EQM-EHL

Intel® Atom®x6000E Series/Pentium®/Celeron® SoC processor Qseven Module

User's Manual

1st Ed – 01 October 2023

Part No.E2047400100R

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-EHL Qseven Module
- 1 x Desiccant (5g)

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

1.3 Document Amendment History

Revision	Date	By	Comment
1st	October 2023	Avalue	Initial Release

1.4 Manual Objectives

This manual describes in details Avalue Technology EQM-EHL Qseven 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-EHL 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	Onboard Intel® Celeron®/ Pentium®/Atom™ SoC BGA Processor (Elkhart Lake Platform 6~12W)
BIOS	AMI uEFI BIOS, 256 Mbit SPI Flash ROM
System Chipset	Elkhart lake SoC integrated
I/O Chipset	EC ITE IT5571
System Memory	Onboard Single channel LPDDR4 4GB memory down (8GB for BOM option) with 3200MT/s
Watchdog Timer	H/W Reset, 1sec. ~ 65535sec. and 1sec./step
H/W Status Monitor	Monitoring System Temperature, Voltage and FAN Status with Auto Throttling Control
TPM	SPI TPM, NuvoTon_NPCT754AADYX
Storage	
eMMC	eMMC 5.1 64GB / 128 GB (optional)
I/O Interface (SOM)	
PCI Express	4 x PCIe Gen 3 x1
UART	1 x UART
USB3.1 / USB 2.0	1 x USB 3.2 Gen1 (5 Gbps) + 8 x USB2.0
SATA	2 x SATA 6Gb/s
SDIO	1 x SDIO
I^2C Bus	1 x I2C
SMBus	1 x SMBus
SD	1 x SD
SPI	1 x SPI
Display	
Graphic Chipset	Intel® Elkhart Lake SoC Processor integrated Intel® UHD Gen11 LP graphics
Spec. & Resolution	A: DP 1.4 Max resolution 4096x2160 @60Hz or HDMI 2.0b Max resolution 4096x2160 @60Hz B1: eDP 1.3 Max resolution 4096x2160 @60Hz only Or B2: LVDS Max resolution 1920 x 1080@60Hz Dual channel 18/24-bits LVDS (Chrontel CH7511A-BF eDP to LVDS) Note: By BOM Option via HW/BIOS, refer to the block diagram for detail.
Multiple Display	Up to 2 independent displays

