BC170Q

Intel® Core™ Processors with Intel® Q170 ATX Motherboard

User's Manual

1st Ed – 12 June 2017

Part No. E2047AK1700R

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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Life Support Policy

OUR PRODUCTS ARE NOT FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE PRIOR WRITTEN APPROVAL.

As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into body, or (b) support or sustain life and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

A Message to the Customer

Customer Services

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

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

Technical Support

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

Product Warranty

We warrant to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized, or which have been subject to misuse, abuse, accident or improper installation. We assume no liability under the terms of this warranty as a consequence of such events. Because of our high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If any of the product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time, and freight. Please consult your dealer for more details. If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU type and speed, our 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

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 BC170Q 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	June 2017		Initial Release

1.4 Manual Objectives

This manual describes in details of the BC170Q ATX Motherboard.

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 BC170Q 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® LGA1151 Socket Supports 6/7th Generation Core™ i7/ i5/ i3 Processors (Max. TDP at 95W)
BIOS	AMI uEFI BIOS, 128Mbit SPI Flash ROM
System Chipset	Intel® Q170 Express Chipset
I/O Chip	Nuvoton® NCT6106D
System Memory	Four 288-pin DDR4 2400MHz DIMM socket, supports up to 64GB Max
Watchdog Timer	H/W Reset, 5 ~ 255 seconds/5 ~ 255 minutes (*1)
H/W Status Monitor	CPU temperature monitoring Voltages monitoring CPU fan speed control
Expansion	1 x PCI-e x 16 1 x PCI-e x 4 1 x PCI-e x 1 4 x PCI 1 x M.2 2230 KeyA Slot support WiFi module 1 x SIM card slot 1 x Full Size Mini-PCIe with mSATA Support (SATA III)
S3/S4	Yes (S0/S3/S4/S5)
I/O	
USB	4 x USB 3.0, 2 x USB 2.0
GPIO	8-bit GPIO
Display	
Chipset	Intel® Q170 Express chipset
Resolution	VGA: 2048 x 1536@50 Hz HDMI: 4096 x 2160@24 Hz, 2560 x 1600@60 Hz DP: 4096 x 2304@60Hz
Multiple Display	Triple Display
Audio	
AC97 Codec	Realtek ALC892 HD Audio Decoding Controller
Audio Amp	2 x 6W Amplifier
Ethernet	
LAN Chip	1 x Intel® I219LM Gigabit Ethernet PHY 1 x Intel® I211AT PCI-e Gigabit Ethernet
Ethernet Interface	Gigabit Ethernet
Internal I/O	

Connectors	
Fan	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
Buzzer	Onboard
CMOS Battery	1 x Vertical type battery connector Co-lay 1 x 2 Pin Pitch 1.25mm horizontal type battery connector
Power ON	1 x 2 x 5 pin, pitch 2.54mm connector for front panel
Audio	1 x 2 x 5 pin, pitch 2.54mm connector for front Audio
Internal I/O Connector	Storage: - 1 x SATA III or 1 x full size Mini PCI-e support mSATA by auto switch IC - 5 x SATA III 1 x M.2 KeyA 2230 Slot support WiFi module 1 x Full Size Mini PCI-e with mSATA Support (SATA III) SIM card slot Onboard Infineon SLB9665 support TPM 2.0(co-lay TPM 1.2) COM: COM 1 Pin9 power selection: - 1 x 1 x 3 pin, pitch 2.0mm connector for COM1 & COM2 support RS232 with Pin 9, +5V&+12V/RI COM 2~6: - 1 x 2 x 5 pin, pitch 2.54mm BOX connector for COM2 support RS232 with Pin 9, +5V&+12V/RI - 1 x 1 x 3 pin, pitch 2.0mm connector for COM1 & COM2 support RS232 with Pin 9, +5V&+12V/RI - 1 x 2 x 3 pin, pitch 2.00mm connector for COM2: support RS422/485 connector, Pin 5 with +5V By BIOS setting RS232/422/485 Selection. COM3 ~ 6: - 4 x 2 x 5 pin, pitch 2.54mm BOX connector for COM3 ~ 6: support RS-232 connector, Pin 9 with RI Supported 3 x USB 2.0 by pin header, 1 x USB 2.0 By Vertical type A connector 1 x 2 x 10 pin, pitch 2.0mm connector for USB 3.0 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

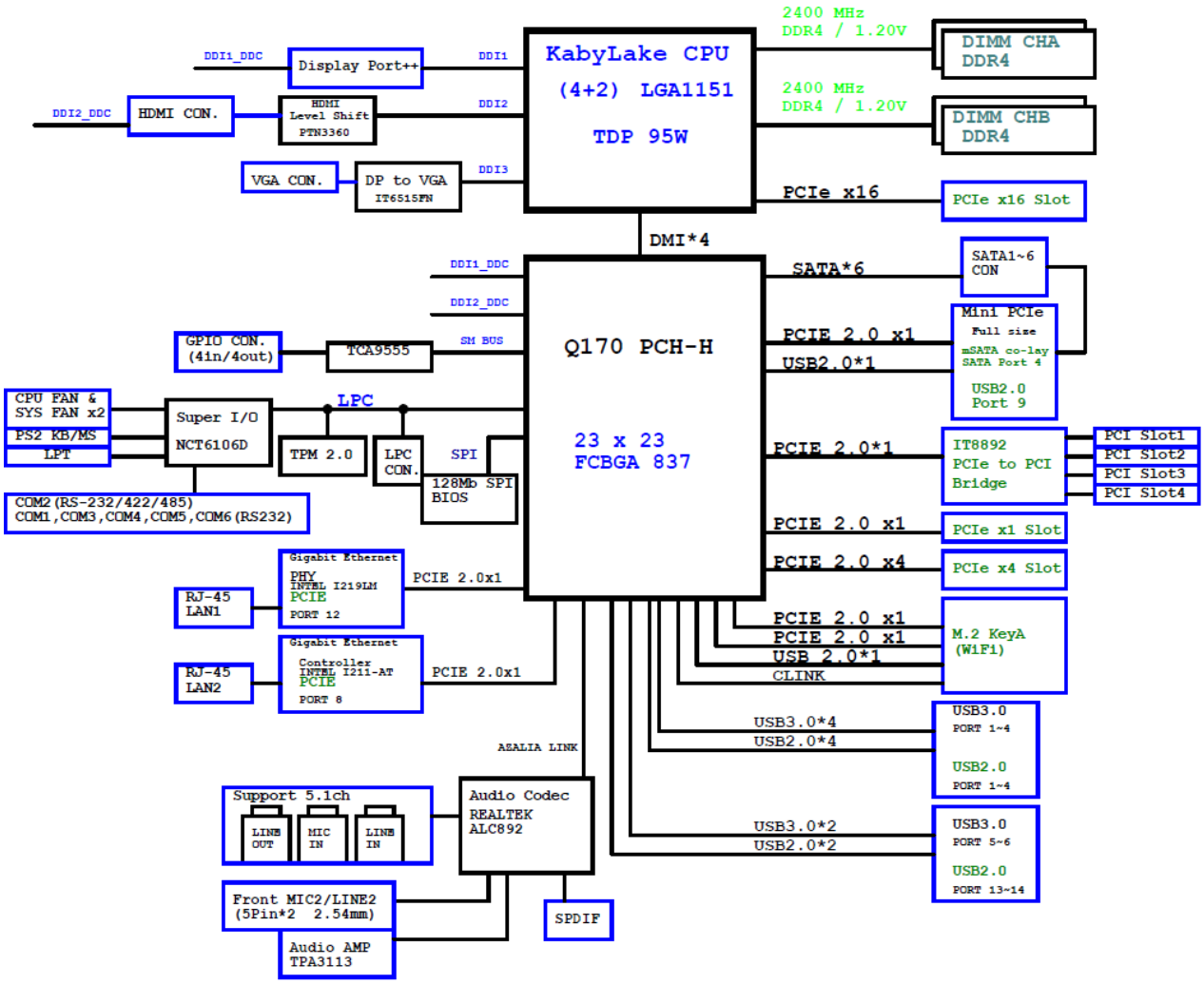
	1 x 4 pin, pitch wafer 2.00mm connector for 6W x 2 Speaker 1 x 1 x 4 pin, pitch 2.54mm connector for S/PDIF 1 x 1 x 3 pin, pitch 2.54mm connector for COMS Clear 1 x Vertical type battery connector Co-lay 1 x 2 pin Pitch 1.25mm horizontal type battery connector 1 x 2 x 6 pin, pitch 2.00mm connector for 8 bits GPIO 1 x 6 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 wafer connector for LPT (Only at Intel® LGA1151 Socket Supports 6th Generation) 1 x 1 x 6 pin, pitch 2.5mm wafer connector for PS2 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	
USB	4 x USB3.0
LAN	1 x Intel® I219LM Gigabit Ethernet PHY 1 x Intel® I211AT PCI-e Gigabit Ethernet
HDMI	1 x HDMI
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/MS + USB2.0 connector
Mechanical & Environmental	
Power Requirement	+12V/+5V/5VSB/+3.3V/-12V
ACPI	Single power ATX Support S0, S3, S4, S5
Power on Type	AT/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)	12" x 9.6" (304.8mm x 243.84mm)
Weight	0.60 kg

Note: Specifications are subject to change without notice.

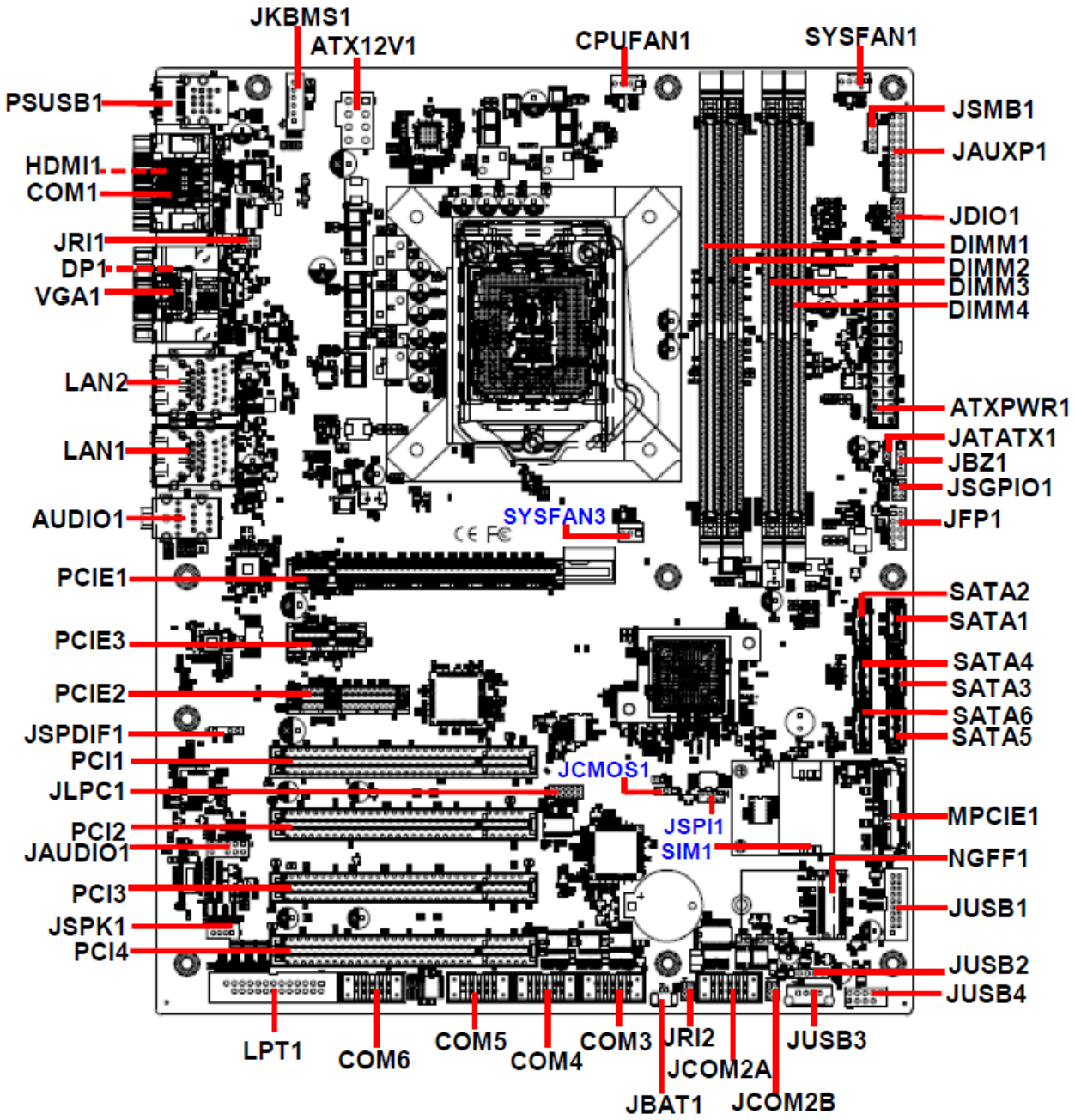
1.6 Architecture Overview—Block Diagram

The following block diagram shows the architecture and main components of BC170Q.



2. Hardware Configuration

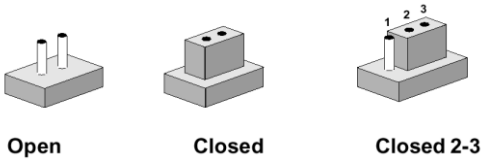
2.1 Product Overview



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	Serial port 1/2 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

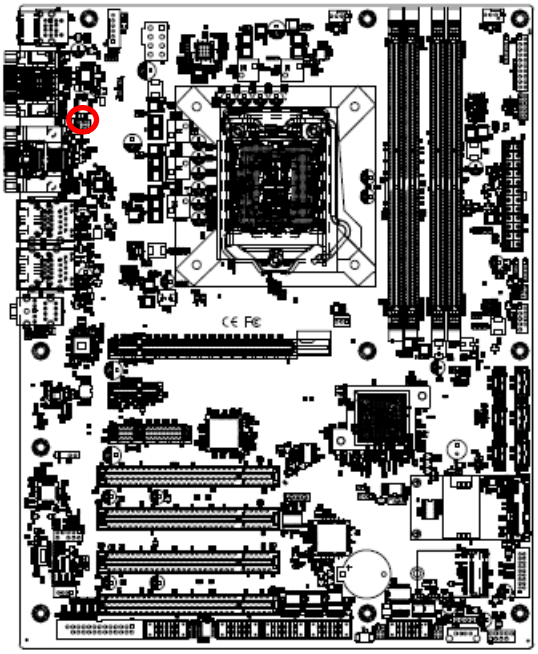
Connectors

Label	Function	Note
CPUFAN1	CPU fan connector	4 x 1 wafer, pitch 2.54mm
SYSFAN1	System fan connector 1 (with smart fan function supported)	4 x 1 wafer, pitch 2.54mm
SYSFAN3	System fan connector 2	3 x 1 wafer, pitch 2.54mm
JFP1	Miscellaneous setting connector	5 x 2 header, pitch 2.54 mm
DIMM1/2/3/4	288-pin DDR4 DIMM socket	
AUDIO1	Audio connector	

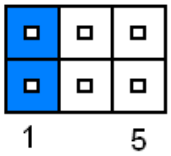
JAUDIO1	Audio connector 2	5 x 2 header, pitch 2.54 mm
JAUXP1	Auxiliary Panel connector	10 x 2 header, pitch 2.54 mm
JSPI1	SPI connector	4 x 2 header, pitch 2.00mm
COM1	Serial Port 1 connector	D-sub 9 pin, male
JCOM2A	Serial Port 2 connector	5 x 2 wafer, pitch 2.54mm
JCOM2B	COM2 RS485/422 connector	3 x 2 header, pitch 2.00 mm
JCOM3/4/5/6	Serial Port 3/4/5/6 connector	5 x 2 wafer, pitch 2.54mm
JBZ1	External Speaker connector	4 x 1 header, pitch 2.54 mm
JDIO1	General purpose I/O connector	6 x 2 header, pitch 2.00mm
JSGPIO1	SGPIO connector	3 x 2 header, pitch 2.00 mm
JSPK1	Speaker connector	1 x 4 wafer, pitch 2.00 mm
PSUSB1	PS/2 keyboard & mouse connector 2 x USB 2.0 connector	
JKBMS1	PS/2 keyboard & mouse connector	6 x 1 wafer, pitch 2.50 mm
LAN1/2	2 x RJ-45 with Dual deck USB 3.0 connector	
JUSB1	USB connector 1	10 x 2 wafer, pitch 2.00mm
JUSB2	USB connector 2	5 x 1 header, pitch 2.54mm
JUSB3	USB connector 3	
JUSB4	USB connector 4	5 x 2 header, pitch 2.54mm
JLPC1	LPC connector	5 x 2 header, pitch 2.00mm
PCIE1/2/3	PCIe slot 1/2/3	
PCI1/2/3/4	PCI slot 1/2/3/4	
JBAT1	Battery connector	2 x 1 wafer, pitch 1.25mm
MPCIE1	Mini-PCI connector	
ATXPWR1	ATX Power connector	12 x 2 wafer, pitch 4.20mm
ATX12V1	Power connector	2 x 4 wafer, pitch 4.20mm
SATA1~6	Serial ATA connector 1~6	
HDMI1	HDMI connector	
DP1	DP connector	
VGA1	VGA connector	
NGFF1	M.2 2230 KeyA Slot support WiFi module	
LPT1	LPT connector	13 x 2 header, pitch 2.54mm
JSIM1	SIM card slot	
JSPDIF1	S/PDIF connector	
JSMB1	SMBus connector	5 x 1 header, pitch 2.54mm

2.3 Setting Jumpers & Connectors

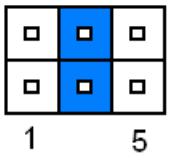
2.3.1 Serial port 1 pin9 signal select (JRI1)



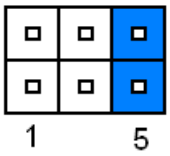
Ring*



+5V

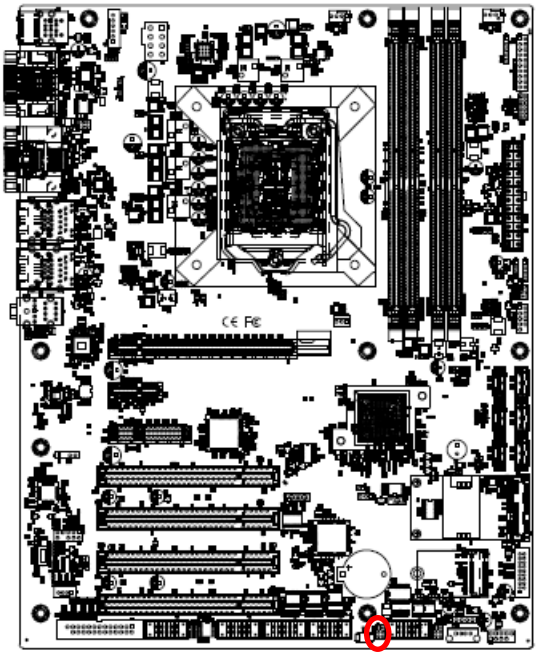


+12V

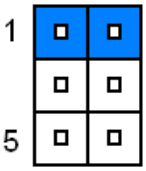


*** Default**

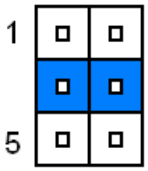
2.3.2 Serial port 2 pin9 signal select (JRI2)



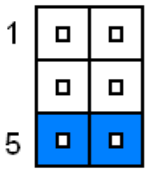
Ring*



+5V

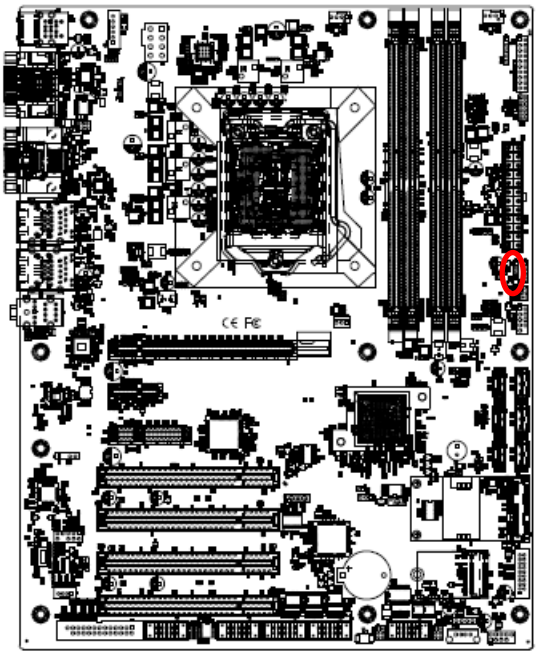


+12V

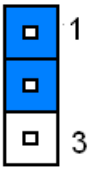


*** Default**

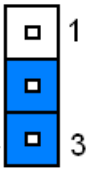
2.3.3 AT/ATX Power Mode Select (JATATX1)



AT*

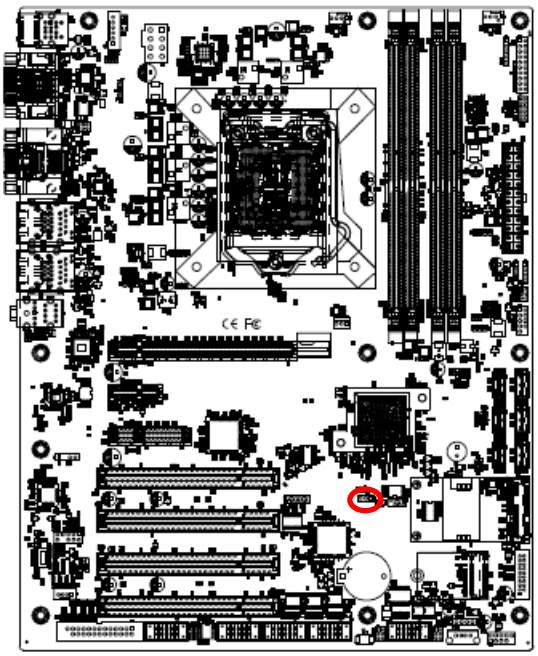


ATX

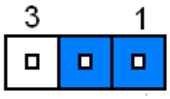


*** Default**

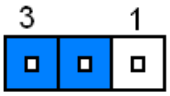
2.3.4 Clear CMOS (JCMOS1)



Protect*

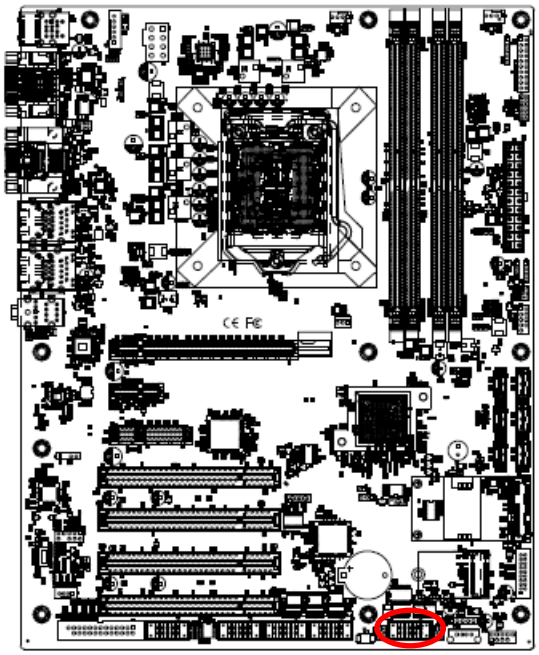


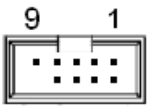
Clear CMOS



*** Default**

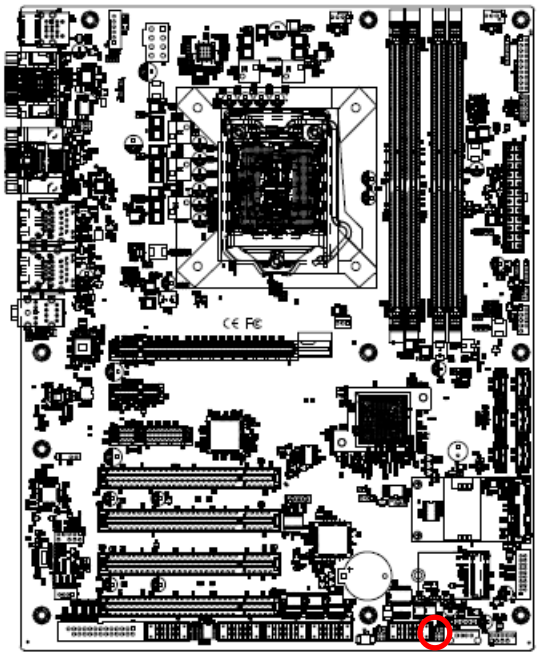
2.3.5 Serial port 2 connector (JCOM2A)

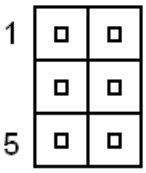




Signal	PIN	PIN	Signal
NRXD	2	1	NDCD#
NDTR#	4	3	NTXD
NDSR#	6	5	GND
NCTS#	8	7	NRTS#
		9	JNRI#

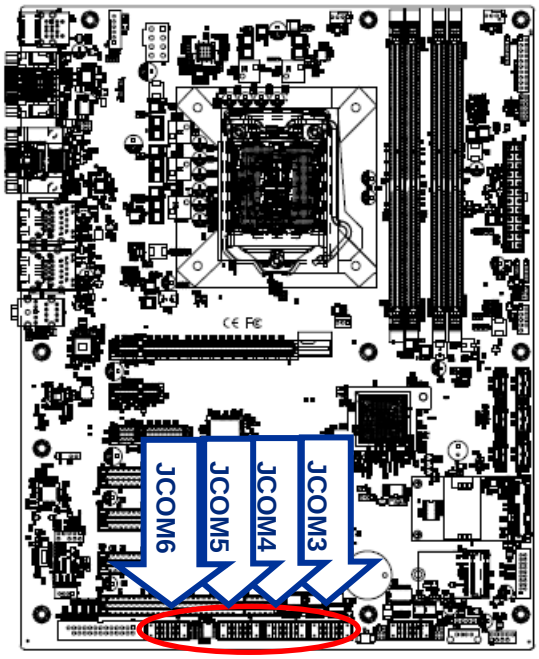
2.3.6 COM2 RS485/422 connector (JCOM2B)

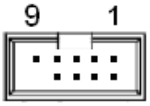




Signal	PIN	PIN	Signal
485TX-	1	2	422RX-
485TX+	3	4	422RX+
+5V	5	6	GND

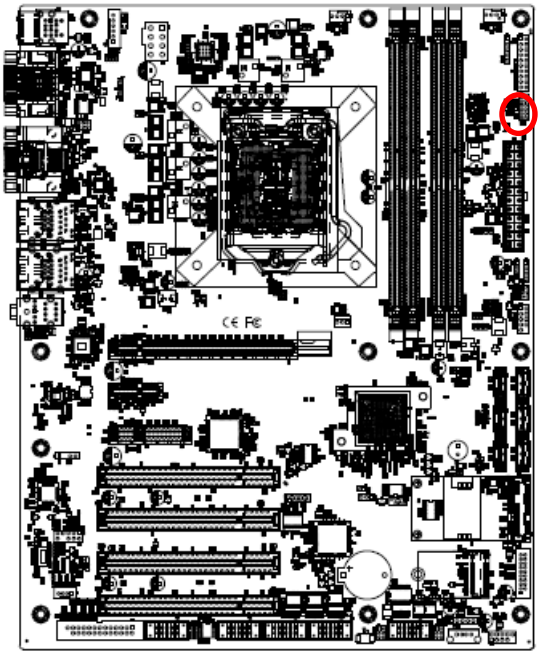
2.3.7 Serial port 3/4/5/6 connector (JCOM3/4/5/6)

