EQM-APL

Intel® Pentium ® /Celeron® /Atom™ SoC processor Qseven Module

User's Manual

2nd Ed – 23 May 2017

Part No.E2047400001R

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 EQM-APL Intel® Pentium ® /Celeron® /Atom™ SoC processor Qseven Module
- 1 x Driver/Utility DVD-ROM

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

1.3 Document Amendment History

Revision	Date	By	Comment
1st	March 2017		Initial Release
2nd	May 2017		Update 1.5 System Specifications

1.4 Manual Objectives

This manual describes in details EQM-APL QSeven version 2.1 Module.

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 EQM-APL QSeven Module 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

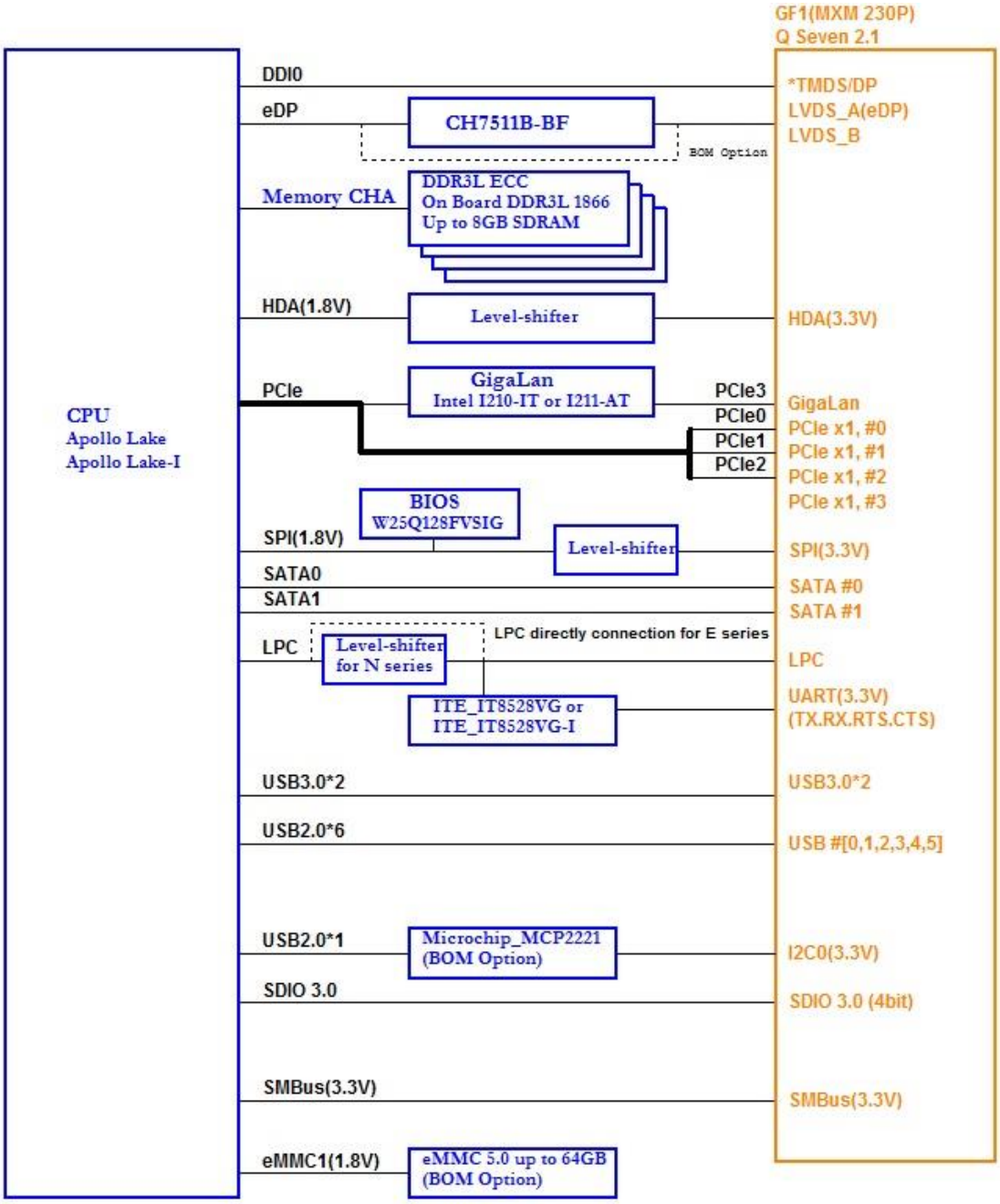
System	
CPU	Apollo Lake Intel® Pentium® Processor N4200 4C 1.1 GHz Intel® Celeron® Processor N3350 2C 1.1 GHz Apollo Lake-I(wide temperature) Intel® Atom™ Processor x7 E3950 4C 1.6 GHz Intel® Atom™ Processor x5 E3930 4C 1.6 GHz Intel® Atom™ Processor x5 E3930 2C 1.3 GHz
BIOS	AMI uEFI BIOS, 128Mbit SPI Flash ROM
System Chipset	Apollo Lake SoC integrated
I/O Chipset	EC (IT8528VG or IT8528VG-I)
System Memory	Onboard DDR3L 1866 4GB up to 8GB, supports ECC (Factory Option)
Watchdog Timer	H/W Reset, 1sec. ~ 65535sec. and 1sec./step
H/W Status Monitor	Monitoring system temperature, voltage. Auto trotting control when CPU CPU temperature monitoring V-Core Voltages monitoring VDDQ Voltage monitoring
I/O	
PCIe	3 PCIe (3 x PCIe x1)
USB	6 x USB 2.0; 2 x USB3.0
SATA	2 x SATAIII
eMMC	1 x eMMC 5.0 onboard flash up to 64GB(Factory Option) (eMMC5.1 device not support wide Temp.)
SDIO	1 x SD CARD (SDIO 3.0) (4-bit)
Others	1 x SPI, 1 X USB-to-I2C (Option) Bus, 1 x UART, 1 x SMBus, 1 x LPC Bus
Display	
Chipset	Apollo lake SoC integrated Graphics
LCD	LVDS support 2 channels 18/24-bit, up to 1920x1200@60H (Chrontel® CH7511B), Optional eDP 1.3 up to 4096x2160@60Hz
DDI	1 Port, optional configurable to HDMI 1.4b(TMDS)/DP1.2 HDMI up to 3840x2160 @30Hz, Optional DP up to 4096x2160 @60Hz
Multiple Display	LVDS or eDP(Factory Option), HDMI or Display Port
Audio	
Chipset	Intel® Apollo lake SoC integrated
Audio interface	Audio High Definition Audio (HDA) interface with support for multiple

	codecs
Ethernet	
LAN Chip	Intel I211AT or I210IT Gigabit Ethernet
Ethernet Interface	10/100/1000 GbE
Mechanical & Environmental	
Power Requirement	+5V±5%
ACPI	Single power ATX Support S0, S3, S4, S5 ACPI 5.0 Compliant
Power Type	Qseven power spec
Operating Temp.	Standard Supports 0°C ~ 70°C (N4200/N3350) Extended Supports -40°C ~ 85°C (E3900 series)
Storage Temp.	-40°C to 85°C
Operating Humidity	0%~90% relative humidity, non-condensing
Size (L x W)	Compact Size: 70*70 mm (2.75'x 2.75')
Weight	0.041lbs(0.03kg)
OS	Win10(64 bit)/ Linux (64 bit)/ Android(64 bit)

Note: Specifications are subject to change without notice.

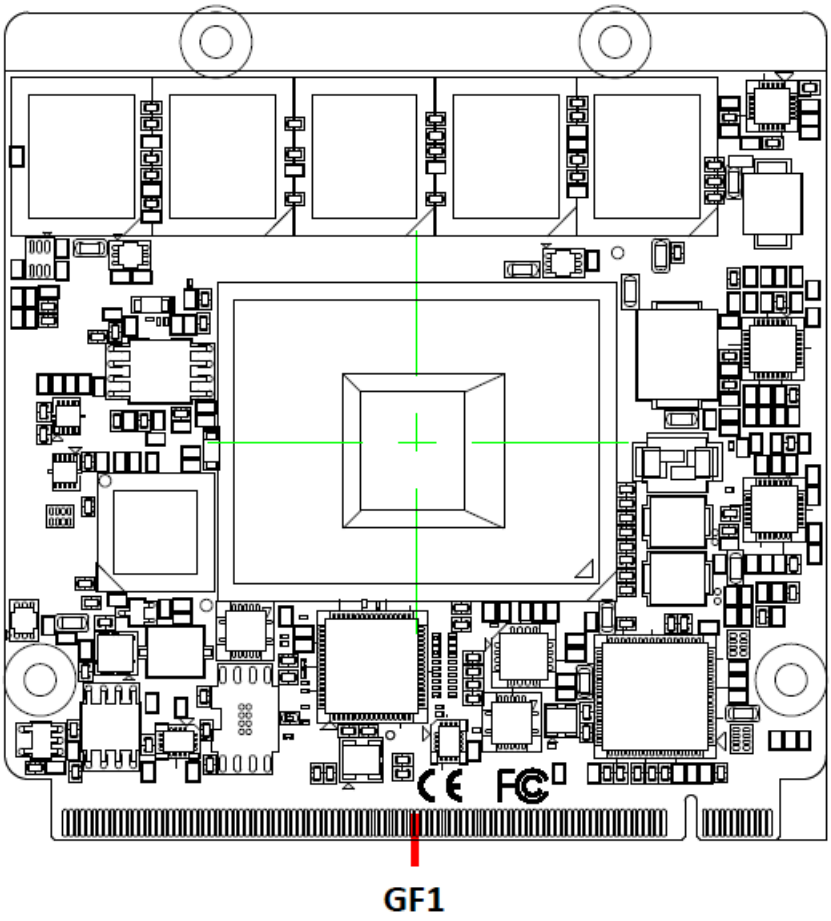
1.6 Architecture Overview—Block Diagram

The following block diagram shows the architecture and main components of EQM-APL QSeven Module.



2. Hardware Configuration

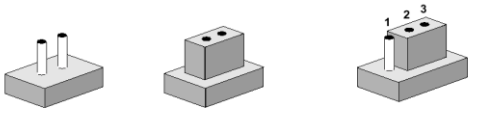
2.1 Product Overview



2.2 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.



Open Closed Closed 2-3

The jumper settings are schematically depicted in this manual as follows:

Open Closed Closed 2-3

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.

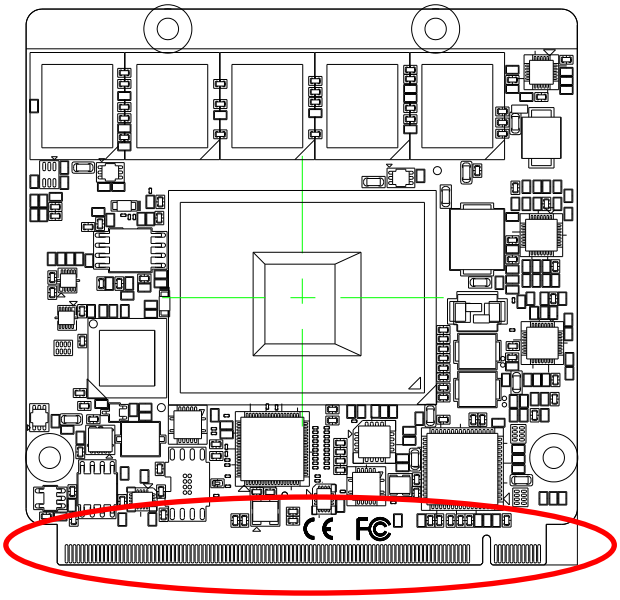
The following tables list the function of each of the board's jumpers and connectors.

Connectors

Label	Function	Note
GF1	QSeven connector	Pin Definition follows QSeven version 2.1

2.3 Setting Connectors

2.3.1 QSeven connector (GF1)



Note:

Pin Definition follows QSeven version 2.1.

Signal	PIN	PIN	Signal
GND	1	2	GND
LAN1_MDI3N_n	3	4	LAN1_MDI2N_n
LAN1_MDI3P_n	5	6	LAN1_MDI2P_n
LAN1_LED_100#_n	7	8	LAN1_LED_1000#_n
LAN1_MDI1N_n	9	10	LAN1_MDI0N_n
LAN1_MDI1P_n	11	12	LAN1_MDI0P_n
LAN1_LINK#	13	14	LAN1_LED_ACT_n
NC	15	16	PCH_SUS_S5#
WAKE#	17	18	PCH_SLP_S3#
PMU_SUS_STAT#	19	20	PWR_BTN_IN
NC	21	22	NC
GND	23	24	GND
GND	25	26	PWGIN
PMU_BATLOW#	27	28	PMU_RSTBTN#
SATA_TXP_0	29	30	SATA_TXP_1
SATA_TXN_0	31	32	SATA_TXN_1
SATA_LED#	33	34	GND
SATA_RXP_0	35	36	SATA_RXP_1
SATA_RXN_0	37	38	SATA_RXN_1

Signal	PIN	PIN	Signal
GND	39	40	GND
BIOS_DISABLE#	41	42	SDIO_CLK#
SDIO_CLK#	43	44	NC
SDIO_CMD	45	46	SDIO_WP
SDIO_PWR#	47	48	SDIO_DAT1
SDIO_DAT0	49	50	SDIO_DAT3
SDIO_DAT2	51	52	NC
NC	53	54	NC
NC	55	56	USB_DRIVE_VBUS
GND	57	58	GND
HDA_SYNC	59	60	SMB_SCL_S5
HDA_RST#	61	62	SMB_SDA_S5
HDA_BCLK	63	64	SMB_ALERT#_S5
HDA_SDI	65	66	I2C0_CLK
HDA_SDO	67	68	I2C0_DATA
THRM#	69	70	WDTRIG#
THRMTRIP	71	72	WDTO
GND	73	74	GND
SS_USB_TXN_0	75	76	SS_USB_RXN_0
SS_USB_TXP_0	77	78	SS_USB_RXP_0
USB_OC#	79	80	USB_OC#
USB_DN_5	81	82	USB_DN_4
USB_DP_5	83	84	USB_DP_4
USB_OC#	85	86	USB_OC#
USB_DN_3	87	88	USB_DN_2
USB_DP_3	89	90	USB_DP_2
USB_VBUS	91	92	USB_ID
USB_DN_0_OTG	93	94	USB_DN_1
USB_DP_0_OTG	95	96	USB_DP_1
GND	97	98	GND
eDP0_TX0+ / LVDS_A0+	99	100	LVDS_B0+
eDP0_TX0- / LVDS_A0-	101	102	LVDS_B0-
eDP0_TX1- / LVDS_A1-	103	104	LVDS_B1+

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Signal	PIN	PIN	Signal
eDP0_TX1- / LVDS_A1-	105	106	LVDS_B1-
eDP0_TX2+ / LVDS_A2+	107	108	LVDS_B2+
eDP0_TX2- / LVDS_A2-	109	110	LVDS_B2-
LVDS_VDDEN	111	112	LVDS_BKLTEN
eDP0_TX3+ / LVDS_A3+	113	114	LVDS_B3+
eDP0_TX3- / LVDS_A3-	115	116	LVDS_B3-
GND	117	118	GND
eDP0_AUX+ / LVDS_A_CLK+	119	120	LVDS_B_CLK+
eDP0_AUX- / LVDS_A_CLK-	121	122	LVDS_B_CLK-
LVDS_BLT_CTRL	123	124	NC
NC	125	126	eDP0_HPD#
NC	127	128	NC
NC	129	130	NC
DDI0_P3	131	132	SS_USB_TXN_1
DDI0_N3	133	134	SS_USB_TXP_1
GND	135	136	GND
DDI0_P1	137	138	DP_AUXP
DDI0_N1	139	140	DP_AUXN
GND	141	142	GND
DDI0_P2	143	144	SS_USB_RXN_1
DDI0_N2	145	146	SS_USB_RXP_1
GND	147	148	GND
DDI0_P0	149	150	HDMI_CTRL_DAT
DDI0_N0	151	152	HDMI_CTRL_CLK
HDMI_HPD#	153	154	DP_HPD#
CLK_PCIE_P0	155	156	PCIE_WAKE#
CLK_PCIE_N0	157	158	PCIE_RST#
GND	159	160	GND
NC	161	162	NC
NC	163	164	NC
GND	165	166	GND
PCIE_TXP_2	167	168	PCIE_RXP_2
PCIE_TXN_2	169	170	PCIE_RXN_2

Signal	PIN	PIN	Signal
UART_TXD_1	171	172	UART_RTS#_1
PCIE_TXP_1	173	174	PCIE_RXP_1
PCIE_TXN_1	175	176	PCIE_RXN_1
UART_RXD_1	177	178	UART_CTS#_1
PCIE_TXP_0	179	180	PCIE_RXP_0
PCIE_TXN_0	181	182	PCIE_RXN_0
GND	183	184	GND
LPC_AD0	185	186	LPC_AD1
LPC_AD2	187	188	LPC_AD3
LPC_CLK	189	190	LPC_FRAME#
LPC_SERIRQ	191	192	NC
VCC_RTC	193	194	SPKR
FAN_TACHOIN	195	196	FAN_PWMOUT
GND	197	198	GND
SPI_MOSI	199	200	SPI_CS#0
SPI_MISO	201	202	NC
SPI_CLK	203	204	NC
+5VSB	205	206	+5VSB
NC	207	208	NC
NC	209	210	NC
NC	211	212	NC
NC	213	214	NC
NC	215	216	NC
NC	217	218	NC
+5V	219	220	+5V
+5V	221	222	+5V
+5V	223	224	+5V
+5V	225	226	+5V
+5V	227	228	+5V
+5V	229	230	+5V

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

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

Press <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.

