NUC-APL
NUC-APL-Slim

Intel® Celeron SoC Processor Apollo Lake NUC System
Intel® Celeron SoC Processor Apollo Lake NUC Slim System

Quick Reference Guide

2nd Ed – 02 November 2020

Part No. E2017JAI0A1R

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 INSTATLLED 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.

A Message to the Customer

Customer Services

Each and every of our 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.

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

- 1 x NUC-APL/NUC-APL-Slim Intel® Apollo Lake Fanless NUC System
- Other major components include the followings:
  - Screw kit/Adapter/Power Cord/NUC-APL VESA/Din Rail kit

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

1.3 System Specifications

System	
CPU	Intel® Celeron® Processor J3455/N3350
Memory	1 x 204-pin SODIMM Socket Up to 8GB DDR3L 1866MHz SDRAM
BIOS	AMI BIOS, 128Mbit SPI Flash ROM
Watchdog Timer	H/W Reset, 1sec. ~ 65535sec and 1sec. or 1min./step
H/W Status Monitor	Monitoring CPU Temperature, Voltage with Auto Throttling Control
Board	NCM-APL
Expansion	
Expansion	**NUC-APL** 1 x M.2 (Key-B, 2242/3042, PCIe, SATA, USB 3.0, USB 2.0, SIM Slot) 1 x M.2 (Key-E, 2230, PCIe, USB2.0) **NUC-APL-Slim** 1 x M.2 (Key-B, 2242/3042, PCIe, SATA, USB 3.0, USB 2.0) 1 x M.2 (Key-E, 2230, PCIe, USB2.0)
Storage	
Solid State Drive	**NUC-APL** 1 x 2.5” Drive Bay, 1 x M.2 (Key-B, 2242, SATA) **NUC-APL-Slim** 1 x M.2 (Key-B, 2242, SATA)
External I/O	
Serial Port	**NUC-APL** 1 x RS232, 1 x RS-232/ 422/ 485 (BIOS&Cable) **NUC-APL-Slim** 1 x RS-232/ 422/ 485 (BIOS&Cable)
USB Port	4 x USB 3.0
Display Port	**NUC-APL** 2 x HDMI, 1 x DP (DVI-I/VGA Factory Option) **NUC-APL-Slim** 2 x HDMI, *1 x DP/DVI-I/VGA (Factory Option) *The DP/DVI-I/VGA is an option which will replace the location of COM
Audio Port	1 x Audio Jack (Line-out + MIC Combo)
Wireless LAN Antenna	2 x Antenna Mounting with Dust Cover
Switch	1 x Power Switch
Display	

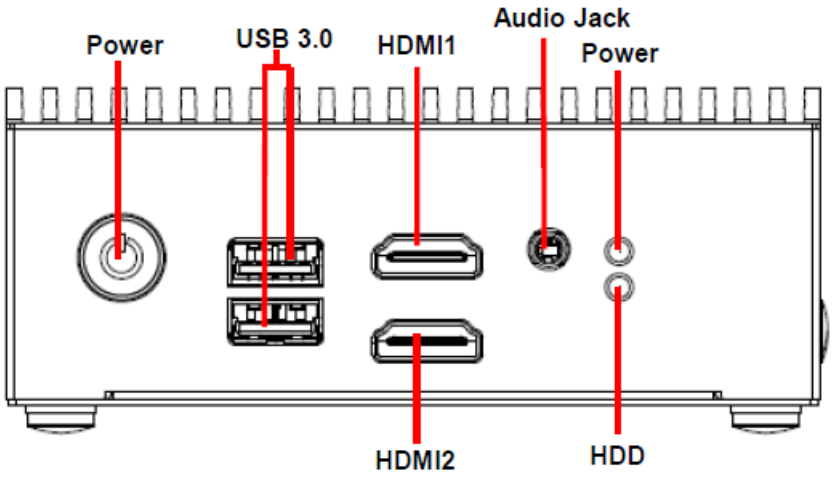
Chipset	Processor Graphics Intel® HD Graphics 500
Resolution	**NUC-APL** 2 x HDMI 1.4b: 3840x2160@30Hz 1 x DP (DVI-I/VGA Factory Option): 1920 x 1080@60Hz **NUC-APL-Slim** 2 x HDMI, *1 x DP/DVI-I/VGA (Factory Option) *The DP/DVI-I/VGA is an option which will replace the location of COM
Triple Display	**NUC-APL (Triple Display)** 2 x HDMI, 1 x DP (DVI-I/VGA Factory Option) **NUC-APL-Slim (Dual Display)** 2 x HDMI, *1 x DP/DVI-I/VGA (Factory Option) * The DP/DVI-I/VGA is an option which will replace the location of COM
System Control	
LED Indicator	2 x LED for Power On/Off & Storage Access
Audio	
Chipset	Realtek ALC892
Audio Interface	1 x Audio Jack (Line-out + MIC Combo)
Ethernet	
Chipset	Realtek RTL8111E Gigabit Ethernet
Ethernet Interface	10/100/1000 Base-Tx Gigabit Ethernet Compatible
Lan Port	2 x RJ45 w/LED
Mechanical	
Power Requirement	Power Input: Typical +12V
ACPI	Single power ATX Support S0, S3, S4, S5 ACPI 5.0 Compliant
Power Type	AT/ ATX (ATX is default setting)
Operating Temperature	**NUC-APL** With extended temperature peripherals -10°C ~ 50°C (14°F ~ 122°F) with 0.2m/s air flow With extended temperature peripherals -10°C ~ 60°C (14°F ~ 140°F) with 0.5m/s air flow **NUC-APL-Slim** -10°C ~ 40°C (14°F ~ 104°F) with 0.2m/s air flow -10°C ~ 50°C (14°F ~ 122°F) with 0.5m/s air flow
Storage Temperature	-40 ~ 75°C (-40 ~ 167°F)
Operating Humidity	40°C @ 90% Relative Humidity, Non-condensing
Net Weight	**NUC-APL** 0.85KG (1.87lbs)

	NUC-APL-Slim 0.72KG (1.59lbs)
Construction	Aluminum + Metal
Mounting Kit	VESA/ Din Rail kit
Dimension (L x W x H)	**NUC-APL** 115mm x 111mm x 58mm (4.53” x 4,37” x 2.28”) **NUC-APL-Slim** 115mm x 111mm x 45mm (4.53” x 4,37” x 1.77”)
Vibration Protection	With SSD: 5G, IEC 60068-2-64, Random, 10~ 500Hz, 30min/Axis, 3 Axis
Shock Protection	With SDD: 55G, IEC 60068-2-27, Half Sine, 11ms,Z Axis
Drop	ISTA 2A, IEC-60068-2-32 Test : Ed, 1corner, 3 Edges, 6 Faces
Certification	
Certification Information	**NUC-APL** CE/ FCC Class A **NUC-APL-Slim** CE/ FCC Class A
Software Support	
OS Information	Win 10, Linux
Power Requirement	
Adapter	Input: 100 ~ 240Vdc/ 50 ~ 60Hz Output: 12V/ 5A AC-DC 60W Adapter

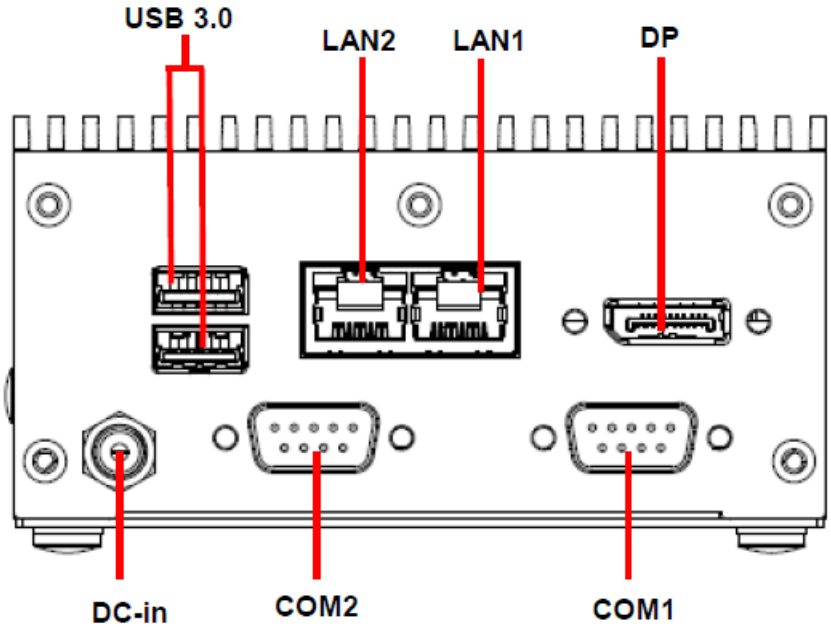
Note: Specifications are subject to change without notice.

1.4 System Overview

1.4.1 NUC-APL Front View



1.4.2 NUC-APL Rear View

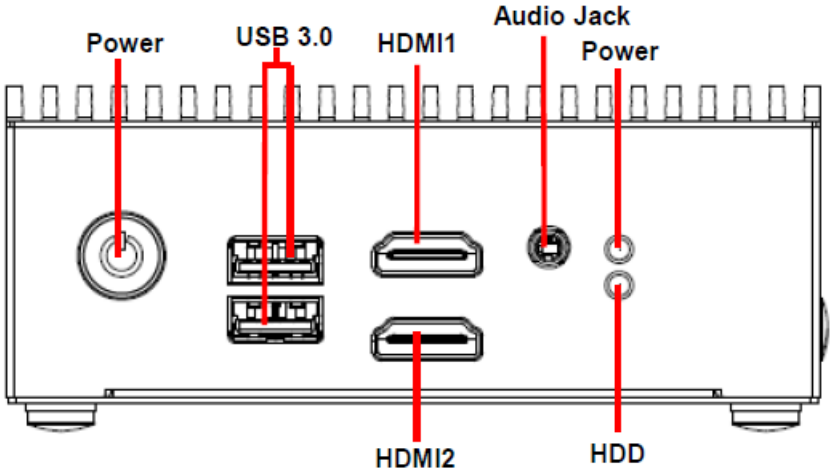


Connectors

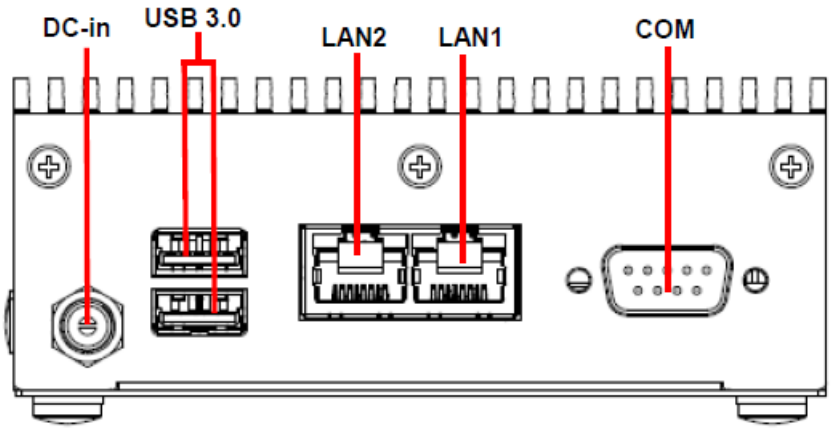
Label	Function	Note
Power	Power on button	
USB 3.0	4 x USB 3.0 connector	
HDMI1/2	2 x HDMI connector	
Audio Jack	Line-out + MIC Combo	
HDD	HDD Indicator	
LAN1/2	2 x RJ-45 Ethernet connector	
COM1	Serial port connector 1	
COM2	Serial port connector 2	
DC-in	DC power-in connector	

DP	DP connector

1.4.3 NUC-APL-Slim Front View



1.4.4 NUC-APL-Slim Rear View

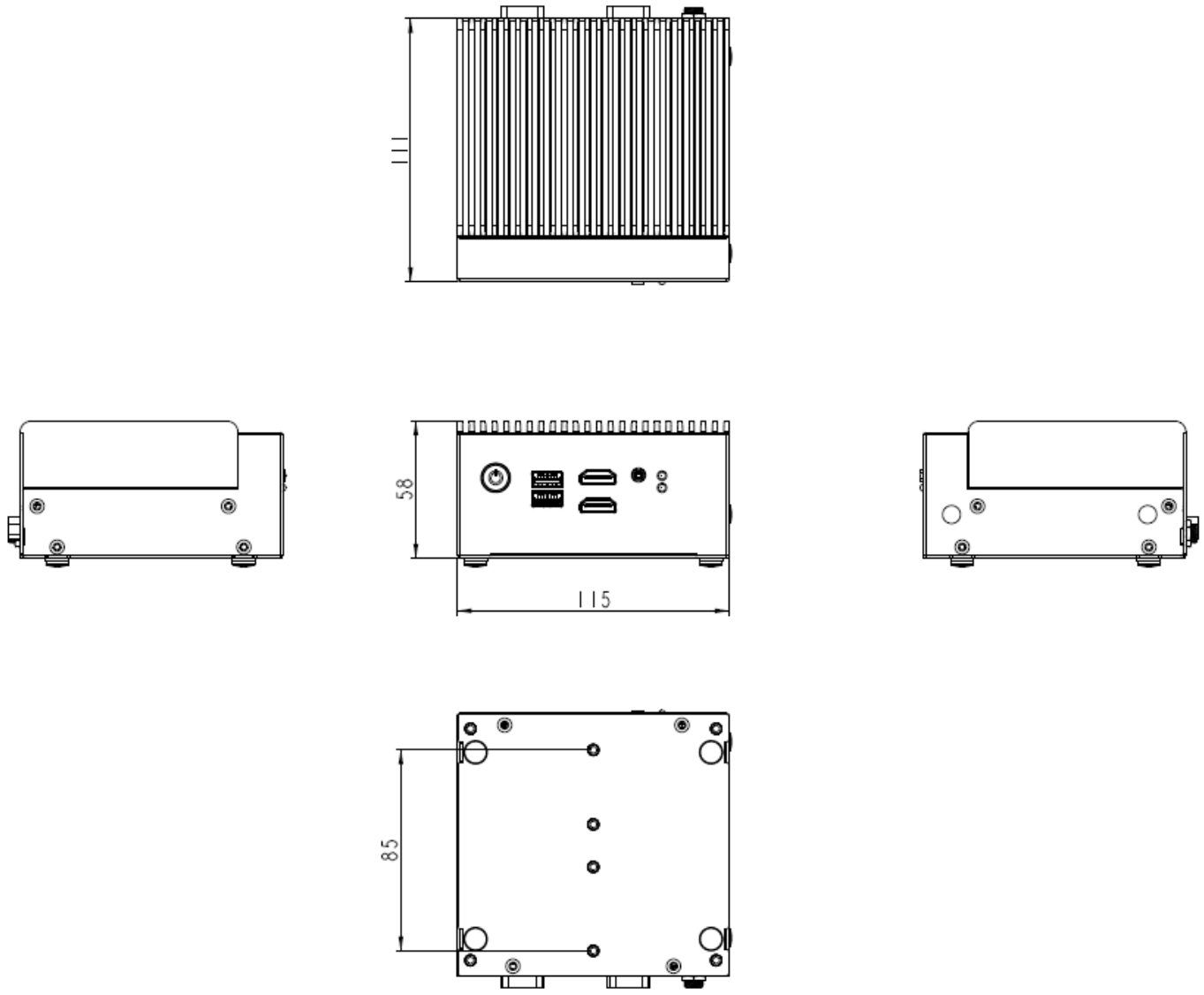


Connectors

Label	Function	Note
Power	Power on button	
USB 3.0	4 x USB 3.0 connector	
HDMI1/2	2 x HDMI connector	
Audio Jack	Line-out + MIC Combo	
HDD	HDD Indicator	
LAN1/2	2 x RJ-45 Ethernet connector	
COM	Serial port connector	
DC-in	DC power-in connector	

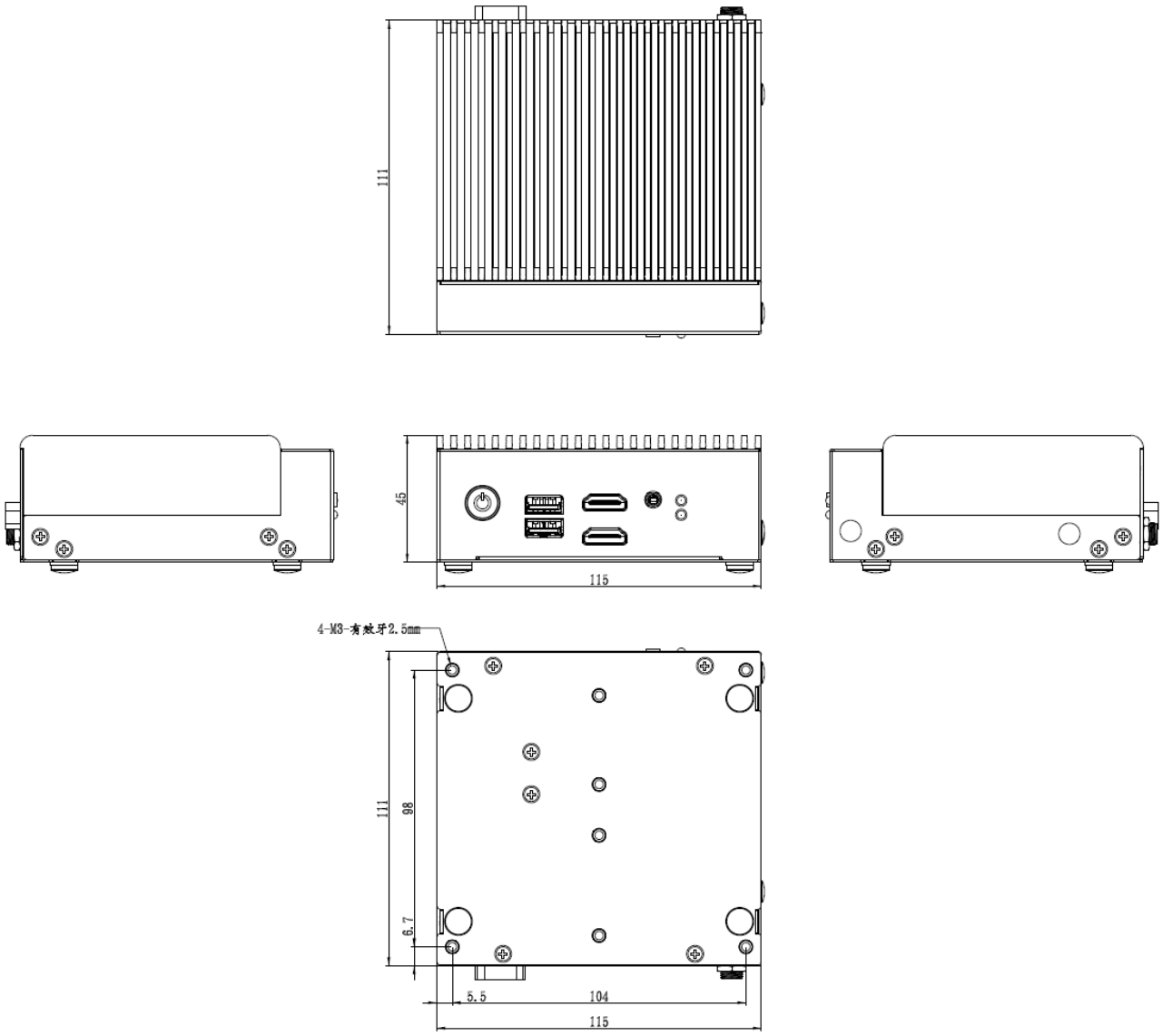
1.5 System Dimensions

1.5.1 NUC-APL Front & Top view



(Unit: mm)

1.5.2 NUC-APL-Slim Front & Top view



(Unit: mm)

2. Hardware Configuration

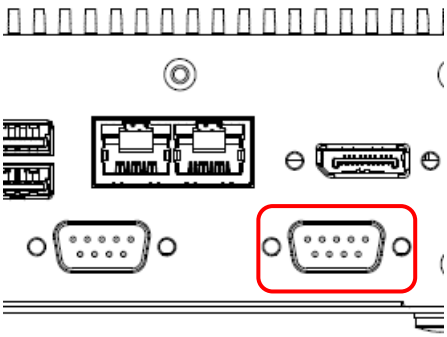
Jumper and Connector Setting, Driver and BIOS Installing

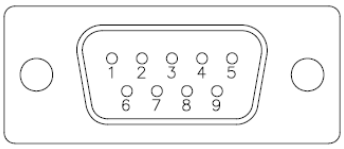
For advanced information, please refer to:

1- NCM-APL included in this manual.