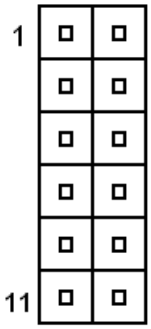




Signal	PIN	PIN	Signal
NRXD	2	1	NDCD#
NDTR#	4	3	NTXD
NDSR#	6	5	GND
NCTS#	8	7	NRTS#
NC	10	9	NRI#

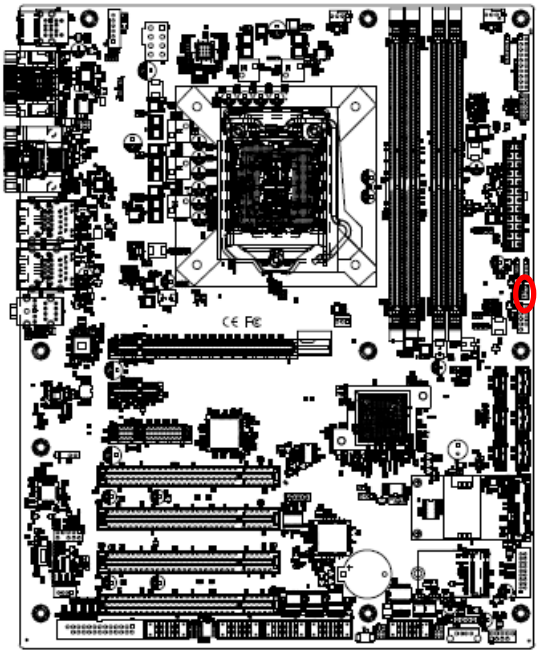
2.3.8 General purpose I/O connector (JDIO1)

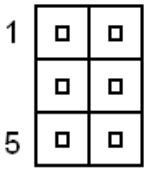




Signal	PIN	PIN	Signal
DI0	1	2	DO0
DI1	3	4	DO1
DI2	5	6	DO2
DI3	7	8	DO3
SMB_CLK_9555	9	10	SMB_DATA_9555
GND	11	12	+5V

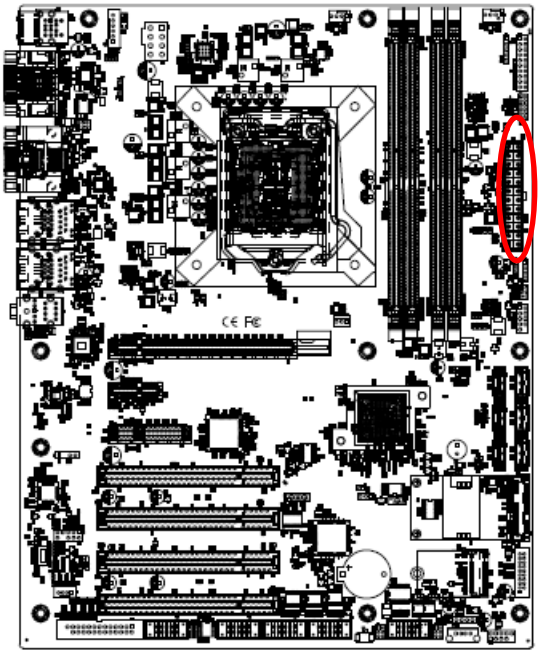
2.3.9 SGPIO connector (JSGPIO1)

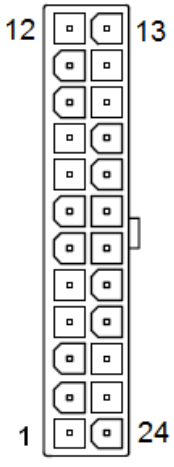




Signal	PIN	PIN	Signal
GND	1	2	GND
SGIO_LOAD	3	4	SGIO_DATOUT0
SGIO_CLK	5	6	SGIO_DATOUT1

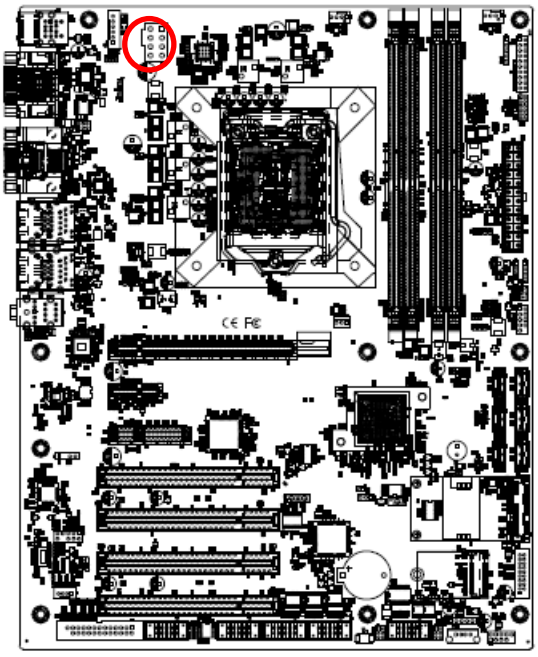
2.3.10 ATX Power connector (ATXPWR1)

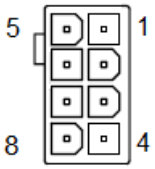




Signal	PIN	PIN	Signal
+3.3V	12	24	GND
+12V	11	23	+5V
+12V	10	22	+5V
+V5SB	9	21	+5V
ATX_PWRGD	8	20	-5V
GND	7	19	GND
+5V	6	18	GND
GND	5	17	GND
+5V	4	16	ATX_PSON#
GND	3	15	GND
+3.3V	2	14	-12V
+3.3V	1	13	+3.3V

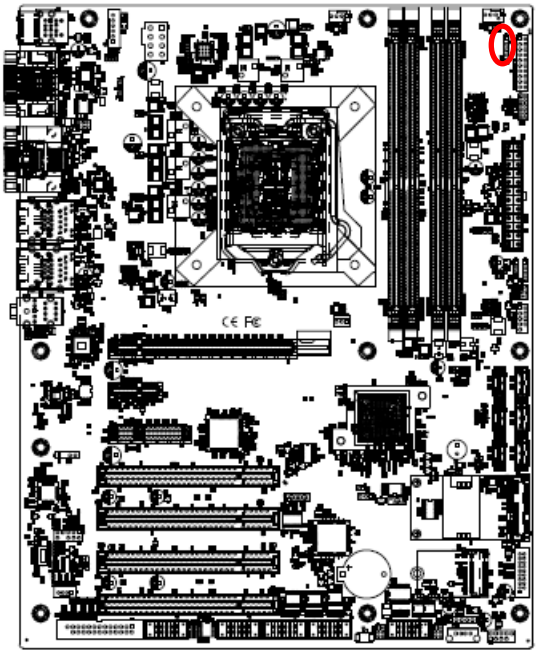
2.3.11 Power connector (ATX12V1)

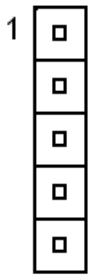




Signal	PIN	PIN	Signal
+12V	5	1	GND
+12V	6	2	GND
+12V	7	3	GND
+12V	8	4	GND

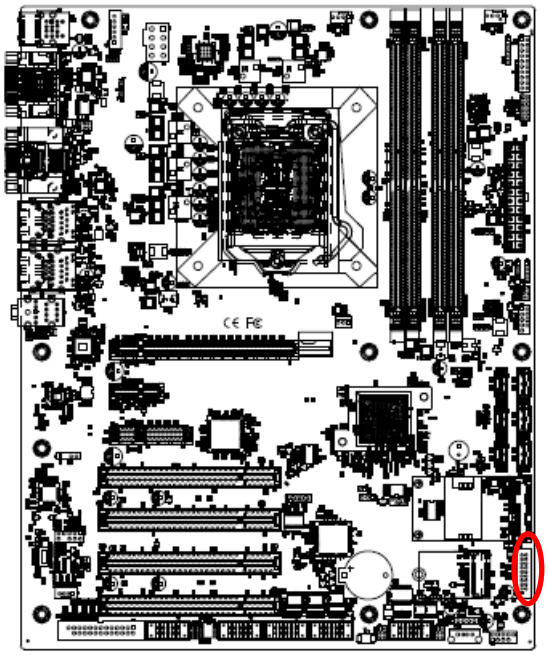
2.3.12 SMBus connector (JSMB1)

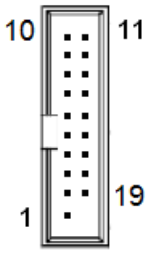




Signal	PIN
SMB_CLK_MAIN	1
SMB_DATA_MAIN	2
SMB_ALERT#_MAIN	3
GND	4
+3.3V	5

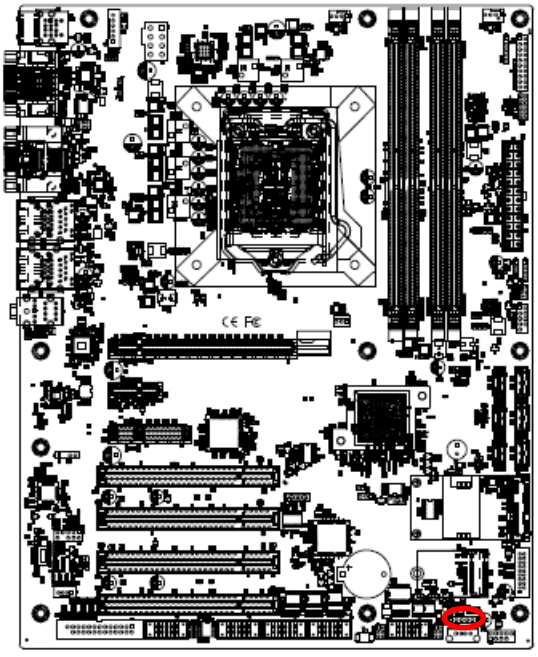
2.3.13 USB connector 1 (JUSB1)





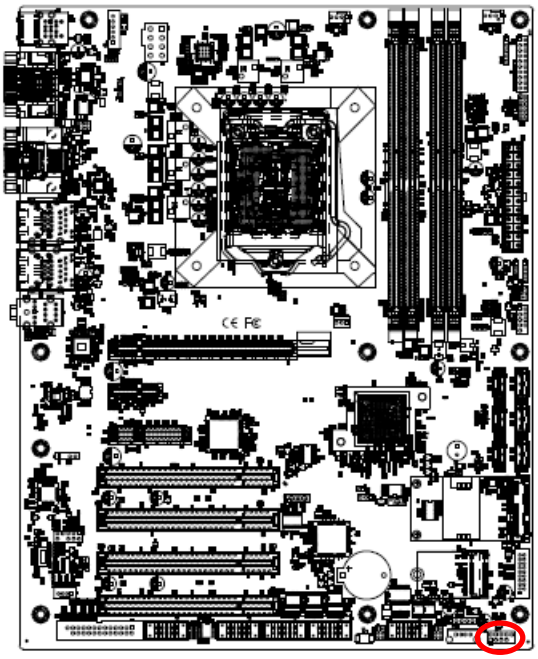
Signal	PIN	PIN	Signal
NC	10	11	USB_R_DP14
USB_R_DP13	9	12	USB_R_DN14
USB_R_DN13	8	13	GND
GND	7	14	SS_USB_TXP_C_6
SS_USB_TXP_C_5	6	15	SS_USB_TXN_C_6
SS_USB_TXN_C_5	5	16	GND
GND	4	17	SS_USB_RXP_C_6
SS_USB_RXP_C_5	3	18	SS_USB_RXN_C_6
SS_USB_RXN_C_5	2	19	USBVCC_DE
USBVCC_DE	1		

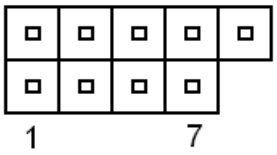
2.3.14 USB connector 2 (JUSB2)



Signal	PIN
USBVCC56	1
USB_R_DN5	2
USB_R_DP5	3
GND	4
GND	5

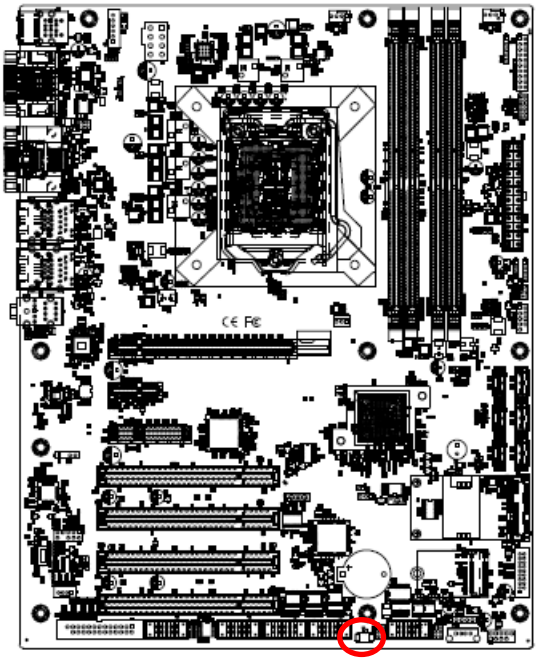
2.3.15 USB connector 4 (JUSB4)

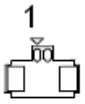




Signal	PIN	PIN	Signal
USBVCC_BC	1	2	USBVCC_BC
USB_R_DN12	3	4	USB_R_DN11
USB_R_DP12	5	6	USB_R_DP11
GND	7	8	GND
		10	NC

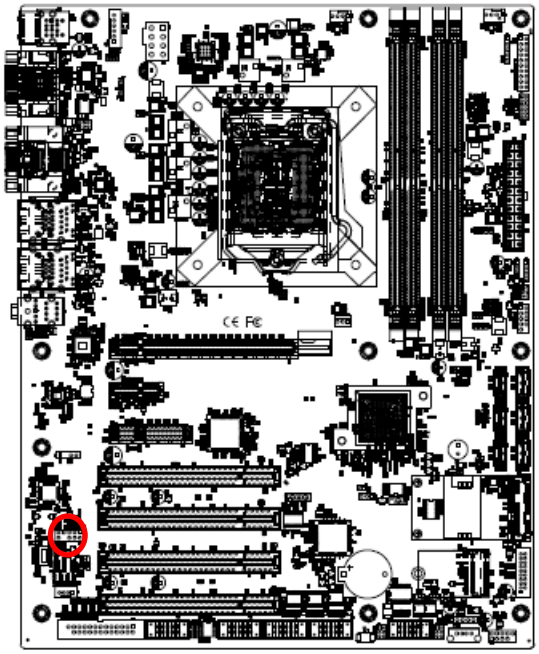
2.3.16 Battery connector (JBAT1)

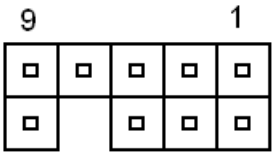




Signal	PIN
RTC_VBAT_1	1
GND	2

2.3.17 Audio connector (JAUDIO1)



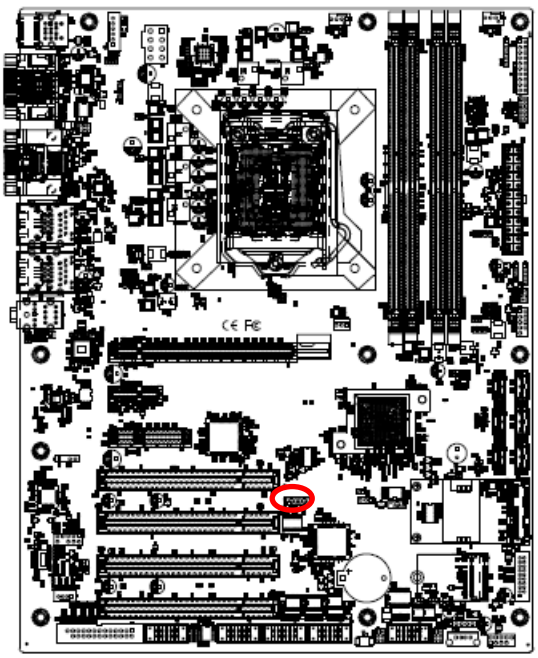


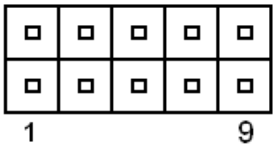
Signal	PIN	PIN	Signal
MIC2_L	1	2	GND
MIC2_R	3	4	ACZ_DET#_R
LNE2_RIN	5	6	MIC2_JD
GND	7		
LINE2_LIN	9	10	LINE2_JD

2.3.17.1 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

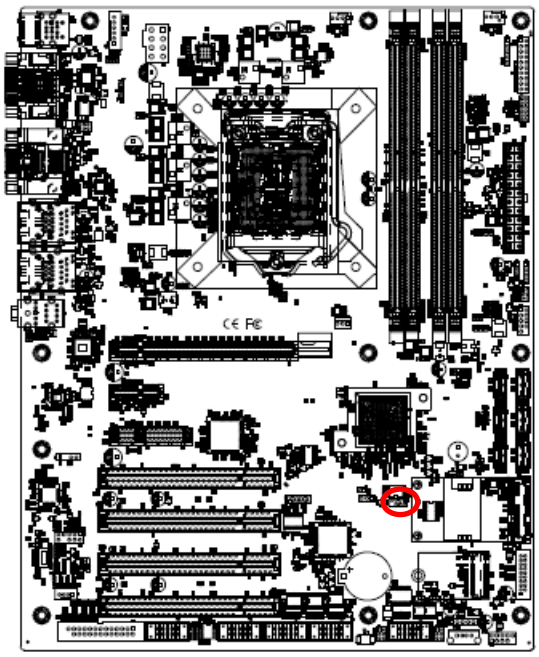
2.3.18 LPC connector (JLPC1)

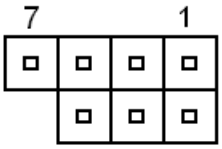




Signal	PIN	PIN	Signal
LPC_AD0_R	1	2	+3.3V
LPC_AD1_R	3	4	BUF_PLT_RST#
LPC_AD2_R	5	6	LPC_FRAME#_R
LPC_AD3_R	7	8	LPC_CLK
LPC_SERIRQ_R	9	10	GND

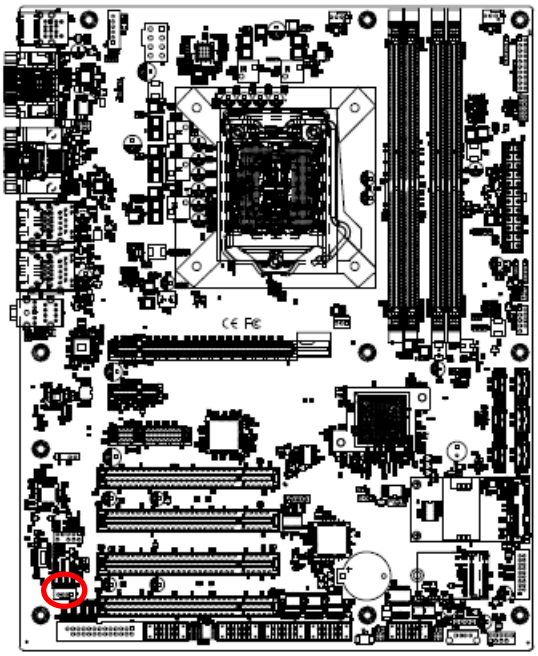
2.3.19 SPI connector (JSPI1)

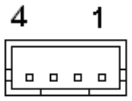




Signal	PIN	PIN	Signal
+3.3V	1	2	GND
SSPI_CS0#_R	3	4	SSPI_SCLK_R
SSPI_SO_R	5	6	SSPI_SI_R
SSPI_HOLD#0	7		

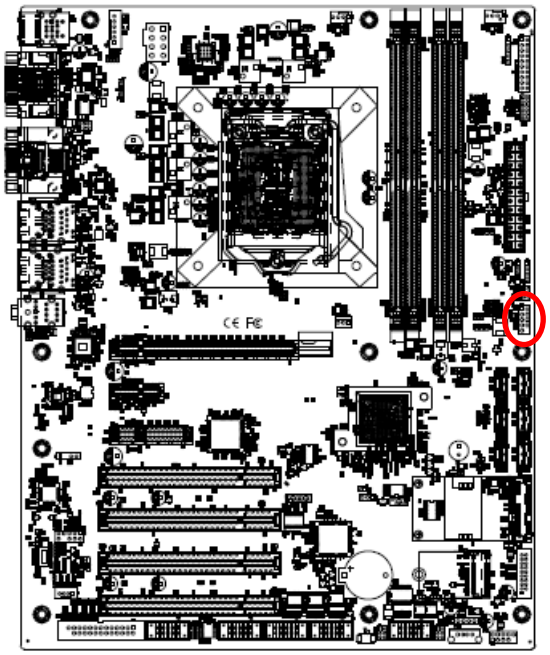
2.3.20 Speaker connector (JSPK1)

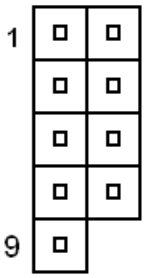




Signal	PIN
SPK_L+	1
SPK_L-	2
SPK_R+	3
SPK_R-	4

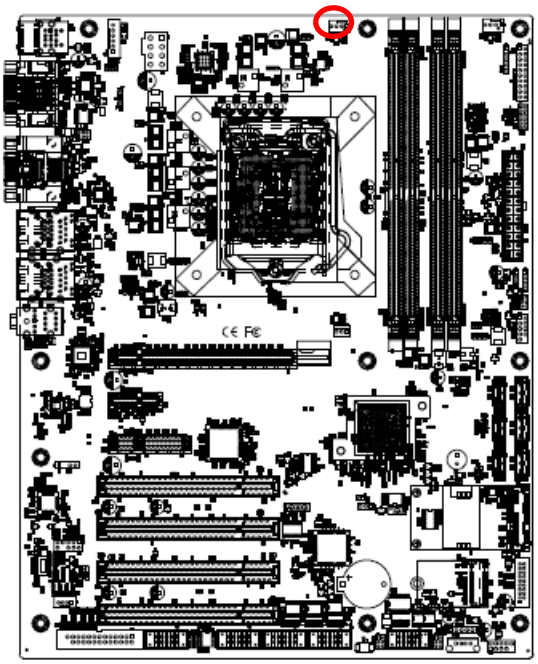
2.3.21 Miscellaneous setting connector (JFP1)

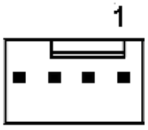




Signal	PIN	PIN	Signal
HDD_LED+	1	2	PWR_LED+
HDD_LED-	3	4	PWE_LED-
RSET_BTN#	5	6	PWRBTN#
GND	7	8	GND
NC	9		

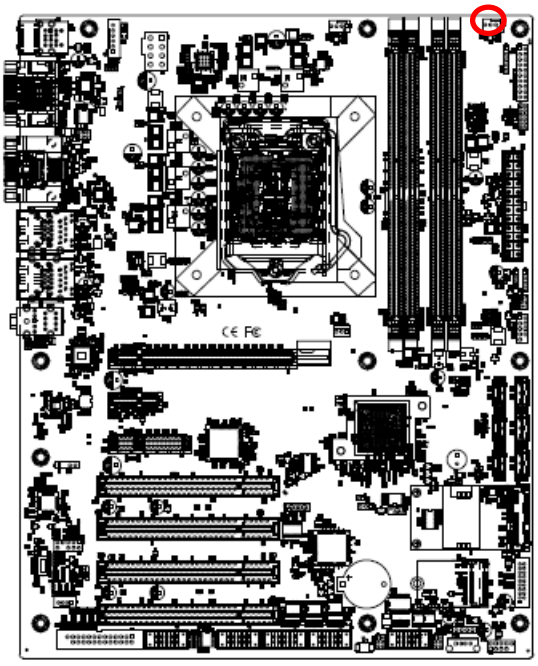
2.3.22 CPU fan connector (CPUFAN1)

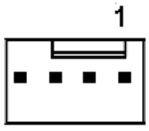




Signal	PIN
GND	1
+12V	2
CPUFANIN	3
CPUFANOUT	4

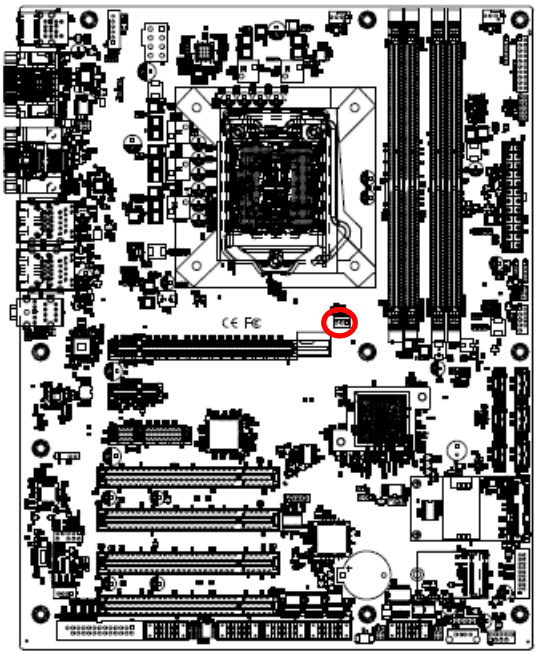
2.3.23 System fan connector 1 (SYSFAN1)

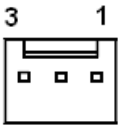




Signal	PIN
GND	1
+12V	2
SYSFANIN1	3
SYSFANOUT1	4

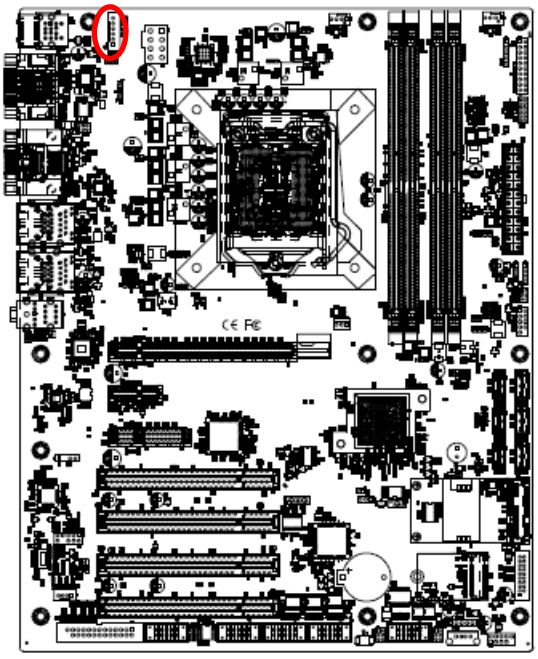
2.3.24 System fan connector 2 (SYSFAN3)

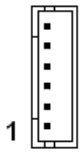




Signal	PIN
GND	1
+12V	2
SYS_FAN_IN_2	3

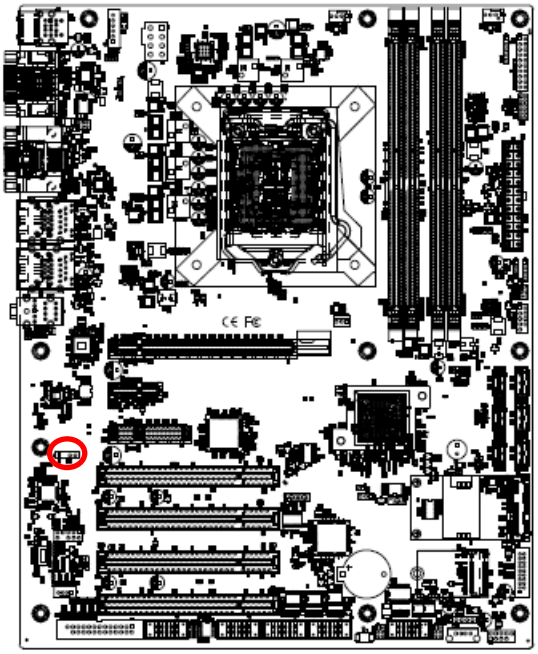
2.3.25 PS/2 keyboard & mouse connector (JKBMS1)