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
F9 key	Optimized defaults
F10 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 Insyde BIOS supports an override to the NVRAM settings which resets your system to its defaults.

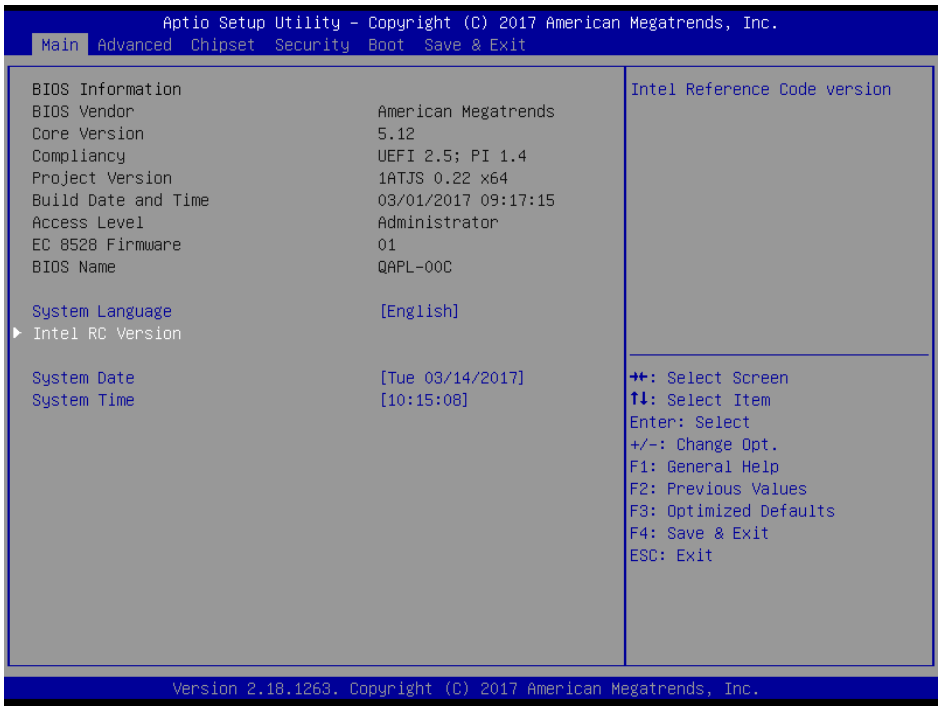
The best advice is to only alter settings which you thoroughly understand. To this end, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both BIOS Vendor and your systems manufacturer to provide the absolute maximum performance 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 InsydeH2O 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

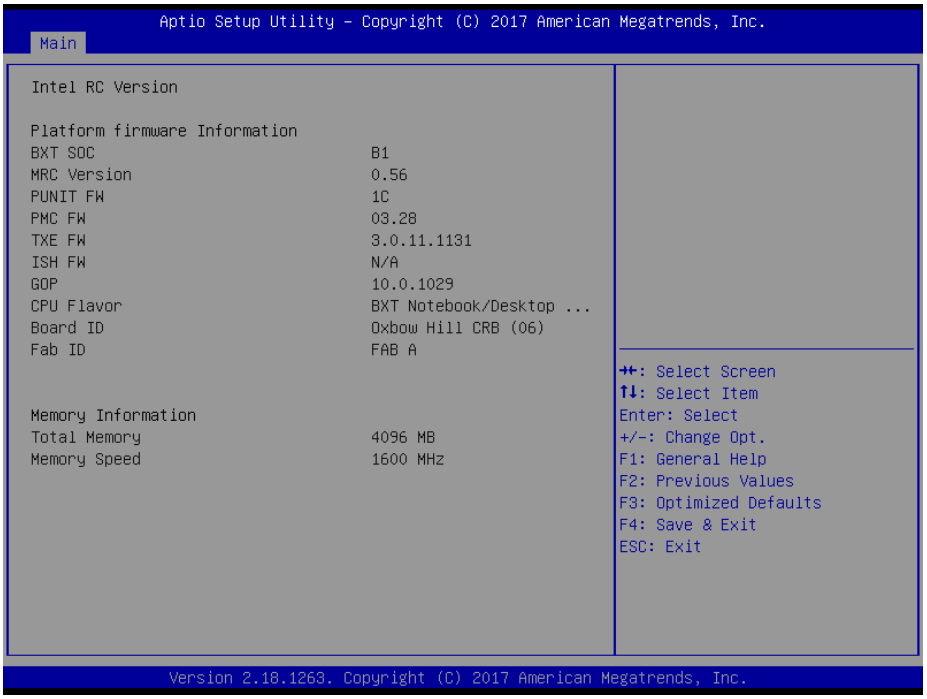
This section allows you to record some basic hardware configurations in your computer and set the system clock.



Item	Description
System Language	Choose the system default language.
System Date	Set the Date. Use Tab to switch between Date elements. Default Ranges: Year: 2005-2009 Months: 1-12 Days: dependent on month.
System Time	Set the Time. Use Tab to switch between Time elements.

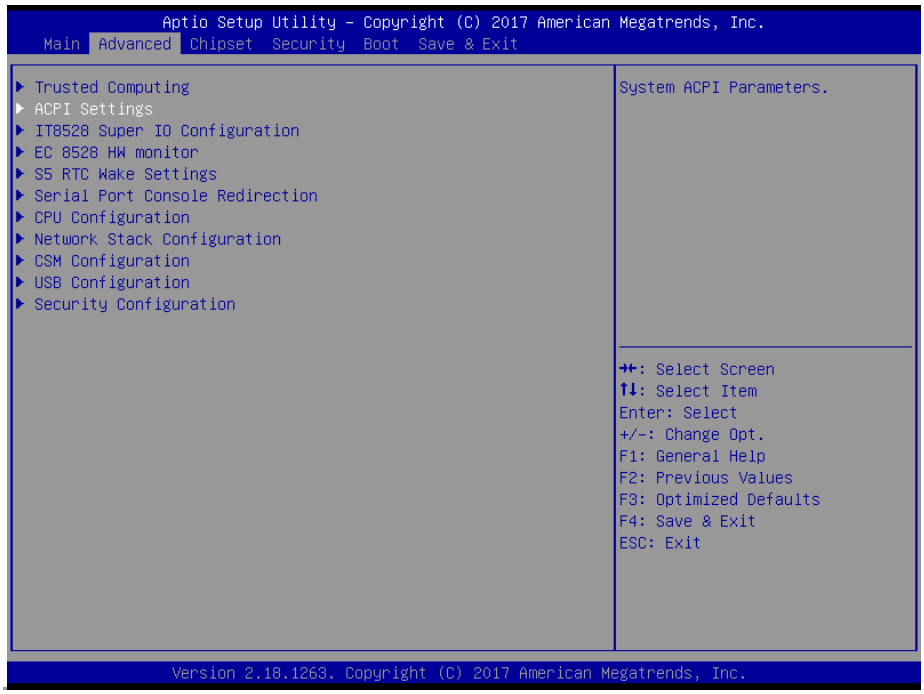
Note: The BIOS setup screens shown in this chapter are for reference purposes only, and may not exactly match what you see on your screen.

3.6.1.1 Intel RC Version

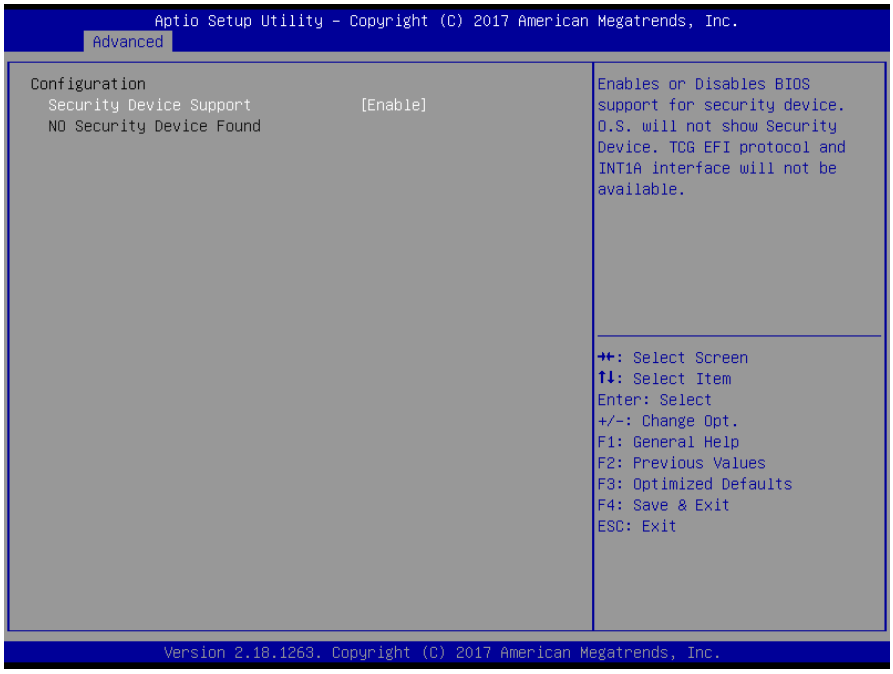


3.6.2 Advanced Menu

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

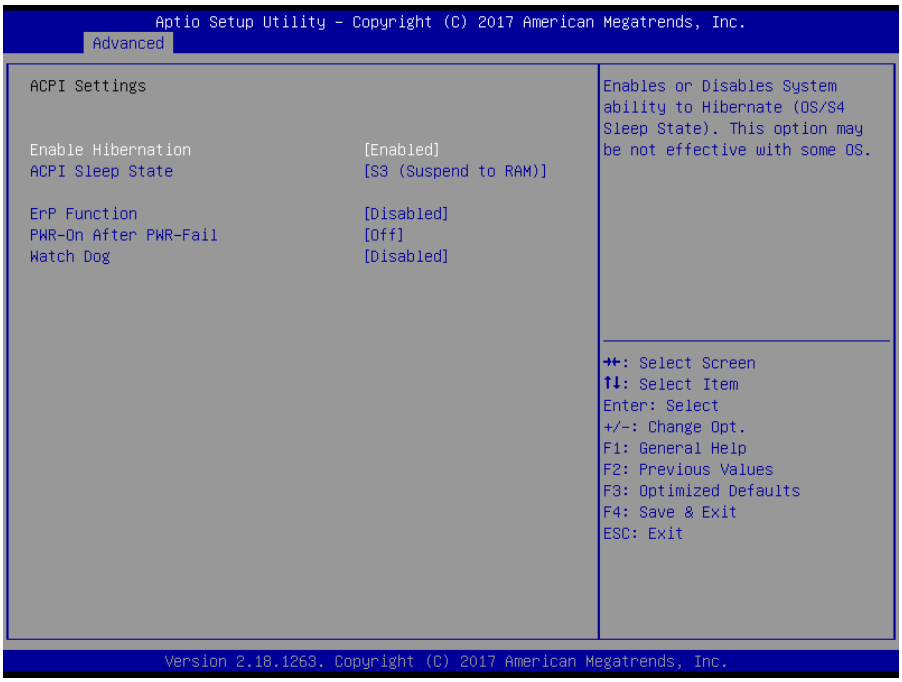


3.6.2.1 Trusted Computing



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 APCI Settings



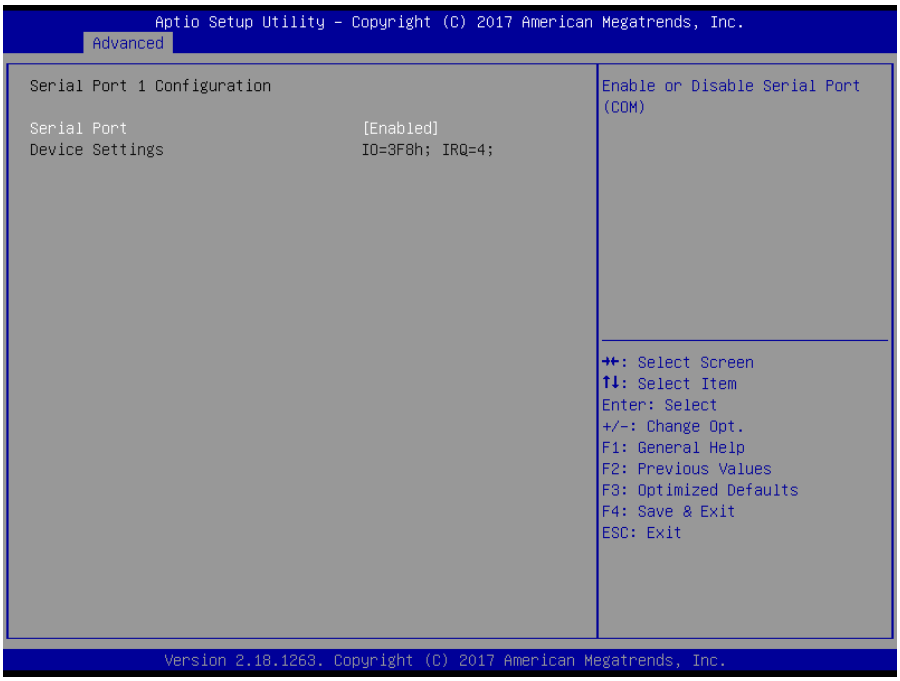
Item	Options	Description
Enable Hibernation	Disabled Enabled**[Default]**	Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.
ACPI Sleep State	Suspend Disabled, S3 (Suspend to RAM) **[Default]**	Select the highest ACPI sleep state the system 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.

3.6.2.3 IT8528 Super IO Configuration

You can use this item to set up or change the IT8528 Super IO configuration for serial ports.