2.1 NUC-APL connector mapping

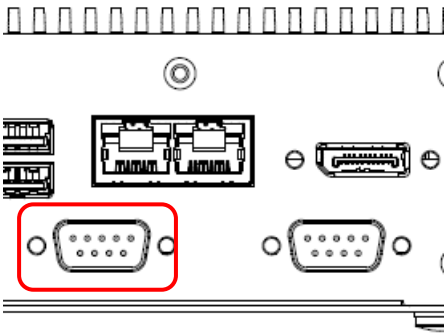
2.1.1 Serial Port connector 1 (COM1)

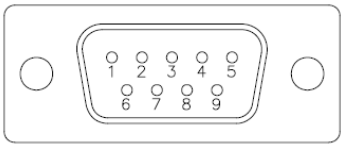




Signal	PIN	PIN	Signal
NDCD#	1	6	NDSR#
NRXD	2	7	NRTS#
NTXD	3	8	NCTS#
NDTR#	4	9	NRI#
GND	5		

2.1.2 Serial Port connector 2 (COM2)





In RS-232 Mode

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

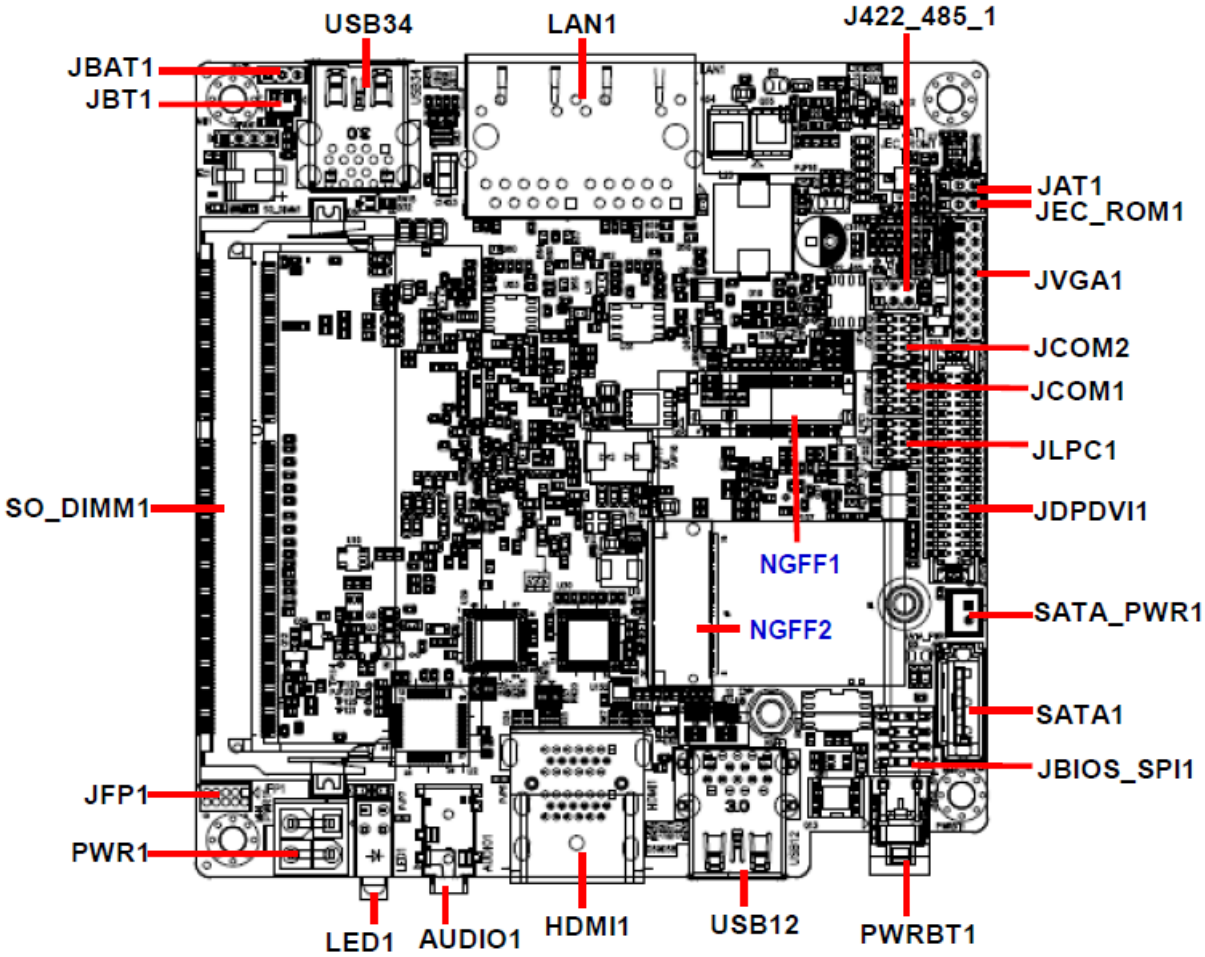
In RS-485 Mode

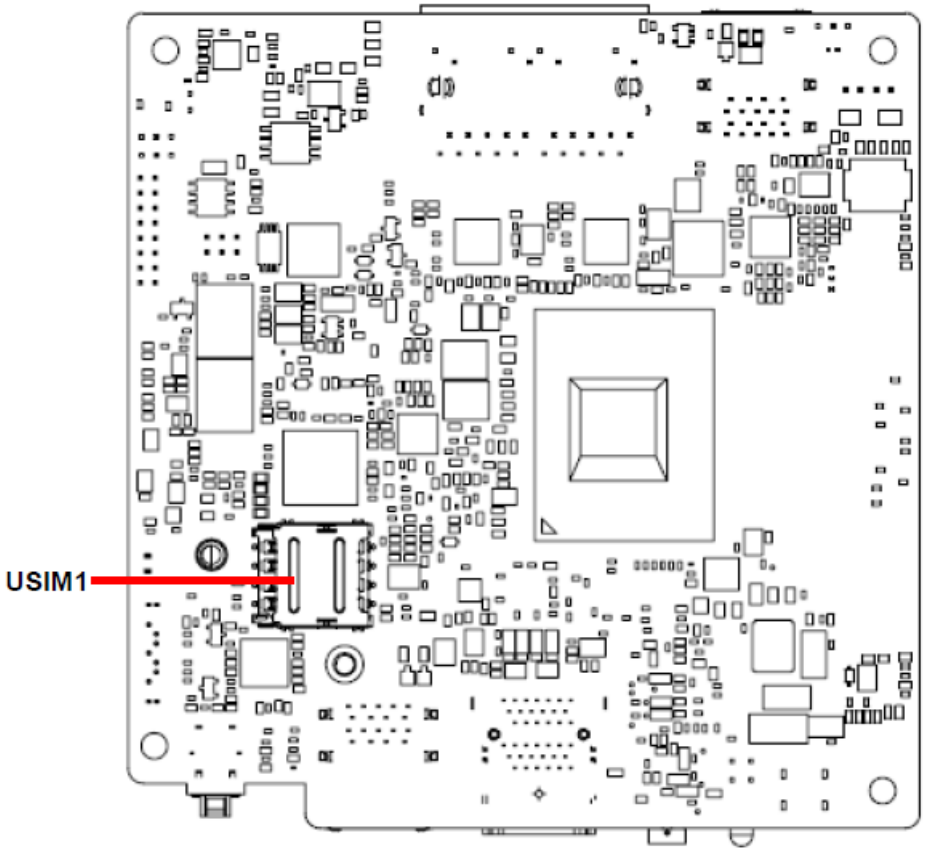
Signal	PIN	PIN	Signal
DATA1-	1	6	NC
DATA1+	2	7	NC
NC	3	8	NC
NC	4	9	NC
GND	5		

In RS-422 Mode

Signal	PIN	PIN	Signal
TxD1-	1	6	NC
TxD1+	2	7	NC
RxD1+	3	8	NC
RxD1-	4	9	NC
GND	5		

2.2 NCM-APL Overviews





2.3 NCM-APL Jumper & Connector list

Jumpers

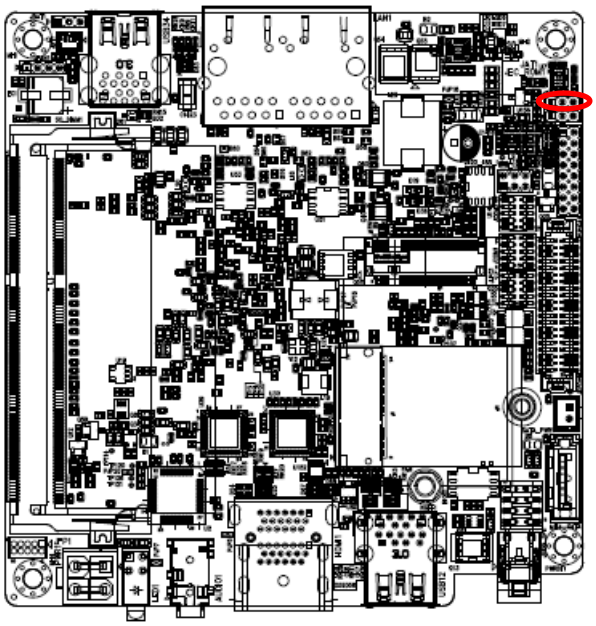
Label	Function	Note
JAT1	AT/ATX Input power select	3 x 1 header, pitch 2.00mm
JBAT1	Clear CMOS	3 x 1 header, pitch 2.00mm

Connectors

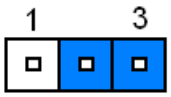
Label	Function	Note
JCOM1	Serial Port 1 connector	5 x 2 header, pitch 1.27mm
JCOM2	Serial Port 2 connector	5 x 2 header, pitch 1.27mm
J422_485_1	Serial port 2 in RS-422/485 mode	6 x 2 wafer, pitch 2.00mm
NGFF1	M.2 KEY-B 2242/3042 connector	
NGFF2	M.2 KEY-E 2230 connector	
LED1	HDD/Power LED indicator	
JFP1	Front Panel connector	5 x 2 header, pitch 1.27mm
USB12/34	4 x USB3.0 connector	
JVGA1	VGA connector	8 x 2 header, pitch 2.00mm
JDPDVI1	Display DVI connector	20 x 2 wafer, pitch 1.25mm
LAN1	RJ-45 Ethernet	
JBT1	Battery connector	2 x 1 wafer, pitch 1.25mm
JLPC1	LPC port connector	5 x 2 header, pitch 1.27mm
PWR1	Power connector	2 x 2 wafer, pitch 4.20mm
JEC_ROM1	EC Debug connector	3 x 1 header, pitch 2.00mm
SATA_PWR1	SATA Power connector	2 x 1 wafer, pitch 2.00mm
SATA1	Serial ATA connector	
HDMI1	HDMI connector	
SO_DIMM1	DDR3L SODIMM socket	
JBIOS_SPI1	BIOS SPI connector	4 x 2 header, pitch 2.00mm
PWRBT1	Power Button	
AUDIO1	Audio connector	
USIM1	SIM card slot	

2.4 NCM-APL Jumpers & Connectors settings

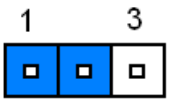
2.4.1 AT/ATX Input power select (JAT1)



ATX*

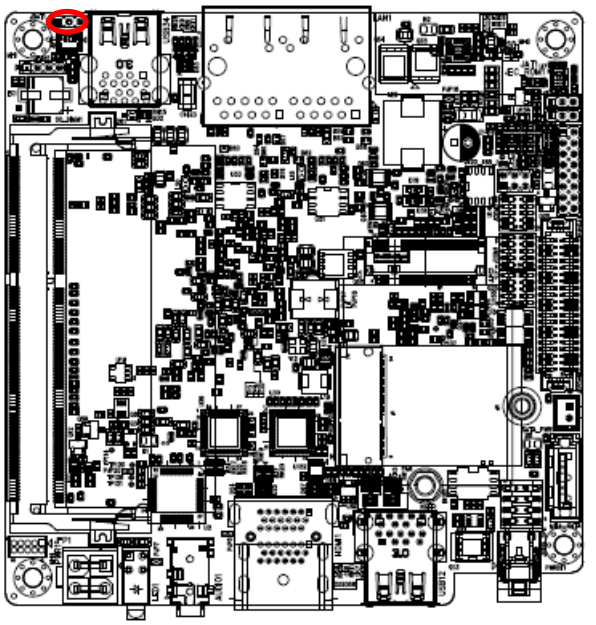


AT

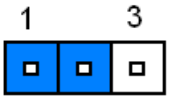


***Default**

2.4.2 Clear CMOS (JBAT1)



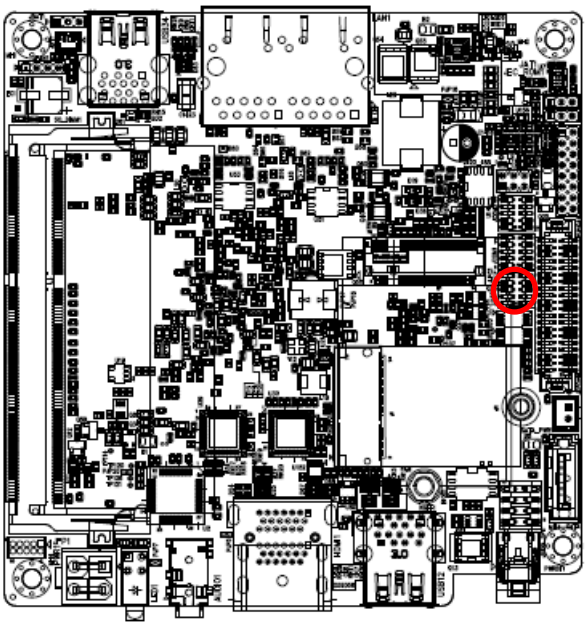
Normal*

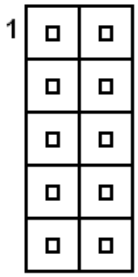


Clear CMOS

***Default**

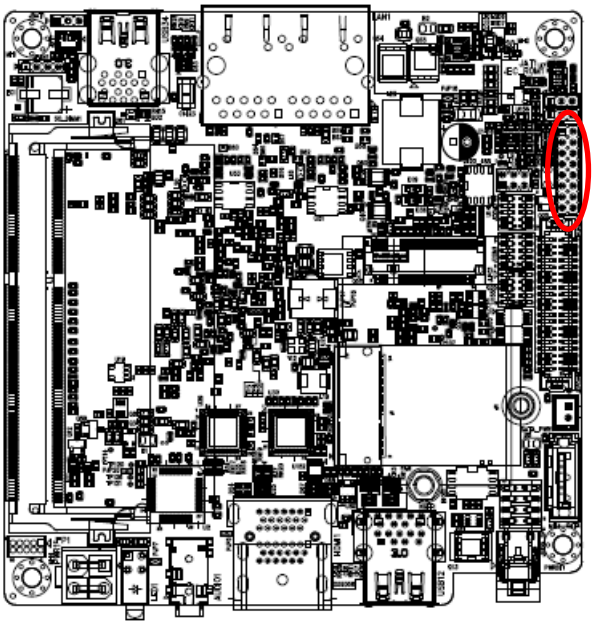
2.4.3 LPC port connector (JLPC1)

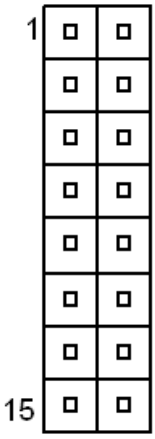




Signal	PIN	PIN	Signal
LPC_AD0	1	2	+3.3V
LPC_AD1	3	4	PLT_RST_BUF#
LPC_AD2	5	6	LPC_FRAME#
LPC_AD3	7	8	LPC1_PORT80_CLK
LPC_SERIRQ	9	10	GND

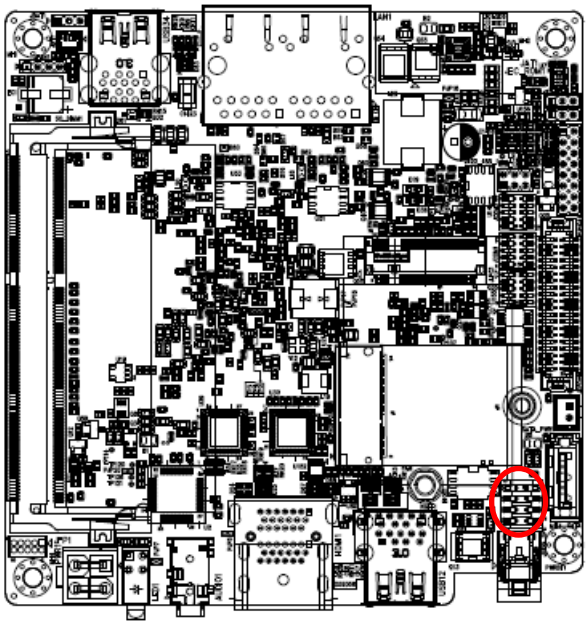
2.4.4 VGA connector (JVGA1)

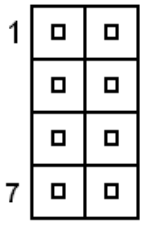




Signal	PIN	PIN	Signal
+5V	1	2	RED
GND	3	4	GREEN
GND	5	6	BLUE
SD_VGA	7	8	GND
VHSYNC	9	10	GND
VVSYNC	11	12	GND
SC_VGA	13	14	GND
GND	15	16	GND

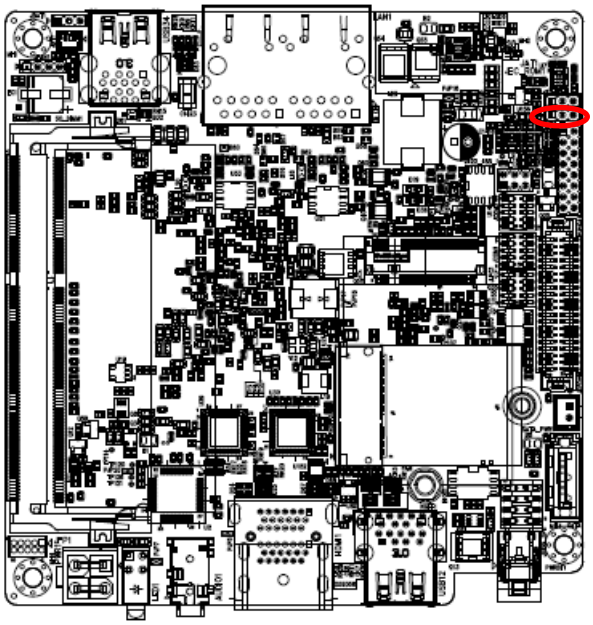
2.4.5 BIOS SPI connector (JBIOS_SPI1)

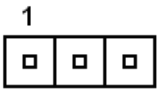




Signal	PIN	PIN	Signal
+1.8VSB	1	2	GND
SPI_CS#0	3	4	SPI_CLK
SPI_MISO	5	6	SPI_MOSI
SPI_HOLD#	7	8	SPI_WP#

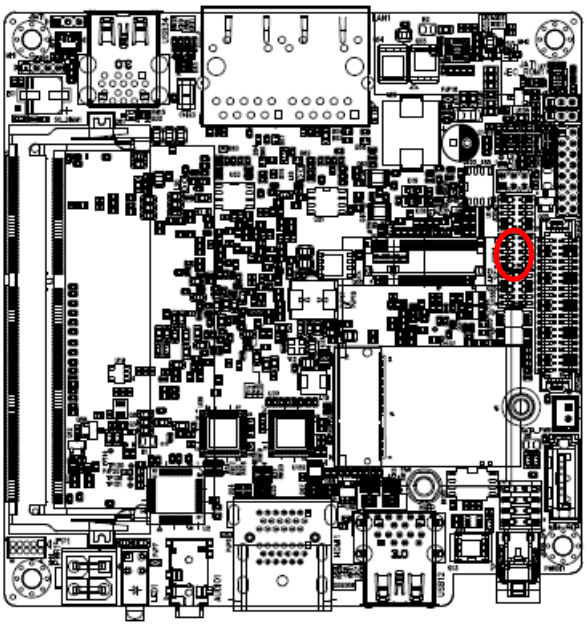
2.4.6 EC Debug connector (JEC_ROM1)

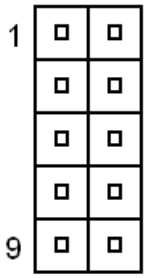




Signal	PIN
EC_SMCLK_DEBUG	1
EC_SMDAT_DEBUG	2
GND	3

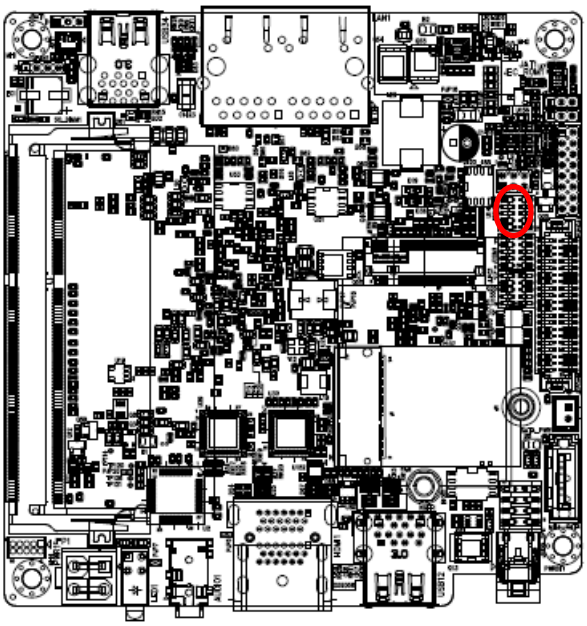
2.4.7 Serial port 1 connector (JCOM1)

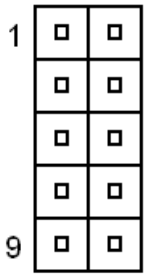




Signal	PIN	PIN	Signal
NDCDA#_1	1	2	NRXDA_1
NTXDA_1	3	4	NDTRA#_1
GND	5	6	NDSRA#_1
NRTSA#_1	7	8	NCTSA#_1
NRIA#_1	9	10	NC

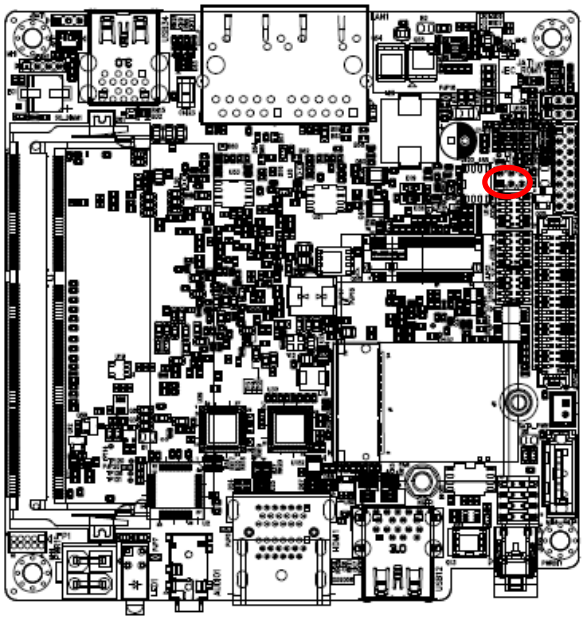
2.4.8 Serial port 2 connector (JCOM2)

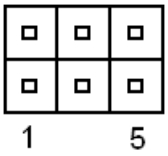




Signal	PIN	PIN	Signal
NDCDA#_2	1	2	NRXDA_2
NTXDA_2	3	4	NDTRA#_2
GND	5	6	NDSRA#_2
NRTSA#_2	7	8	NCTSA#_2
NRIA#_2	9	10	NC

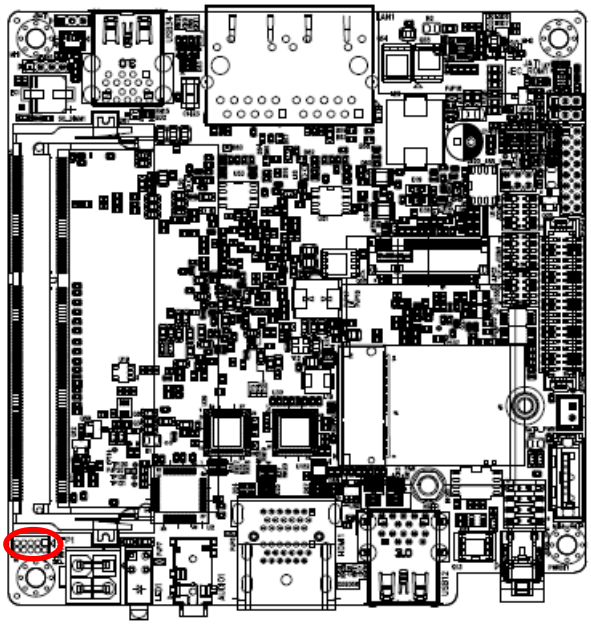
2.4.9 Serial port 2 in RS-422/485 mode (J422_485_1)

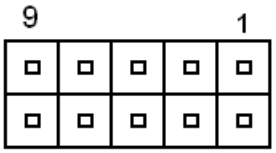




Signal	PIN	PIN	Signal
485TX1-	1	2	485TX1+
485RX1+	3	4	485RX1-
+V5SC1_422485	5	6	GND