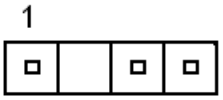




Signal	PIN
MSCK	6
+5V	5
GND	4
MSDT	3
KBDT	2
KBCK	1

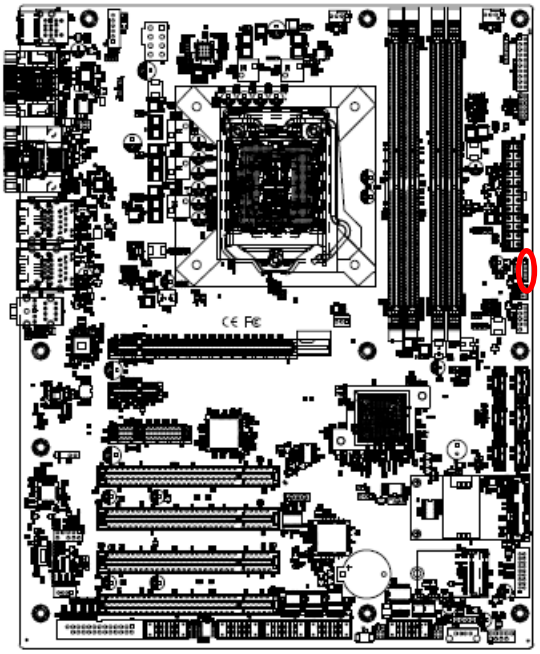
2.3.26 S/PDIF connector (JSPDIF1)





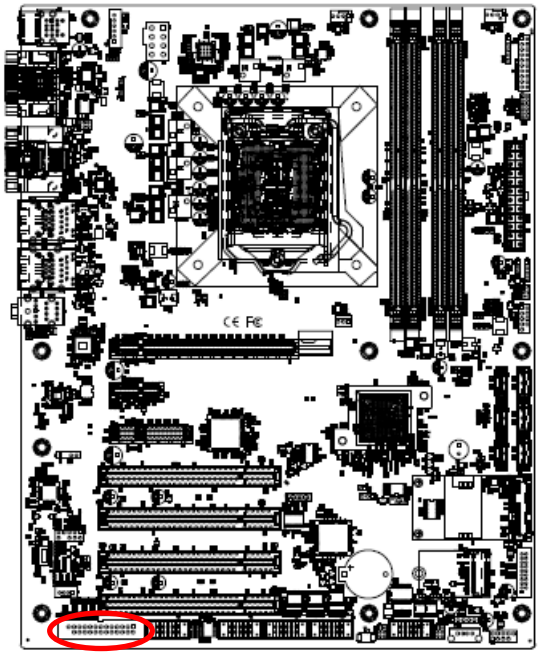
Signal	PIN
+5V	1
SPDIF_O	3
GND	4

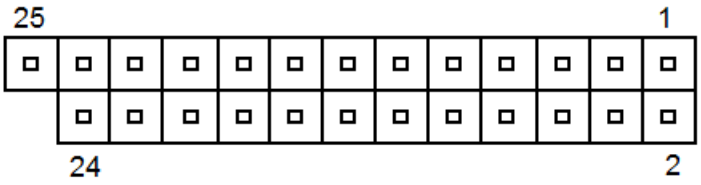
2.3.27 External Speaker connector (JBZ1)



Signal	PIN
+5V	1
NC	2
NC	3
SIO_BEEP	4

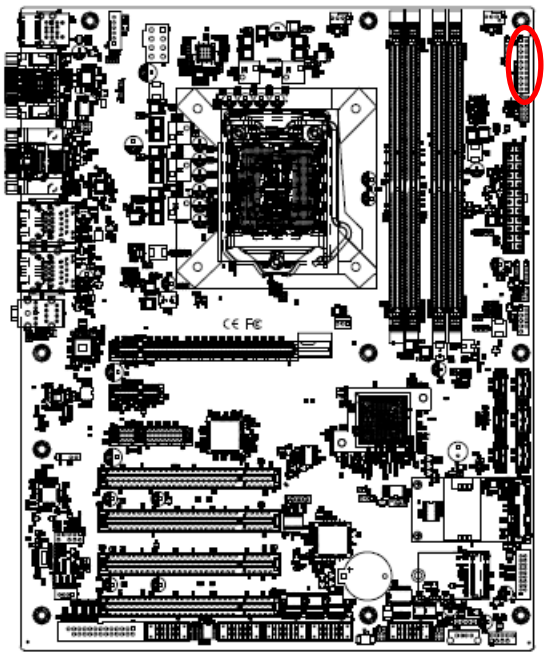
2.3.28 LPT connector (LPT1)

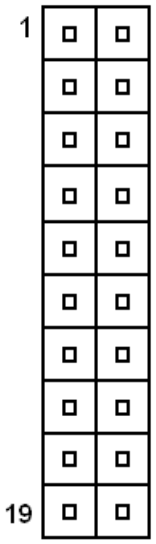




Signal	PIN	PIN	Signal
PT-STB-	1	2	PT_AFD#
PTD0	3	4	ERR#
PTD1	5	6	PT_PAR_INIT#
PTD2	7	8	PT_SLIN#
PTD3	9	10	GND
PTD4	11	12	GND
PTD5	13	14	GND
PTD6	15	16	GND
PTD7	17	18	GND
ACK#	19	20	GND
BUSY	21	22	GND
PE	23	24	GND
SLCT	25		

2.3.29 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#

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.

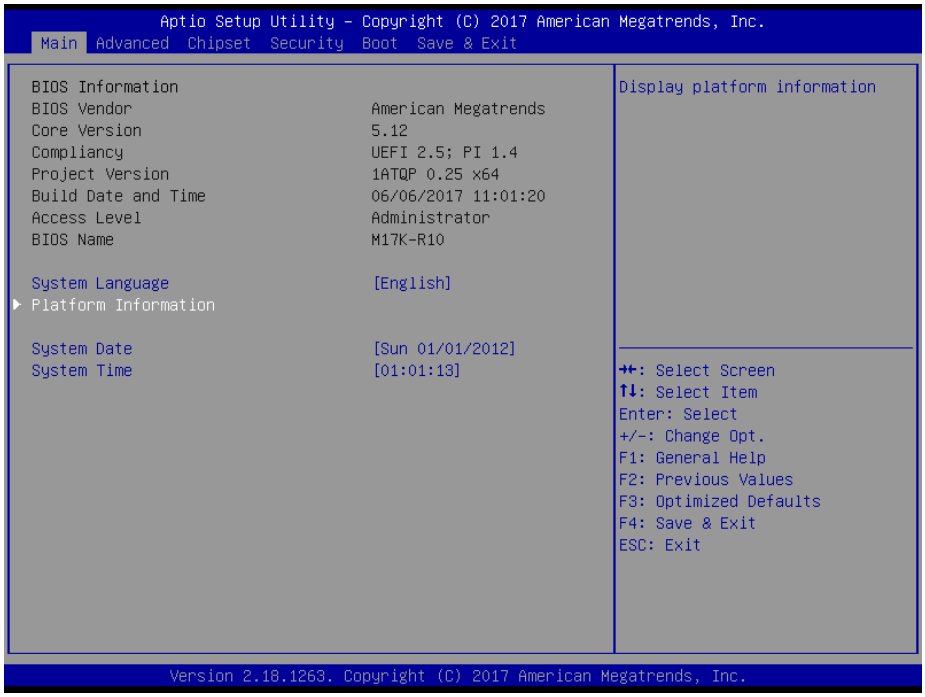
The best advice is to only alter settings which you thoroughly understand. To this end, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both BIOS Vendor and your systems manufacturer to provide the absolute maximum performance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

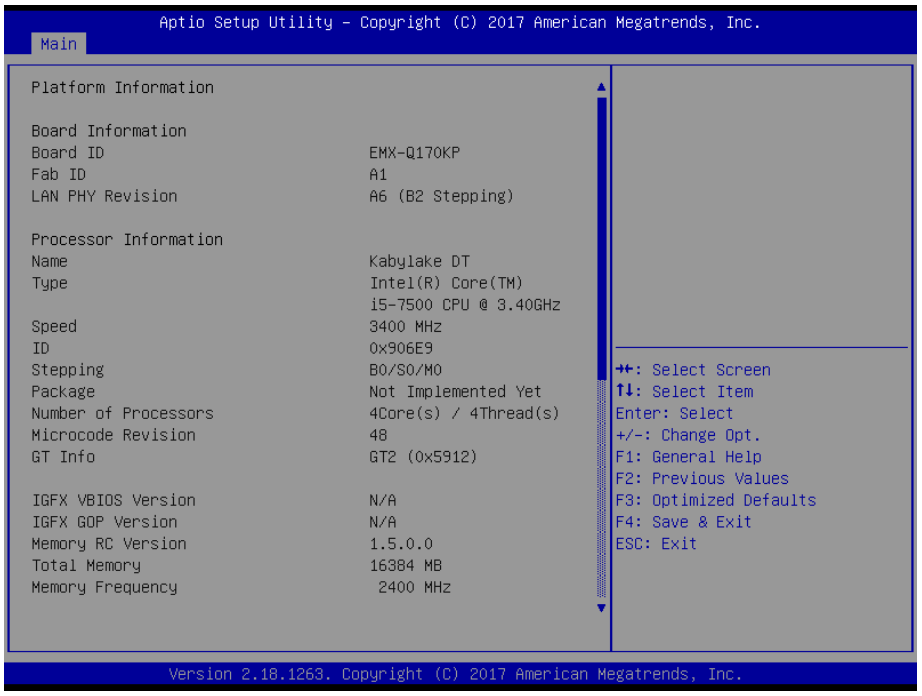
3.6 BIOS setup

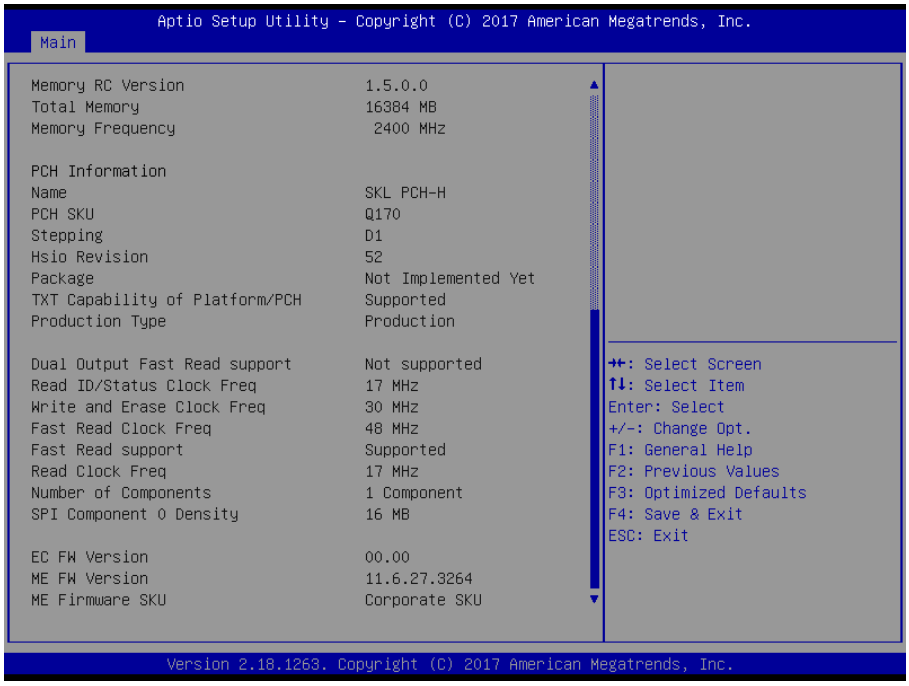
Once you enter the Aptio Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from several setup functions and exit choices. Use the arrow keys to select among the items and press <Enter> to accept and enter the sub-menu.

3.6.1 Main Menu

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







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.

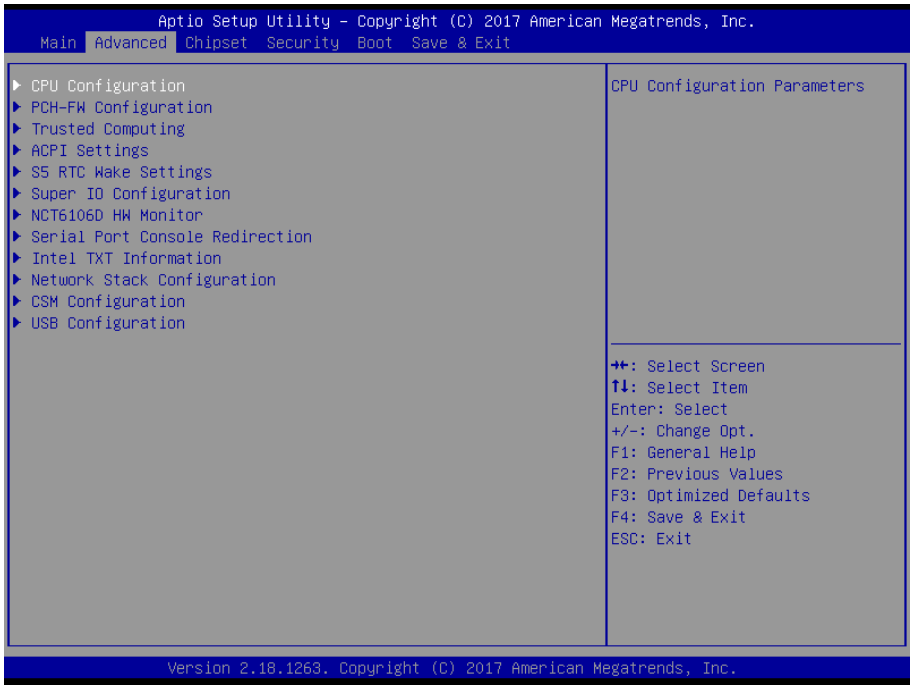
3.6.1.3 System Time

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

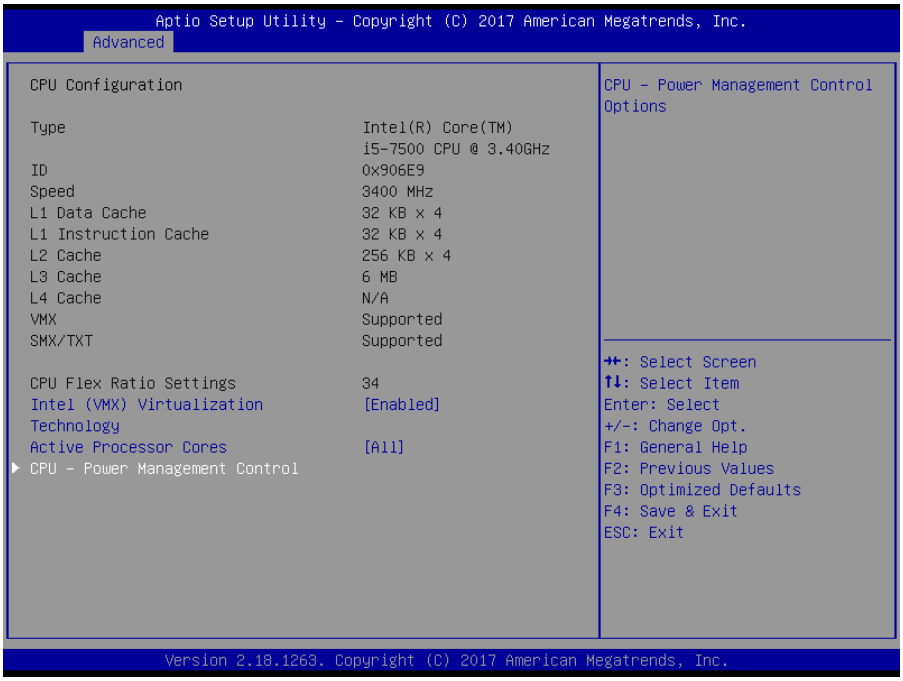
Note: The BIOS setup screens shown in this chapter are for reference purposes only, and may not exactly match what you see on your screen.

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.



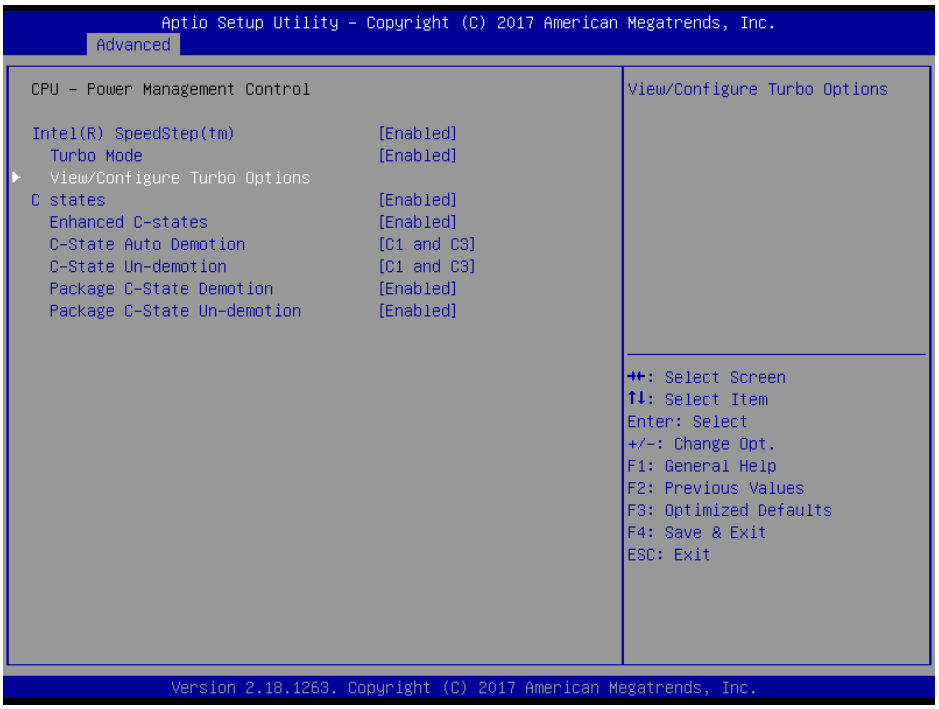
3.6.2.1 CPU Configuration



Item	Options	Description
Intel (VMX) Virtualization Technology	Disabled Enabled**[Default]**,	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

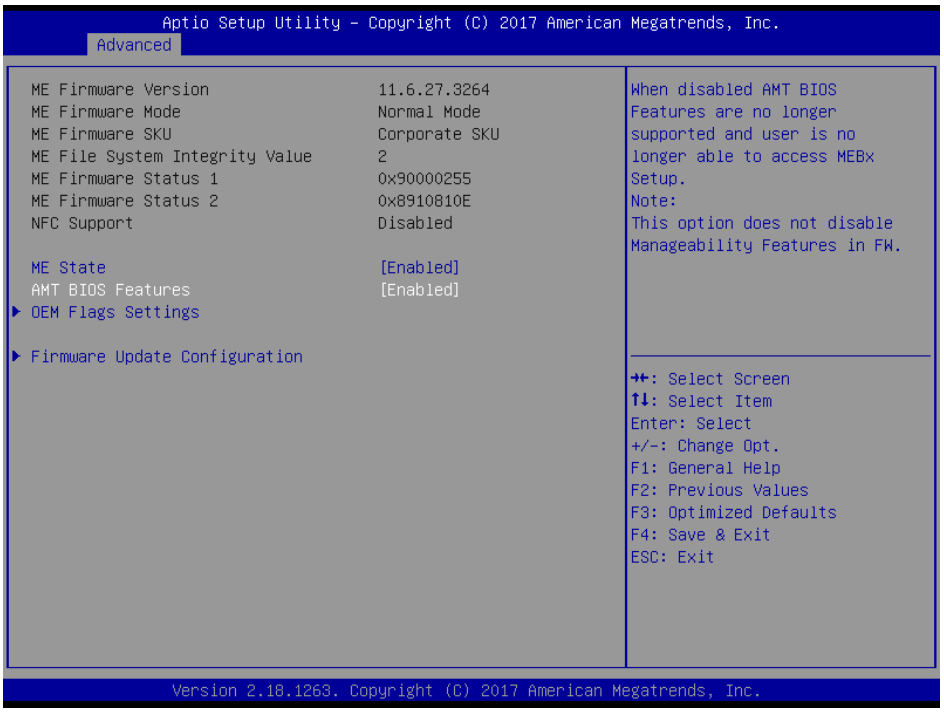
Active Processor Cores	All**[Default]**, 1 2 3	Number of cores to enable in each processor package.

3.6.2.1.1 CPU – Power management Control



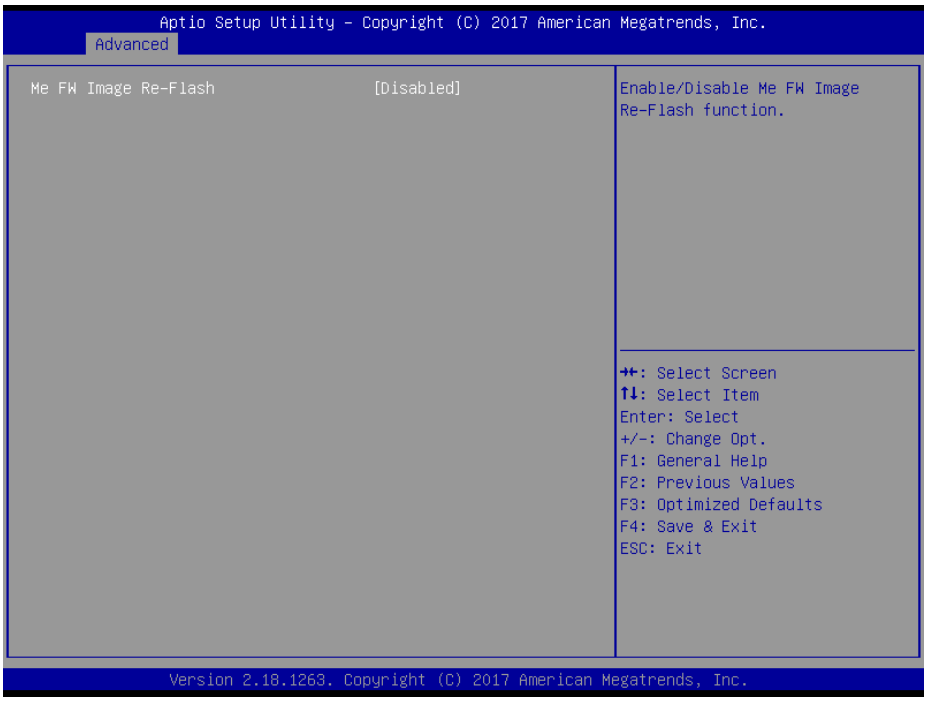
Item	Option	Description
Intel® SpeedStep™	Disabled, Enabled**[Default]**	Allows more than two frequency ranges to be supported.
Turbo Mode	Disabled, Enabled**[Default]**	Enable/Disable processor Turbo Mode (requires EMTTM enabled too). AUTO means enabled, unless max turbo ratio is bigger than 16 – SKL A0 W/A.
C states	Disabled, Enabled**[Default]**	Enable/Disable CPU Power Management. Allows CPU to go to C states when it's not 100280215848tilized.
Enhanced C-states	Disabled, Enabled**[Default]**	Enable/Disable C1E. When enabled, CPU will switch to minimum speed when all cores enter C-State.
C-State Auto Demotion	Disabled C1 C3 C1 and C3**[Default]**	Configure C-State Auto Demotion.
C-State Un-demotion	Disabled C1 C3 C1 and C3**[Default]**	Configure C-State Un-demotion.
Package C-State Demotion	Disabled, Enabled**[Default]**	Package C-State Demotion.
Package C-State Un-demotion	Disabled, Enabled**[Default]**	Package C-State Un-demotion.

3.6.2.2 PCH-FW Configuration



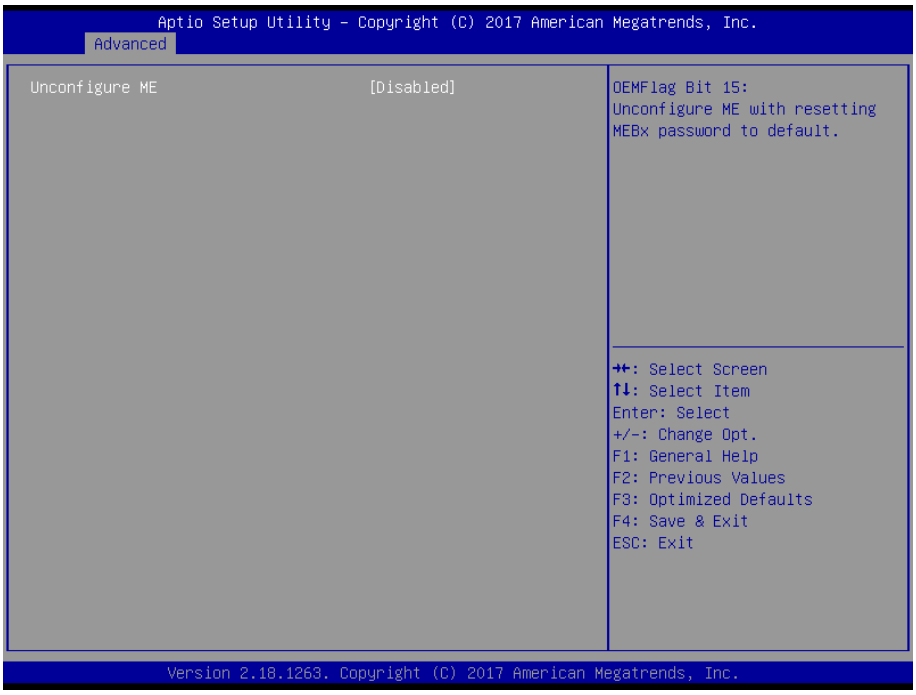
Item	Options	Description
ME State	Disabled, Enabled**[Default]**	When Disabled ME will be put into ME Temporarily Disabled Mode.
AMT BIOS Features	Disabled, Enabled**[Default]**	When disabled AMT BIOS Features are no longer supported and user is no longer able to access MEBx Setup. Note: This option does not disable Manageability Features in FW.