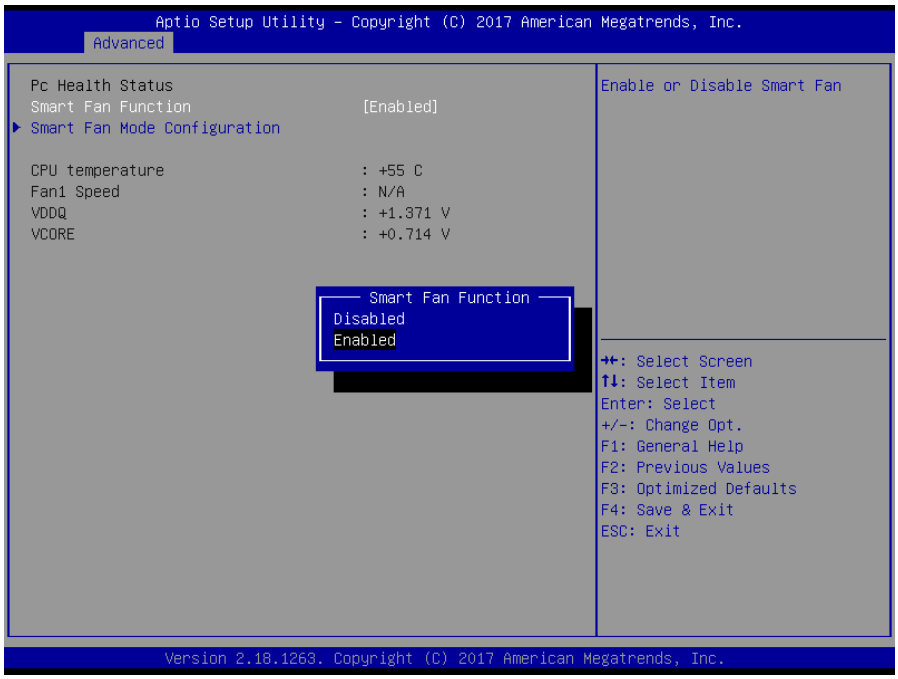
Item	Description
Serial Port 1 Configuration	Set Parameters of Serial Port 1 (COMA).

3.6.2.3.1 Serial Port 1 Configuration



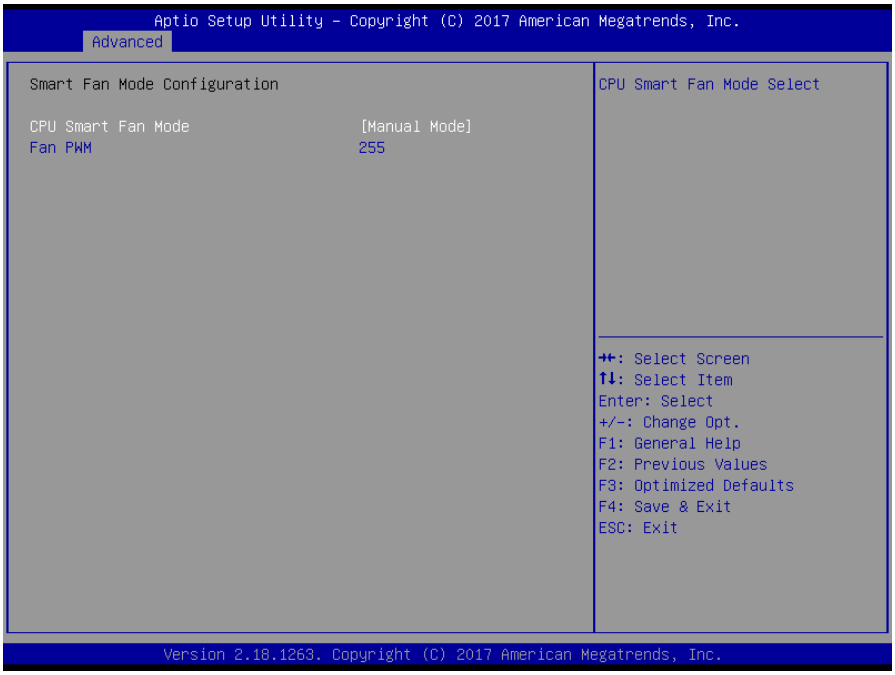
Item	Option	Description
Serial Port	Disabled Enabled**[Default]**	Enable or Disable Serial Port (COM).

3.6.2.4 H/W Monitor



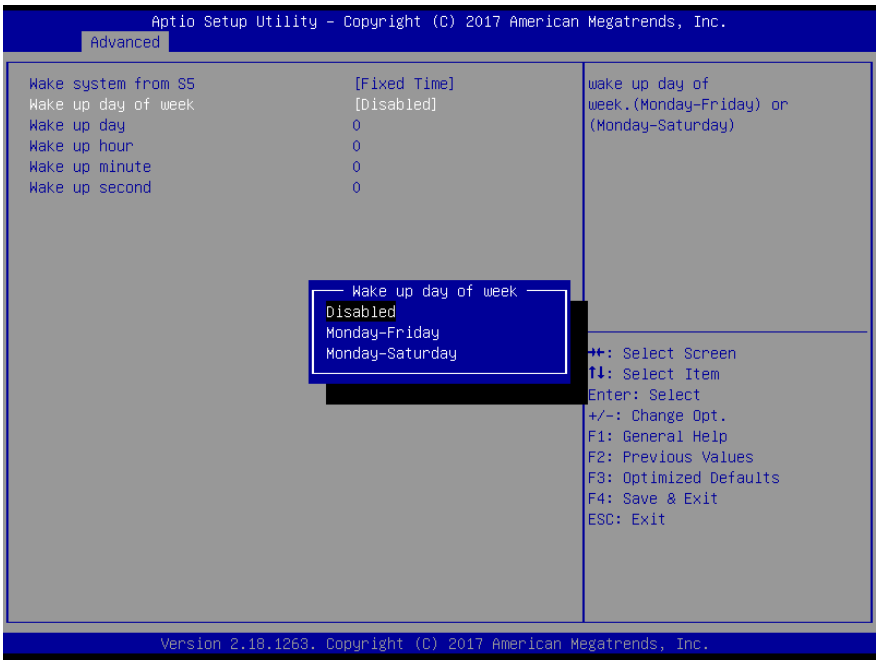
Item	Options	Description
Smart Fan Function	Enabled, Disabled**[Default]**	Enables or Disables Smart Fan.

3.6.2.4.1 Smart Fan Mode Configuration

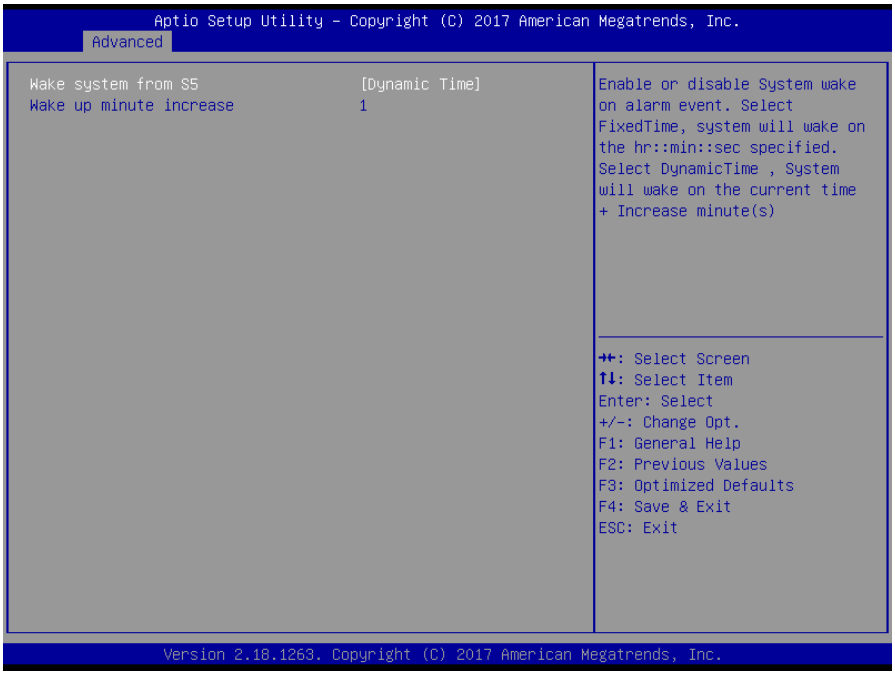


Item	Option	Description
CPU Smart Fan Mode	Manual Mode**[Default]/** Mode 01/Mode 02/Mode 03/Mode 04/Mode 05/ Mode 06/Mode 07/Mode 08/Mode 09/Mode 10/ Mode 11/Mode 12/Mode 13/Mode 14/Mode 15/Mode 16/ Mode 17/Mode 18/Mode 19/Mode 20	CPU Smart Fan Mode Select.
Fan PWM	1-255**[Default]**	Fan PWM duty.

3.6.2.5 S5 RTC Wake Settings

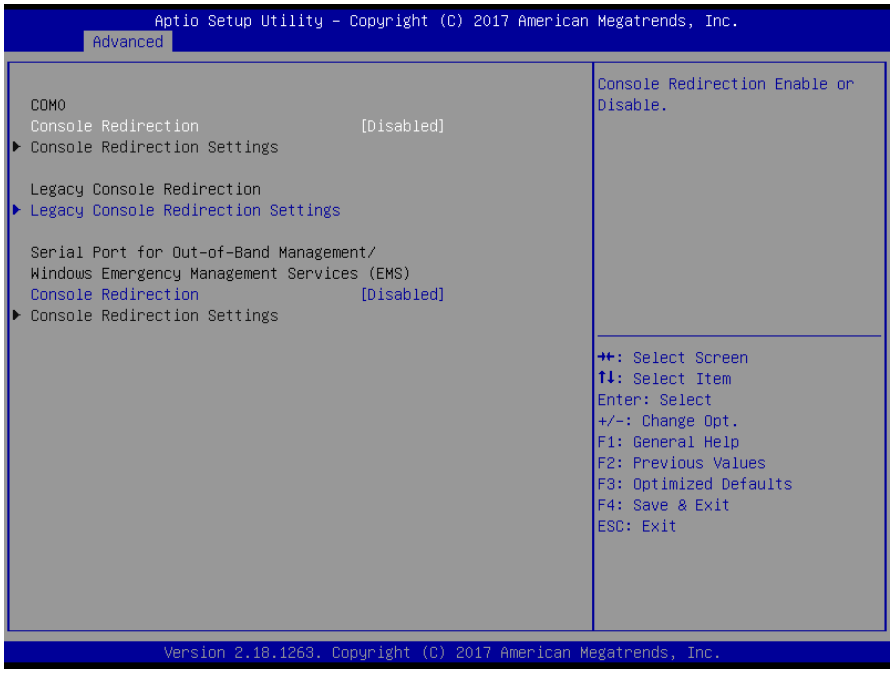


Item	Options	Description
Wake system from S5	Disabled**[Default]**, Fixed Time**(Selected)** Dynamic Time	Enable or disable System wake on alarm event. Select Fixed Time, system will wake on the hr::min::sec specified. Select Dynamic Time, System will wake on the current time + Increase minute(s).
Wake up day of week	Disabled**[Default]** Monday-Friday Monday-Saturday	Wake up day of week. (Monday-Friday) or (Monday-Saturday).
Wake up day	1-31	Select 0 for daily system wake up 1-31 for which day of the month that you would loke the system to wake up.
Wake up hour	0-23	Select 0-23 For example enter 3 for 3am and 15 for 3pm.
Wake up minute	0-23	Select 0-23 For example enter 3 for 3am and 15 for 3pm.
Wake up second	0-23	Select 0-23 For example enter 3 for 3am and 15 for 3pm.



Item	Options	Description
Wake system from S5	Disabled**[Default]**, Fixed Time Dynamic Time**(Selected)**	Enable or disable System wake on alarm event. Select Fixed Time, system will wake on the hr::min::sec specified. Select Dynamic Time, System will wake on the current time + Increase minute(s).
Wake up minute increase	1**[Default]**-5	1-5.

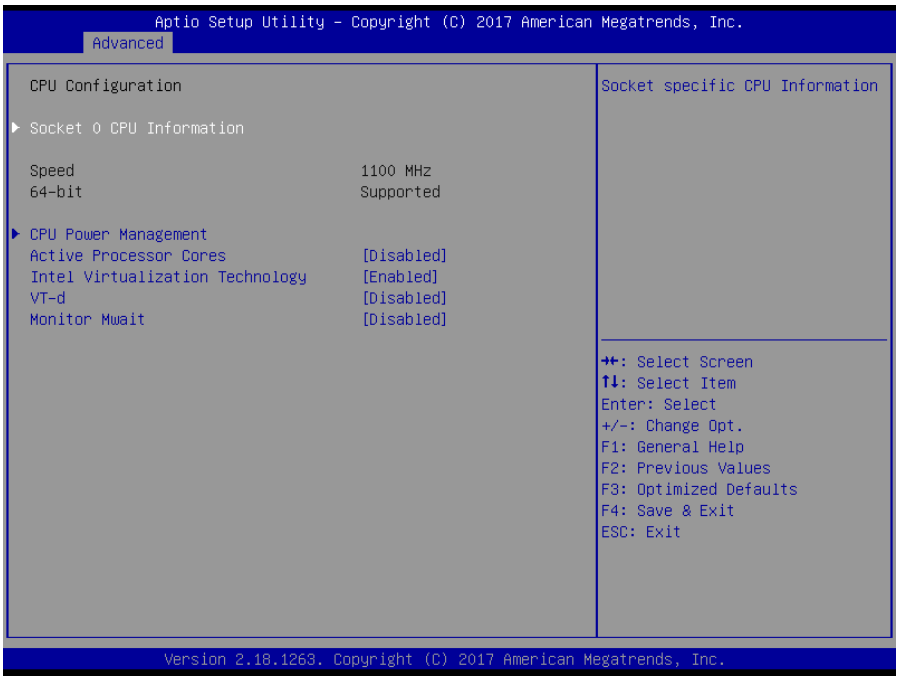
3.6.2.6 Serial Port Console Redirection



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

3.6.2.7 CPU Configuration

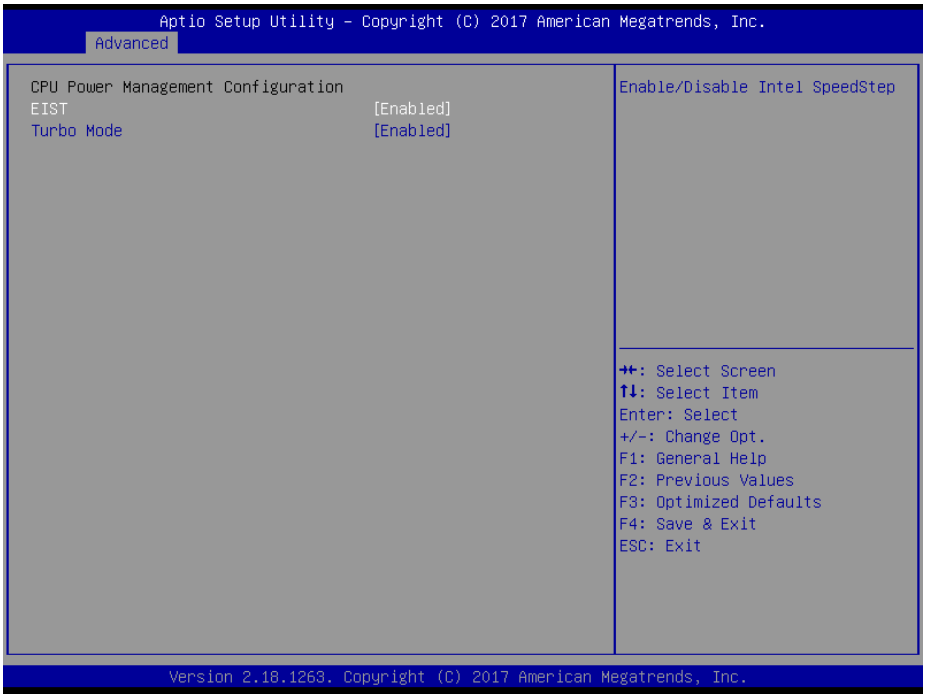
Use the CPU configuration menu to view detailed CPU specification and configure the CPU.



