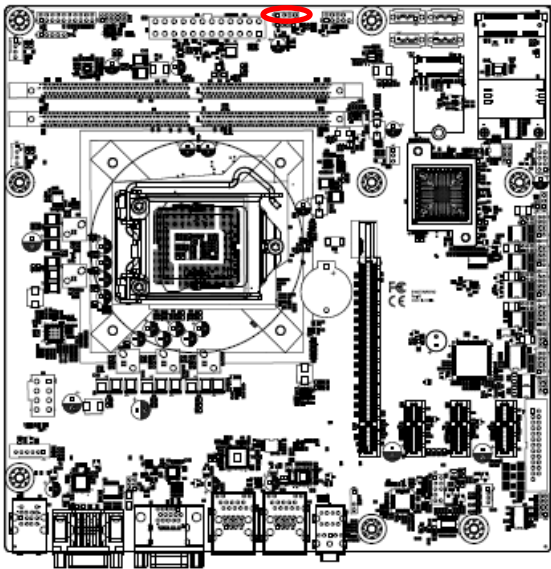
Signal	PIN
+5V	1
NC	2
NC	3
SIO_BEEP	4

2.3.27 LPT connector (JLPT1)
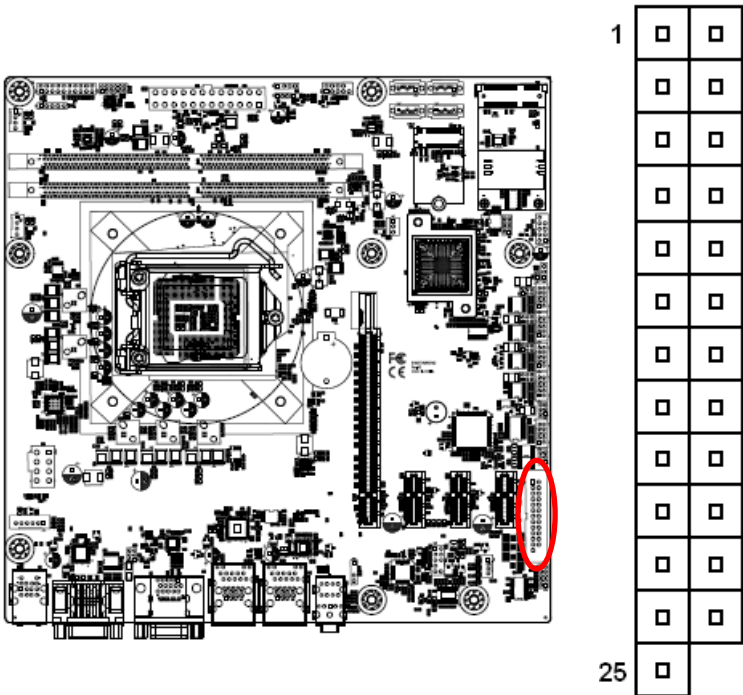
Signal	PIN	PIN	Signal
PT_STB-	1	2	PT_AFD#
PTD0	3	4	ERR#
PTD1	5	6	PT_PAR_INIT#
PTD2	7	8	PT_SLIN#
PTD3	9	10	GND
PTD4	11	12	GND
PTD5	13	14	GND
PTD6	15	16	GND
PTD7	17	18	GND
ACK#	19	20	GND
BUSY	21	22	GND
PE	23	24	GND
SLCT	25		

2.3.28 Gigabit LAN (RJ-45) connector (LAN1/2)
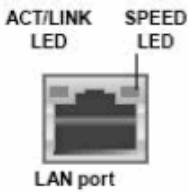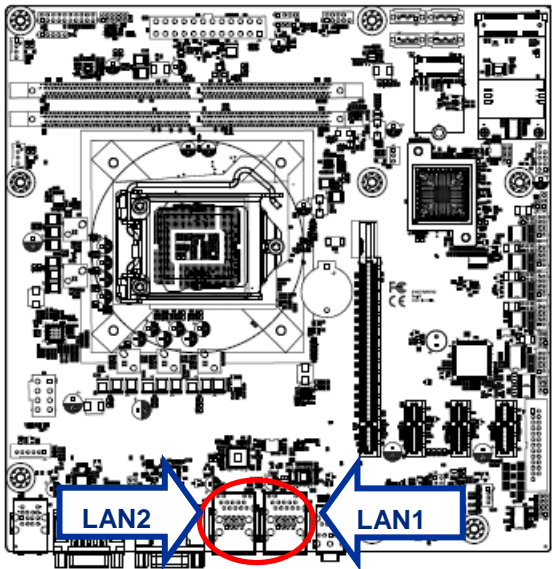
ACT/LINK LED		SPEED LED	
Status	Description	Status	Description
OFF	No Light	OFF	10Mbps connection
Orange	Linked	Green	100Mbps connection
Blinking	Data activity	Orange	1Gbps connection

Note:

This port allows Gigabit connection to a Local Area Network (LAN) through a network hub. Refer to the table below for the LAN port LED indications.

3.BIOS Setup

3.1 Introduction

The BIOS setup program allows users to modify the basic system configuration. In this following chapter will describe how to access the BIOS setup program and the configuration options that may be changed.

3.2 Starting Setup

The AMI BIOS™ is immediately activated when you first power on the computer. The BIOS reads the system information contained in the NVRAM and begins the process of checking out the system and configuring it. When it finishes, the BIOS will seek an operating system on one of the disks and then launch and turn control over to the operating system.

While the BIOS is in control, the Setup program can be activated in one of two ways:
By pressing <Del> or <F2> immediately after switching the system on, or
By pressing the <Del> or <F2> key when the following message appears briefly at the left-top of the screen during the POST (Power On Self Test).

Press <Del> or <F2> to enter SETUP

If the message disappears before you respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys. If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to.

Press F1 to Continue, DEL to enter SETUP

3.3 Using Setup

In general, you use the arrow keys to highlight items, press <Enter> to select, use the PageUp and PageDown keys to change entries, press <F1> for help and press <Esc> to quit. The following table provides more detail about how to navigate in the Setup program using the keyboard.

Button	Description
↑	Move to previous item
↓	Move to next item
←	Move to the item in the left hand
→	Move to the item in the right hand
Esc key	Main Menu -- Quit and not save changes into NVRAM Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
+ key	Increase the numeric value or make changes
- key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2 key	Previous Values.
F3 key	Optimized defaults
F4 key	Save & Exit Setup

- **Navigating Through The Menu Bar**
  Use the left and right arrow keys to choose the menu you want to be in.

  Note: Some of the navigation keys differ from one screen to another.

- **To Display a Sub Menu**
  Use the arrow keys to move the cursor to the sub menu you want. Then press <Enter>.   A "➢" pointer marks all sub menus.

3.4 Getting Help

Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window press <Esc> or the F1 key again.

3.5 In Case of Problems

If, after making and saving system changes with Setup, you discover that your computer no longer is able to boot, the AMI BIOS supports an override to the NVRAM settings which resets your system to its defaults.

The best advice is to only alter settings which you thoroughly understand. To this end, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both BIOS Vendor and your systems manufacturer to provide the absolute maximum performance and reliability. Even a seemingly small change to the chipset setup has the potential for causing you to use the override.

3.6 BIOS setup

Once you enter the Aptio Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from several setup functions and exit choices. Use the arrow keys to select among the items and press <Enter> to accept and enter the sub-menu.

3.6.1 Main Menu

This section allows you to record some basic hardware configurations in your computer and set the system clock.

```
          Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
     Main  Advanced  Chipset  Security  Boot  Save & Exit

    BIOS Information                                        Platform Information
    BIOS Vendor                    American Megatrends
    Core Version                   5.11
    Compliancy                     UEFI 2.4; PI 1.3
    Project Version                1ASOH 0.31 x64
    Build Date and Time            04/11/2016 10:09:40
    Access Level                   Administrator
    BIOS Name                      EROP_Beta006

    System Language                [English]
  ▶ Platform Information

    System Date                    [Thu 05/12/2016]
    System Time                    [06:22:43]             →←: Select Screen
                                                          ↑↓: Select Item
                                                          Enter: Select
                                                          +/-: Change Opt.
                                                          F1: General Help
                                                          F2: Previous Values
                                                          F3: Optimized Defaults
                                                          F4: Save & Exit
                                                          ESC: Exit




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```

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

    Processor Information                                  ▲
    Name                           SkyLake DT
    Brand String                   Intel(R) Core(TM)
                                   i7-6700 CPU @ 3.40GHz
    Frequency                      3400 MHz
    Processor ID                   506E3
    Stepping                       R0/S0/N0
    Number of Processors           4Core(s) / 8Thread(s)
    Microcode Revision             7C
    GT Info                        GT2

    Memory RC Version              1.9.0.0
    Total Memory                   4096 MB               →←: Select Screen
    Memory Frequency               2133 MHz              ↑↓: Select Item
                                                          Enter: Select
    PCH Information                                       +/-: Change Opt.
    Name                           SKL PCH-H             F1: General Help
    PCH SKU                        PCH-H Desktop H110 SKU F2: Previous Values
    Stepping                       31/D1                 F3: Optimized Defaults
    LAN PHY Revision               B2                    F4: Save & Exit
                                                          ESC: Exit
    ME FW Version                  11.0.0.1202
    ME Firmware SKU                Consumer SKU           ▼

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```

3.6.1.1 System Language

This option allows choosing the system default language.

3.6.1.2 System Date

Use the system date option to set the system date. Manually enter the day, month and year.

3.6.1.3 System Time

Use the system time option to set the system time. Manually enter the hours, minutes and seconds.

Note: The BIOS setup screens shown in this chapter are for reference purposes only, and may not exactly match what you see on your screen.
Visit the Avalue website (www.avalue.com.tw) to download the latest product and BIOS information.

3.6.2 Advanced Menu

This section allows you to configure your CPU and other system devices for basic operation through the following sub-menus.

```
         Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
     Main  Advanced  Chipset  Security  Boot  Save & Exit

 ▶ Trusted Computing                              Trusted Computing Settings
 ▶ ACPI Settings
 ▶ PCH-FW Configuration
 ▶ Super IO Configuration
 ▶ NCT6106D HW Monitor
 ▶ S5 RTC Wake Settings
 ▶ Serial Port Console Redirection
 ▶ CPU Configuration
 ▶ Intel TXT Information
 ▶ SATA Configuration
 ▶ AMI Graphic Output Protocol Policy
 ▶ Network Stack Configuration
 ▶ CSM Configuration
 ▶ USB Configuration
                                                 →←: Select Screen
                                                 ↑↓: Select Item
                                                 Enter: Select
                                                 +/-: Change Opt.
                                                 F1: General Help
                                                 F2: Previous Values
                                                 F3: Optimized Defaults
                                                 F4: Save & Exit
                                                 ESC: Exit



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```

3.6.2.1 Trusted Computing

Item	Options	Description
Security Device Support	Disable, Enable**[Default]**	Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1Ainterface will not be available.

3.6.2.2 APCI Settings
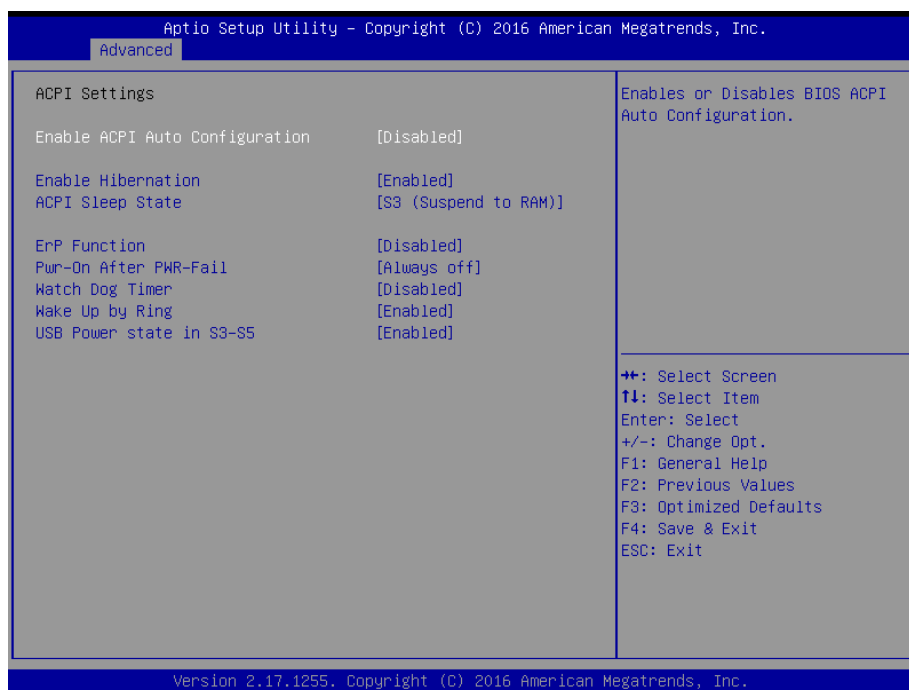
ERX-H110P User's Manual

Item	Options	Description
Enable ACPI Auto Configuration	Disabled**[Default]**, Enabled	Enables or Disables BIOS ACPI Auto Configuration.
Enable Hibernation	Disabled Enabled**[Default]**,	Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.
ACPI Sleep State	Suspend Disabled, S3 (Suspend to RAM)**[Default]**	Select the highest ACPI sleep state the system will enter when the SUSPEDN button is pressed.
ErP Function	Disabled**[Default]**, Enabled	ErP Function (Deep S5).
Pwr-On After PWR-Fail	Always Off**[Default]** Always On Keep Last state	Specify what state to go to when power is re-applied after a power failure (G3 state).
Watch Dog Timer	Disabled**[Default]**, 30 sec 40 sec 50 sec 1 min 2 min 10 min 30 min	Select Watch Dog Timer (WDT) Mode.
Wake Up by Ring	Disabled Enabled**[Default]**,	Enable/Disable system waked up by Ring signal from standby states (S3~S5).
USB Power state in S3-S5	Disabled Enabled**[Default]**,	Enable/Disable USB Power delivery in S3 (Sleep), S4 (Hibernate) and S5 (Soft Off) States.

3.6.2.3 PCH-FW Configuration
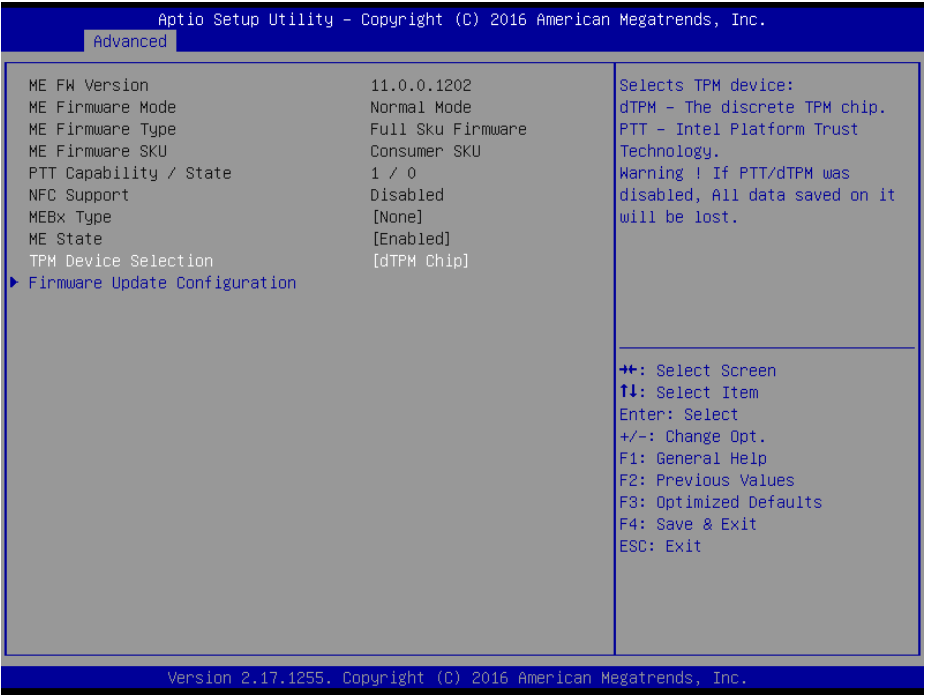
Item	Options	Description
TPM Device Selection	dTPM Chip**[Default]**, PTT	Selects TPM device: dTPM – The discrete TPM chip. PTT – Intel Platform Trust Technology. Warning! If PTT/dTPM was disabled, All data saved on it will be lost.