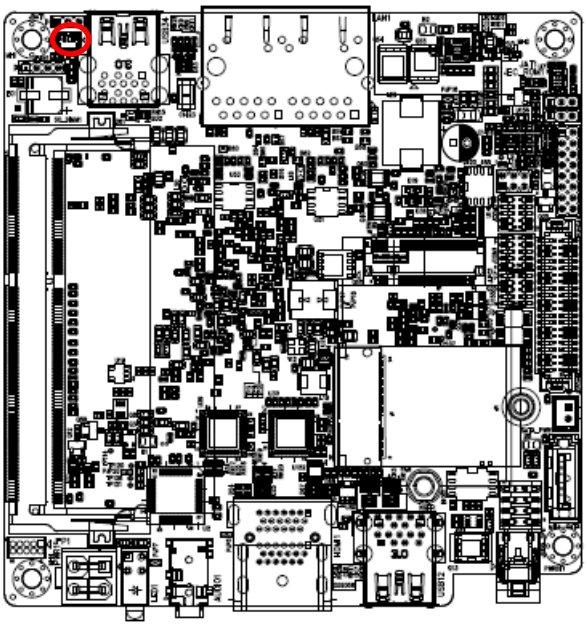
2.4.10 Front Panel connector (JFP1)





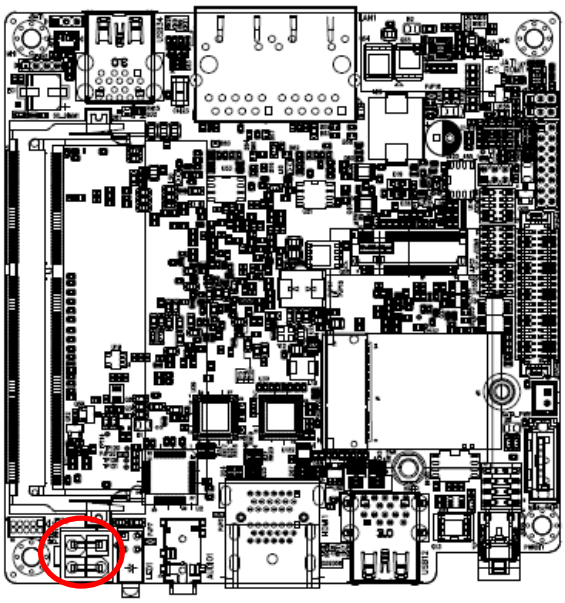
Signal	PIN	PIN	Signal
PWRBT_FP#	1	2	GND
RSTBTNP#	3	4	GND
FP_PWR_LED+	5	6	PWR_LED#
HDD_LED#	7	8	+5V
CASE_OPEN#	9	10	GND

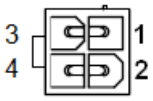
2.4.11 Battery connector 1 (JBT1)



Signal	PIN
+RTCBATT	1
GND	2

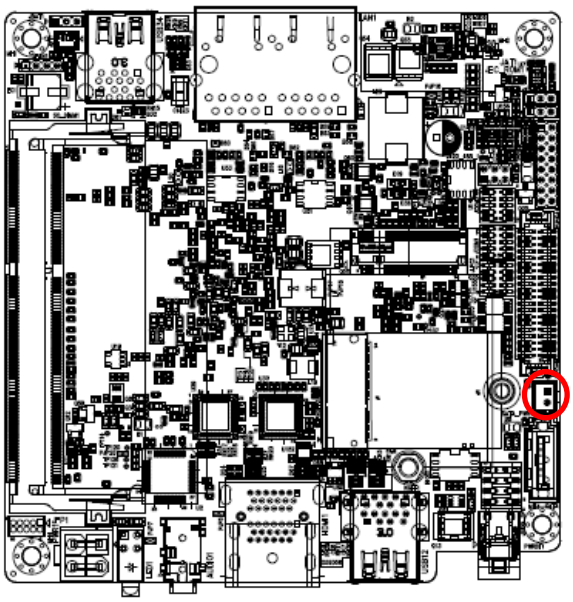
2.4.12 Power connector (PWR1)





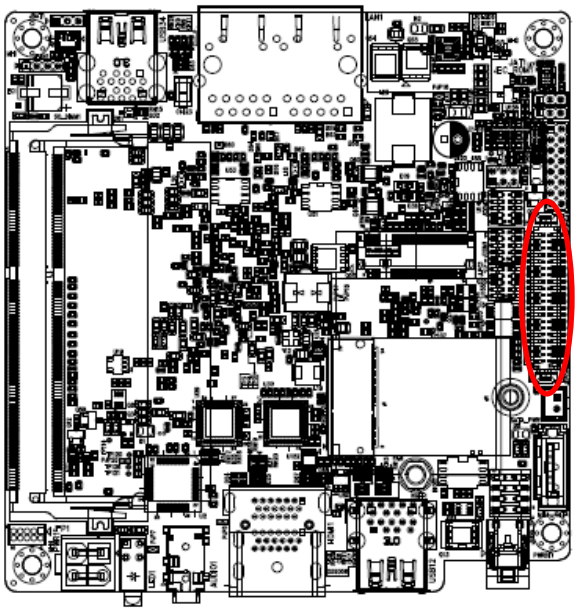
Signal	PIN	PIN	Signal
+12V	3	1	GND
+12V	4	2	GND

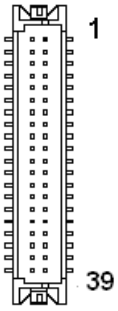
2.4.13 SATA Power connector (SATA_PWR1)



Signal	PIN
GND	1
SATA_PWR	2

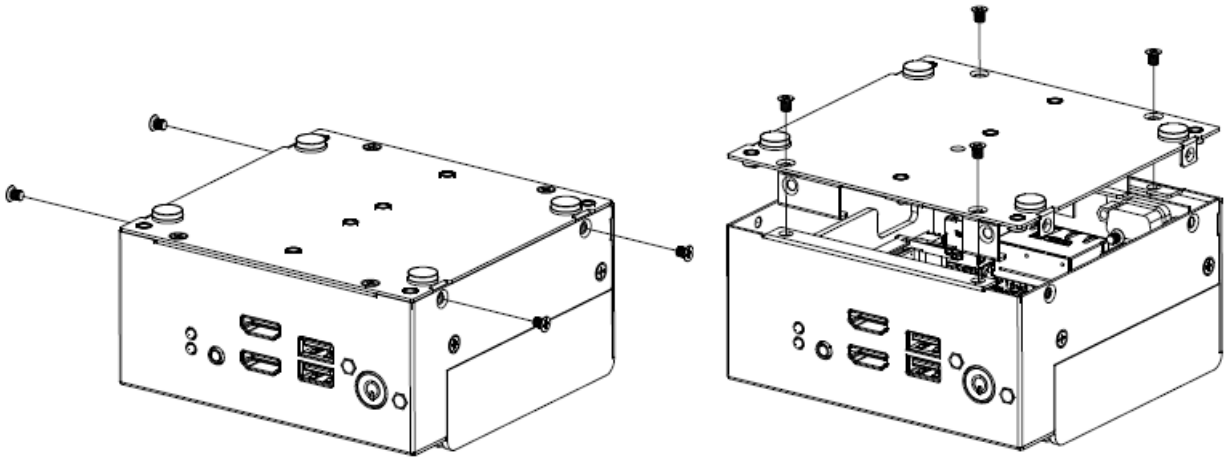
2.4.14 Display DVI connector (JDPDVI1)



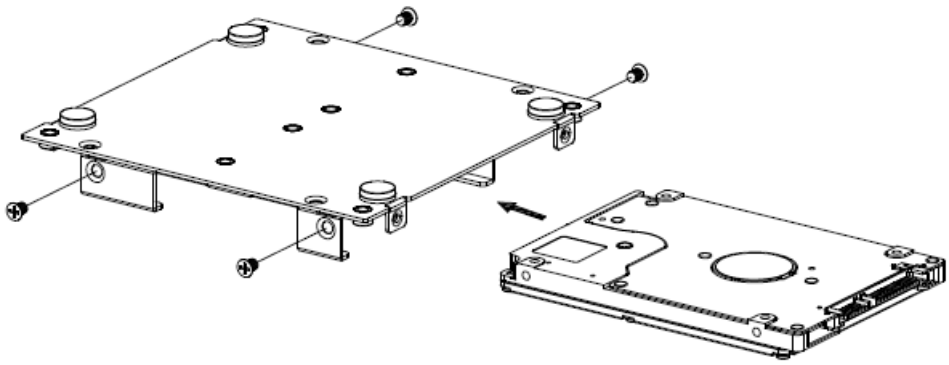


Signal	PIN	PIN	Signal
+5V	2	1	+3.3V
GND	4	3	GND
DP0P	6	5	DP2P
DP0N	8	7	DP2N
GND	10	9	GND
DP1P	12	11	DP3P
DP1N	14	13	DP3N
GND	16	15	GND
DPAUXP	18	17	HPD_DPTX
DPAUXN	20	19	DPCONFIG1
GND	22	21	DPCONFIG2
HMTX0+	24	23	GND
HMTX0-	26	25	HMTXC+
DVIG1	28	27	HMTXC-
HMTX1+	30	29	DVIG3
HMTX1-	32	31	SC_HMTX
DVIG2	34	33	SD_HMTX
HMTX2+	36	35	HPD_HMTX
HMTX2-	38	37	DVIG4
GND	40	39	GND

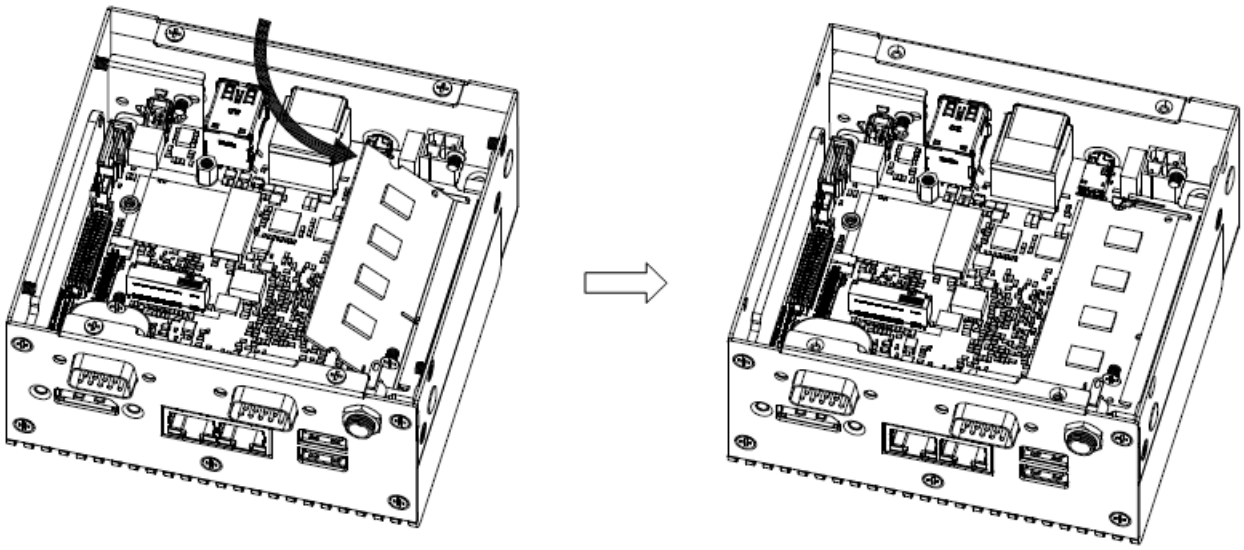
2.5 Installing Hard Disk & Memory



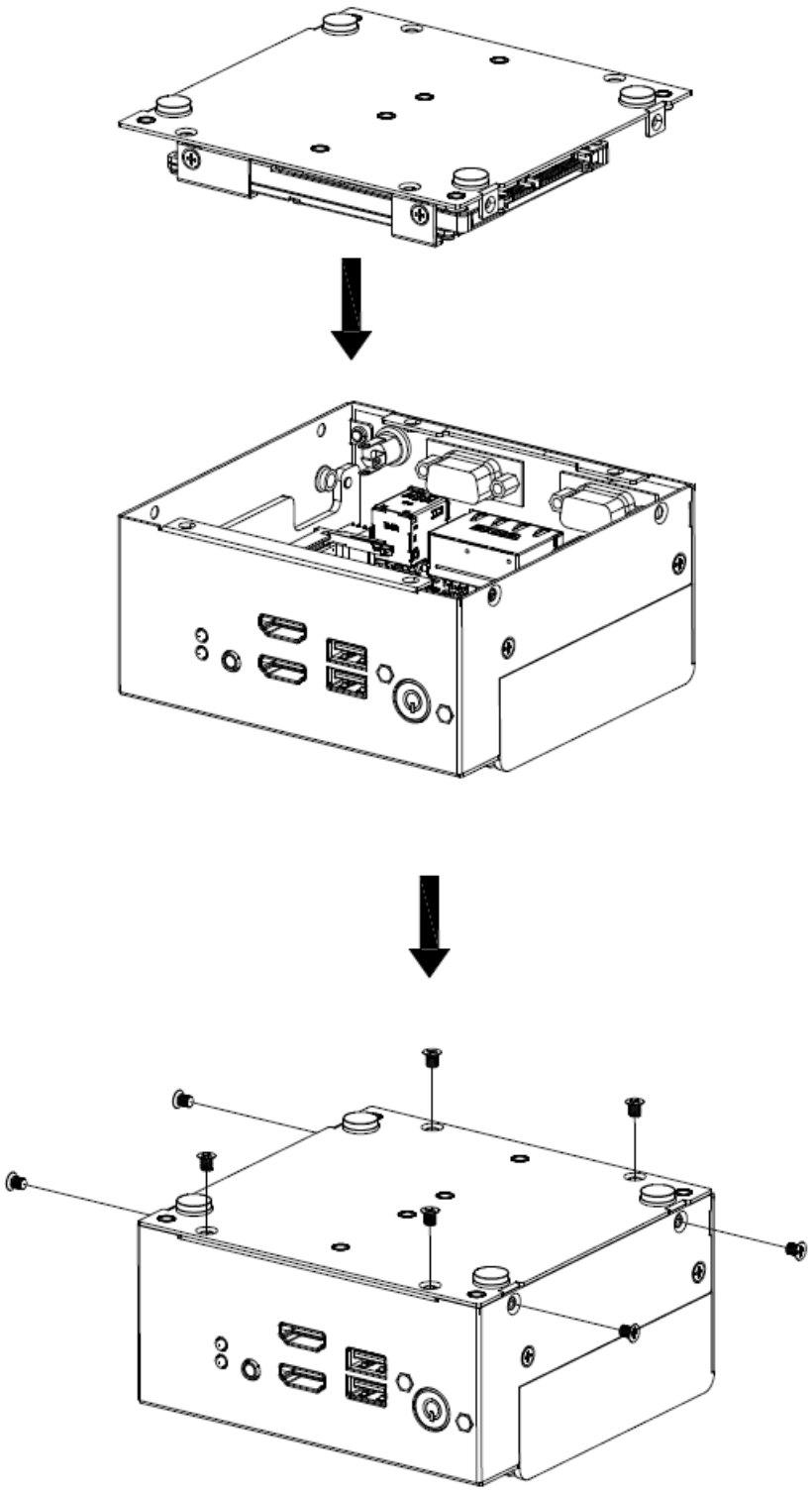
Step 1. For HDD/SSD installation, remove four screws from side and bottom of system.



Step 2. Install HDD/SSD then fix HDD/SSD with four M3*4L screws.

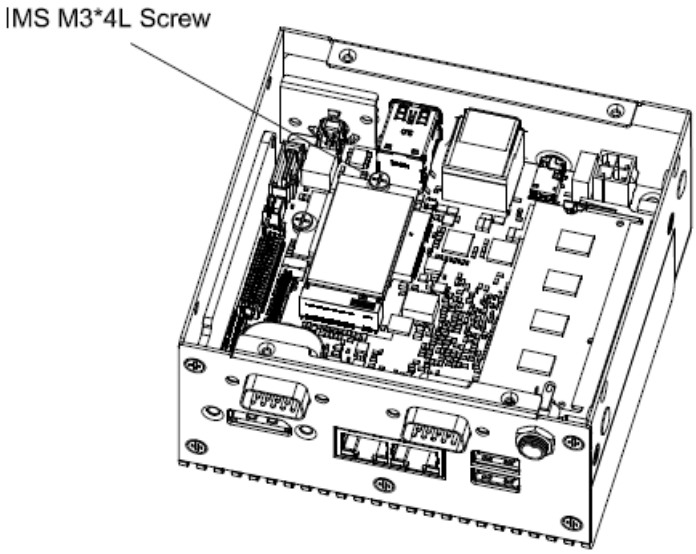


Step 3. For Memory installation, properly install the memory module and press until properly seated.

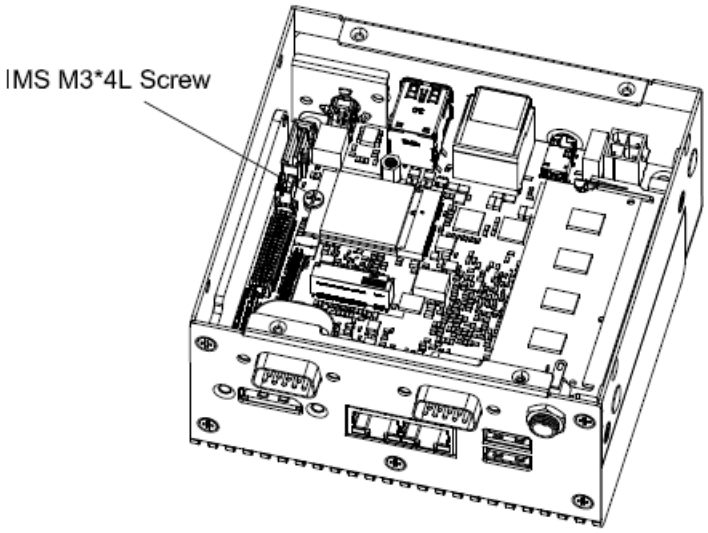


Step 4. Put the bottom back and fix with screws that were originally on the side of the system.

2.6 Installing M.2 card devices



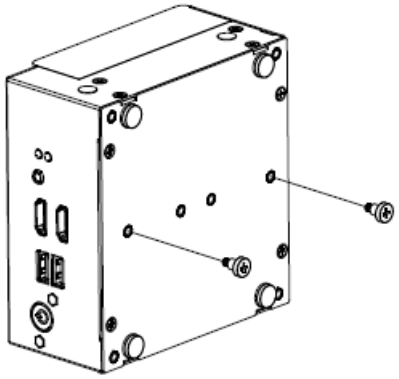
Fix M.2 B-Key with four M3*4L screw



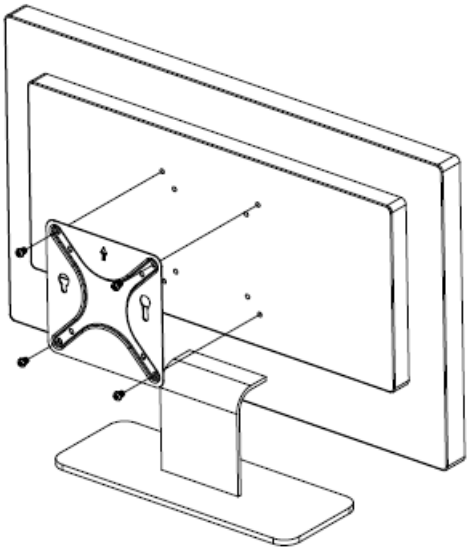
Fix M.2 E-Key with four M3*4L screw

Step 1. Fix M.2 card using the screw in the Accessory Kit.

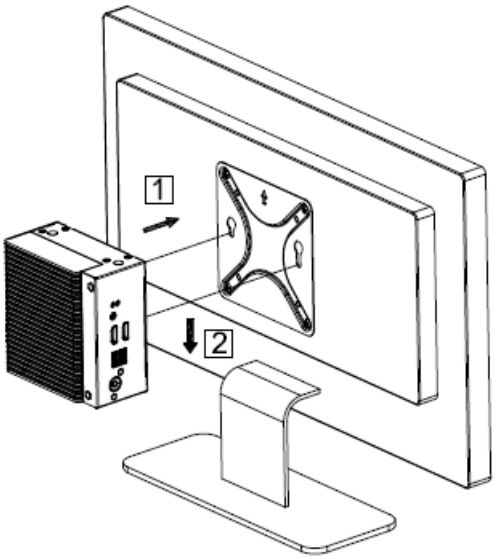
2.7 Installing VESA Mounting



Step 1. Insert and fasten two M3*L11.1 screw on the bottom.

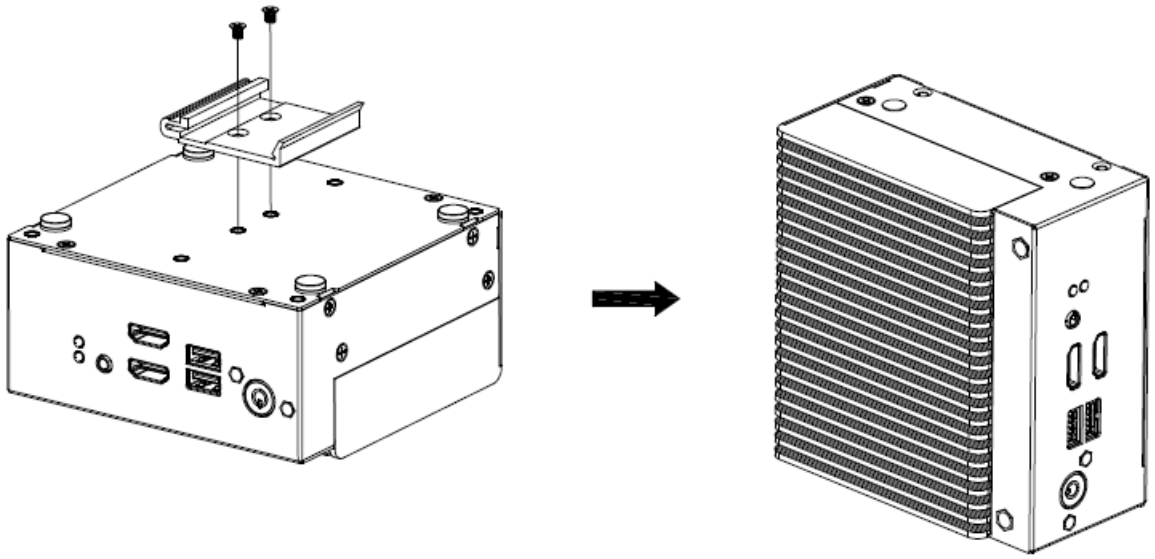


Step 2. Fix with four M4*6mm screws on the monitor (or wall).



Step 3. Slide the system onto the VESA mount bracket.

2.8 Installing Din Rail Mounting



Step 1. Fix with two M3*4 screws on the system.

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 <ESC> immediately after switching the system on, or
By pressing the <Del> or <ESC> key when the following message appears briefly at the left-top of the screen during the POST (Power On Self Test).