EQM-EHL

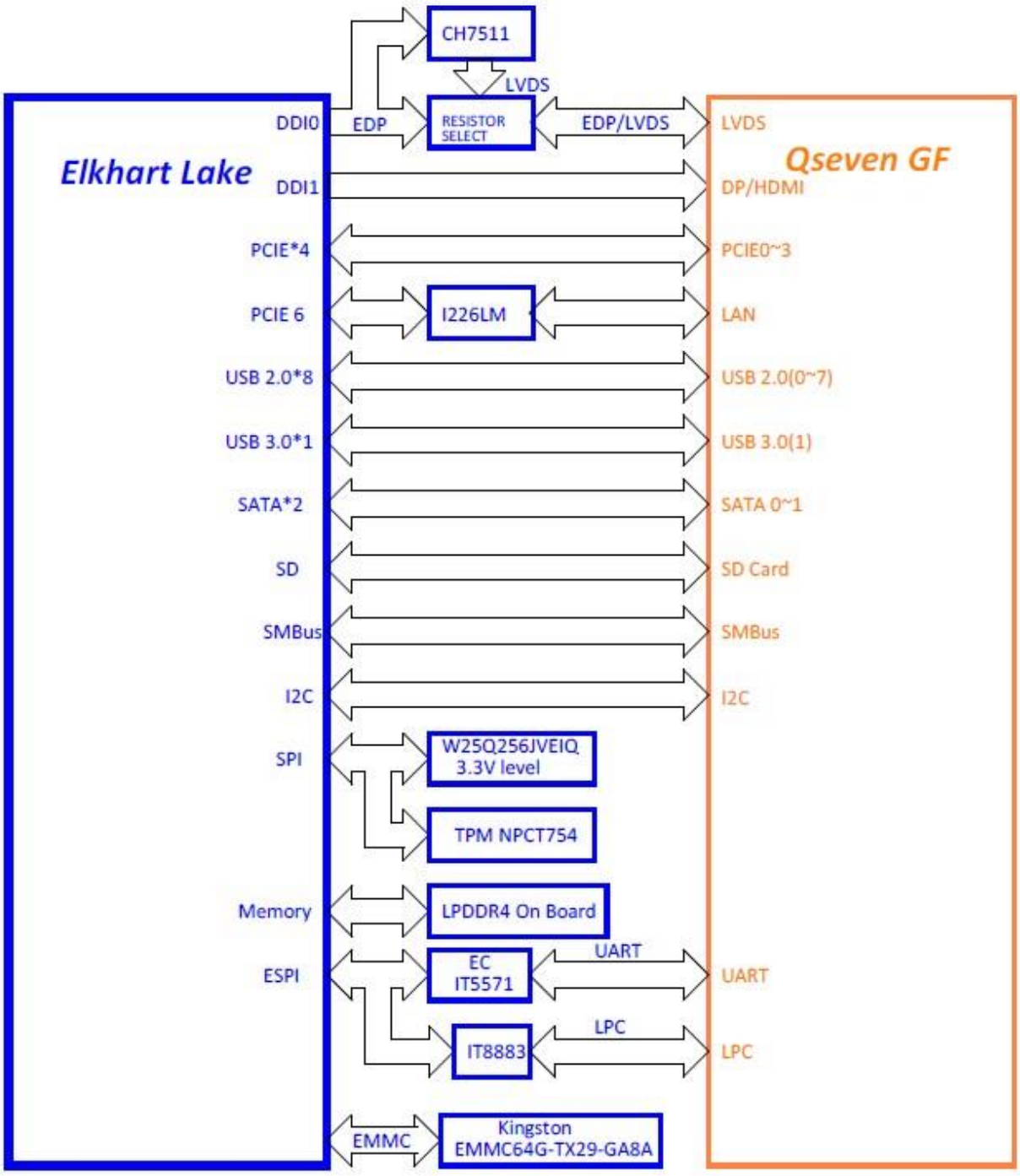
Audio	
Audio Codec	Intel® HD Audio integrated in SoC
Ethernet	
LAN Chipset	1x Intel® i226 LM/IT
LAN Spec.	10/100/1000 Base-Tx GbE compatible
Mechanical & Environmental	
Power Requirement	+5V DC
ACPI	Single power ATX Support S0, S3, S4, S5 ACPI 5.0 Compliant
Power Mode	ATX
Operating Temp.	Standard supports 0°C ~ 60°C Extended supports -40°C ~ 85°C
Storage Temp.	-40°C ~ 85°C (-40°F ~ 185°F)
Operating Humidity	40°C @ 95% Relative Humidity, Non-condensing
Size (L x W) (Please consult product engineers for the production feasibility if the size is larger than 410x360mm or smaller than 80x70mm)	2.75" x 2.75" (70mm x 70mm)
Weight	0.02 kg
Vibration Test	Random Vibration Operation 1 Test PSD: 0.00454G²/Hz , 1.5 Grms 2 System condition : operation mode 3 Test frequency : 5~500 Hz 4 Test axis : X,Y and Z axis 5 Test time : 30 minutes per each axis 6 IEC60068-2-64 Test Fh 6 Storage : mSATA Random vibration test (Non-operation) 1 PSD: 0.01818G²/Hz , 3.0 Grms 2 Non-Operation mode 3 Test Frequency : 5-500Hz 4 Test Axis : X,Y and Z axis 5 30 min. per each axis 6 IEC 60068-2-64 Test:Fh Package Vibration Test: 1 Test PSD : 0.026G²/Hz , 2.16 Grms 2 Test frequency : 5~500 Hz 3 Test axis : X,Y and Z axis 4 Test time : 30 minutes per each axis 5 IEC 60068-2-64 Test Fh

Shock Test	1 Wave from : Half Sine wave 2 Acceleration Rate : 10g 3 Duration Time : 11ms 4 No. of shock : Z axis 300 times 5 Test Axis : Z axis 6 operation mode 7 Reference IEC 60068-2-27 testing procedures Test Eb : Shock Test
Drop Test	Package drop test Reference ISTA 2A, Method : IEC-60068-2-32 Test:Ed Test Ea : Drop Test 1 Test phase : One corner, three edges, six faces 2 Test high : 96.5cm 3 Package weight : 5Kg 4 Test drawing
OS Information	Windows* 10 & 11 IoT Enterprise (64-bit), Linux * Elkhart Lake platform doesn't support Win11. The current message is that Microsoft expects to support Win11 in 2024.
Carrier Board	Please confirm if crrent Carrier board for EQM-APL can use in EQM-EHL. ● The Carrier Board for EQM-APL: REV-Q703-B1-00R / E9697Q70304R DIP REV-Q703 Rev.B1 W/Q7 VER:2.1

Note: Specifications are subject to change without notice.