3.6.2.3.1 Firmware Update Configuration
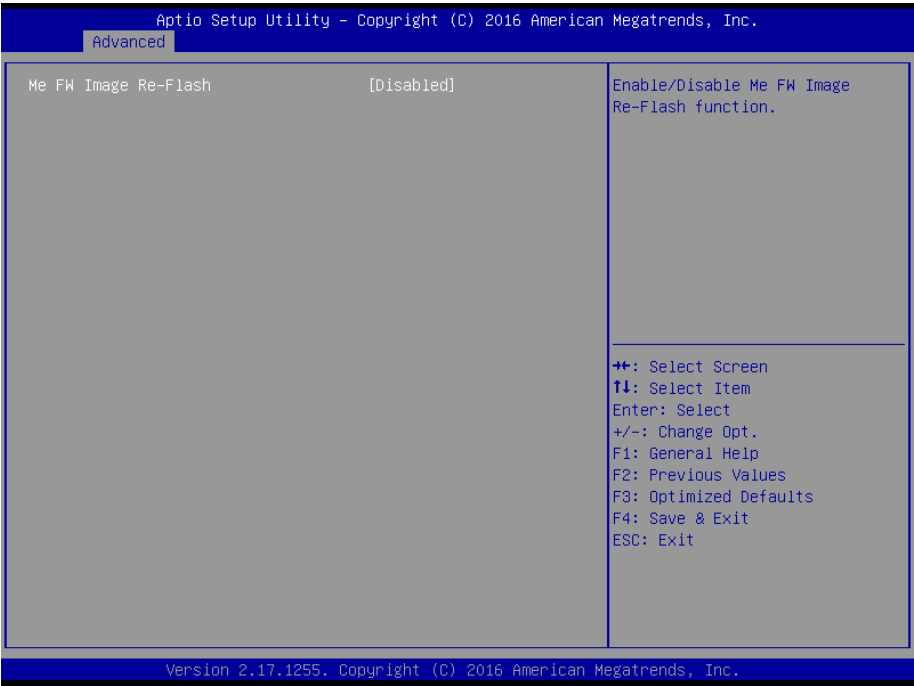
Item	Option	Description
ME FW Image Re-Flash	Disabled**[Default]**, Enabled	Enable/Disable Me FW Image Re-Flash function.

3.6.2.4 Super IO Configuration

You can use this item to set up or change the Super IO configuration for serial ports. Please refer to 3.6.2.4.1~ 3.6.2.4.6 for more information.

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

     Super IO Configuration                                  Set Parameters of Serial Port
                                                             1 (COMA)
     Super IO Chip                      NCT6106D
   ▶ Serial Port 1 Configuration
   ▶ Serial Port 2 Configuration
   ▶ Serial Port 3 Configuration
   ▶ Serial Port 4 Configuration
   ▶ Serial Port 5 Configuration
   ▶ Serial Port 6 Configuration



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




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```

Item	Description
Serial Port 1 Configuration	Set Parameters of Serial Port 1 (COMA).
Serial Port 2 Configuration	Set Parameters of Serial Port 2 (COMB).
Serial Port 3 Configuration	Set Parameters of Serial Port 3 (COMC).
Serial Port 4 Configuration	Set Parameters of Serial Port 4 (COMD).
Serial Port 5 Configuration	Set Parameters of Serial Port 5 (COME).
Serial Port 6 Configuration	Set Parameters of Serial Port 6 (COMF).

3.6.2.4.1 Serial Port 1 Configuration
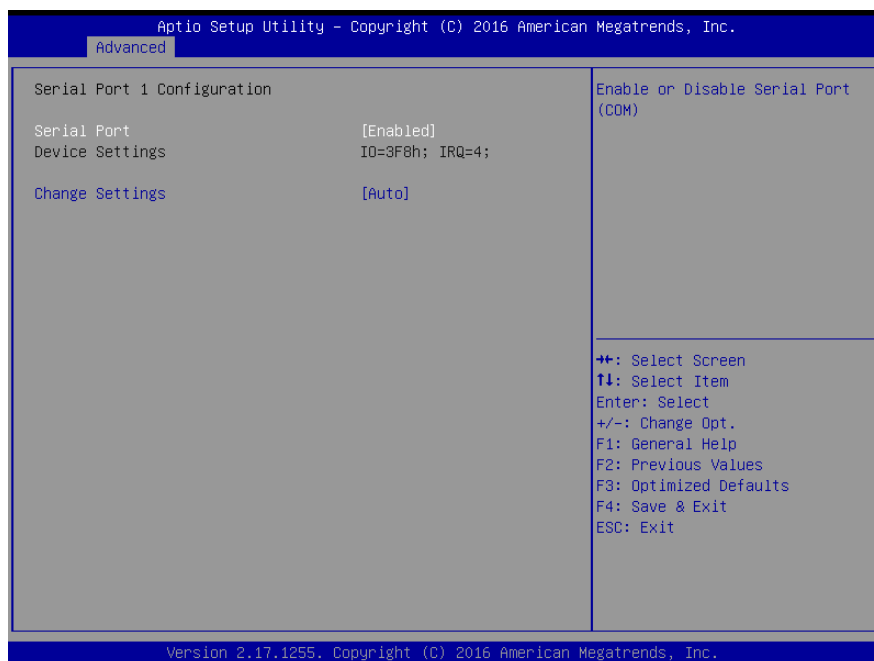
```
                Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
        Advanced

   Serial Port 1 Configuration                            Enable or Disable Serial Port
                                                          (COM)
   Serial Port                        [Enabled]
   Device Settings                    IO=3F8h; IRQ=4;

   Change Settings                    [Auto]




                                                          ─────────────────────────
                                                          →←: 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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```

Item	Option	Description
Serial Port	Enabled**[Default]**, Disabled	Enable or Disable Serial Port (COM).
Change Settings	Auto**[Default]**	Select an optimal setting for Super IO Device.

3.6.2.4.2 Serial Port 2 Configuration
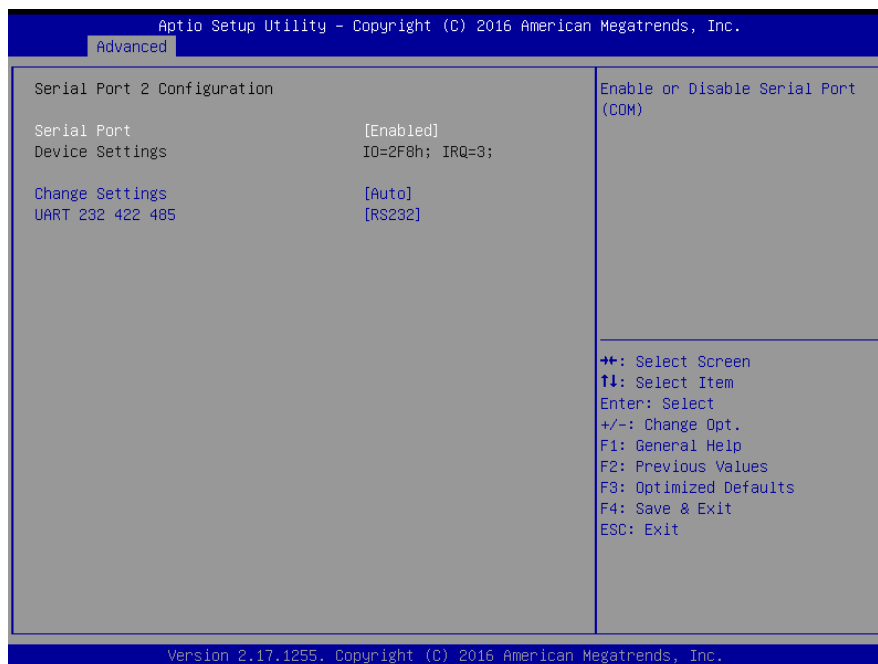
```
                Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
        Advanced

   Serial Port 2 Configuration                            Enable or Disable Serial Port
                                                          (COM)
   Serial Port                        [Enabled]
   Device Settings                    IO=2F8h; IRQ=3;

   Change Settings                    [Auto]
   UART 232 422 485                   [RS232]




                                                          ─────────────────────────
                                                          →←: 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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```

Item	Option	Description
Serial Port	Enabled**[Default]**, Disabled	Enable or Disable Serial Port (COM).

Change Settings	Auto**[Default]**	Select an optimal setting for super IO Device.
UART 232 422 485	RS232**[Default]** RS422 RS485	Set COM Port as RS232, RS422 or RS485 mode.

3.6.2.4.3 Serial Port 3 Configuration
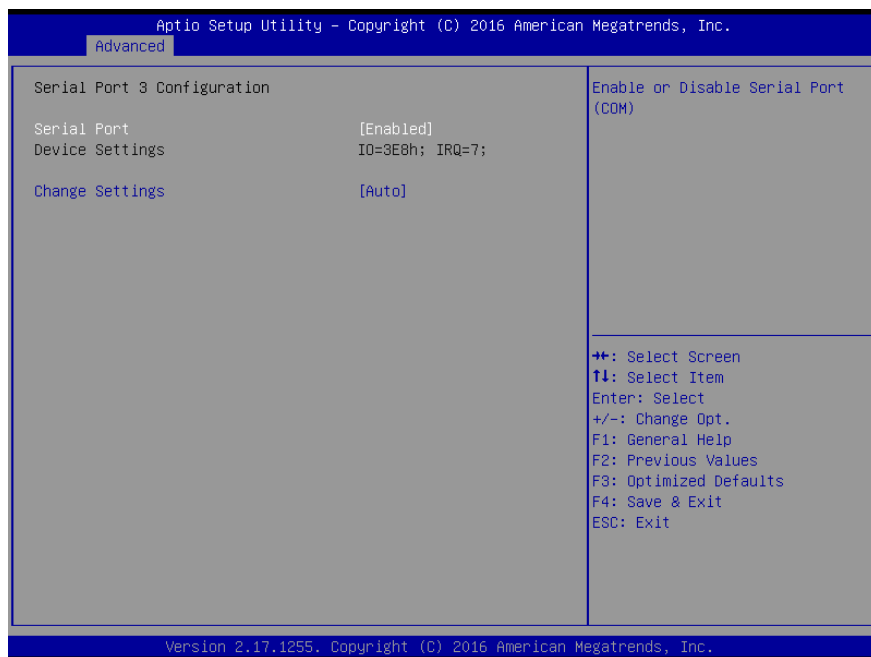
Item	Option	Description
Serial Port	Enabled**[Default]**, Disabled	Enable or Disable Serial Port (COM).
Change Settings	Auto**[Default]**	Select an optimal setting for Super IO Device.

3.6.2.4.4 Serial Port 4 Configuration
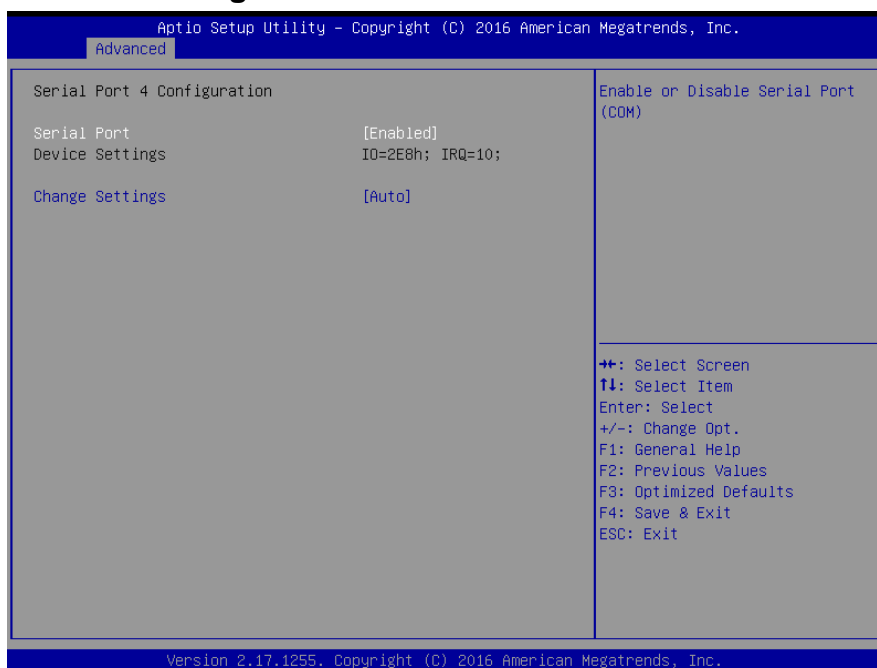
Item	Option	Description
Serial Port	Enabled**[Default]**, Disabled	Enable or Disable Serial Port (COM).
Change Settings	Auto**[Default]**	Select an optimal setting for super IO Device.

3.6.2.4.5 Serial Port 5 Configuration
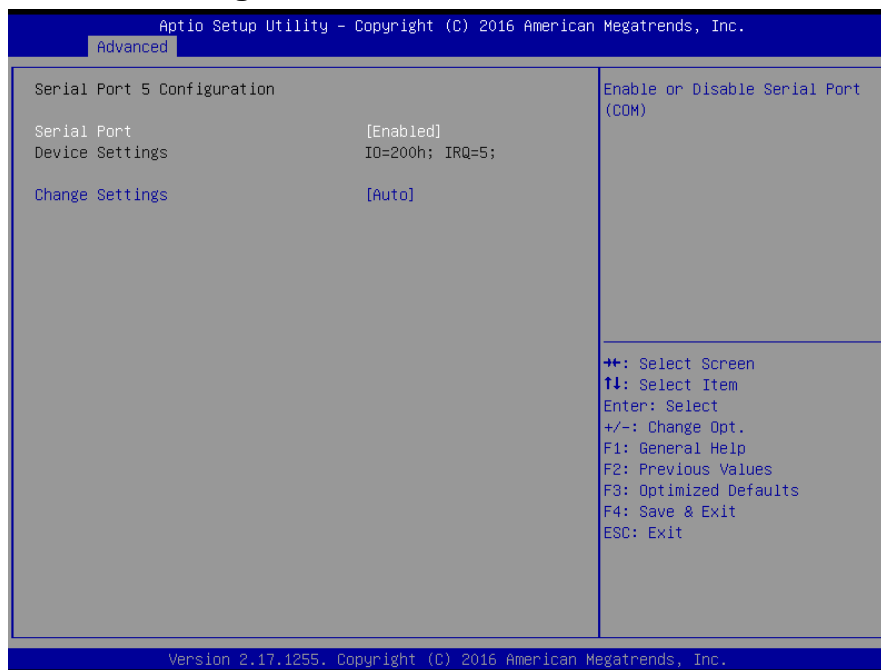
Item	Option	Description
Serial Port	Enabled**[Default]**, Disabled	Enable or Disable Serial Port (COM).
Change Settings	Auto**[Default]**	Select an optimal setting for super IO Device.

3.6.2.4.6 Serial Port 6 Configuration

Item	Option	Description
Serial Port	Enabled**[Default]**, Disabled	Enable or Disable Serial Port (COM).
Change Settings	Auto**[Default]**	Select an optimal setting for super IO Device.

3.6.2.5   NCT6106D H/W Monitor

3.6.2.5.1 Smart Fan Configuration

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

        NCT6106D Smart Fan Configuration                              Smart Fan Mode Selection:
                                                                     Manual Mode (No Smart Fan),
        CPU Fan Mode                        [Manual]                 SmartFan IV(TM) Mode.
        CPU Fan Manual Duty                 255

        SYSFAN1 Mode                        [SmartFan IV]


                                                                     ──────────────────────────
                                                                     →←: 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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```

Item	Option	Description
CPU Fan Mode	Manual**[Default]**, SmartFan IV	Smart Fan Mode Selection: Manual Mode (No Smart Fan), SmartFan IV™ Mode.
CPU Fan Manual Duty	0-255	CPU Fan manual output duty: 0 to 255.
SYSFAN1 Mode	Manual SmartFan IV**[Default]**,	Smart Fan Mode Selection: Manual Mode (No Smart Fan), SmartFan IV™ Mode.

3.6.2.6 S5 RTC Wake Settings

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

        Wake system from S5               [Disabled]                 Enable or disable System wake
                                                                     on alarm event. Select
                                                                     FixedTime, system will wake on
                                                                     the hr::min::sec specified.
                                                                     Select DynamicTime , System
                                                                     will wake on the current time
                                                                     + Increase minute(s)




                                                                     →←: 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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```

Item	Options	Description
Wake system from S5	Disabled**[Default]**, Fixed Time Dynamic Time	Enable or disable System wake on alarm event. Select Fixed Time, system will wake on the hr::min::sec specified. Select Dynamic Time, System will wake on the current time + Increase minute(s).