Press <Del> or <ESC> 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 <Enter> 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.

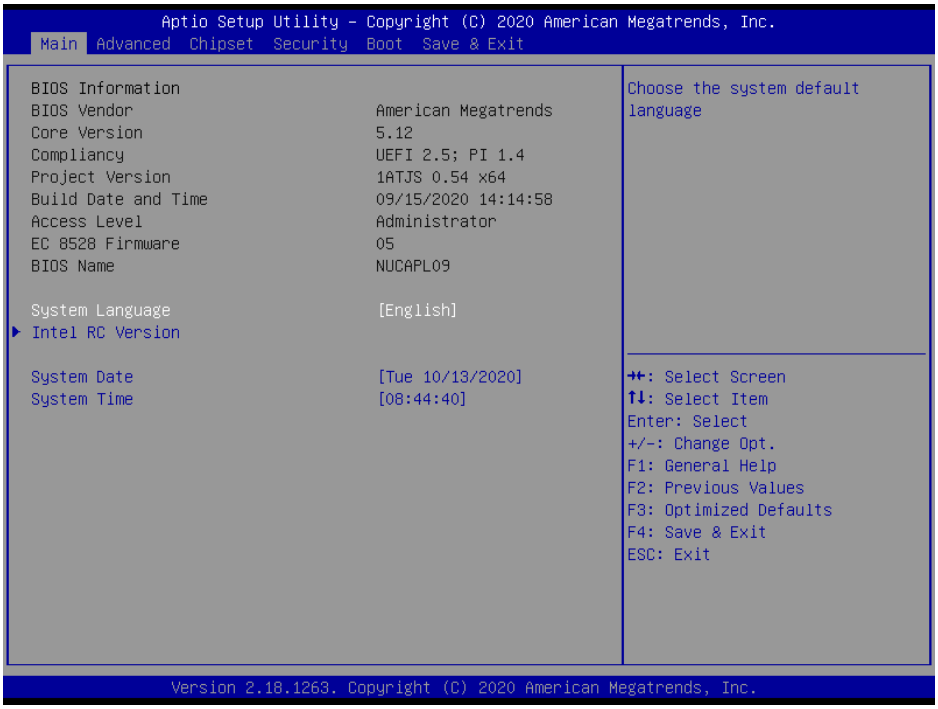
3.6 BIOS setup

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.

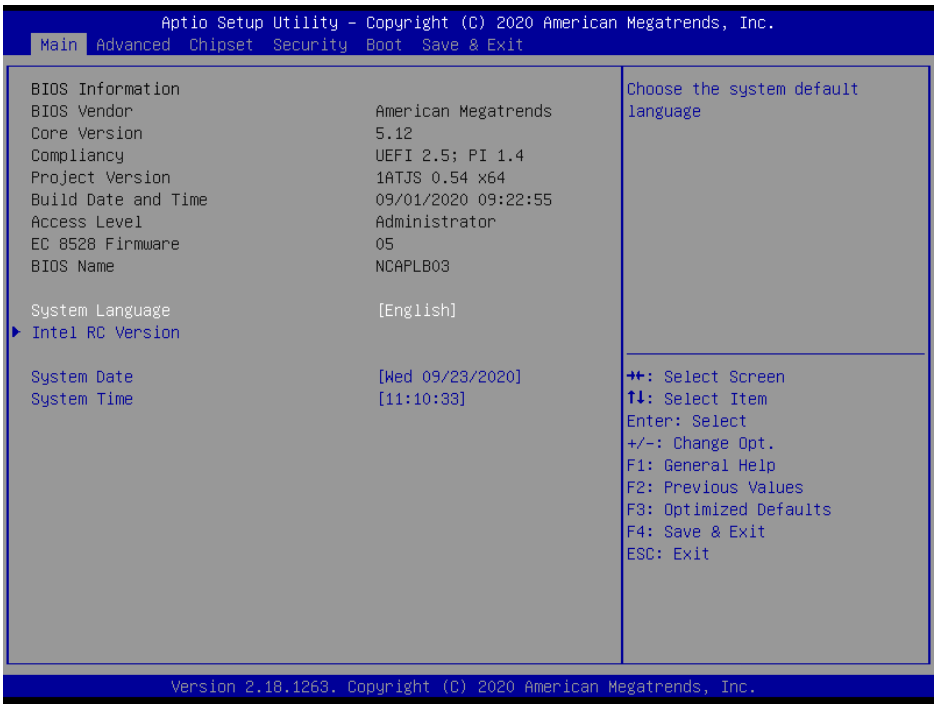
3.6.1 Main Menu

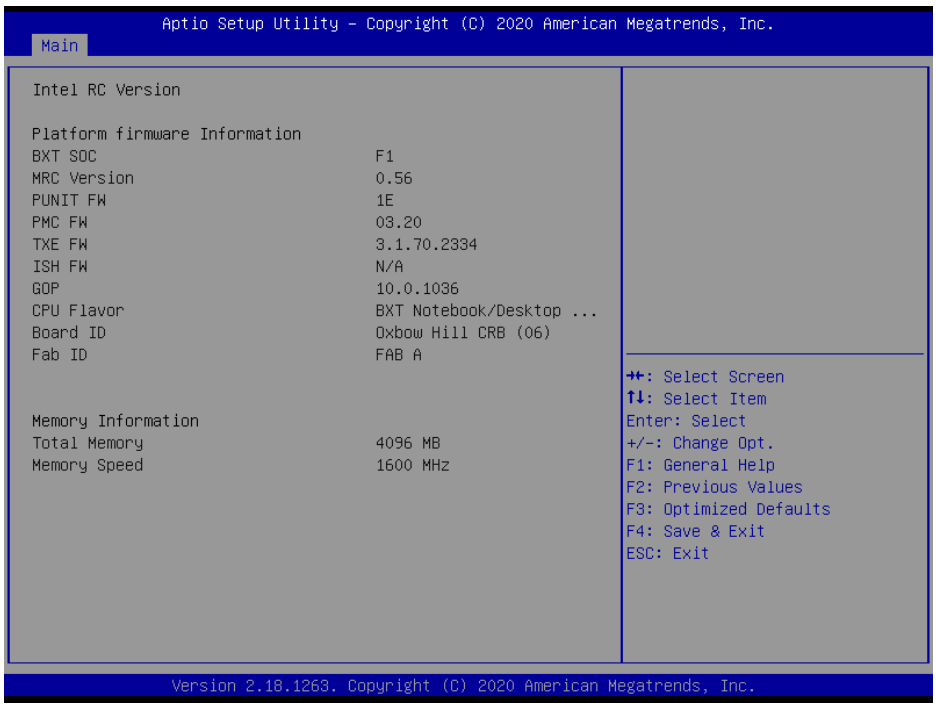
This section allows you to record some basic hardware configurations in your computer and set the system clock.

NUC-APL



NUC-APL-Slim





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.

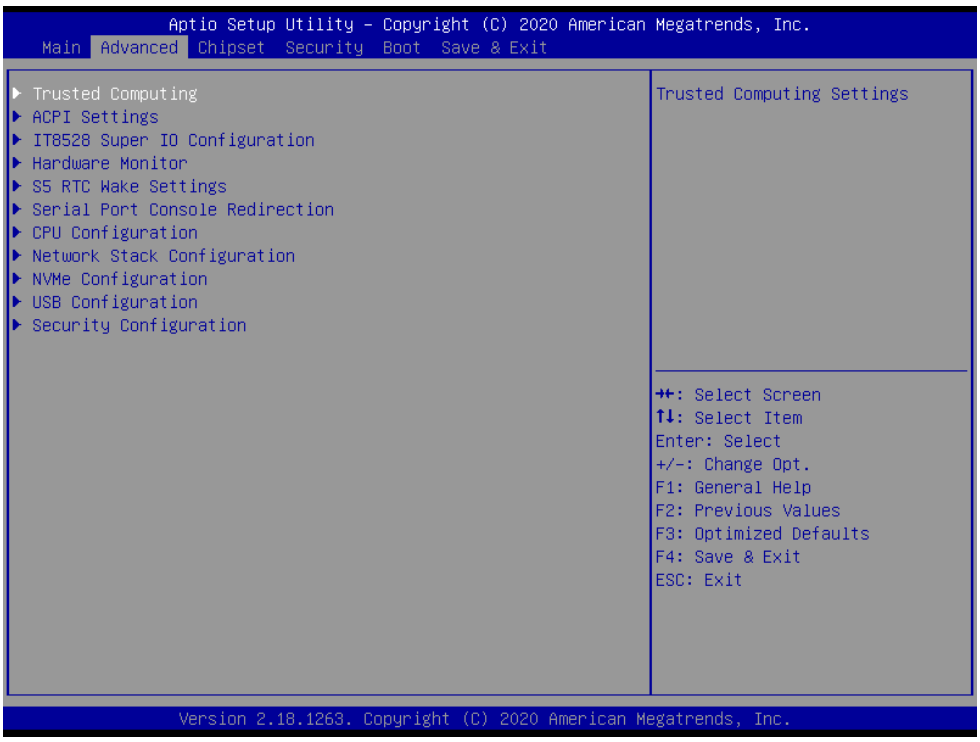
3.6.1.3 System Time

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

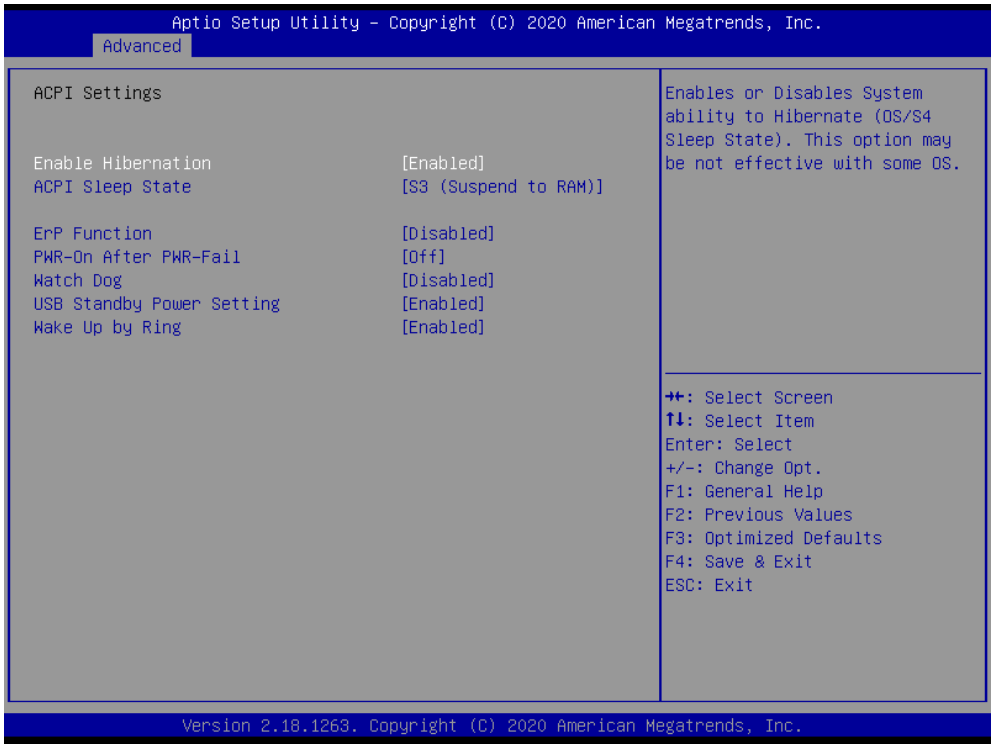
This section allows you to configure your CPU and other system devices for basic operation through the following sub-menus.



3.6.2.1 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 INT1A interface will not be available.

3.6.2.2 ACPI Settings



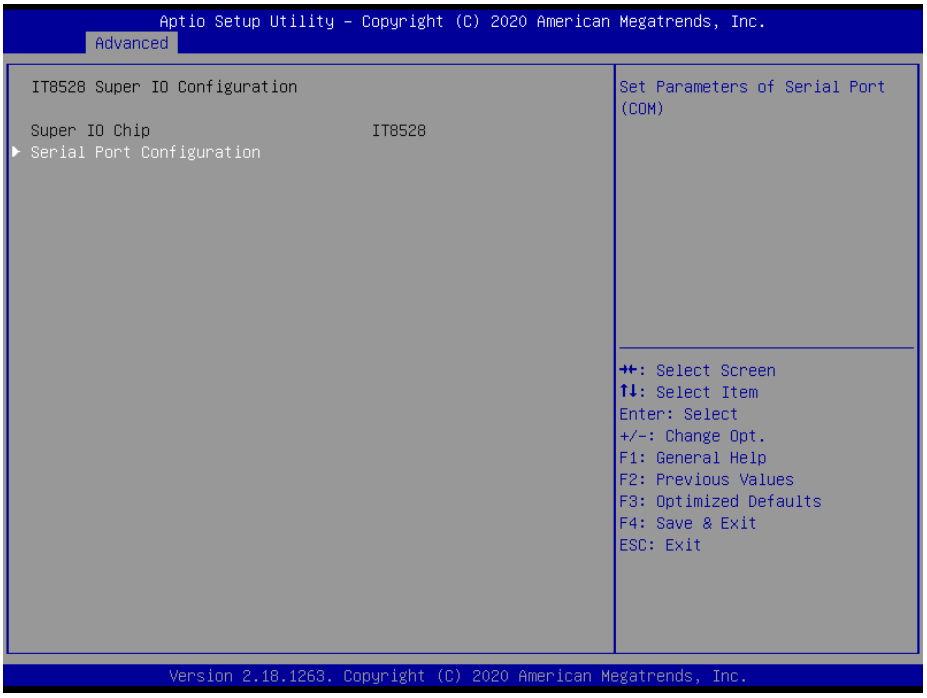
Item	Options	Description
Enable Hibernation	Disabled Enabled**[Default]**,	Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.
ACPI Sleep State	Suspend Disabled, S3 (Suspend to RAM) **[Default]**	Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.
ErP Function	Disabled**[Default]** Enabled	ErP Function(Deep S5).
PWR-On After PWR-Fail	Off**[Default]** On Last state	AC loss resume.
Watch Dog	Disabled**[Default]**, 30 sec 40 sec 50 sec 1 min 2 min 10 min 30 min	Select WatchDog.
USB Standby Power Setting	Disabled Enabled**[Default]**,	Enabled/Disabled USB Standby Power during S3/S4/S5.
Wake Up by Ring	Disabled Enabled**[Default]**,	Wake Up by Ring from S3/S4/S5.

3.6.2.3 IT8528 Super IO Configuration

NUC-APL

Item	Description
Serial Port 1 Configuration	Set Parameters of Serial Port 1 (COMA).
Serial Port 2 Configuration	Set Parameters of Serial Port 2 (COMB).

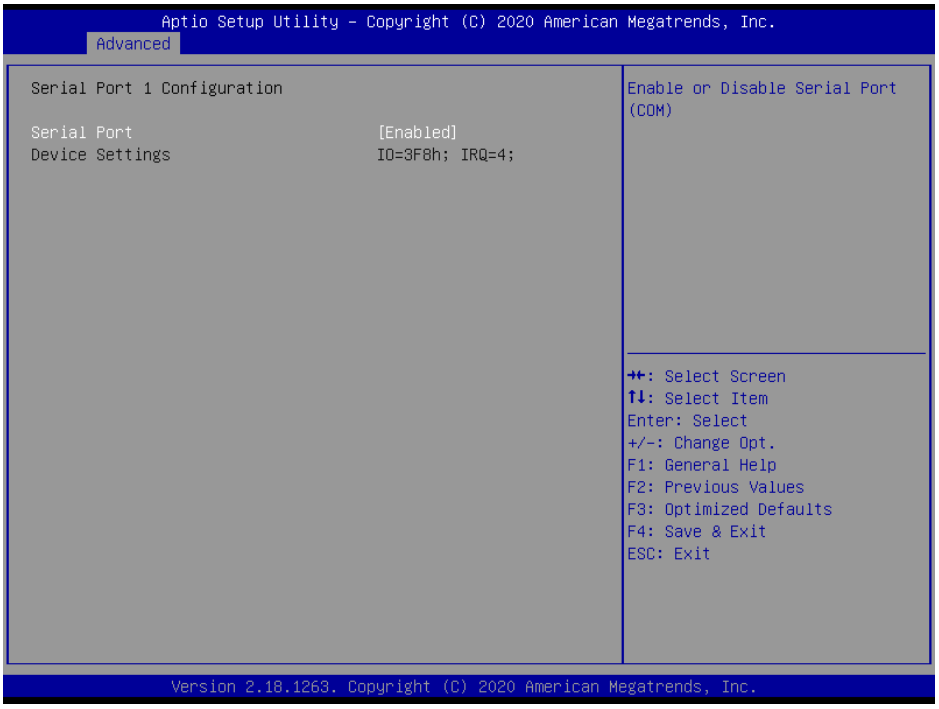
NUC-APL-Slim



Item	Description
Serial Port Configuration	Set Parameters of Serial Port (COM).

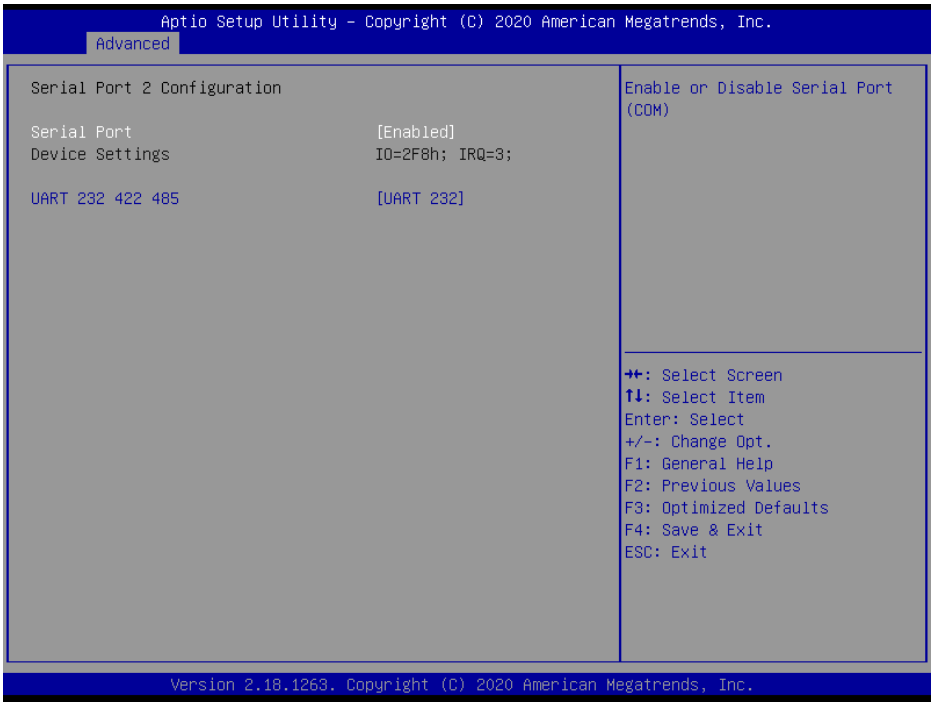
NUC-APL

3.6.2.3.1 Serial Port 1 Configuration



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

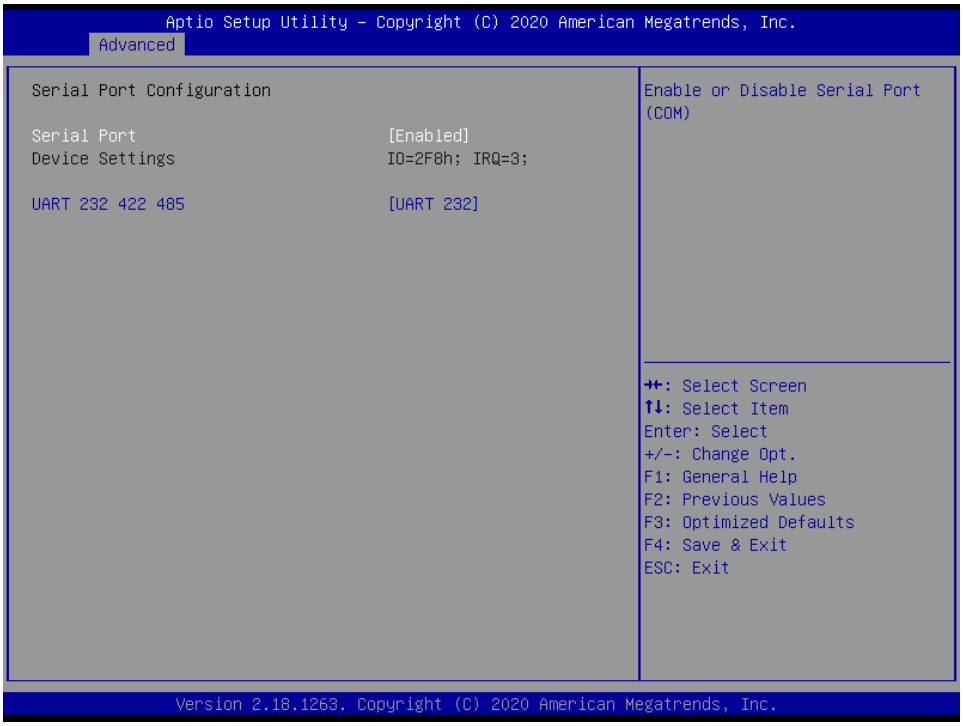
3.6.2.3.2 Serial Port 2 Configuration



Item	Option	Description
Serial Port	Enabled**[Default]**, Disabled	Enable or Disable Serial Port (COM).
UART 232 422 485	UART 232**[Default]** UART 422 UART 485	Change the Serial Port as RS232/422/485.

