

EAX-Q170P

Intel® Core™ Processors with Intel® Q170 ATX Motherboard

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 UNDESIRE 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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5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

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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 EAX-Q170P 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
1 st	December 2015	Avalue	Initial Release
2 nd	August 2017	Avalue	Update System Specifications

1.4 Manual Objectives

This manual describes in details Avalue Technology EAX-Q170P 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 EAX-Q170P 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 6th 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 2133MHz DIMM socket, supports up to 64GB Max
Watchdog Timer	H/W Reset, 5 ~ 255 seconds/5 ~ 255 minutes
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)
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	
Audio Codec	Realtek ALC892 supports 5.1-CH HD Audio Decoding Controller with 6W Amplifier
Ethernet	
LAN Chip	1 x Intel® I219LM PCI-e Gigabit Ethernet PHY 1 x Intel® I211AT 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 auto switch IC - 5 x SATA III 1 x M.2 2230 Slot support WiFi module 1 x PCI-e Slot with SIM card slot

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	UEFI Win 8.1 FTPM 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 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
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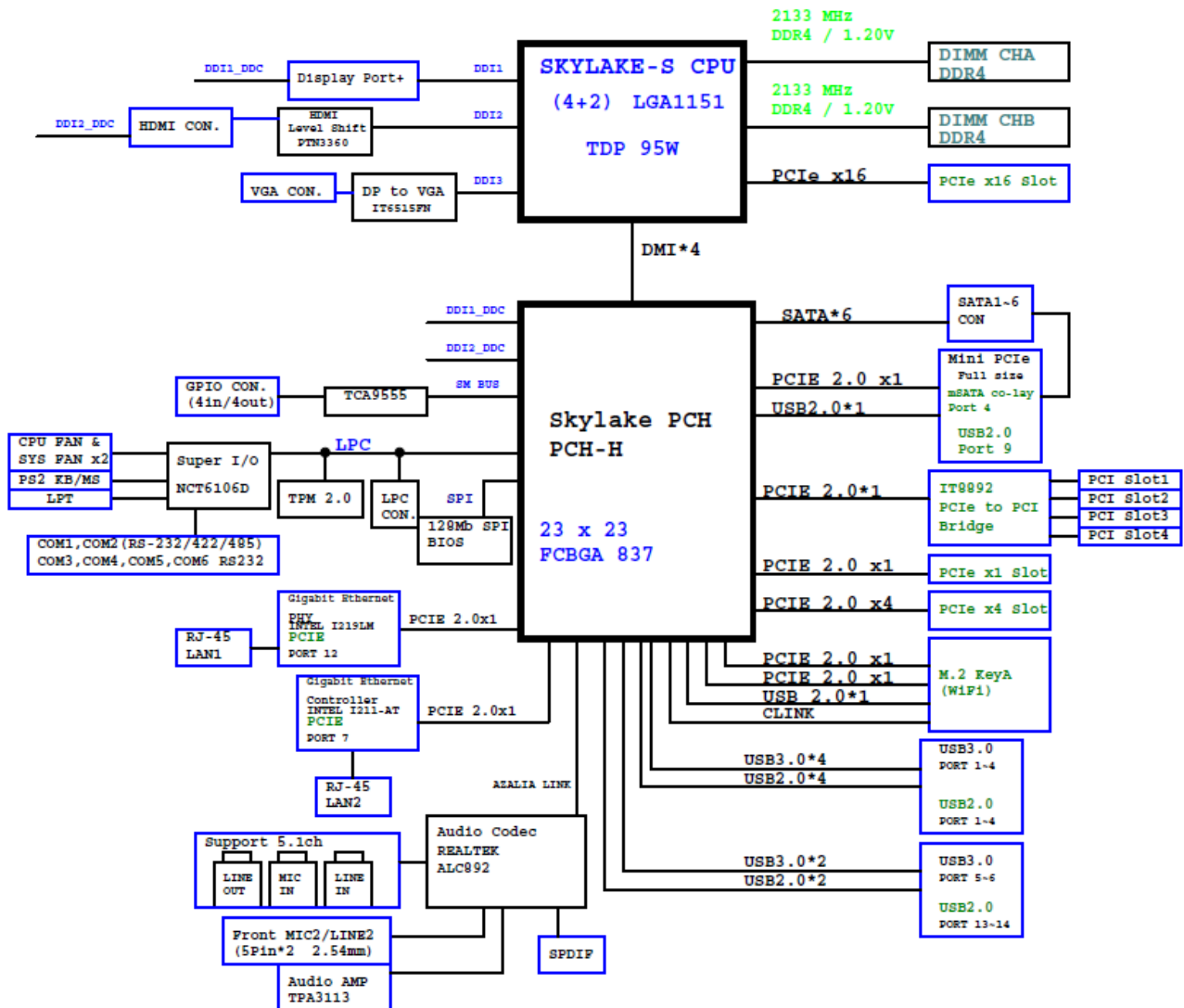
	1 x 1 x 6 pin, pitch 2.5mm wafer for KB /Mouse 1 x 1 x 3 pin pitch 2.00mm connector for AT/ATX jumper 1 x 2 x 12 pin ATX power connector 1 x 2 x 4 pin ATX 12V power connector
Rear I/O Connectors	
Rear Side External I/O Connector	2 x RJ-45 with Dual deck USB 3.0 connector 1 x VGA 1 x DP 1 x HDMI COM1 support RS-232 DB9 connector, Pin 9 with /+5V/+12V/RI Supported 1 x Line-out, 1 x Mic-In, 1 x Line-in PS2 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.

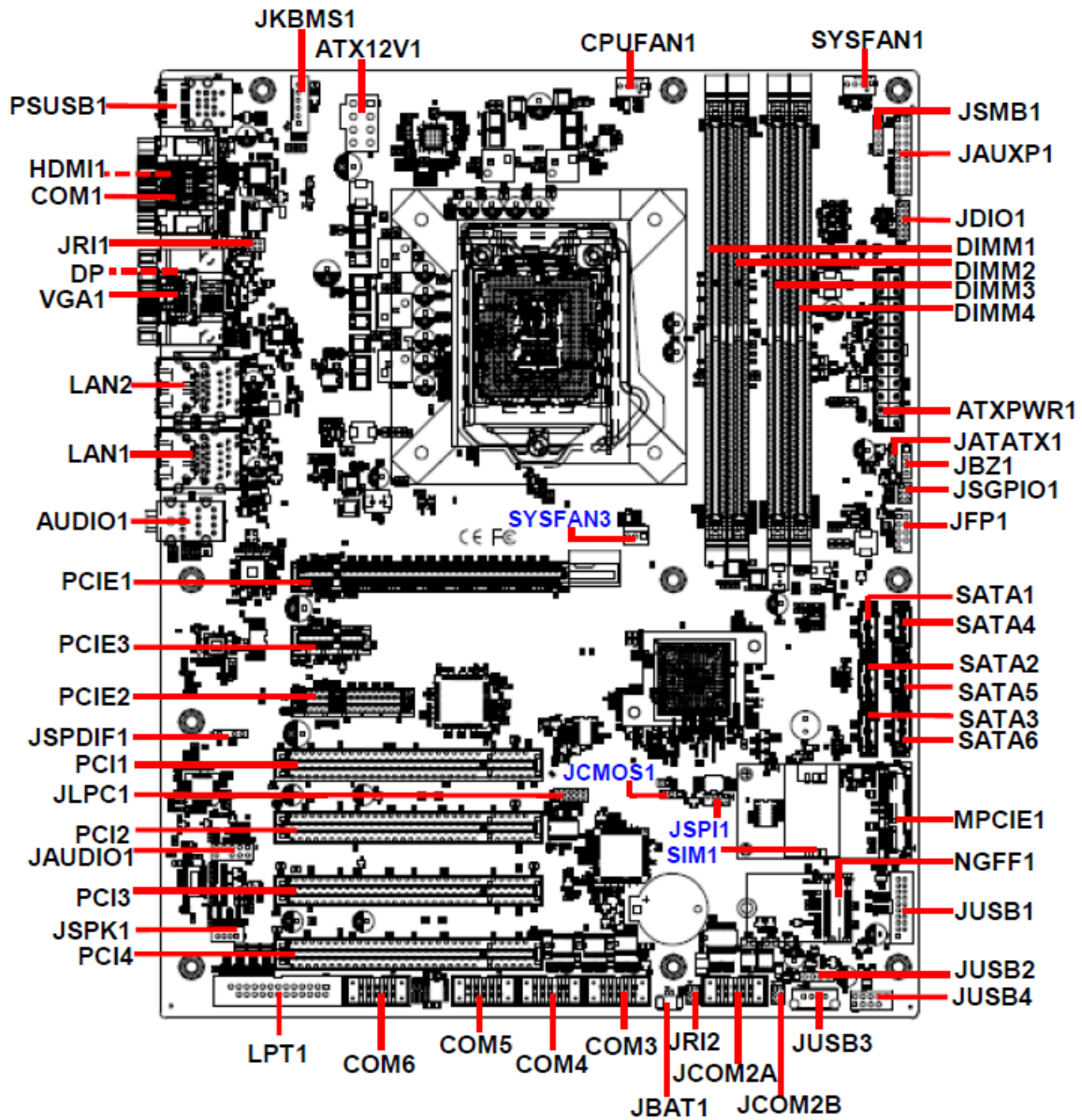
1.6 Architecture Overview—Block Diagram

The following block diagram shows the architecture and main components of EAX-Q170P.



2. Hardware Configuration

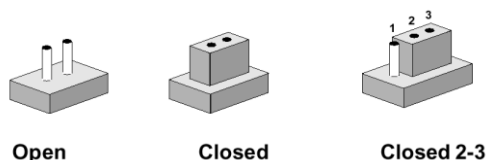
2.1 Product Overview



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

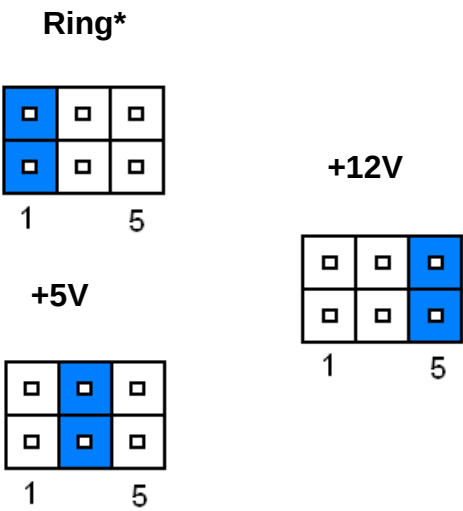
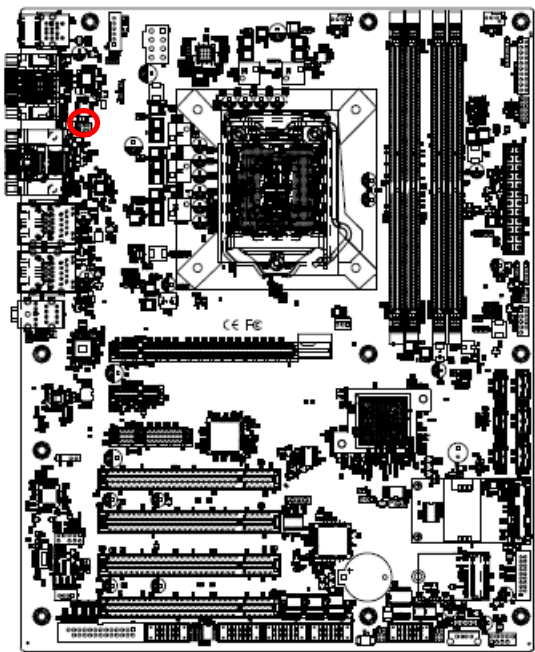
Label	Function	Note
CPUFAN1	CPU fan connector	4 x 1 wafer, pitch 2.54mm
SYSFAN1	System fan connector 1 (with smart fan function supported)	4 x 1 wafer, pitch 2.54mm
SYSFAN3	System fan connector 2	3 x 1 wafer, pitch 2.54mm
JFP1	Miscellaneous setting connector	5 x 2 header, pitch 2.54 mm
DIMM1/2/3/4	288-pin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

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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

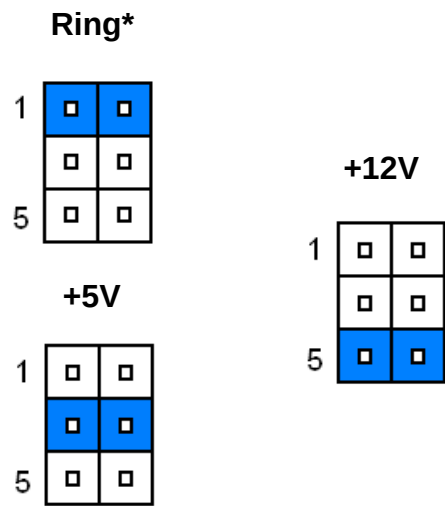
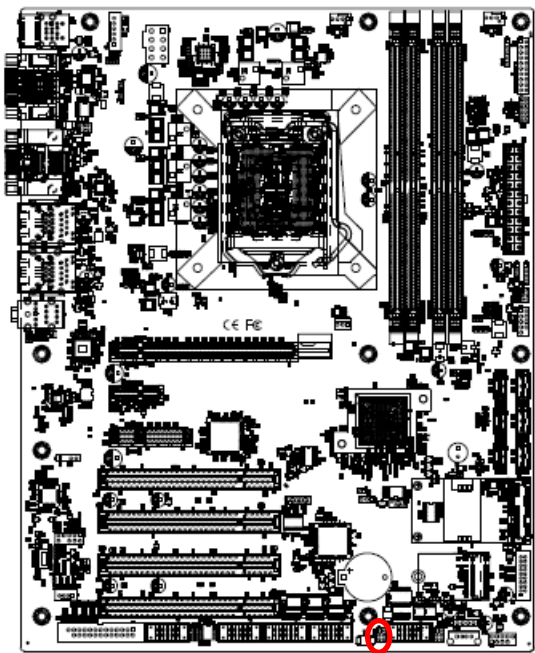
2.3 Setting Jumpers & Connectors

2.3.1 Serial port 1 pin9 signal select (JRI1)



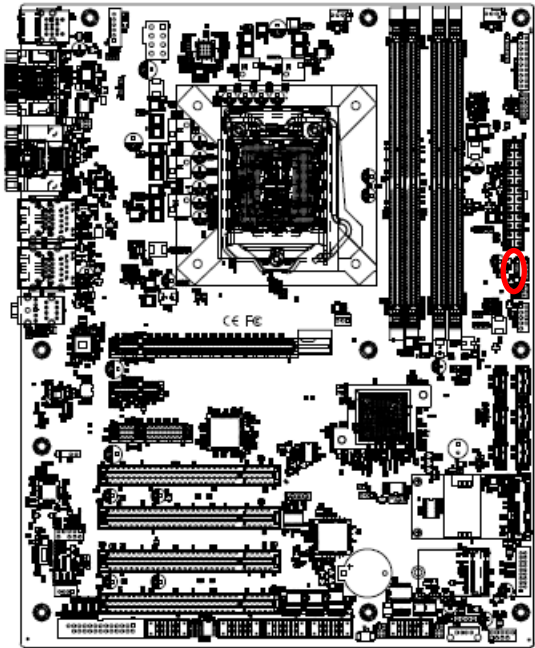
* Default

2.3.2 Serial port 2 pin9 signal select (JRI2)

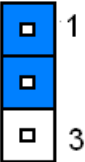


* Default

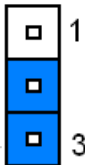
2.3.3 AT/ATX Power Mode Select (JATATX1)



AT*

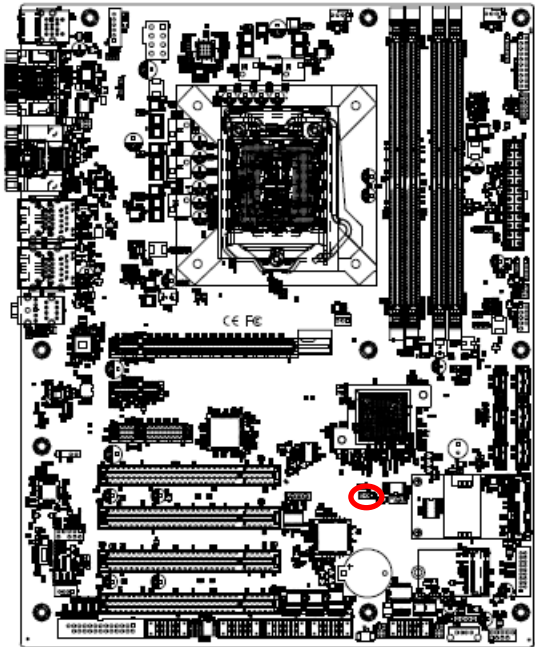


ATX



* Default

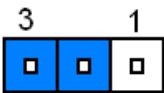
2.3.4 Clear CMOS (JCMOS1)



Protect*

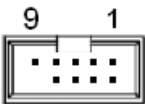
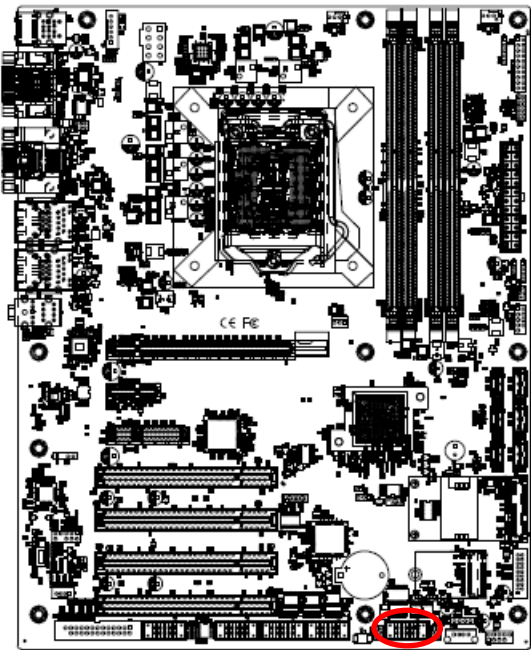


Clear CMOS



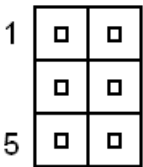
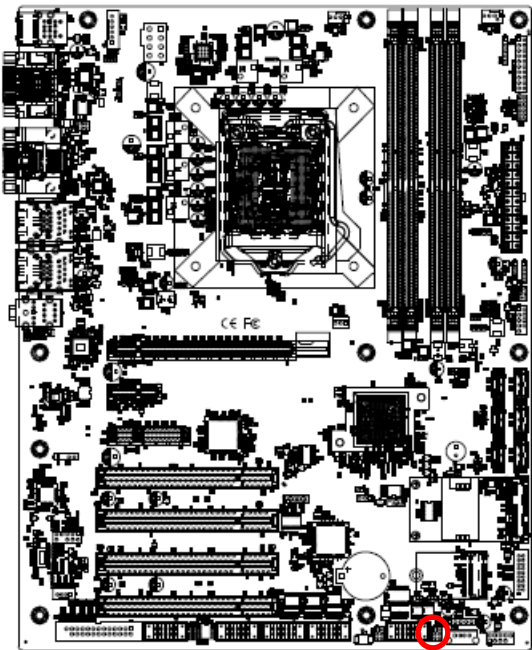
* Default

2.3.5 Serial port 2 connector (JCOM2A)



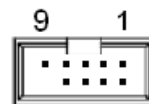
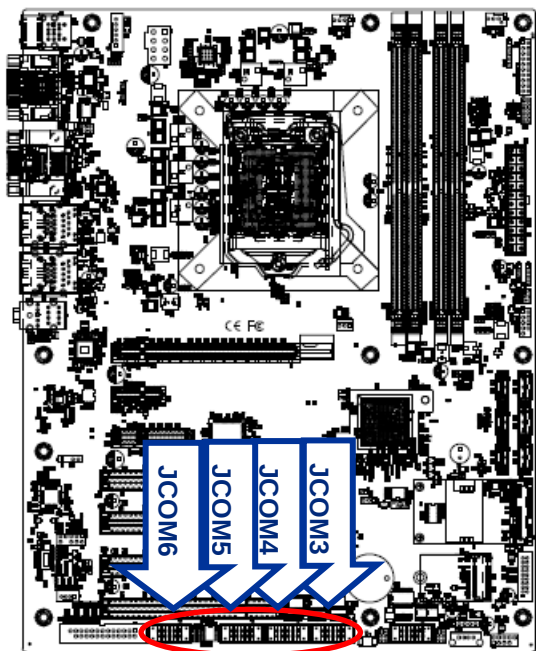
Signal	PIN	PIN	Signal
RXD	2	1	DCD
DTR	4	3	TXD
DSR	6	5	GND
CTS	8	7	RTS
		9	RI

2.3.6 COM2 RS485/422 connector (JCOM2B)



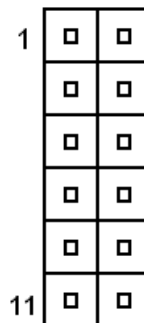
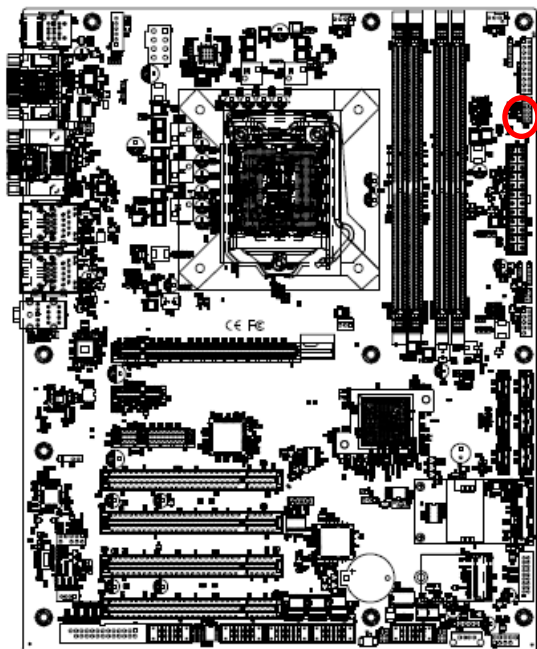
Signal	PIN	PIN	Signal
485TX-	1	2	422RX-
485TX+	3	4	422RX+
+5V	5	6	GND