3.6.2.7 Serial Port Console Redirection
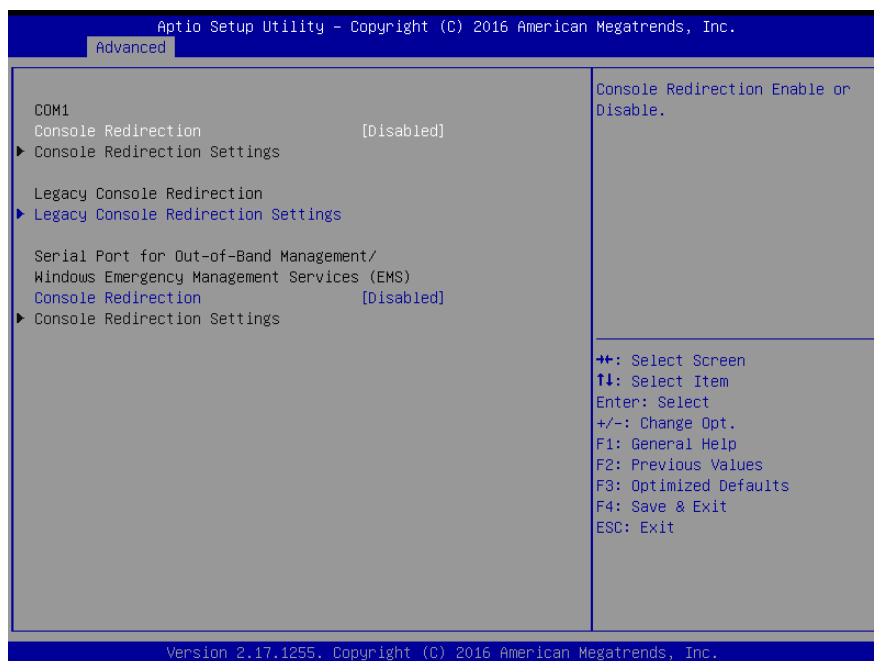
Item	Options	Description
Console Redirection	Disabled**[Default]**, Enabled	Console Redirection Enable or Disable.

3.6.2.7.1 Legacy Console Redirection Settings
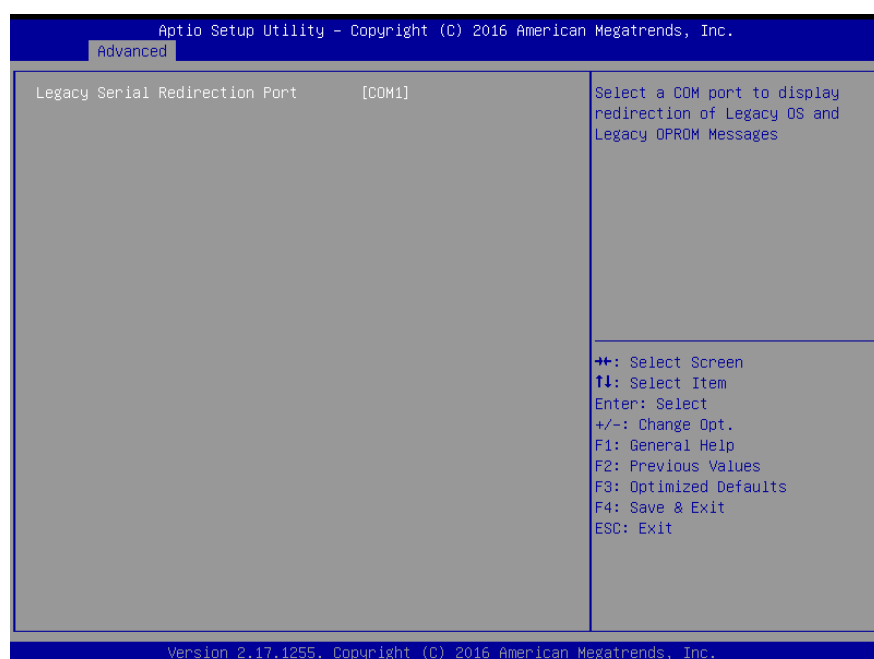
Item	Option	Description
Legacy Serial Redirection Port	COM1**[Default]**	Select a COM port to display redirection of Legacy OS and Legacy OPROM Messages.

3.6.2.8   CPU Configuration

Use the CPU configuration menu to view detailed CPU specification and configure the CPU.
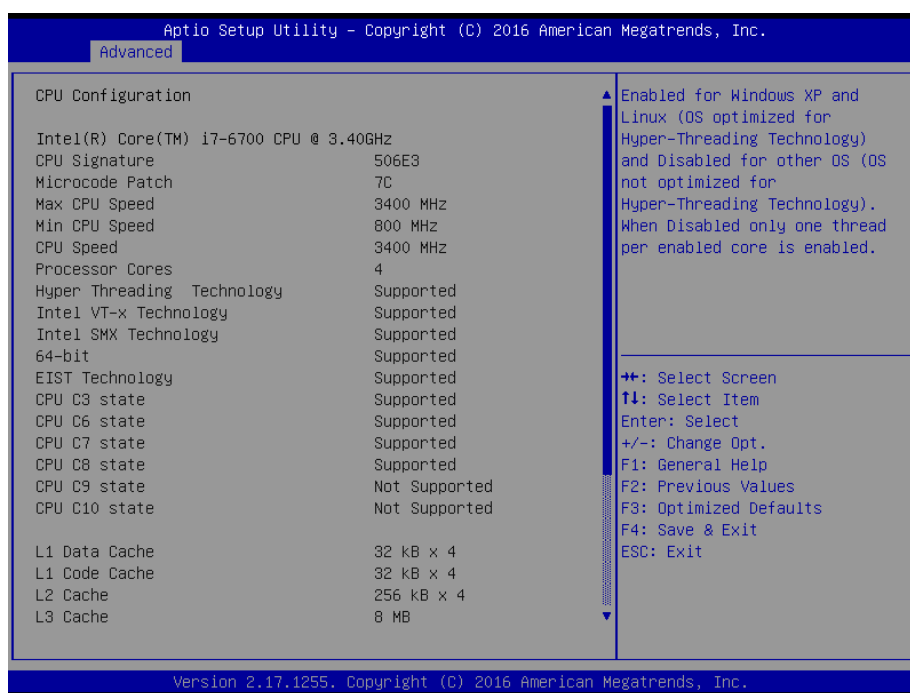
3.6.2.9   Intel TXT Configuration

3.6.2.10 SATA Configuration

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

      SATA Controller(s)                [Enabled]              Enable or disable SATA Device.
      SATA Mode Selection               [AHCI]
    ▶ Software Feature Mask Configuration

      Serial ATA Port 0                 Empty
         Software Preserve              Unknown
         Port 0                         [Enabled]
         SATA Device Type               [Hard Disk Drive]
         Topology                       [Flex]
      Serial ATA Port 1                 Empty
         Software Preserve              Unknown
         Port 1                         [Enabled]
         SATA Device Type               [Hard Disk Drive]
         Topology                       [Flex]                →←: Select Screen
      Serial ATA Port 2                 Empty                 ↑↓: Select Item
         Software Preserve              Unknown               Enter: Select
         Port 2                         [Enabled]             +/-: Change Opt.
         SATA Device Type               [Hard Disk Drive]     F1: General Help
         Topology                       [Flex]                F2: Previous Values
      Serial ATA Port 3                 Empty                 F3: Optimized Defaults
         Software Preserve              Unknown               F4: Save & Exit
         Port 3                         [Enabled]             ESC: Exit
         SATA Device Type               [Hard Disk Drive]
         Topology                       [Flex]


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```

Item	Options	Description
SATA Controller(s)	Disabled, Enabled**[Default]**	Enable or disable SATA Device.
SATA Mode Selection	AHCI**[Default]**	Determines how SATA controller(s) operate.
Port 0/1/2/3	Disabled, Enabled**[Default]**	Enable or Disable SATA Port.
SATA Device Type	Hard Disk Drive**[Default]** Solid State Drive	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.

3.6.2.10.1 Software Feature Mask Configuration
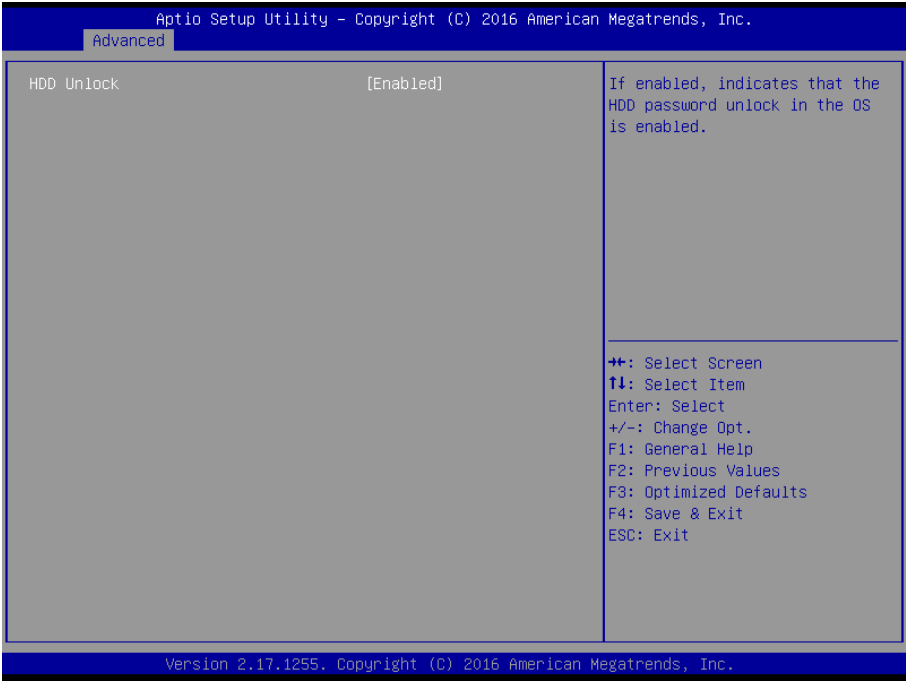
Item	Option	Description
HDD Unlock	Disabled Enabled**[Default]**,	If enabled, indicates that the HDD password unlock in the OS is enabled.

3.6.2.11 AMI Graphic Output Protocol Policy
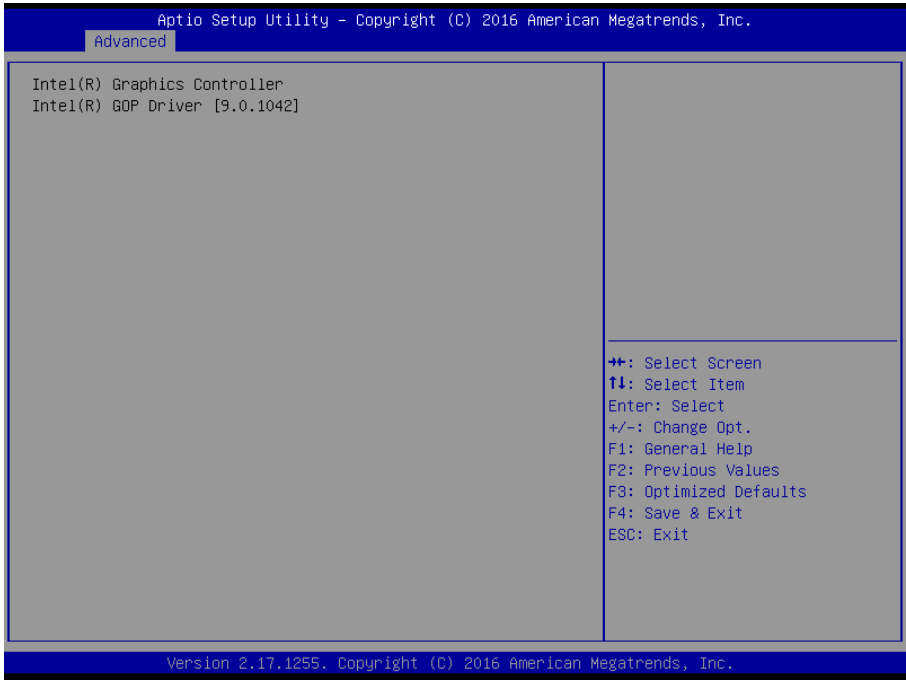
3.6.2.12 Network Stack Configuration
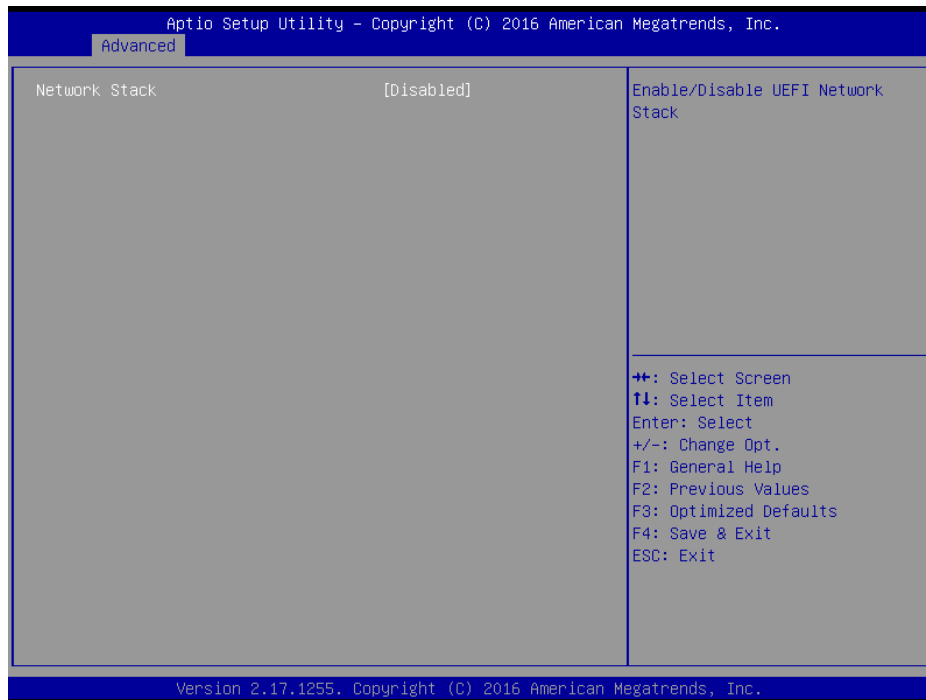
Item	Options	Description
Network Stack	Enabled Disabled**[Default]**	Enable/Disable UEFI Network Stack.

3.6.2.13 CSM Configuration
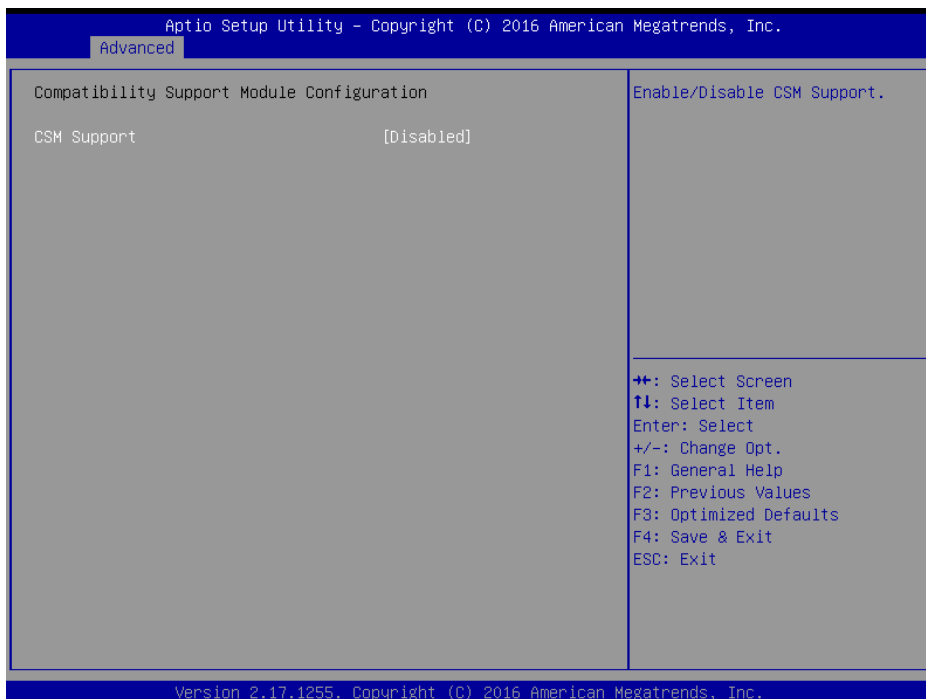
Item	Options	Description
CSM Support	Enabled Disabled**[Default]**	Enable/Disable CSM Support.

3.6.2.14 USB Configuration

The USB Configuration menu helps read USB information and configures USB settings.