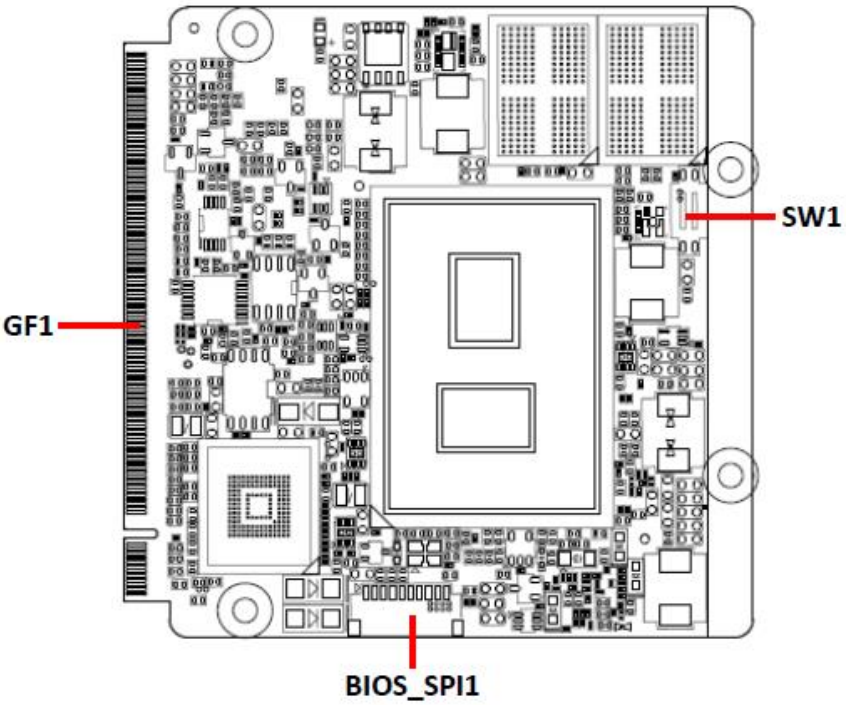
1.6 Architecture Overview—Block Diagram

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



2. Hardware Configuration

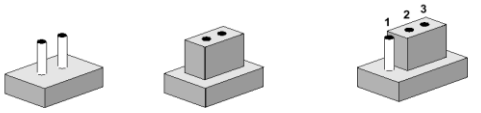
2.1 Product Overview



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.

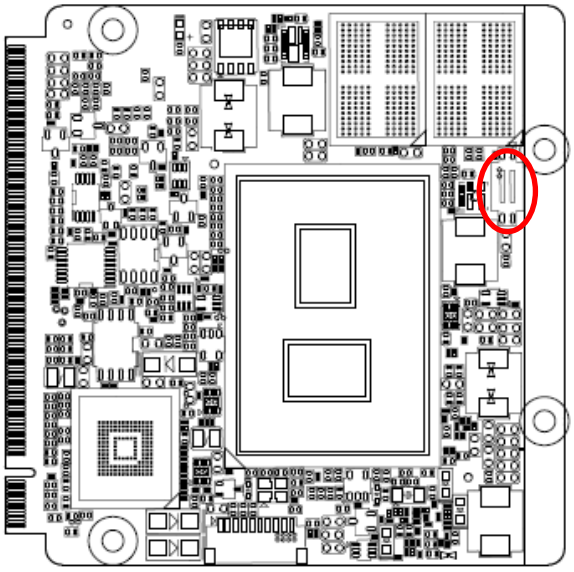
The following tables list the function of each of the board's jumpers and connectors.

Connectors

Label	Function	Note
BIOS_SPI1	(Reserved for BIOS programming)	10P wafer, pitch 1.00mm (ACES 83217)
SW1	AT/ATX mode selector	
GF1	QSeven connector	