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



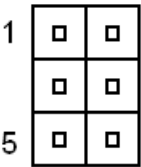
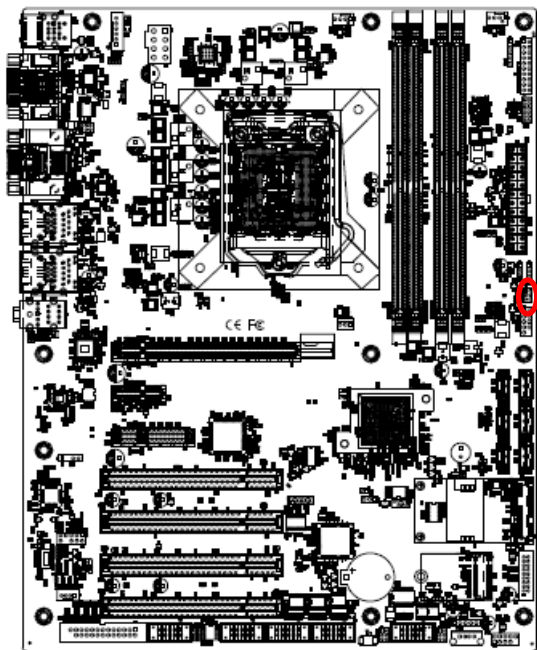
Signal	PIN	PIN	Signal
RXD	2	1	DCD
DTR	4	3	TXD
DSR	6	5	GND
CTS	8	7	RTS
NC	10	9	RI

2.3.8 General purpose I/O connector (JDIO1)



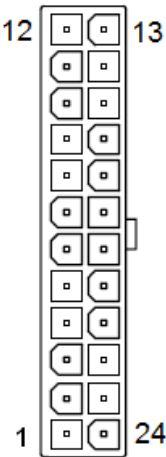
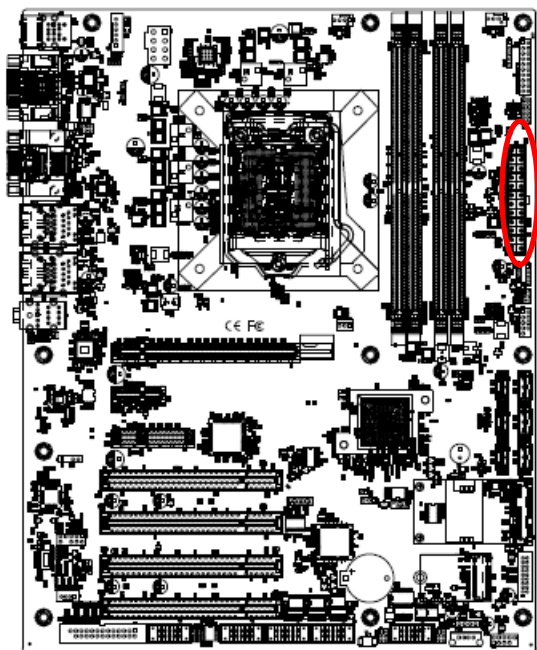
Signal	PIN	PIN	Signal
DI0	1	2	DO0
DI1	3	4	DO1
DI2	5	6	DO2
DI3	7	8	DO3
SMB_CLK_9555	9	10	SMB_DATA_9555
GND	11	12	+5V

2.3.9 SGPIO connector (JSGPIO1)



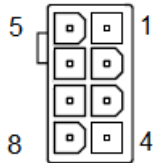
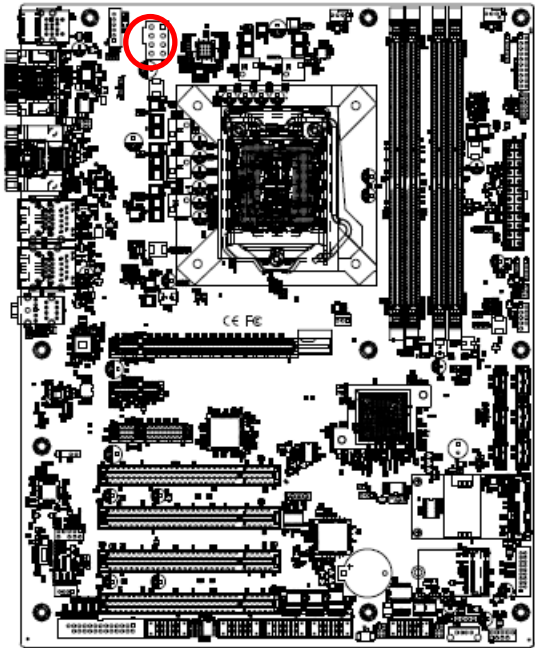
Signal	PIN	PIN	Signal
GND	1	2	GND
SGIO_LOAD	3	4	SGIO_DATOUT0
SGIO_CLK	5	6	SGIO_DATOUT1

2.3.10 ATX Power connector (ATXPWR1)



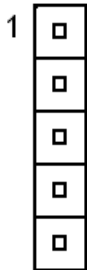
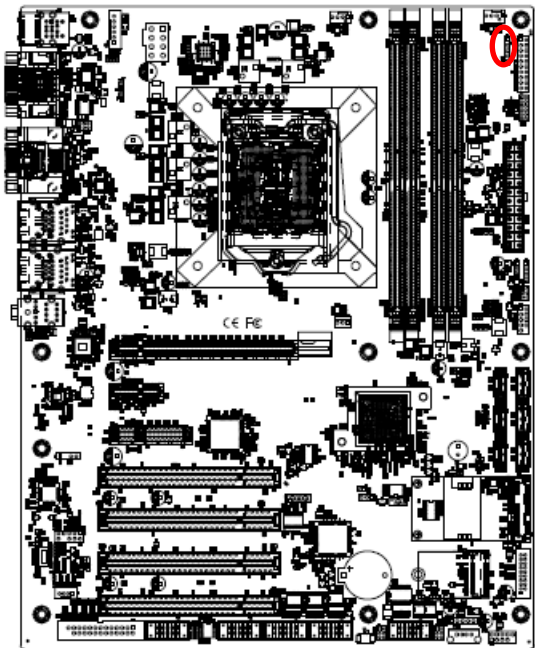
Signal	PIN	PIN	Signal
+3.3V	12	24	GND
+12V	11	23	+5V
+12V	10	22	+5V
+V5SB	9	21	+5V
ATX_PWRGD	8	20	-5V
GND	7	19	GND
+5V	6	18	GND
GND	5	17	GND
+5V	4	16	ATX_PSON#
GND	3	15	GND
+3.3V	2	14	-12V
+3.3V	1	13	+3.3V

2.3.11 Power connector (ATX12V1)



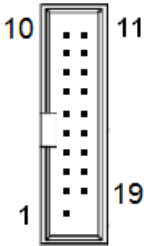
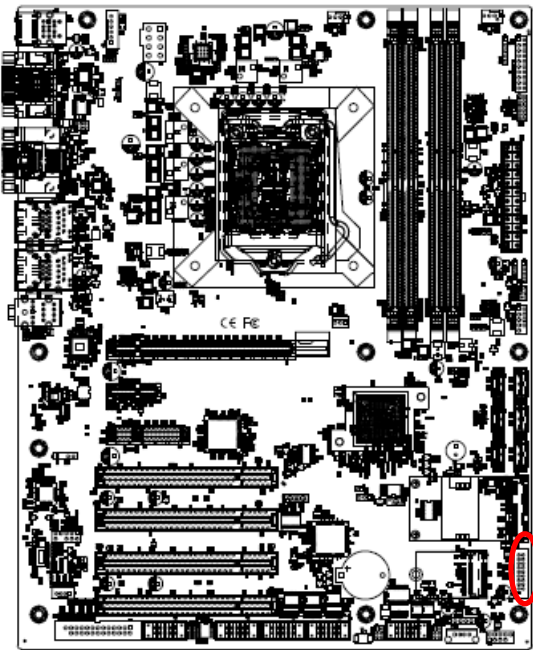
Signal	PIN	PIN	Signal
+12V	5	1	GND
+12V	6	2	GND
+12V	7	3	GND
+12V	8	4	GND

2.3.12 SMBus connector (JSMB1)



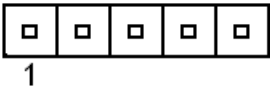
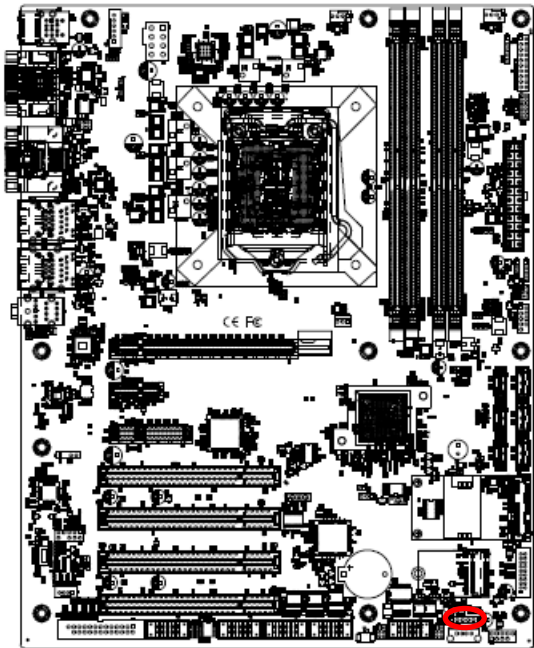
Signal	PIN
SMB_CLK_MAIN	1
SMB_DATA_MAIN	2
SMB_ALERT#_MAIN	3
GND	4
+3.3V	5

2.3.13 USB connector 1 (JUSB1)



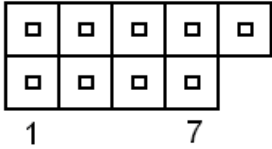
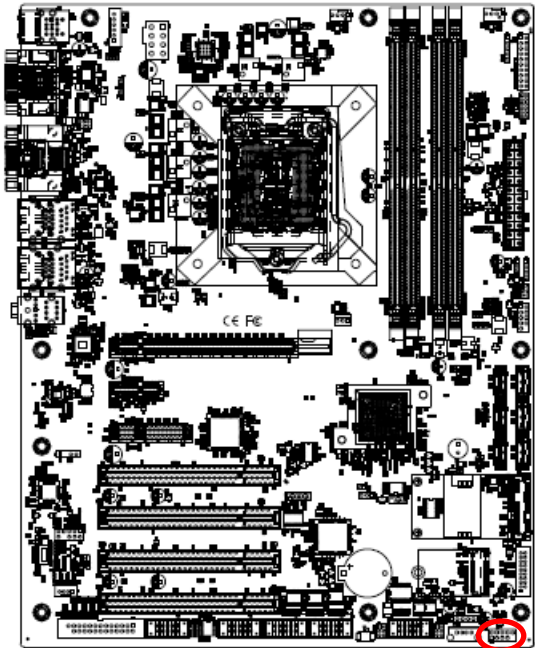
Signal	PIN	PIN	Signal
NC	10	11	USB_R_DP14
USB_R_DP13	9	12	USB_R_DN14
USB_R_DN13	8	13	GND
GND	7	14	SS_USB_TXP_C_6
SS_USB_TXP_C_5	6	15	SS_USB_TXN_C_6
SS_USB_TXN_C_5	5	16	GND
GND	4	17	SS_USB_RXP_C_6
SS_USB_RXP_C_5	3	18	SS_USB_RXN_C_6
SS_USB_RXN_C_5	2	19	USBVCC_DE
USBVCC_DE	1		

2.3.14 USB connector 2 (JUSB2)



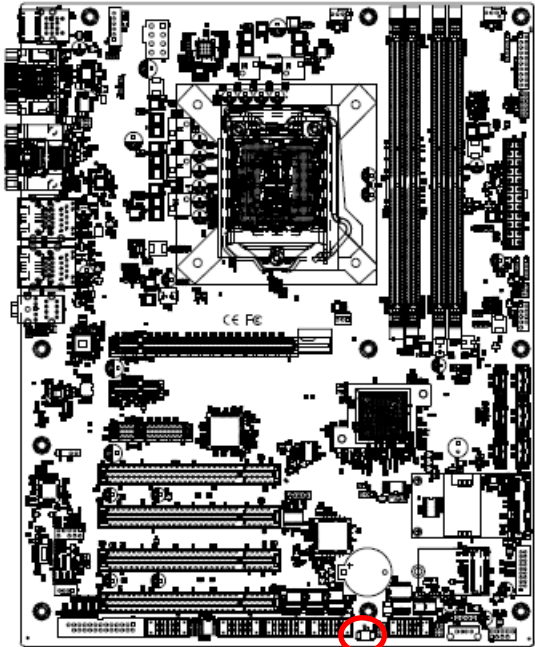
Signal	PIN
USBVCC56	1
USB_R_DN5	2
USB_R_DP5	3
GND	4
GND	5

2.3.15 USB connector 4 (JUSB4)



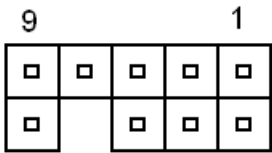
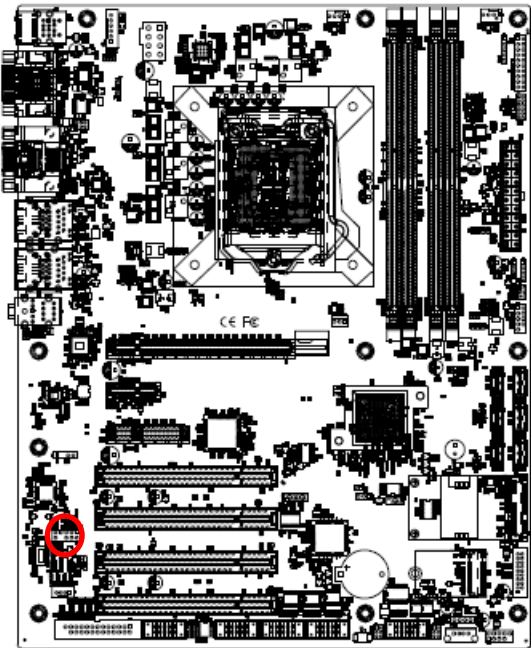
Signal	PIN	PIN	Signal
USBVCC_BC	1	2	USBVCC_BC
USB_R_DN12	3	4	USB_R_DN11
USB_R_DP12	5	6	USB_R_DP11
GND	7	8	GND
		10	NC

2.3.16 Battery connector (JBAT1)



Signal	PIN
RTC_VBAT_1	1
GND	2

2.3.17 Audio connector (JAUDIO1)

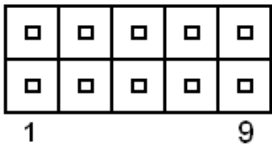
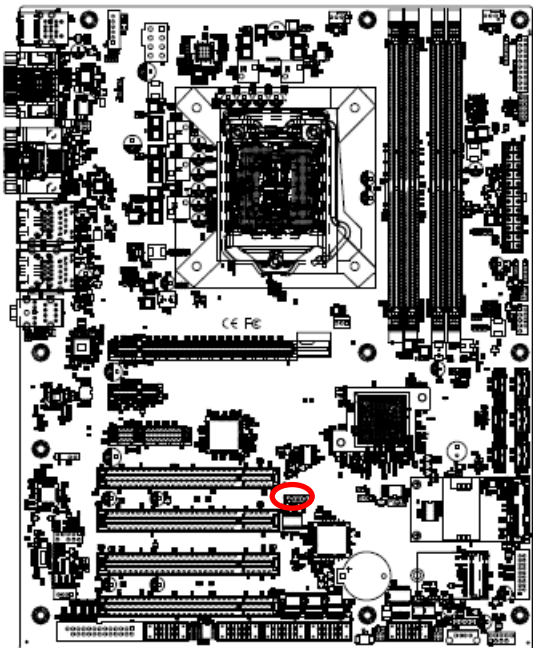


Signal	PIN	PIN	Signal
MIC2_L	1	2	GND
MIC2_R	3	4	ACZ_DET#_R
LNE2_RIN	5	6	MIC2_JD
GND	7		
LINE2_LIN	9	10	LINE2_JD

2.3.17.1 Signal Description –Audio connector (JAUDIO1)

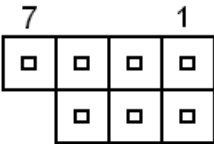
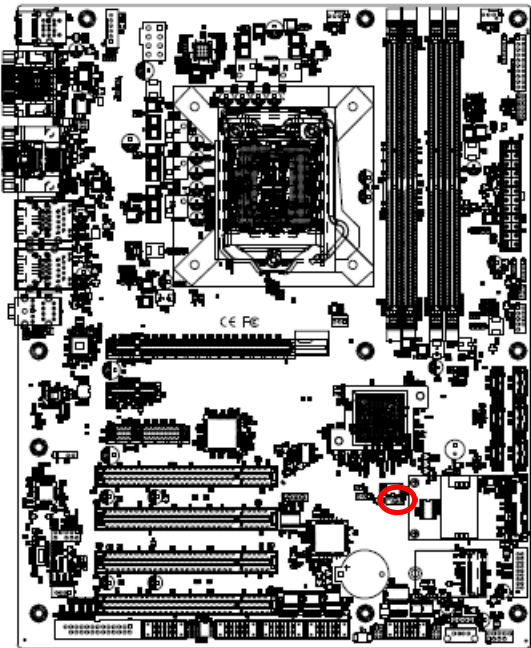
Signal	Signal Description
LINE2_JD	AUDIO IN (LINE_RIN/LIN)sense pin
MIC2_JD	MIC IN (MIC_RIN/LIN) sense pin

2.3.18 LPC connector (JLPC1)



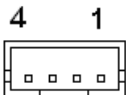
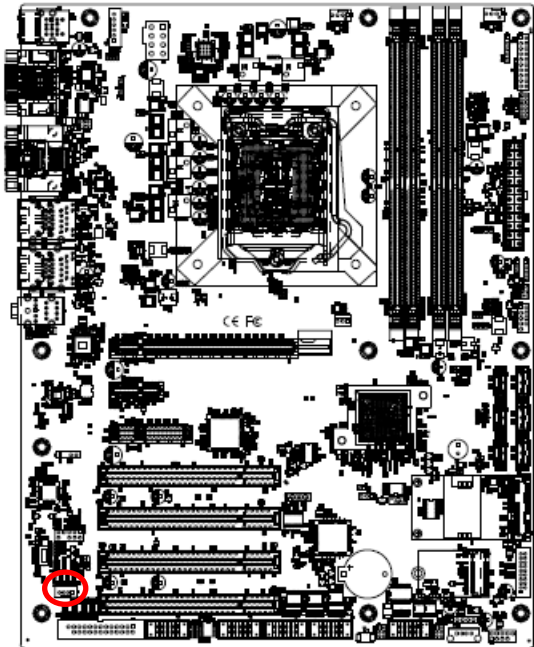
Signal	PIN	PIN	Signal
LPC_AD0_R	1	2	+3.3V
LPC_AD1_R	3	4	BUF_PLT_RST#
LPC_AD2_R	5	6	LPC_FRAME#_R
LPC_AD3_R	7	8	LPC_CLK
LPC_SERIRQ_R	9	10	GND

2.3.19 SPI connector (JSPI1)



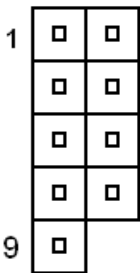
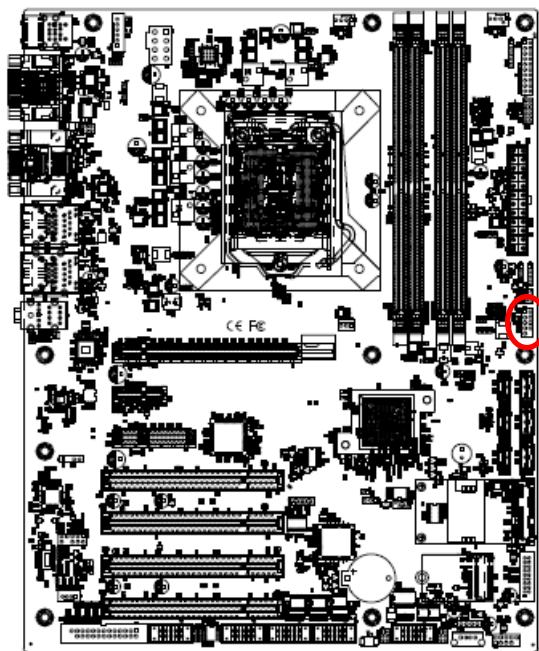
Signal	PIN	PIN	Signal
+3.3V	1	2	GND
SSPI_CS0#_R	3	4	SSPI_SCLK_R
SSPI_SO_R	5	6	SSPI_SI_R
SSPI_HOLD#0	7		

2.3.20 Speaker connector (JSPK1)



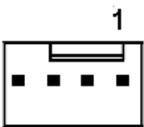
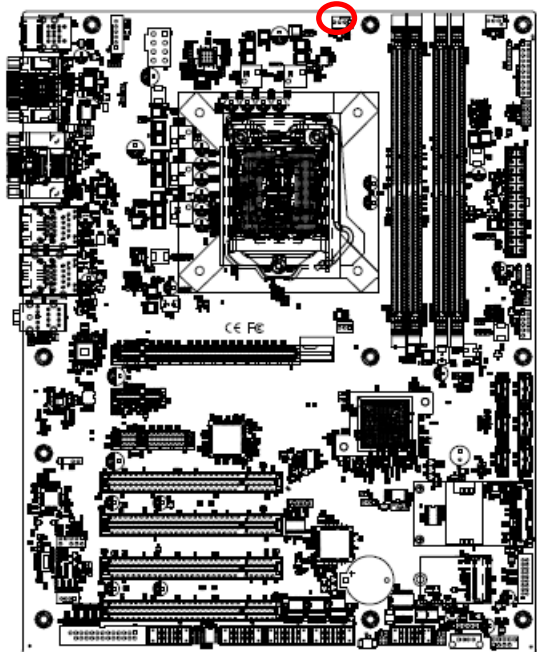
Signal	PIN
SPK_L+	1
SPK_L-	2
SPK_R+	3
SPK_R-	4