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

    USB Configuration                                       This is a workaround for OSes
                                                            without XHCI hand-off support.
    USB Module Version              14                      The XHCI ownership change
                                                            should be claimed by XHCI
    USB Controllers:                                        driver.
        1 XHCI
    USB Devices:
        1 Drive

    XHCI Hand-off                   [Disabled]
    Port 60/64 Emulation            [Disabled]

    USB hardware delays and time-outs:
    USB transfer time-out           [20 sec]                →←: Select Screen
    Device reset time-out           [20 sec]                ↑↓: Select Item
    Device power-up delay           [Auto]                  Enter: Select
                                                            +/-: Change Opt.
    Mass Storage Devices:                                   F1: General Help
    hp v220w 1100                   [Auto]                  F2: Previous Values
                                                            F3: Optimized Defaults
                                                            F4: Save & Exit
                                                            ESC: Exit


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```

Item	Options	Description
XHCI Hand-off	Enabled Disabled**[Default]**	This is a workaround for OSew without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
Port 60/64 Emulation	Enabled Disabled**[Default]**	Enables I/O port 60h/64h emulation support. This should be enabled for the completer USB keyboard legacy support for non-USB aware OSes.
USB transfer time-out	1 sec 5 sec 10 sec 20 sec**[Default]**	The time-out value for Control, Bulk, and Interrupt transfers.
Device reset time-out	10 sec 20 sec**[Default]** 30 sec 40 sec	USB mass storage device Start Unit command time-out.
Device power-up delay	Auto**[Default]** Manual	Maximum time the device will take before it properly reports itself to the Host Controller. 'Auto' uses default value: for a Root port it is 100ms, for a Hub port the delay is taken form Hub descriptor.
Mass Storage Devices	Auto**[Default]** Floppy Forced FDD Hard Disk CD-ROM	Mass storage device emulation type. 'AUTO' enumerates devices according to their media format. Optical drives are emulated as 'CDROM', drives with no media will be emulated according to a drive type.

3.6.3 Chipset

```
            Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
        Main   Advanced   Chipset   Security   Boot   Save & Exit

 ▶ System Agent (SA) Configuration                          System Agent (SA) Parameters
 ▶ PCH-IO Configuration




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



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```

3.6.3.1 System Agent (SA) Configuration

```
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                  Chipset

 System Agent Bridge Name        Skylake                    VT-d capability
 SA PCIe Code Version            1.9.0.0
 VT-d                            Supported

 VT-d                            [Enabled]

 ▶ Graphics Configuration
 ▶ DMI/OPI Configuration
 ▶ PEG Port Configuration
 ▶ Memory Configuration
 ▶ GT - Power Management Control

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



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```

Item	Option	Description
VT-d	Enabled**[Default]** Disabled	VT-d capability.

3.6.3.1.1 Graphics Configuration

```
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          Chipset

  Graphics Configuration                                   If Enable, it will not scan
                                                           for External Gfx Card on PEG
                                                           and PCH PCIE Ports
  Skip Scaning of External Gfx Card     [Disabled]
  Primary Display                       [Auto]
  Internal Graphics                     [Auto]




                                                           ++: 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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```

Item	Option	Description
Skip Scanning of External Gfx Card	Enabled Disabled**[Default]**	If Enable, it will not scan for External Gfx Card on PEG and PCH PCIE Ports.
Primary Display	Auto**[Default]** IGFX PEG PCIE	Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select SG for Switchable Gfx.
Internal Graphics	Auto **[Default]** Disabled Enabled	Keep IGFX enabled based on the setup options.

3.6.3.1.2 DMI/OPI Configuration

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

        DMI/OPI Configuration

        DMI                              X4  Gen2




                                                                        ↔: 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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```

3.6.3.1.3 PEG Port Configuration

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

        PEG Port Configuration                                 Enable or Disable the Root Port

        PCI-E x16 Slot                  Not Present
          Enable Root Port              [Auto]
          Max Link Speed                [Auto]

        Detect Non-Compliance Device    [Disabled]
        Program PCIe ASPM after OpROM    [Disabled]




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




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```

Item	Option	Description
Enable Root Port	Disabled Enabled Auto**[Default]**	Enable or Disable the Root Port.
Max Link Speed	Auto**[Default]** Gen1 Gen2 Gen3	Configure PCI-E x16 Slot Max Speed.

Detect Non-Compliance Device	Disabled**[Default]** Enabled	Detect Non-Compliance PCI Express Device in PEG.
Program PCIe ASPM after OpROM	Disabled**[Default]** Enabled	Enabled: PCIe ASPM will be programmed after OpROM. Disabled: PCIe ASPM will be programmed before OpROM.

3.6.3.1.4 Memory Configuration

Item	Option	Description
Maximum Memory Frequency	Auto**[Default]** 1067/1200/1333/1400/1600 /1800/1867/2000/2133/2200 /2400/2600/2667/2800/2933 /3000/3200	Maximum Memory Frequency Selections in Mhz.

3.6.3.1.5 GT – Power Management Control

Item	Option	Description
RC6 (Render Standby)	Disabled Enabled**[Default]**	Check to enable render standby support.

3.6.3.2   PCH-IO Configuration

Item	Option	Description
LAN PHY Controller	Disabled Enabled**[Default]**	Enable or disable OnBoard PCH LAN PHY Controller.
Serial IRQ Mode	Quiet Continuous**[Default]**	Configure Serial IRQ Mode.

3.6.3.2.1 PCI Express Configuration
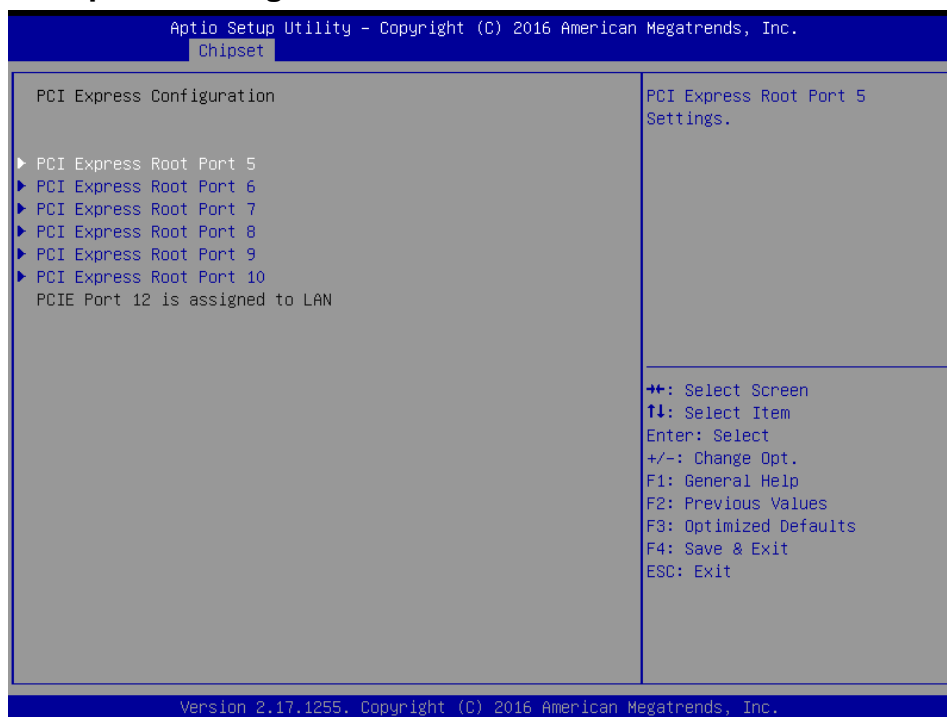
3.6.3.2.1.1 PCI Express Root Port 5

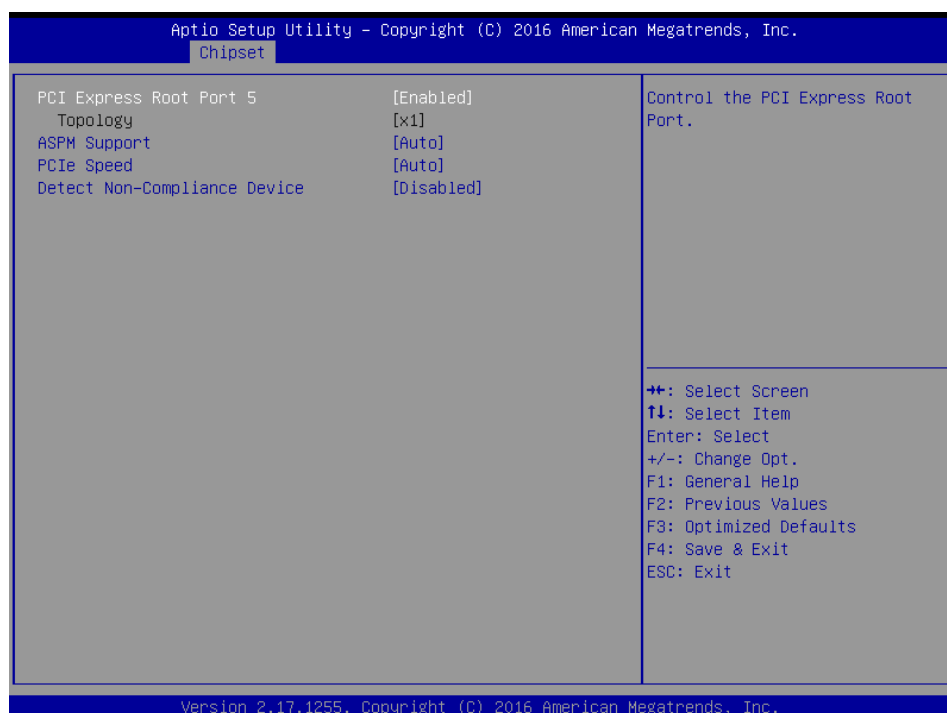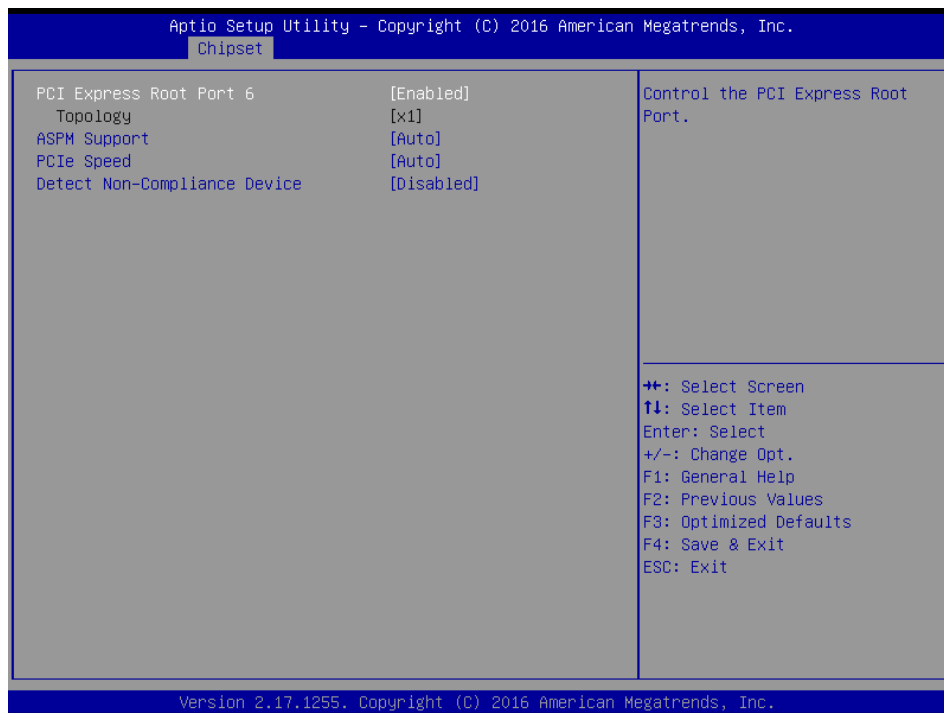| Item	Option	Description
PCI Express Root Port 5	Enabled**[Default]**, Disabled	Control the PCI Express Root Port.
ASPM Support	Disabled L0s L1 L0sL1 Auto**[Default]**	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
PCIe Speed	Auto**[Default]** Gen1 Gen2	Select PCI Express port speed.
Detect Non-Compliance Device	Disabled**[Default]**, Enabled	Detect Non-Compliance PCI Express Device. If enable, it will take more time at POST time.

3.6.3.2.1.2 PCI Express Root Port 6

```
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  Chipset

PCI Express Root Port 6          [Enabled]          Control the PCI Express Root
  Topology                       [x1]               Port.
ASPM Support                     [Auto]
PCIe Speed                       [Auto]
Detect Non-Compliance Device     [Disabled]




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



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```

Item	Option	Description
PCI Express Root Port 6	Enabled**[Default]**, Disabled	Control the PCI Express Root Port.
ASPM Support	Disabled L0s L1 L0sL1 Auto**[Default]**	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
PCIe Speed	Auto**[Default]** Gen1 Gen2	Select PCI Express port speed.

	Disabled**[Default]**, Enabled	Detect Non-Compliance PCI Express Device. If enable, it will take more time at POST time.
Detect Non-Compliance Device		

3.6.3.2.1.3 PCI Express Root Port 7

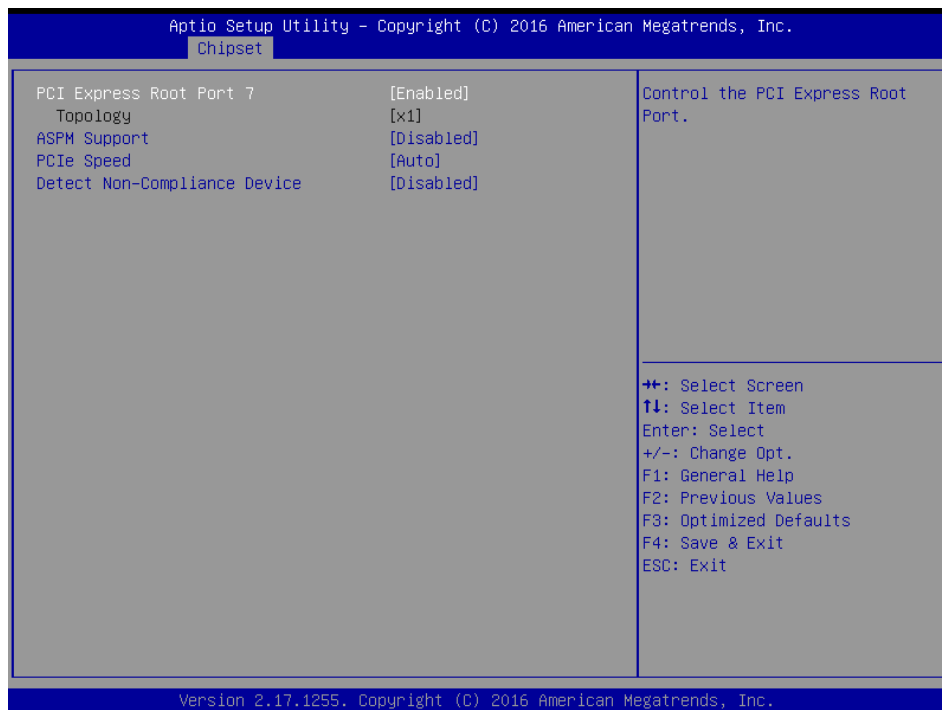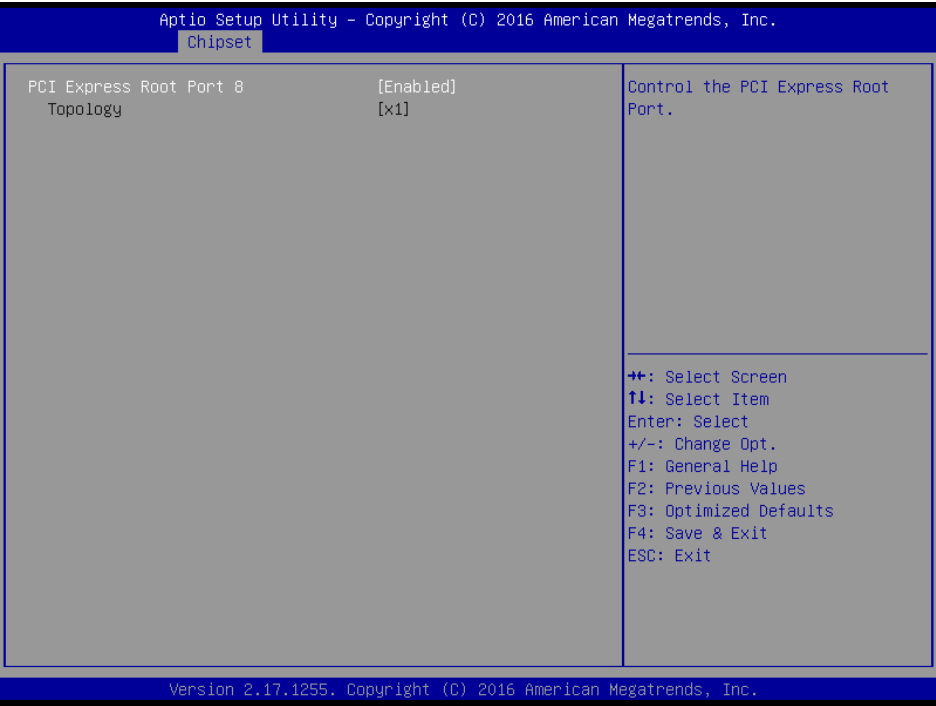| Item	Option	Description
PCI Express Root Port 7	Enabled**[Default]**, Disabled	Control the PCI Express Root Port.
ASPM Support	Disabled**[Default]** L0s L1 L0sL1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
PCIe Speed	Auto**[Default]** Gen1 Gen2	Select PCI Express port speed.
Detect Non-Compliance Device	Disabled**[Default]**, Enabled	Detect Non-Compliance PCI Express Device. If enable, it will take more time at POST time.