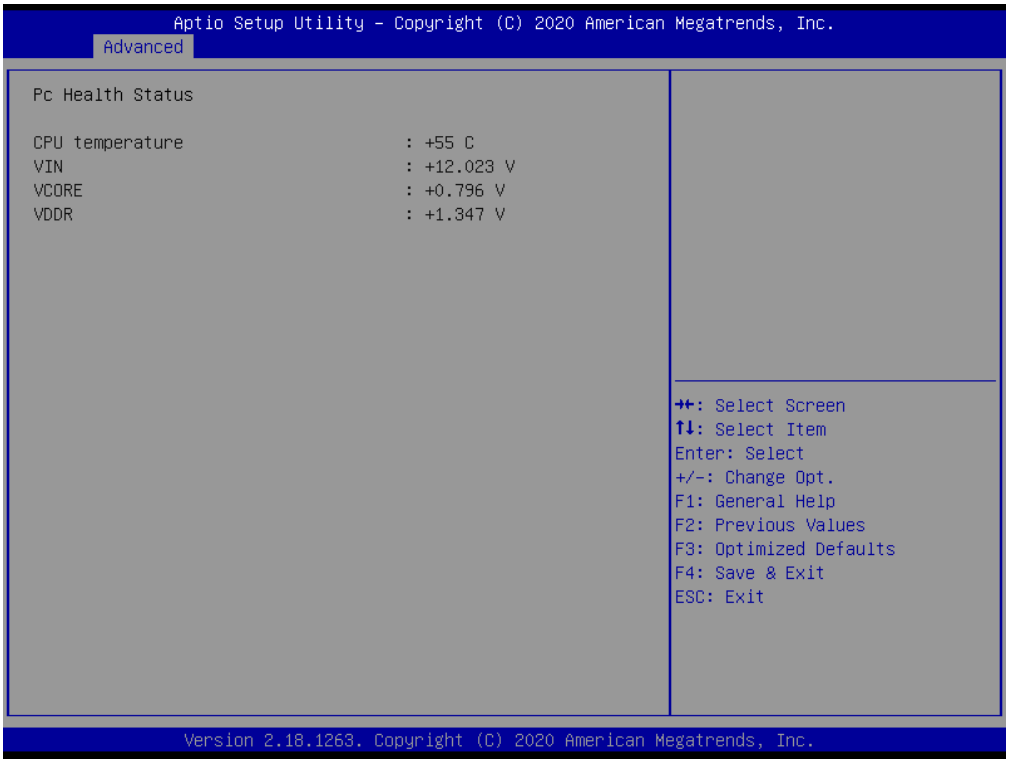
NUC-APL-Slim

3.6.2.3.3 Serial Port Configuration

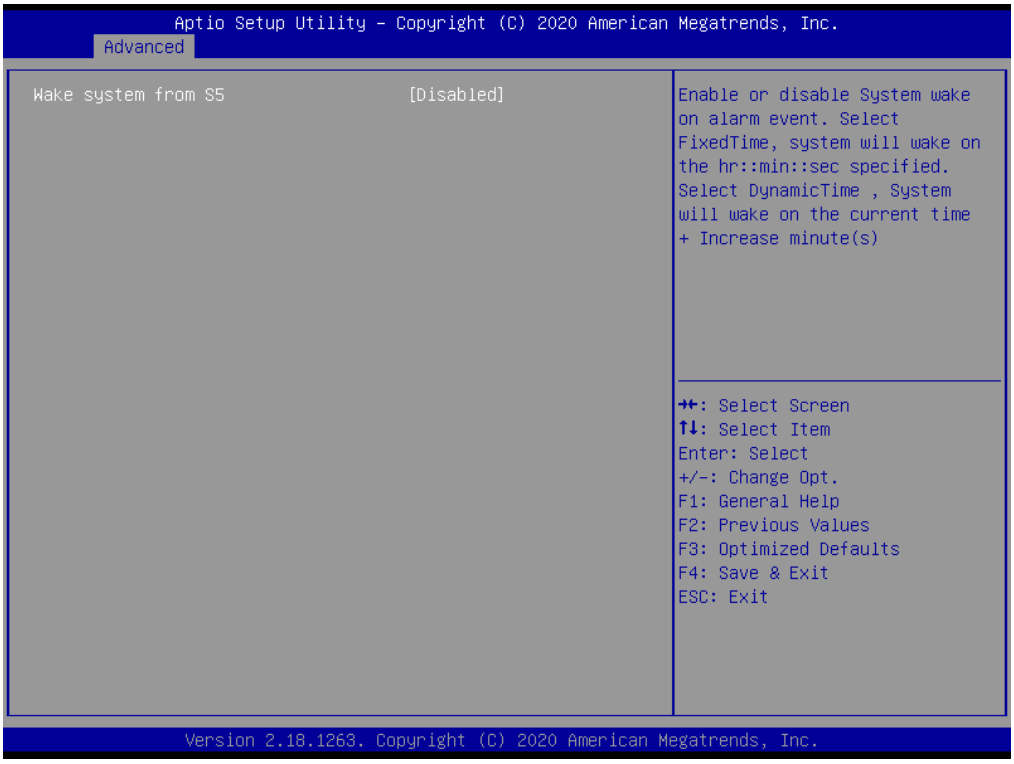


Item	Option	Description
Serial Port	Enabled**[Default]**, Disabled	Enable or Disable Serial Port (COM).
UART 232 422 485	UART 232**[Default]**	Change the Serial Port as RS232/422/485.

3.6.2.4 Hardware Monitor

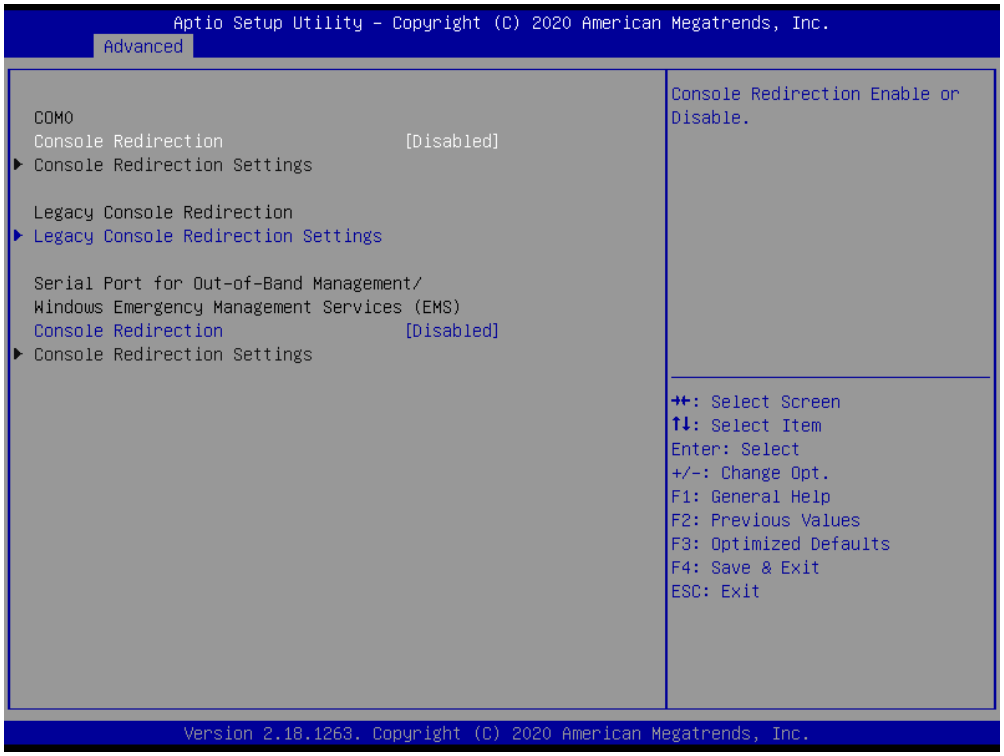


3.6.2.5 S5 RTC Wake Settings



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).

3.6.2.6 Serial Port Console Redirection



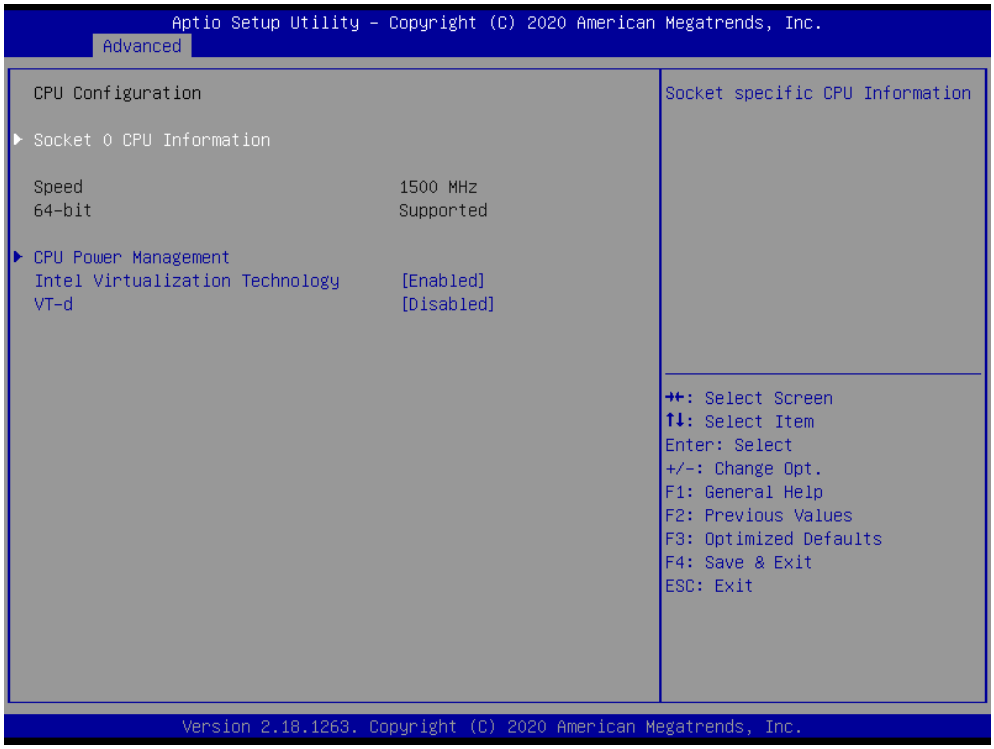
Item	Options	Description
Console Redirection	Disabled**[Default]**, Enabled	Console Redirection Enable or Disable.

3.6.2.6.1 Legacy Console Redirection Settings

Item	Option	Description
Redirection COM Port	COM0**[Default]**,	Select a COM port to display redirection of Legacy OS and Legacy OPROM Messages.

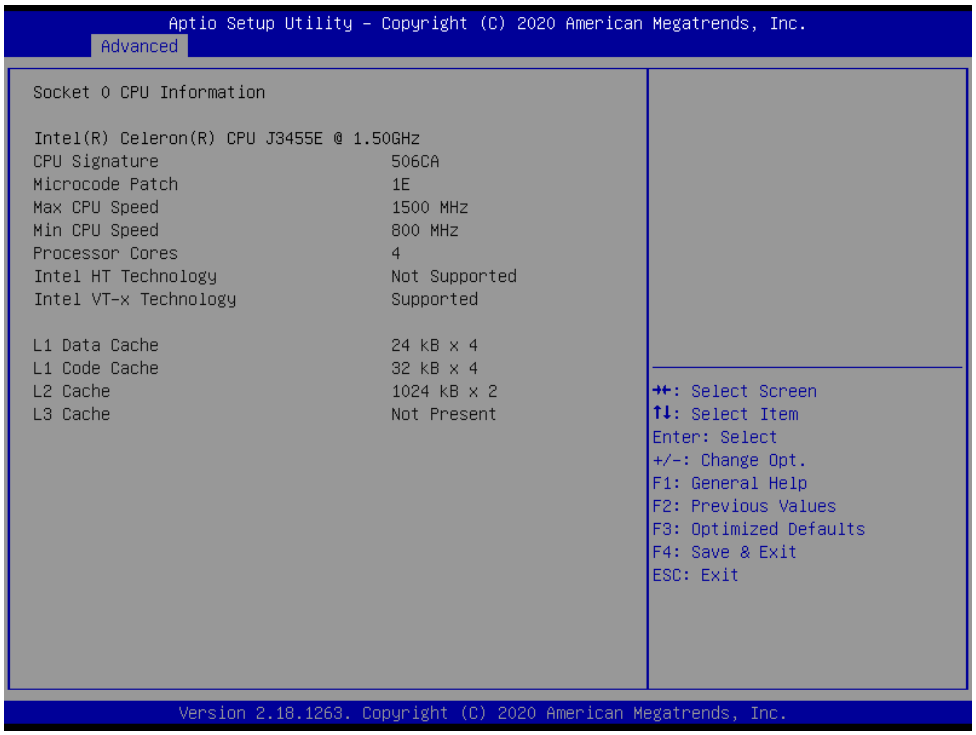
3.6.2.7 CPU Configuration

Use the CPU configuration menu to view detailed CPU specification and configure the CPU.

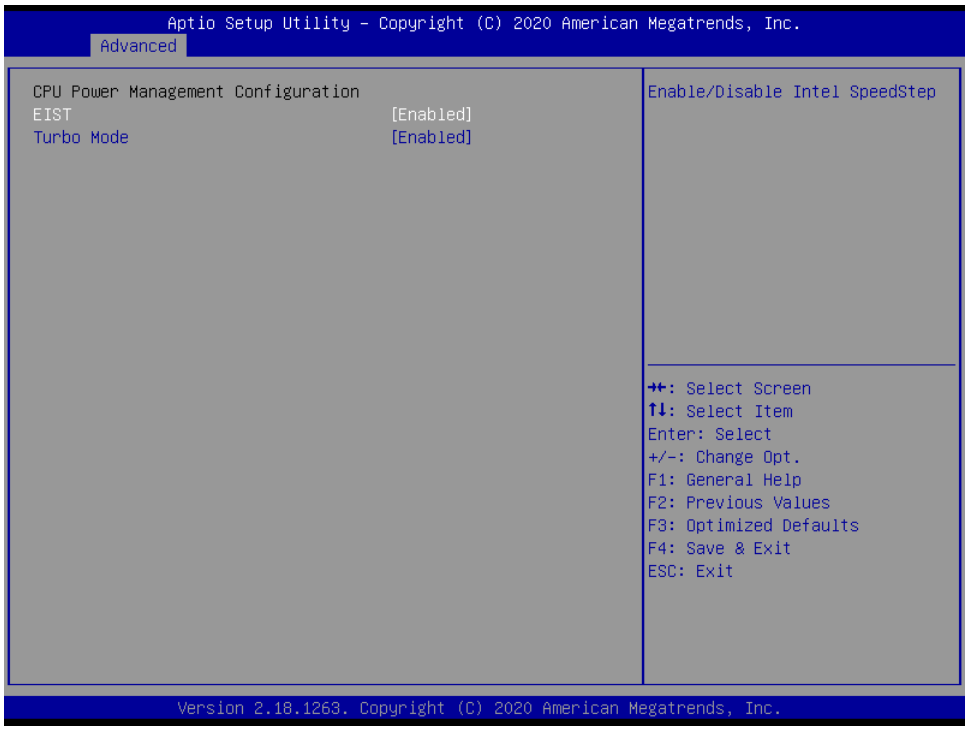


Item	Options	Description
Intel Virtualization Technology	Disabled, Enabled**[Default]**	When enabled, a VMM can utilize the additional hardware capabilities provided by Virtualization Technology.
VT-d	Disabled**[Default]**, Enabled	Enable/Disable CPU VT-d.

3.6.2.7.1 Socket 0 CPU Information



3.6.2.7.2 CPU Power Management Configuration

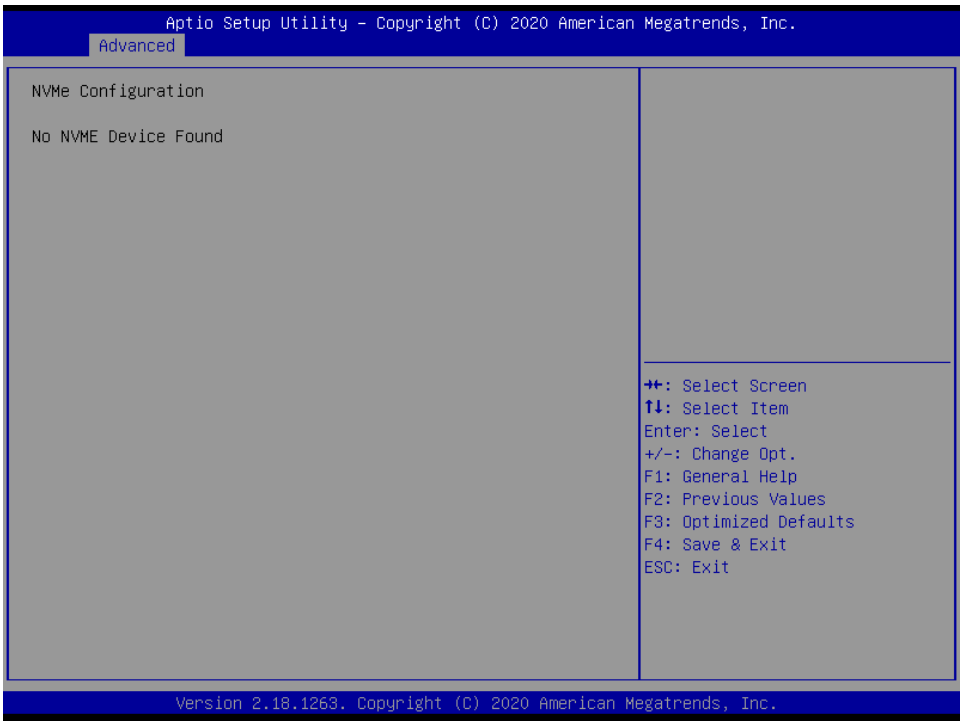


Item	Options	Description
EIST	Disabled, Enabled**[Default]**	Enable/Disable Intel SpeedStep.
Turbo Mode	Disabled, Enabled**[Default]**	Turbo Mode.

3.6.2.8 Network Stack Configuration

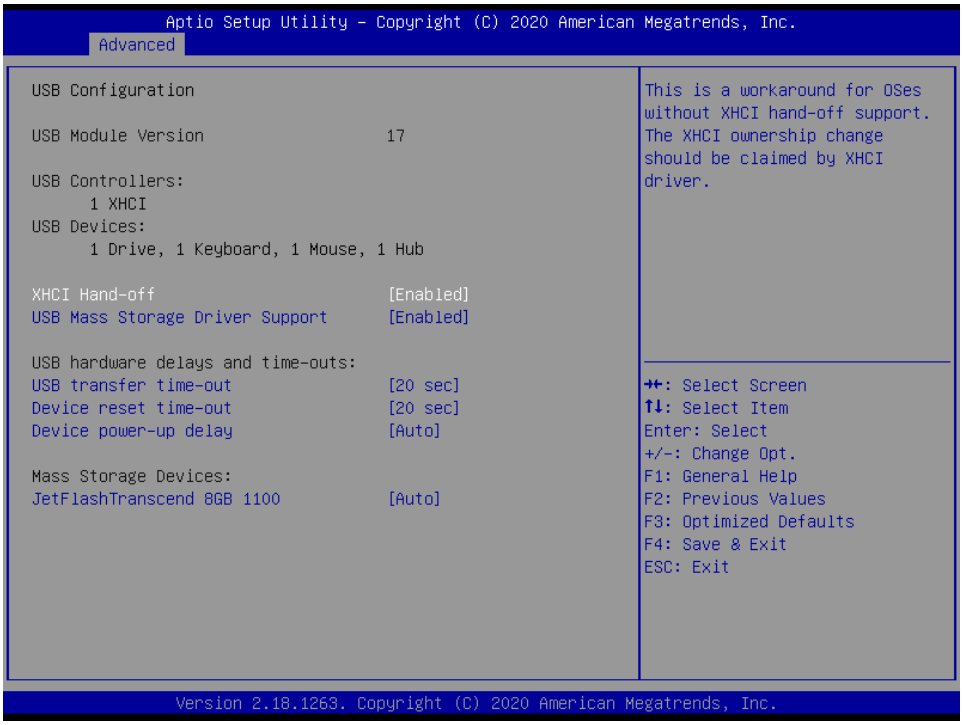
Item	Options	Description
Network Stack	Enabled Disabled**[Default]**,	Enable/Disable UEFI Network Stack.

3.6.2.9 NVMe Configuration



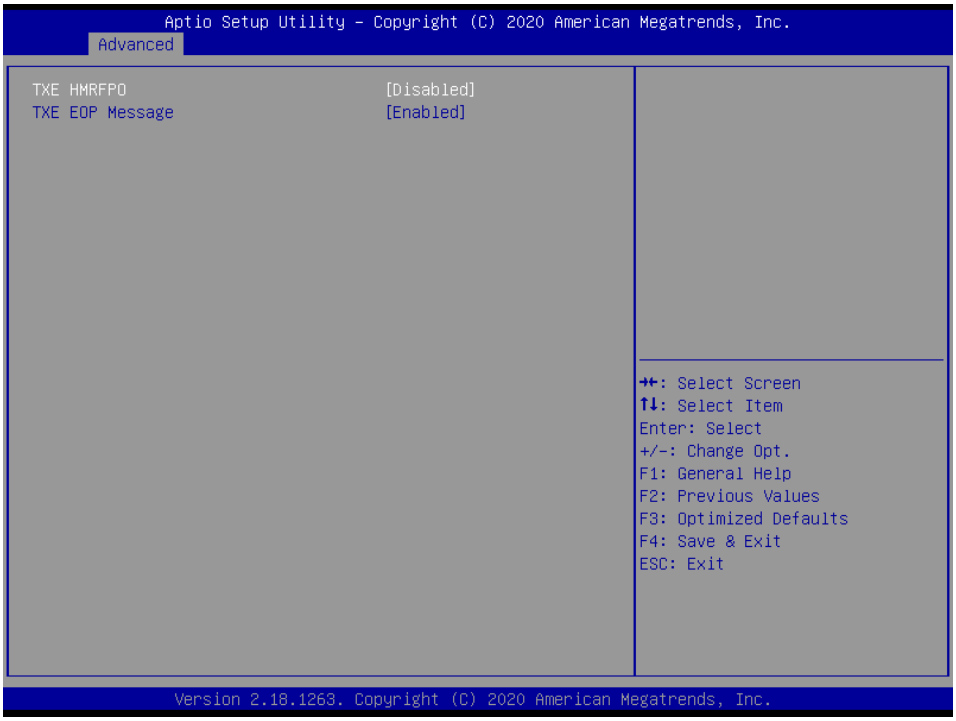
3.6.2.10 USB Configuration

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



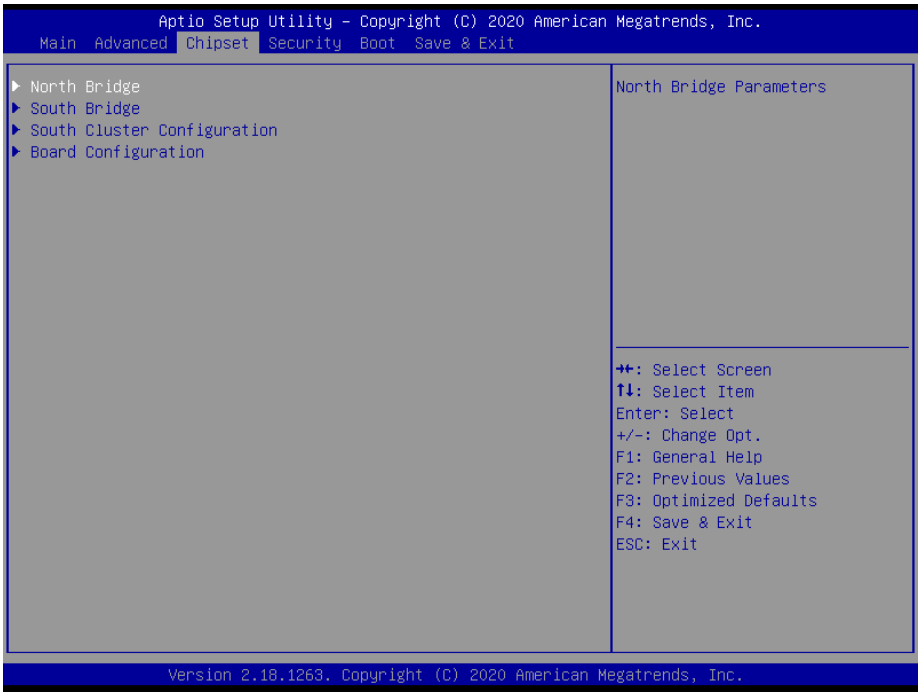
Item	Options	Description
XHCI Hand-off	Enabled**[Default]** Disabled	This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
USB Mass Storage Driver Support	Enabled**[Default]** Disabled	Enable/Disable USB Mass Storage Driver Support.
USB 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.