2.3.21 Miscellaneous setting connector (JFP1)



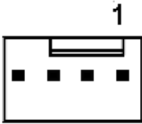
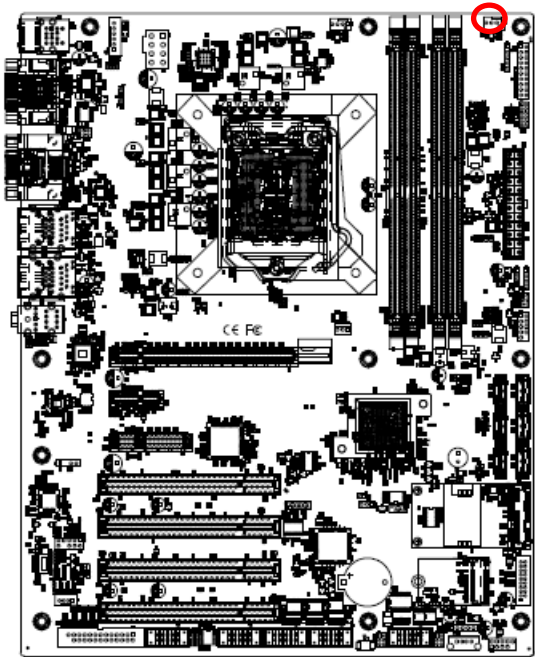
Signal	PIN	PIN	Signal
HDD_LED+	1	2	PWR_LED+
HDD_LED-	3	4	PWE_LED-
RSET_BTN#	5	6	PWRBTN#
GND	7	8	GND
NC	9		

2.3.22 CPU fan connector (CPUFAN1)



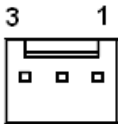
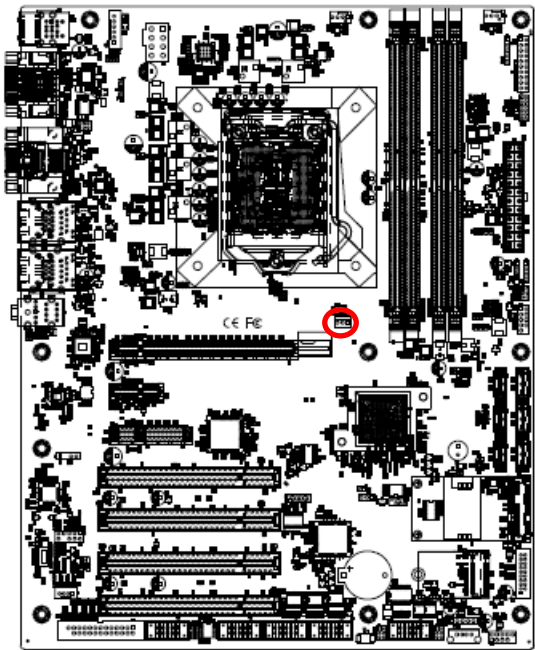
Signal	PIN
GND	1
+12V	2
CPUFANIN	3
CPUFANOUT	4

2.3.23 System fan connector 1 (SYSFAN1)



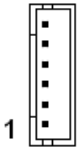
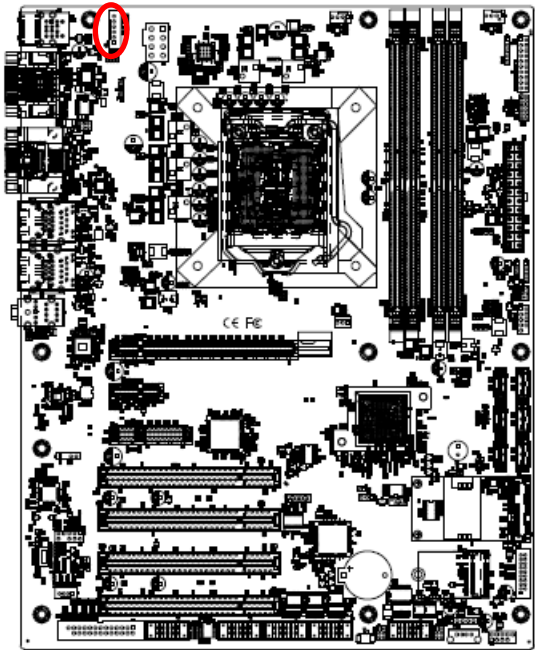
Signal	PIN
GND	1
+12V	2
SYSFANIN1	3
SYSFANOUT1	4

2.3.24 System fan connector 2 (SYSFAN3)



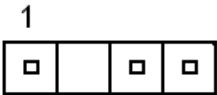
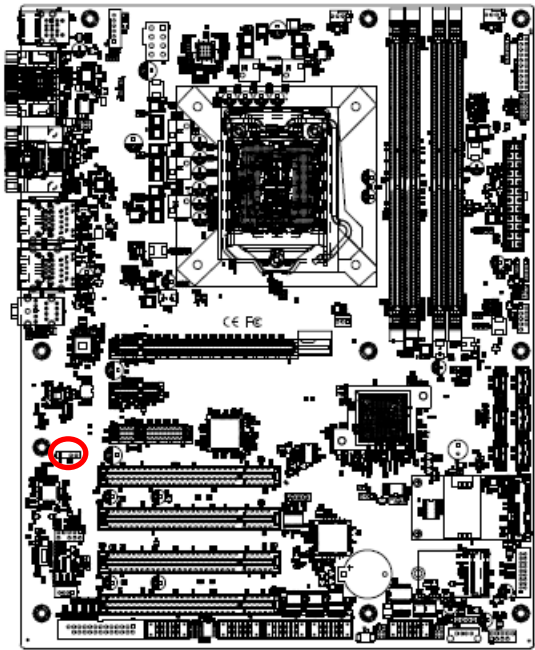
Signal	PIN
GND	1
+12V	2
SYS_FAN_IN_2	3

2.3.25 PS/2 keyboard & mouse connector (JKBMS1)



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

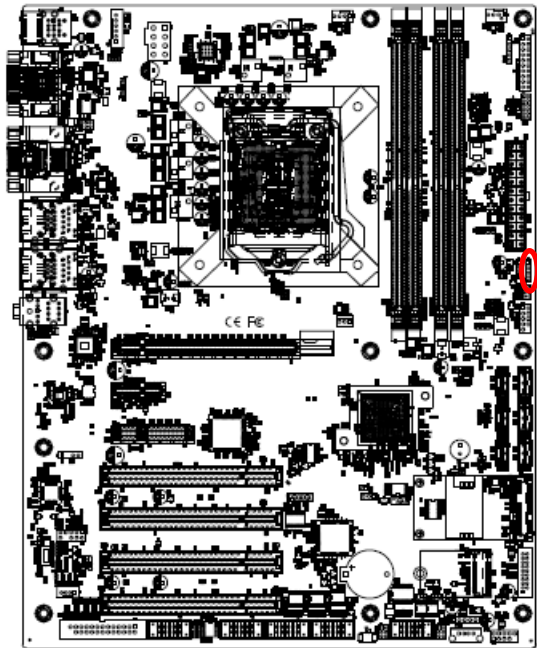
2.3.26 S/PDIF connector (JSPDIF1)



Signal	PIN
+5V	1
SPDIF_O	3
GND	4

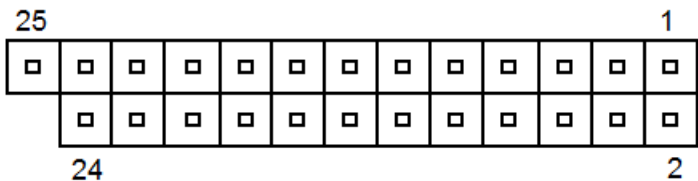
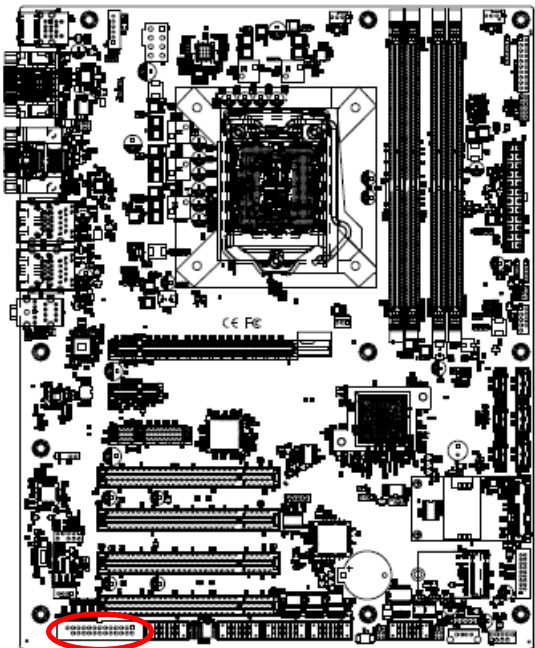
EAX-Q170P User’s Manual

2.3.27 External Speaker connector (JBZ1)



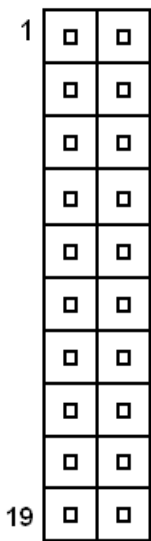
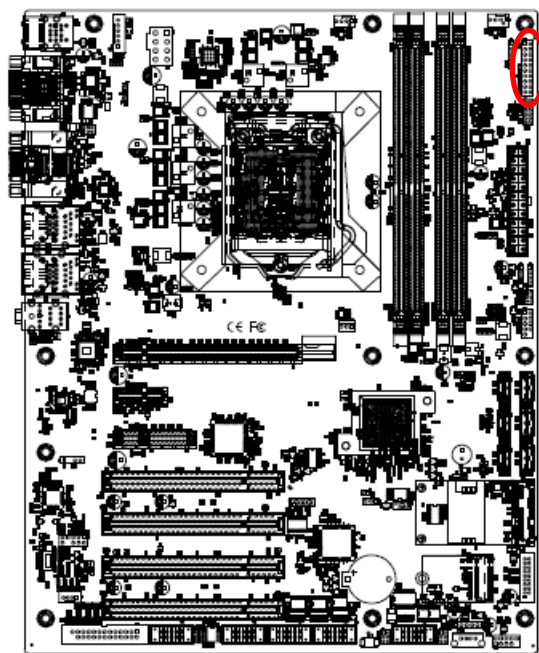
Signal	PIN
+5V	1
NC	2
NC	3
+5V	4

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 or <F2> immediately after switching the system on, or

By pressing the or <F2> key when the following message appears briefly at the left-top of the screen during the POST (Power On Self Test).

Press 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.

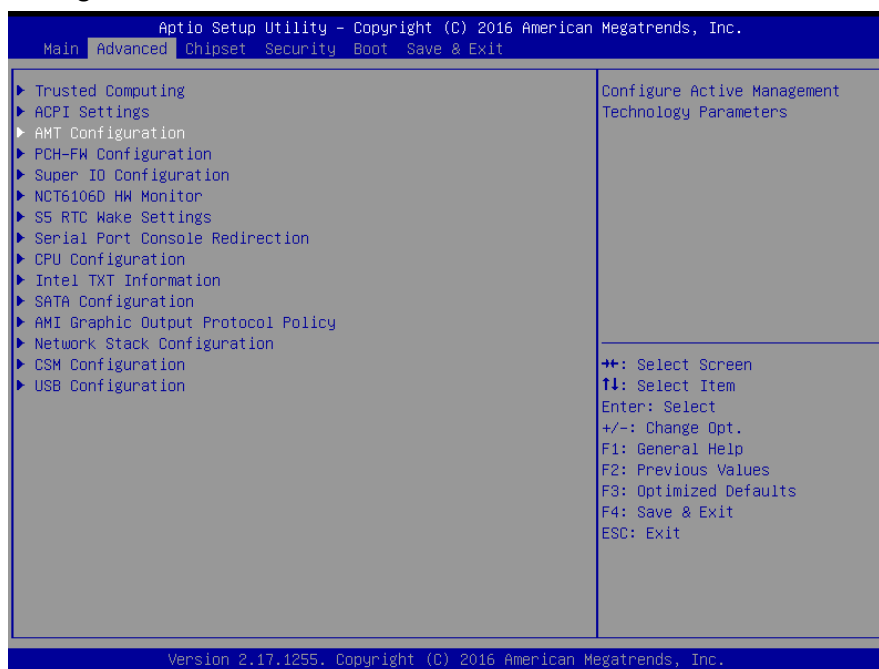


Note: The BIOS setup screens shown in this chapter are for reference purposes only, and may not exactly match what you see on your screen.

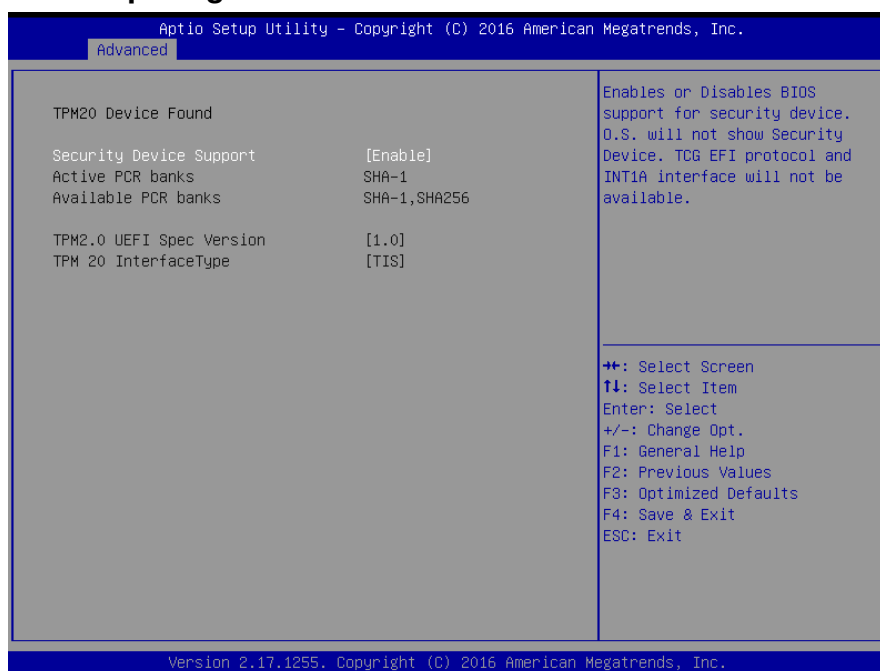
Visit the Avalue website (www.avalue.com.tw) to download the latest product and BIOS information.

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.

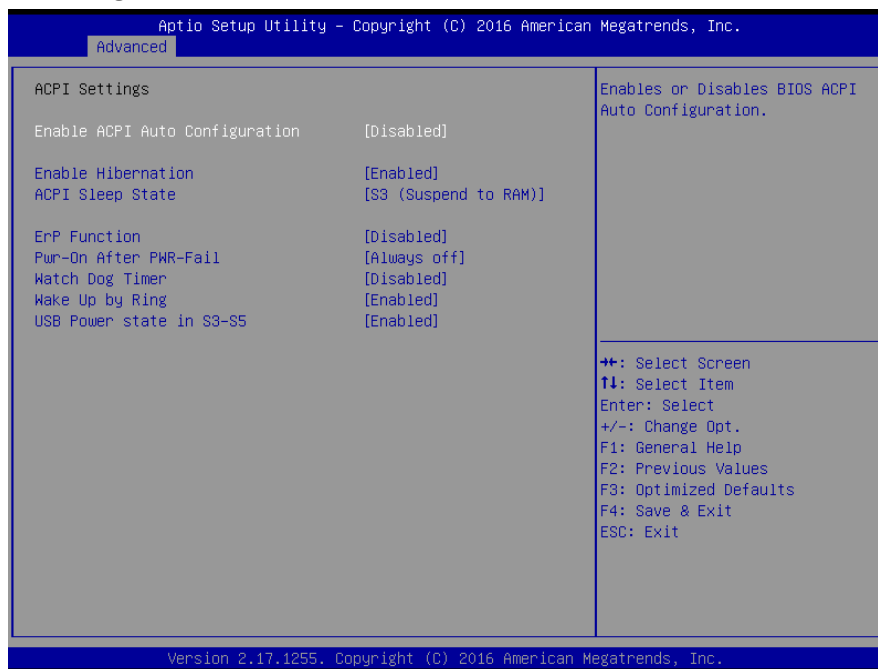


3.6.2.1 Trusted Computing



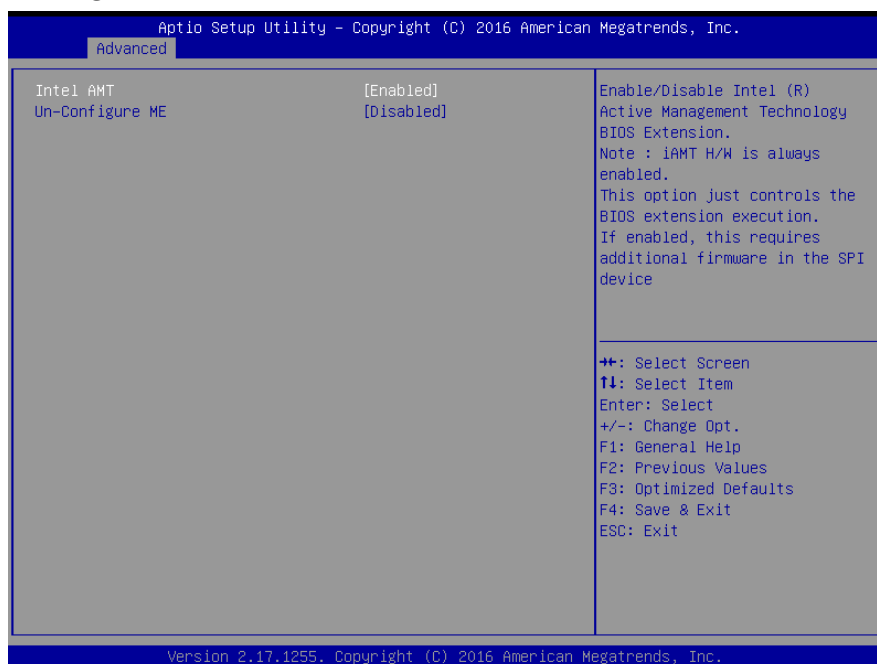
Item	Options	Description
Security Device Support	Disable, Enable[Default]	Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1Ainterface will not be available.

3.6.2.2 APCI Settings



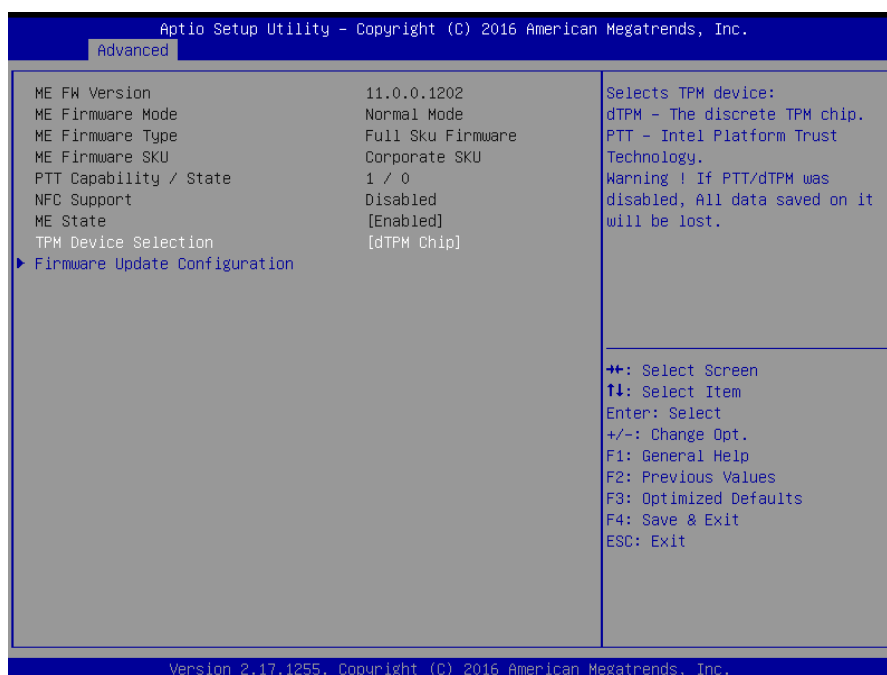
Item	Options	Description
Enable ACPI Auto Configuration	Disabled [Default] , Enabled	Enables or Disables BIOS ACPI Auto Configuration.
Enable Hibernation	Disabled Enabled [Default] ,	Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.
ACPI 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 AMT Configuration



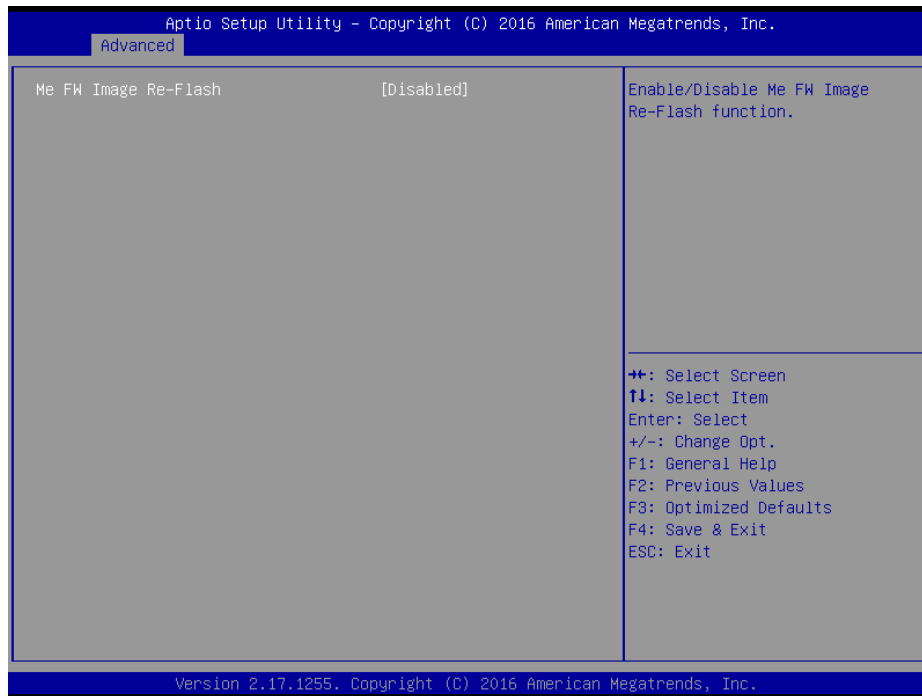
Item	Options	Description
Intel AMT	Disabled Enabled[Default],	Enable/Disable Intel® Active Management Technology BIOS Extension. Note: iAMT H/W is always enabled. This option just controls the BIOS extension execution. If enabled, this requires additional firmware in the SPI device.
Un-Configure ME	Disabled[Default], Enabled	OEMFlag Bit 15: Un-Configure ME without password.