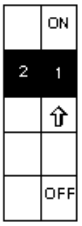
2.3 Setting Connectors

2.3.1 AT/ATX mode selector (SW1)

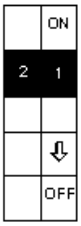


AT/ATX mode

AT mode*



ATX mode

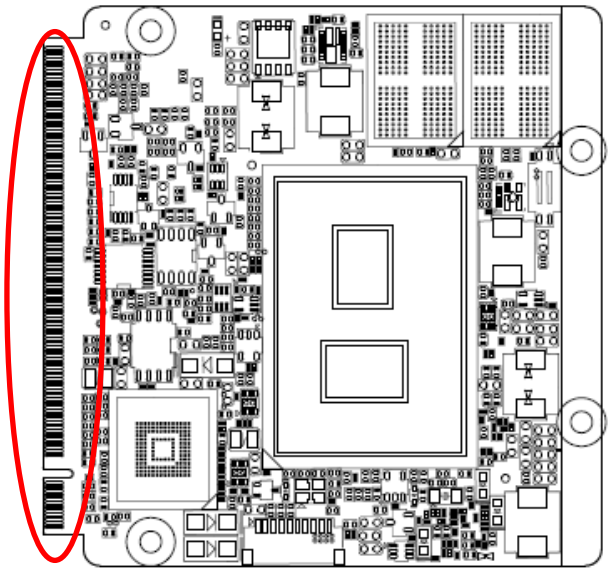


***Default**

2.3.1.1 Signal Description –AT/ATX mode selection

AT/ATX mode	Description
AT mode 	Auto-power on, no need to press Power button to enable power on/off
ATX mode 	Press the power button to enable power on/off

2.3.2 QSeven connector (GF1)



Signal	PIN	PIN	Signal
GND1	1	2	GND2
GBE_MDI3-	3	4	GBE_MDI2-
GBE_MDI3+	5	6	GBE_MDI2+
GBE_LINK100#	7	8	GBE_LINK1000#
GBE_MDI1-	9	10	GBE_MDI0-
GBE_MDI1+	11	12	GBE_MDI0+
GBE_LINK#	13	14	GBE_ACT#
GBE_CTREF	15	16	SUS_S5#
WAKE#	17	18	SUS_S3#
GPO0	19	20	PWRBTN#
SLP_BTN#	21	22	LID_BTN#
GND3	23	24	GND4
GND5	25	26	PWGIN
BATLOW#	27	28	RSTBTN#
SATA0_TX+	29	30	SATA1_TX+
SATA0_TX-	31	32	SATA1_TX-
SATA_ACT#	33	34	GND6
SATA0_RX+	35	36	SATA1_RX+
SATA0_RX-	37	38	SATA1_RX-