3.6.3.2.1.4 PCI Express Root Port 8

Item	Option	Description
PCI Express Root Port 8	Enabled**[Default]**, Disabled	Control the PCI Express Root Port.

3.6.3.2.1.5 PCI Express Root Port 9
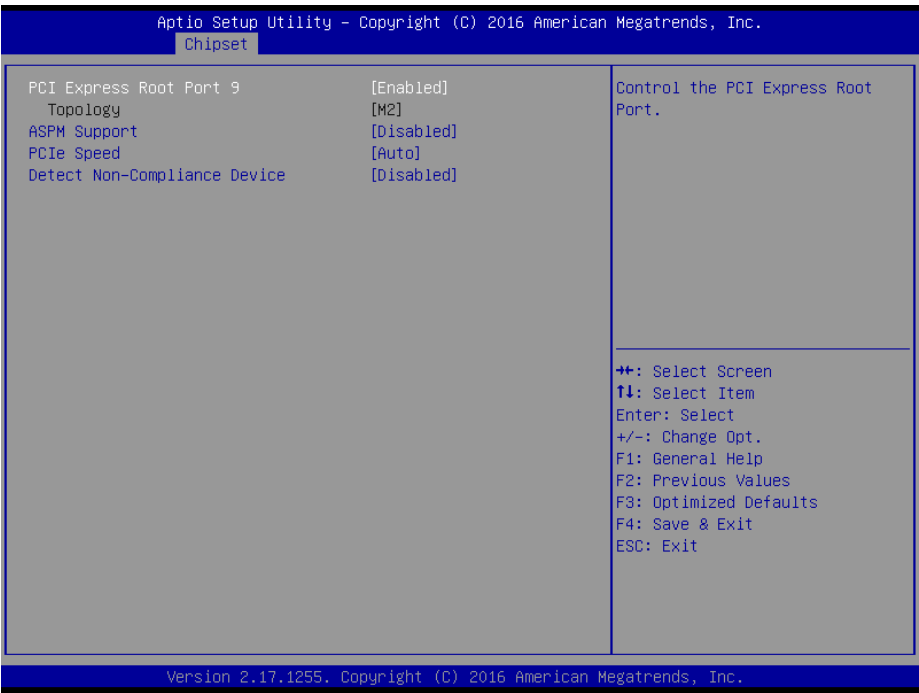
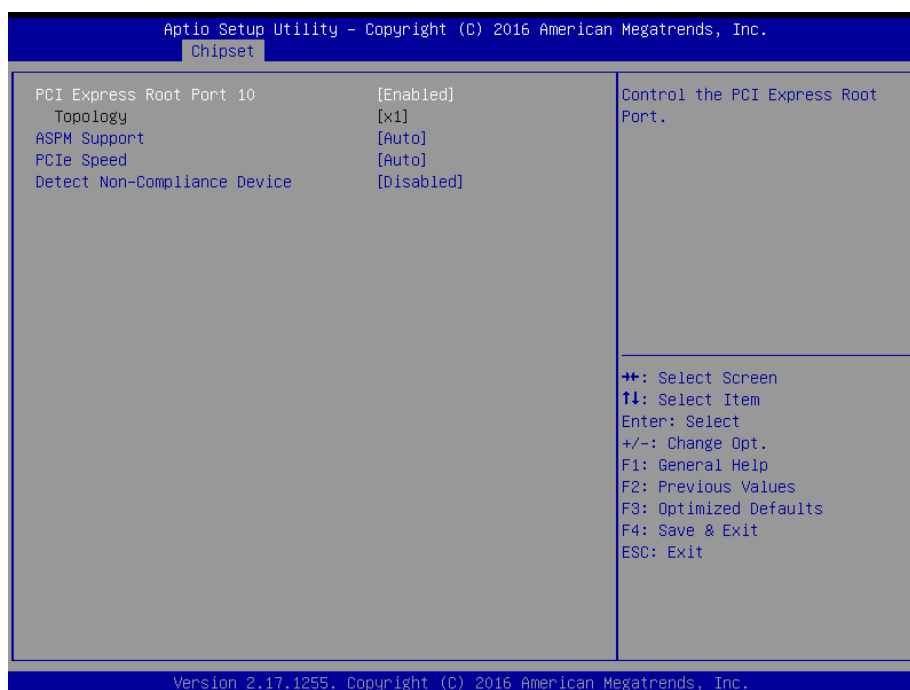| Item	Option	Description
PCI Express Root Port 9	Enabled**[Default]**, Disabled	Control the PCI Express Root Port.
ASPM Support	Disabled**[Default]** L0s L1 L0sL1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
PCIe Speed	Auto**[Default]** Gen1 Gen2	Select PCI Express port speed.
Detect Non-Compliance Device	Disabled**[Default]**, Enabled	Detect Non-Compliance PCI Express Device. If enable, it will take more time at POST time.

3.6.3.2.1.6 PCI Express Root Port 10

```
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 Chipset

 PCI Express Root Port 10          [Enabled]            Control the PCI Express Root
   Topology                        [x1]                 Port.
 ASPM Support                      [Auto]
 PCIe Speed                        [Auto]
 Detect Non-Compliance Device      [Disabled]




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




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```

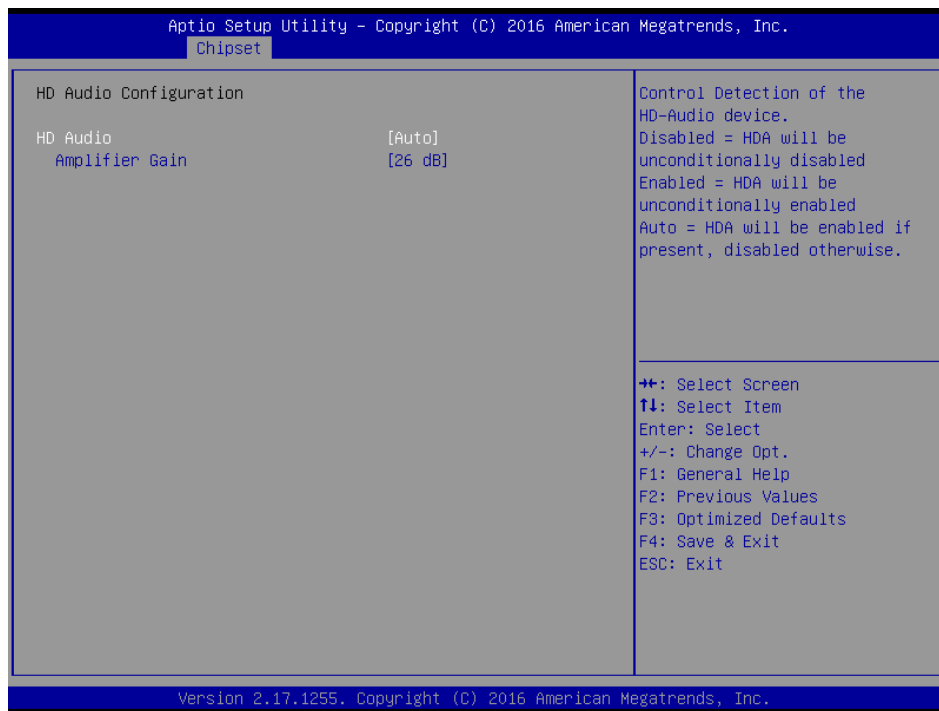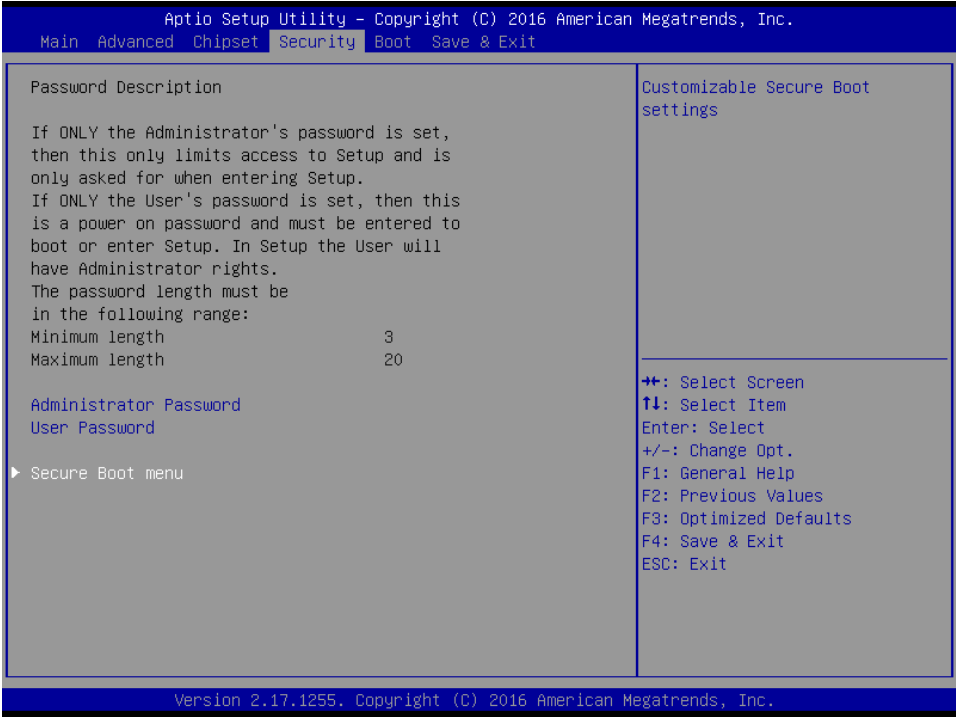| Item	Option	Description
PCI Express Root Port 10	Enabled**[Default]**, Disabled	Control the PCI Express Root Port.
ASPM Support	Disabled L0s L1 L0sL1 Auto**[Default]**	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
PCIe Speed	Auto**[Default]** Gen1 Gen2	Select PCI Express port speed.
Detect Non-Compliance Device	Disabled**[Default]**, Enabled	Detect Non-Compliance PCI Express Device. If enable, it will take more time at

		POST time.

3.6.3.2.2 HD Audio Configuration

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

  HD Audio Configuration                            Control Detection of the
                                                    HD-Audio device.
  HD Audio                          [Auto]          Disabled = HDA will be
    Amplifier Gain                  [26 dB]         unconditionally disabled
                                                    Enabled = HDA will be
                                                    unconditionally enabled
                                                    Auto = HDA will be enabled if
                                                    present, disabled otherwise.


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


            Version 2.17.1255. Copyright (C) 2016 American Megatrends, Inc.
```
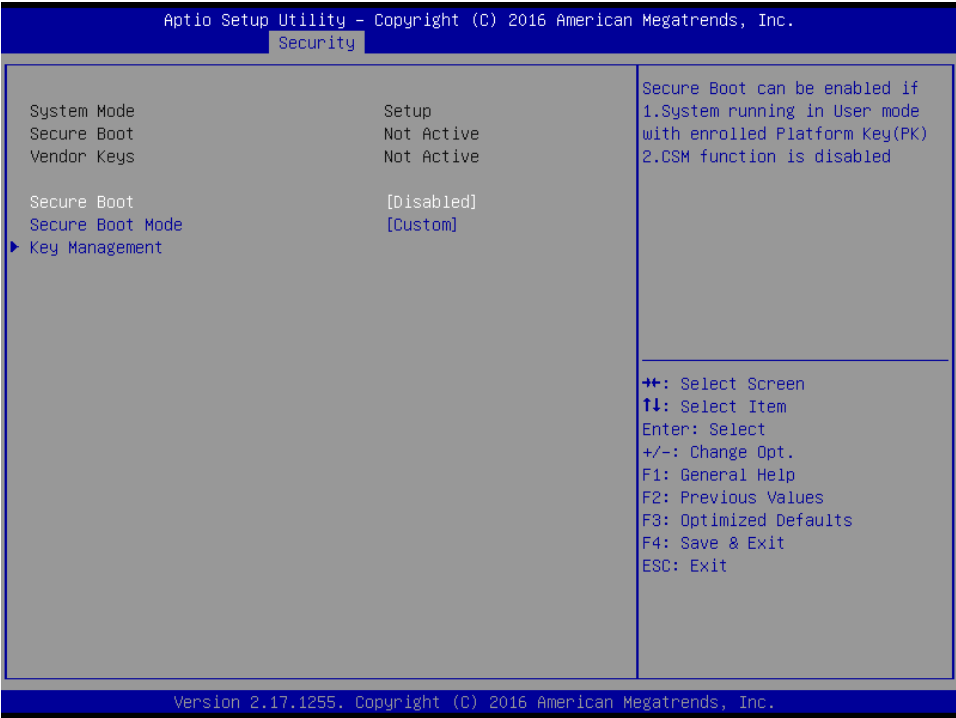
Item	Option	Description
HD Audio	Disabled Enabled Auto**[Default]**,	Control Detection of the HD-Audio device. Disable = HAD will be unconditionally disabled Enabled = HAD will be unconditionally enabled Auto = HAD will be enabled if present, disabled otherwise.
Amplifier Gain	20dB 26dB**[Default]** 32dB 36dB	Select Amplifier Gain (dB).

3.6.4   Security

```
                    Aptio Setup Utility – Copyright (C) 2016 American Megatrends, Inc.
       Main  Advanced  Chipset   Security  Boot  Save & Exit

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


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```

● **Administrator Password**

Set setup Administrator Password

● **User Password**

Set User Password

3.6.4.1   Secure Boot menu

```
                    Aptio Setup Utility – Copyright (C) 2016 American Megatrends, Inc.
                                        Security

                                                            Secure Boot can be enabled if
  System Mode                   Setup                       1.System running in User mode
  Secure Boot                   Not Active                  with enrolled Platform Key(PK)
  Vendor Keys                   Not Active                  2.CSM function is disabled

  Secure Boot                   [Disabled]
  Secure Boot Mode              [Custom]
► Key Management


                                                            →←: 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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```

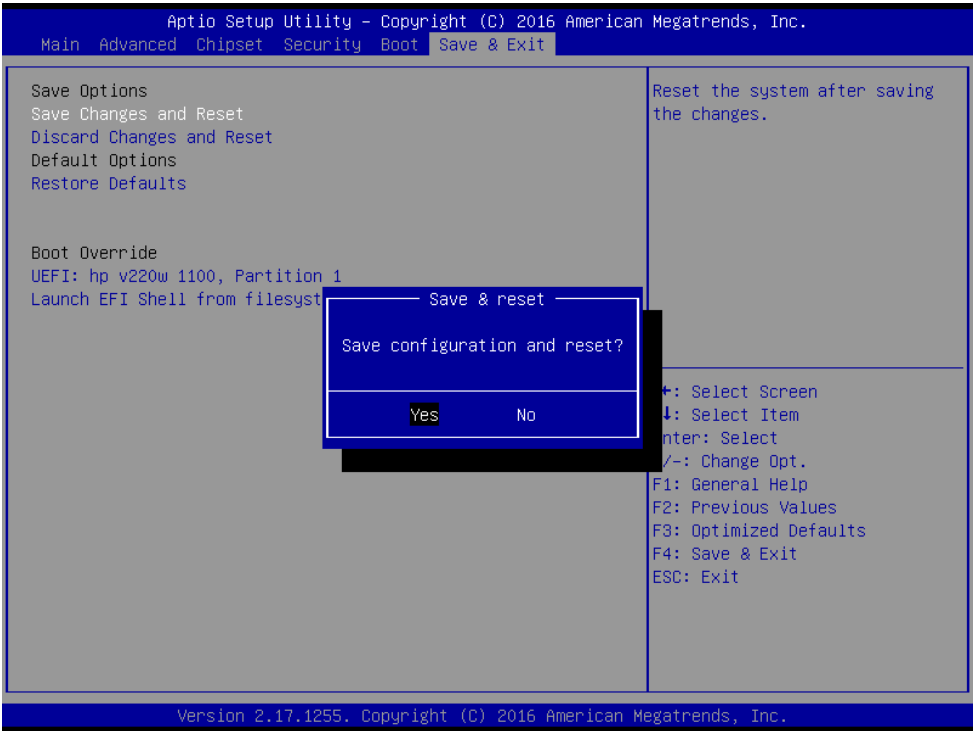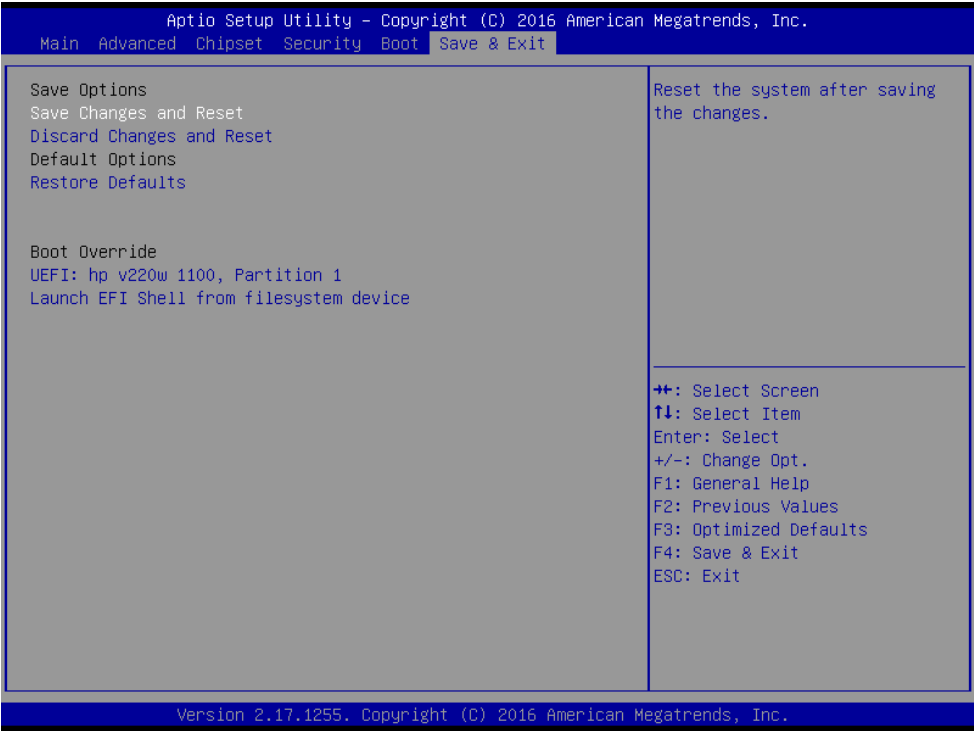| Item	Option	Description
Secure Boot	Disabled**[Default]** Enabled	Secure Boot can be enabled if 1.System running in User mode with enrolled Platform Key(PK) 2.CSM function is disabled.
Secure Boot Mode	Standard Custom**[Default]**	Secure Boot mode selector. 'Custom' Mode enables users to change Image Execution policy and manage Secure Boot Keys.