3.6.2.4 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.

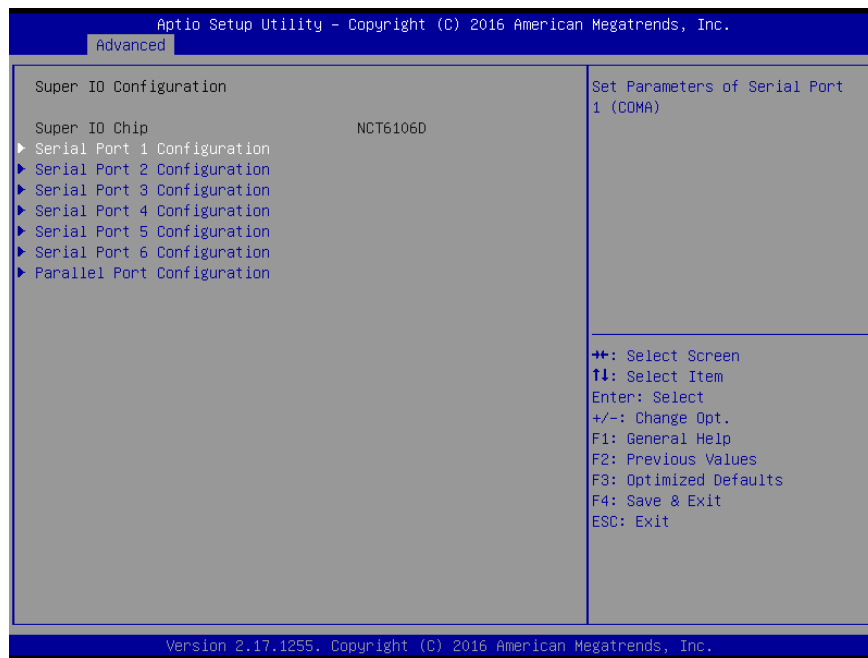
3.6.2.4.1 Firmware Update Configuration



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

3.6.2.5 Super IO Configuration

You can use this item to set up or change the Super IO configuration for serial ports. Please refer to 3.6.2.5.1~ 3.6.2.5.7 for more information.



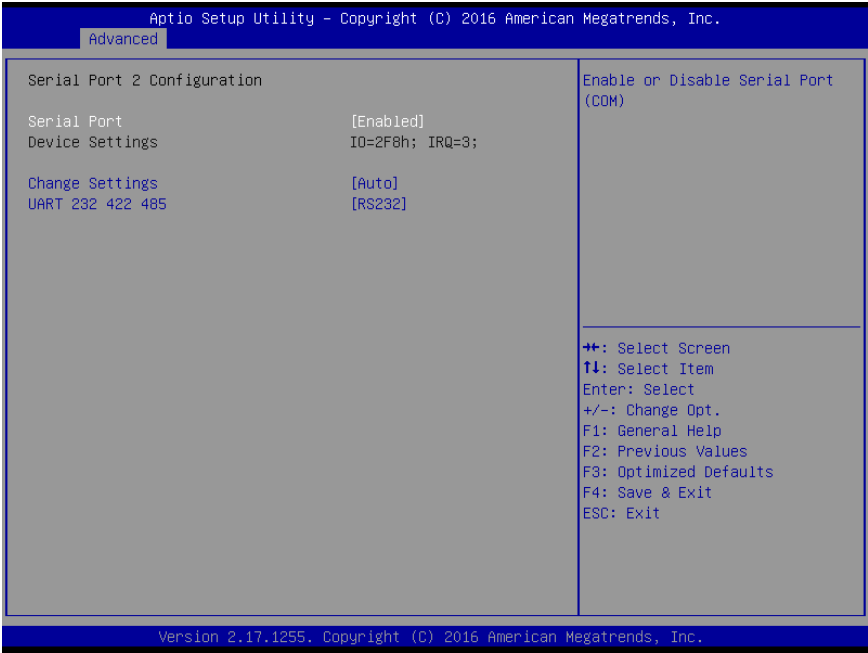
Item	Description
Serial Port 1 Configuration	Set Parameters of Serial Port 1 (COMA).
Serial Port 2 Configuration	Set Parameters of Serial Port 2 (COMB).
Serial Port 3 Configuration	Set Parameters of Serial Port 3 (COMC).
Serial Port 4 Configuration	Set Parameters of Serial Port 4 (COMD).
Serial Port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

3.6.2.5.1 Serial Port 1 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.

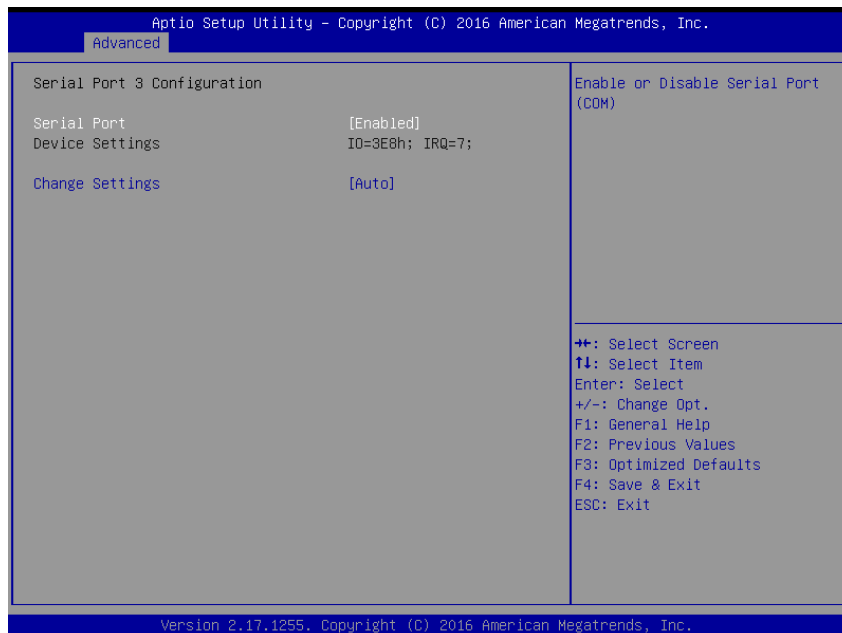
3.6.2.5.2 Serial Port 2 Configuration



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

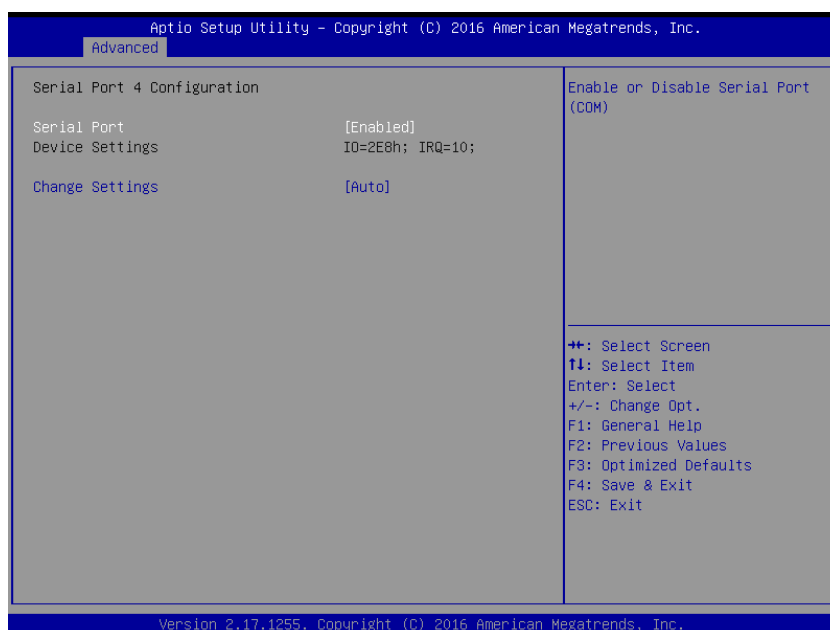
Change Settings	Auto[Default]	Select an optimal setting for super IO Device.
UART 232 422 485	RS232[Default] RS422 RS485	Set COM Port as RS232, RS422 or RS485 mode.

3.6.2.5.3 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.

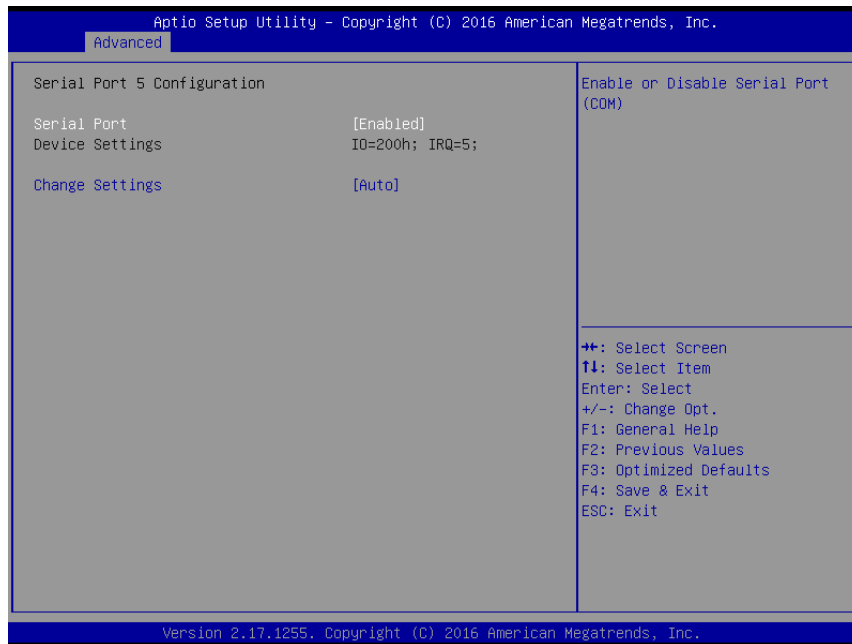
3.6.2.5.4 Serial Port 4 Configuration



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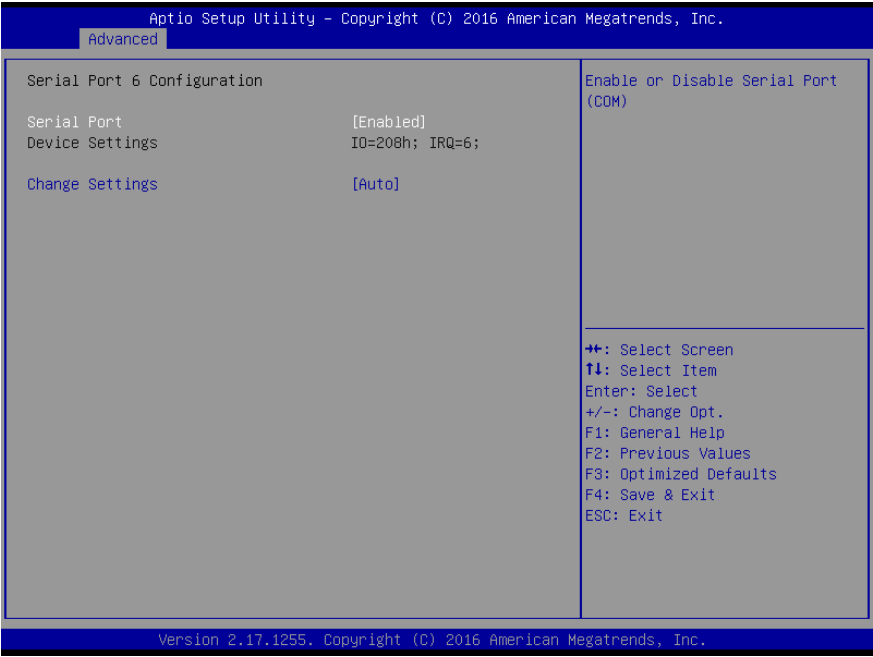
Item	Option	Description
Serial Port	Enabled[Default], Disabled	Enable or Disable Serial Port (COM).
Change Settings	Auto[Default]	Select an optimal setting for super IO Device.

3.6.2.5.5 Serial Port 5 Configuration



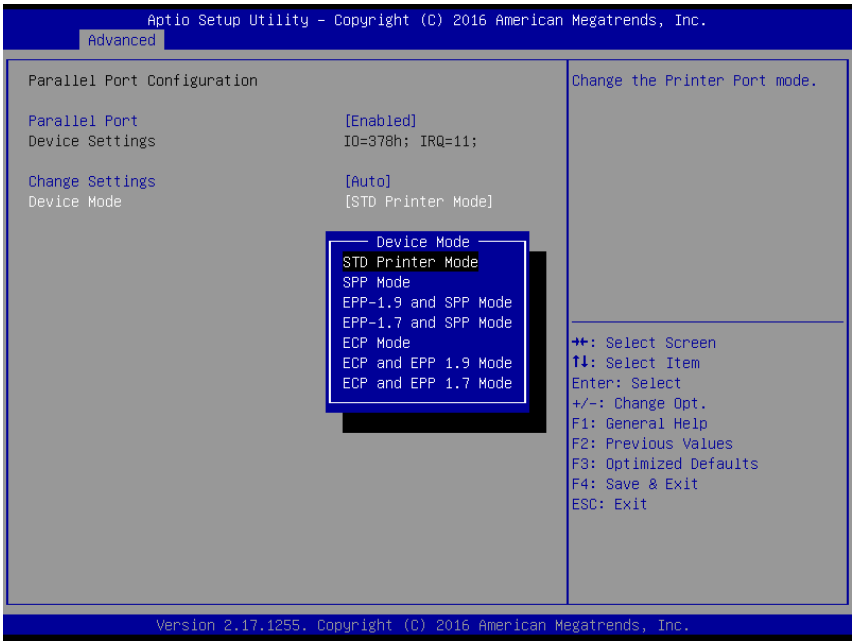
Item	Option	Description
Serial Port	Enabled[Default], Disabled	Enable or Disable Serial Port (COM).
Change Settings	Auto[Default]	Select an optimal setting for super IO Device.

3.6.2.5.6 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.

3.6.2.5.7 Parallel Port Configuration

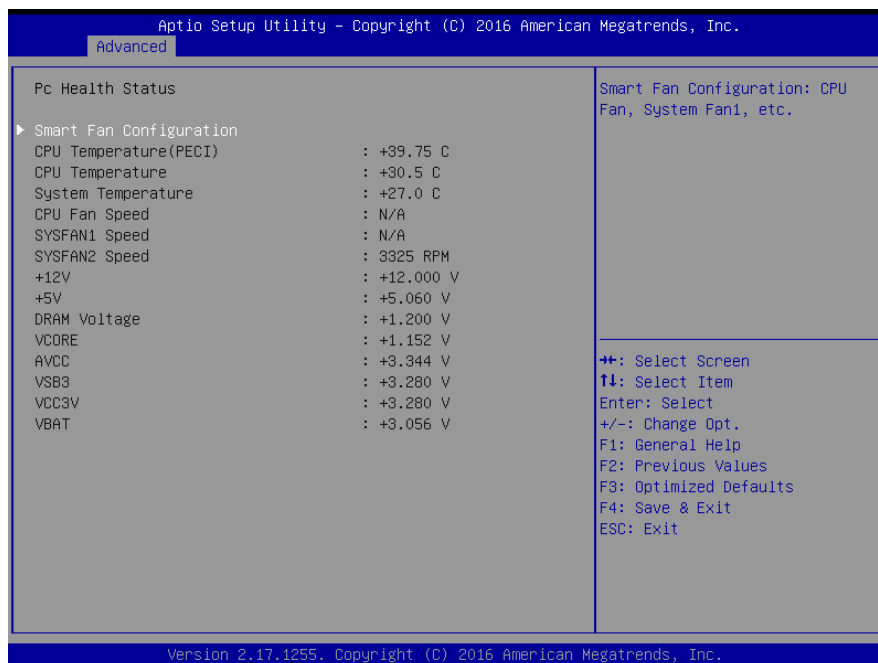


Item	Option	Description
Parallel Port	Enabled[Default],	Enable or Disable Parallel Port (LPT/LPTE).

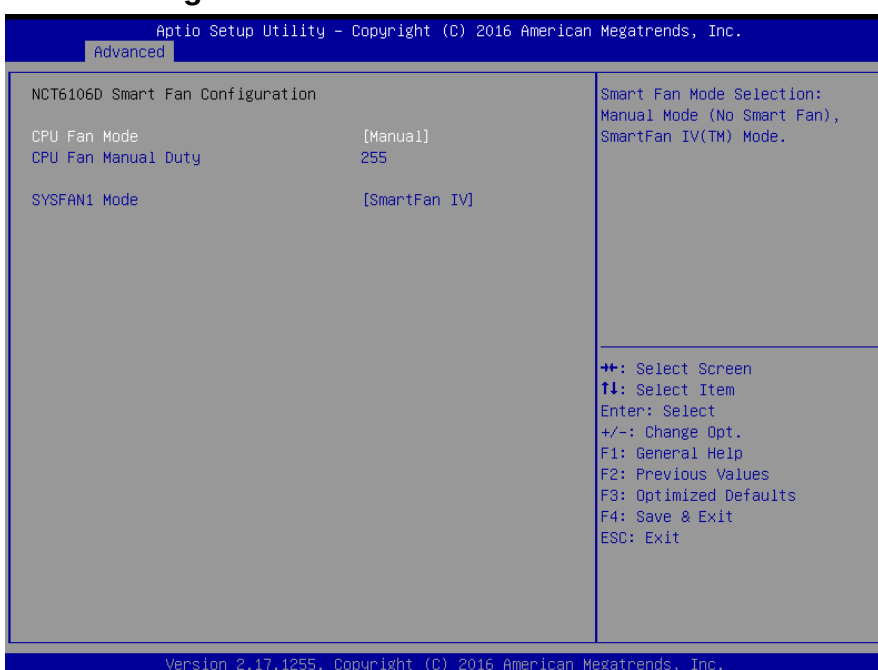
EAX-Q170P User's Manual

	Disabled	
Change Settings	Auto[Default]	Select an optimal setting for Super IO Device.
Device Mode	STD Printer Mode[Default] SPP Mode EPP-1.9 and SPP Mode EPP-1.7 and SPP Mode ECP Mode ECP and EPP 1.9 Mode ECP and EPP 1.7 Mode	Change the Printer Port mode.