3.6.2.2.1 Firmware Update Configuration



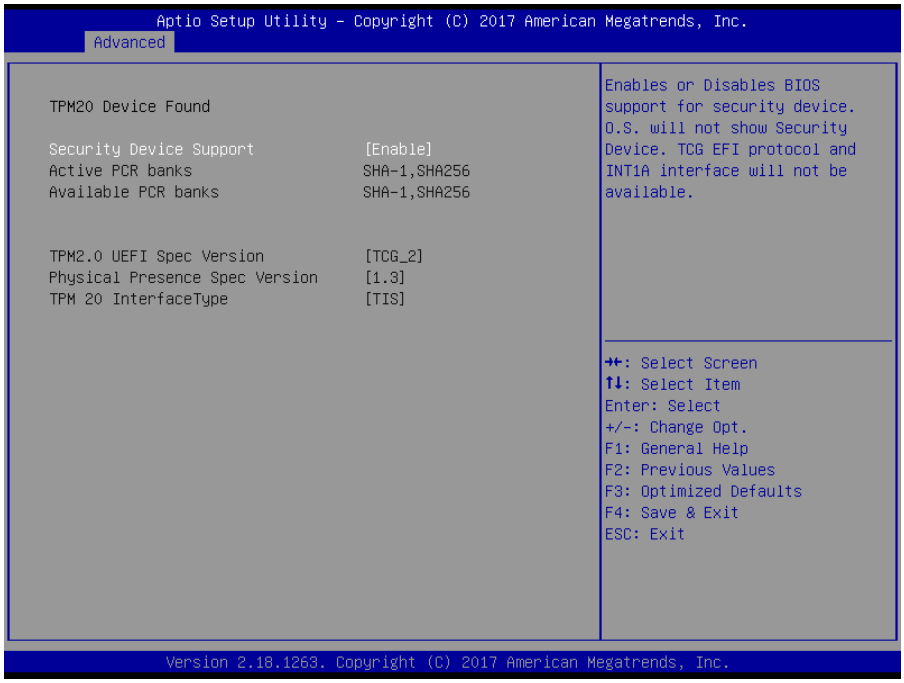
Item	Option	Description
Me FW Image Re-Flash	Disabled**[Default]**, Enabled	Enable/Disable Me FW Image Re-Flash function.

3.6.2.2.2 OEM Flags Settings



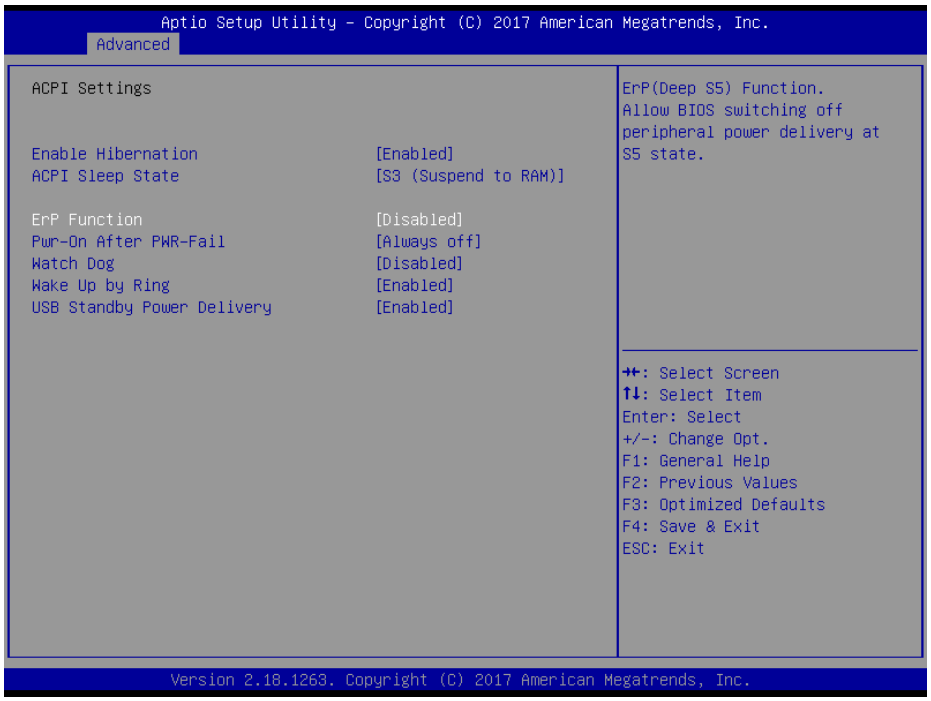
Item	Option	Description
Unconfigure ME	Disabled**[Default]**, Enabled	OEMFlag Bit 15: Unconfigure ME with resetting MEBx password to default.

3.6.2.3 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.

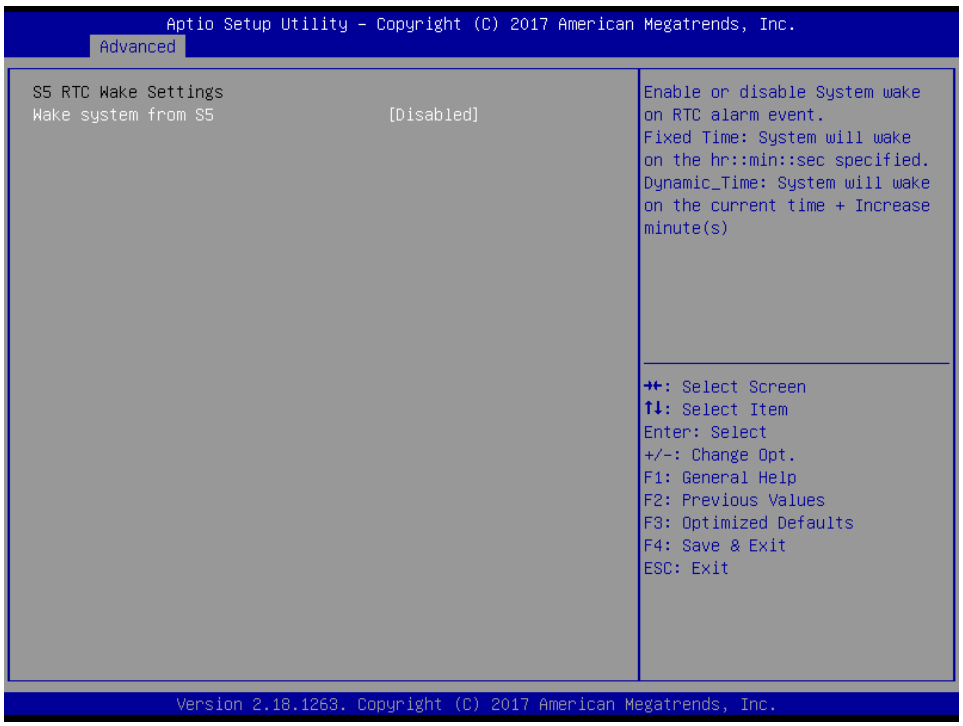
3.6.2.4 APCI Settings



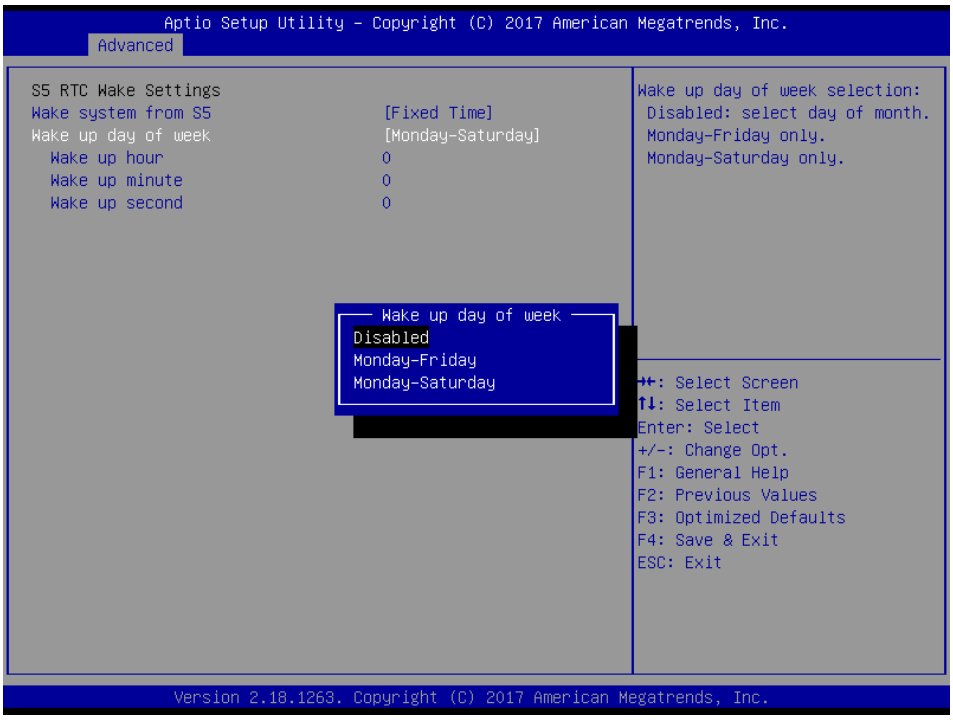
Item	Options	Description
Enable Hibernation	Disabled Enabled**[Default]**,	Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some operating systems.
ACPI Sleep State	Suspend Disabled, S3 (Suspend to RAM)**[Default]**	Select the highest ACPI sleep state the system will enter when the SUSPEDN button is pressed.
ErP Function	Disabled**[Default]**, Enabled	ErP (Deep S5) Function. Allow BIOS switching off peripheral power delivery at S5 state.
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	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 S3(Sleep). S4(Hibernate) and S5(Soft Off) States.
USB Standby Power Delivery	Disabled Enabled**[Default]**,	Enable/Disable USB Power delivery in S3 (Sleep), S4 (Hibernate) and S5 (Soft Off) States.

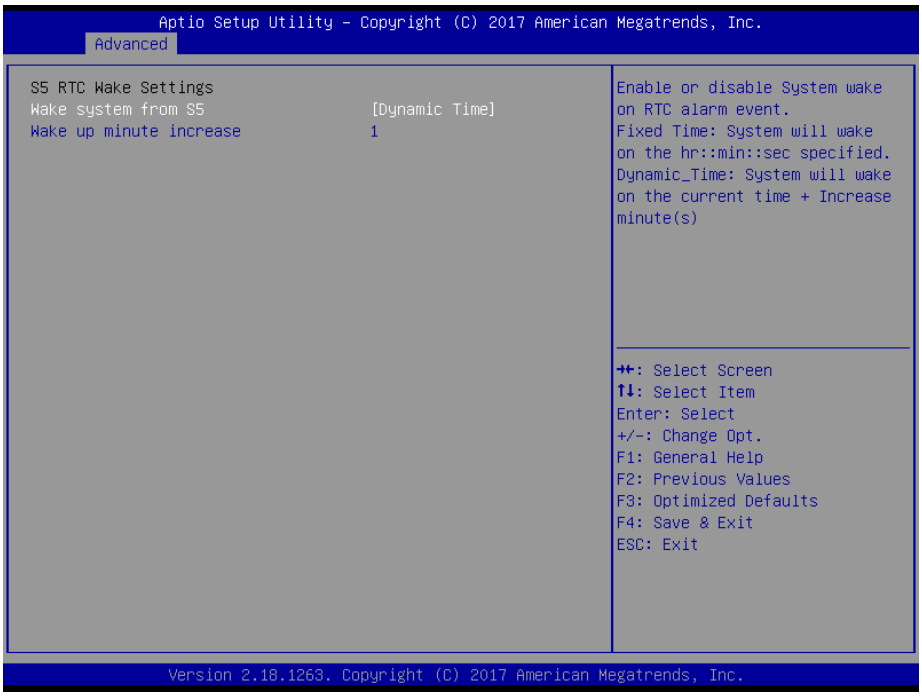
3.6.2.5 S5 RTC Wake Settings



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).



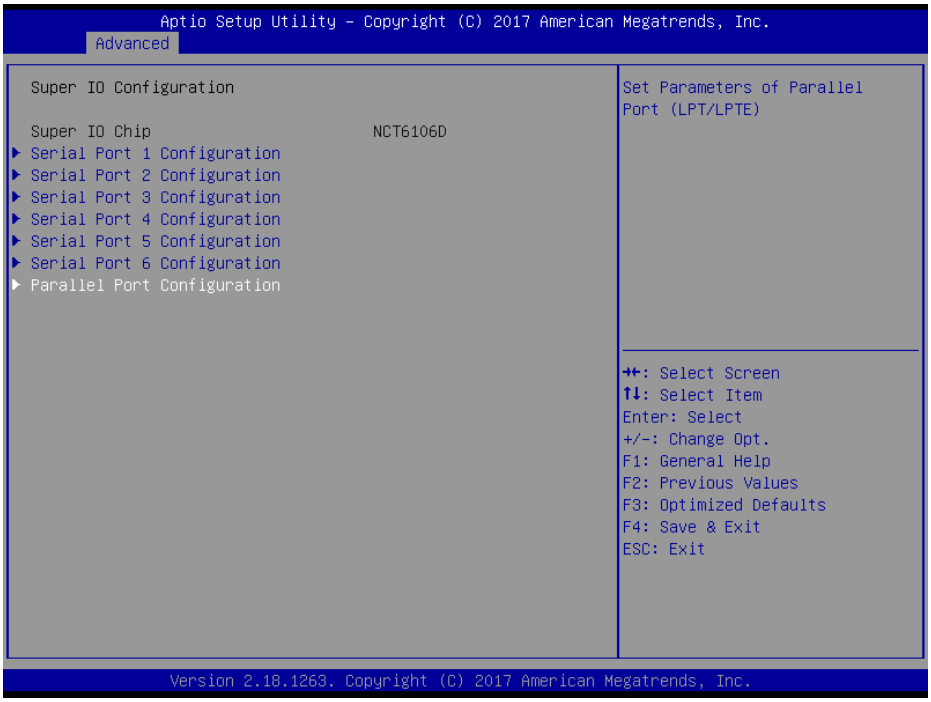
Item	Options	Description
Wake system from S5	Disabled, Fixed Time**[Default]** Dynamic Time	Enable or disable System wake on alarm event. Select Fixed Time, system will wake on the hr::min::sec specified. Select Dynamic Time, System will wake on the current time + Increase minute(s).
Wake up day of week	Disabled**[Default]**, Monday-Friday Monday-Saturday	Wake up day of week selection: Disabled: select day of month. Monday-Friday only. Monday-Saturday only.
Wake up hour	0-23	Select 0-23 For example enter 3 for 3am and 15 for 3pm.
Wake up minute	0-59	0-59.
Wake up second	0-59	0-59.



Item	Options	Description
Wake system from S5	Disabled, Fixed Time Dynamic Time**[Default]**	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).
Wake up minute increase	1-5	1-5.

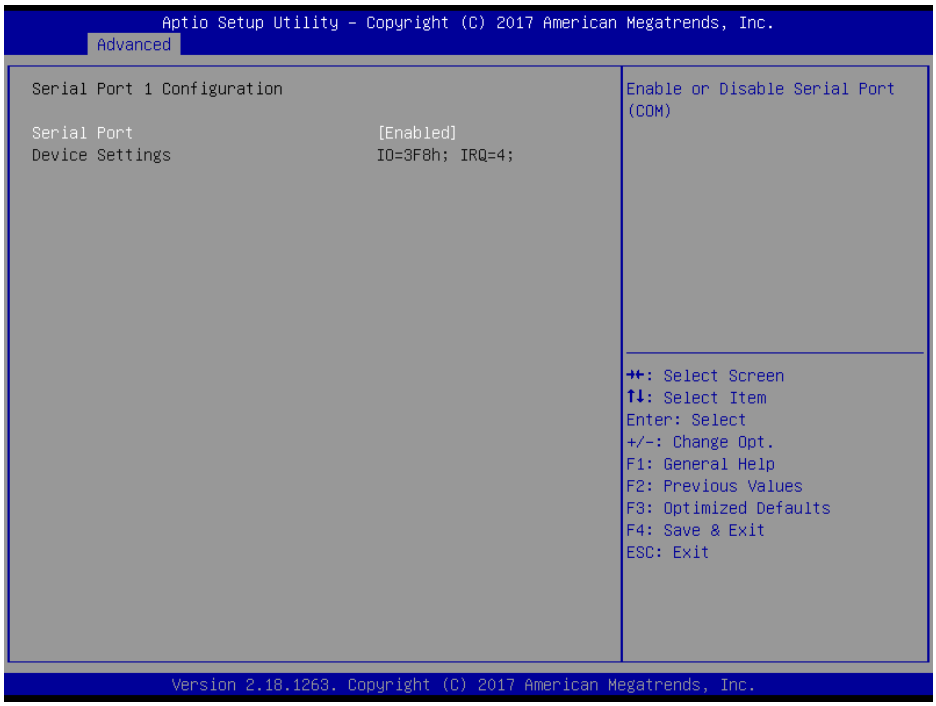
3.6.2.6 Super IO Configuration

You can use this item to set up or change the Super IO configuration for serial ports. Please refer to 3.6.2.6.1~ 3.6.2.6.7 for more information.



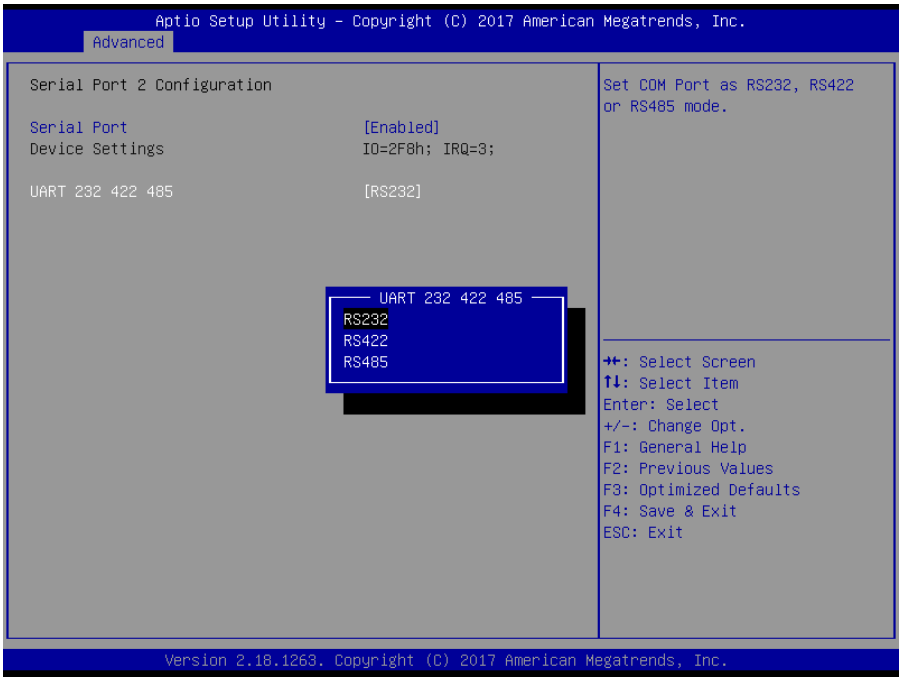
Item	Description
Serial Port 1 Configuration	Set Parameters of Serial Port 1 (COMA).
Serial Port 2 Configuration	Set Parameters of Serial Port 2 (COMB).
Serial Port 3 Configuration	Set Parameters of Serial Port 3 (COMC).
Serial Port 4 Configuration	Set Parameters of Serial Port 4 (COMD).
Serial Port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

3.6.2.6.1 Serial Port 1 Configuration



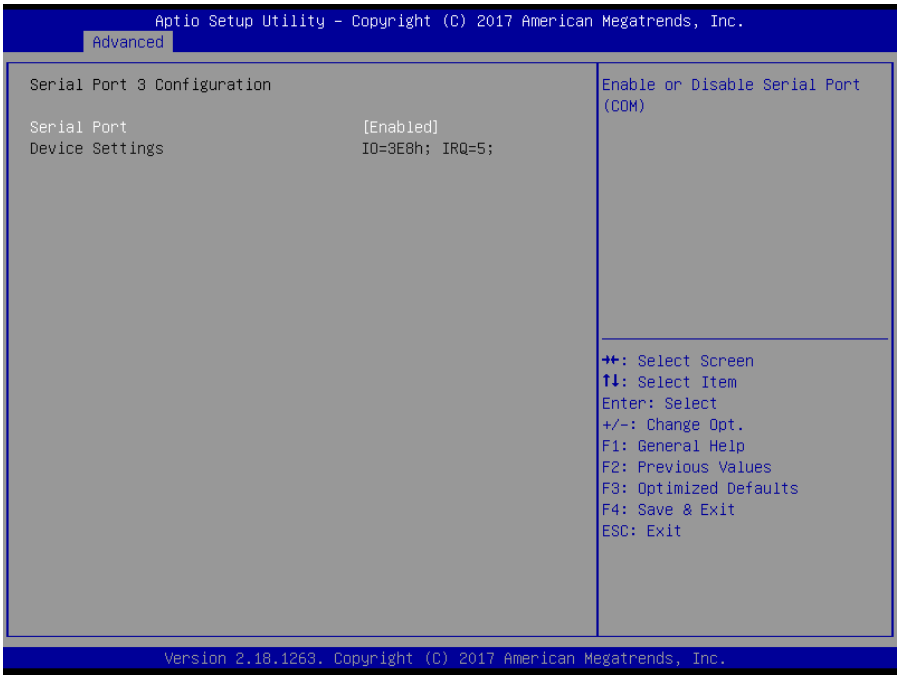
Item	Option	Description
Serial Port	Enabled**[Default]**, Disabled	Enable or Disable Serial Port (COM).

3.6.2.6.2 Serial Port 2 Configuration



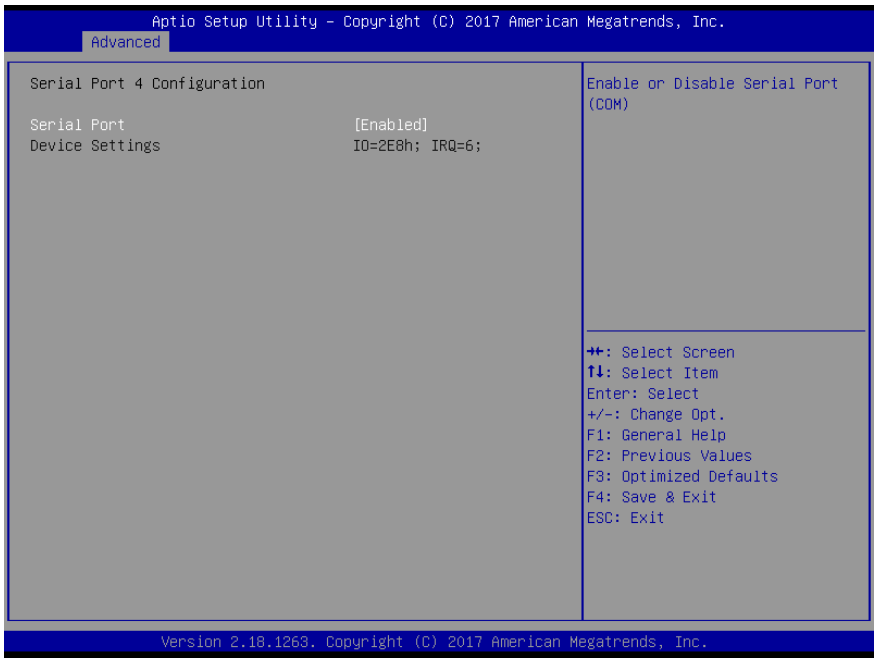
Item	Option	Description
Serial Port	Enabled**[Default]**, Disabled	Enable or Disable Serial Port (COM).
UART 232 422 485	RS232**[Default]** RS422 RS485	Set COM Port as RS232, RS422 or RS485 mode.

3.6.2.6.3 Serial Port 3 Configuration



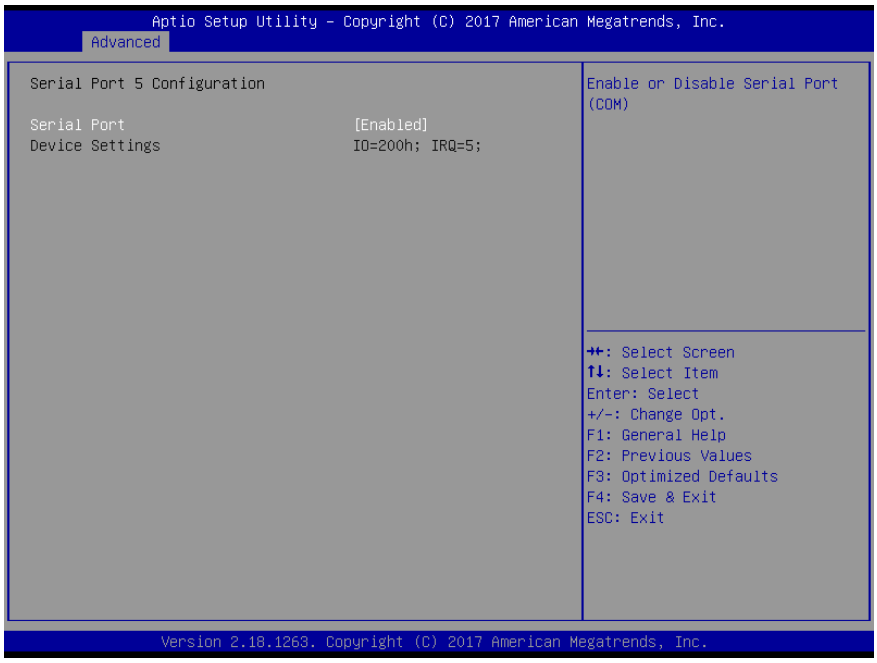
Item	Option	Description
Serial Port	Enabled**[Default]**, Disabled	Enable or Disable Serial Port (COM).

3.6.2.6.4 Serial Port 4 Configuration



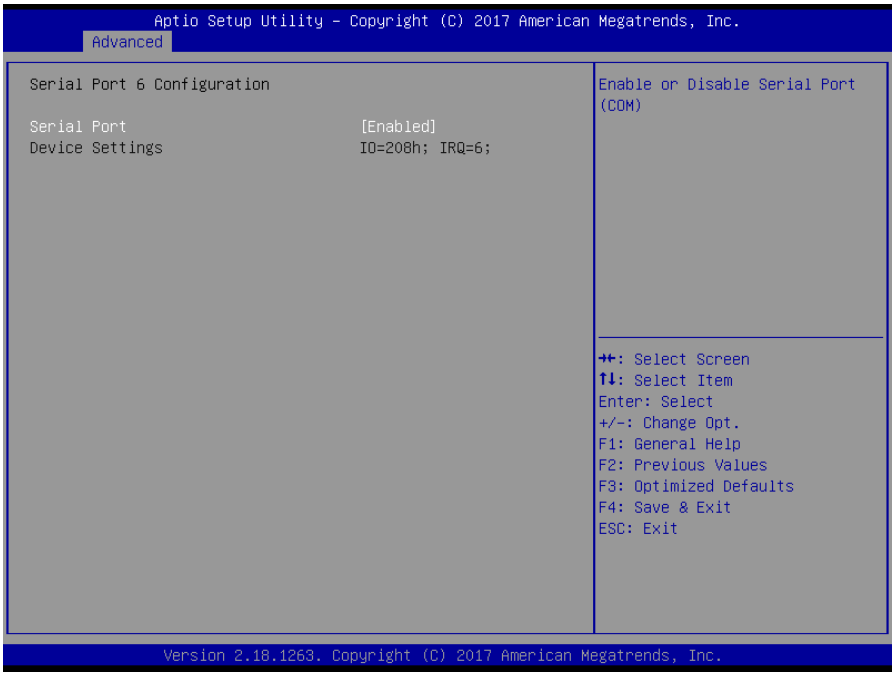
Item	Option	Description
Serial Port	Enabled**[Default]**, Disabled	Enable or Disable Serial Port (COM).