Item	Options	Description
Active Processor Cores	Disabled**[Default]**	Number of cores to enable in each processor

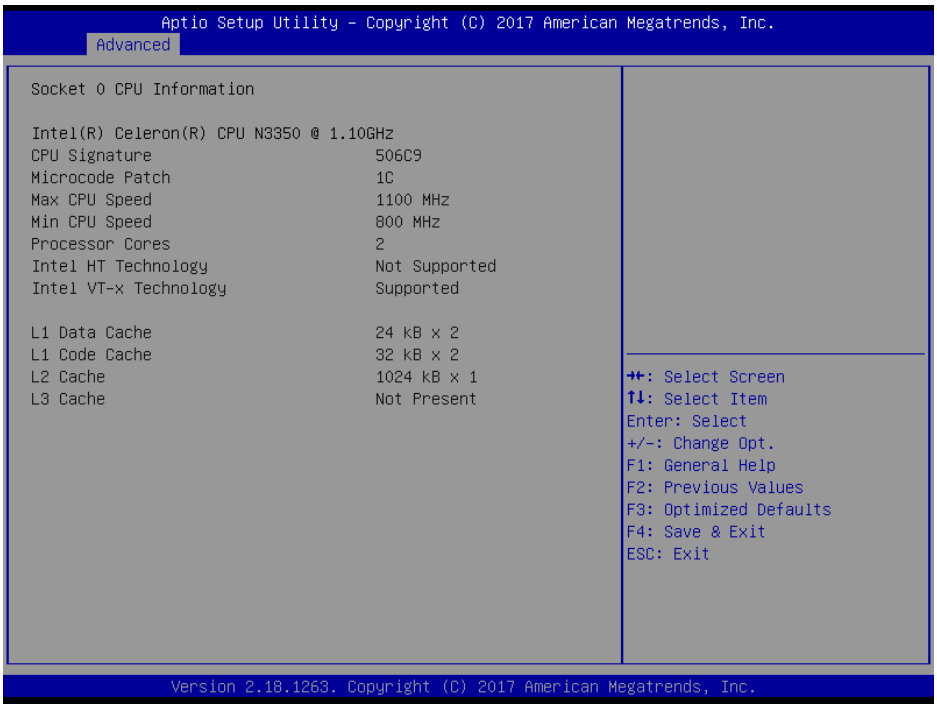
	Enabled	package.
Intel Virtualization Technology	Disabled Enabled**[Default]**	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.
VT-d	Disabled**[Default]** Enabled	Enable/Disable CPU VT-d.
Monitor Mwait	Disabled**[Default]** Enabled Auto	Enable/Disable Monitor Mwait.

3.6.2.7.1 CPU Power Management Configuration

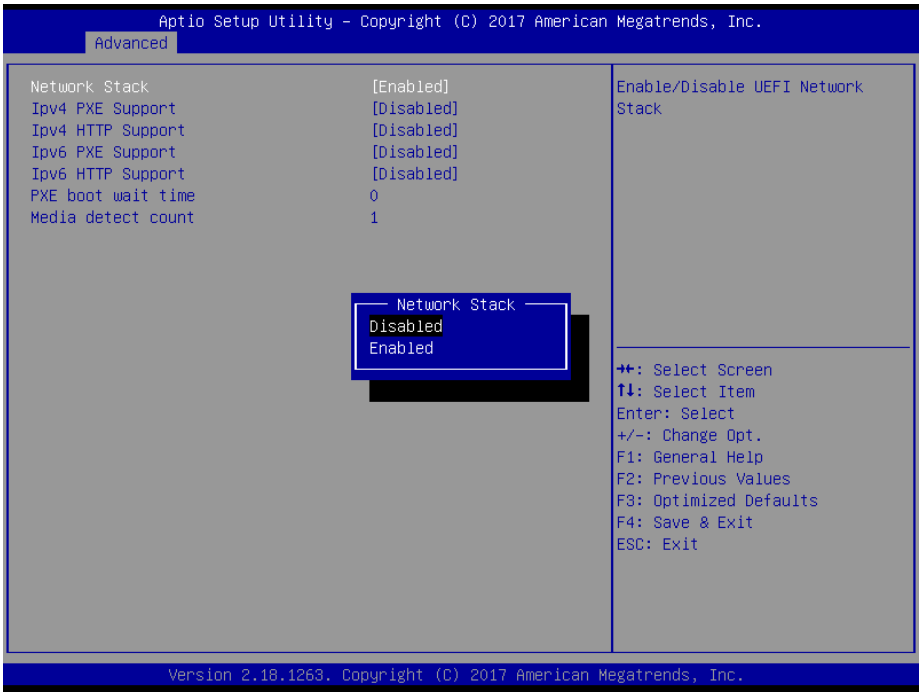


Item	Option	Description
EIST	Disabled Enabled**[Default]**	Enable/Disable Intel SpeedStep.
Turbo Mode	Disabled Enabled**[Default]**	Turbo Mode.

3.6.2.7.2 Socket 0 CPU Information



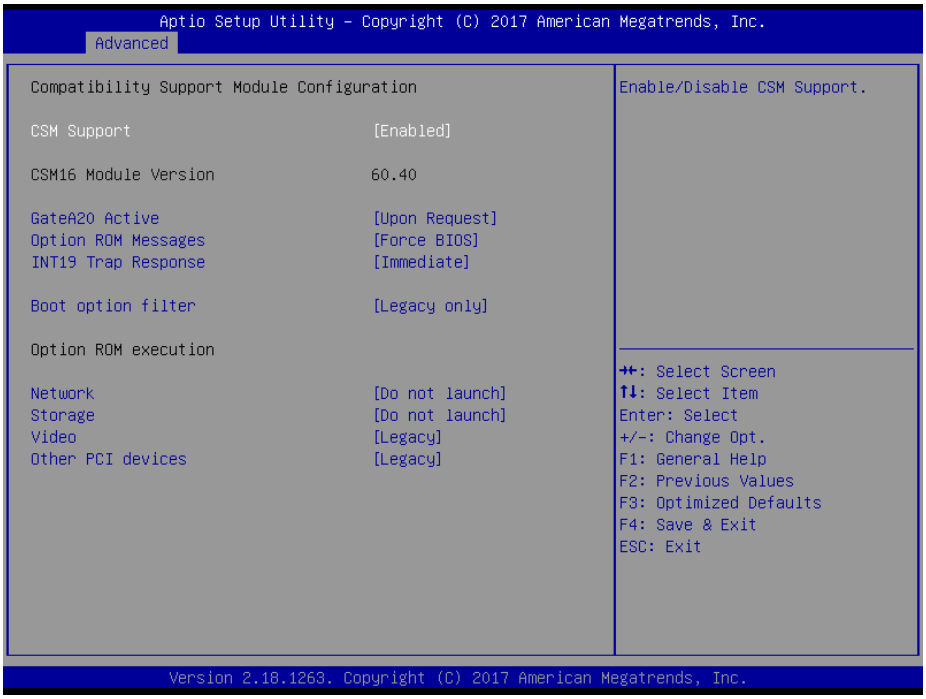
3.6.2.8 Network Stack Configuration



Item	Options	Description
Network Stack	Disabled**[Default]** Enabled	Enable/Disable UEFI Network Stack.
Ipv4 PXE Support	Disabled**[Default]** Enabled	Enable Ipv4 PXE Boot Support. If disabled IPV4 PXE boot option will not be created.

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

3.6.2.9 CSM Configuration

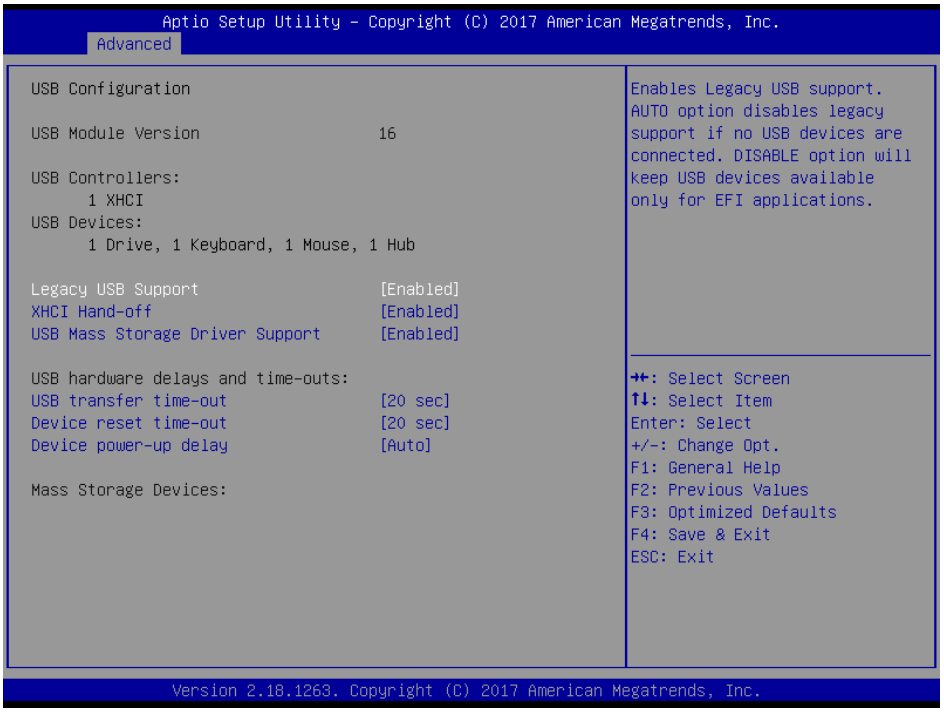


Item	Options	Description
CSM Support	Disabled**[Default]** Enabled	Enable/Disable CSM Support.
GateA20 Active	Upon Request**[Default]** Always	UPON REQUEST – GA20 can be disabled using BIOS services. ALWAYS – do not allow disabling GA20; this option is useful when any RT code is executed above 1MB.
Option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

	UEFI only	
Network	Do not launch**[Default]** UEFI Legacy	Controls the execution of UEFI and Legacy PXE OpROM.
Storage	Do not launch**[Default]** UEFI Legacy	Controls the execution of UEFI and Legacy Storage OpROM.
Video	Do not launch UEFI Legacy**[Default]**	Controls the execution of UEFI and Legacy Video OpROM.
Other PCI devices	Do not launch UEFI Legacy**[Default]**	Determines OpROM execution policy for devices other than Network, Storage, or Video.

3.6.2.10 USB Configuration

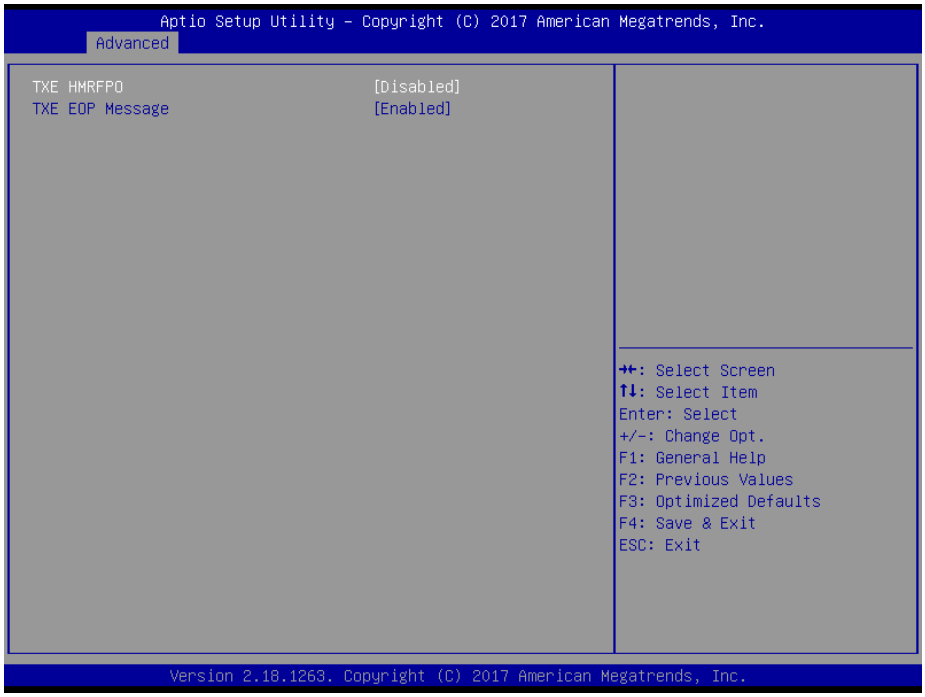
The USB Configuration menu helps read USB information and configures USB settings.



Item	Options	Description
Legacy USB Support	Enabled**[Default]** Disabled Auto	Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.
XHCI Hand-off	Disabled Enabled**[Default]**	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	Disabled Enabled**[Default]**	Enable/Disable USB Mass Storage Driver Support.
USB transfer time-out	1 sec 5 sec 10 sec	The time-out value for Control, Bulk, and Interrupt transfers.

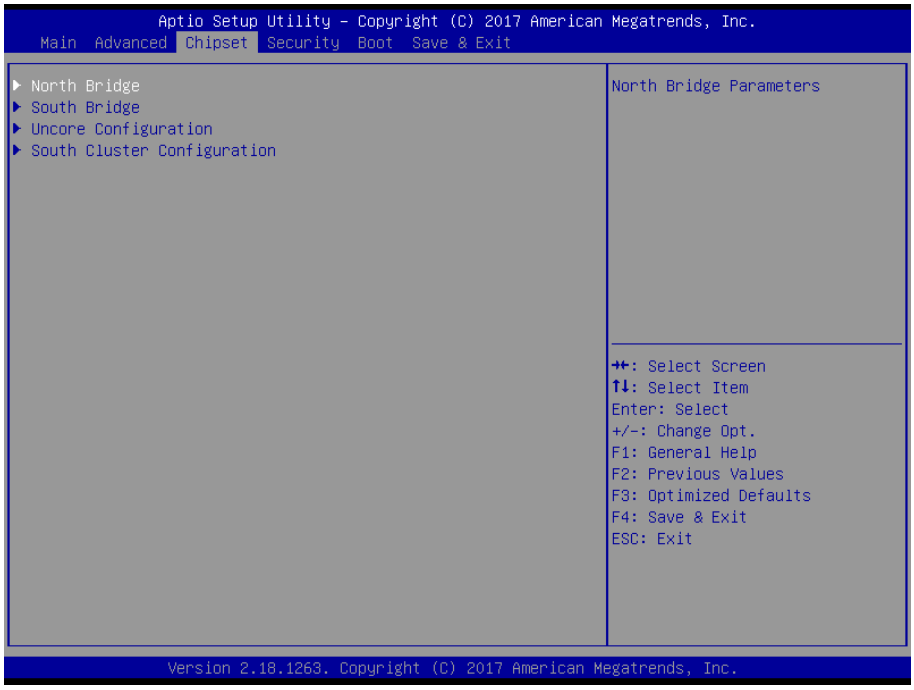
	20 sec**[Default]**	
Device reset time-out	10 sec 20 sec**[Default]** 30 sec 40 sec	USB mass storage device Start Unit command time-out.
Device power-up delay	Auto**[Default]** Manual	Maximum time the device will take before it properly reports itself to the Host Controller. 'Auto' uses default value: for a Root port it is 100ms, for a Hub port the delay is taken form Hub descriptor.