3.6.4.1.1 Key Management
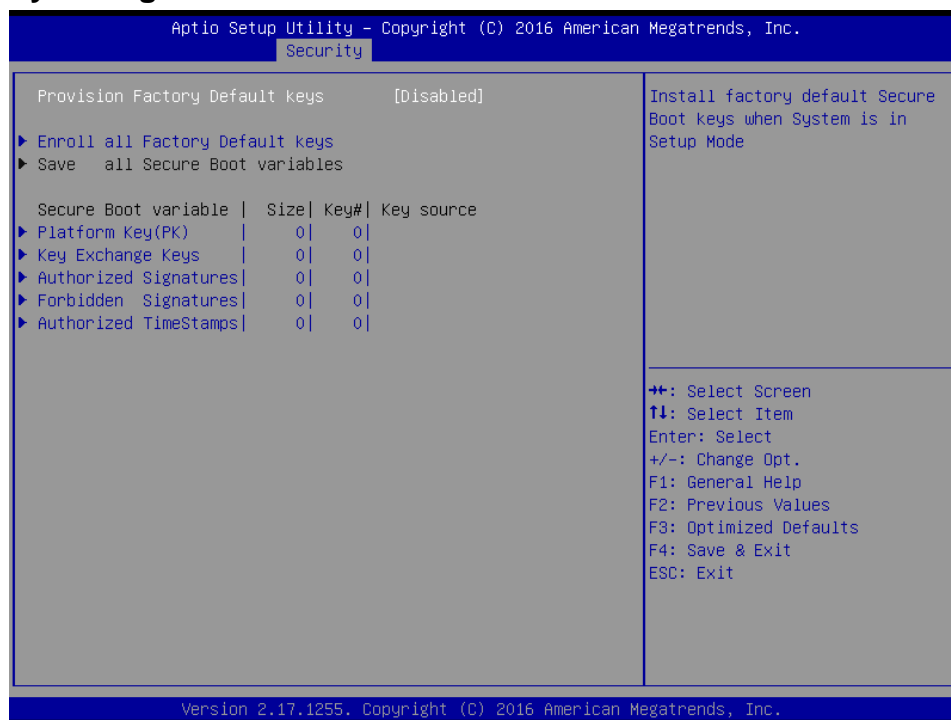
Item	Option	Description
Provision Factory Default Keys	Enabled, Disabled**[Default]**	Install Factory default Secure Boot Keys when System is in Setup Mode.

3.6.5   Boot

```
                    Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
       Main  Advanced  Chipset  Security  Boot  Save & Exit

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

      Boot Option Priorities
      Boot Option #1                        [UEFI: hp v220w 1100,
                                            Partition 1]
      Fast Boot                             [Disabled]

      New Boot Option Policy                [Default]

                                                               →←: 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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```

Item	Option	Description
Setup Prompt Timeout	1~ 65535	Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.
Bootup NumLock State	On**[Default]** Off	Select the Keyboard NumLock state
Quiet Boot	Disabled**[Default]** Enabled	Enables or disables Quiet Boot option
Fast Boot	Disabled**[Default]** Enabled	Enables or disables boot with initialization of a minimal set of devices required to launch active boot option. Has no effect for BBS boot options.
New Boot Option Policy	Default**[Default]** Place First Place Last	Controls the placement of newly detected UEFI boot options.
Boot Option #1	Set the system boot order.	

3.6.6 Save and exit

```
         Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
     Main  Advanced  Chipset  Security  Boot  Save & Exit

    Save Options                                          Reset the system after saving
    Save Changes and Reset                                the changes.
    Discard Changes and Reset
    Default Options
    Restore Defaults


    Boot Override
    UEFI: hp v220w 1100, Partition 1
    Launch EFI Shell from filesystem device