3.6.2.11 Security Configuration

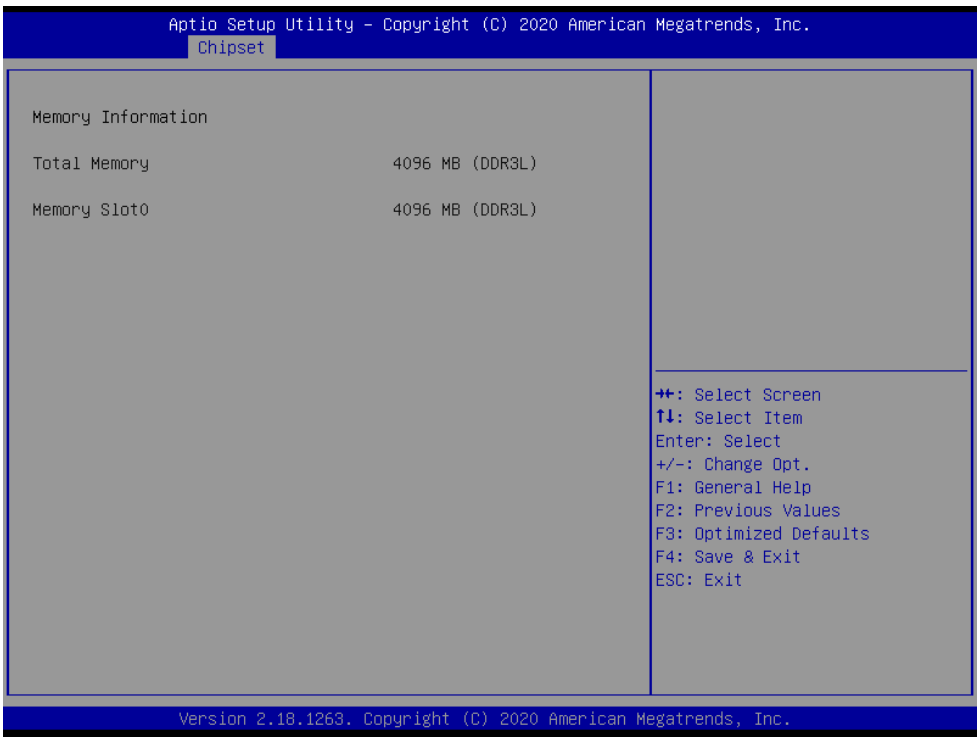


Item	Options	Description
TXE HMRFPO	Disabled**[Default]** Enabled,	TXE HMRFPO.
TXE EOP Message	Disabled Enabled**[Default]**,	Send EOP Message Before Enter OS.

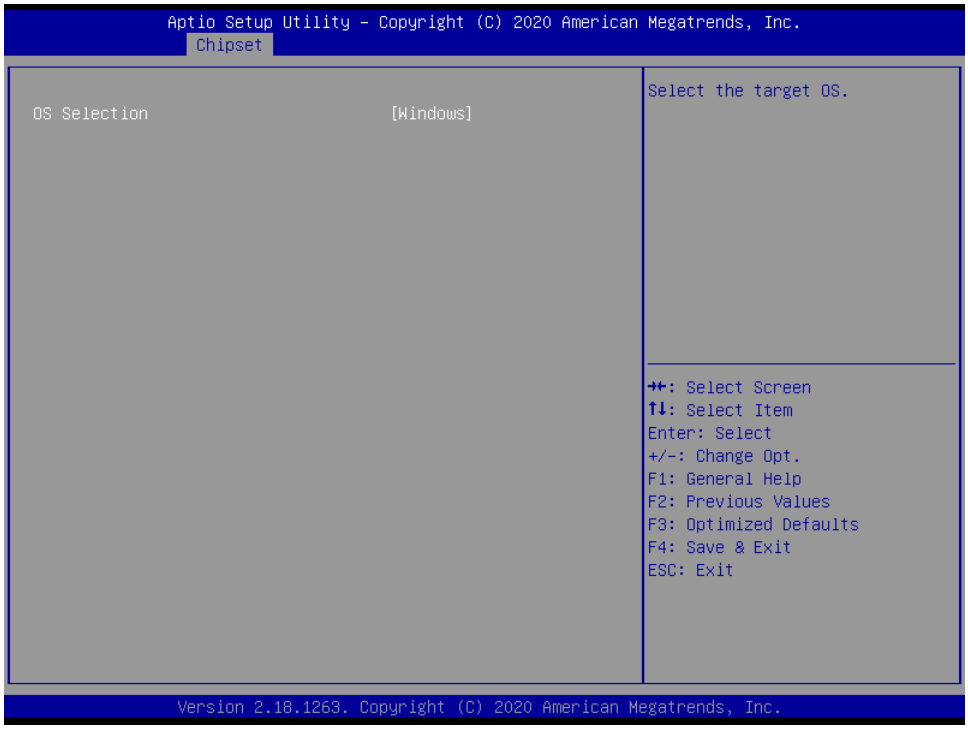
3.6.3 Chipset



3.6.3.1 North Bridge



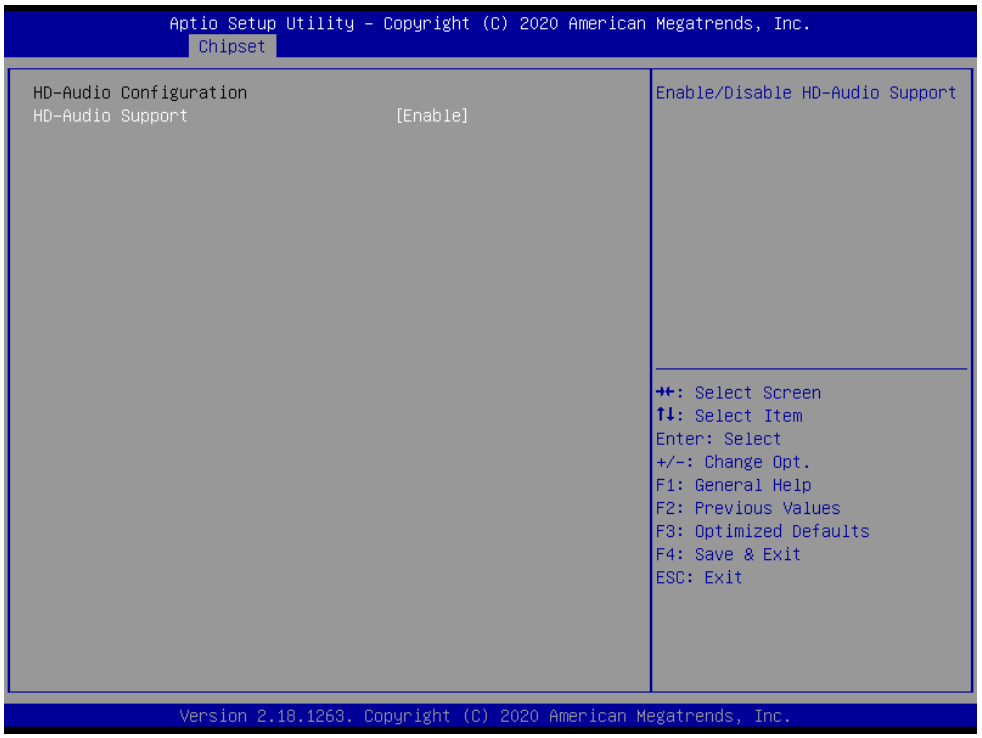
3.6.3.2 South Bridge



Item	Option	Description
OS Selection	Windows**[Default]** Intel Linux	Select the target OS.

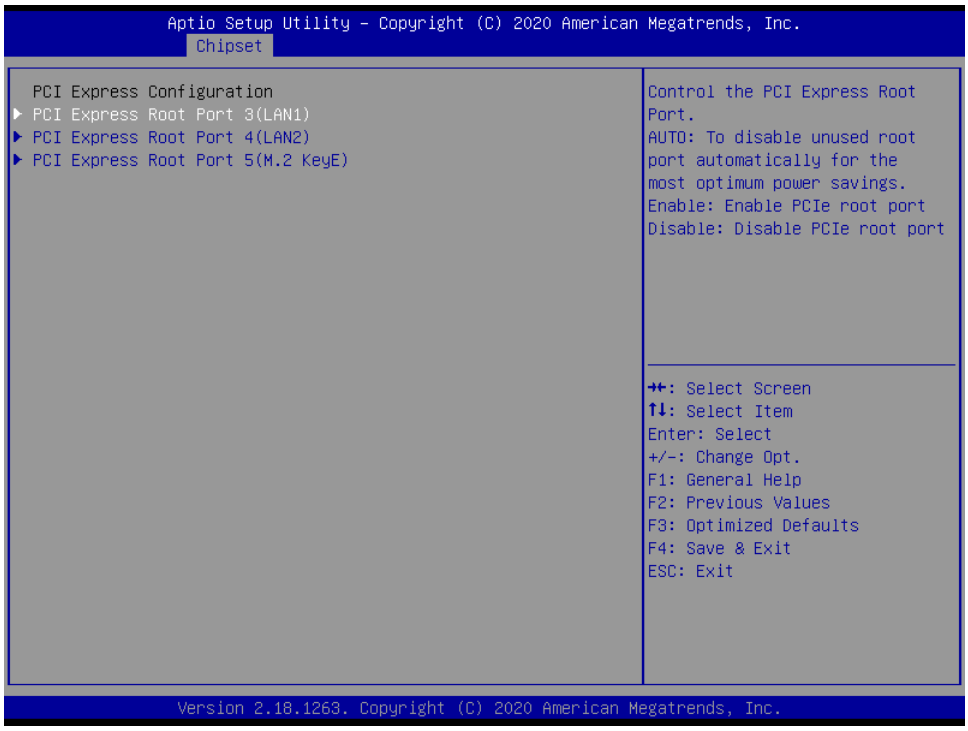
3.6.3.3 South Cluster Configuration

3.6.3.3.1 HD-Audio Configuration

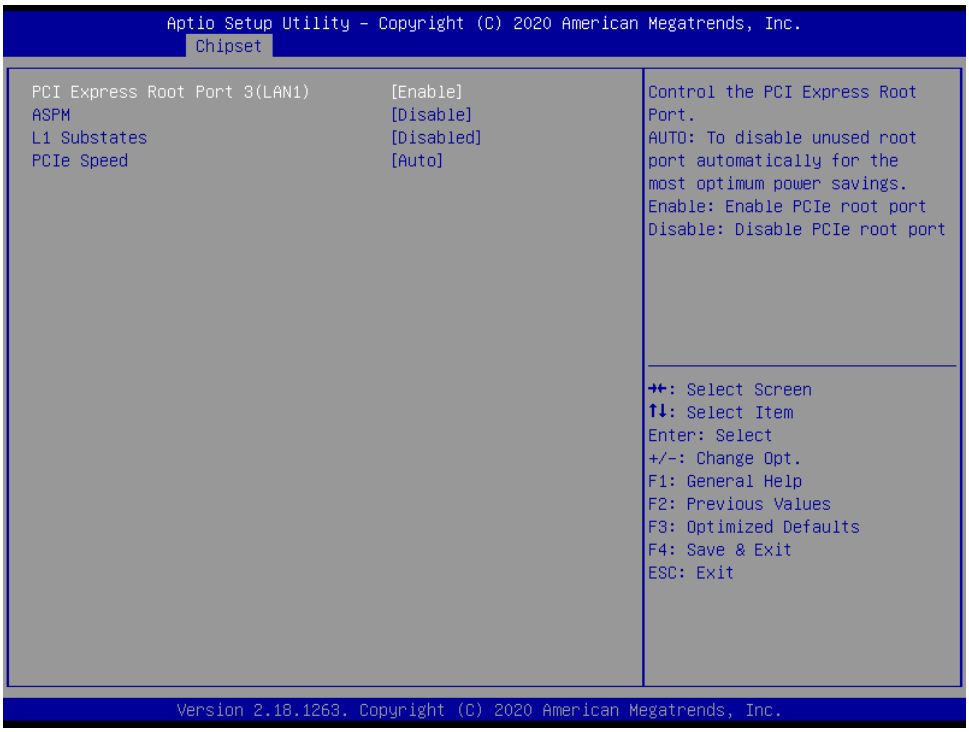


Item	Option	Description
HD-Audio Support	Disable Enable**[Default]**,	Enable/Disable HD-Audio Support.

3.6.3.3.2 PCI Express Configuration



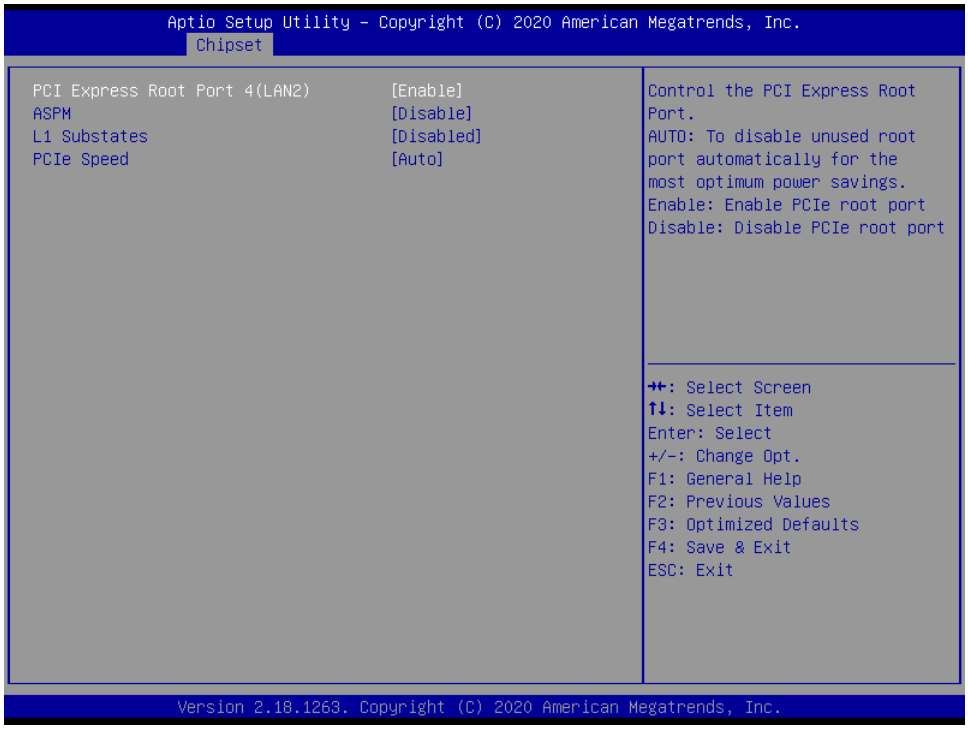
3.6.3.3.2.1 PCI Express Root Port 3(LAN1)



Item	Option	Description
PCI Express Root Port 3(LAN1)	Disable Enable**[Default]**	Control the PCI Express Root Port. AUTO: To disable unused root port automatically for

		the most optimum power savings. Enable: Enable PCIe root port Disable: Disable PCIe root port.
ASPM	Disable**[Default]** L0s L1 L0sL1 Auto	PCI Express Active State Power Management settings.
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.

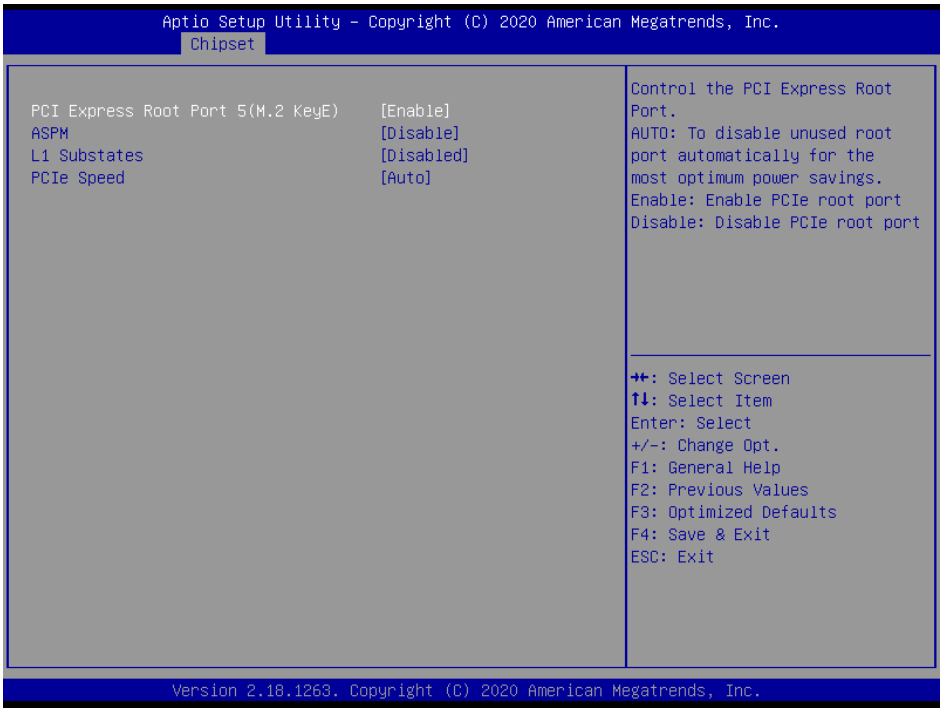
3.6.3.3.2.2 PCI Express Root Port 4(LAN2)



Item	Option	Description
PCI Express Root Port 4(LAN2)	Disable Enable**[Default]**	Control the PCI Express Root Port. AUTO: To disable unused root port automatically for the most optimum power savings. Enable: Enable PCIe root port Disable: Disable PCIe root port.
ASPM	Disable**[Default]** L0s L1 L0sL1 Auto	PCI Express Active State Power Management settings.

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.

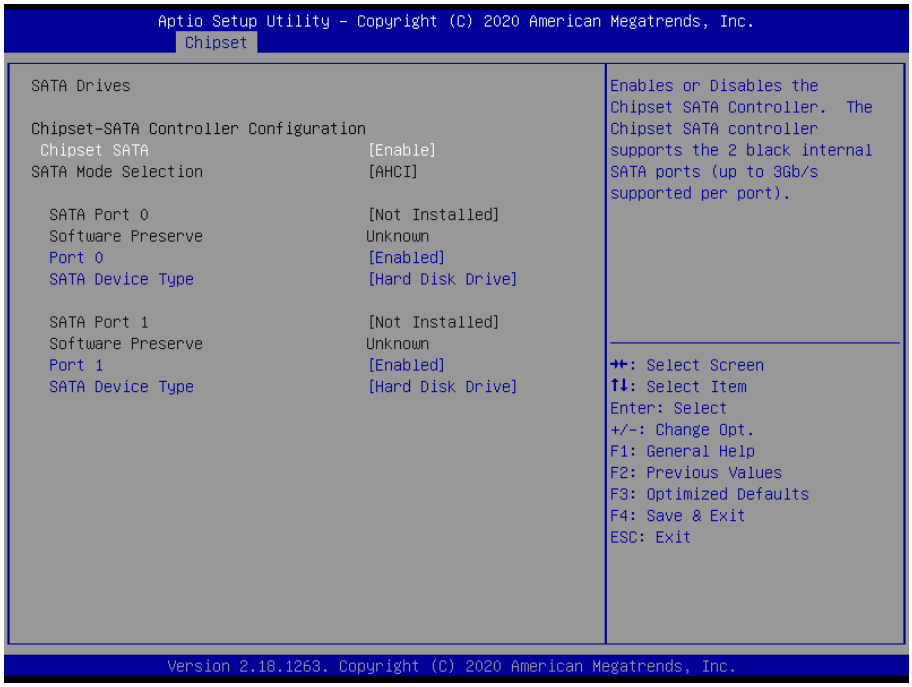
3.6.3.3.2.3 PCI Express Root Port 5(M.2 KeyE)



Item	Option	Description
PCI Express Root Port 5(M.2 KeyE)	Disable Enable**[Default]**	Control the PCI Express Root Port. AUTO: To disable unused root port automatically for the most optimum power savings. Enable: Enable PCIe root port Disable: Disable PCIe root port.
ASPM	Disable**[Default]** L0s L1 L0sL1 Auto	PCI Express Active State Power Management settings.
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.