3.6.2.11 Security Configuration



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

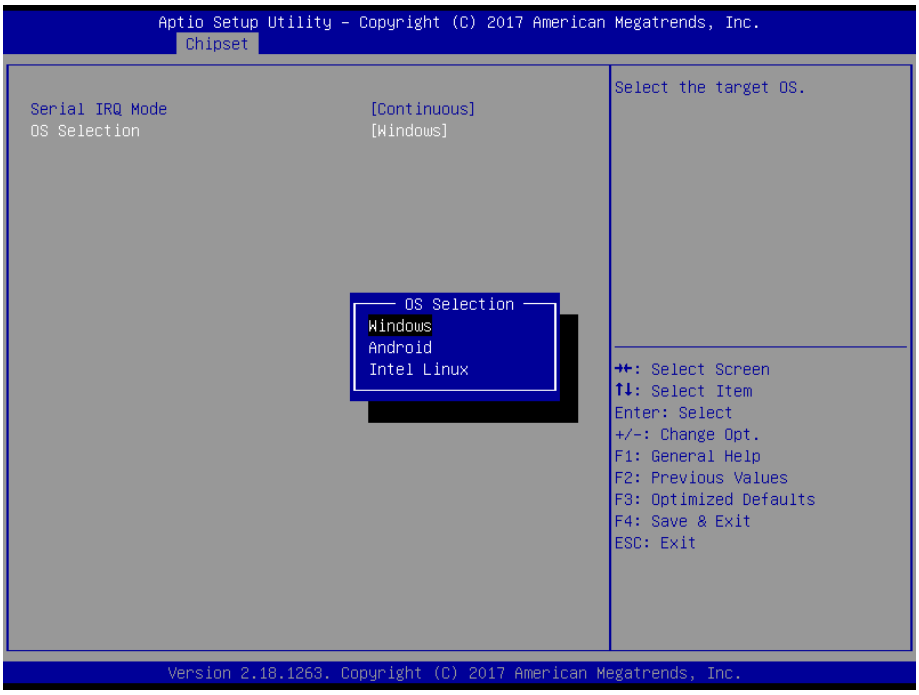
3.6.3 Chipset



3.6.3.1 North Bridge

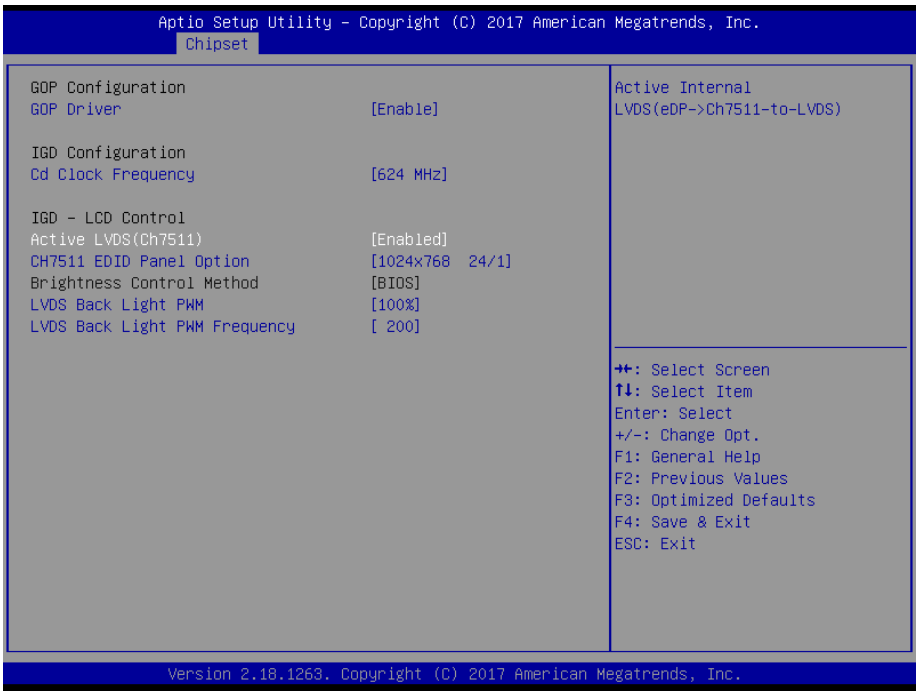
Item	Option	Description
Max TOLUD	2 GB**[Default]** 2.25 GB 2.5 GB 2.75 GB	Maximum Value of TOLUD.

3.6.3.2 South Bridge



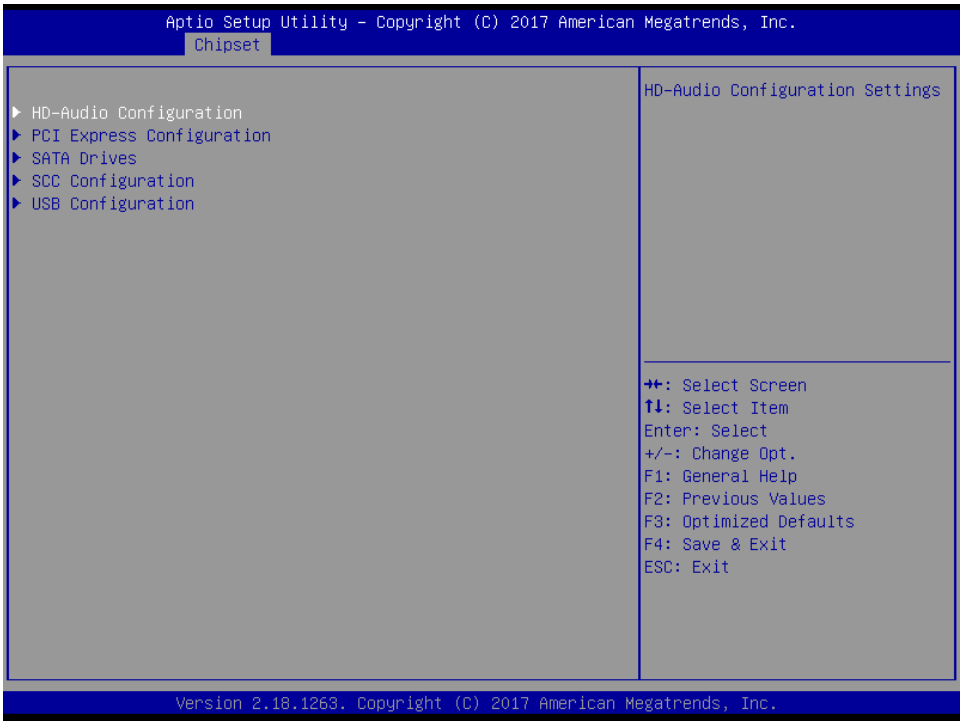
Item	Option	Description
Serial IRQ Mode	Quiet Continuous**[Default]**	Configure Serial IRQ Mode.
OS Selection	Windows**[Default]** Android Intel Linux	Select the target OS.

3.6.3.3 Uncore Configuration

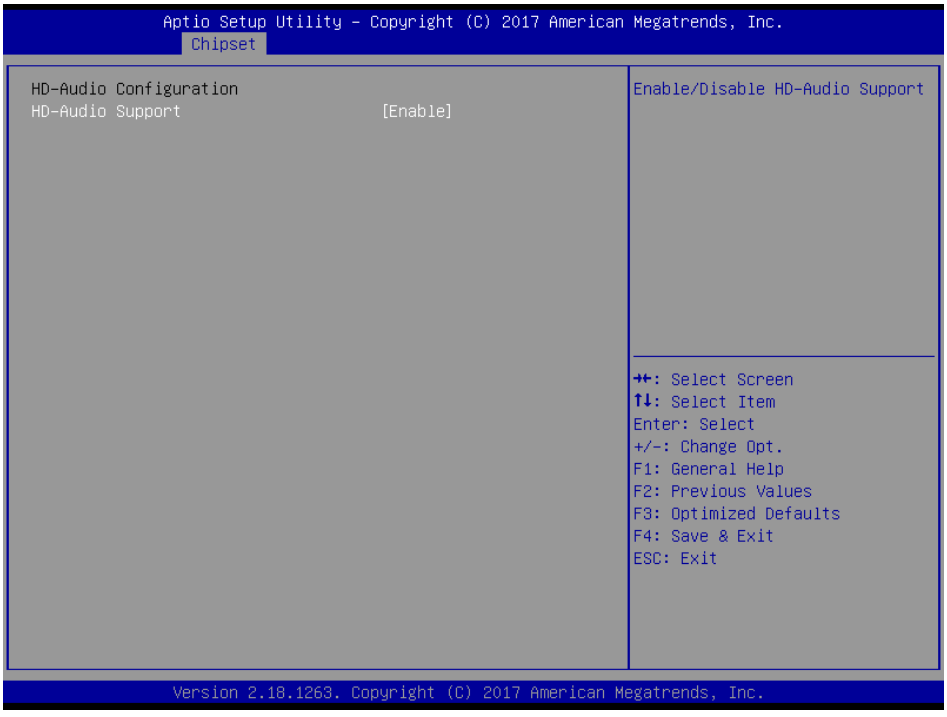


Item	Option	Description
GOP Driver	Enable**[Default]** Disable	Enable GOP Driver will unload VBIOS ; Dsiable it will load VBIOS.
Cd Clock Frequency	144 MHz 288 MHz 384 MHz 576 MHz 624 MHz**[Default]**	Select the highest Cd Clock frequency supported by the platform.
Active LVDS (CH7511)	Disabled Enabled**[Default]**	Active Internal LVDS(eDP->Ch7511-to-LVDS).
CH7511 EDID Panel Option	1024x768 24/1**[Default]** 800x600 18/1 1024x768 18/1 1366x768 18/1 1024x600 18/1 1280x800 18/1 1920x1200 24/2 1920x1080 18/2 1280x1024 24/2 1440x900 18/2 1600x1200 24/2 1366x768 24/1 1920x1080 24/2 1680x1050 24/2	Port1-EDP to LVDS(Chrotel 7511) Panel EDID Option.
LVDS Back Light PWM	00% 25% 50% 75% 100%**[Default]**	Select LVDS back light PWM duty.
LVDS Back Light PWM Frequency	200**[Default]** 300 400 500 700 1k 2k 3k 5k 10k 20k	Select LVDS back light PWM Frequency.

3.6.3.4 South Cluster Configuration

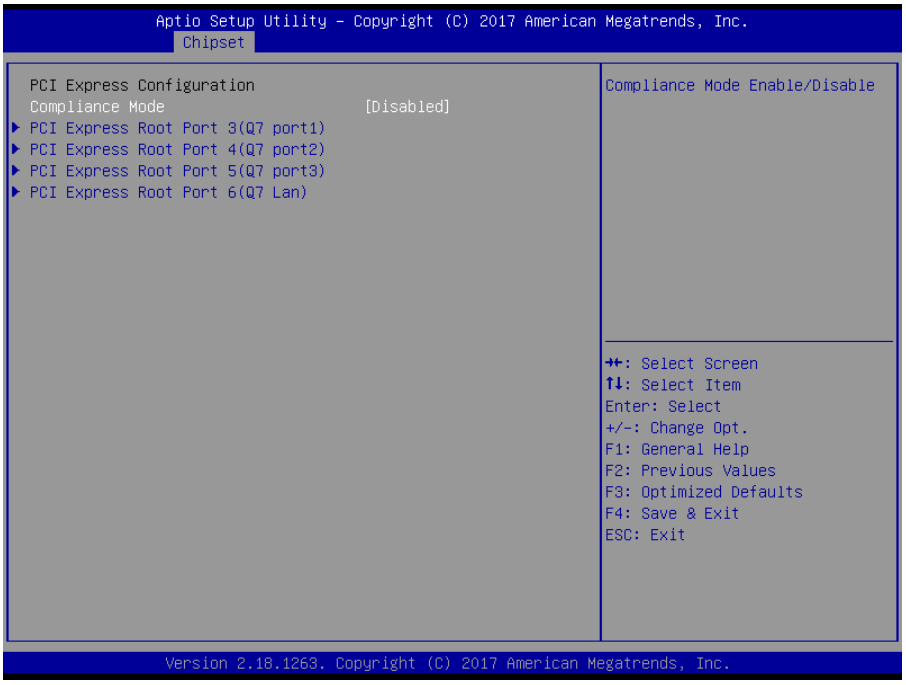


3.6.3.4.1 HD-Audio Configuration



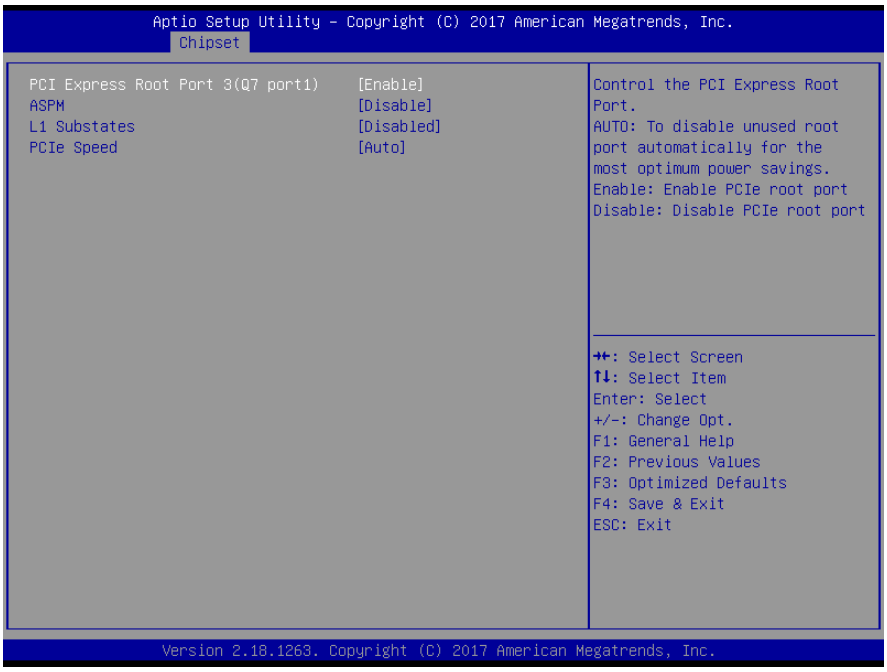
Item	Option	Description
HD-Audio Support	Disable Enable**[Default]**	Enable/Disable HD-Audio Support.

3.6.3.4.2 PCI Express Configuration



Item	Option	Description
Compliance Mode	Disabled**[Default]** Enabled	Compliance Mode Enable/Disable.