3.6.2.6.5 Serial Port 5 Configuration



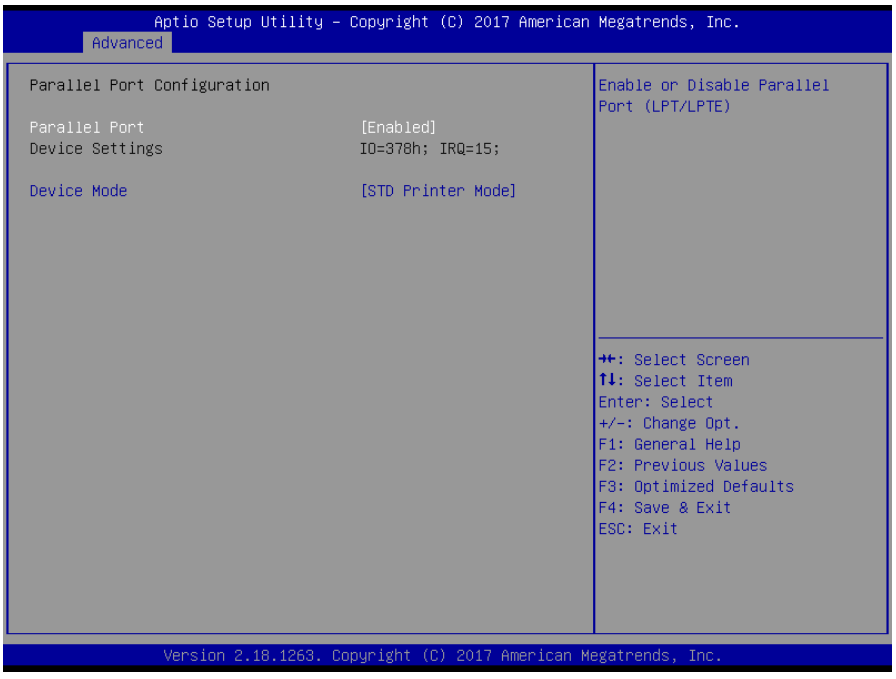
Item	Option	Description
Serial Port	Enabled**[Default]**, Disabled	Enable or Disable Serial Port (COM).

3.6.2.6.6 Serial Port 6 Configuration



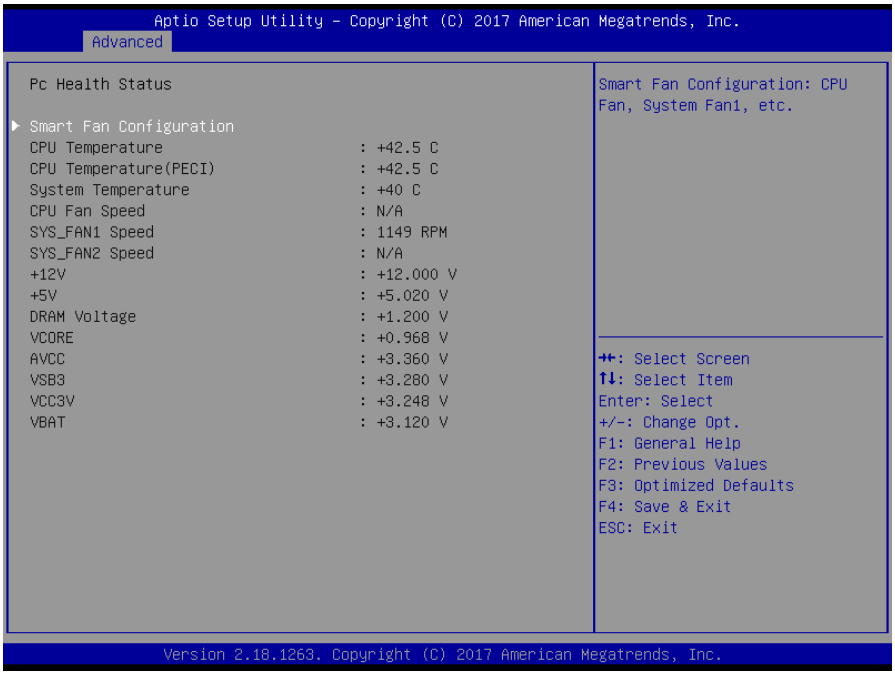
Item	Option	Description
Serial Port	Enabled**[Default]**, Disabled	Enable or Disable Serial Port (COM).

3.6.2.6.7 Parallel Port Configuration

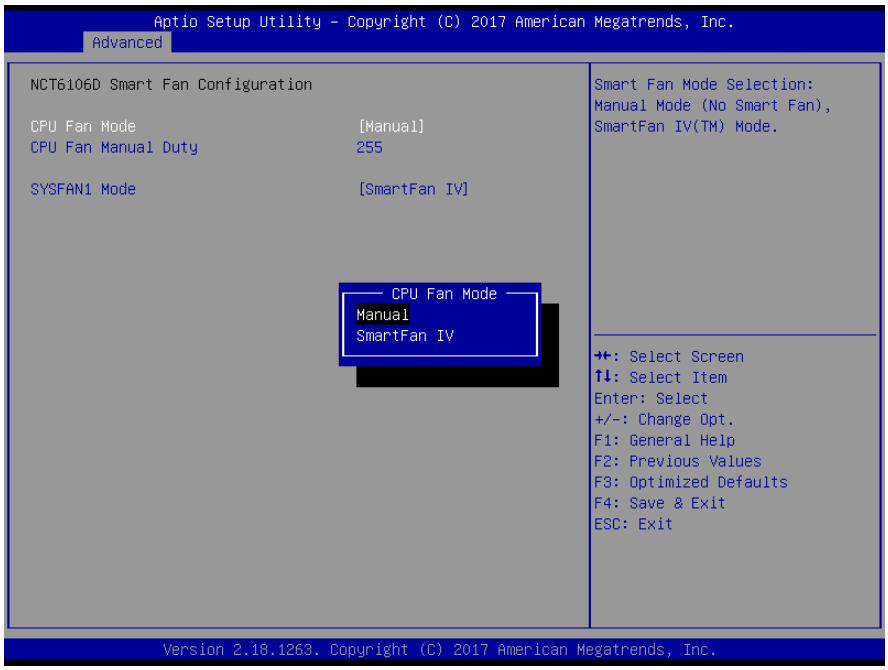


Item	Option	Description
Parallel Port	Enabled**[Default]**, Disabled	Enable or Disable Parallel Port (LPT/LPTE).
Device Mode	STD Printer Mode**[Default]** SPP Mode EPP-1.9 and SPP Mode EPP-1.7 and SPP Mode	Change the Printer Port mode.

3.6.2.7 NCT6106D H/W Monitor

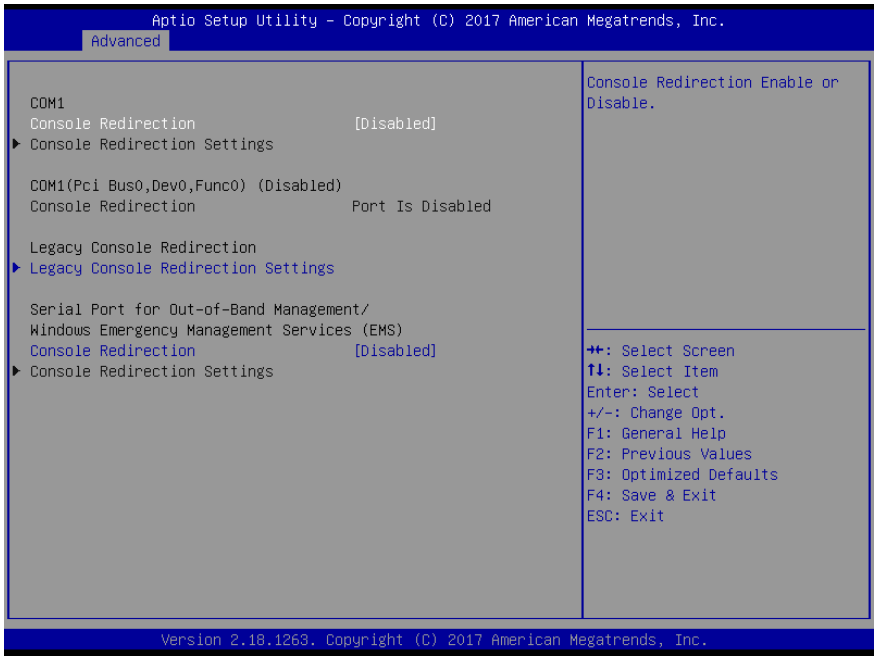


3.6.2.7.1 Smart Fan Configuration



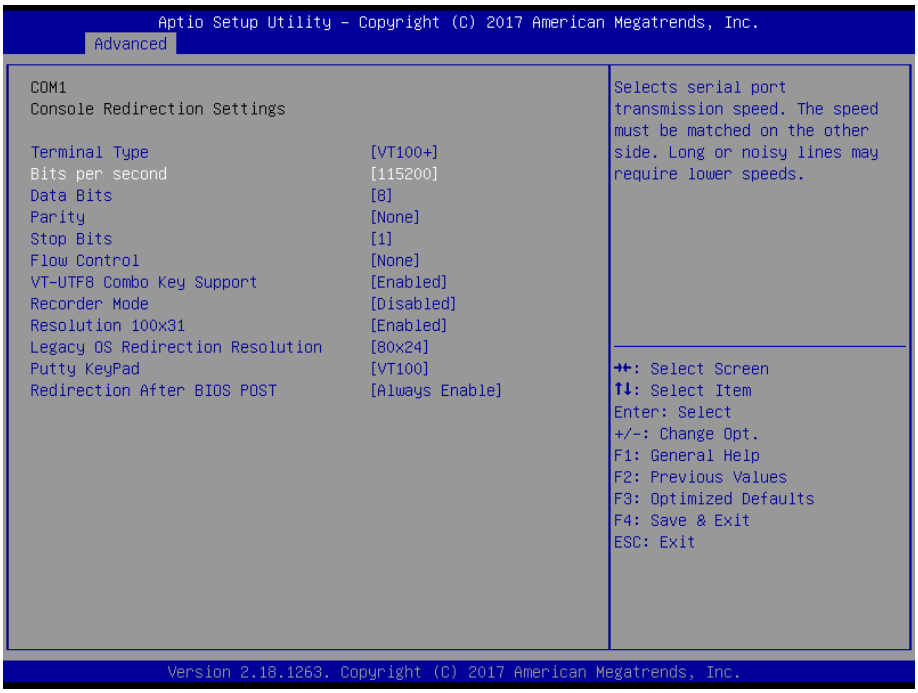
Item	Option	Description
CPU Fan Mode	Manual**[Default]**, SmartFan IV	Smart Fan Mode Selection: Manual Mode (No Smart Fan), SmartFan IV™ Mode.
CPU Fan Manual Duty	0-255	CPU Fan manual output duty: 0 to 255.
SYSFAN1 Mode	Manual SmartFan IV**[Default]**,	Smart Fan Mode Selection: Manual Mode (No Smart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

3.6.2.8 Serial Port Console Redirection



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

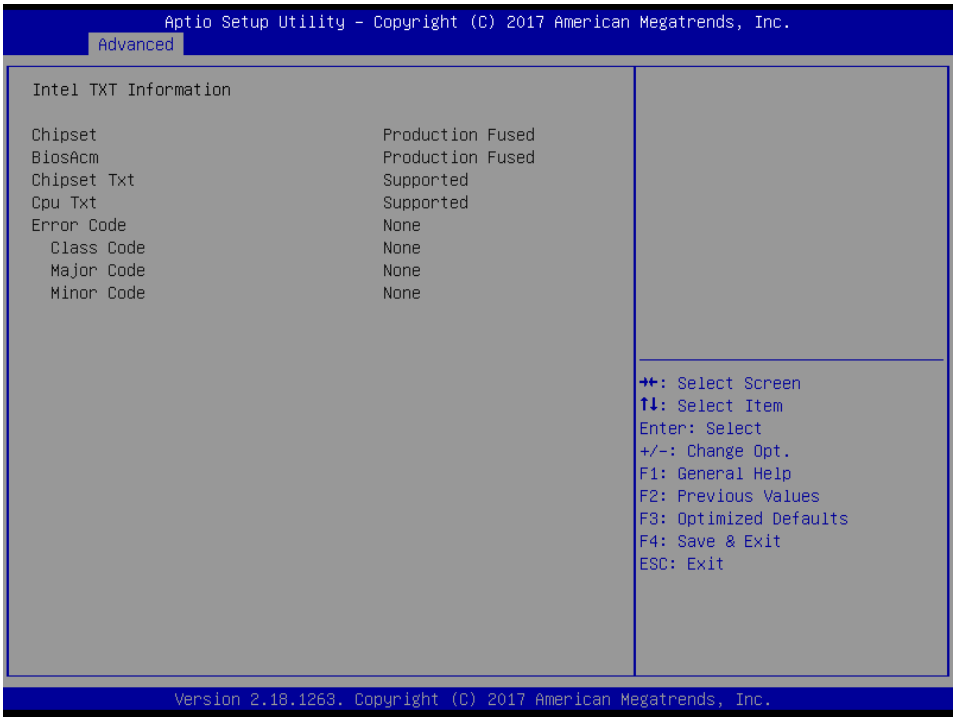
3.6.2.8.1 COM1



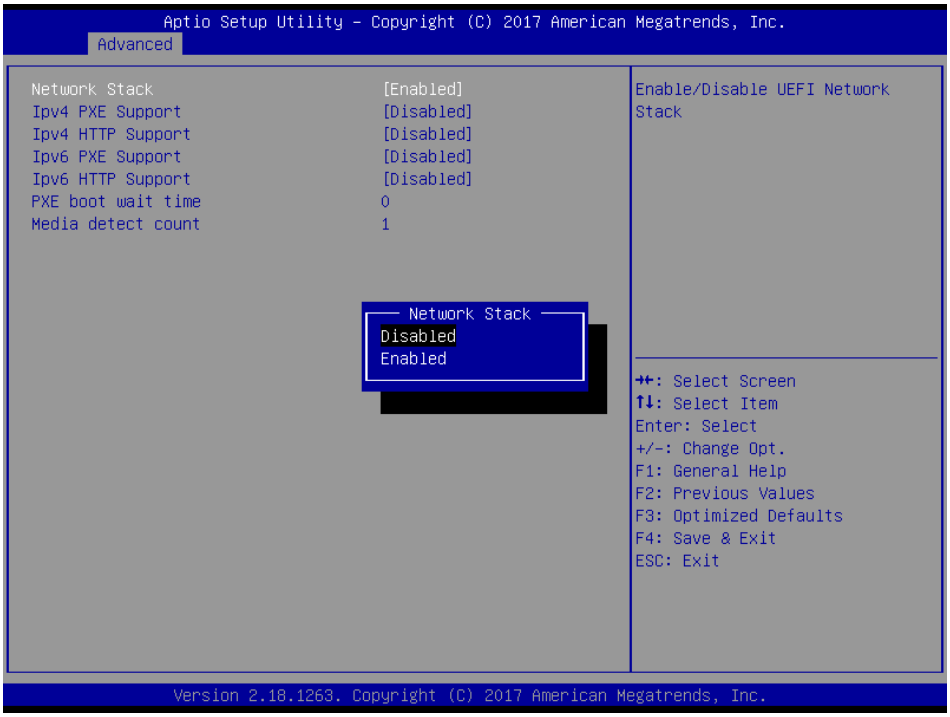
Item	Option	Description
Terminal Type	VT100 VT100+**[Default]** VT-UTF8 ANSI	Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT100+: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.
Bits per second	9600 19200 38400 57600 115200**[Default]**	Select serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.
Data Bits	7 8**[Default]**	Data Bits.
Parity	None**[Default]** Even Odd Mark Space	A parity bit can be sent with the data bits to detect some transmission errors. Even: parity bit is 0 if the num of 1's in the data bits is even. Odd: parity bit is 0 if num of 1's in the data bits is odd. Mark: Parity bit is always. 1. Space: Parity bit is always 0. Mark and Space Parity do not allow for error detection. They can be used as an additional data bit.
Stop Bits	1**[Default]** 2	Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit.
Flow Control	None**[Default]** Hardware RTS/CTS	Flow control can prevent data loss from buffer overflow. When sending data, if the

		receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.
VT-UTF8 Combo Key Support	Disabled Enabled**[Default]**	Enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals.
Recorder Mode	Disabled**[Default]** Enabled	With this mode enabled only text will be sent. This is to capture Terminal data.
Resolution 100×31	Disabled Enabled**[Default]**	Enables or disables extended terminal resolution.
Legacy OS Redirection Resolution	80×24**[Default]** 80×25	On Legacy OS, the Number of Rows and Columns supported redirection.
Putty KeyPad	VT100**[Default]** LINUX XTERMR6 SCO ESCN VT400	Select FunctionKey and KeyPad on Putty.
Redirection After BIOS POST	Always Enable**[Default]** BootLoader	The Settings specify if BootLoader is selected then Legacy console redirection is disabled before booting to Legacy OS. Default value is Always Enabled which means Legacy console Redirection is enabled.

3.6.2.9 Intel TXT Configuration

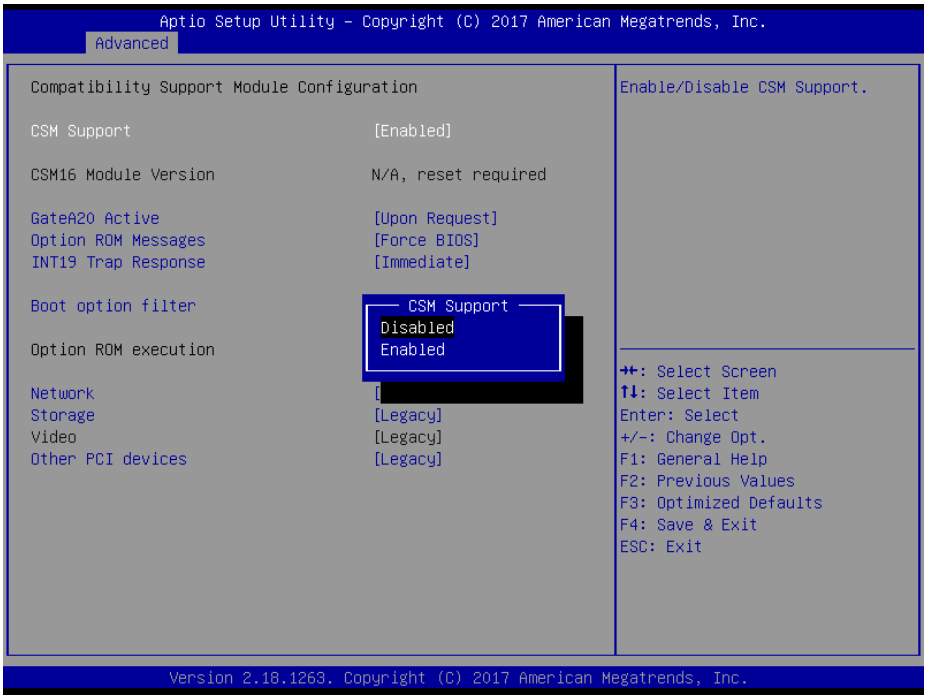


3.6.2.10 Network Stack Configuration



Item	Options	Description
Network Stack	Enabled**[Default]** Disabled	Enable/Disable UEFI Network Stack.
Ipv4 PXE Support	Enabled Disabled**[Default]**	Enable Ipv4 PXE Boot Support. If disabled IPV4 PXE boot option will not be created.
Ipv4 HTTP Support	Enabled Disabled**[Default]**	Enable Ipv4 HTTP Boot Support. If disabled IPV4 HTTP boot option will not be created.
Ipv6 PXE Support	Enabled Disabled**[Default]**	Enable Ipv6 PXE Boot Support. If disabled IPV4 PXE boot option will not be created.
Ipv6 HTTP Support	Enabled Disabled**[Default]**	Enable Ipv6 HTTP Boot Support. If disabled IPV4 HTTP boot option will not be created.
PXE boot wait time	0	Wait time to press ESC key to abort the PXE boot.
Media detect count	1	Number of times presence of media will be checked.

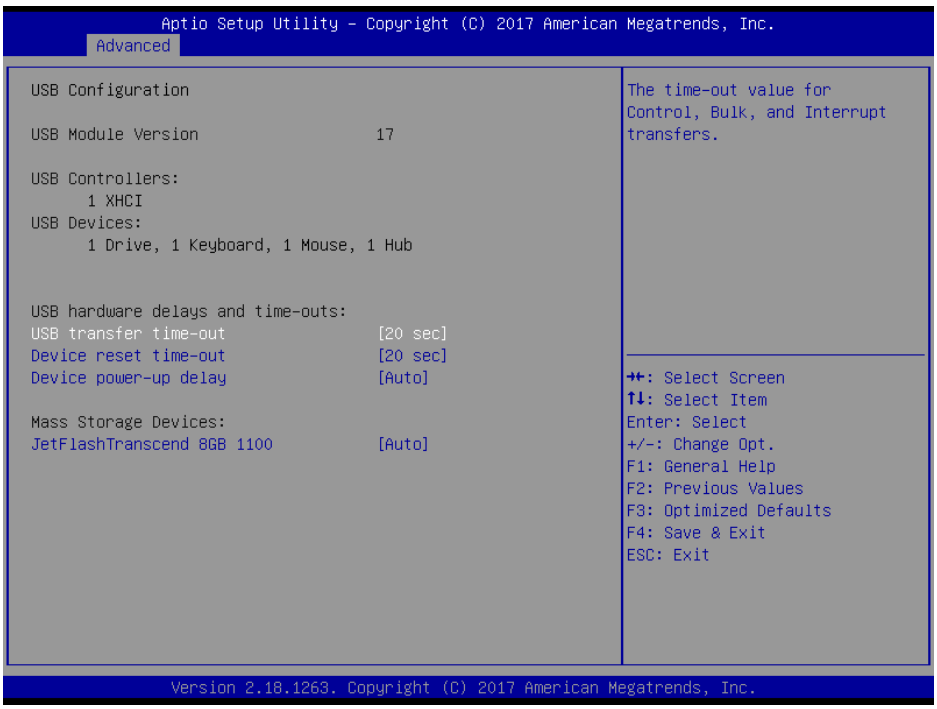
3.6.2.11 CSM Configuration



Item	Options	Description
CSM Support	Enabled**[Default]** Disabled	Enable/Disable CSM Support.
GateA20 Active	Upon Request**[Default]** Always	UPON REQUEST – GA20 can be disabled using BIOS services. ALWAYS – do not allow disabling GA20; this option is useful when any RT code is executed above 1MB.
Option ROM Messages	Force BIOS**[Default]** Keep Current	Set display mode for Option ROM.
INT19 Trap Response	Immediate**[Default]** Postponed	BIOS reaction on INT19 trapping by Option ROM: IMMEDIATE – execute the trap right away; POSTPONED – execute the trap during legacy boot.
Boot option filter	Legacy only**[Default]** UEFI only	This option controls Legacy/UEFI ROMs priority.
Network	Do not launch**[Default]** UEFI Legacy	Controls the execution of UEFI and Legacy PXE OpROM.
Storage	Do not launch UEFI Legacy**[Default]**	Controls the execution of UEFI and Legacy Storage OpROM.
Other PCI devices	Do not launch UEFI Legacy**[Default]**	Determines OpROM execution policy for devices other than Network, Storage, or Video.

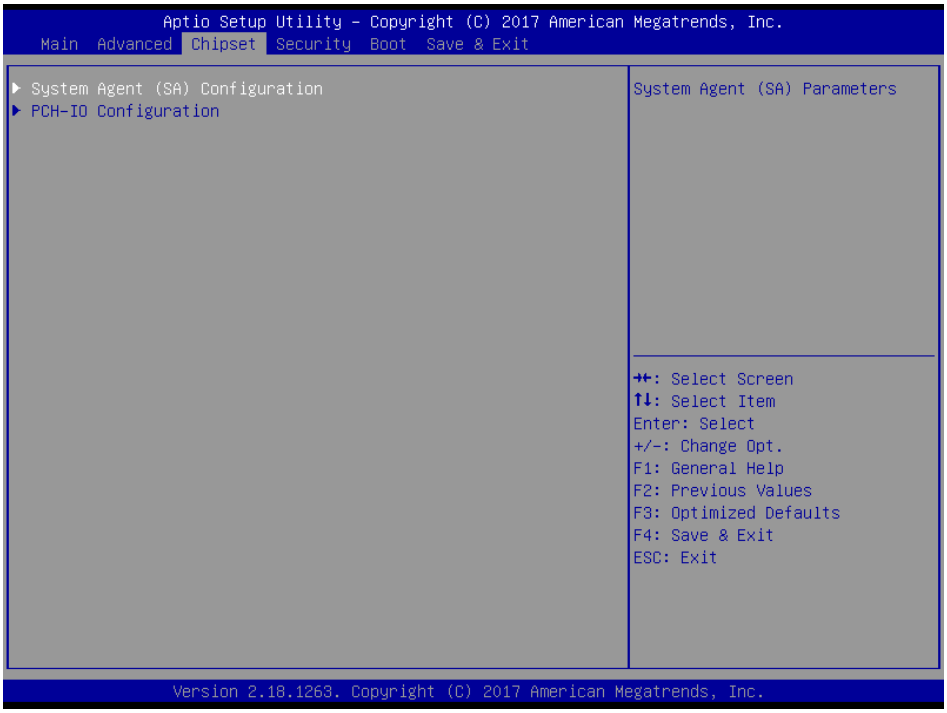
3.6.2.12 USB Configuration

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

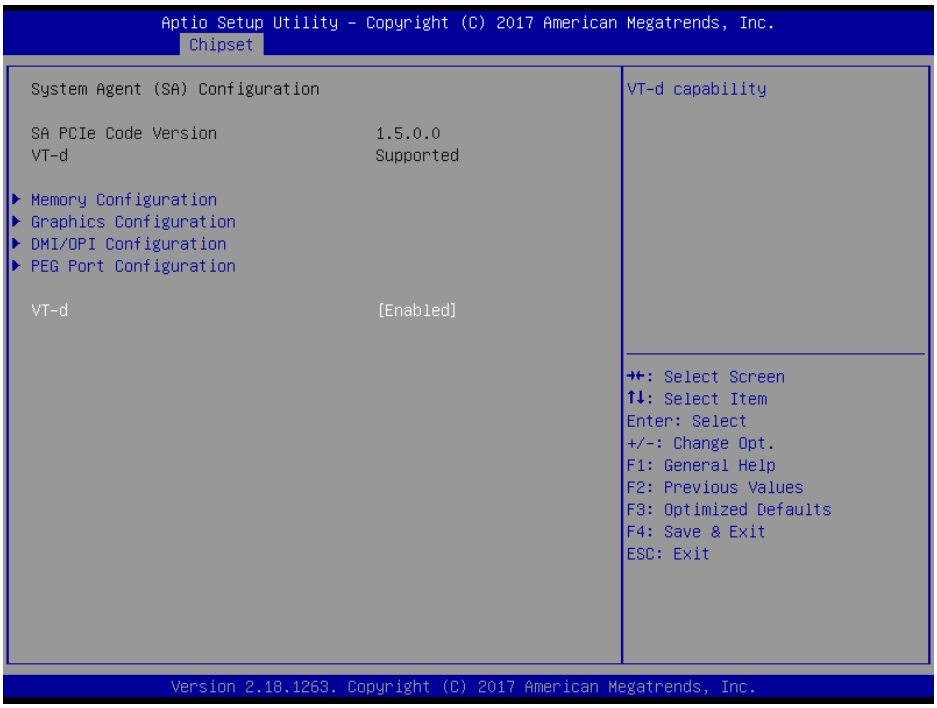


Item	Options	Description
USB transfer time-out	1 sec 5 sec 10 sec 20 sec**[Default]**	The time-out value for Control, Bulk, and Interrupt transfers.
Device reset time-out	10 sec 20 sec**[Default]** 30 sec 40 sec	USB mass storage device Start Unit command time-out.
Device power-up delay	Auto**[Default]** 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