3.6.2.6 NCT6106D H/W Monitor

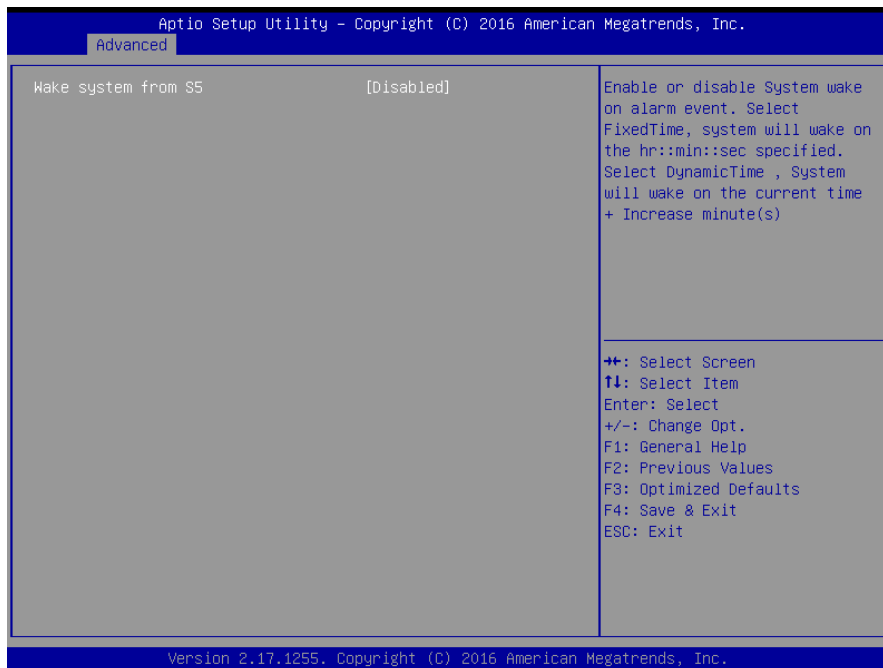


3.6.2.6.1 Smart Fan Configuration



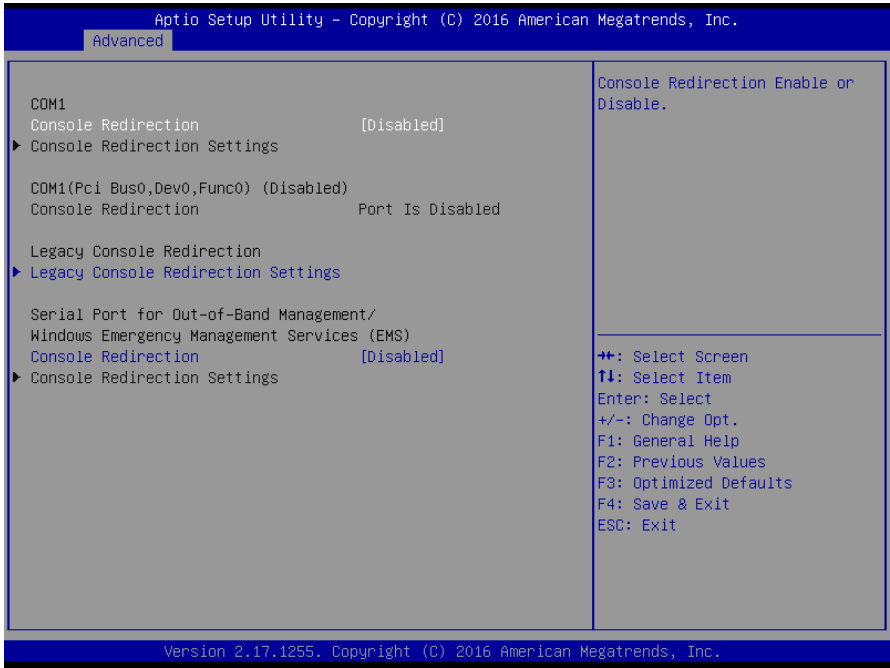
Item	Option	Description
CPU Fan Mode	Manual [Default] , SmartFan IV	Smart Fan Mode Selection: Manual Mode (No Smart Fan), SmartFan IV™ Mode.
CPU Fan Manual Duty	0-255	CPU Fan manual output duty: 0 to 255.
SYSFAN1 Mode	Manual SmartFan IV [Default] ,	Smart Fan Mode Selection: Manual Mode (No Smart Fan),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

3.6.2.7 S5 RTC Wake Settings



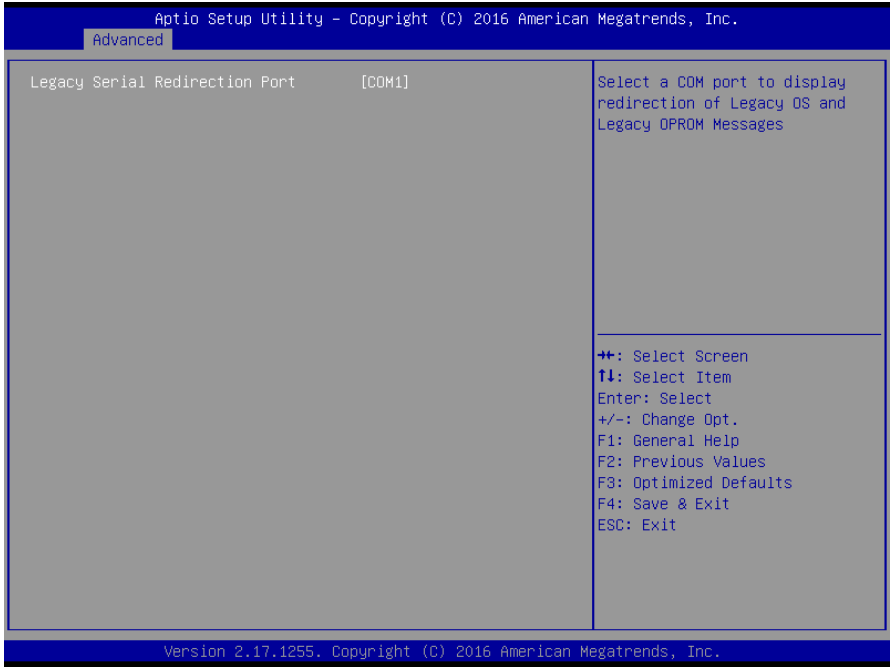
Item	Options	Description
Wake system from S5	Disabled [Default] , Fixed Time Dynamic Time	Enable or disable System wake on alarm event. Select Fixed Time, system will wake on the hr::min::sec specified. Select Dynamic Time, System will wake on the current time + Increase minute(s).

3.6.2.8 Serial Port Console Redirection



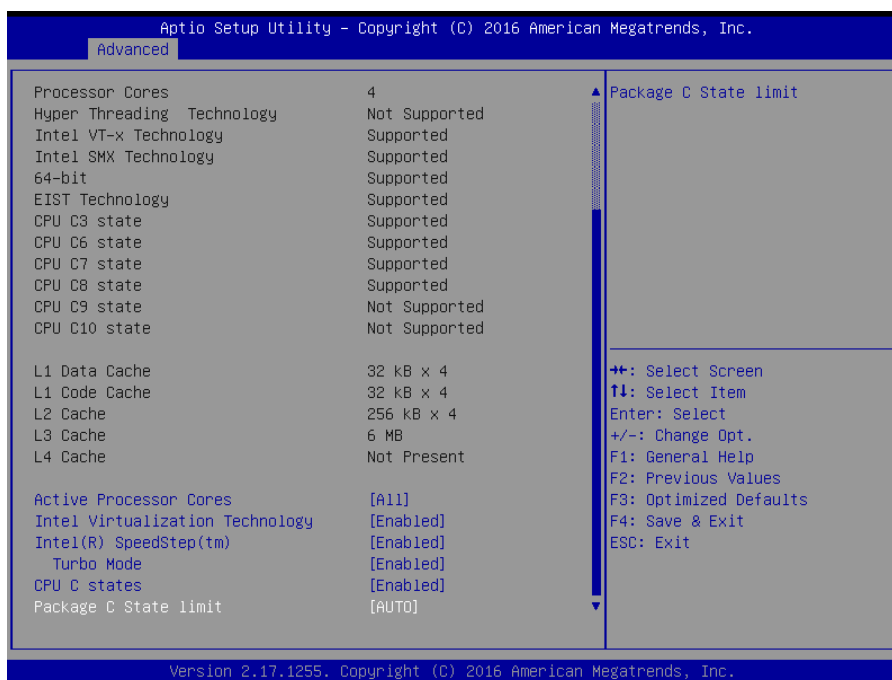
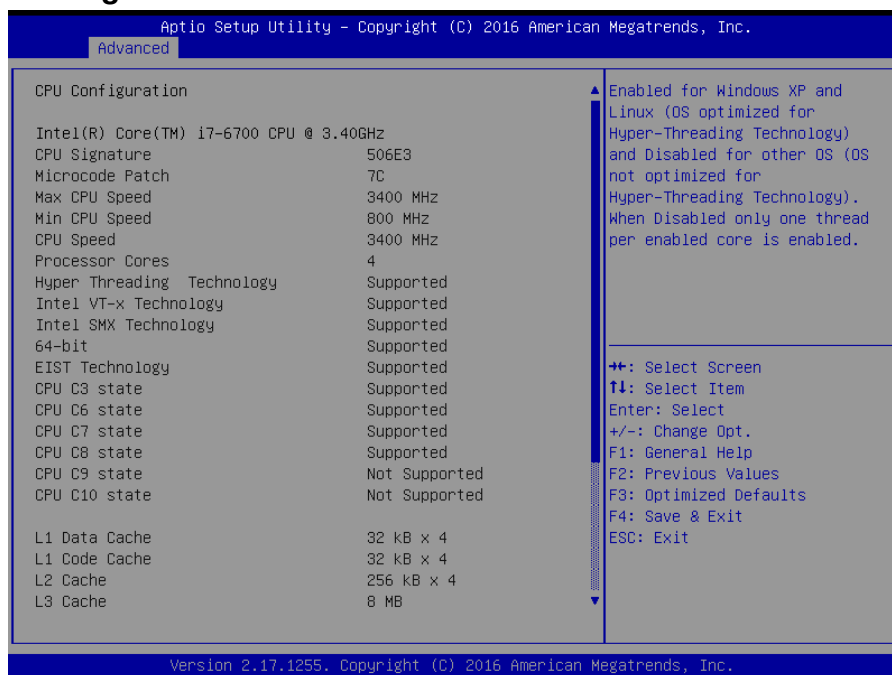
Item	Options	Description
Console Redirection	Disabled[Default], Enabled	Console Redirection Enable or Disable.

3.6.2.8.1 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.

3.6.2.9 CPU Configuration

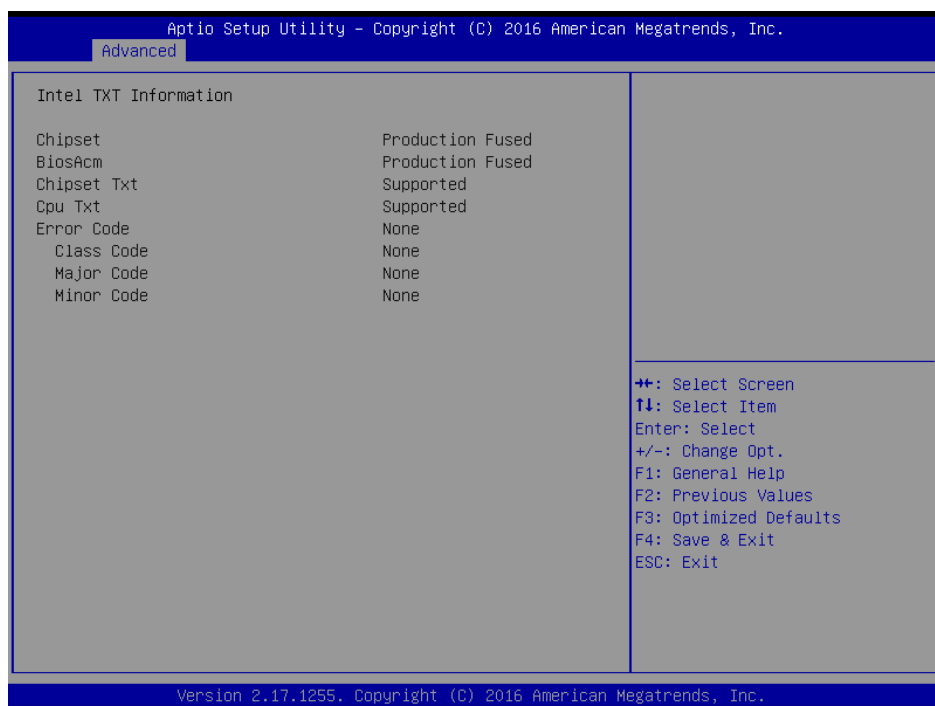


Item	Options	Description
Active Processor Cores	All[Default], 1 2 3	Number of cores to enable in each processor package.
Intel Virtualization Technology	Disabled Enabled[Default],	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.
Intel® SpeedStep™	Disabled	Allows more than two frequency ranges to be

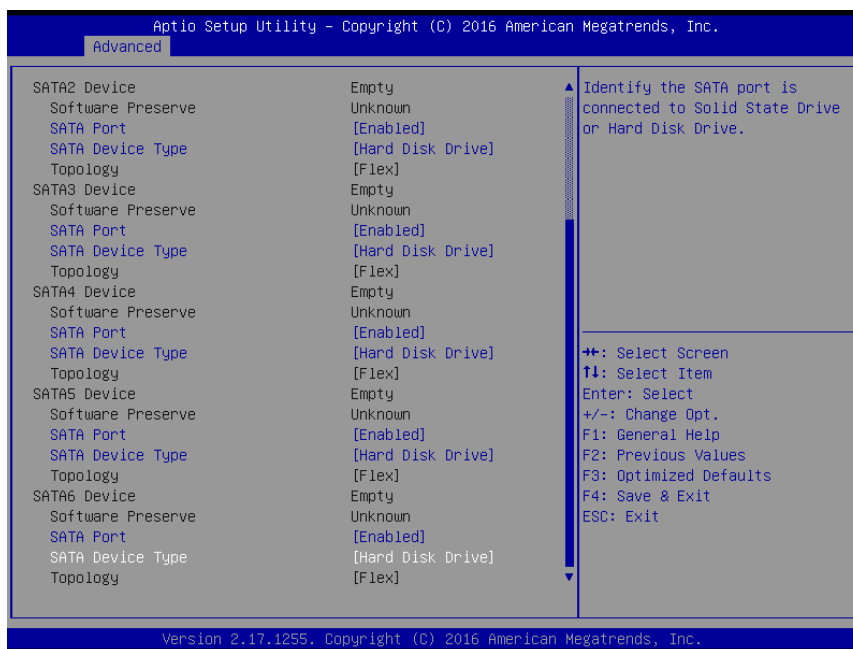
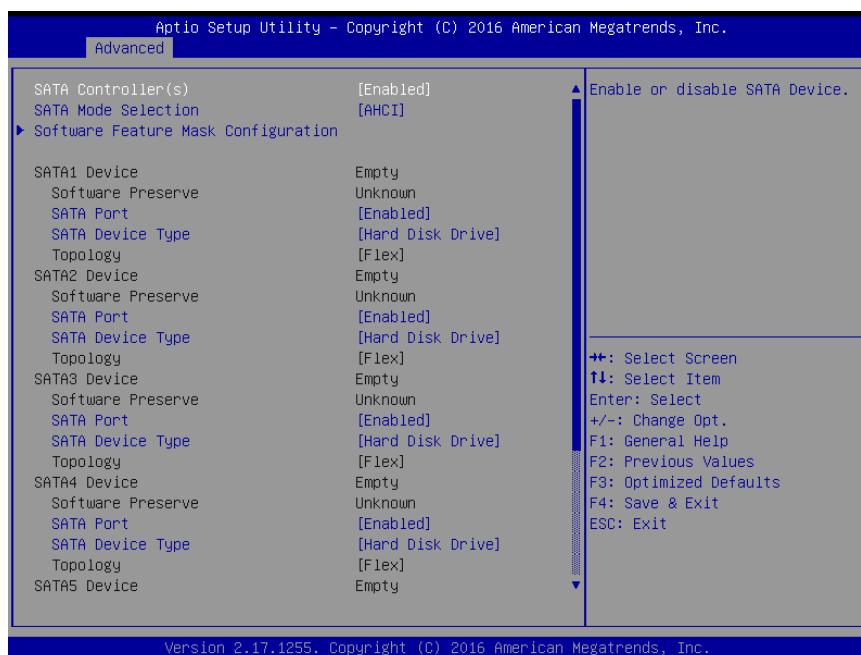
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	Enabled[Default],	supported.
Turbo Mode	Disabled Enabled[Default],	Turbo Mode.
CPU C states	Disabled Enabled[Default],	Enable or disable CPU states.
Package C State limit	C0/C1 C2 C3 C6 C7 C7s AUTO[Default]	Package C State limit.

3.6.2.10 Intel TXT Configuration



3.6.2.11 SATA Configuration



Item	Options	Description
SATA Controller(s)	Disabled, Enabled[Default]	Enable or disable SATA Device.
SATA Mode Selection	AHCI[Default] RAID	Determines how SATA controller(s) operate.
SATA Port	Disabled, Enabled[Default]	Enable or Disable SATA Port.

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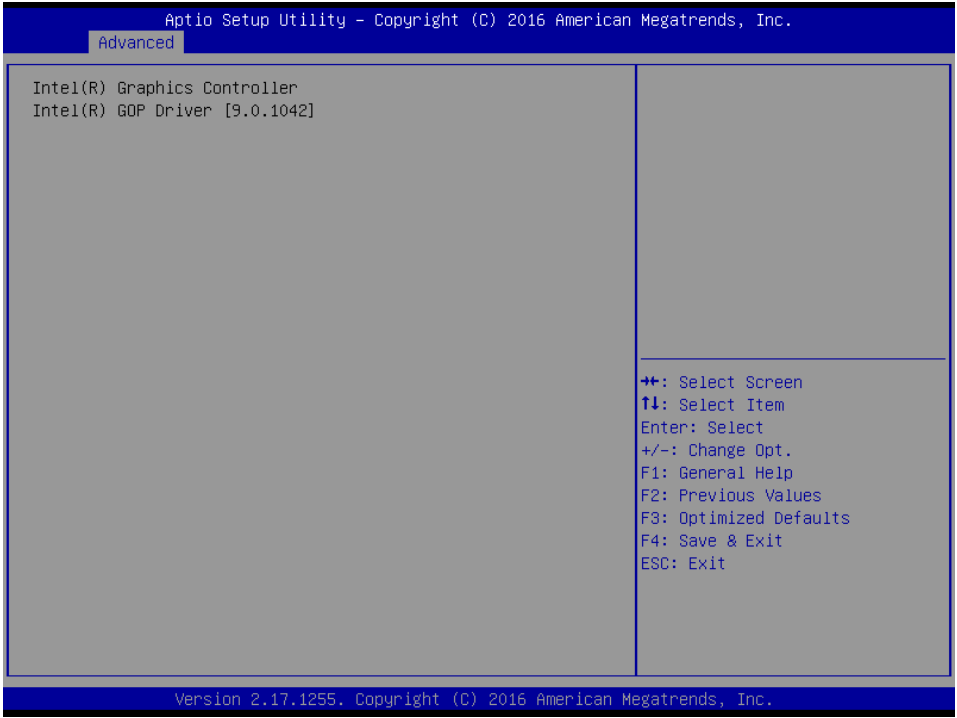
SATA Device Type	Hard Disk Drive [Default] Solid State Drive	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.
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3.6.2.11.1 Software Feature Mask Configuration

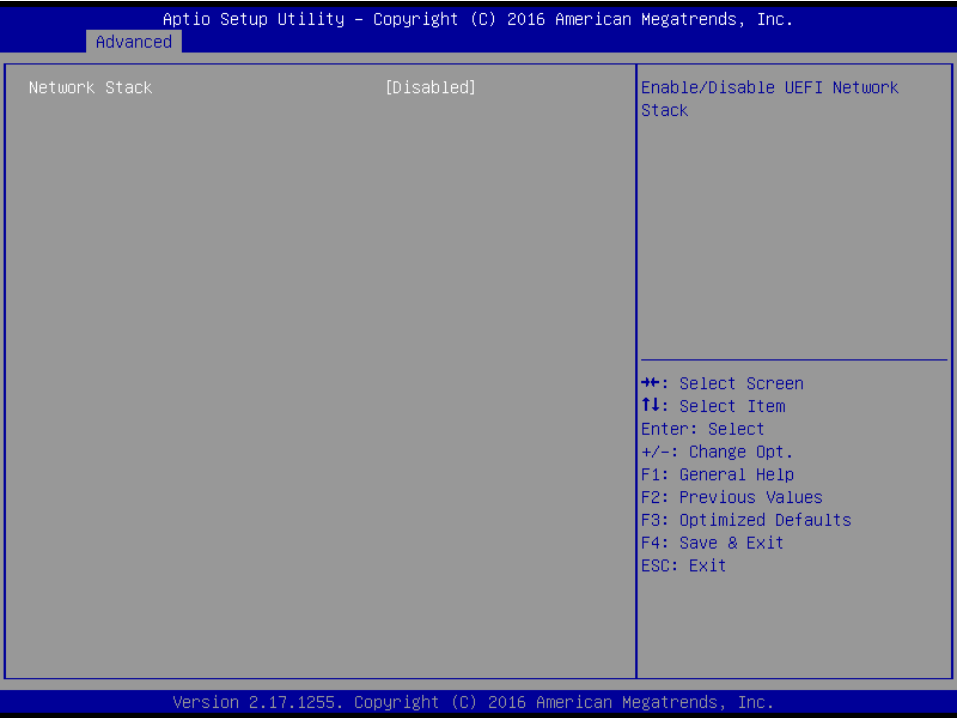


Item	Option	Description
HDD Unlock	Disabled Enabled [Default] ,	If enabled, indicates that the HDD password unlock in the OS is enabled.
LED Locate	Disabled Enabled [Default] ,	If enabled, indicates that the LED/SGPIO hardware is attached and ping to locate feature is enabled on the OS.

3.6.2.12 AMI Graphic Output Protocol Policy

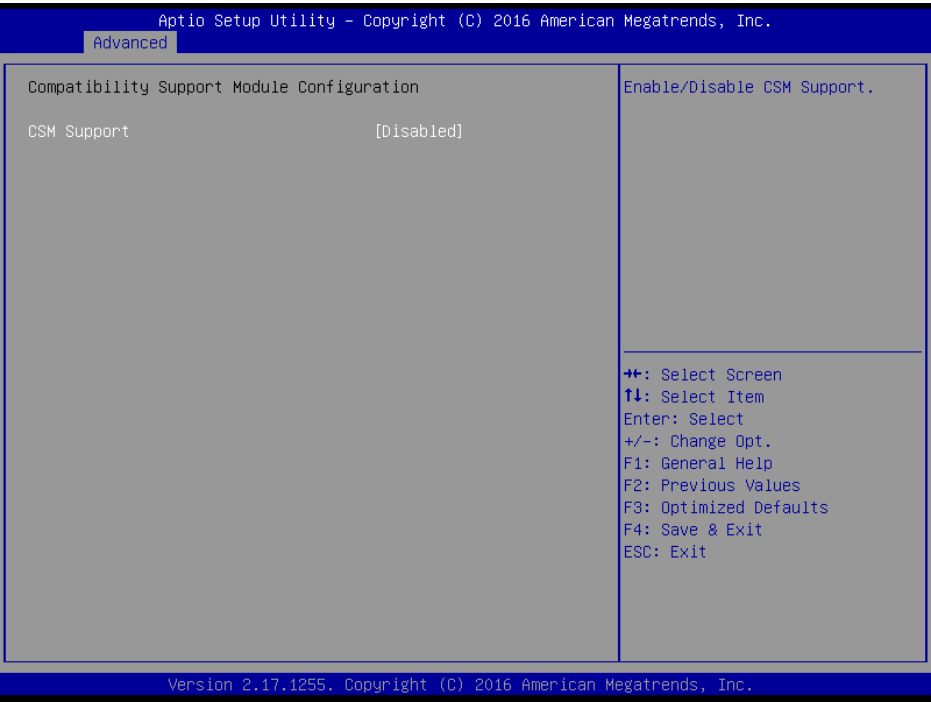


3.6.2.13 Network Stack Configuration



Item	Options	Description
Network Stack	Enabled Disabled [Default]	Enable/Disable UEFI Network Stack.