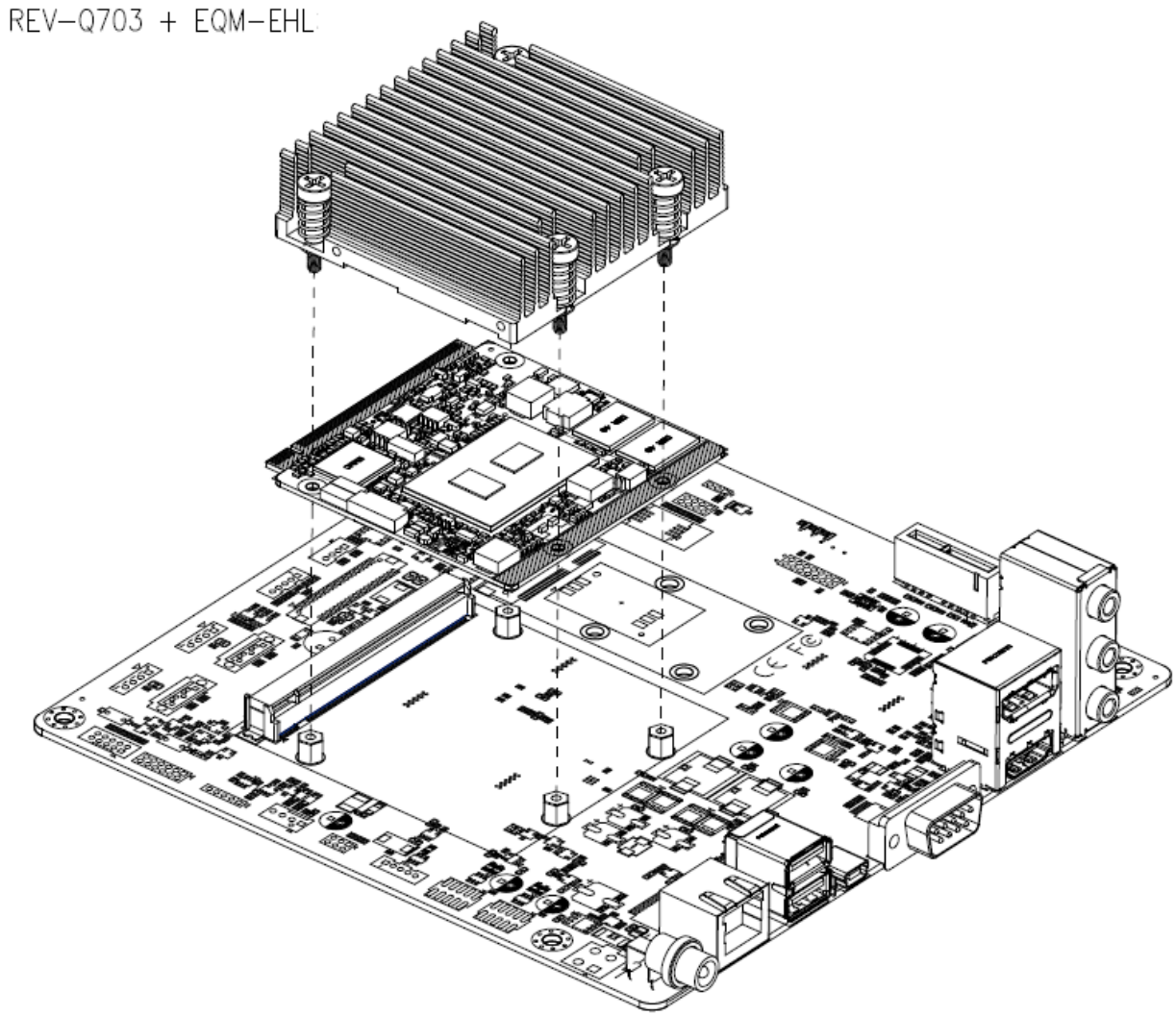
Signal	PIN	PIN	Signal
GND7	39	40	GND8
BIOS_DISABLE#	41	42	SDIO_CLK#
SDIO_CD#	43	44	NC
SDIO_CMD	45	46	SDIO_WP
SDIO_PWR#	47	48	SDIO_DAT1
SDIO_DAT0	49	50	SDIO_DAT3
SDIO_DAT2	51	52	NC
NC	53	54	NC
NC	55	56	USB_OTG_PEN
GND9	57	58	GND10
HDA_SYNC	59	60	SMB_CLK
HDA_RST#	61	62	SMB_DAT
HDA_BITCLK	63	64	SMB_ALERT#
HDA_SDI	65	66	GP0_I2C_CLK
HDA_SDO	67	68	GP0_I2C_DAT
THRM#	69	70	WDTRIG#
THRMTRIP#	71	72	WDOUT
GND11	73	74	GND12
USB_P7-	75	76	USB_P6-
USB_P7+	77	78	USB_P6+
USB_6_7_OC#	79	80	USB_4_5_OC#
USB_P5-	81	82	USB_P4-
USB_P5+	83	84	USB_P4+
USB_2_3_OC#	85	86	USB_0_1_OC#
USB_P3-	87	88	USB_P2-
USB_P3+	89	90	USB_P2+
USB_VBUS	91	92	USB_ID
USB_P1-	93	94	USB_P0-
USB_P1+	95	96	USB_P0+
GND13	97	98	GND14
LVDS_A0+	99	100	LVDS_B0+
LVDS_A0-	101	102	LVDS_B0-
LVDS_A1+	103	104	LVDS_B1+

Signal	PIN	PIN	Signal
LVDS_A1-	105	106	LVDS_B1-
LVDS_A2+	107	108	LVDS_B2+
LVDS_A2-	109	110	LVDS_B2-
LVDS_PPEN	111	112	LVDS_BLEN
LVDS_A3+	113	114	LVDS_B3+
LVDS_A3-	115	116	LVDS_B3-
GND15	117	118	GND16
LVDS_A_CLK+	119	120	LVDS_B_CLK+
LVDS_A_CLK-	121	122	LVDS_B_CLK-
LVDS_BLT_CTRL	123	124	NC
NC	125	126	EDP0_HPD#/ LVDS_BLC_DAT
NC	127	128	LVDS_BLC_CLK
NC	129	130	NC
DP_LANE3+	131	132	USB_SSTX1-
DP_LANE3-	133	134	USB_SSTX1+
GND17	135	136	GND18
DP_LANE1+	137	138	DP_AUX+
DP_LANE1-	139	140	DP_AUX-
GND19	141	142	GND20
DP_LANE2+	143	144	USB_SSRX1-
DP_LANE2-	145	146	USB_SSRX1+
GND21	147	148	GND22
DP_LANE0+	149	150	HDMI_CTRL_SDA
DP_LANE0-	151	152	HDMI_CTRL_CLK
DP_HDMI_HPD#	153	154	DP_HPD#
PCIE_CLK_REF+	155	156	PCIE_WAKE#
PCIE_CLK_REF-	157	158	PCIE_RST#
GND23	159	160	GND24
PCIE3_TX+	161	162	PCIE3_RX+
PCIE3_TX-	163	164	PCIE3_RX-
GND25	165	166	GND26
PCIE2_TX+	167	168	PCIE2_RX+
PCIE2_TX-	169	170	PCIE2_RX-