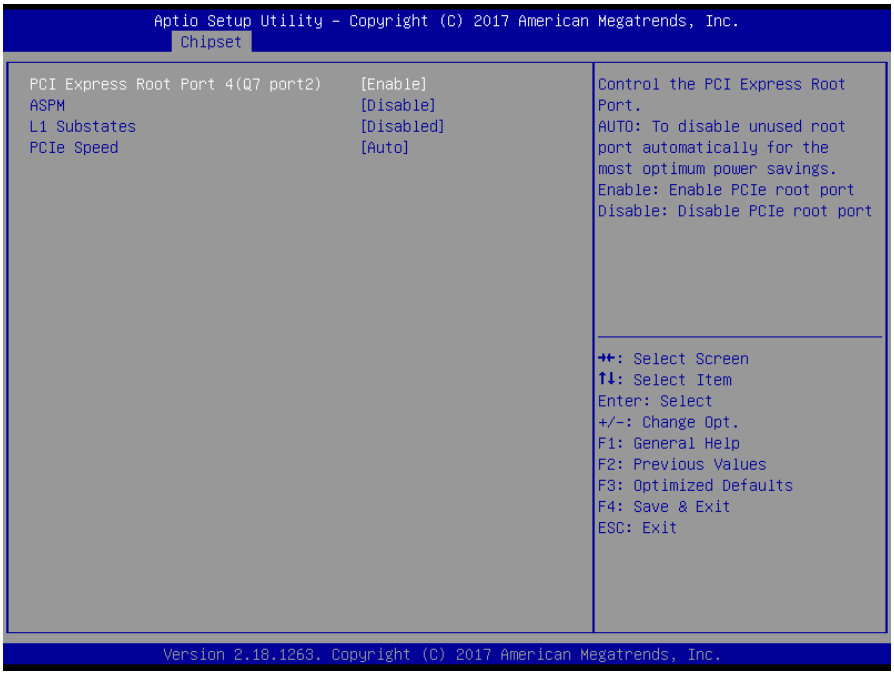
3.6.3.4.2.1 PCI Express Root Port 3(Q7 port1)



Item	Option	Description
PCI Express Root Port 3(Q7 port1)	Disable Enable**[Default]** Auto	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.

3.6.3.4.2.2 PCI Express Root Port 4(Q7 port2)



Item	Option	Description
PCI Express Root Port 4(Q7 port2)	Disable Enable**[Default]** Auto	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.

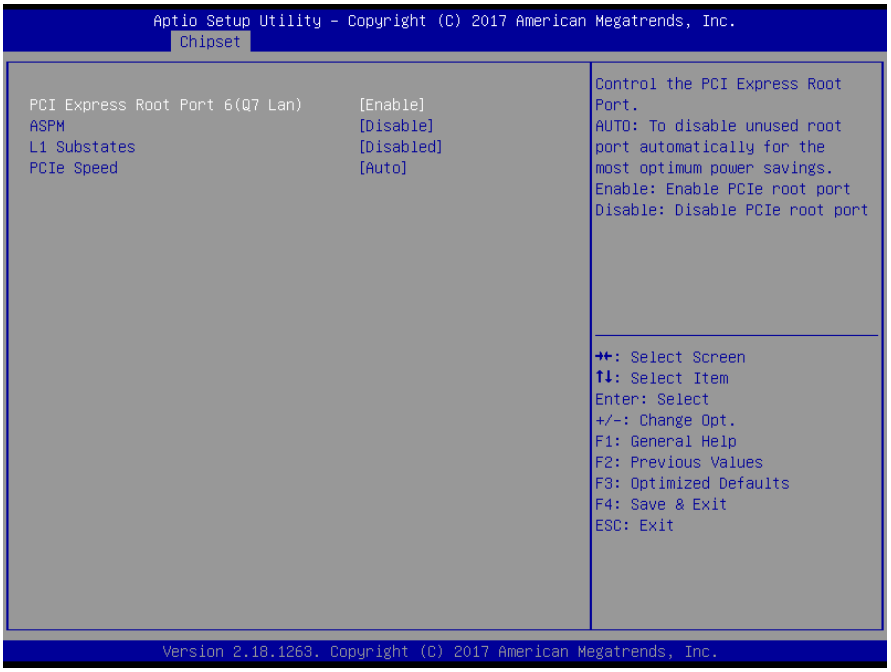
EQM-APL

PCIe Speed	Auto**[Default]** Gen1 Gen2	Configure PCIe Speed.

3.6.3.4.2.3 PCI Express Root Port 5(Q7 port3)

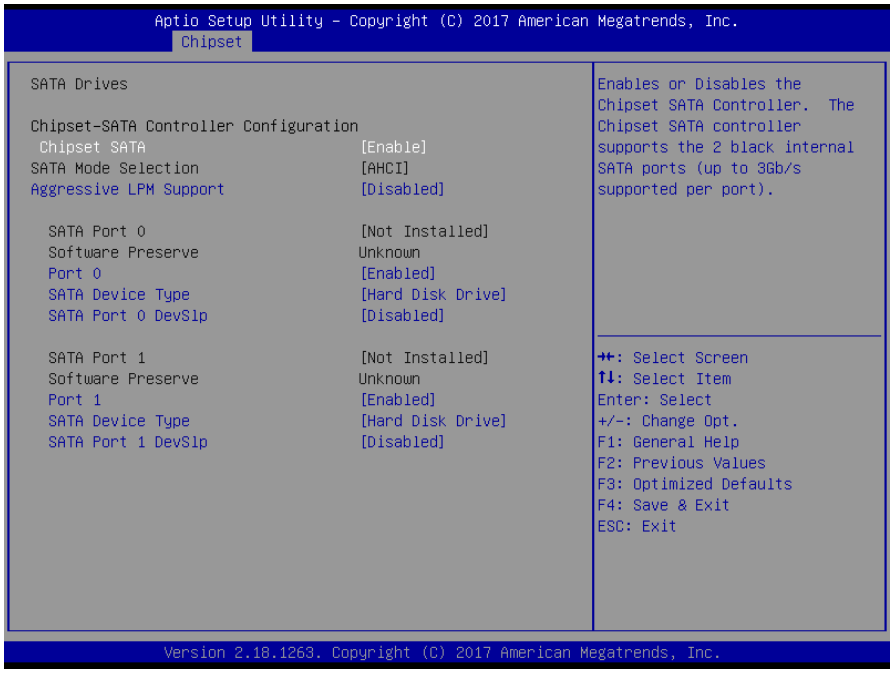
Item	Option	Description
PCI Express Root Port 5(Q7 port3)	Disable Enable**[Default]** Auto	Control the PCI Express Root Port. AUTO: To disable unused root port automatically for the most optimum power savings. Enable: Enable PCIe root port Disable: Disable PCIe root port.
ASPM	Disable**[Default]** L0s 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.

3.6.3.4.2.4 PCI Express Root Port 6(Q7 Lan)



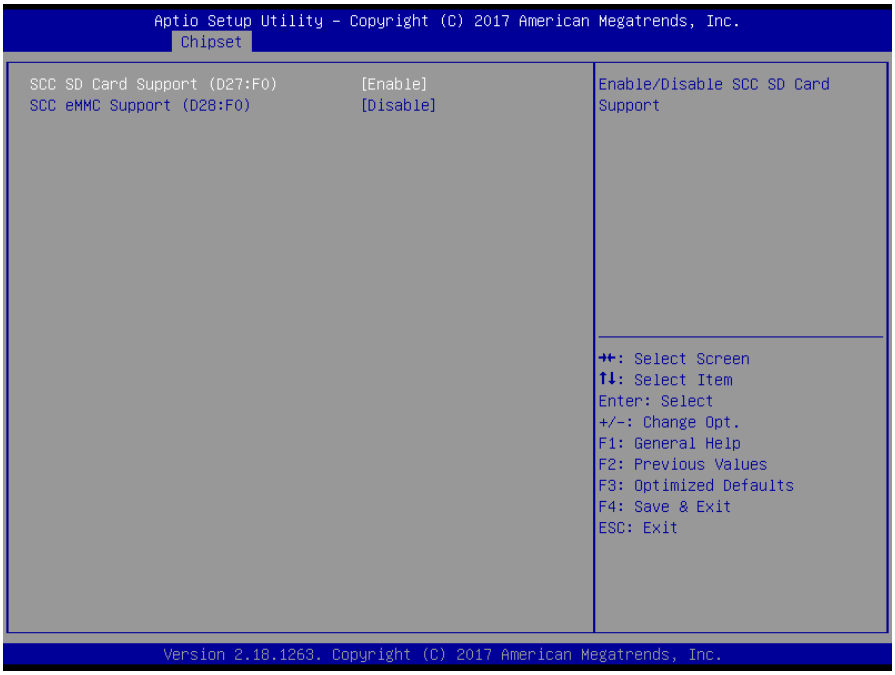
Item	Option	Description
PCI Express Root Port 6(Q7 Lan)	Disable Enable**[Default]** Auto	Control the PCI Express Root Port. AUTO: To disable unused root port automatically for the most optimum power savings. Enable: Enable PCIe root port Disable: Disable PCIe root port.
ASPM	Disable**[Default]** L0s 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.

3.6.3.4.3 SATA Drivers



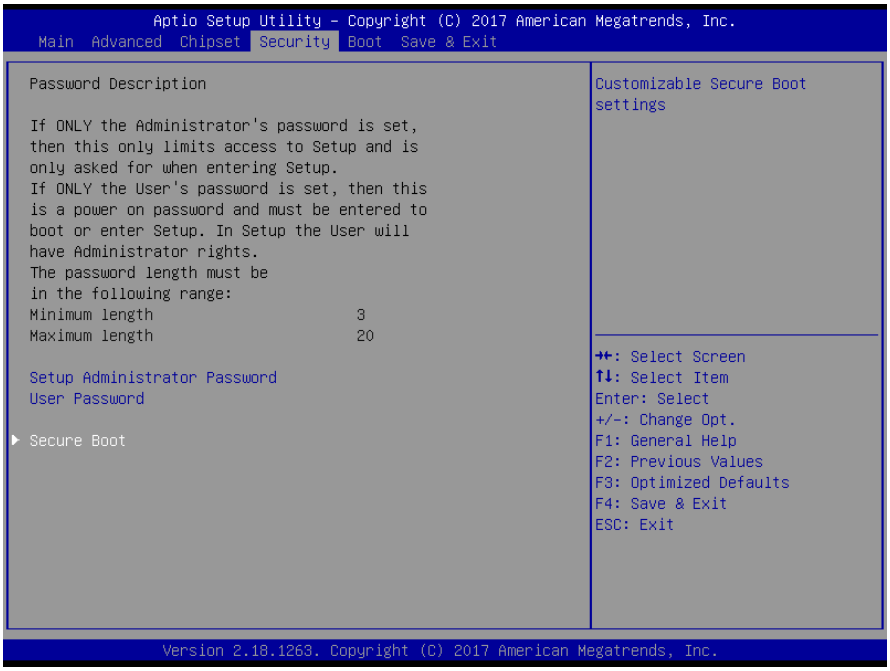
Item	Option	Description
Chipset SATA	Enable**[Default]** Disable	Enables or Disables the Chipset SATA Controller. The Chipset SATA controller supports the 2 black internal SATA ports (up to 3Gb/s supported per port).
Aggressive LPM Support	Disabled**[Default]** Enabled	Enable PCH to aggressively enter link power state.
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.
SATA Port 0 DevSlp	Disabled**[Default]** Enabled	Enable/Disable SATA Port 0 DevSlp. Board rework for LP needed before enable.

3.6.3.4.4 SCC Configuration



Item	Option	Description
SCC SD Card Support (D27:F0)	Disable Enable**[Default]**	Enable/Disable SCC SD Card Support.
SCC eMMC Support (D28:F0)	Disable**[Default]** Enable	Enable/Disable SCC eMMC Support.

3.6.4 Security



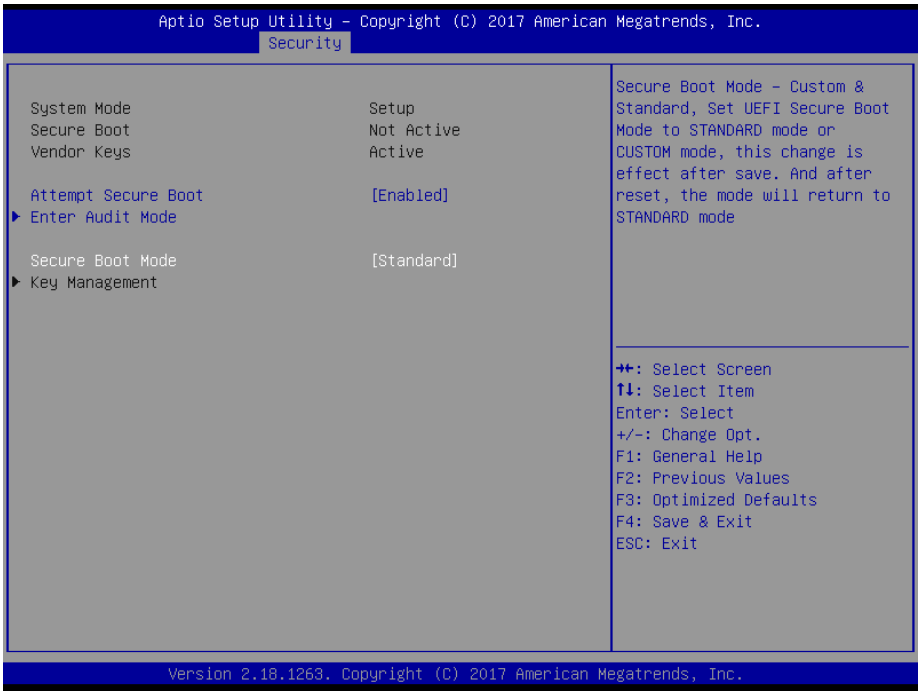
- **Setup Administrator Password**

Set setup Administrator Password

- **User Password**

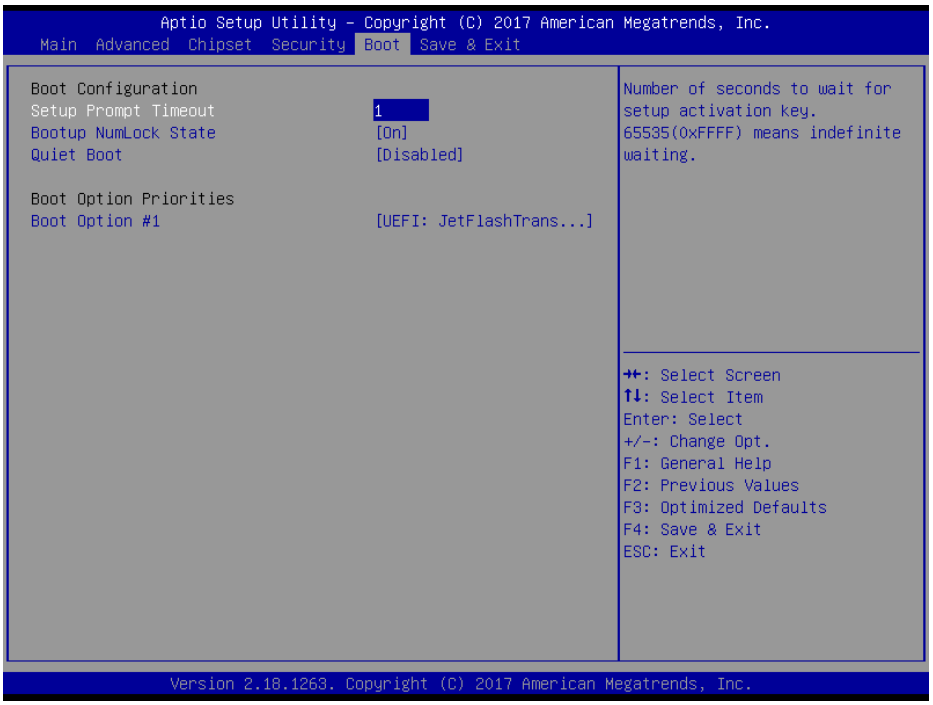
Set User Password

3.6.4.1 Secure Boot



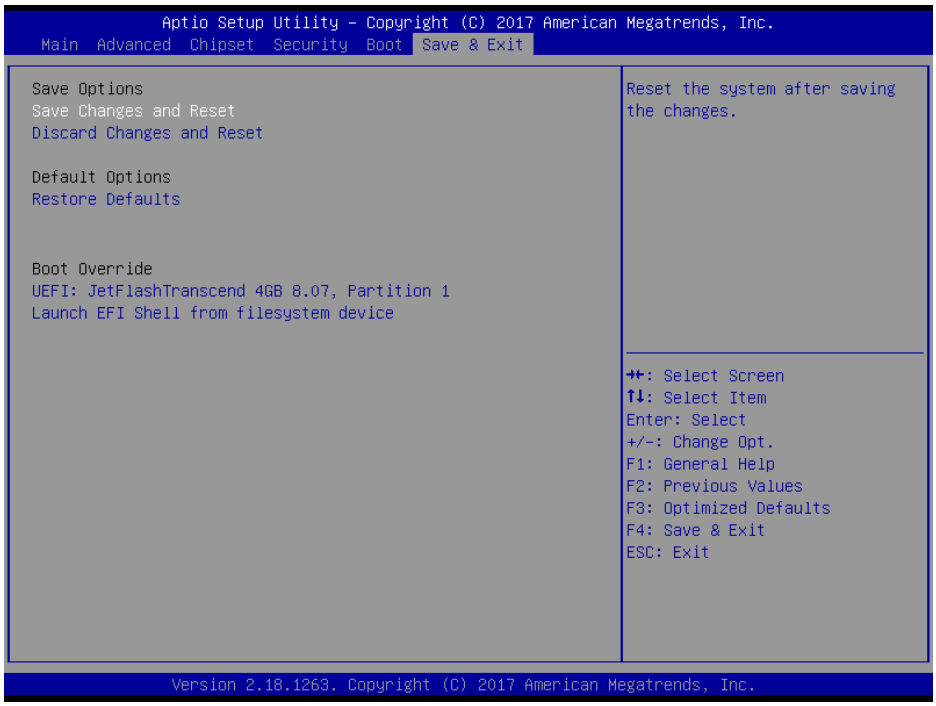
Item	Option	Description
Attempt Secure Boot	Disabled Enabled**[Default]**	Secure Boot activated when Platform Key(PK) is enrolled, System mode is User/Deployed, and CSM function is disabled.
Secure Boot Mode	Standard**[Default]** Customized	Secure Boot Mode – Custom_Standard, Set UEFI Secure Boot Mode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

3.6.5 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 (Shellx64.efi) from one of the available filesystem devices.