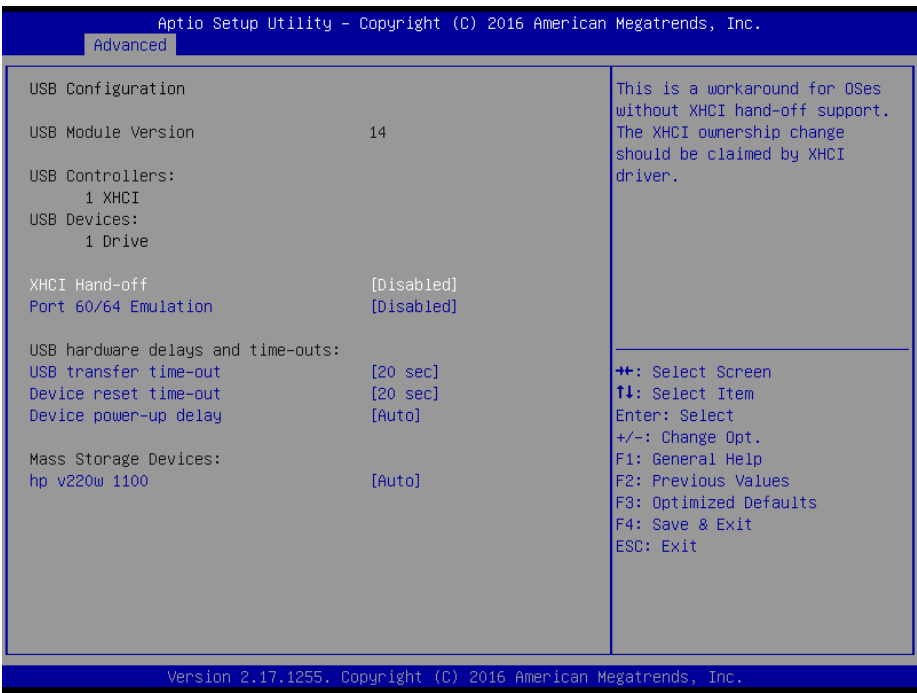
3.6.2.14 CSM Configuration



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

3.6.2.15 USB Configuration

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



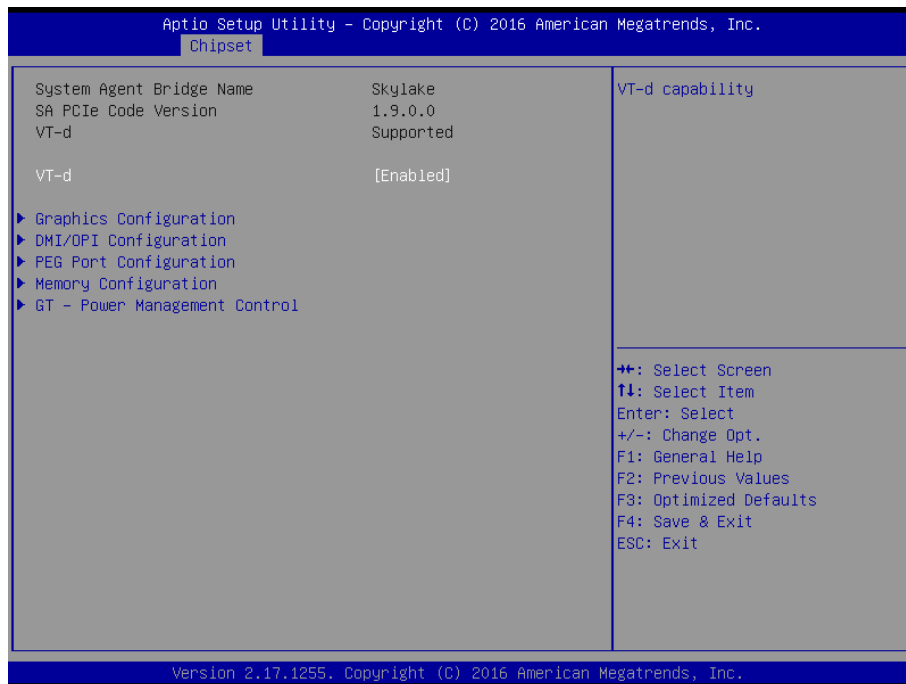
Item	Options	Description
XHCI Hand-off	Enabled Disabled [Default]	This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
Port 60/64 Emulation	Enabled Disabled [Default]	Enables I/O port 60h/64h emulation support. This should be enabled for the complete 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 from 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



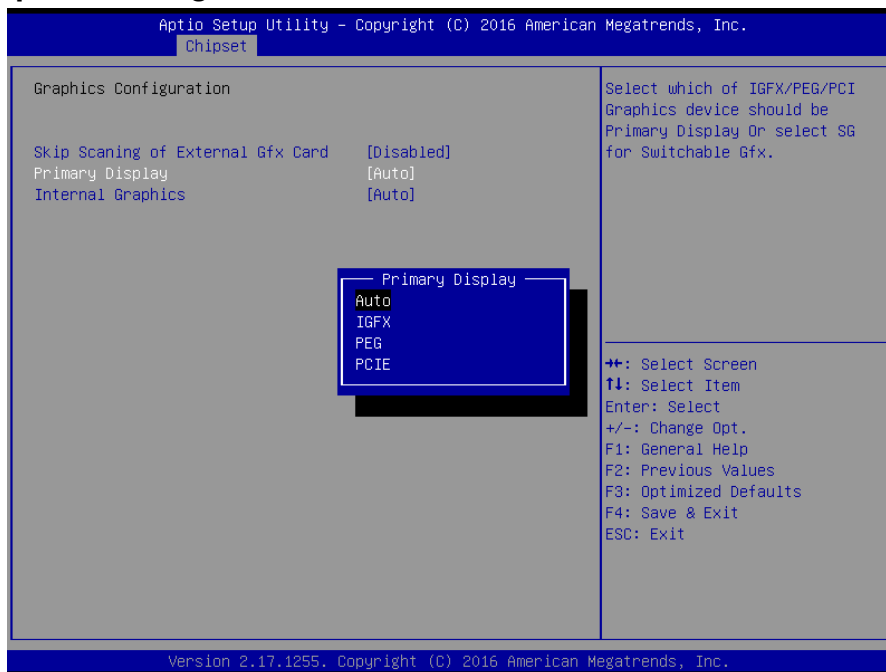
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3.6.3.1 System Agent (SA) Configuration



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

3.6.3.1.1 Graphics Configuration



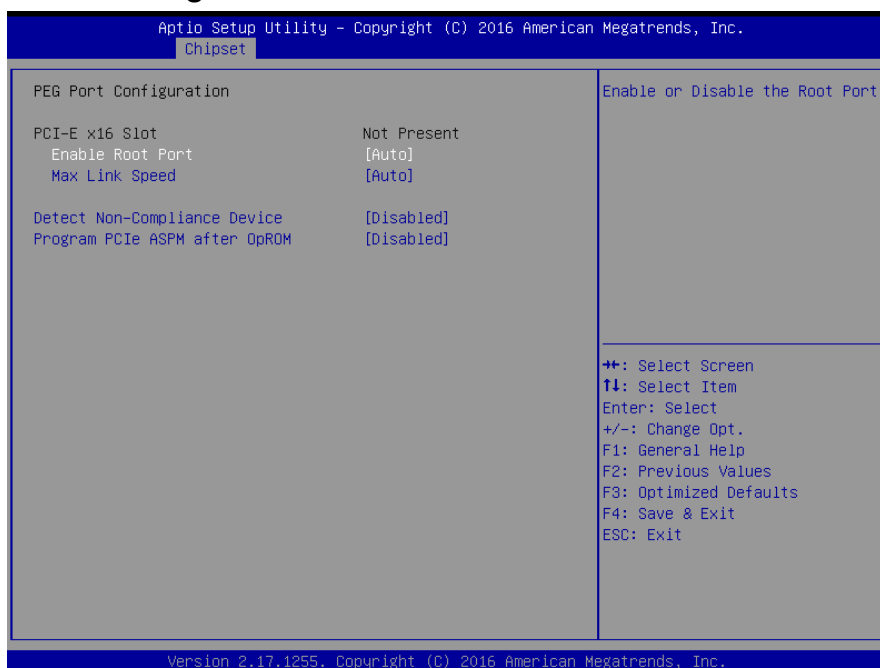
Item	Option	Description
Skip Scanning of External Gfx Card	Enabled Disabled[Default]	If Enable, it will not scan for External Gfx Card on PEG and PCH PCIE Ports.

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



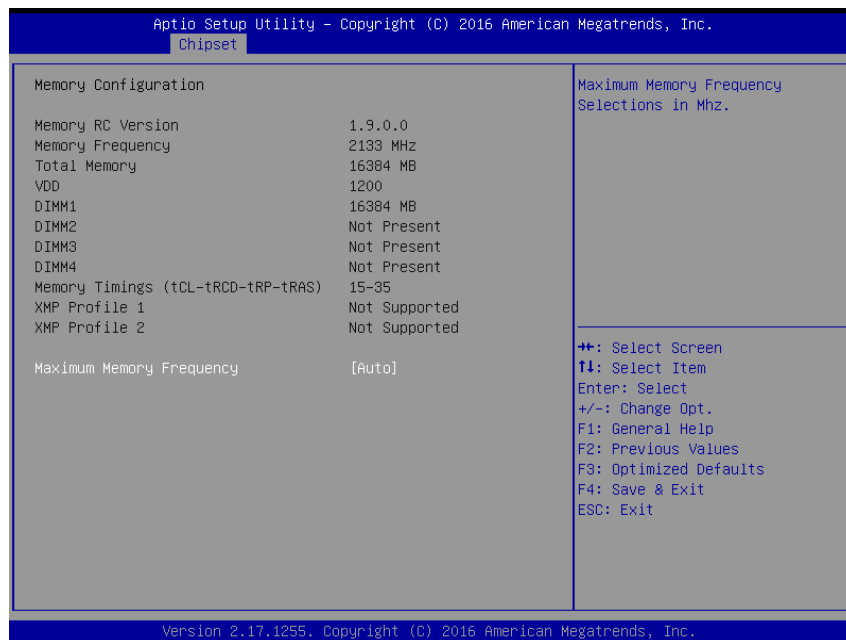
3.6.3.1.3 PEG Port Configuration



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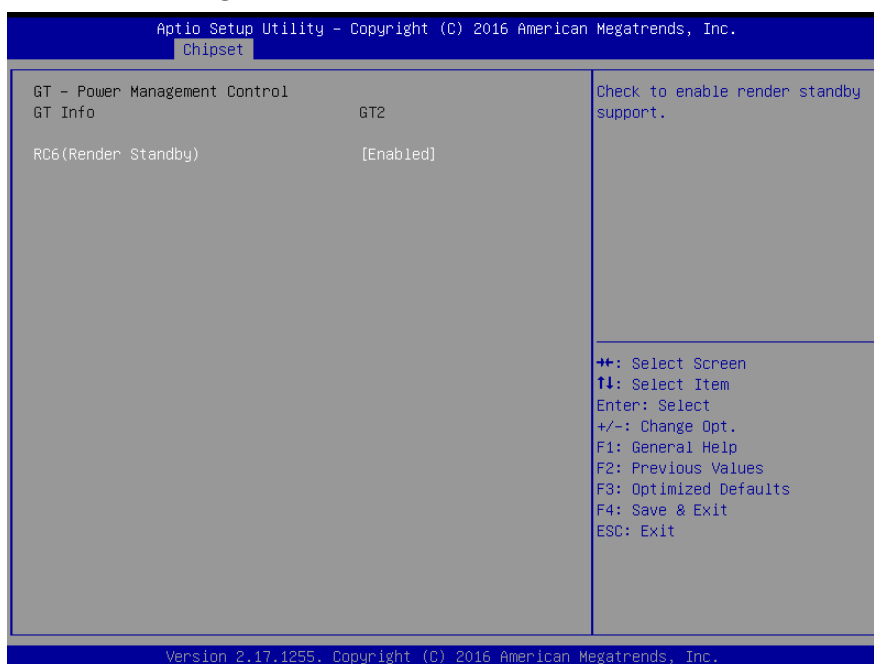
Item	Option	Description
Enable Root Port	Disabled Enabled Auto[Default]	Enable or Disable the Root Port.
Max Link Speed	Auto[Default] Gen1 Gen2 Gen3	Configure PCI-E x16 Slot Max Speed.
Detect Non-Compliance Device	Disabled[Default] Enabled	Detect Non-Compliance PCI Express Device in PEG.
Program PCIe 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

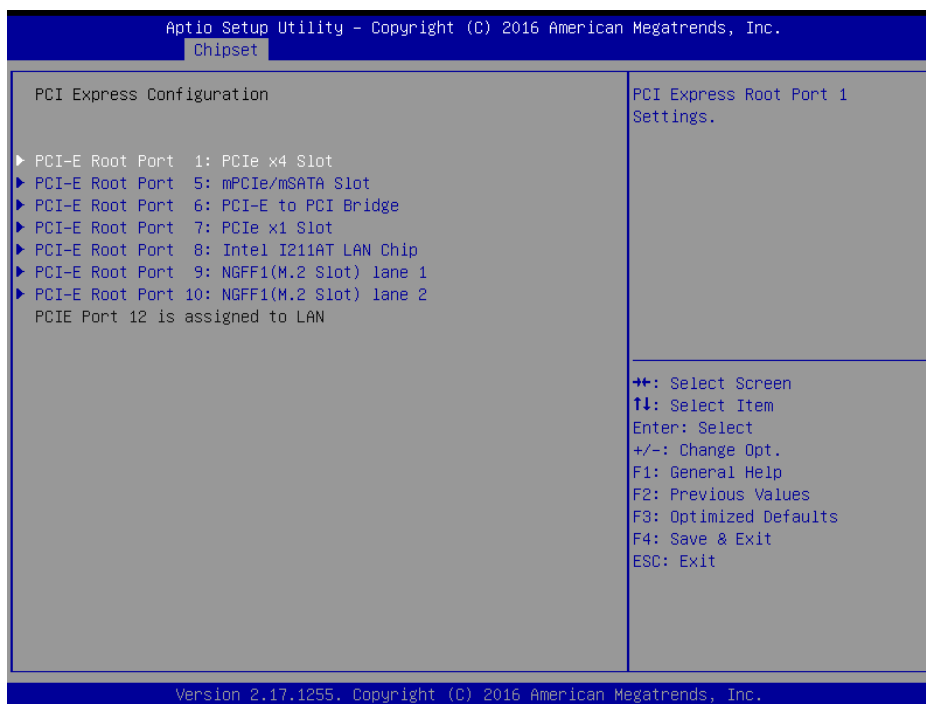


Item	Option	Description
LAN PHY Controller	Disabled Enabled[Default]	Enable or disable OnBoard PCH LAN PHY Controller.

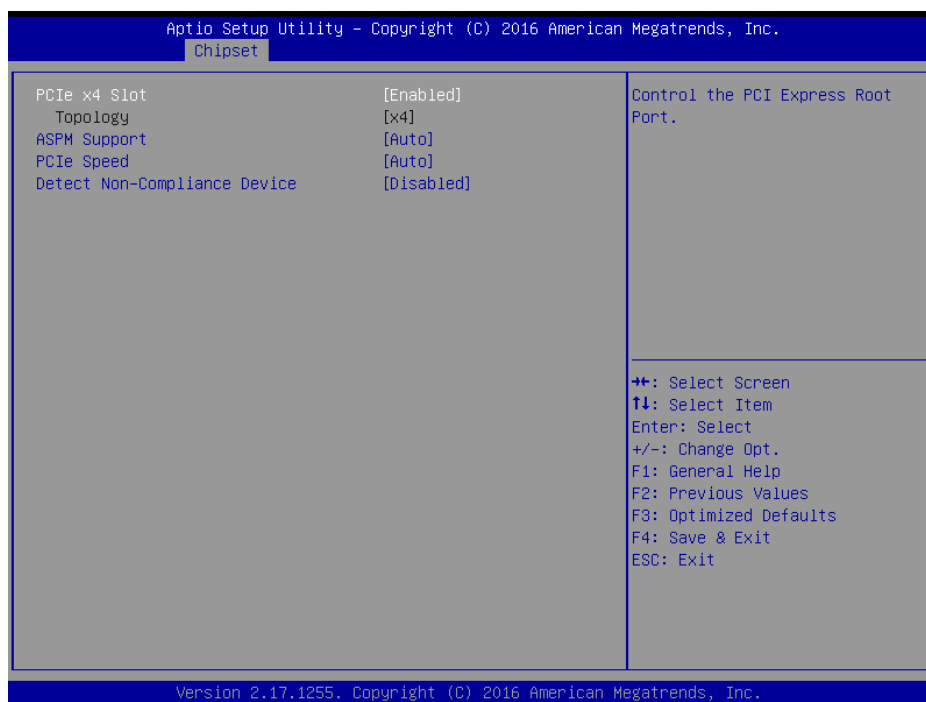
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Serial IRQ Mode	Quiet Continuous[Default]	Configure Serial IRQ Mode.
-----------------	------------------------------	----------------------------

3.6.3.2.1 PCI Express Configuration



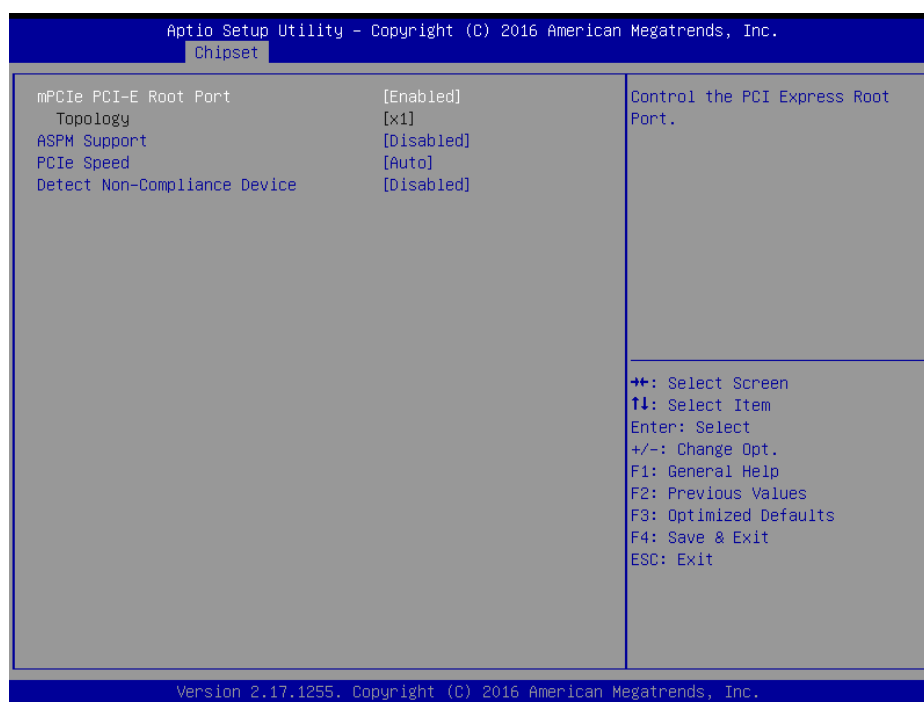
3.6.3.2.1.1 PCI-E Root Port 1: PCIe x4 Slot



Item	Option	Description
PCIe x4 Slot	Enabled[Default], Disabled	Control the PCI Express Root Port.

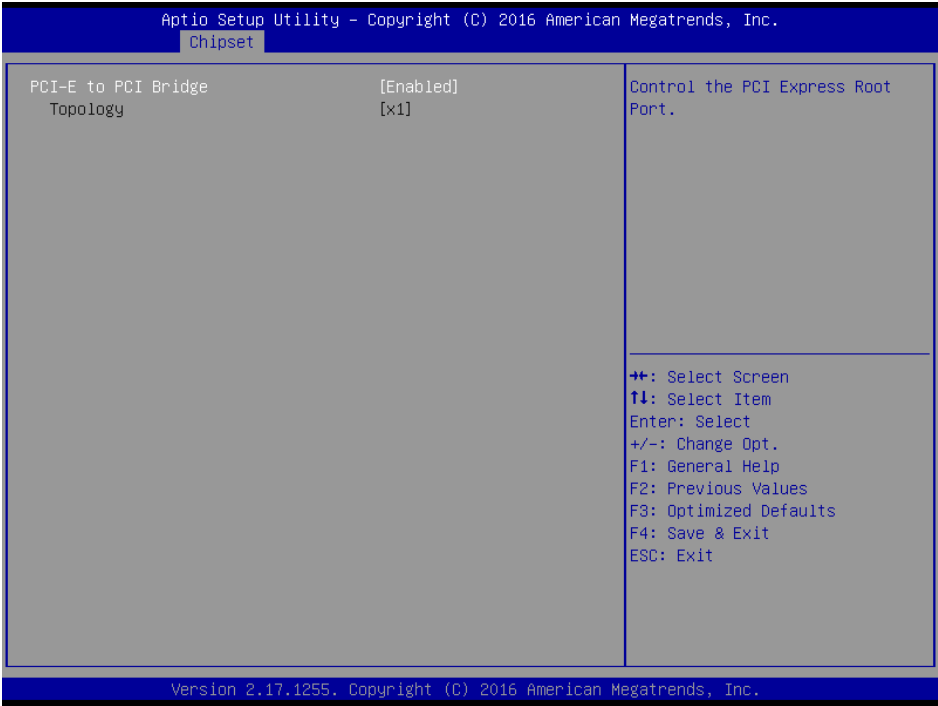
ASPM Support	Disabled L0s L1 L0sL1 Auto[Default]	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
PCIe Speed	Auto[Default] Gen1 Gen2 Gen3	Select PCI Express port speed.
Detect Non-Compliance Device	Disabled[Default], Enabled	Detect Non-Compliance PCI Express Device. If enable, it will take more time at POST time.