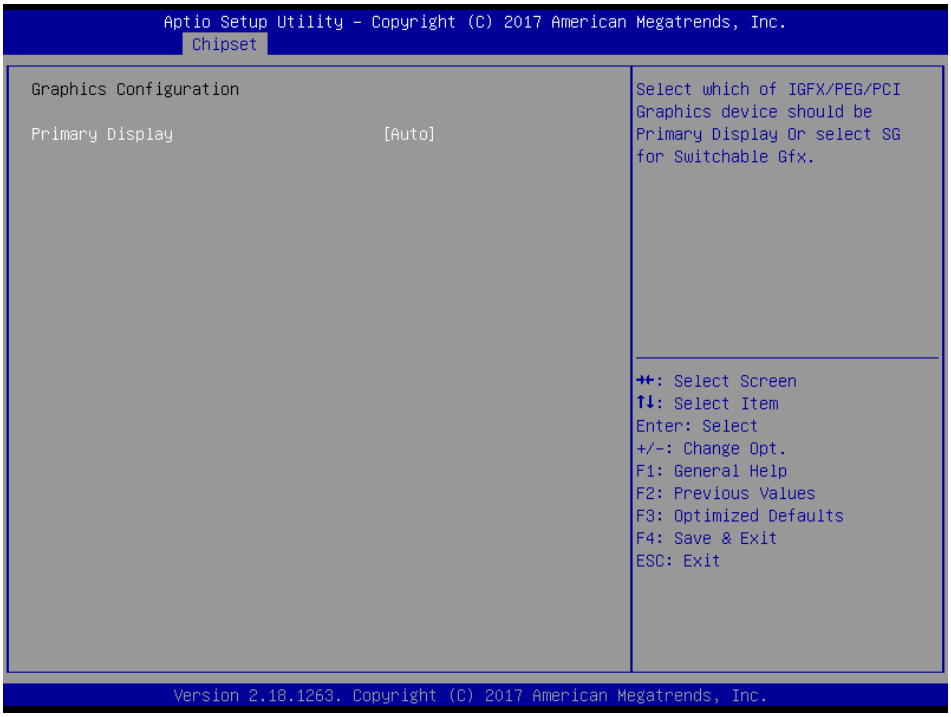


3.6.3.1 System Agent (SA) Configuration



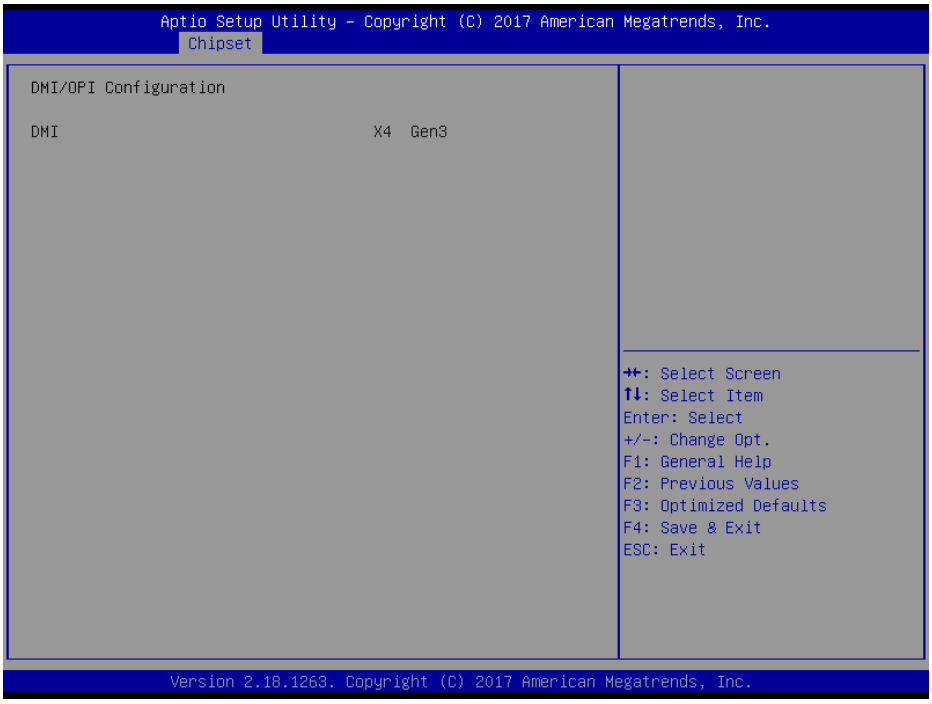
Item	Option	Description
VT-d	Enabled**[Default]** Disabled	VT-d capability.

3.6.3.1.1 Graphics Configuration

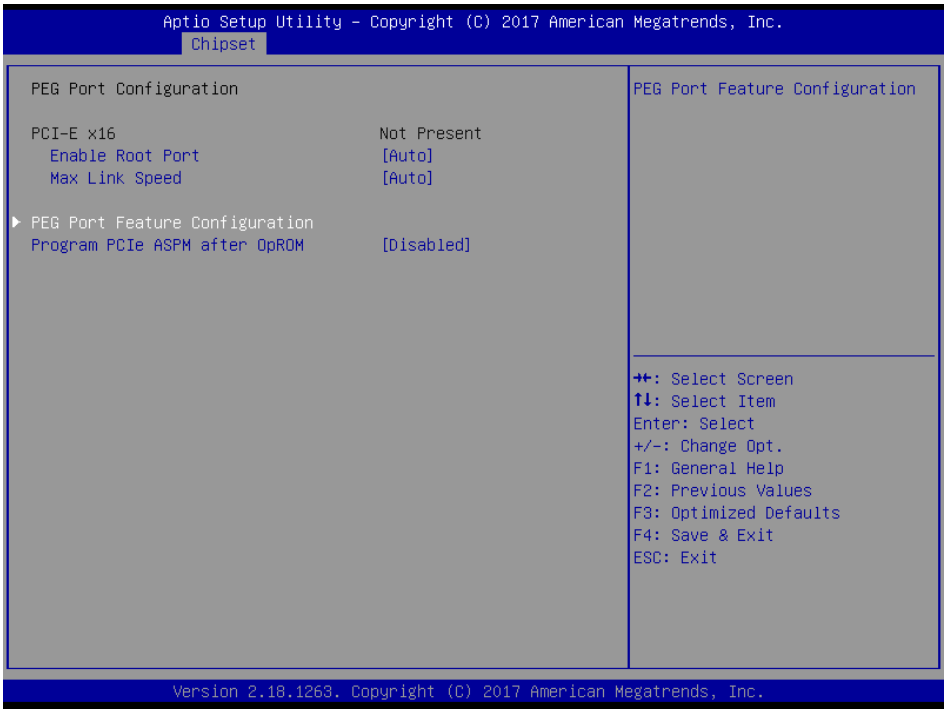


Item	Option	Description
Primary Display	Auto**[Default]** IGFX PEG PCIE	Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select SG for Switchable Gfx.

3.6.3.1.2 DMI/OPI Configuration

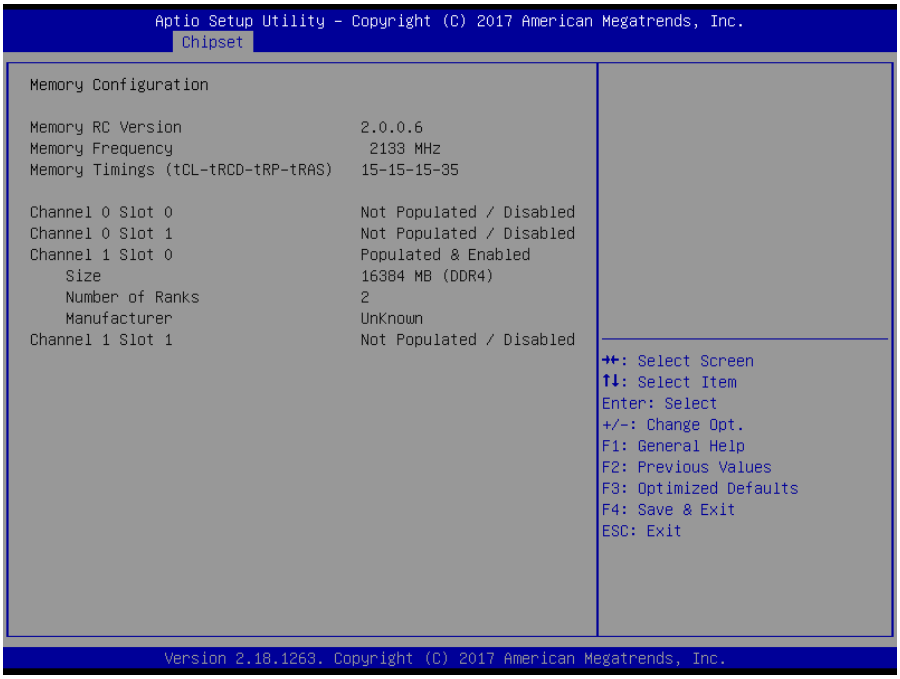


3.6.3.1.3 PEG Port Configuration

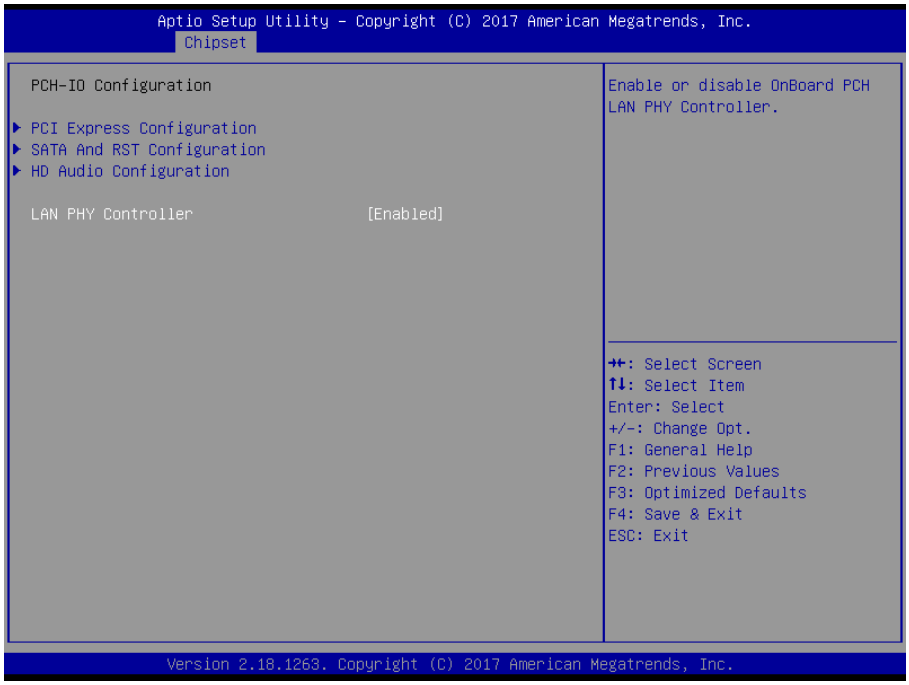


Item	Option	Description
Enable Root Port	Disabled Enabled Auto**[Default]**	Enable or Disable the Root Port.
Max Link Speed	Auto**[Default]** Gen1 Gen2 Gen3	Configure PEG 0:1:0 Max Speed.
Program PCIe ASPM after OpROM	Disabled**[Default]** Enabled	Enabled: PCIe ASPM will be programmed after OpROM. Disabled: PCIe ASPM will be programmed before OpROM.

3.6.3.1.4 Memory Configuration

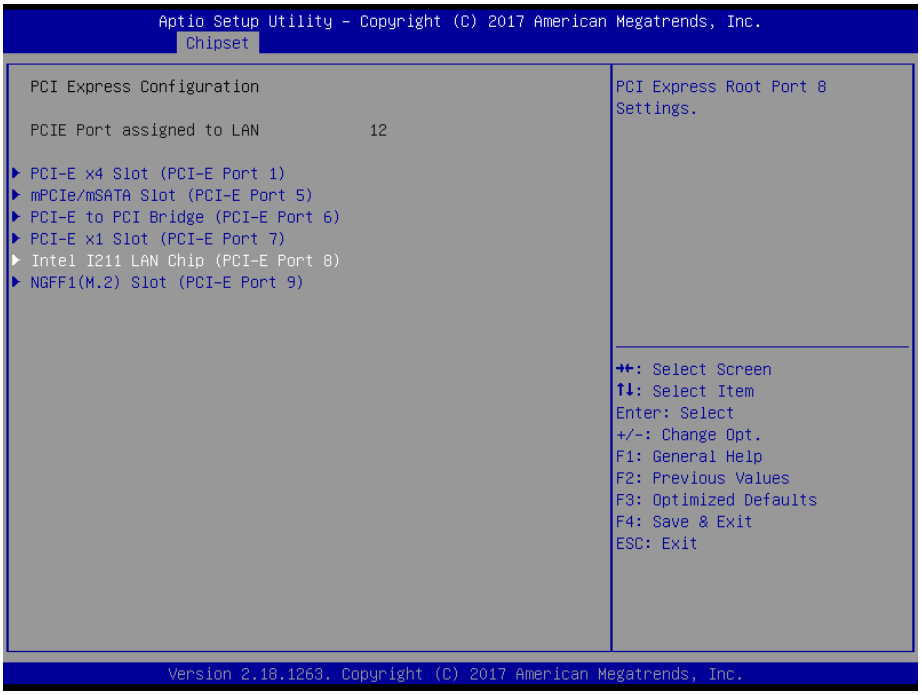


3.6.3.2 PCH-IO Configuration

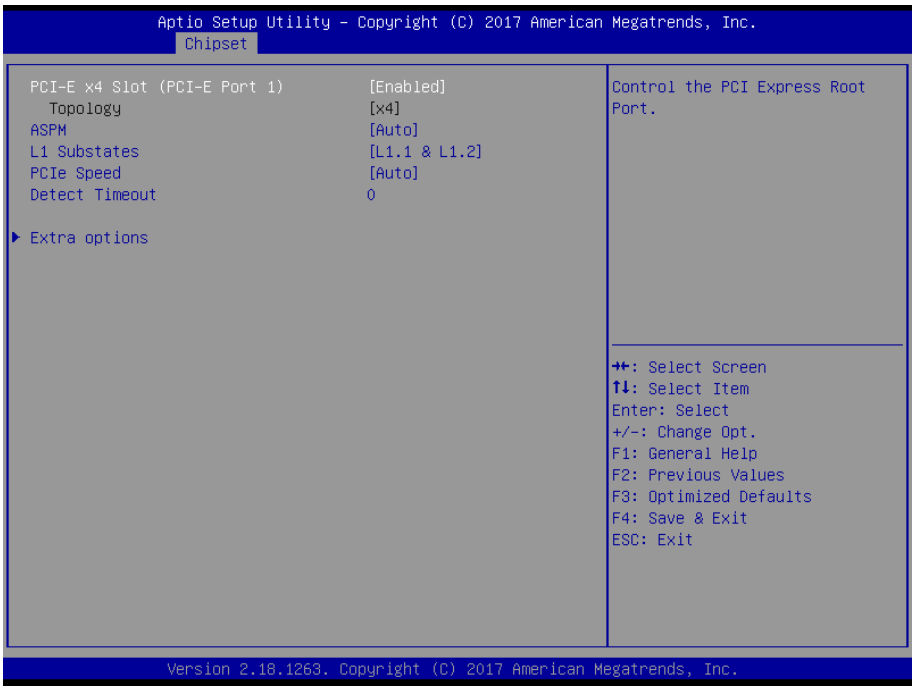


Item	Option	Description
LAN PHY Controller	Disabled Enabled**[Default]**	Enable or disable OnBoard PCH LAN PHY Controller.

3.6.3.2.1 PCI Express Configuration



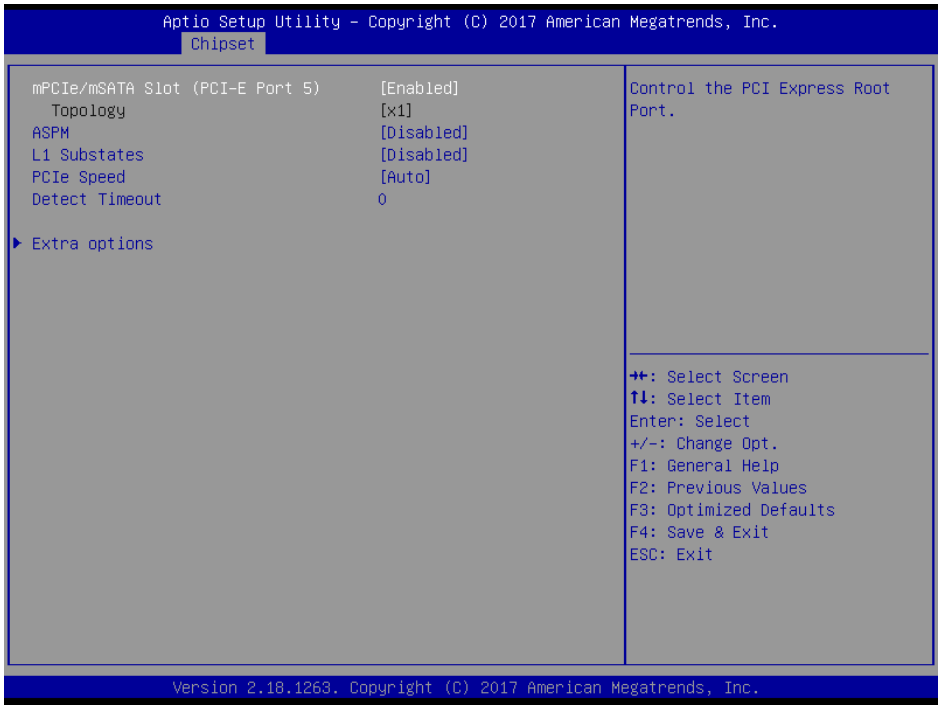
3.6.3.2.1.1 PCI-E x4 Slot (PCI-E Port 1)



Item	Option	Description
PCIe x4 Slot (PCI-E Port 1)	Enabled**[Default]**, Disabled	Control the PCI Express Root Port.
ASPM	Auto**[Default]** L0sL1	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto

	L1 L0s Disabled	configure DISABLE – Disables ASPM.
L1 Substates	Disabled**[Default]** L1.1 L1.2 L1.1 & L1.2	PCI Express L1 Substates settings.
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3	Configure PCIe Speed.
Detect Timeout	0	The number of milliseconds reference code will wait for link to exit Detect state for enabled ports before assuming there is no device and potentially disabling the port.

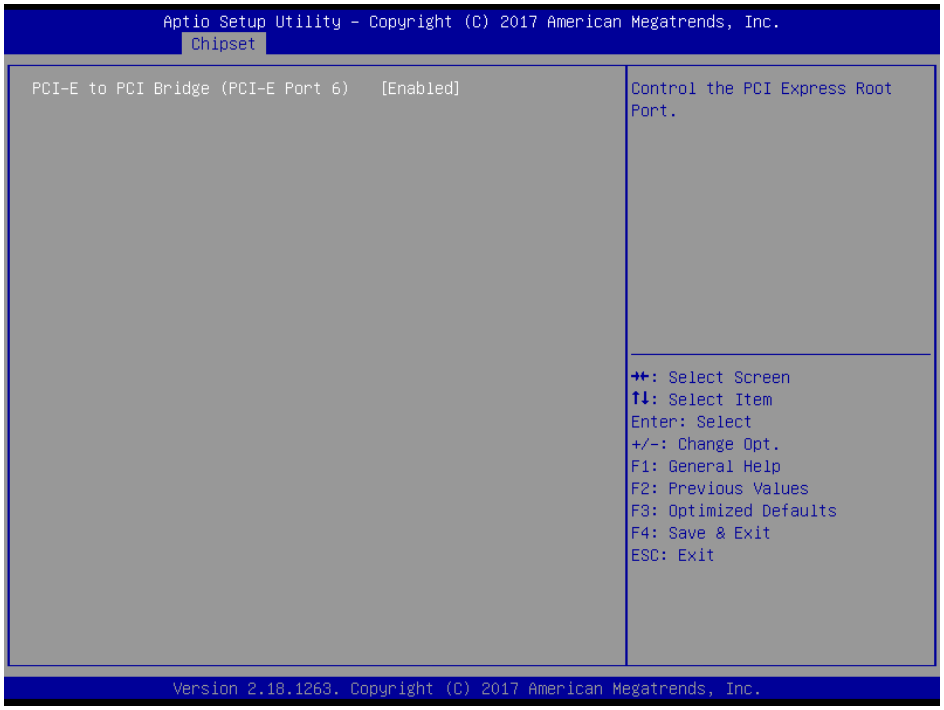
3.6.3.2.1.2 mPCIe/mSATA Slot (PCI-E Port 5)



Item	Option	Description
mPCIe/mSATA Slot (PCI-E Port 5)	Enabled**[Default]**, Disabled	Control the PCI Express Root Port.
ASPM	Auto L0sL1 L1 L0s Disabled**[Default]**	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled**[Default]** L1.1 L1.2 L1.1 & L1.2	PCI Express L1 Substates settings.

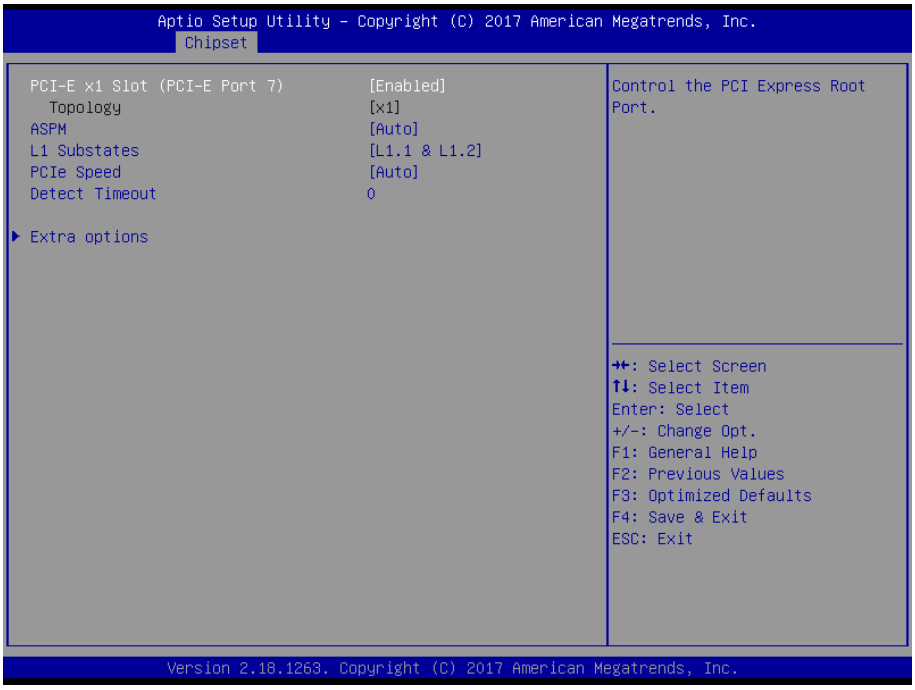
PCIe Speed	Auto**[Default]** Gen1 Gen2	Configure PCIe Speed.
Detect Timeout	0	The number of milliseconds reference code will wait for link to exit Detect state for enabled ports before assuming there is no device and potentially disabling the port.

3.6.3.2.1.3 PCI-E to PCI Bridge (PCI-E Port 6)



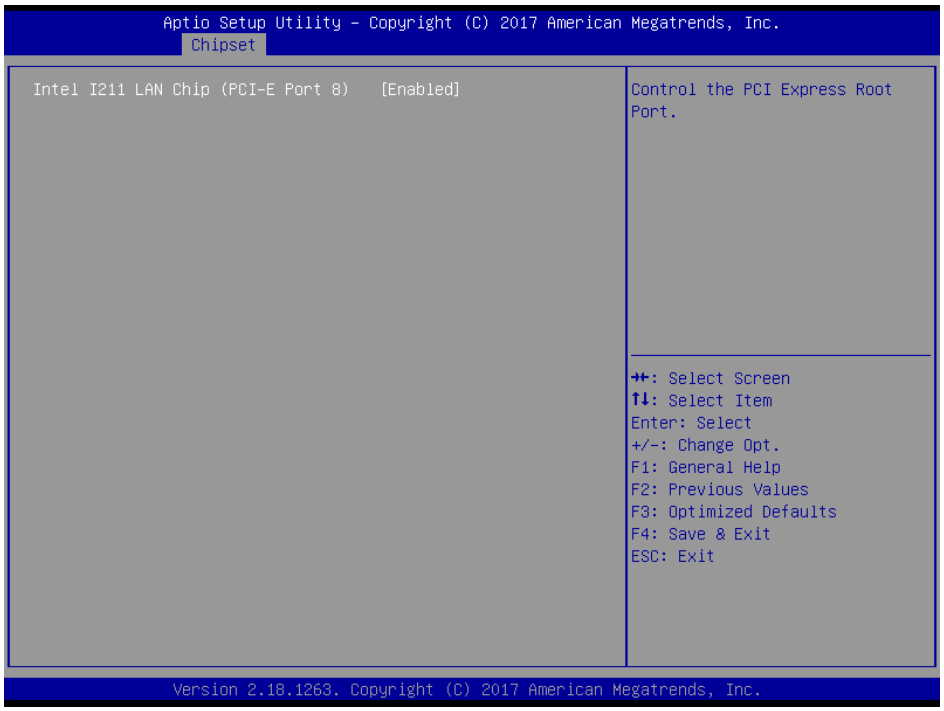
Item	Option	Description
PCI-E to PCI Bridge (PCI-E Port 6)	Enabled**[Default]**, Disabled	Control the PCI Express Root Port.

3.6.3.2.1.4 PCI-E x1 Slot (PCI-E Port 7)



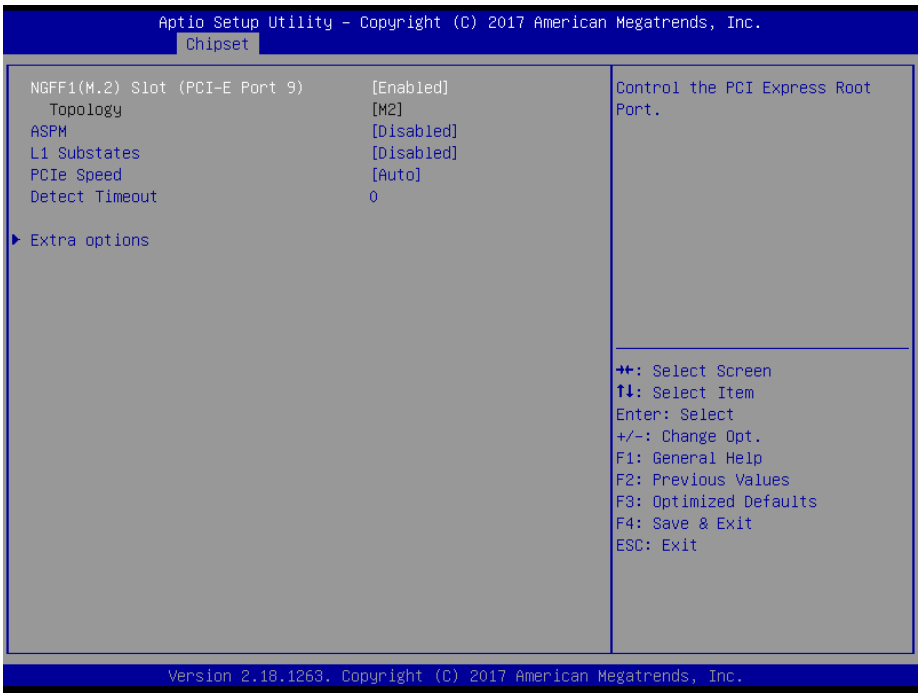
Item	Option	Description
PCI-E x1 Slot (PCI-E Port 7)	Enabled**[Default]**, Disabled	Control the PCI Express Root Port.
ASPM	Auto**[Default]** L0sL1 L1 L0s Disabled	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled L1.1 L1.2 L1.1 & L1.2**[Default]**	PCI Express L1 Substates settings.
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3	Configure PCIe Speed.
Detect Timeout	0	The number of milliseconds reference code will wait for link to exit Detect state for enabled ports before assuming there is no device and potentially disabling the port.