Signal	PIN	PIN	Signal
UART0_TX	171	172	UART0_RTS#
PCIE1_TX+	173	174	PCIE1_RX+
PCIE1_TX-	175	176	PCIE1_RX-
UART0_RX	177	178	UART0_CTS#
PCIE0_TX+	179	180	PCIE0_RX+
PCIE0_TX-	181	182	PCIE0_RX-
GND27	183	184	GND28
LPC_AD0	185	186	LPC_AD1
LPC_AD2	187	188	LPC_AD3
LPC_CLK	189	190	LPC_FRAME#
SERIRQ	191	192	LPC_LDRQ#
VCC_RTC	193	194	SPKR
FAN_TACHOIN	195	196	FAN_PWMOUT
GND29	197	198	GND30
SPI_MOSI	199	200	SPI_CS0#
SPI_MISO	201	202	SPI_CS1#
SPI_SCK	203	204	NC
VCC_5V_SB1	205	206	VCC_5V_SB2
NC	207	208	NC
NC	209	210	NC
NC	211	212	NC
NC	213	214	NC
NC	215	216	NC
NC	217	218	NC
VCC_1	219	220	VCC_2
VCC_3	221	222	VCC_4
VCC_5	223	224	VCC_6
VCC_7	225	226	VCC_8
VCC_9	227	228	VCC_10
VCC_11	229	230	VCC_12