4. Drivers Installation

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

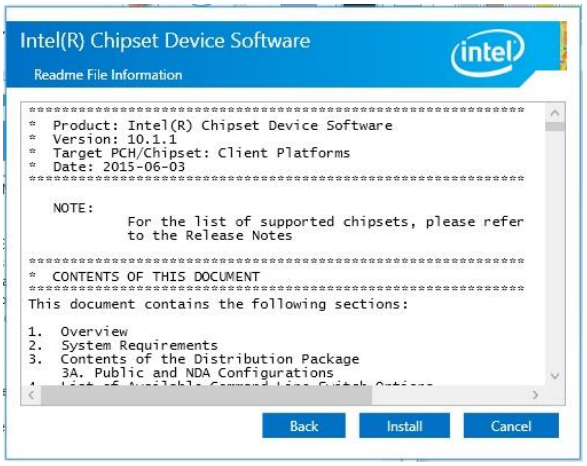
4.1 Install Chipset Driver

Insert the Supporting DVD-ROM to DVD-ROM drive, and it should show the index page of the products automatically. If not, locate Index.htm and choose the product from the menu left, or link to ***/ Driver_Chipset/Intel/EQM-APL***.

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

Step1. Click **Next**.

Step 2. Click **Accept**.



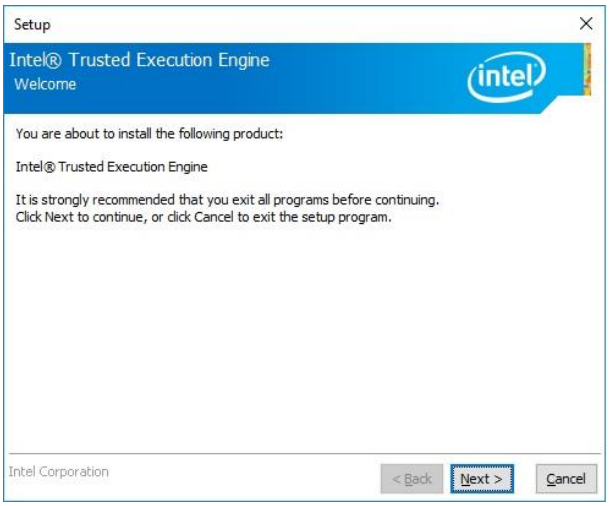
Step 3. Click **Install**.

Step 4. Complete setup.

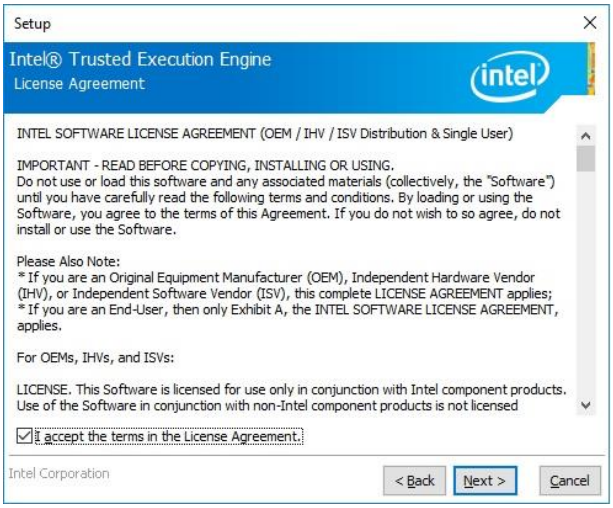
4.2 Install TXE Driver

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

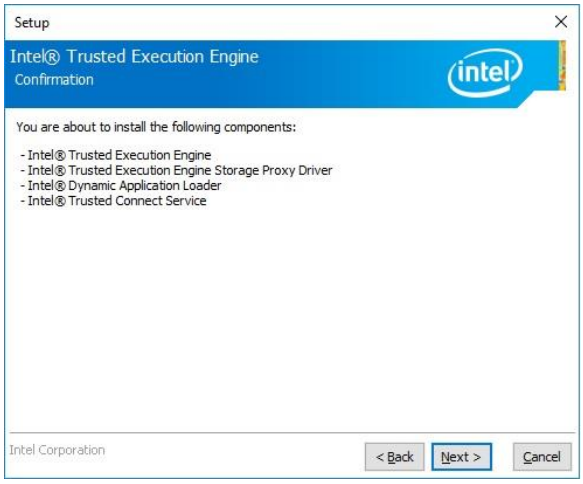
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system. If the warning message appears while the installation process, click Continue to go on.



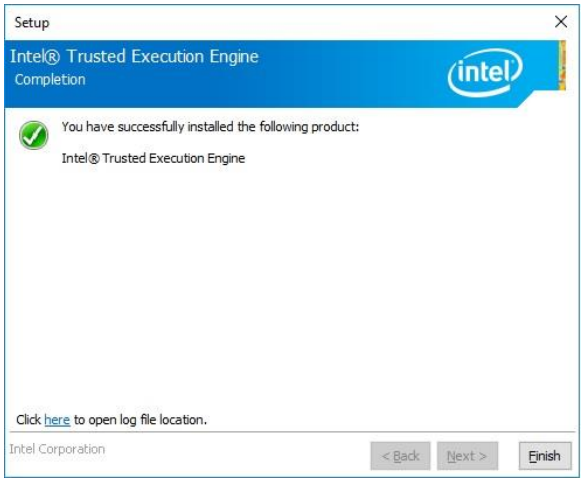
Step1. Click **Next** to start installation.



Step 2. Click **Next**.



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

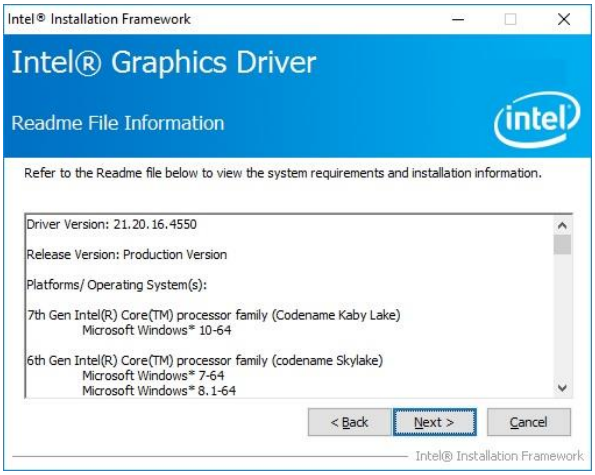


Step 4. Click **Finish** to complete setup.

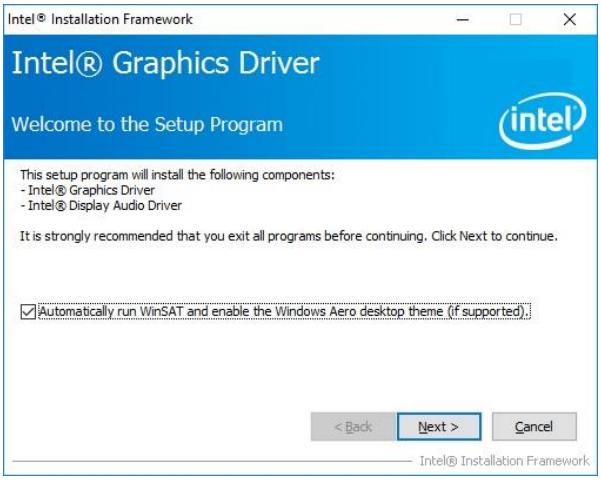
4.3 Install VGA Driver

Insert the Supporting DVD-ROM to DVD-ROM drive, and it should show the index page of the products automatically. If not, locate Index.htm and choose the product from the menu left, or link to ***I VGA/EQM-APL***.

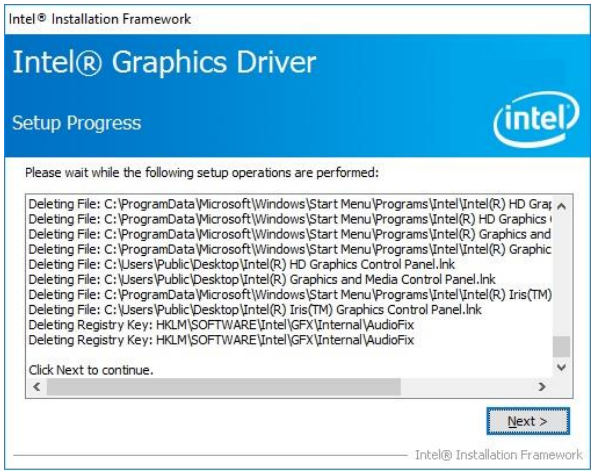
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system.



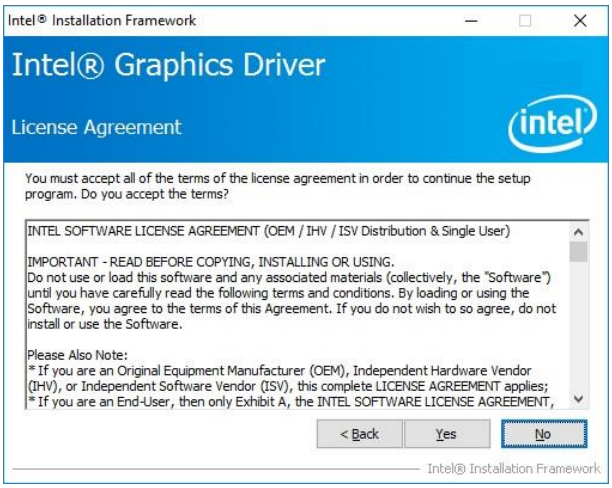
Step 3. Click **Next.**



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

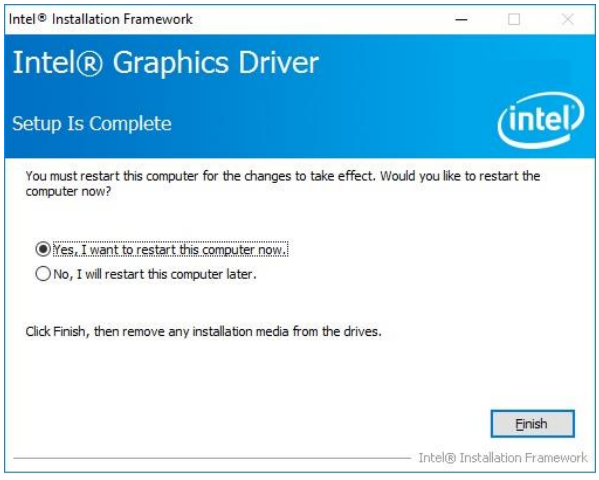


Step 4. Click **Next**.



Step 2.

Click **Yes** to accept license agreement.

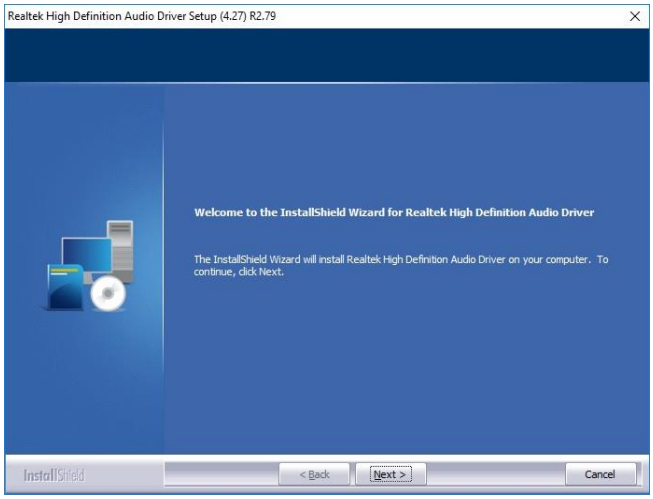


Step 5. Click **Finish** to complete setup.

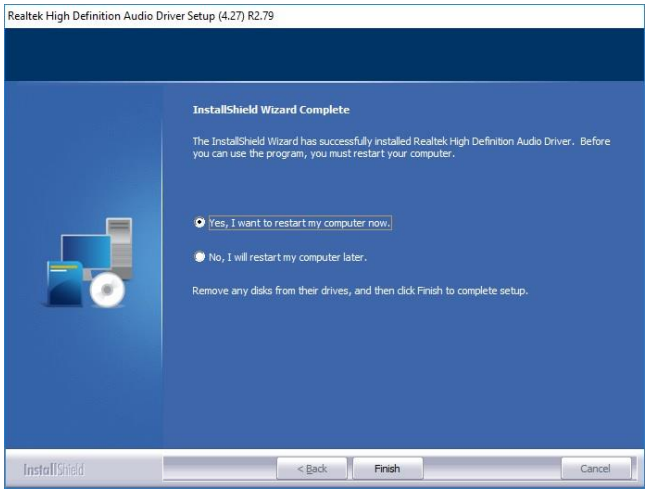
4.4 Install Audio Driver

Insert the Supporting CD-ROM to CD-ROM drive, and it should show the index page of the products automatically. If not, locate Index.htm and choose the product from the menu left, or link to **/Driver_Audio/Realtek/EQM-APL_Audio**.