3.6.3.2.1.5 Intel I211 LAN Chip (PCI-E Port 8)



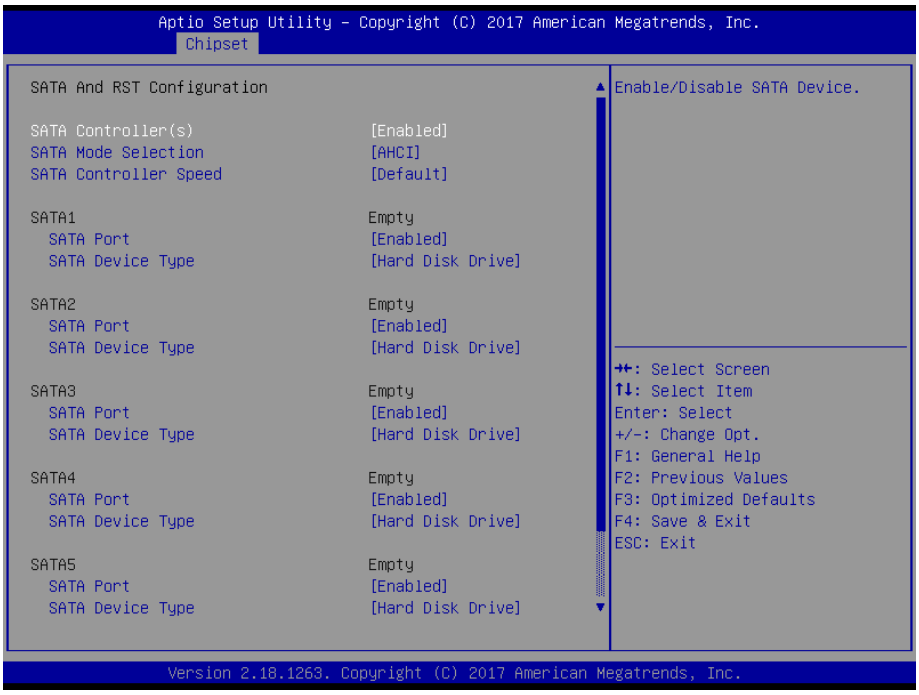
Item	Option	Description
Intel I211 LAN Chip (PCI-E Port 8)	Enabled**[Default]**, Disabled	Control the PCI Express Root Port.

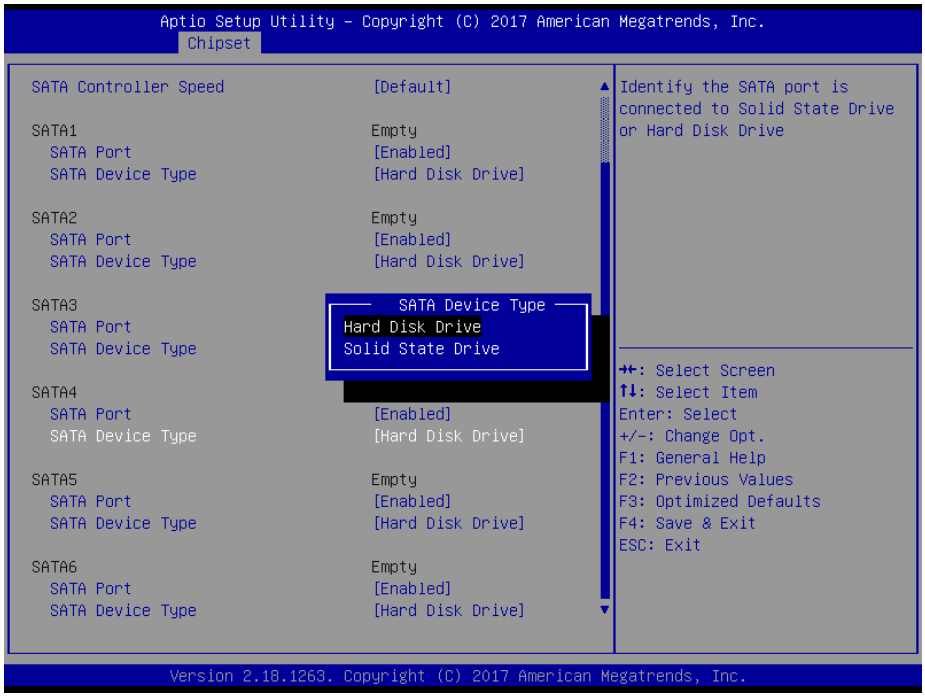
3.6.3.2.1.6 NGFF1(M.2) Slot (PCI-E Port 9)



Item	Option	Description
NGFF1(M.2) Slot (PCI-E Port 9)	Enabled**[Default]**, Disabled	Control the PCI Express Root Port.
ASPM	Auto L0sL1 L1 L0s Disabled**[Default]**	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled**[Default]** L1.1 L1.2 L1.1 & L1.2	PCI Express L1 Substates settings.
PCIe Speed	Auto**[Default]** Gen1 Gen2	Configure PCIe Speed.
Detect Timeout	0	The number of milliseconds reference code will wait for link to exit Detect state for enabled ports before assuming there is no device and potentially disabling the port.

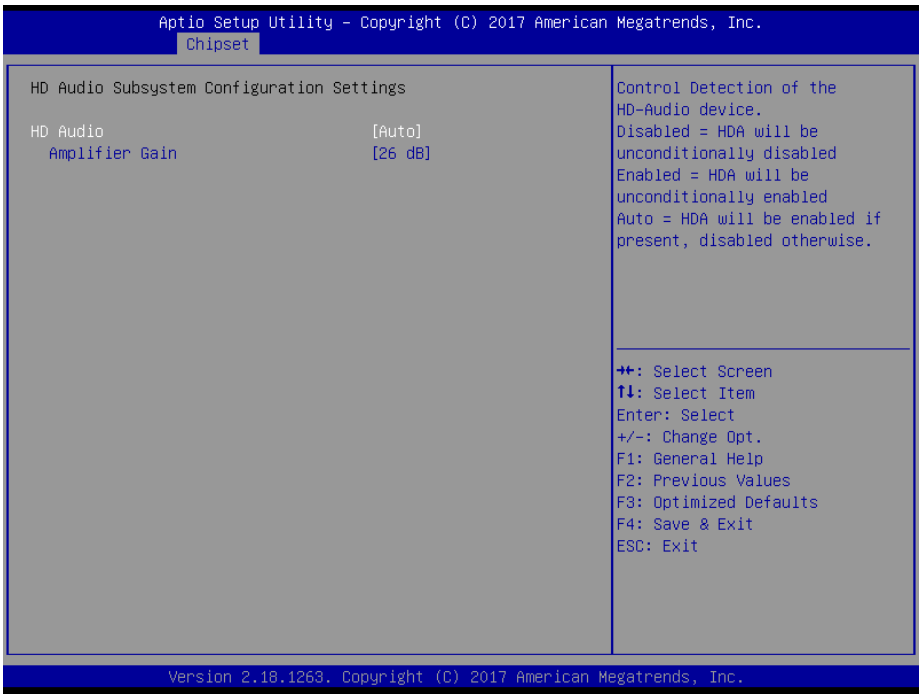
3.6.3.2.2 SATA And RST Configuration





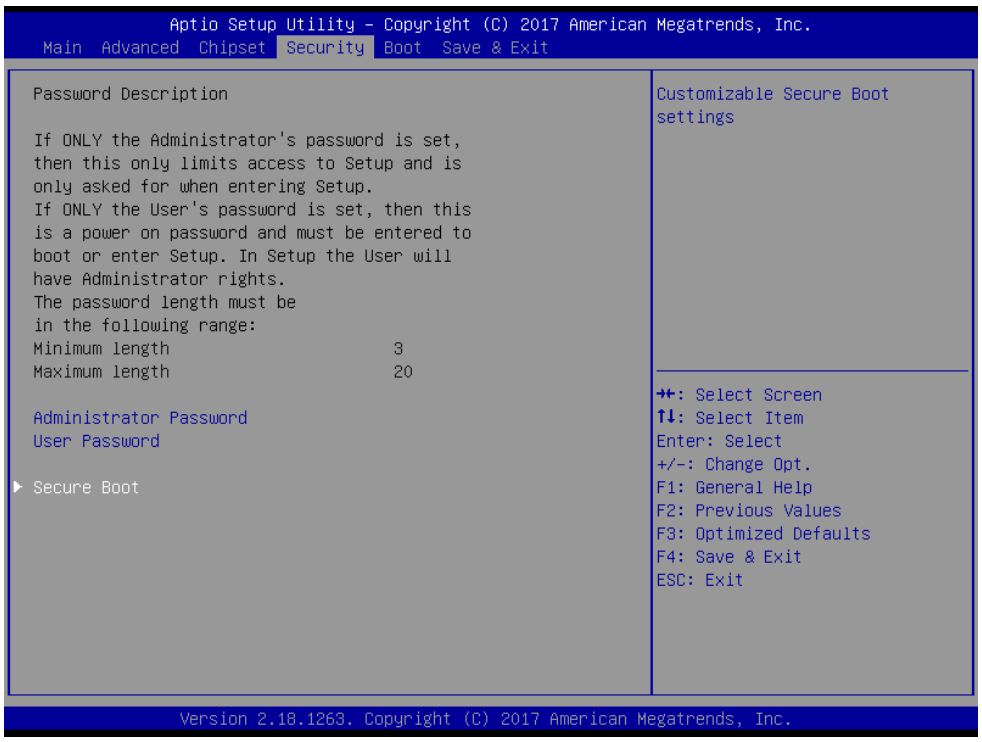
Item	Option	Description
SATA Controller(s)	Enabled**[Default]**, Disabled	Enable/Disable SATA Device.
SATA Mode Selection	AHCI**[Default]**, RAID	Determines how SATA controller(s) operate.
SATA Controller Speed	Default**[Default]**, Gen1 Gen2 Gen3	Indicates the maximum speed the SATA controller can support.
SATA Port	Enabled**[Default]**, Disabled	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.

3.6.3.2.3 HD Audio Configuration



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

3.6.4 Security



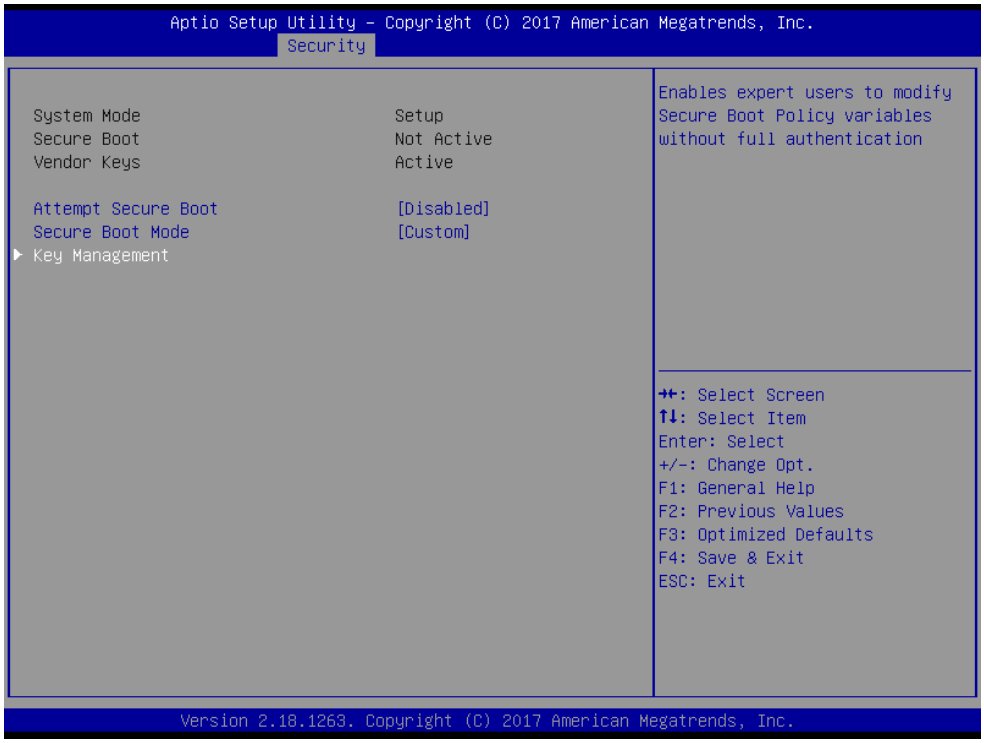
- **Administrator Password**

Set setup Administrator Password

- **User Password**

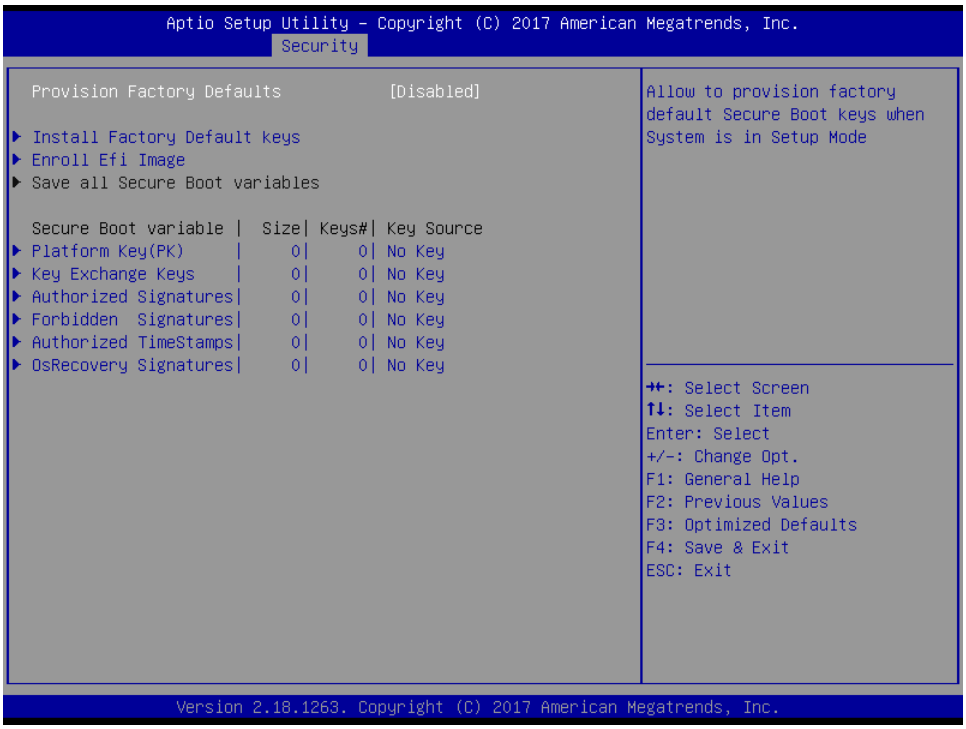
Set User Password

3.6.4.1 Secure Boot menu



Item	Option	Description
Attempt Secure Boot	Disabled**[Default]** Enabled	Secure Boot activated when Platform Key(PK) is enrolled, System mode is User/Deployed, and 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

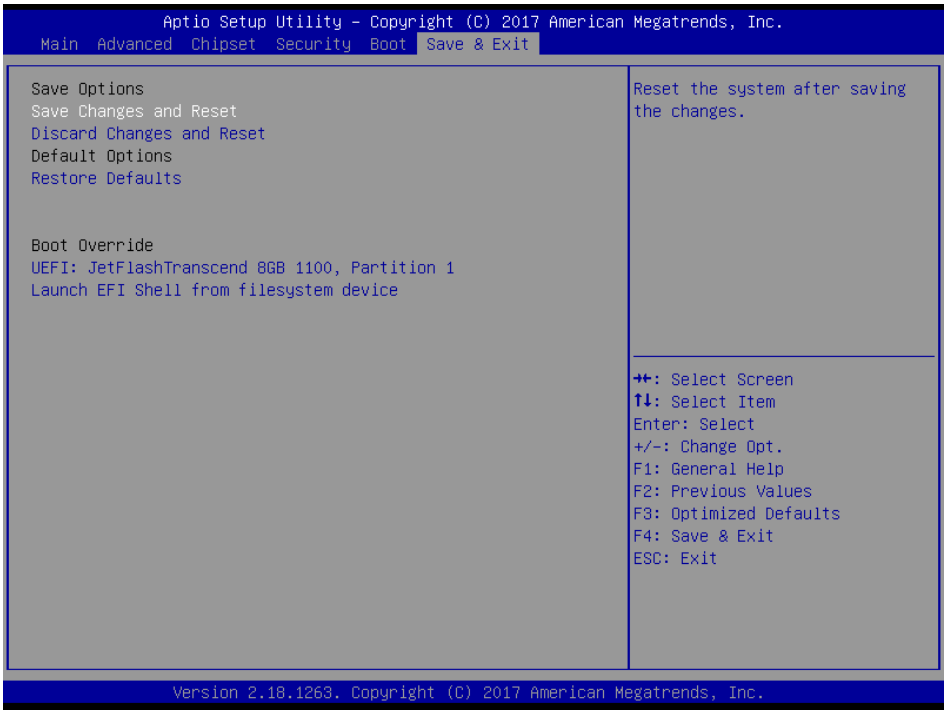


Item	Option	Description
Provision Factory Defaults	Enabled, Disabled**[Default]**	Allow to provision factory default Secure Boot keys when System is in Setup Mode.

3.6.5 Boot

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.
Boot Option #1	Set the system boot order.	

3.6.6 Save and exit



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.

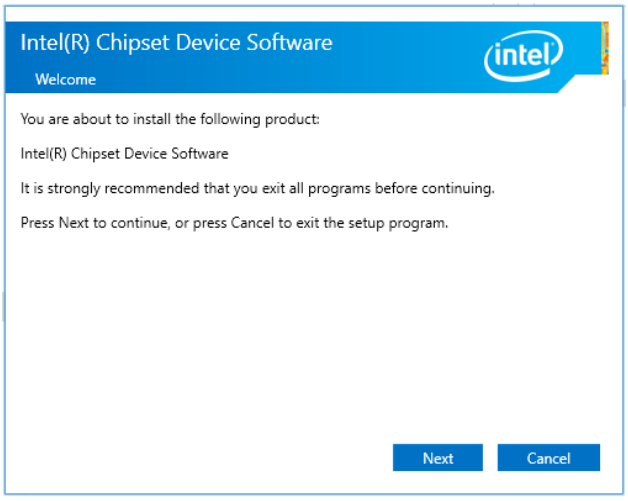
4. Drivers Installation

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.

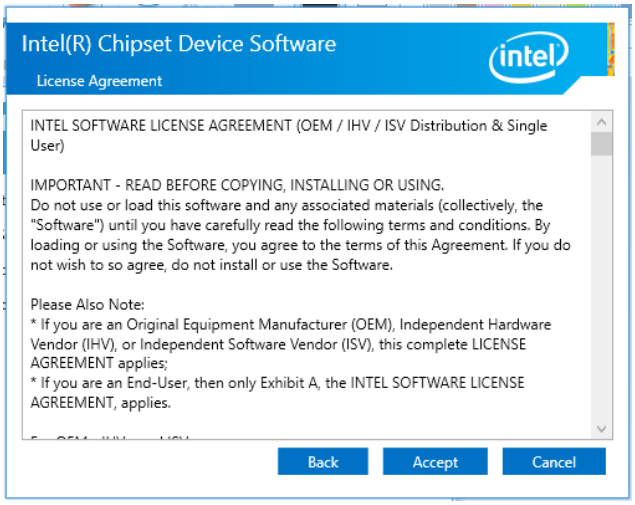
4.1 Install Chipset Driver

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

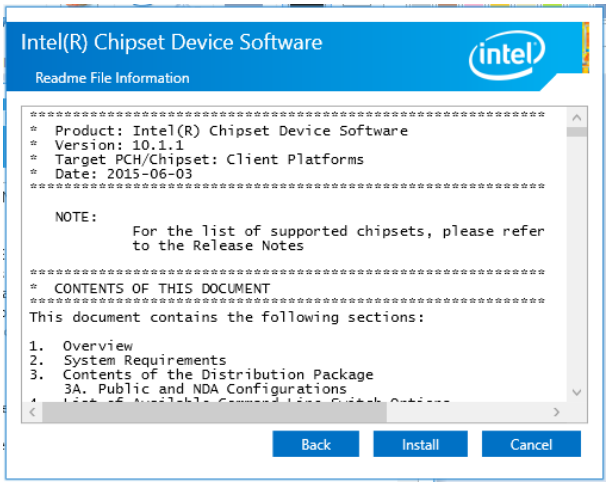
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system. If the warning message appears while the installation process, click Continue to go on.



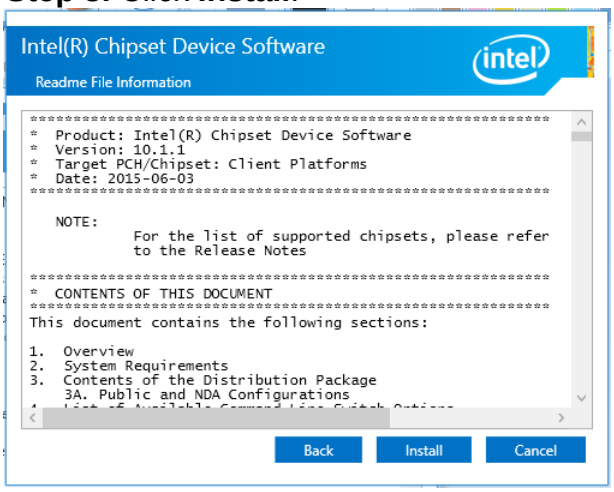
Step1. Click **Next**.



Step 2. Click **Accept**.



Step 3. Click **Install**.

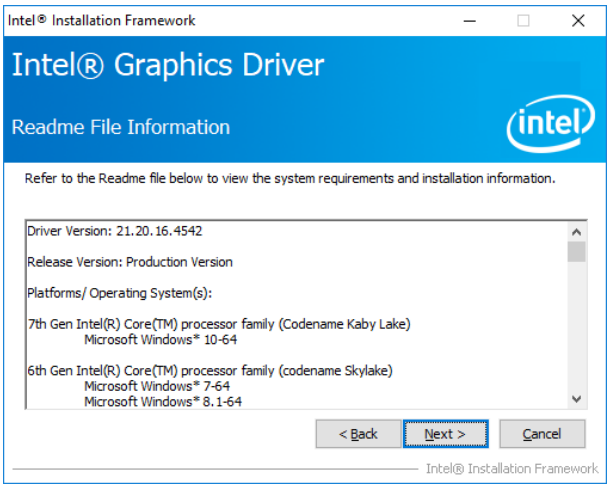


Step 4. Complete setup.

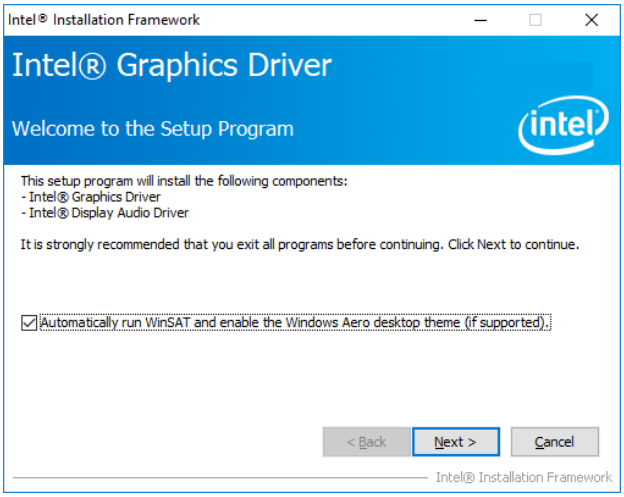
4.2 Install VGA Driver

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

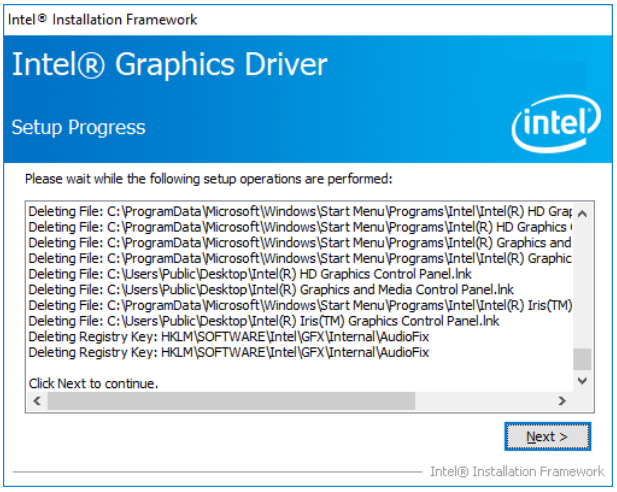
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system.



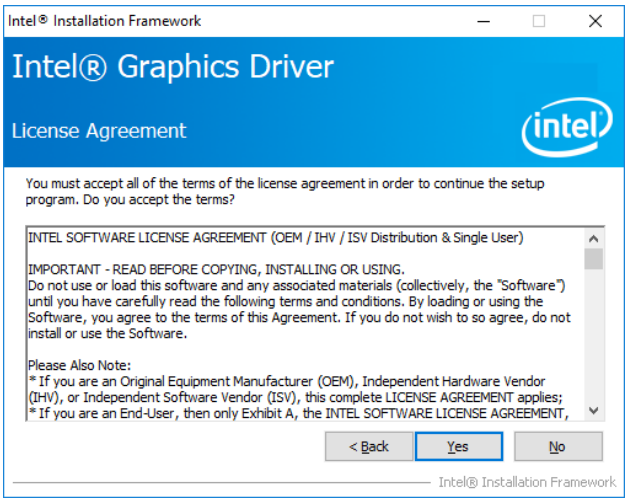
Step 3. Click **Next.**



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

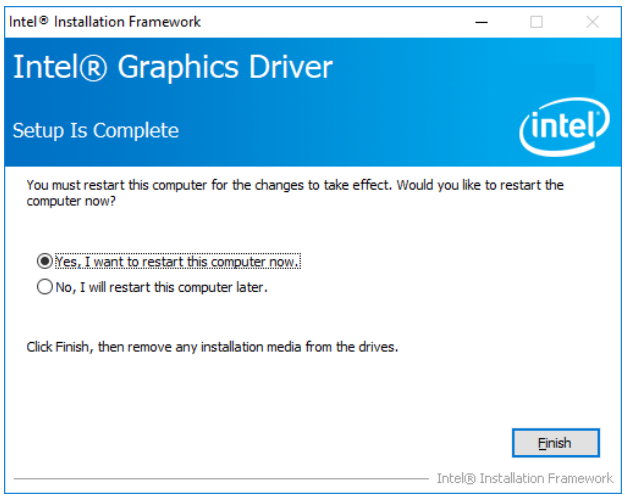


Step 4. Click **Next**.



Step 2.

Click **Yes** to accept license agreement.