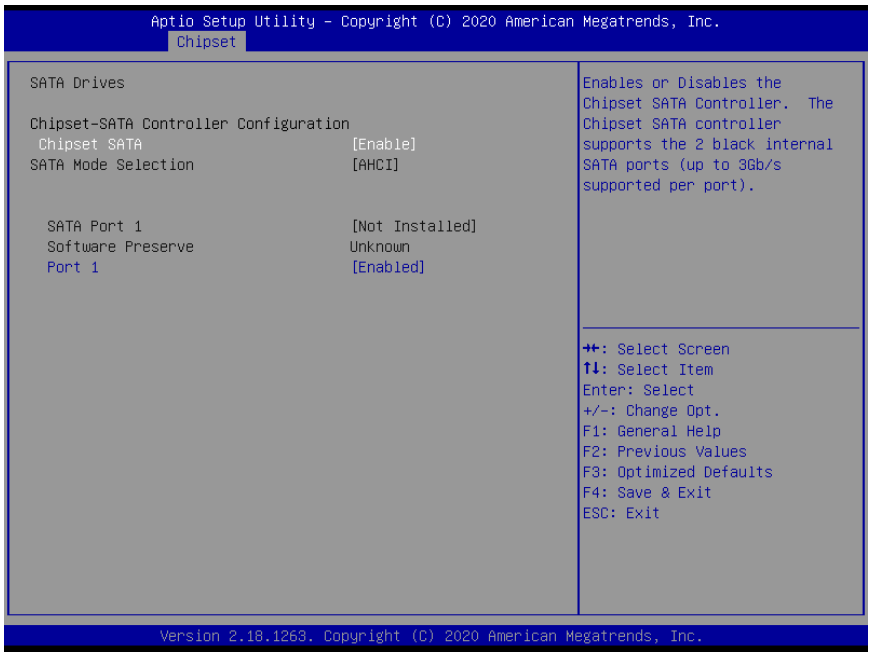
3.6.3.3.3 SATA Drives

NUC-APL



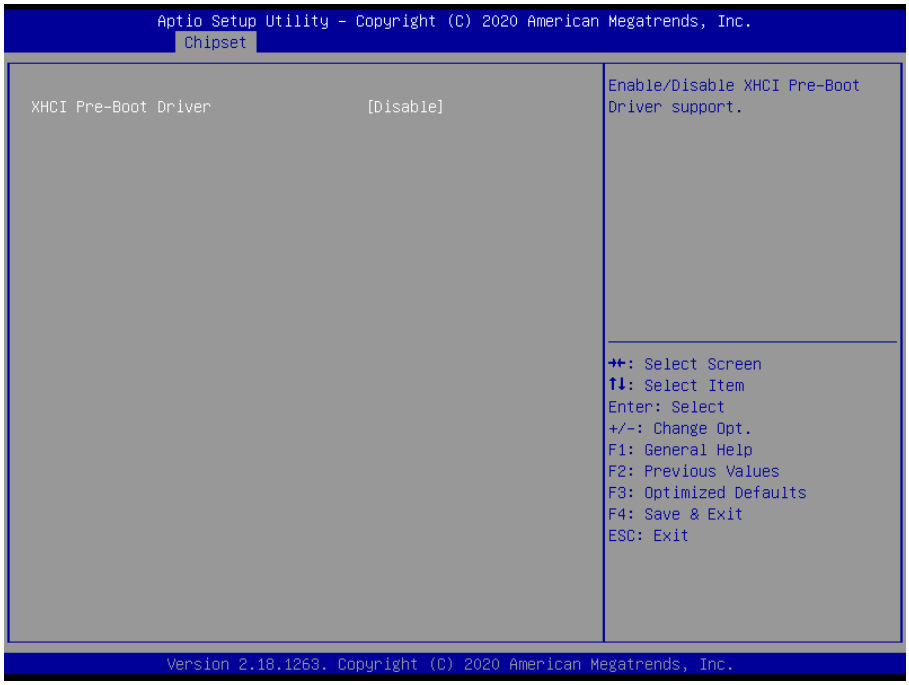
Item	Option	Description
Chipset SATA	Enable**[Default]** Disable	Enables or Disables the Chipset SATA Controller. The Chipset SATA controller supports the 2 black internal SATA ports (up to 3Gb/s supported per port).
Port 0/1	Disabled Enabled**[Default]**	Enable or Disable SATA Port.
SATA Device Type	Hard Disk Drive**[Default]** Solid State Drive	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.

NUC-APL-Slim



Item	Option	Description
Chipset SATA	Enable**[Default]** Disable	Enables or Disables the Chipset SATA Controller. The Chipset SATA controller supports the 2 black internal SATA ports (up to 3Gb/s supported per port).
Port 1	Disabled Enabled**[Default]**	Enable or Disable SATA Port.

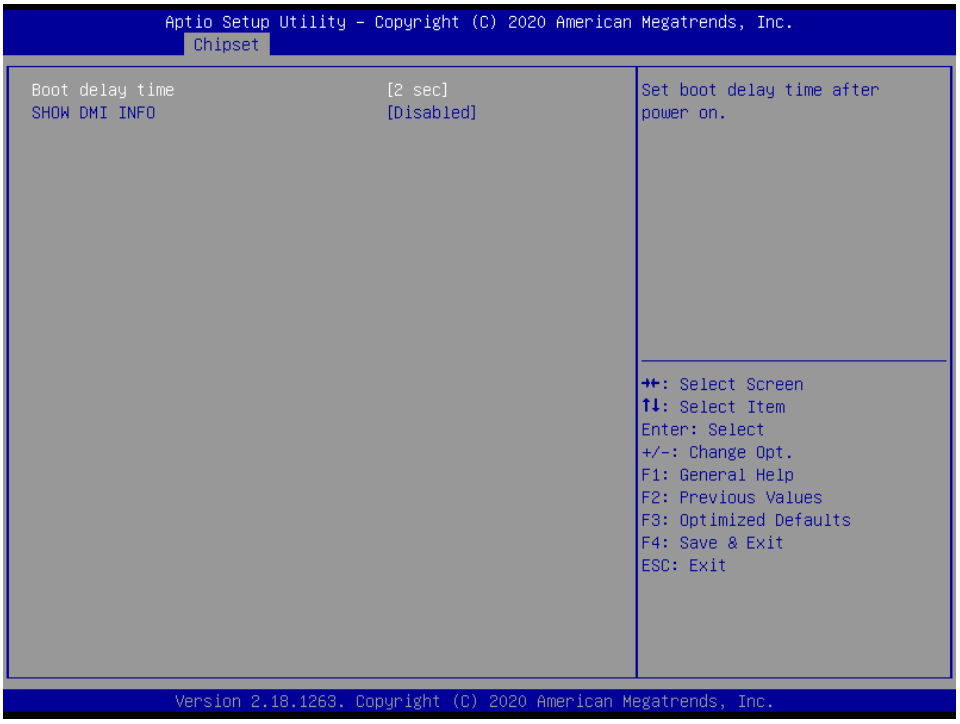
3.6.3.3.4 USB Configuration



Item	Option	Description
XHCI Pre-Boot Driver	Enable Disable**[Default]**	Enable/Disable XHCI Pre-Boot Driver support.

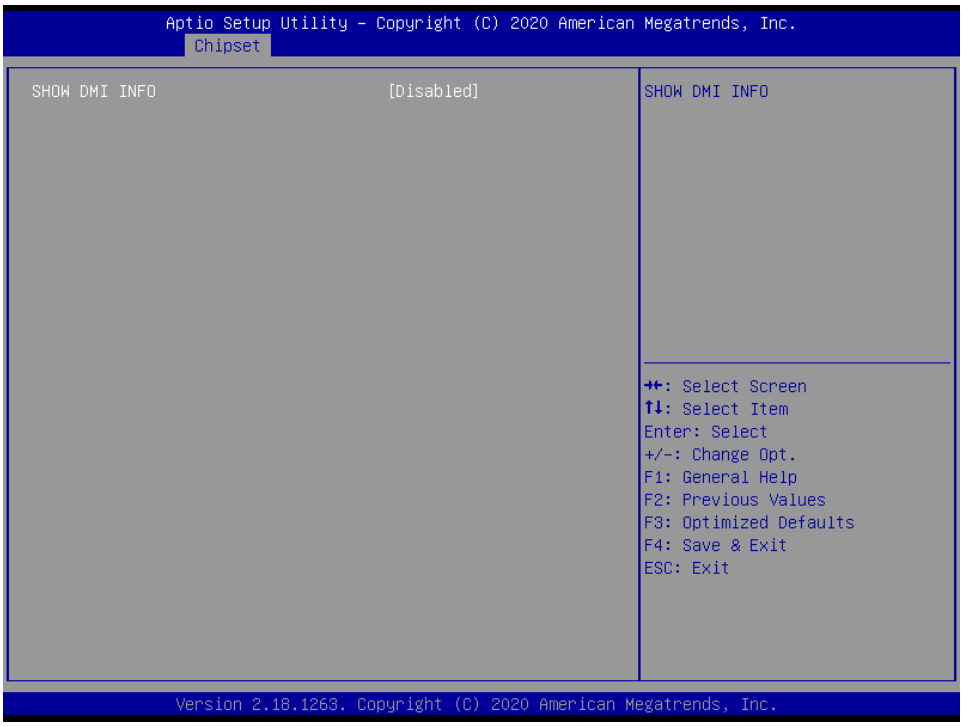
3.6.3.4 Board Configuration

NUC-APL



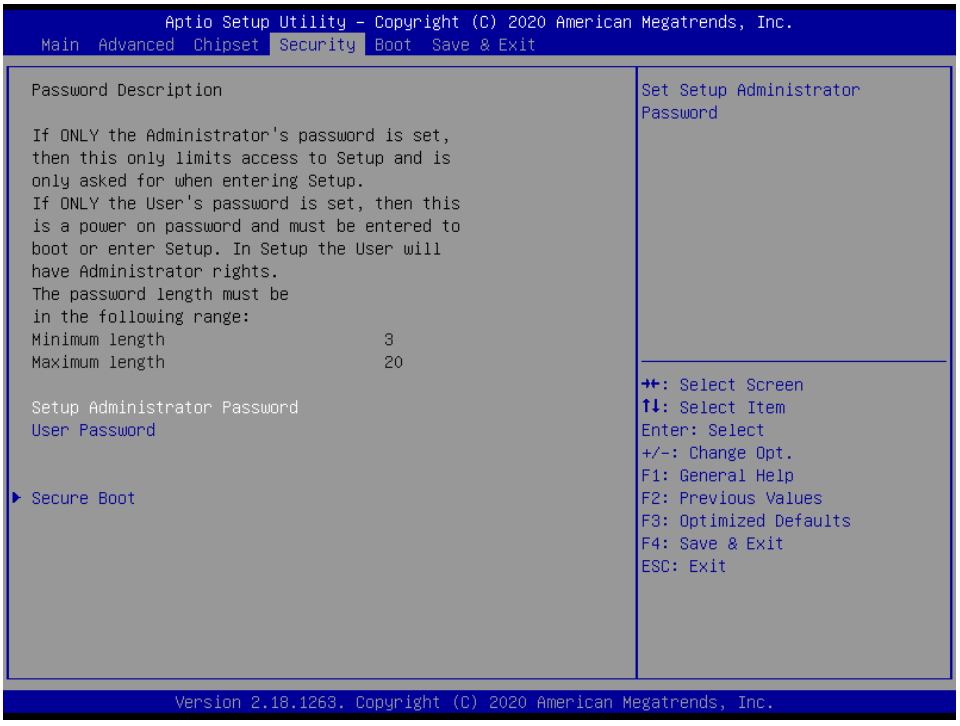
Item	Option	Description
Boot delay time	2 sec**[Default]** 3 sec 4 sec 5 sec	Set boot delay time after power on.
SHOW DMI INFO	Disabled**[Default]** Enabled	SHOW DMI INFO.

NUC-APL-Slim



Item	Option	Description
SHOW DMI INFO	Disabled**[Default]** Enabled	SHOW DMI INFO.

3.6.4 Security



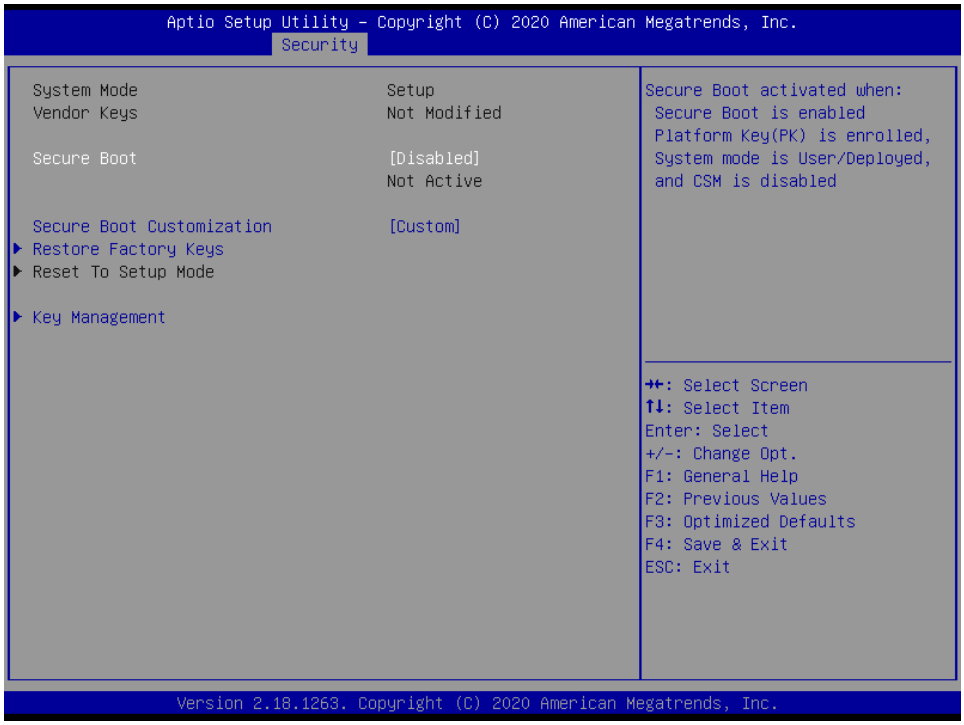
- **Setup Administrator Password**

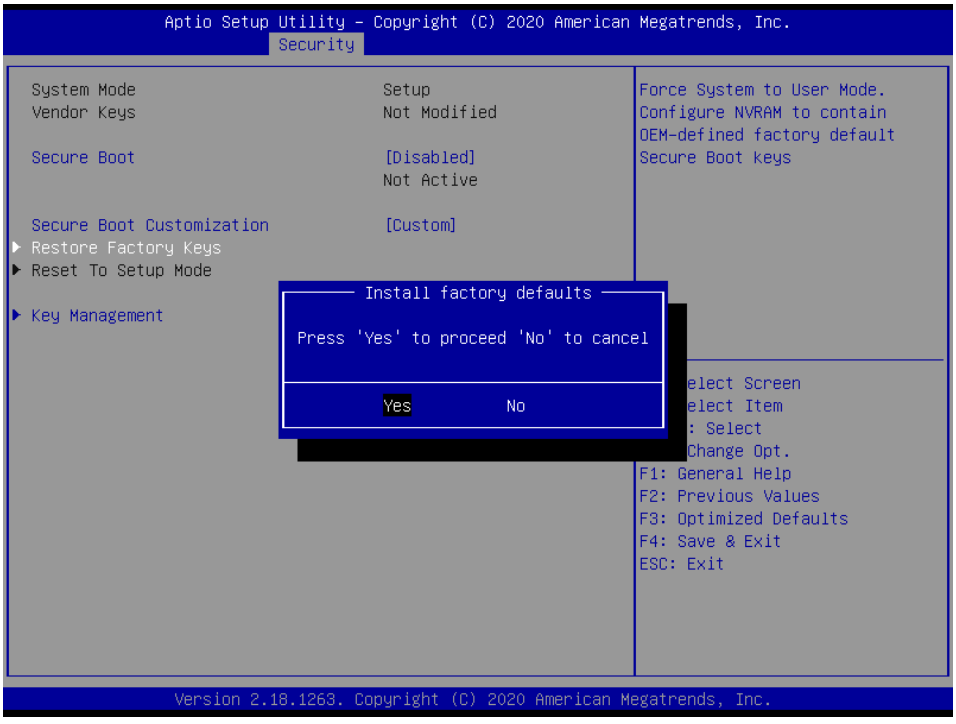
Set setup Administrator Password

- **User Password**

Set User Password

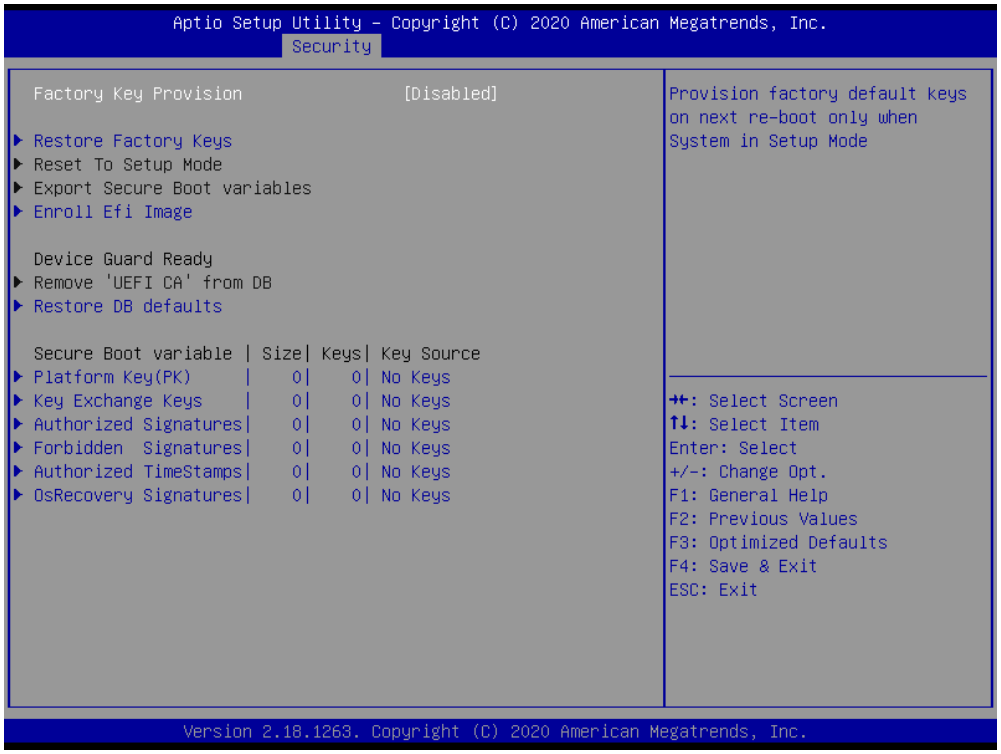
3.6.4.1 Secure Boot





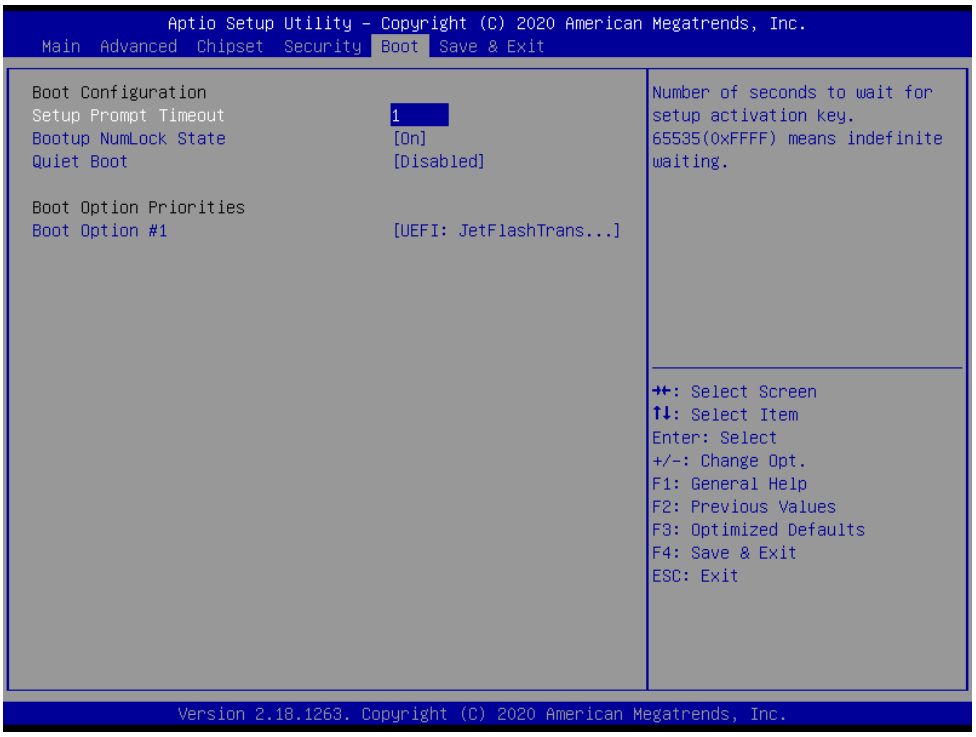
Item	Option	Description
Secure Boot	Disabled**[Default]** Enabled	Secure Boot activated when: Secure Boot is enabled Platform Key(PK) is enrolled, System mode is User/Deployed, and CSM is disabled.
Secure Boot Customization	Standard Custom**[Default]**	Secure Boot mode – Custom_Standard, Set UEFI Secure Boot Mode to STANDARD mode or CUSTOM mode, this change is effect after save. And after reset, the mode will return to STANDARD mode.

3.6.4.1.1 Key Management



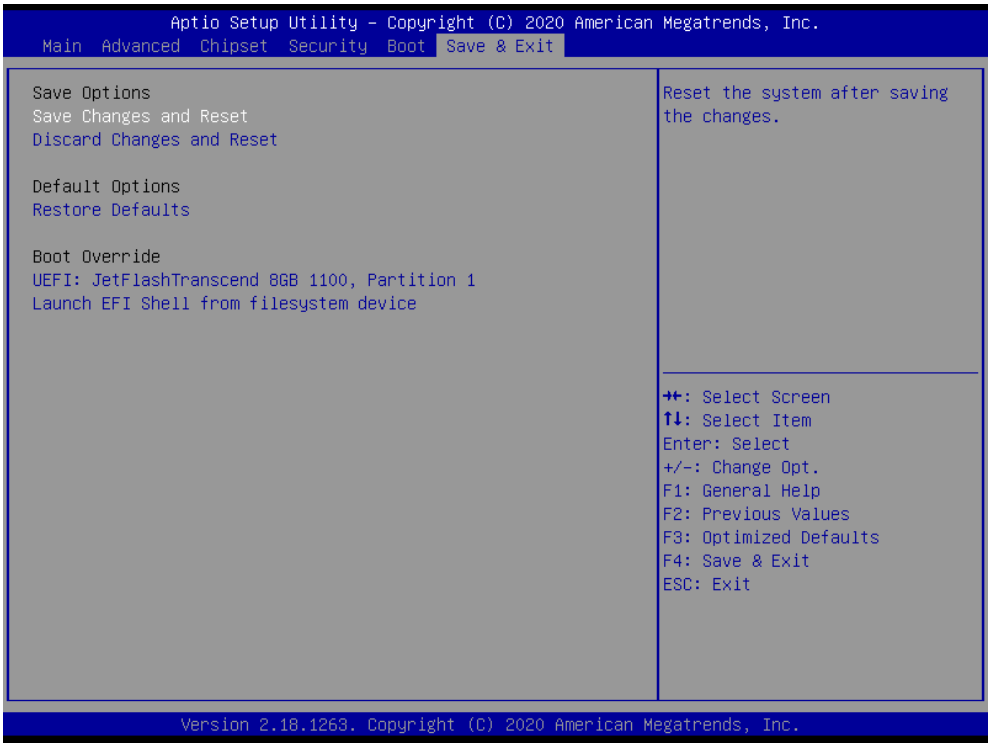
Item	Option	Description
Factory Key Provision	Disabled**[Default]** Enabled	Provision factory default keys on next re-boot only when System in Setup Mode.