3.6.3.2.1.2 PCI-E Root Port 5: mPCIe/mSATA Slot



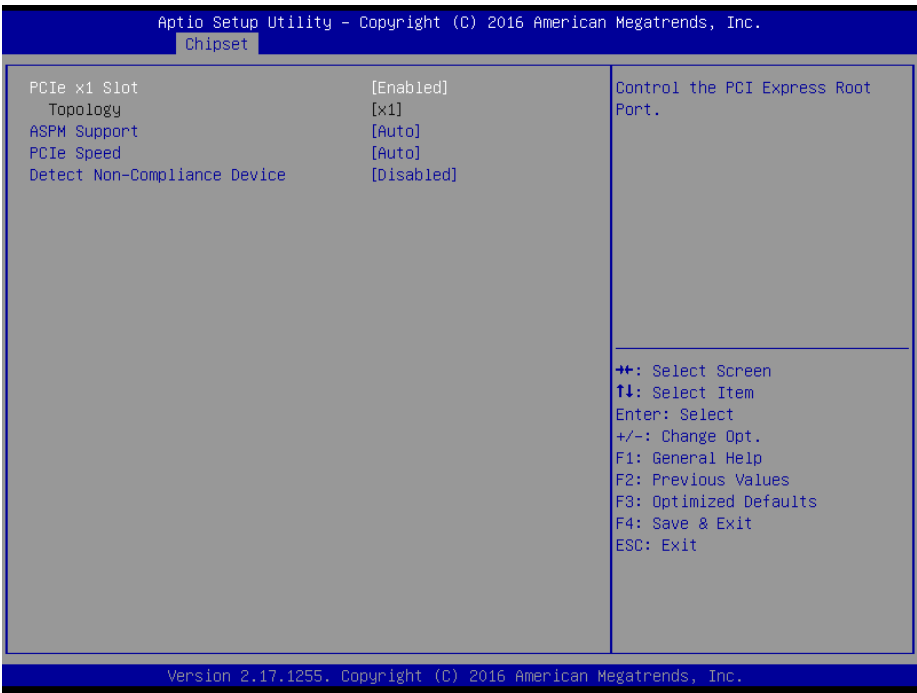
Item	Option	Description
mPCIe PCI-E Root Port	Enabled[Default], Disabled	Control the PCI Express Root Port.
ASPM Support	Disabled L0s L1 L0sL1 Auto[Default]	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
PCIe Speed	Auto[Default] Gen1 Gen2 Gen3	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.

3.6.3.2.1.3 PCI-E Root Port 6: PCI-E to PCI Bridge



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

3.6.3.2.1.4 PCI-E Root Port 7: PCIe x1 Slot



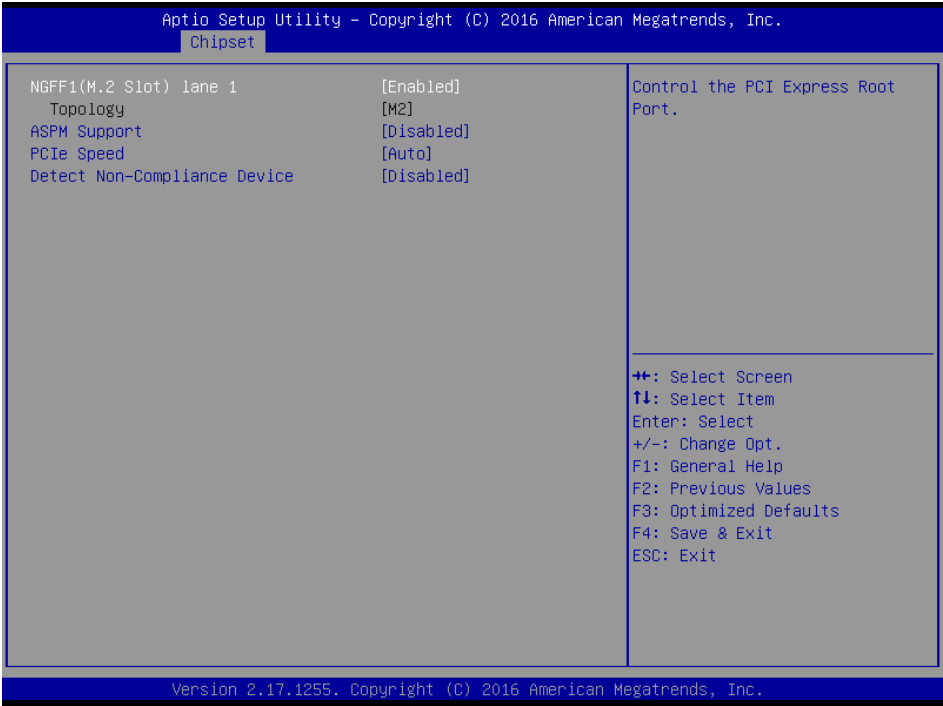
Item	Option	Description
PCIe x1 Slot	Enabled[Default], Disabled	Control the PCI Express Root Port.
ASPM Support	Disabled[Default] L0s L1 L0sL1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
PCIe Speed	Auto[Default] Gen1 Gen2 Gen3	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.

3.6.3.2.1.5 PCI-E Root Port 8: Intel I211AT LAN Chip



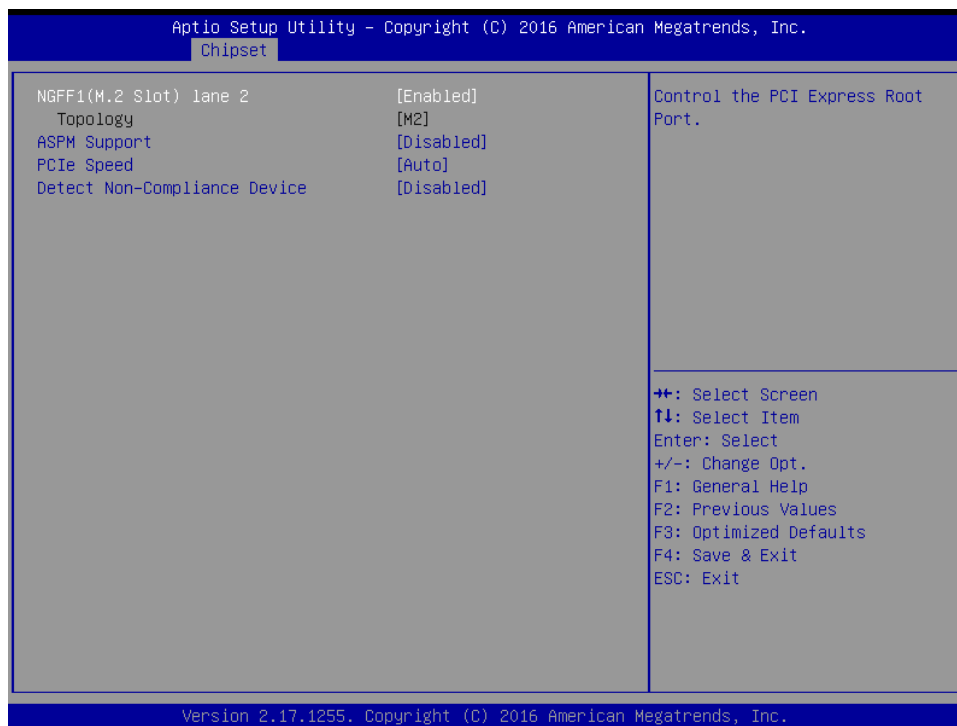
Item	Option	Description
Intel I211AT LAN Chip	Enabled[Default], Disabled	Control the PCI Express Root Port.

3.6.3.2.1.6 PCI-E Root Port 9: NGFF1(M.2 Slot) lane 1



Item	Option	Description
NGFF1 (M.2 Slot) lane 1	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 Gen3	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.

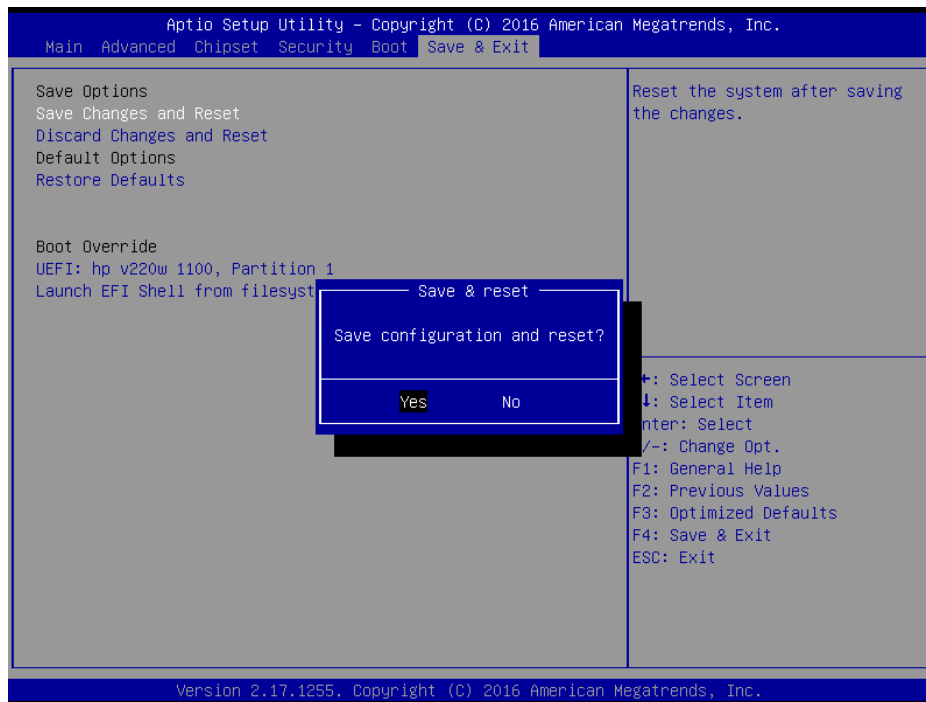
3.6.3.2.1.7 PCI-E Root Port 10: NGFF1(M.2 Slot) lane 2



Item	Option	Description
NGFF1 (M.2 Slot) lane 2	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 Gen3	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.

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3.6.4 Save and exit



3.6.4.1 Save Changes and Reset

Reset the system after saving the changes.

3.6.4.2 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.

3.6.4.3 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.

3.6.4.4 Launch EFI Shell from filesystem device

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

4. Drivers Installation



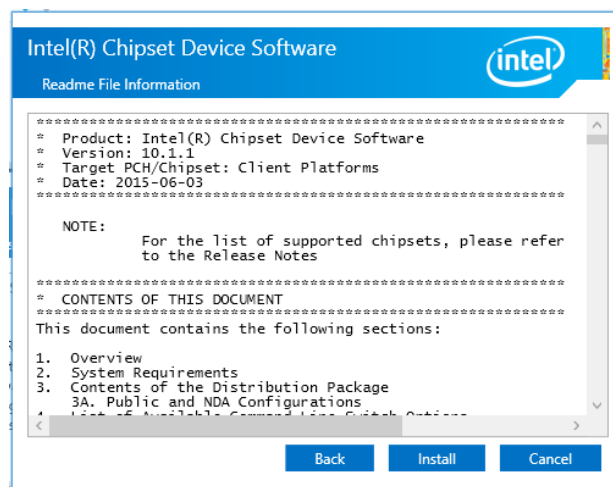
Note: Installation procedures and screen shots in this section are for your reference and may not be exactly the same as shown on your screen.

4.1 Install Chipset Driver

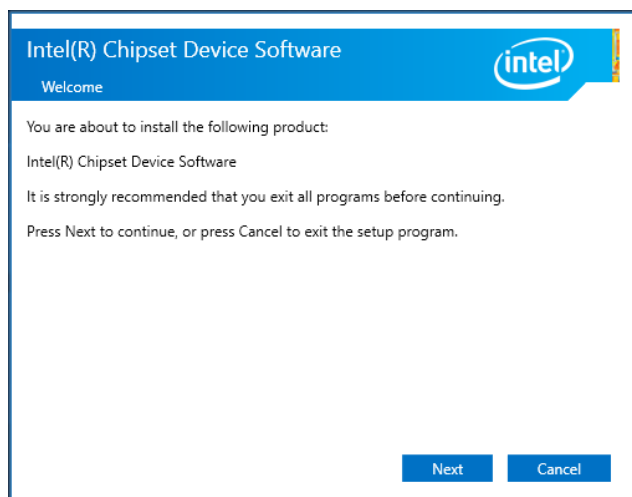
Insert the Supporting DVD-ROM to DVD-ROM drive, and it should show the index page of Avalue's products automatically. If not, locate Index.htm and choose the product from the menu left.



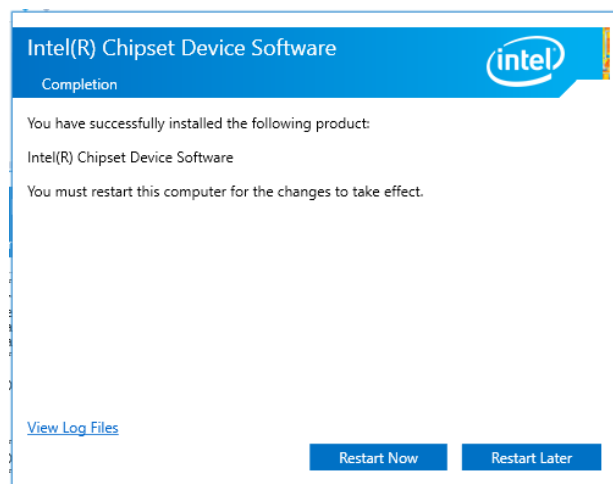
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system. If the warning message appears while the installation process, click Continue to go on.



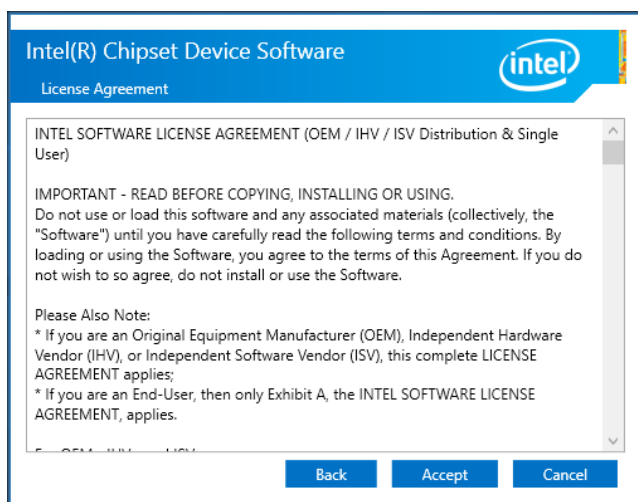
Step 3. Click Install.



Step1. Click Next.



Step 4. Complete setup.



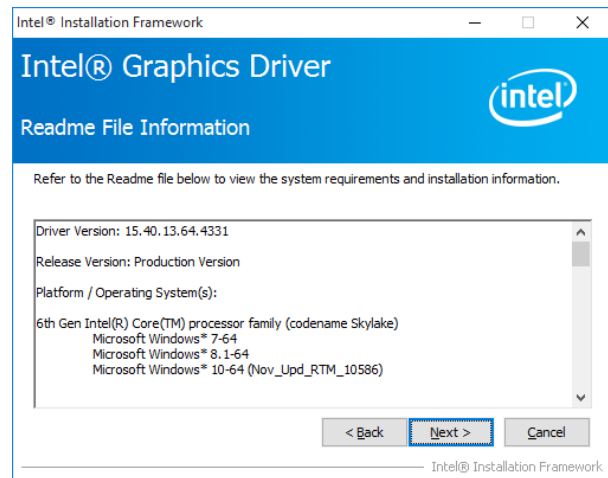
Step 2. Click Accept.

4.2 Install VGA Driver

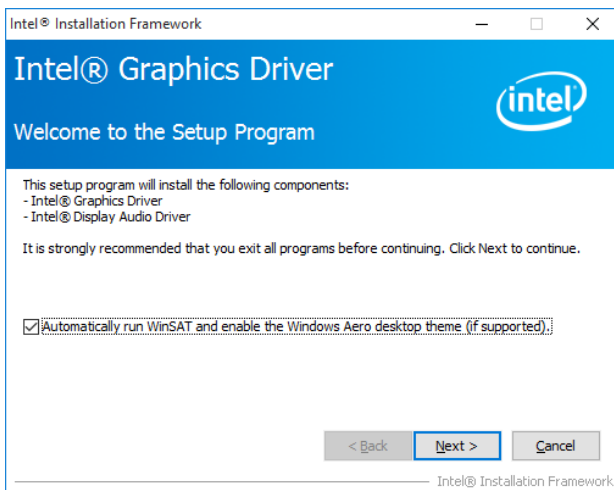
Insert the Supporting DVD-ROM to DVD-ROM drive, and it should show the index page of Avalue's products automatically. If not, locate Index.htm and choose the product from the menu left.



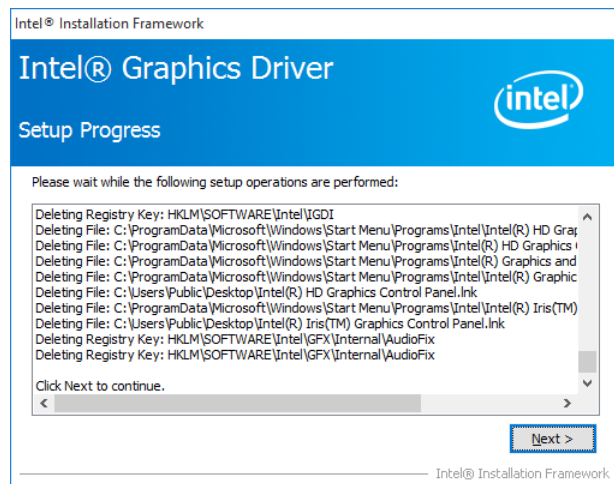
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system.



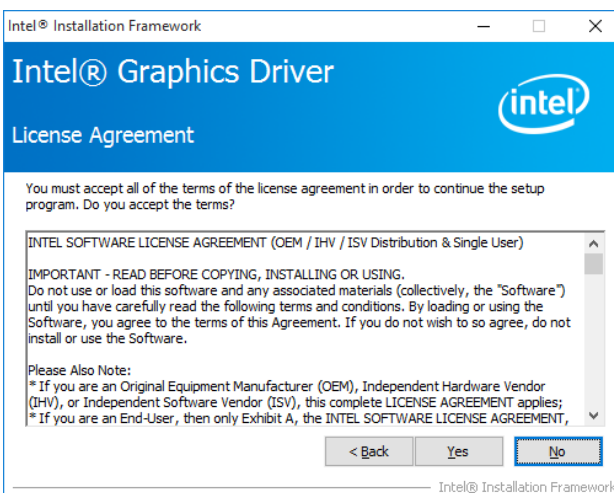
Step 3. Click Next.



Step 1. Click Next to continue installation.

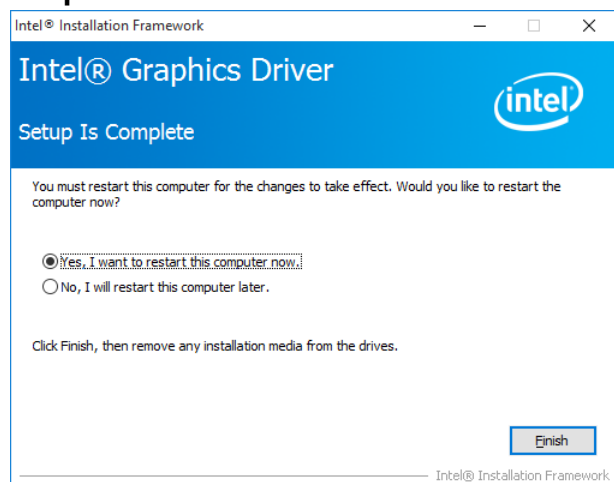


Step 4. Click Next.



Step 2.

Click **Yes** to accept license agreement.



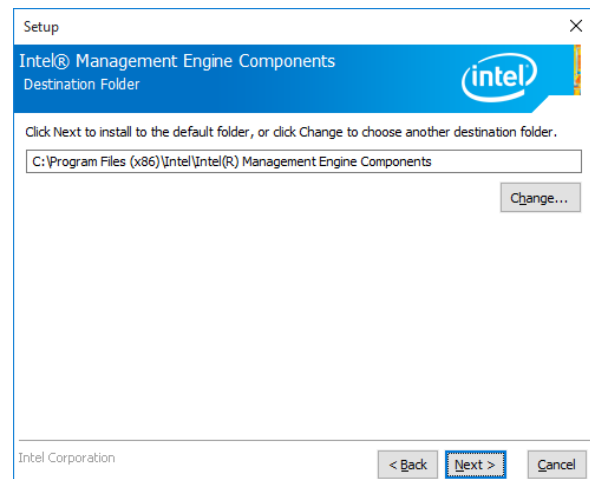
Step 5. Click Finish to complete setup.

4.3 Install ME Driver

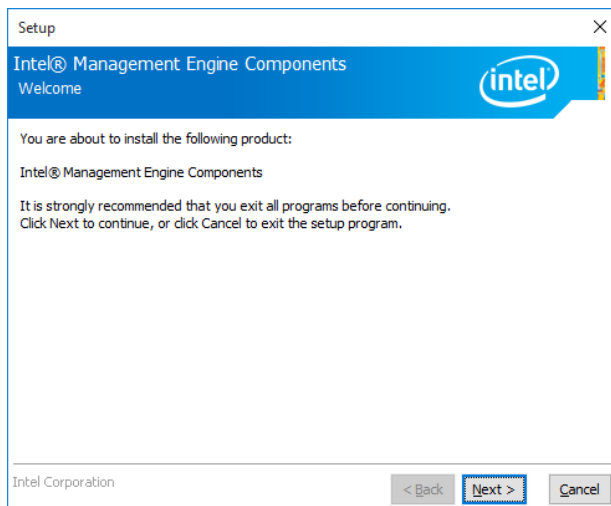
Insert the Supporting CD-ROM to CD-ROM drive, and it should show the index page of Avalue's products automatically. If not, locate Index.htm and choose the product from the menu left.