2.4 Installing Heatsink

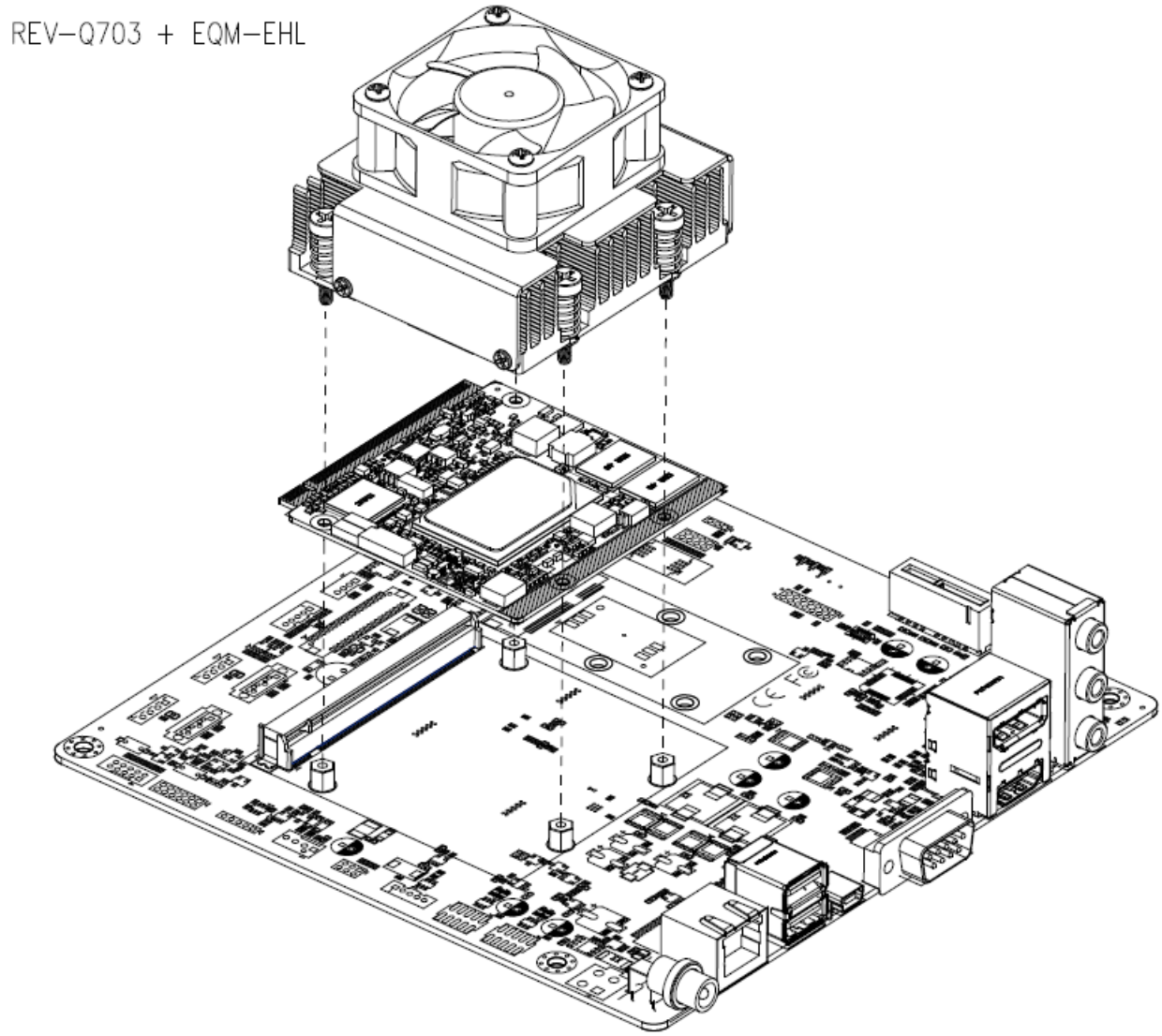
Standard Temperature



Step1. Using 4 screws to lock the Heatsink from PCB backside.

EQM-EHL

Wide Temperature



Step1. Using 4 screws to lock the Heatsink from PCB backside.

3.BIOS Setup

3.1 Introduction

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

3.2 Starting Setup

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

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

Press <Del> or <F2> to enter SETUP

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

Press F1 to Continue, DEL to enter SETUP

3.3 Using Setup

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

Button	Description
↑↓→←	Move
Enter	Select
+/-	Value
Esc	Exit
F1	General Help
F2	Previous Values
F3	Optimized Defaults
F4	Save & Exit Setup
<K>	Scroll help area upwards
<M>	Scroll help area downwards

- **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.

3.5 In Case of Problems

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

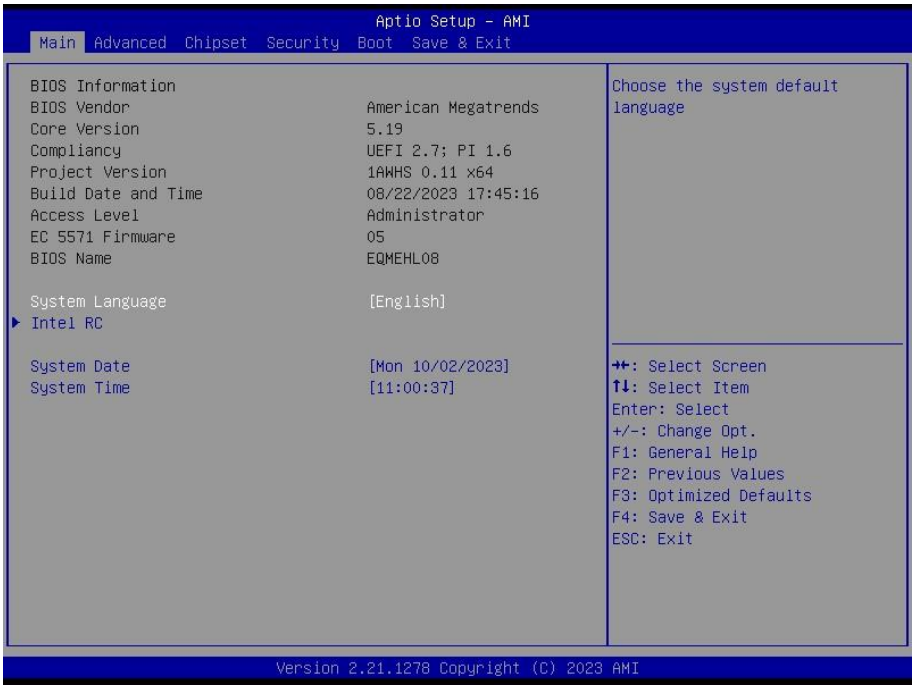
The best advice is to only alter settings which you thoroughly understand. To this end, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both BIOS Vendor and your systems manufacturer to provide the absolute maximum performance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