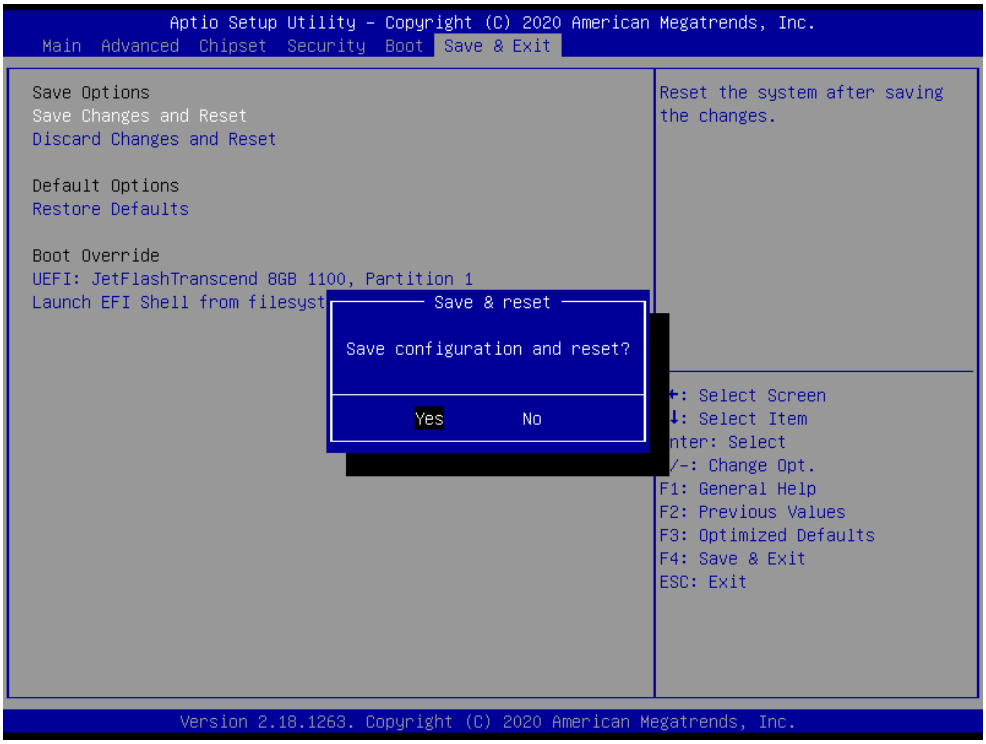
3.6.5 Boot



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
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

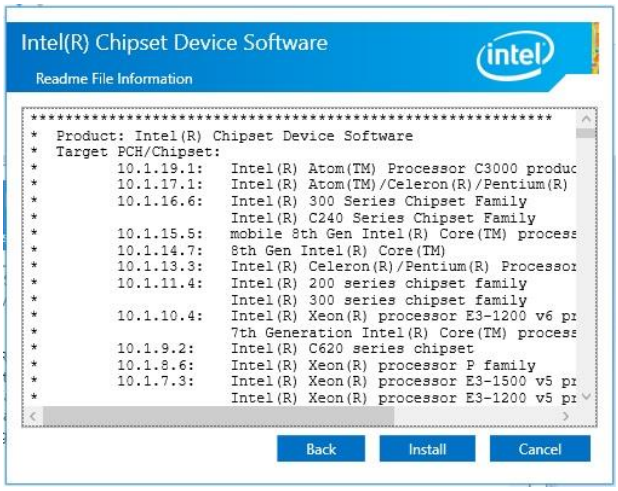
Attempts to Launch EFI Shell application (Shell.efi) from one of the available filesystem devices.

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

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



Step 3. Click **Install**.

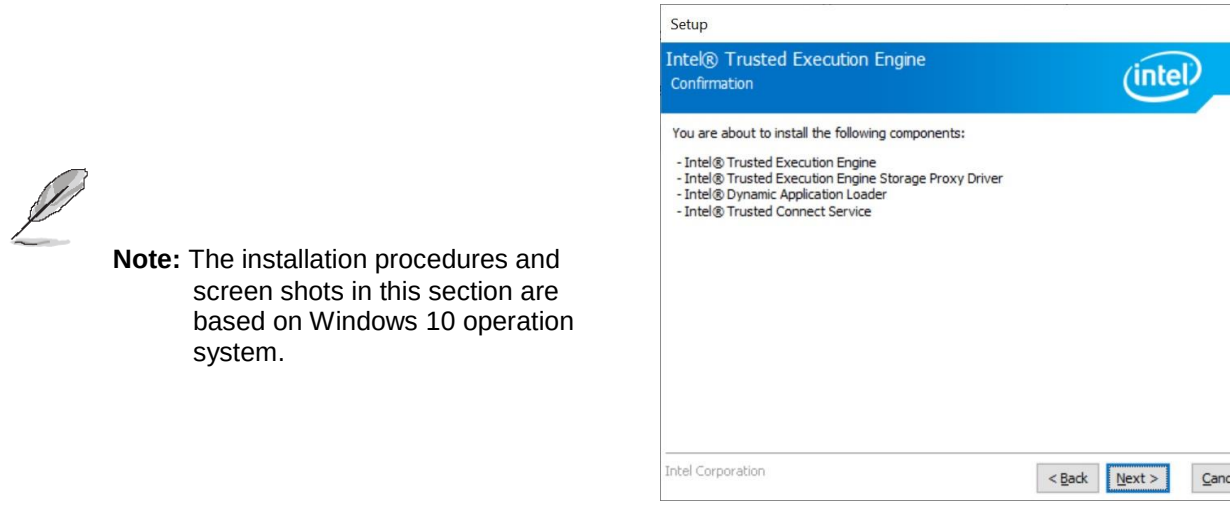
Step1. Click **Next**.

Step 4. Setup completed

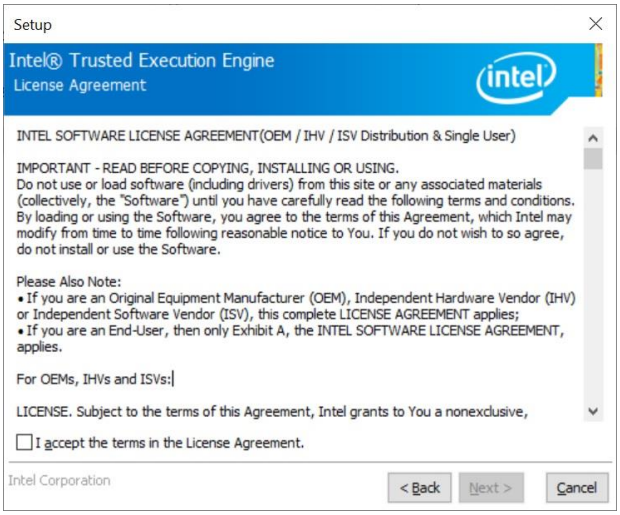
Step 2. Click **Accept**.

4.2 Install TXE Driver

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

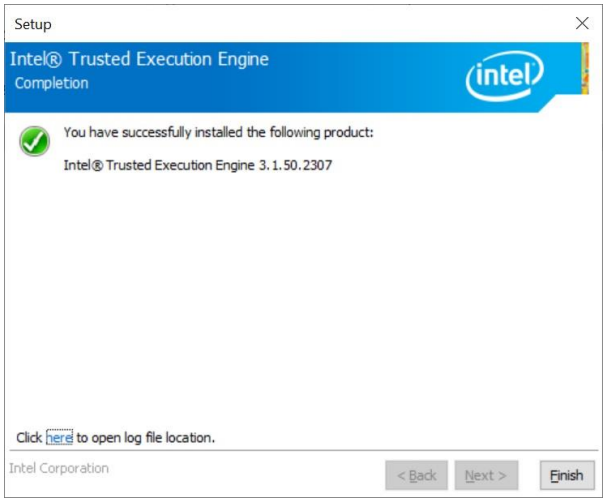


Step1. Click **Next** to start installation.



Step 2. Click **Next**.

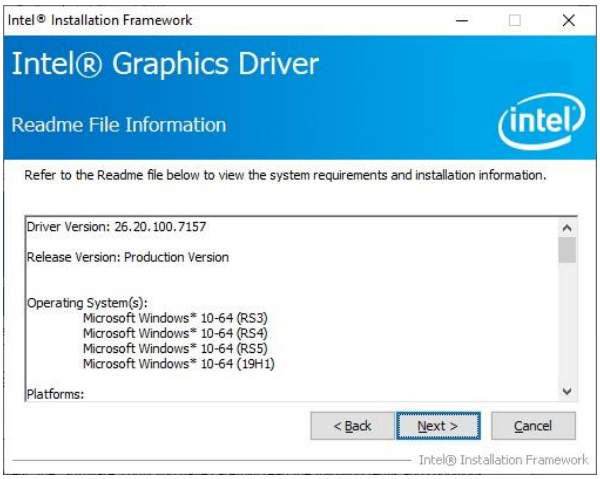
Step 3. Click **Next** to continue installation.



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

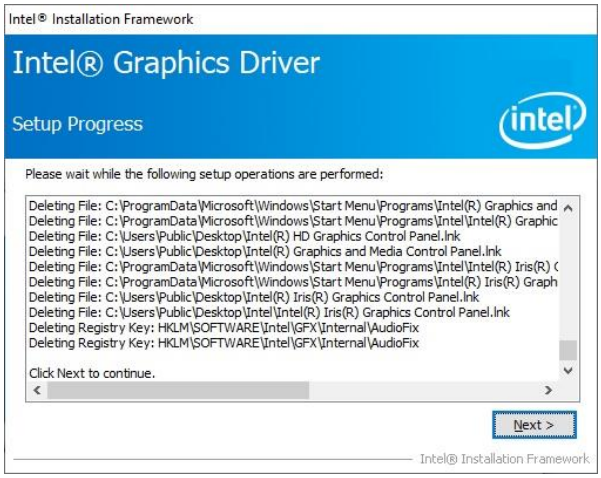
4.3 Install VGA Driver

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

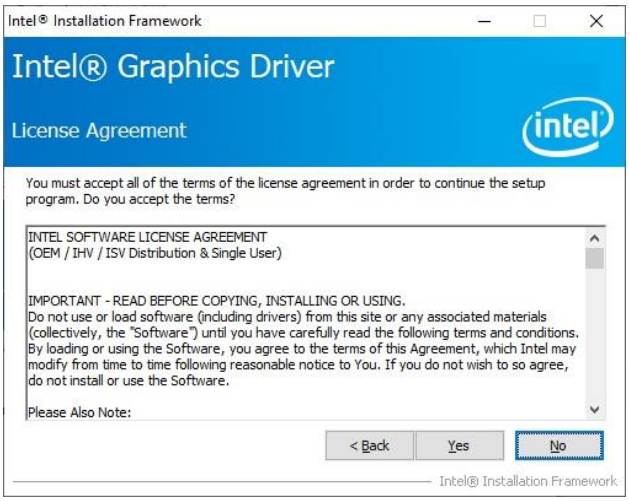


Step 3. Click **Next.**

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

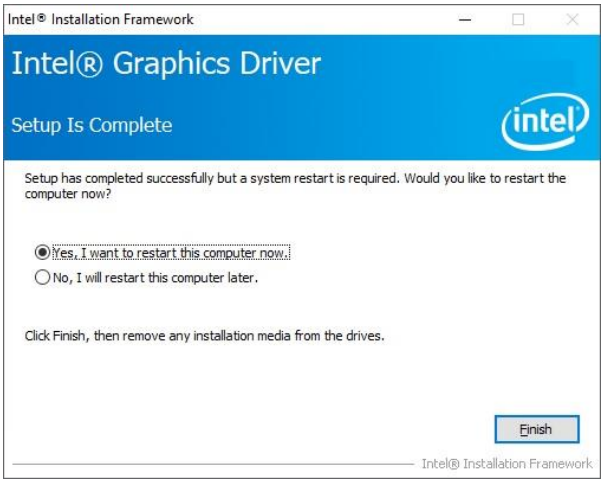


Step 4. Click **Next**.



Step 2.

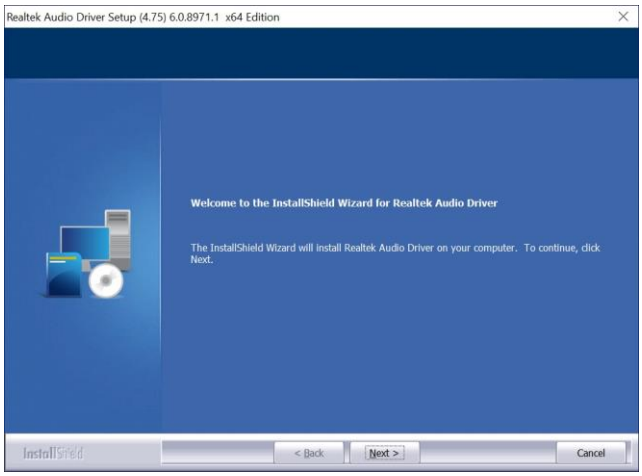
Click **Yes** to accept license agreement.



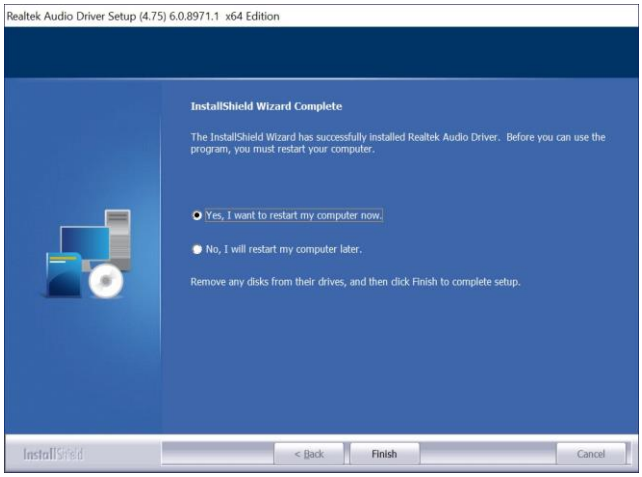
Step 5. Click **Finish** to complete setup.

4.4 Install Audio Driver (For Realtek ALC892)

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



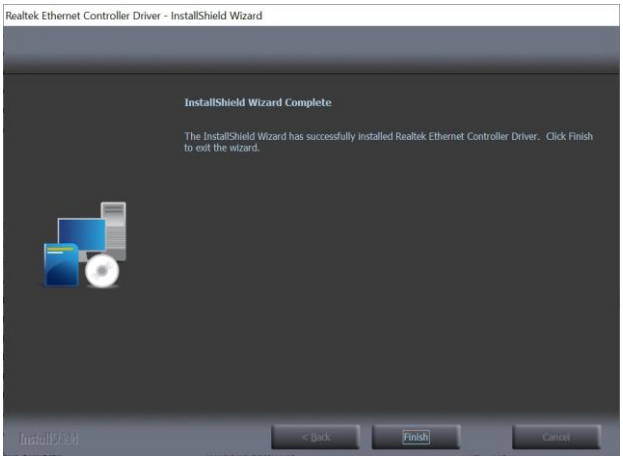
Step 1. Click **Next** to continue setup.



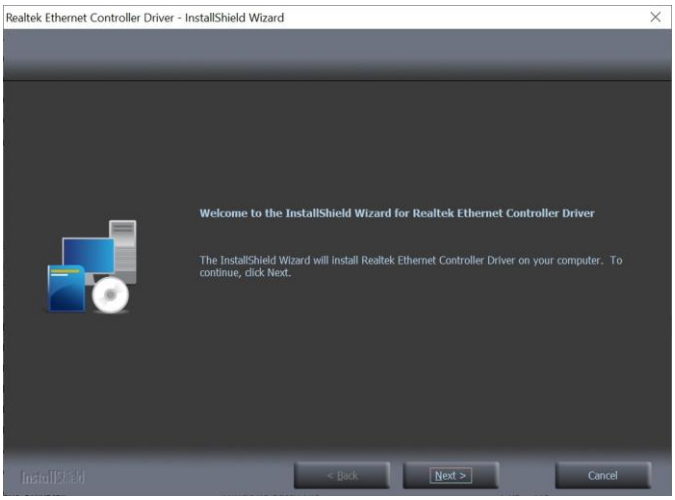
Step 2. Click **Finish** to complete the setup.

4.5 Install Gigabit Driver

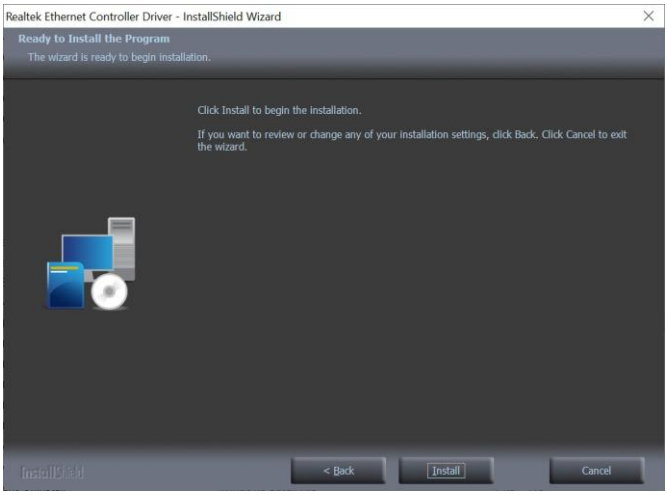
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system.



Step 3. Click **Finish** to complete the setup.



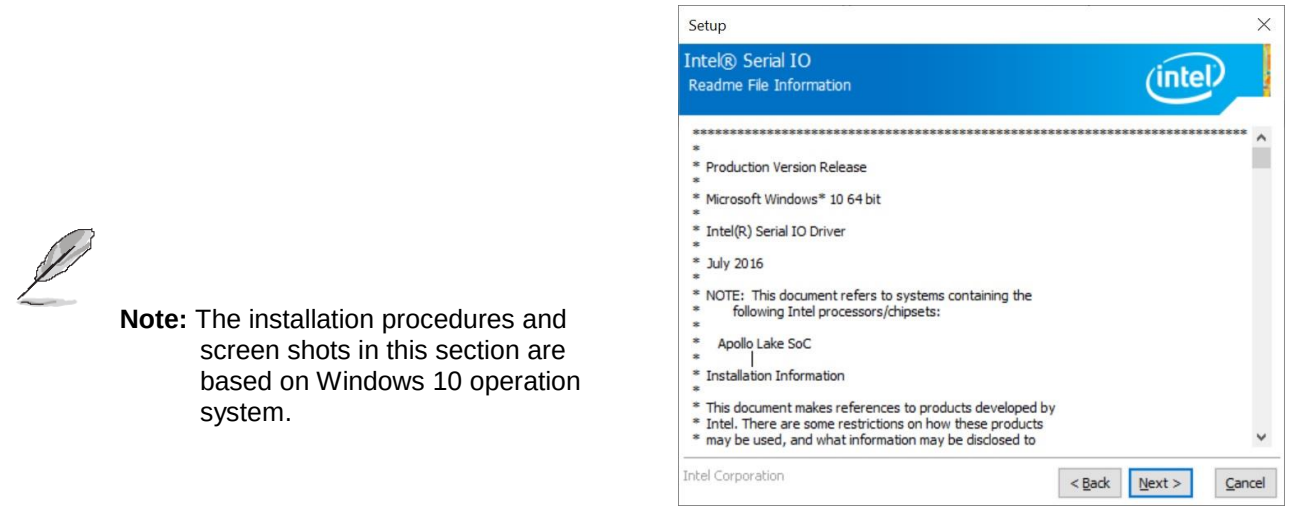
Step 1. Click **Next**.



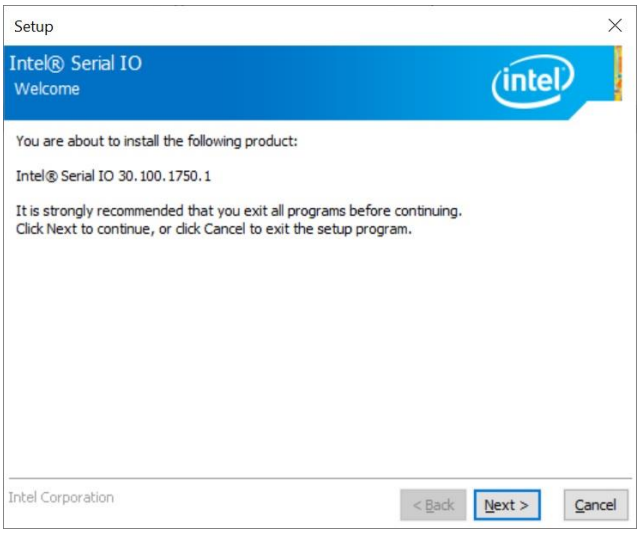
Step 2. Click **Install**.

4.6 Install Serial IO Driver

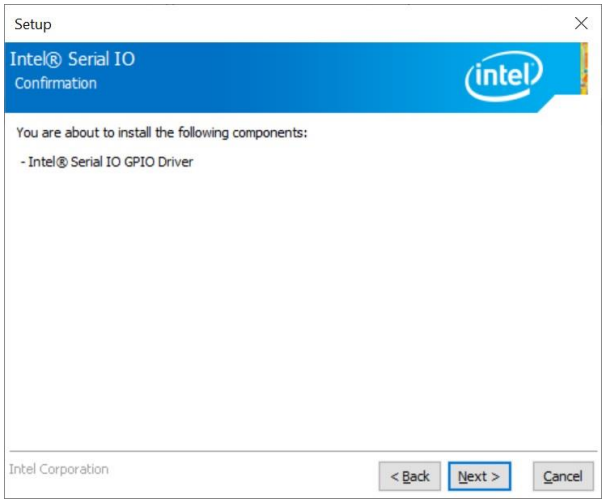
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system.



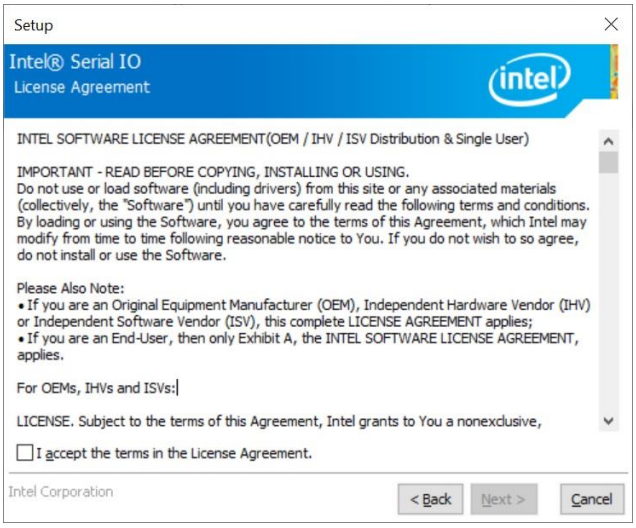
Step 3. Click **Next**.



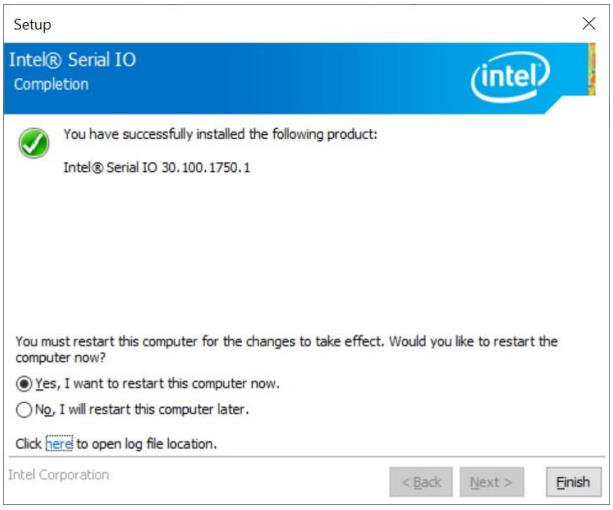
Step 1. Click **Next**.



Step 4. Click **Next** to proceed.



Step 2. Click **Next**.



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