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



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```

```
         Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
     Main  Advanced  Chipset  Security  Boot  Save & Exit

    Save Options                                          Reset the system after saving
    Save Changes and Reset                                the changes.
    Discard Changes and Reset
    Default Options
    Restore Defaults


    Boot Override
    UEFI: hp v220w 1100, Partition 1
    Launch EFI Shell from filesyst┌──── Save & reset ────┐
                                  │                       │
                                  │ Save configuration and reset? │
                                  │                       │←: Select Screen
                                  │                       │↓: Select Item
                                  │    Yes        No      │nter: Select
                                  └───────────────────────┘/-: Change Opt.
                                                          F1: General Help
                                                          F2: Previous Values
                                                          F3: Optimized Defaults
                                                          F4: Save & Exit
                                                          ESC: Exit



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```

3.6.6.1 Save Changes and Reset

Reset the system after saving the changes.

3.6.6.2 Discard Changes and Reset

Any changes made to BIOS settings during this session of the BIOS setup program are discarded. The setup program then exits and reboots the controller.

3.6.6.3 Restore Defaults

This option restores all BIOS settings to the factory default. This option is useful if the controller exhibits unpredictable behavior due to an incorrect or inappropriate BIOS setting.

3.6.6.4 Launch EFI Shell from filesystem device

Attempts to Launch EFI Shell application (Shellx64.efi) from one of the available filesystem devices.

4. Drivers Installation

Note: Installation procedures and screen shots in this section are for your reference and may not be exactly the same as shown on your screen.
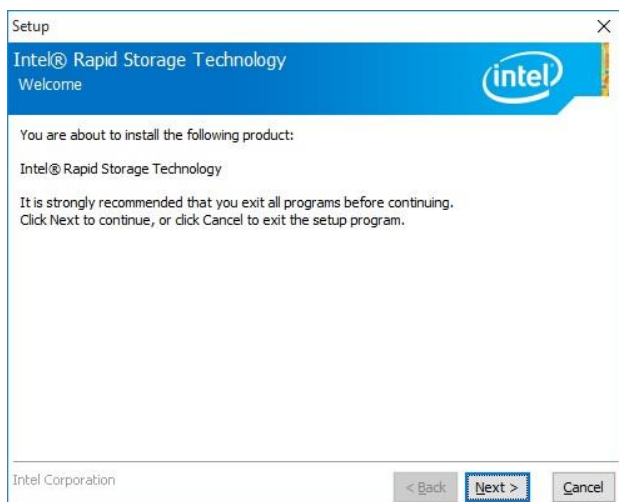
4.1 Install Chipset Driver

Insert the Supporting DVD-ROM to DVD-ROM drive, and it should show the index page of Avalue's products automatically. If not, locate Index.htm and choose the product from the menu left.
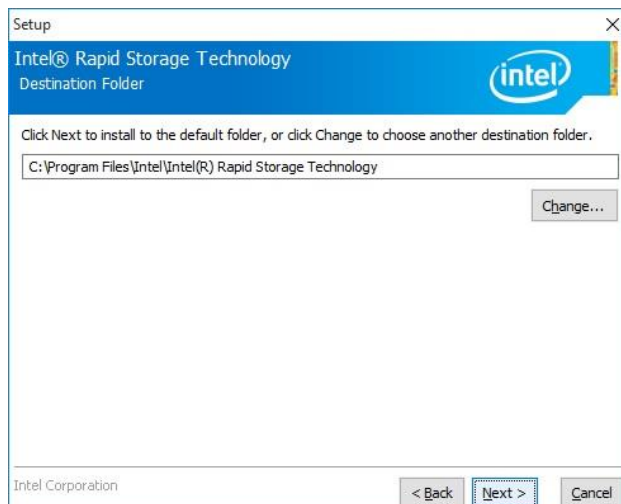
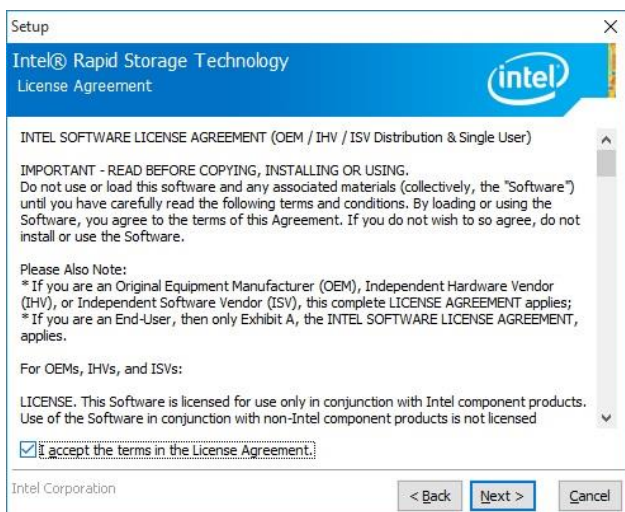**Note:** The installation procedures and screen shots in this section are based on Windows 10 operation system. If the warning message appears while the installation process, click Continue to go on.
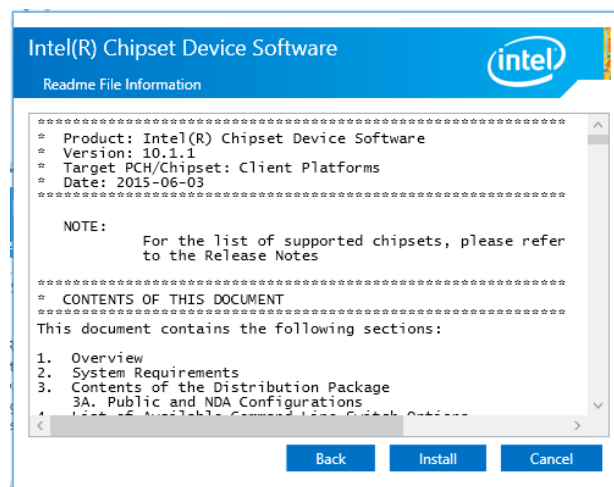
Step 3. Click **Install**.
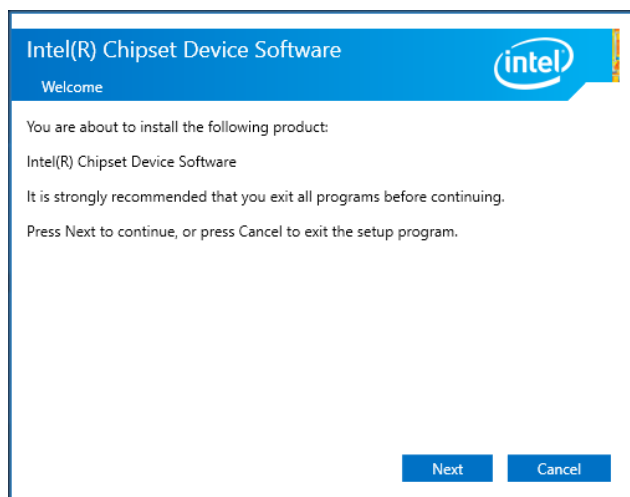
Step1. Click **Next**.

Step 4. Complete setup.
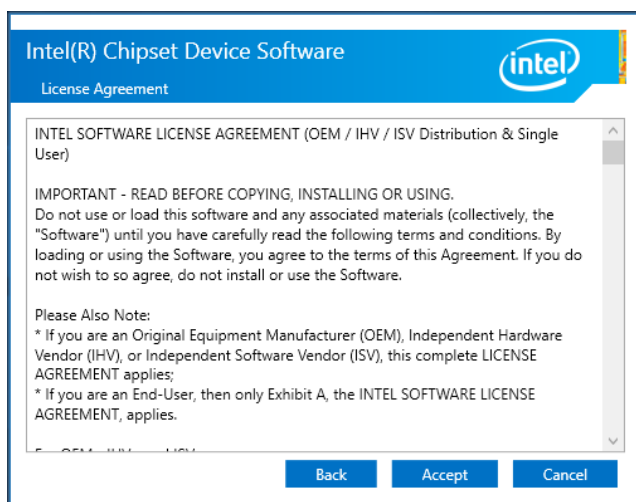
Step 2. Click **Accept**.

4.2 Install VGA Driver

Insert the Supporting DVD-ROM to DVD-ROM drive, and it should show the index page of Avalue's products automatically. If not, locate Index.htm and choose the product from the menu left.

Note: The installation procedures and screen shots in this section are based on Windows 10 operation system.
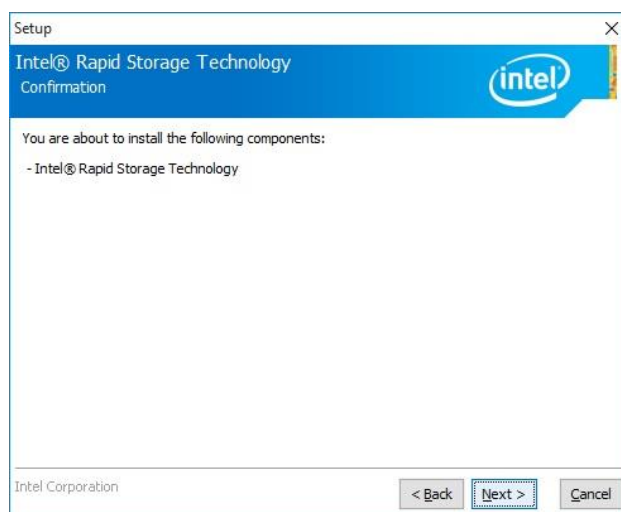

Step 3. Click **Next.**
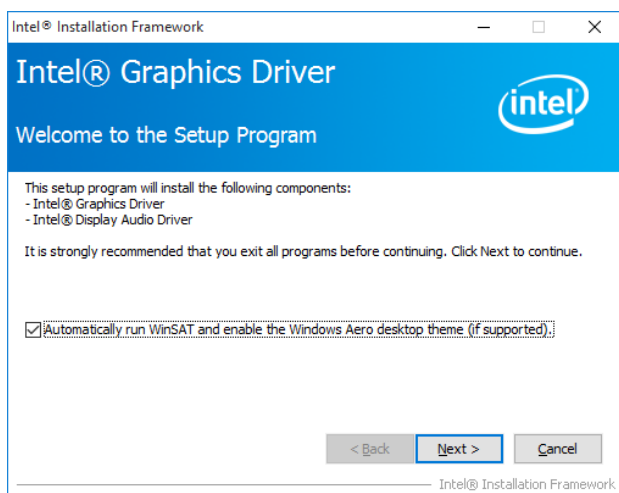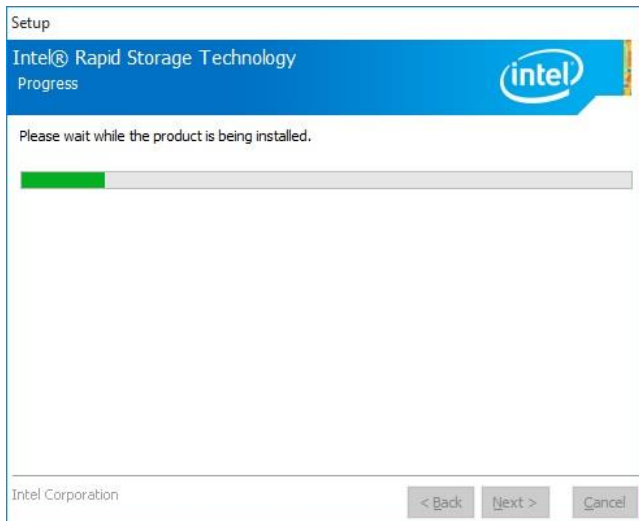

Step 1. Click **Next** to continue installation.
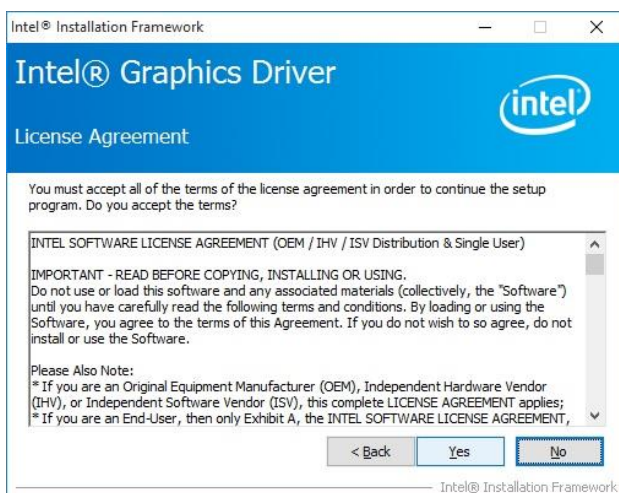
Step 4. Click **Next**.

Step 2.

Click **Yes** to accept license agreement.
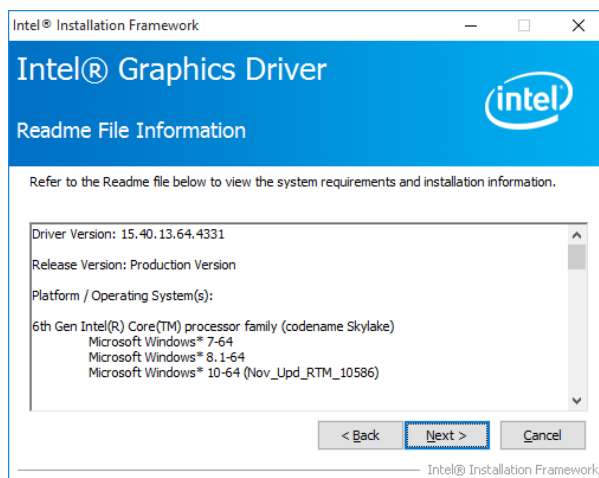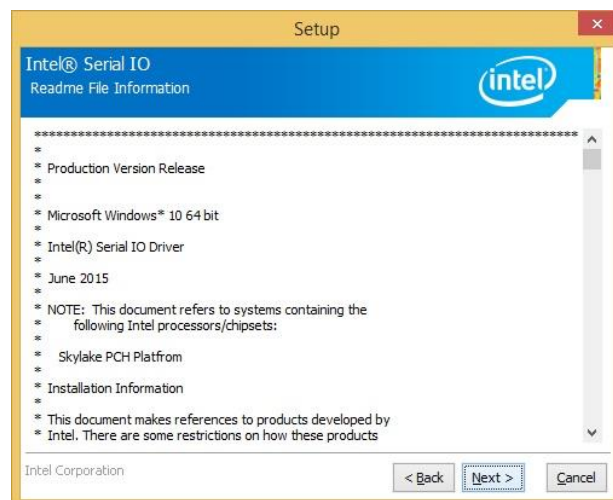

Step 5. Click **Next**.
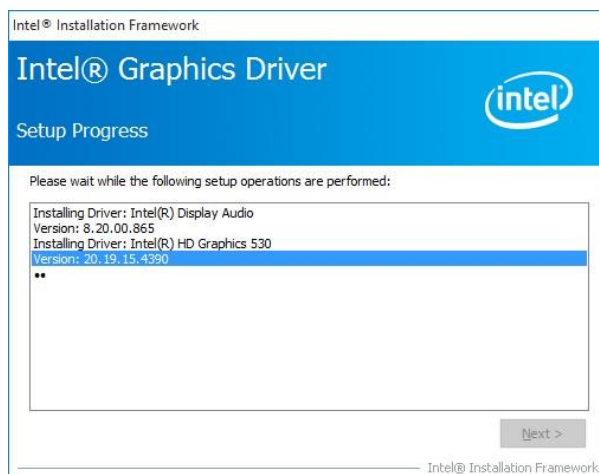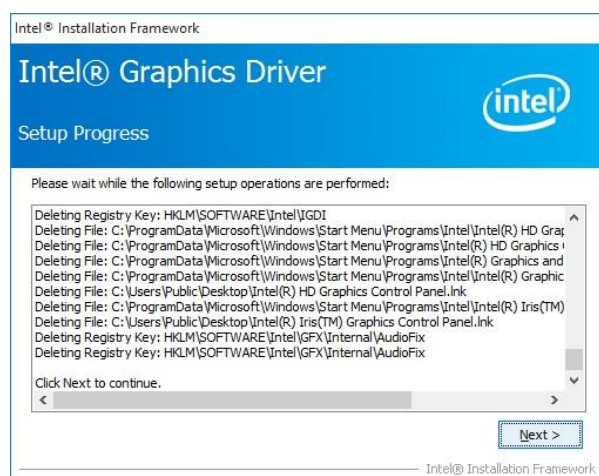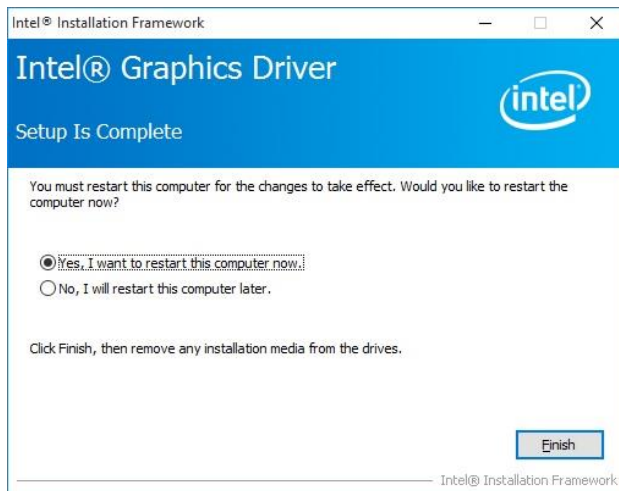
Step 6. Click **Finish** to complete setup.