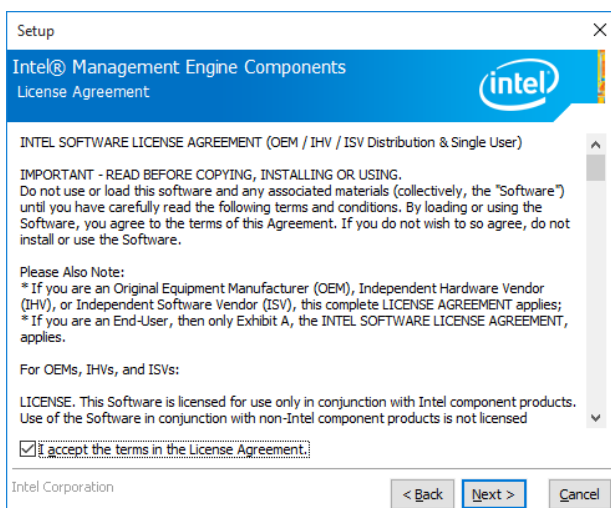
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system.



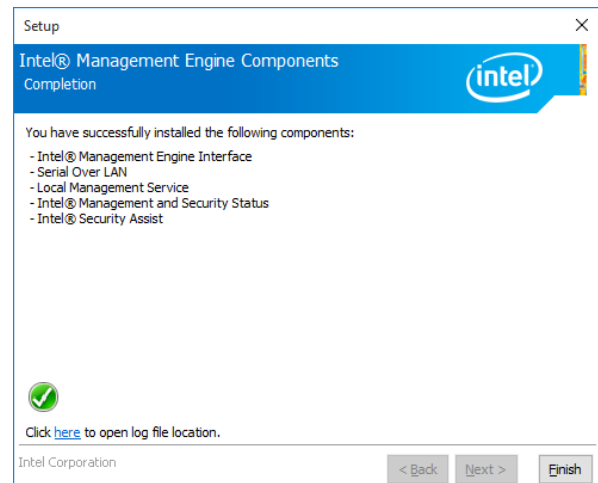
Step 3. Click Next



Step 1. Click Next to continue setup.



Step 2. Click Next.



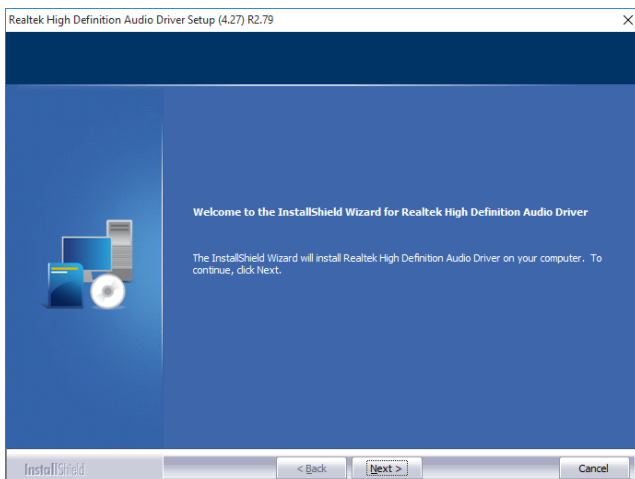
Step 4. Click Finish to complete the setup

4.4 Install Audio Driver (For Realtek ALC892 HD Audio)

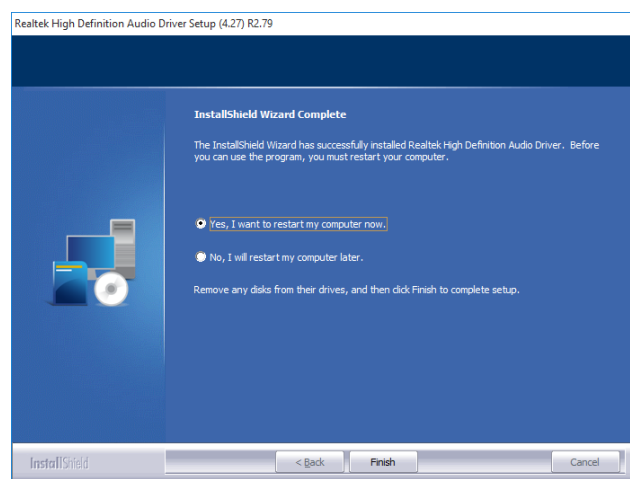
Insert the Supporting DVD-ROM to DVD-ROM drive, and it should show the index page of Avalue's products automatically. If not, locate Index.htm and choose the product from the menu left.



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.



Step1. Click **Next** to Install.



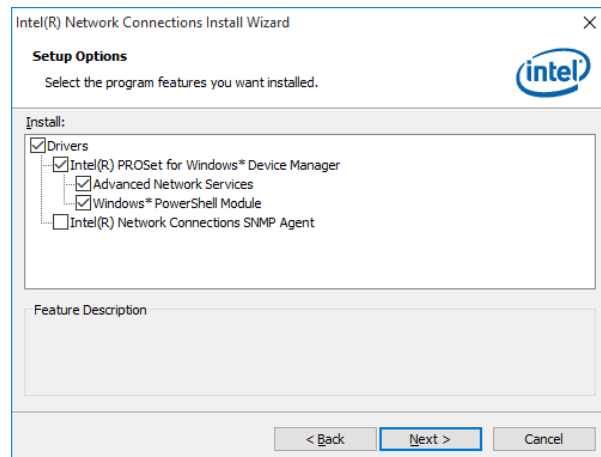
Step 2. Select **Finish** to complete Installation.

4.5 Install LAN Driver

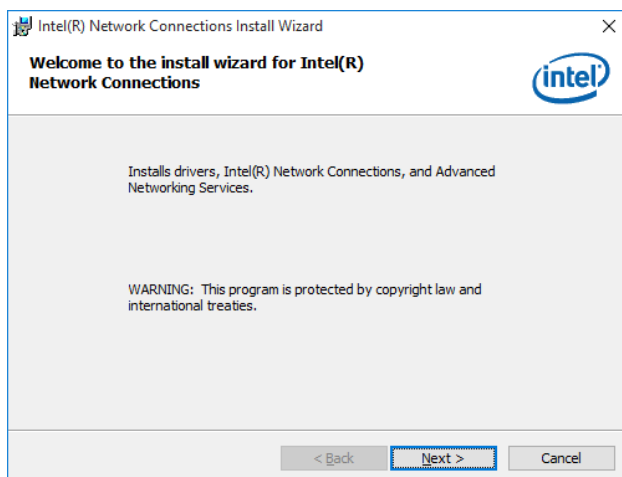
Insert the Supporting DVD-ROM to DVD-ROM drive, and it should show the index page of Avalue's products automatically. If not, locate Index.htm and choose the product from the menu left.



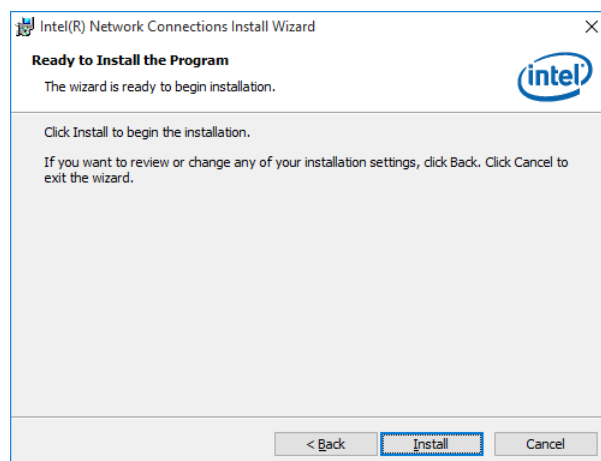
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system.



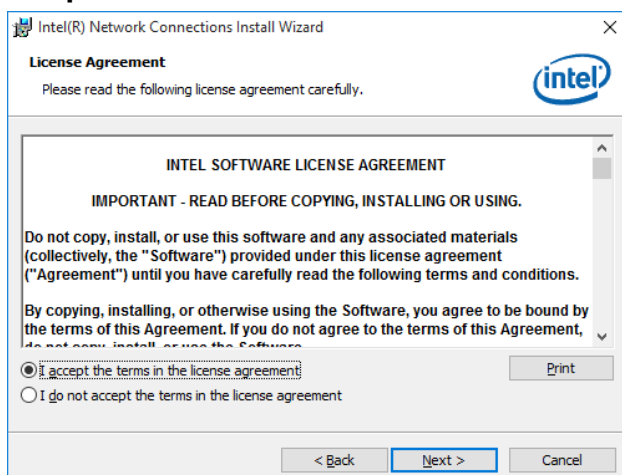
Step 3. Click Next.



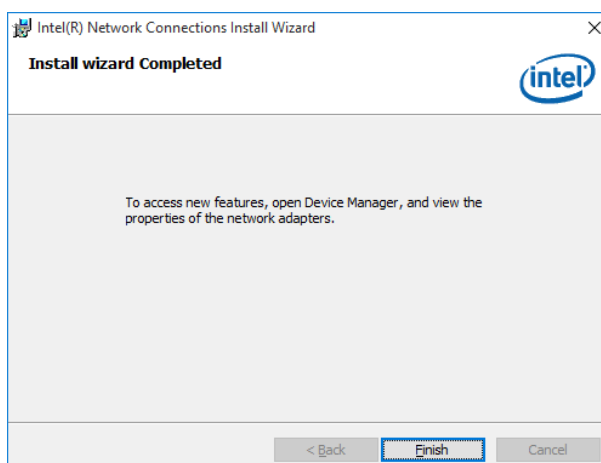
Step 1. Click Next to continue installation.



Step 4. Click Install.



Step 2. Click Next.



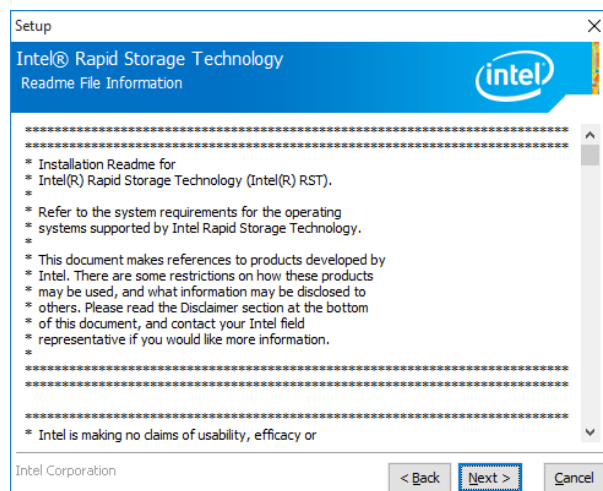
Step 5. Click Finish to complete setup.

4.6 Install RST Driver

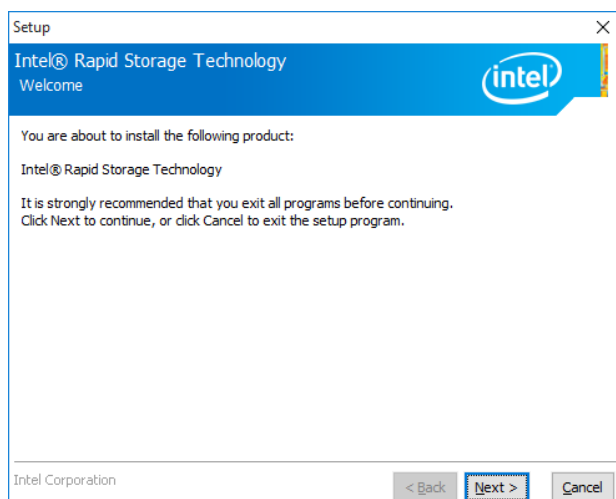
Insert the Supporting DVD-ROM to DVD-ROM drive, and it should show the index page of Avalue's products automatically. If not, locate Index.htm and choose the product from the menu left.



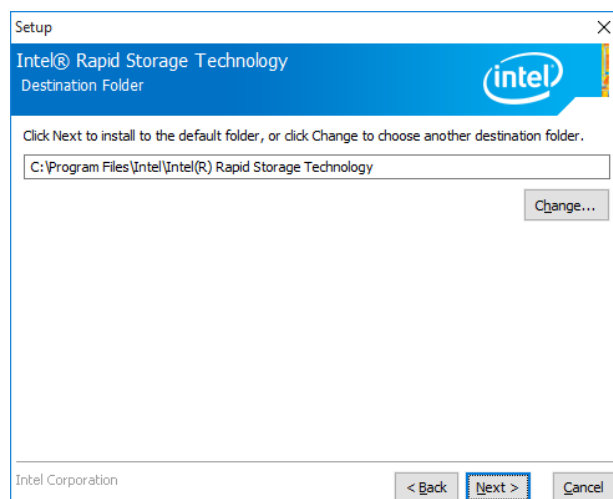
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system.



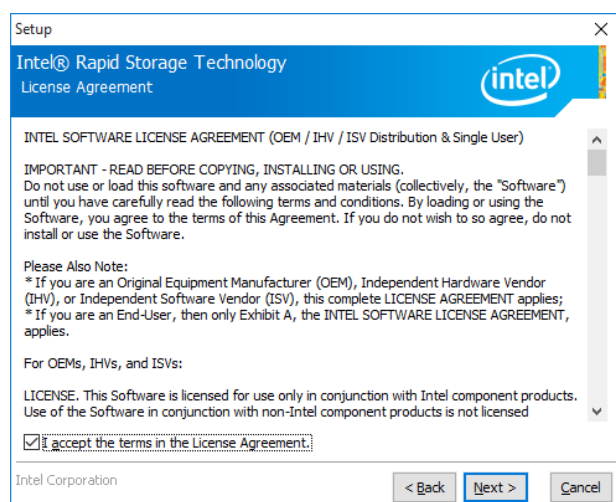
Step 3. Click Next.



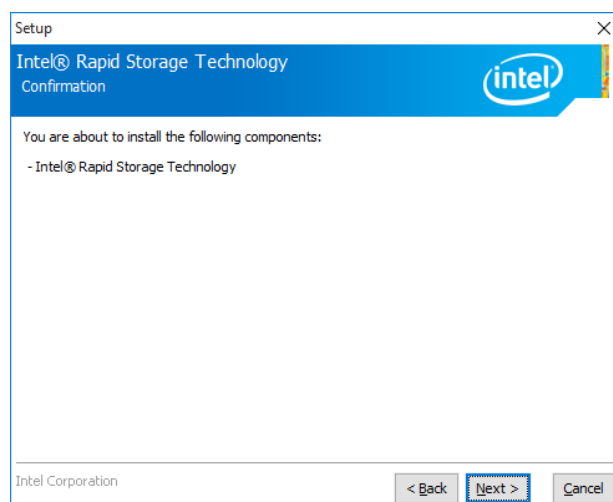
Step 1. Click Next to continue installation.



Step 4. Click Next.



Step 2. Click Next.



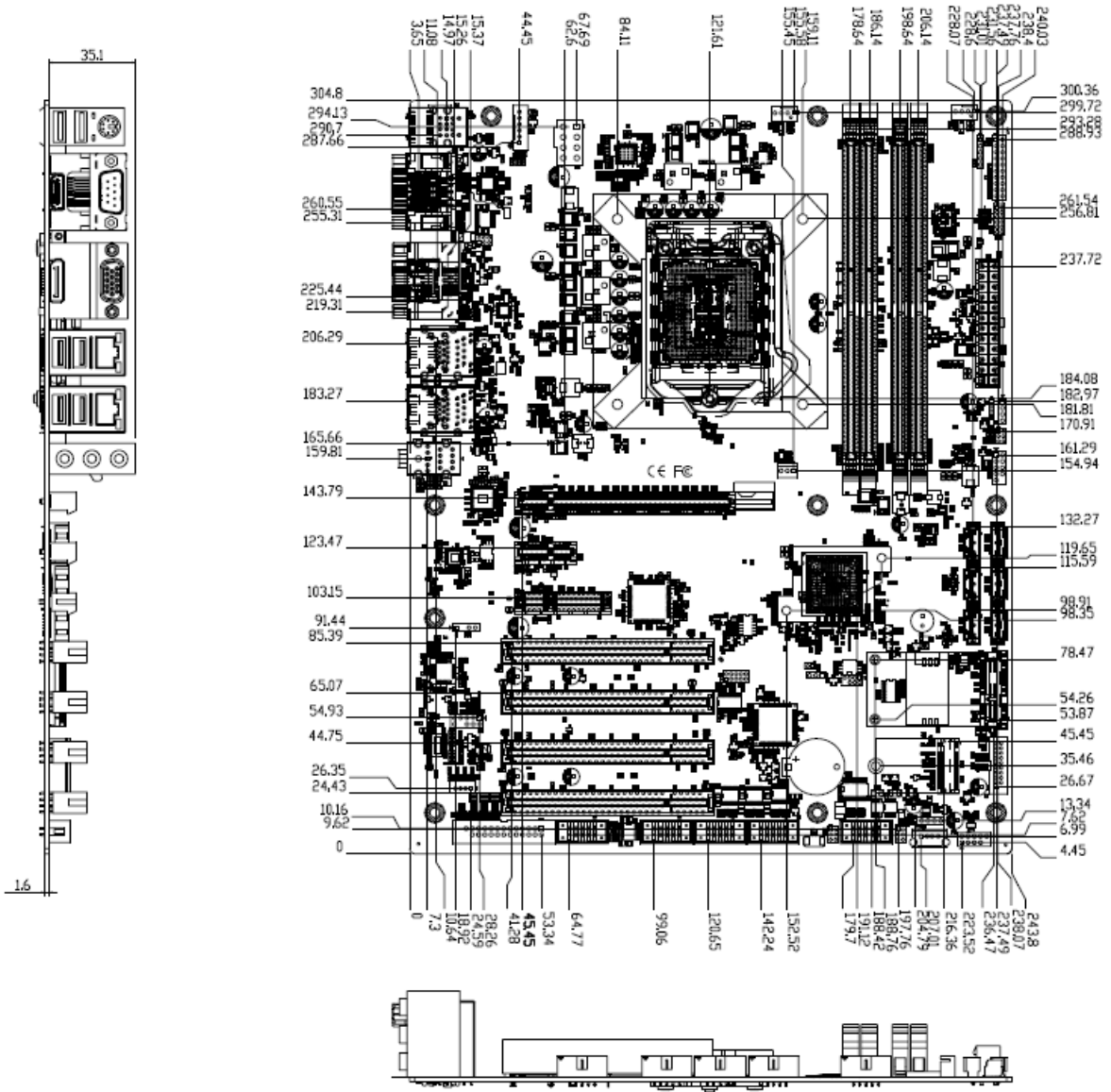
Step 5. Click Finish to complete setup.

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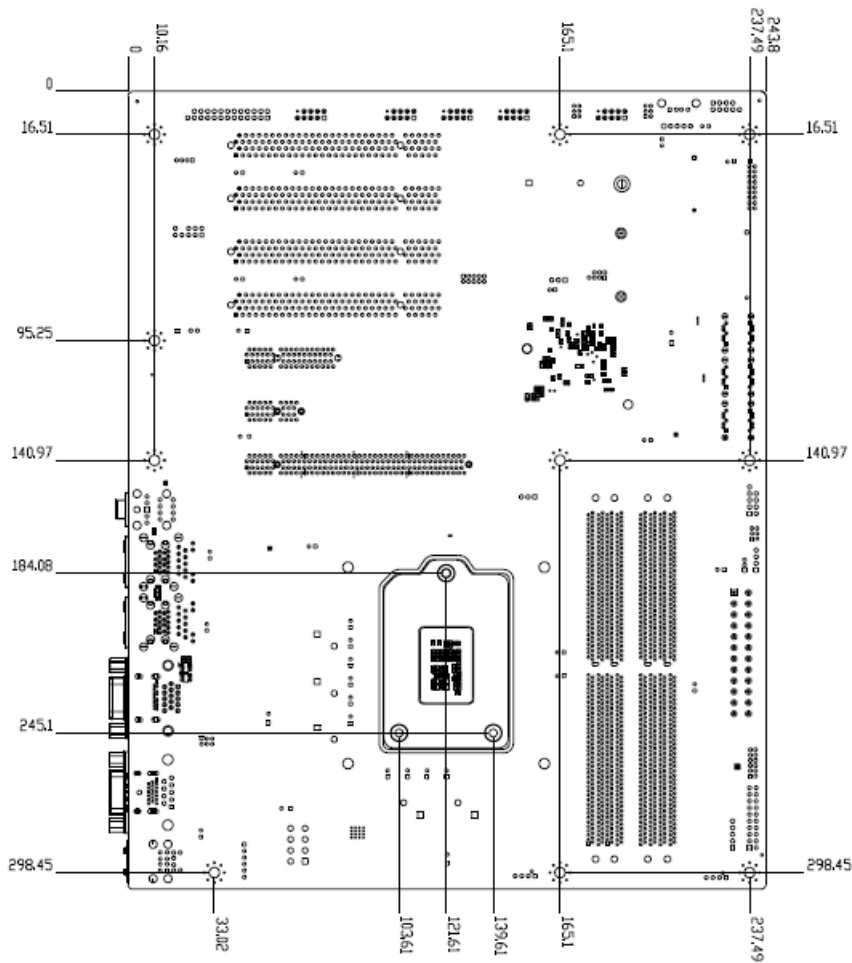


Step 6. Click **Finish** to complete setup.

5. Mechanical Drawing



Unit: mm



Unit: mm