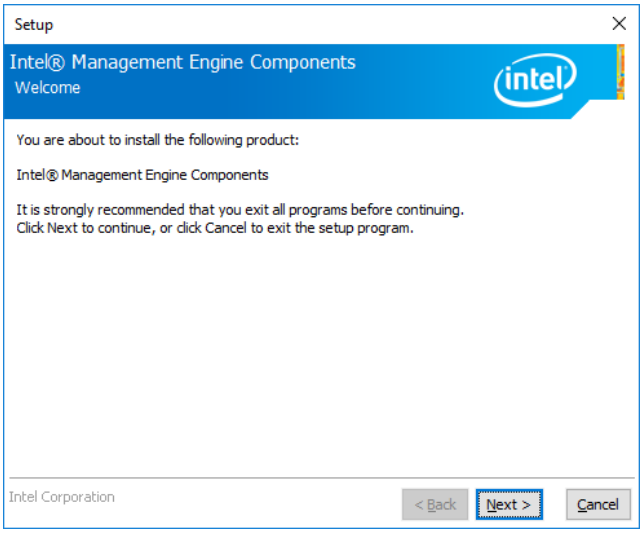


Step 5. Click **Finish** to complete setup.

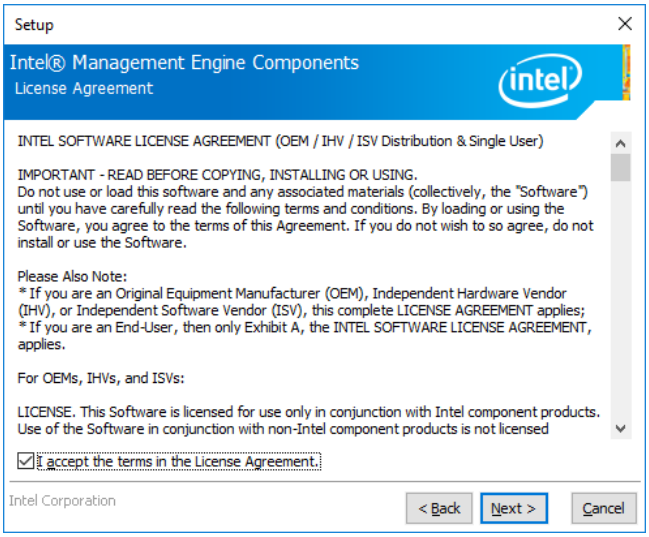
4.3 Install SOL Driver

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

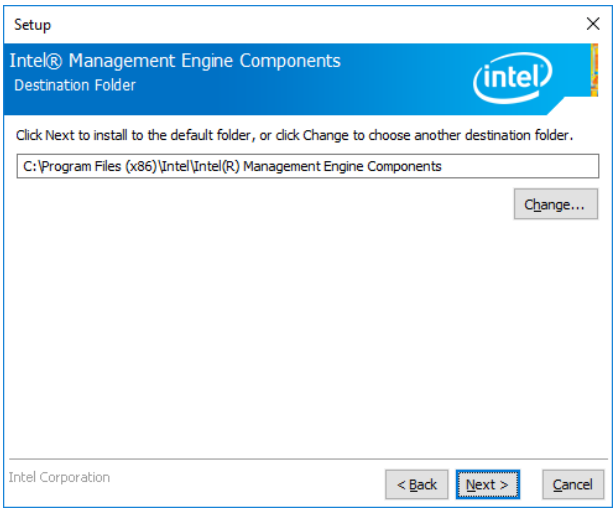
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system.



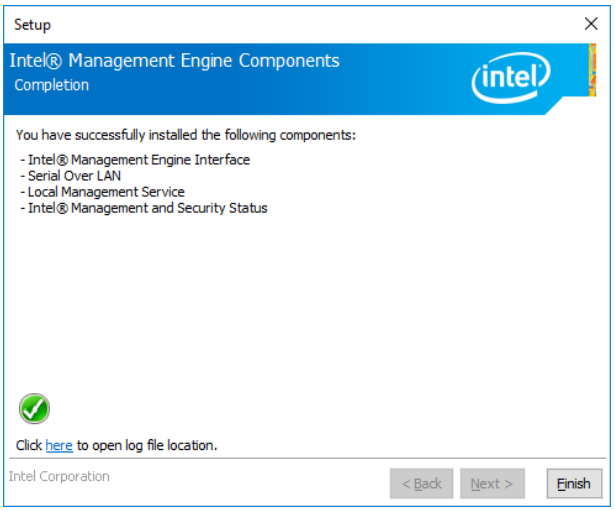
Step 1. Click **Next** to continue setup.



Step 2. Click **Next**.



Step 3. Click **Next**

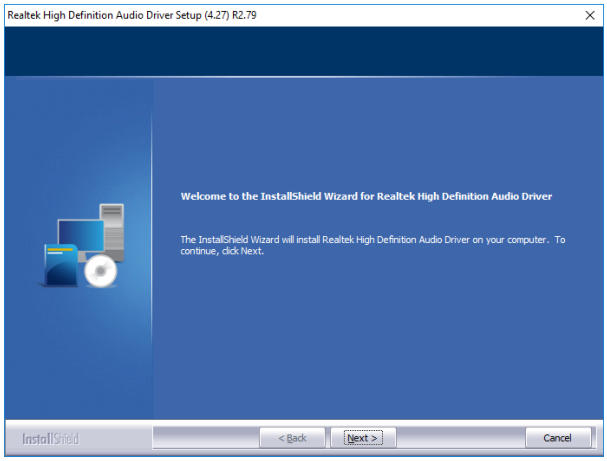


Step 4. Click **Finish** to complete the setup

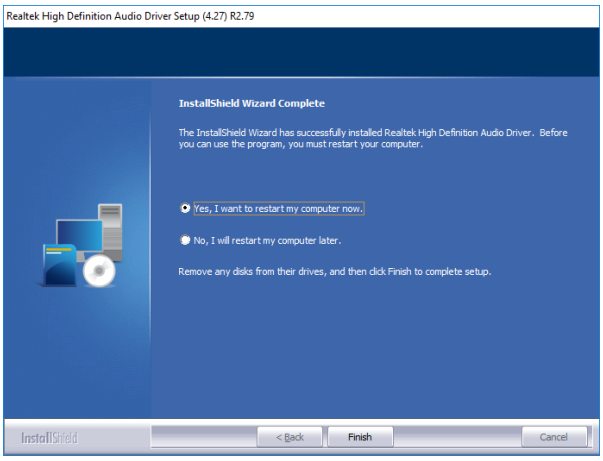
4.4 Install Audio Driver (For Realtek ALC892 HD Audio)

Insert the Supporting DVD-ROM to DVD-ROM drive, and it should show the index page of the 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.



Step1. Click **Next** to Install.

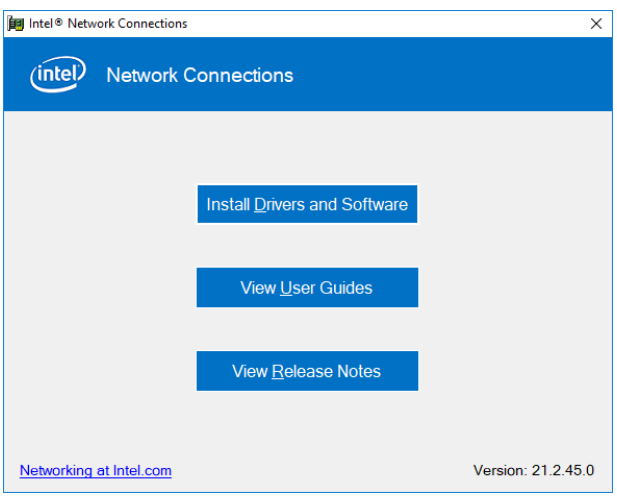


Step 2. Select **Finish** to complete Installation.

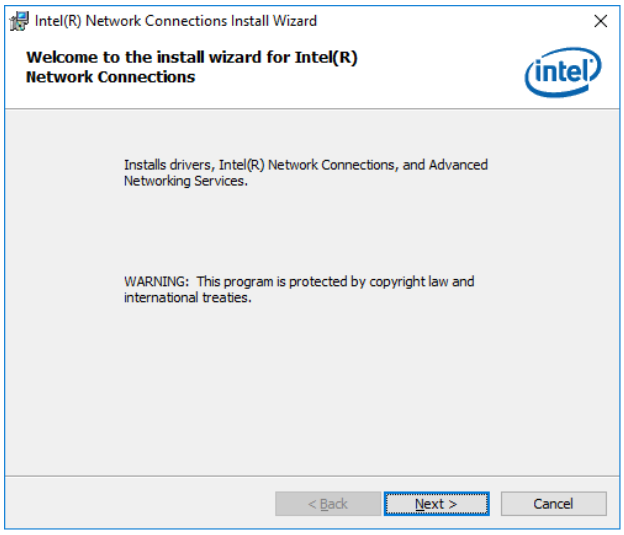
4.5 Install LAN Driver

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

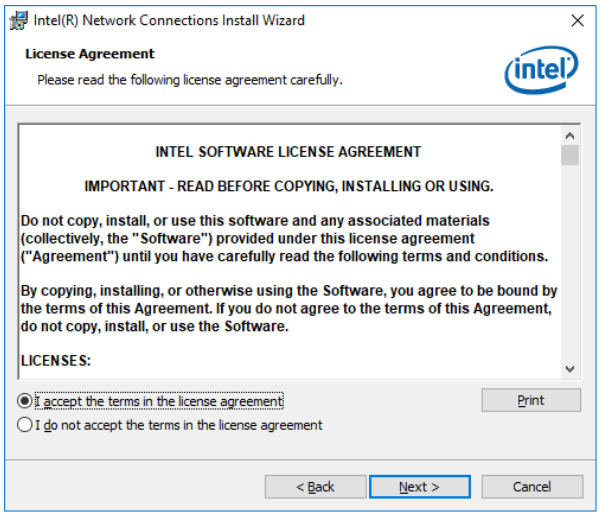
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system.



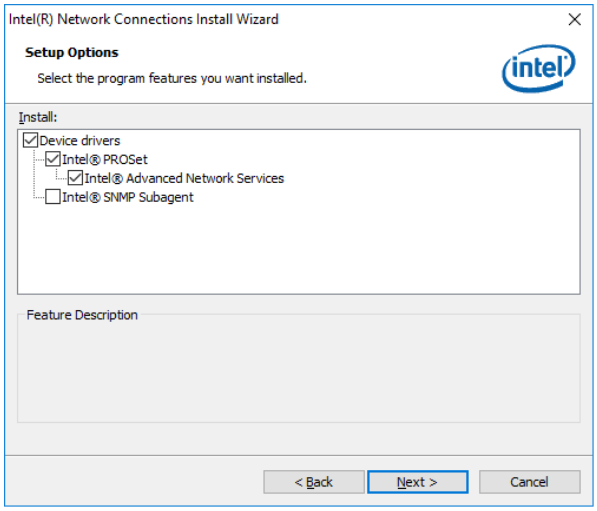
Step 1. Click **Install Drivers and Software**.



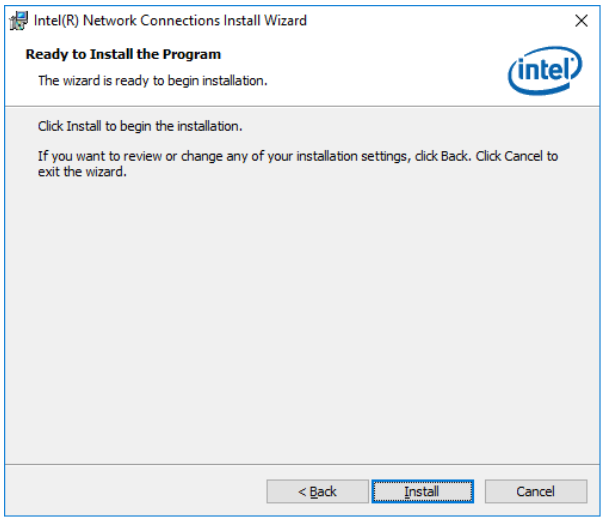
Step 2. Click **Next**.



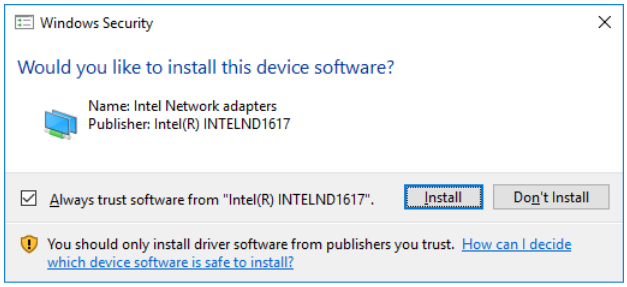
Step 3. Click **Next**.



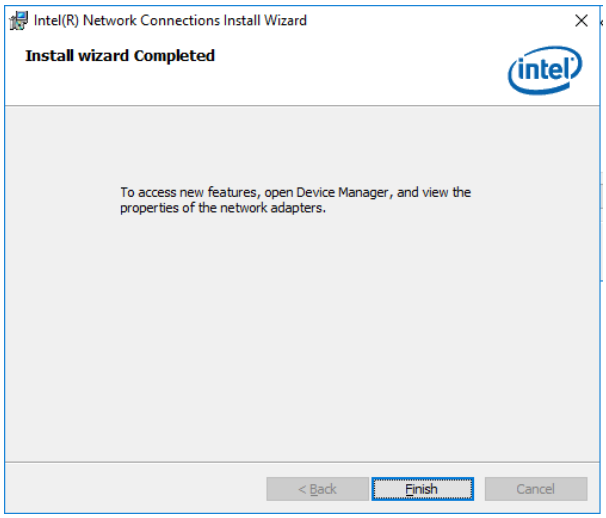
Step 4. Click **Next**.



Step 5. Click **Install**.



Step 6. Click **Install**.

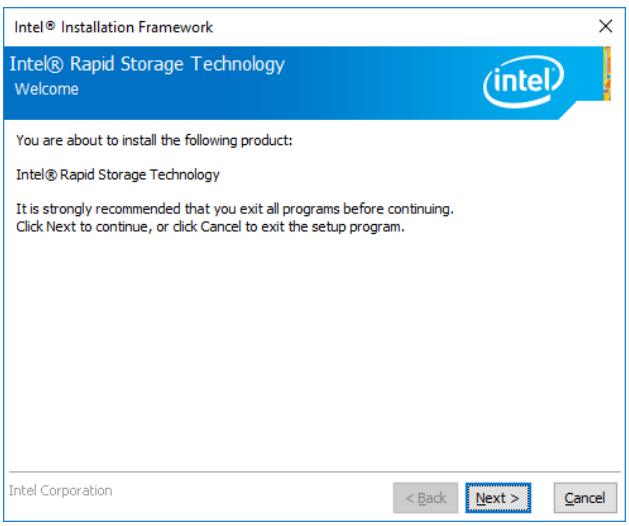


Step 7. Click Finish to complete setup.

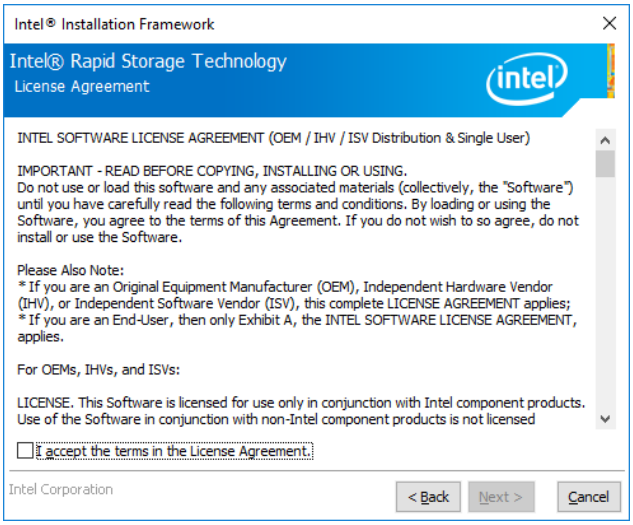
4.6 Install RST Driver

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

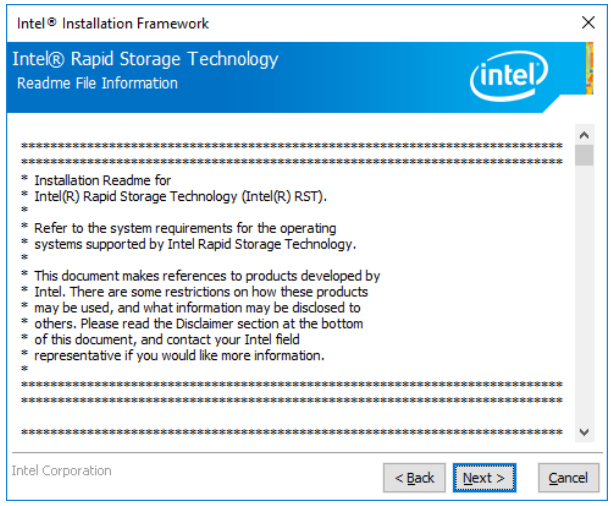
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system.



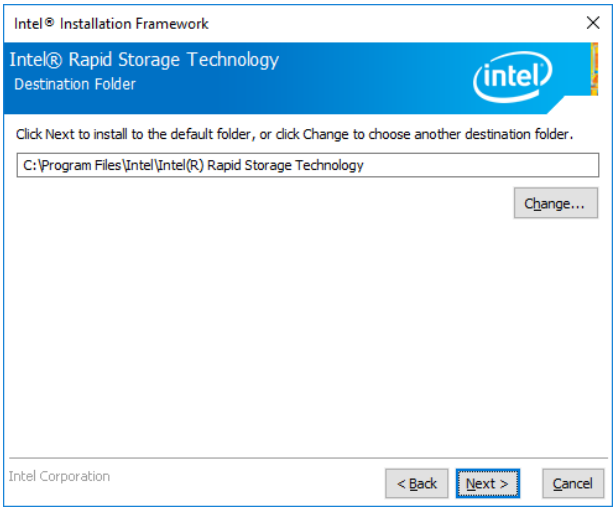
Step 1. Click **Next** to continue installation.



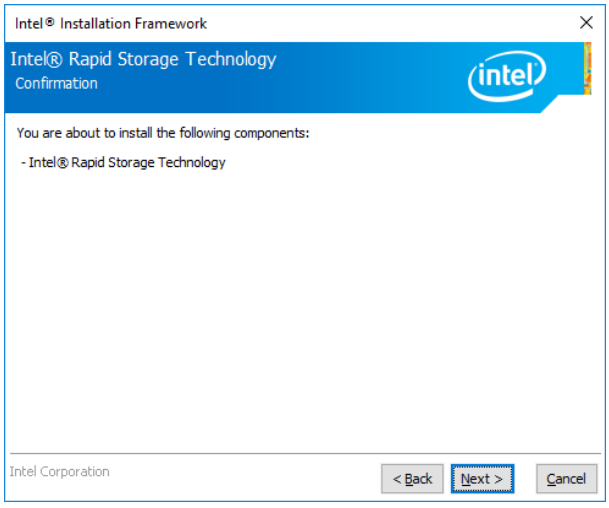
Step 2. Click **Next**.



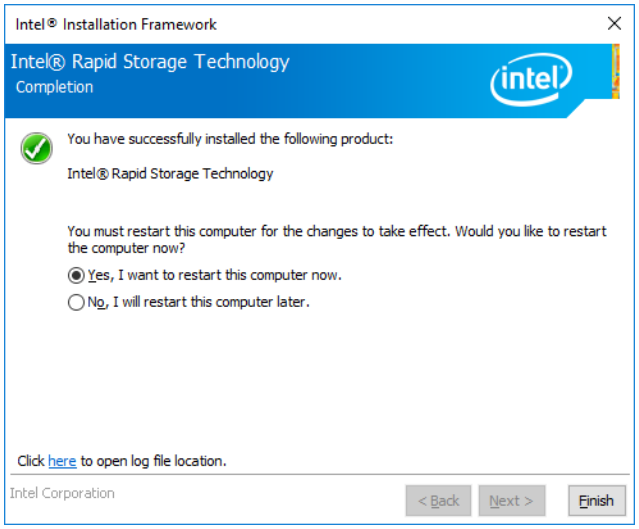
Step 3. Click **Next.**



Step 4. Click **Next**.

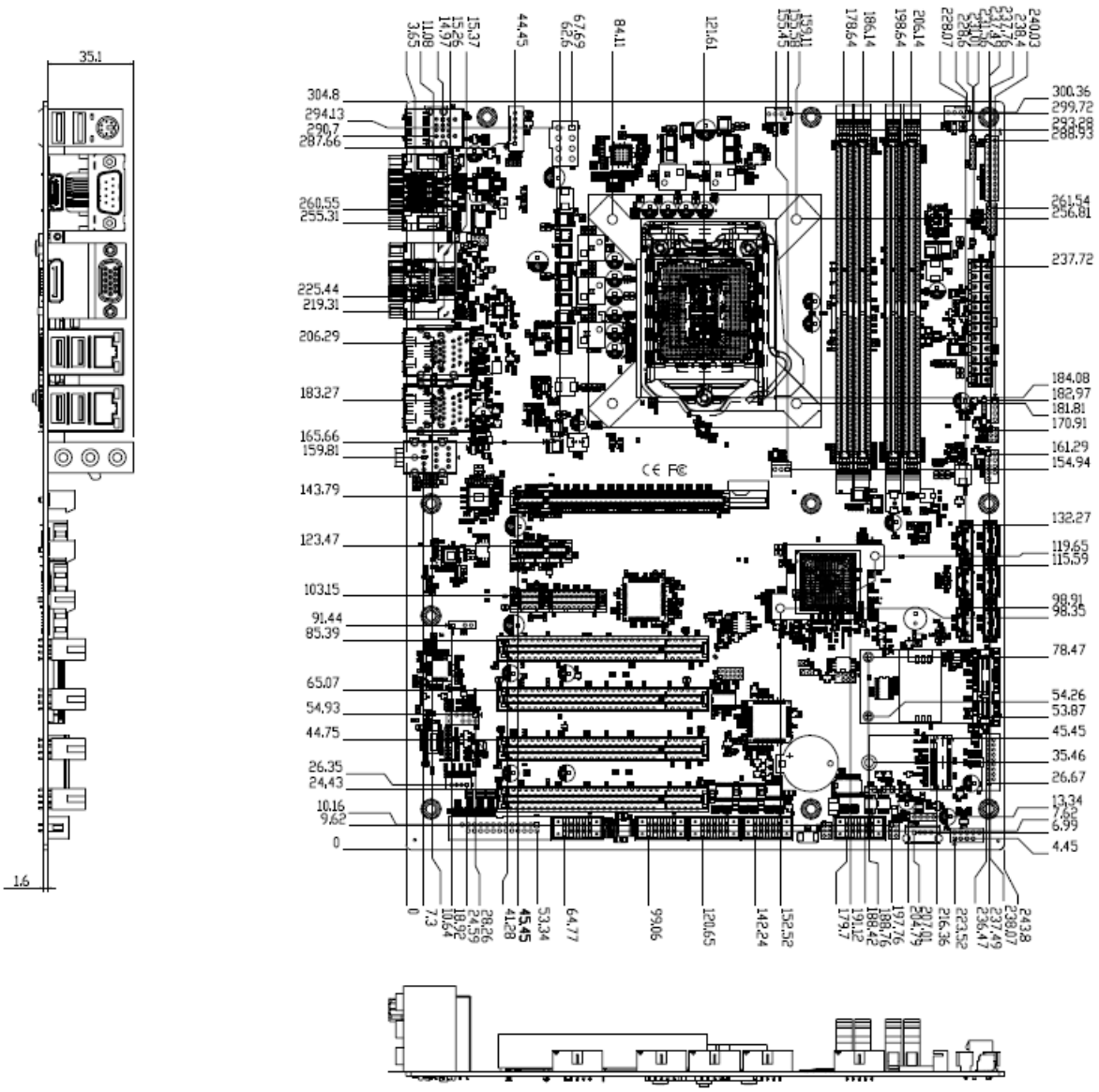


Step 5. Click **Next**.

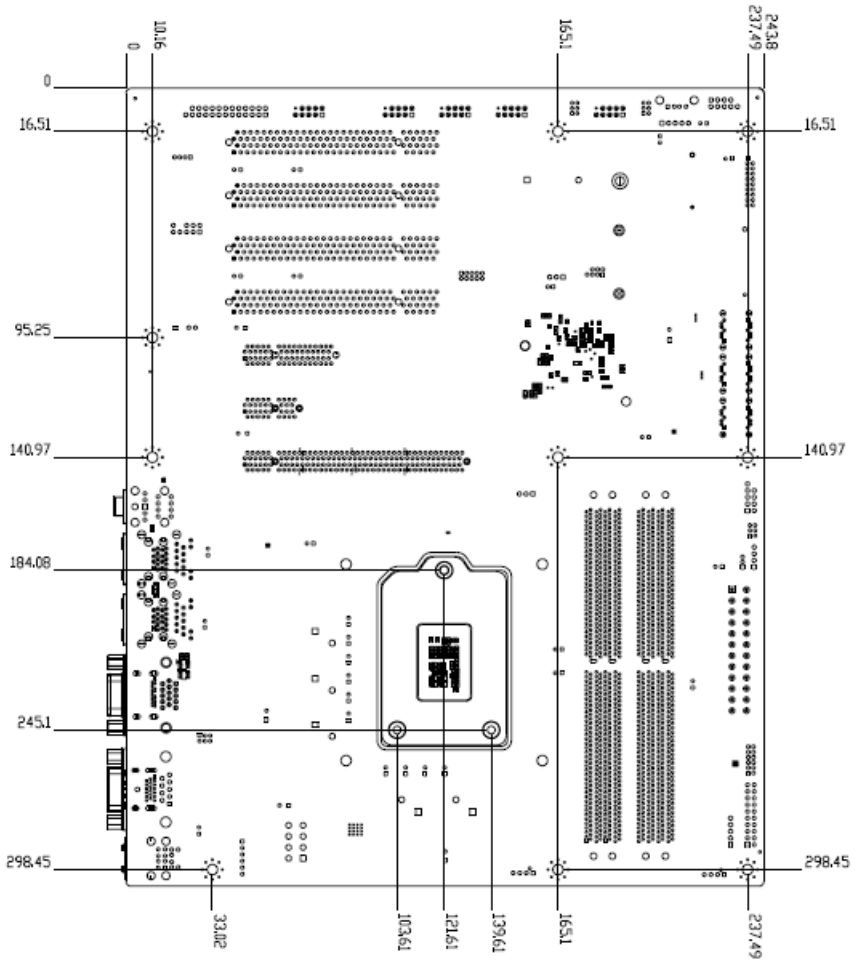


Step 6. Click **Finish** to complete setup.

5. Mechanical Drawing


35.1
1.6
304.8
294.13
290.7
287.66
260.55
255.31
225.44
219.31
206.29
183.27
165.66
159.81
143.79
123.47
103.15
91.44
85.39
65.07
54.93
44.75
26.35
24.43
10.16
9.62
0
3.65
11.08
14.97
15.26
15.37
44.45
62.6
67.69
84.11
121.61
153.45
178.64
186.14
198.64
206.14
228.07
240.03
300.36
299.72
288.93
261.54
256.81
237.72
184.08
182.97
181.81
170.91
161.29
154.94
132.27
119.65
115.59
98.91
98.35
78.47
54.26
53.87
45.45
35.46
26.67
6.99
4.45
0
7.3
10.64
18.92
24.59
28.26
41.28
45.45
53.34
64.77
99.06
120.65
142.24
152.52
179.7
191.12
197.76
198.42
207.95
216.36
223.52
236.47
237.49
238.07
243.8

Unit: mm


0
10.16
165.1
243.8
237.49
16.51
95.25
140.97
184.08
245.1
298.45
33.02
103.61
121.61
139.61

Unit: mm