4.3 Install ME Driver

Insert the Supporting CD-ROM to CD-ROM drive, and it should show the index page of Avalue's products automatically. If not, locate Index.htm and choose the product from the menu left.

Note: The installation procedures and screen shots in this section are based on Windows 10 operation system.
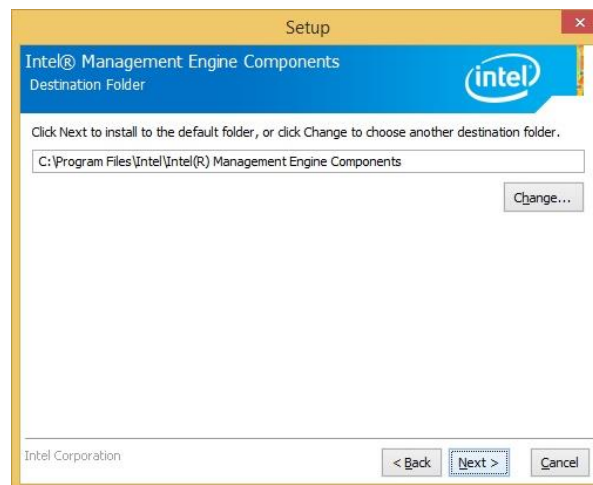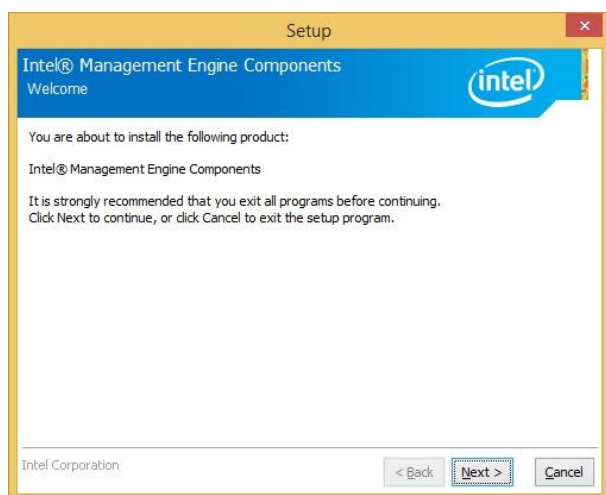
Step 3. Click **Next**

Step 1. Click **Next** to continue setup.
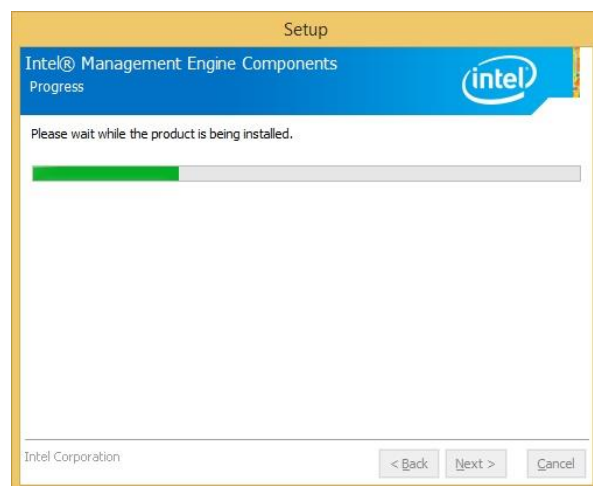
Step 4. Installing.

Step 5. Click **Finish** to complete the setup

Step 2. Click **Next**.
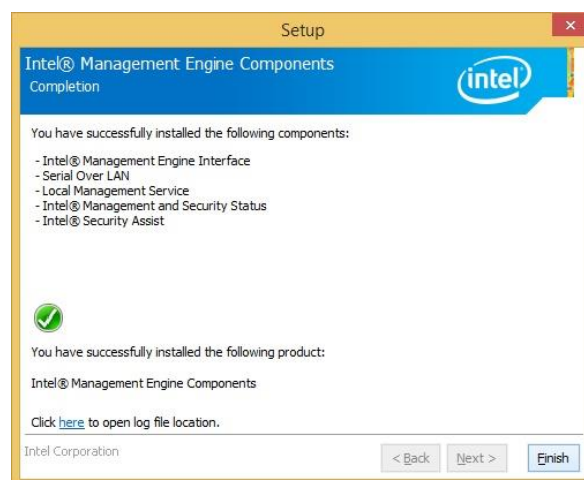
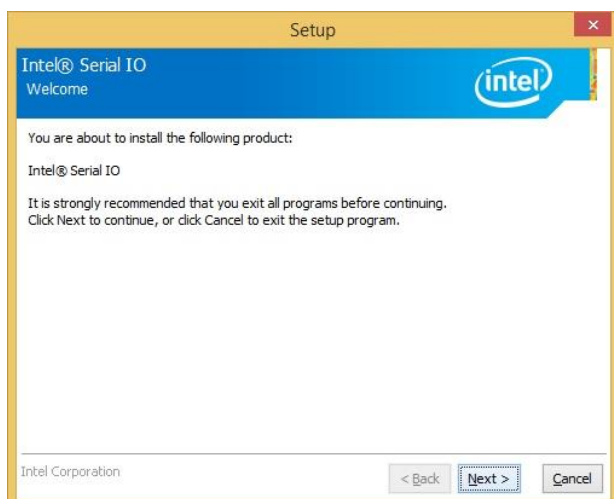## 4.4 Install Audio Driver (For Realtek ALC892 HD Audio)

Insert the Supporting DVD-ROM to DVD-ROM drive, and it should show the index page of Avalue's products automatically. If not, locate Index.htm and choose the product from the menu left.
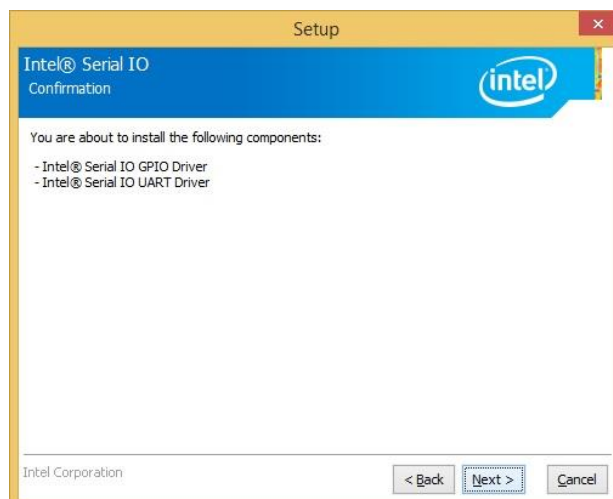
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system. If the warning message appears while the installation process, click Continue to go on.
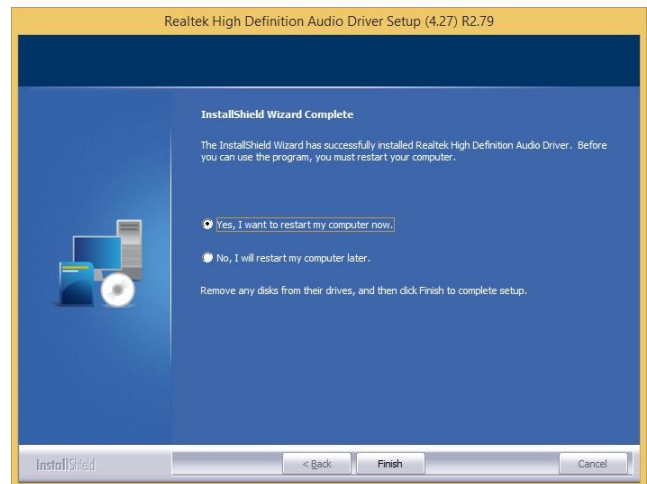
Step 3. Select **Finish** to complete Installation.
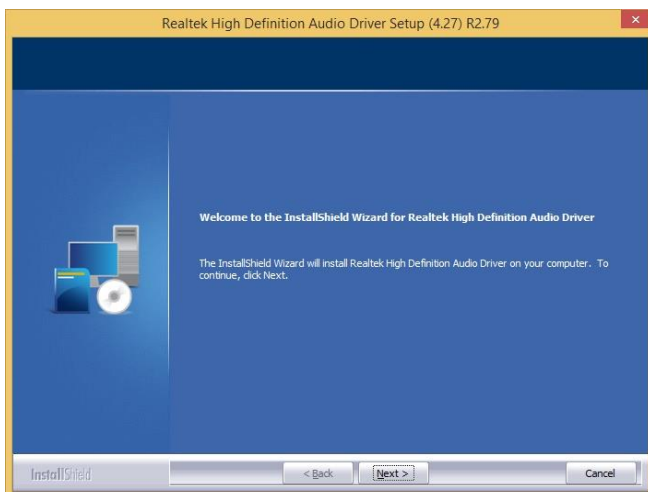
Step1. Click **Next** to Install.
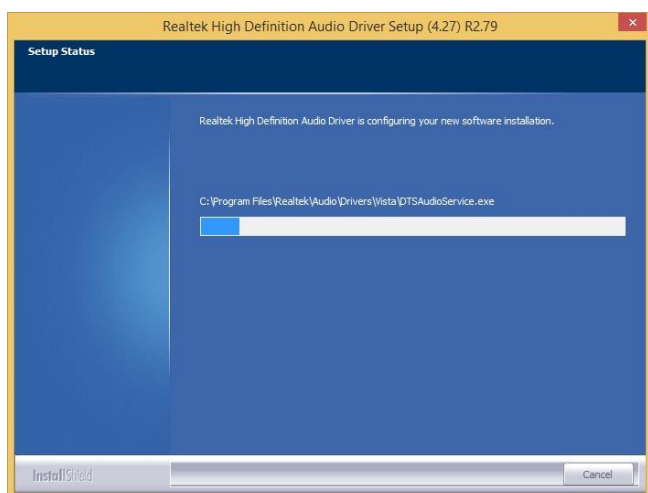
Step2. Installing.

4.5 Install LAN Driver

Insert the Supporting DVD-ROM to DVD-ROM drive, and it should show the index page of Avalue's products automatically. If not, locate Index.htm and choose the product from the menu left.

Note: The installation procedures and screen shots in this section are based on Windows 10 operation system.
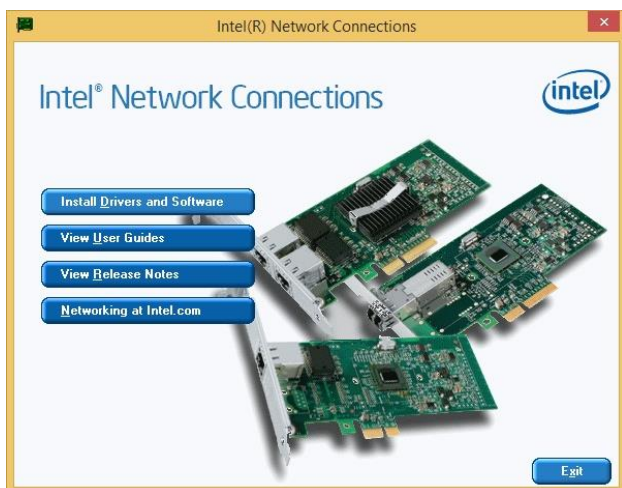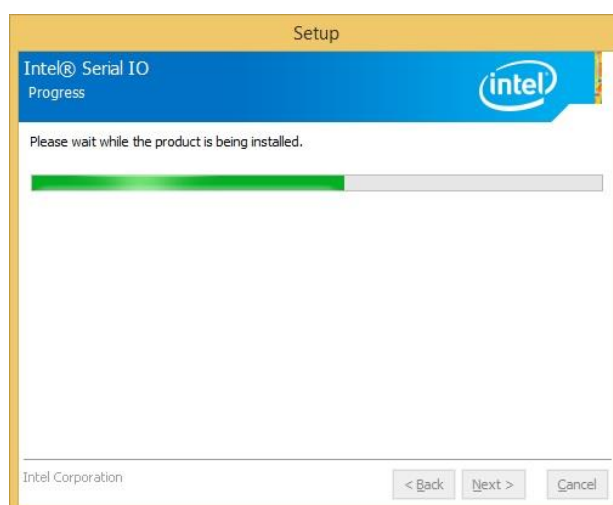
Step 3. Click **Next**.

Step 1. Click **Install Drivers and Software**.
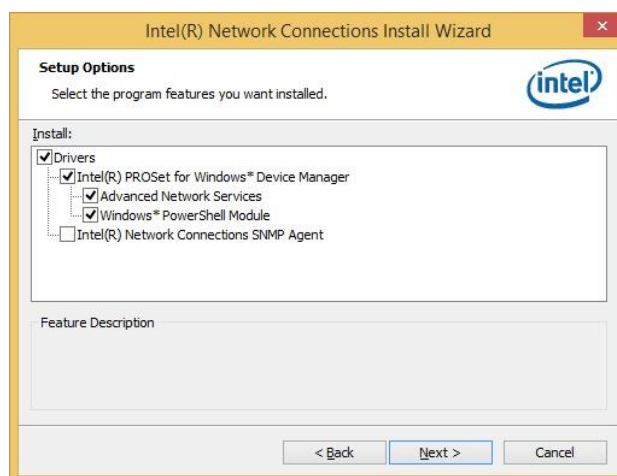
Step 4. Click **Next**.

Step 2. Click **Next**.
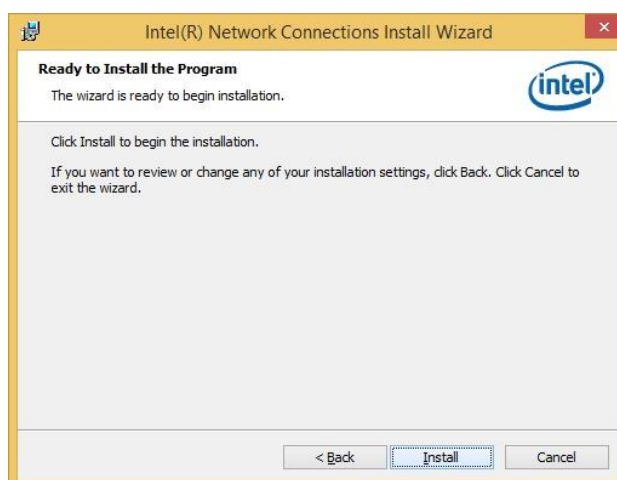
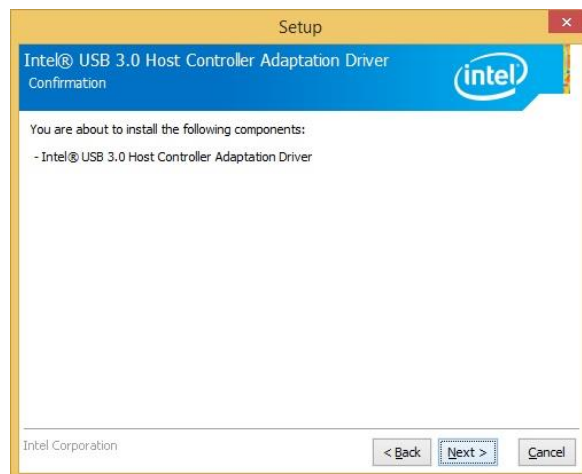**Step 5.** Click **Install**.

Step 6. Installing.

Step 7. Click **Finish** to complete setup.

4.6 Install RST Driver

Insert the Supporting DVD-ROM to DVD-ROM drive, and it should show the index page of Avalue's products automatically. If not, locate Index.htm and choose the product from the menu left.

> **Note:** The installation procedures and screen shots in this section are based on Windows 10 operation system.

Step 3. Click **Next.**

Step 1. Click **Next** to continue installation.

Step 4. Click **Next**.

Step 2. Click **Next**.

Step 5. Click **Next.**

Step 6. Click **Next**.

Step 7. Click **Finish** to complete setup.

4.7 Install Serial IO Driver

Insert the Supporting DVD-ROM to DVD-ROM drive, and it should show the index page of Avalue's products automatically. If not, locate Index.htm and choose the product from the menu left.

Note: The installation procedures and screen shots in this section are based on Windows 10 operation system.
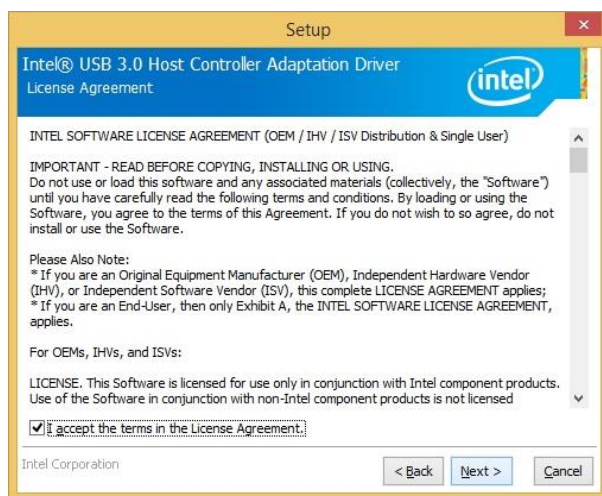
Step 3. Click **Next.**

Step 1. Click **Next** to continue installation.

Step 4. Click **Next**.

Step 2. Click **Next**.

Step 5. Click **Next**.
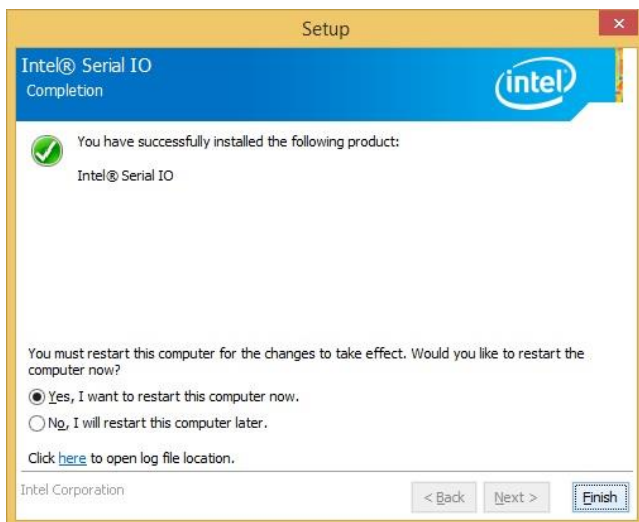
Step 6. Click **Finish** to complete setup.

4.8 Install USB3.0 Driver

Insert the Supporting CD-ROM to CD-ROM drive, and it should show the index page of Avalue's products automatically. If not, locate Index.htm and choose the product from the menu left.

Note: The installation procedures and screen shots in this section are based on Windows 10 operation system.
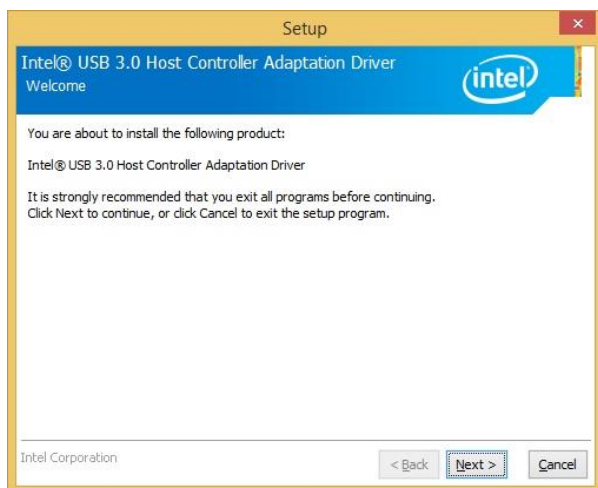
Step 3. Click **Next**

Step 1. Click **Next** to continue setup.
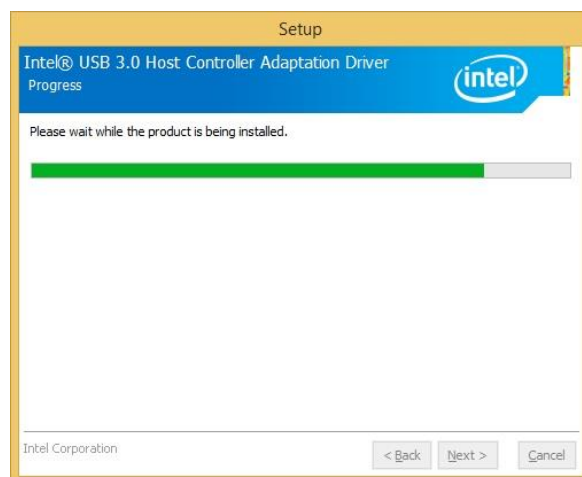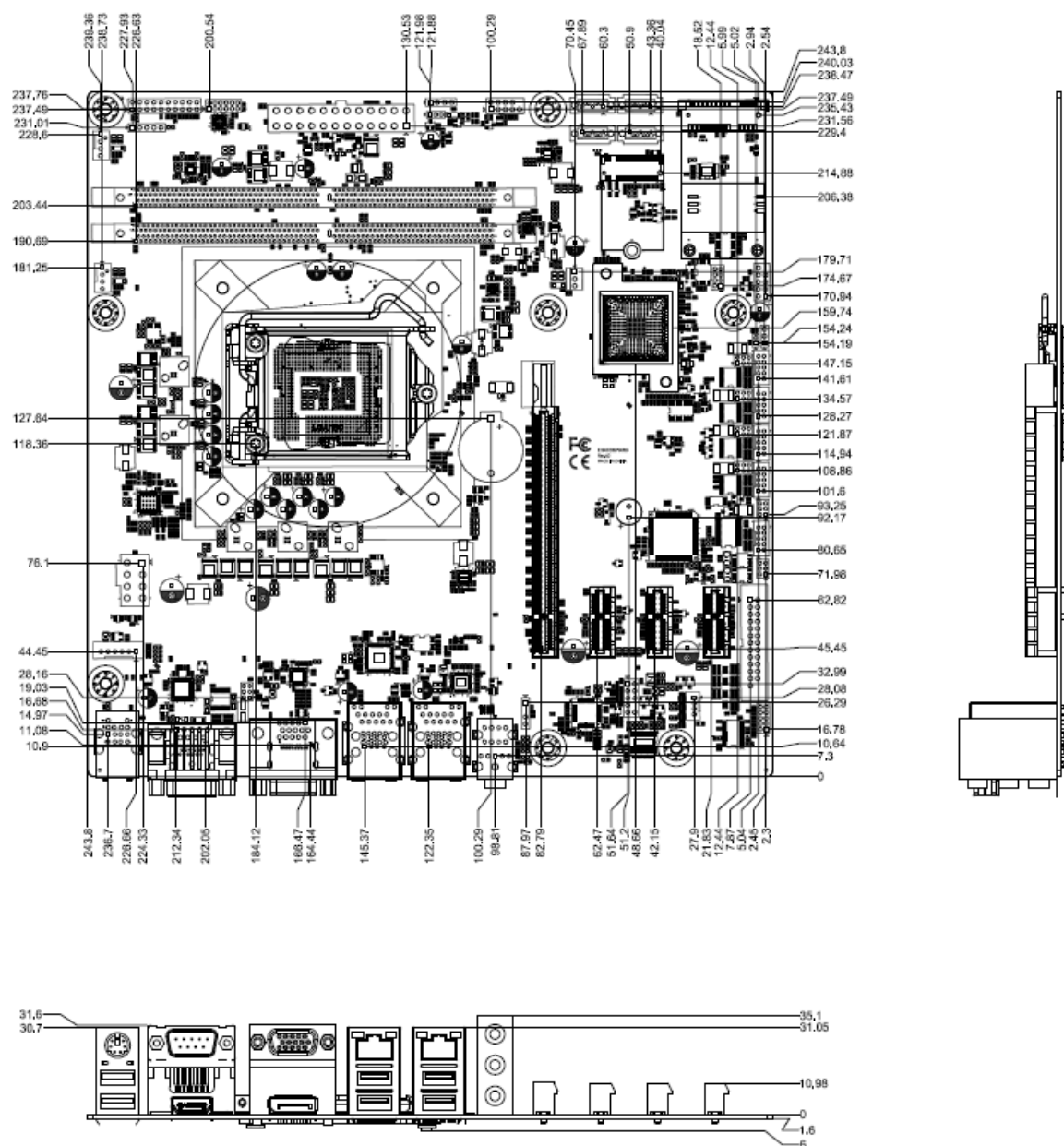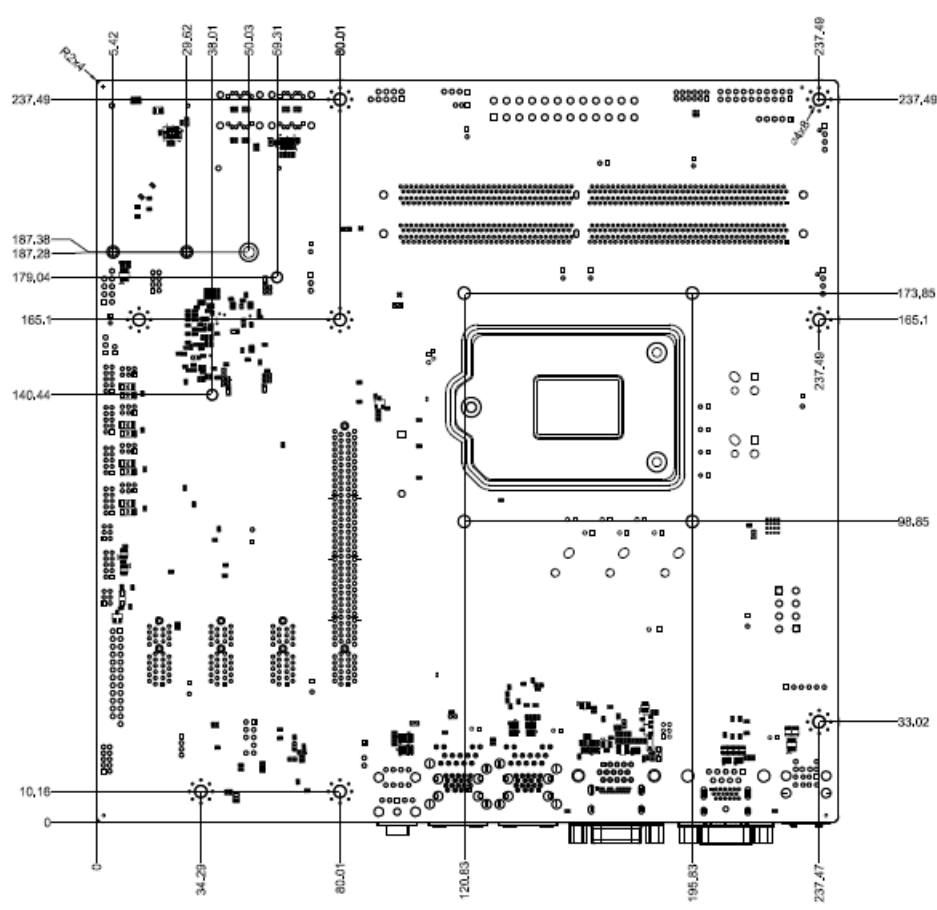

Step 4. Installing.

Step 2. Click **Next**.

Step 5. Click **Finish** to complete the setup

5. Mechanical Drawing

Unit: mm

Unit: mm