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



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

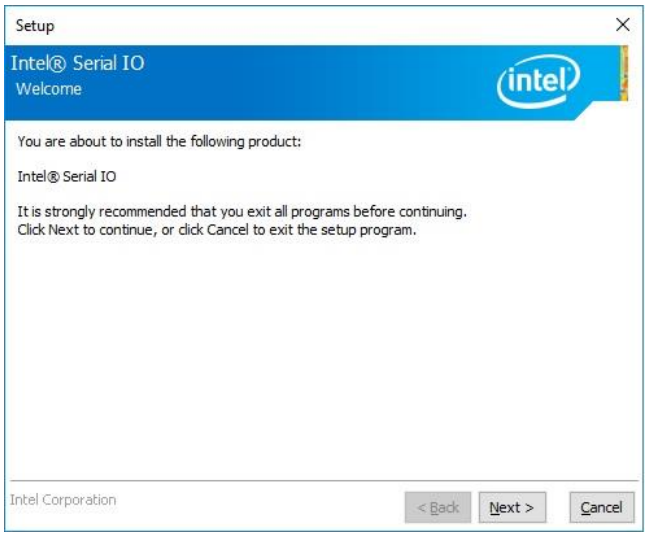


Step 2. Click **Finish** to complete the setup.

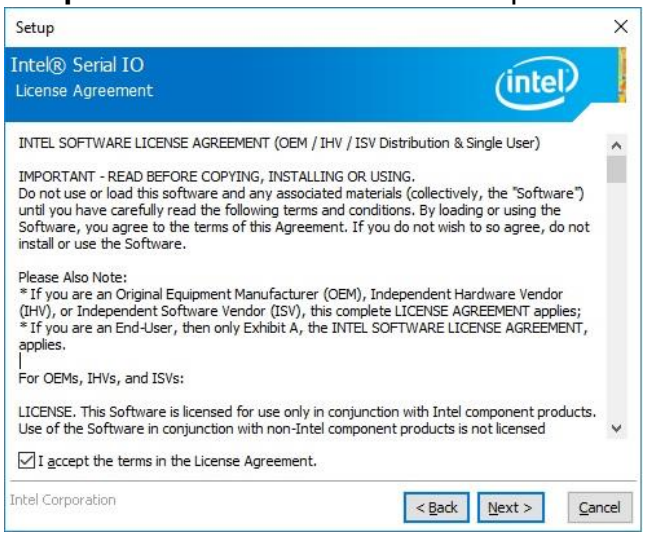
4.5 Install Serial IO Driver

Insert the Supporting CD-ROM to CD-ROM drive, and it should show the index page of the products automatically. If not, locate Index.htm and choose the product from the menu left, or link to **/Utility/EQM-APL_Serial IO**.

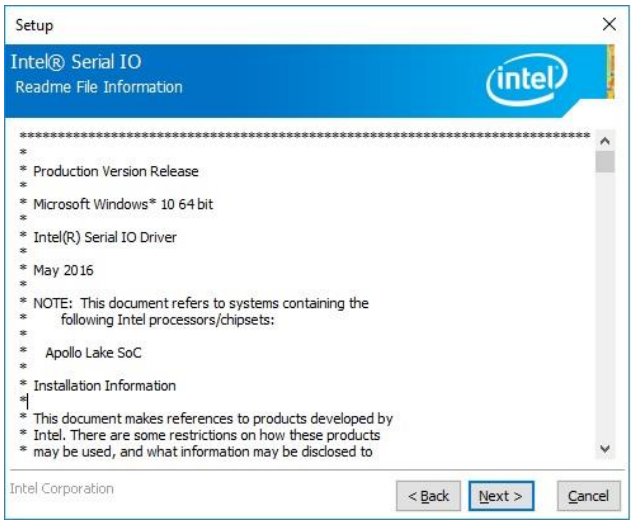
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system.



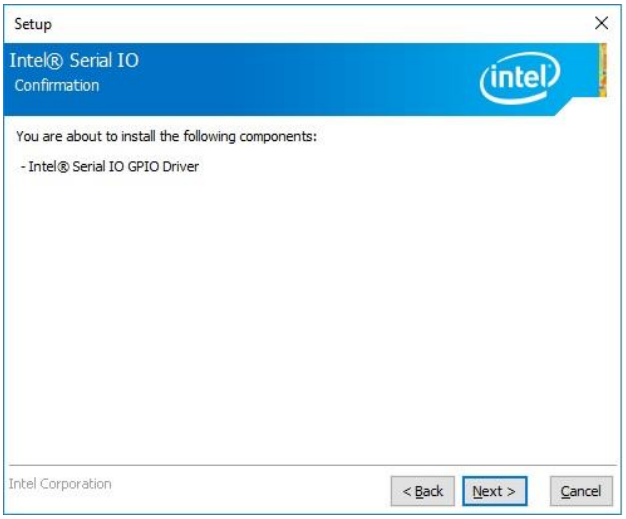
Step 1. Click **Next** to continue setup.



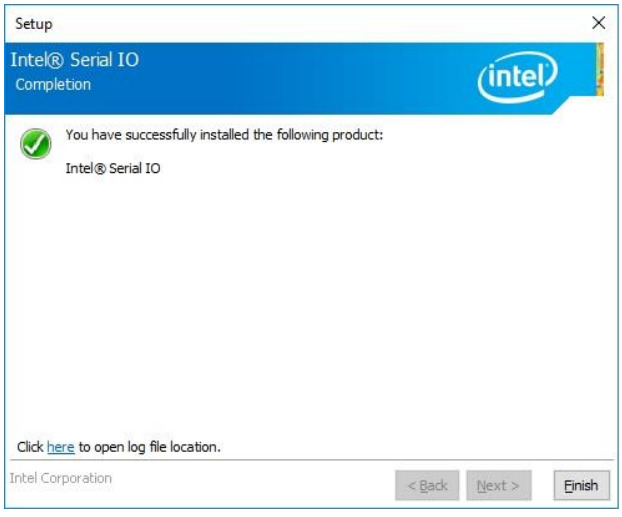
Step 2. Click **Next**.



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



Step 4. Click **Next**.

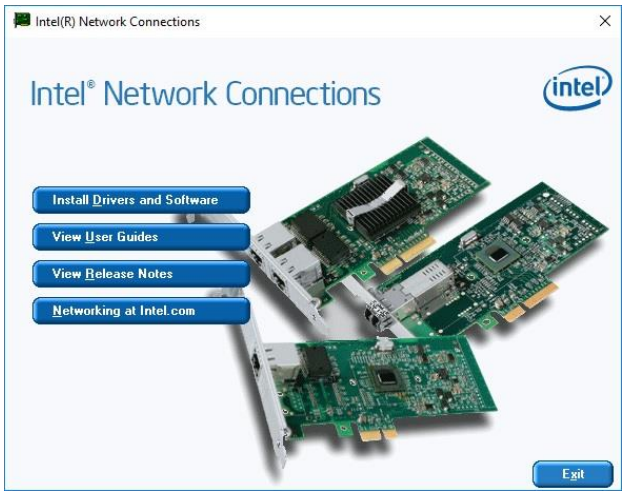


Step 5. Click **Finish** to complete the setup.

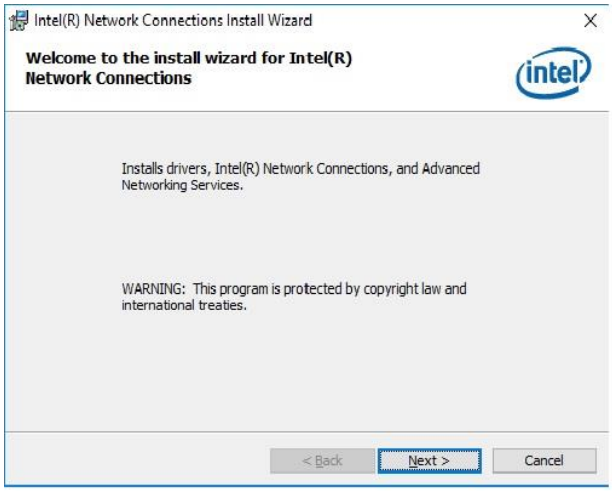
4.6 Install Ethernet Driver

Insert the Supporting CD-ROM to CD-ROM drive, and it should show the index page of the products automatically. If not, locate Index.htm and choose the product from the menu left, or link to **/Driver_Gigabit/Intel/I210IT/EQM-APL**.

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

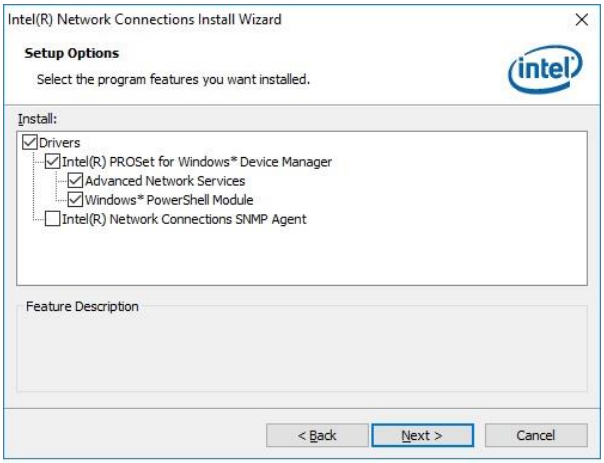


Step 1. Click **Install Drivers and Software**.

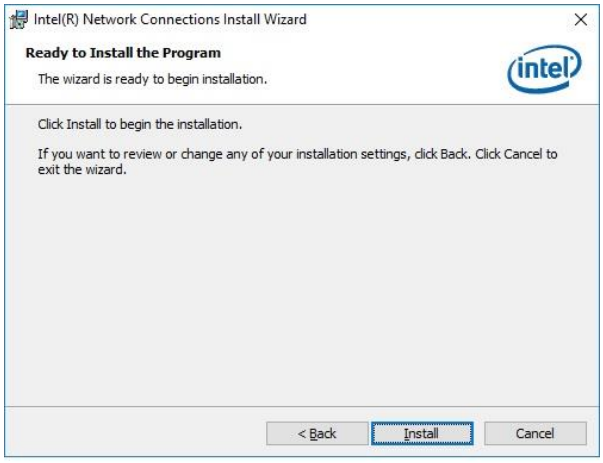


Step 2. Click **Next**.

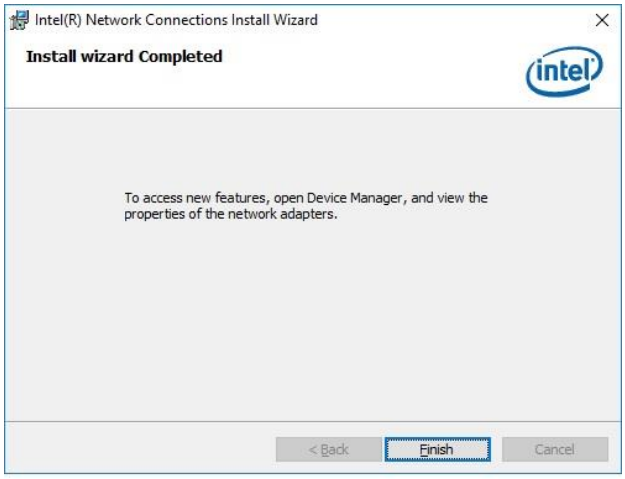
Step 3. Click **Next** to continue setup.



Step 4. Click **Next**.

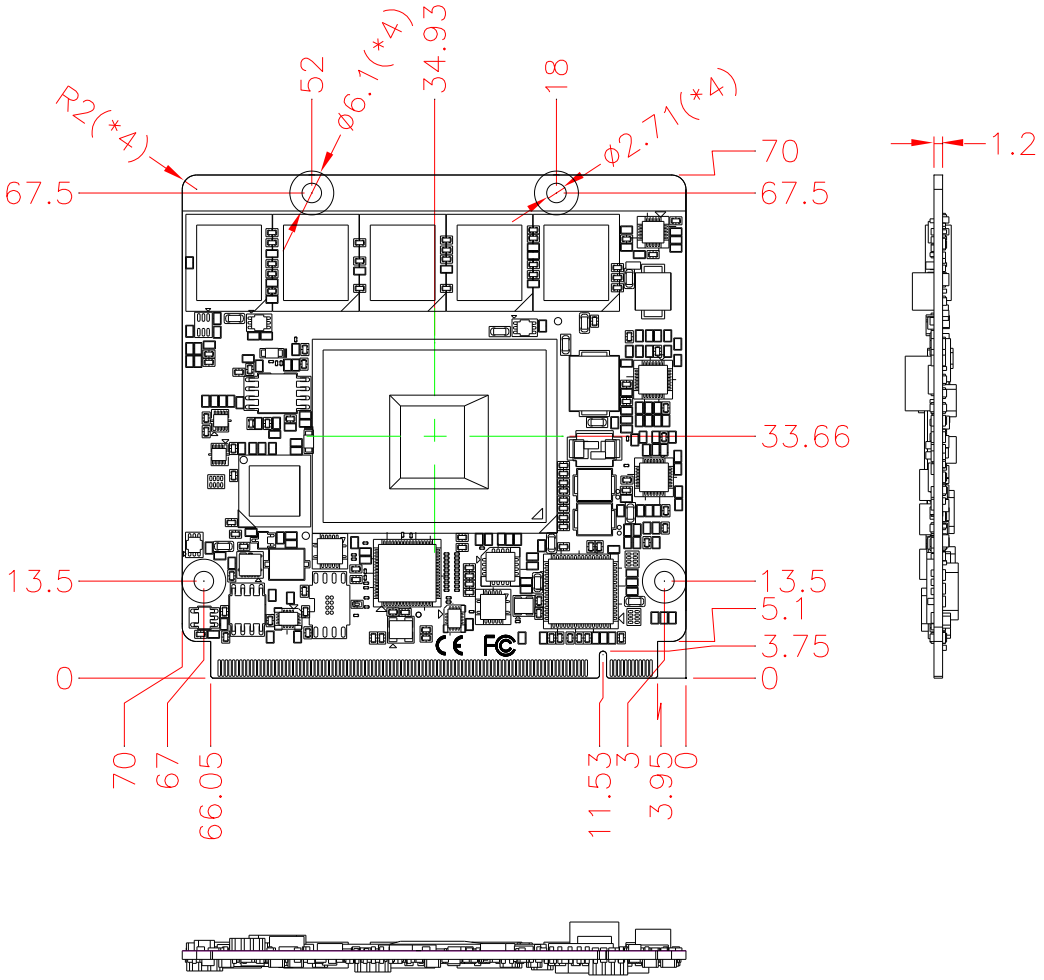


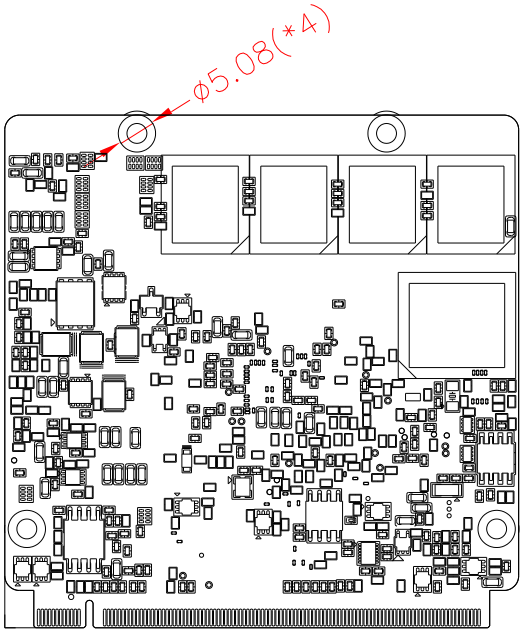
Step 5. Click **Install**.



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

5. Mechanical Drawing


R2(*4)
52
Ø6.1(*4)
34.93
18
Ø2.71(*4)
70
67.5
67.5
1.2
33.66
13.5
13.5
5.1
3.75
0
0
70
67
66.05
11.53
3
3.95
0


Ø5.08(*4)

Unit: mm