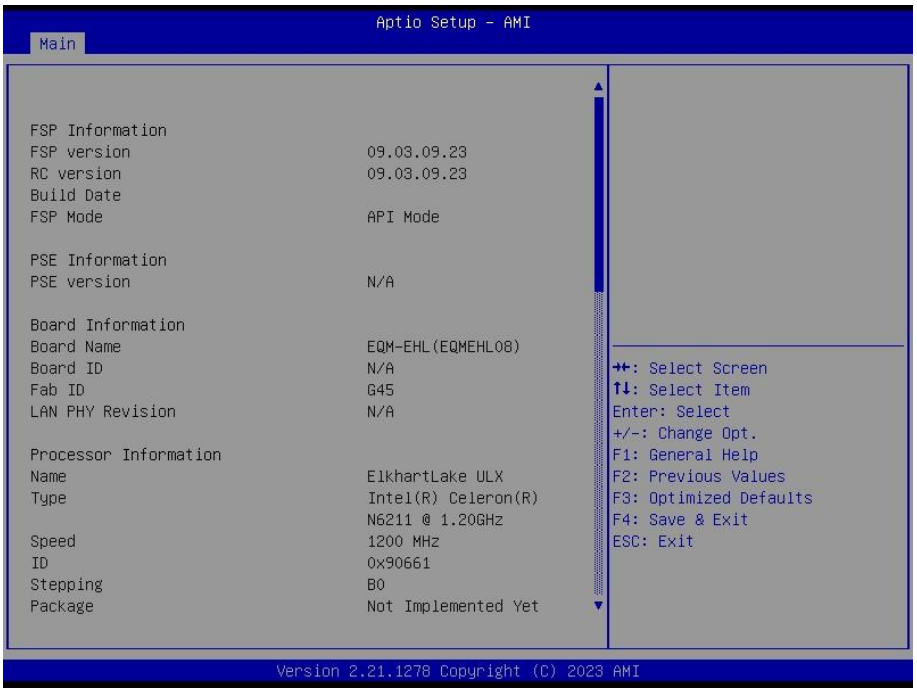
3.6 BIOS setup

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

3.6.1 Main Menu

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





3.6.1.1 System Language

This option allows choosing the system default language.

3.6.1.2 System Date

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

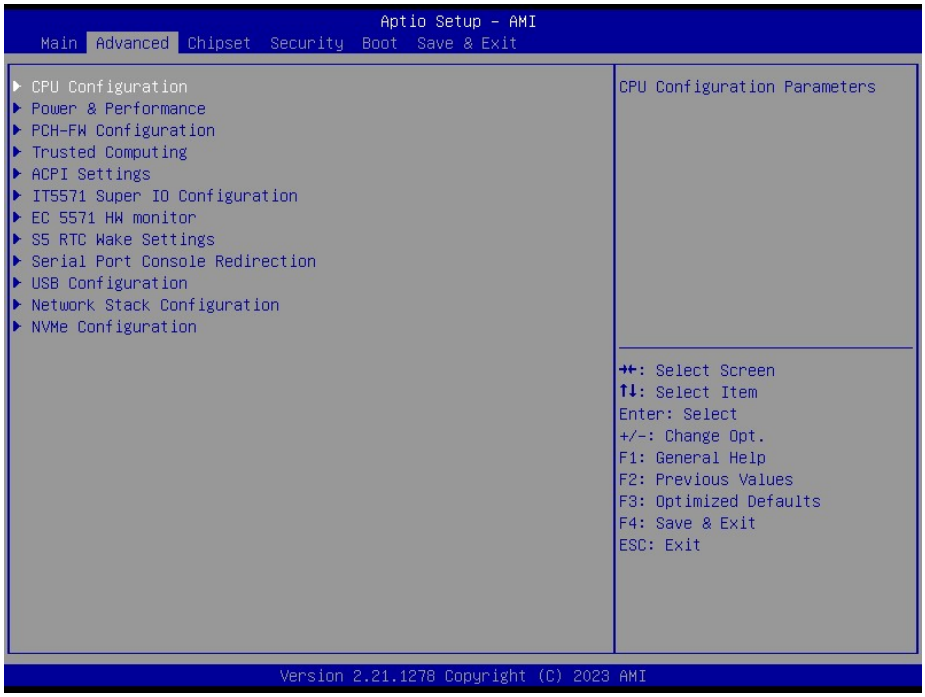
3.6.1.3 System Time

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

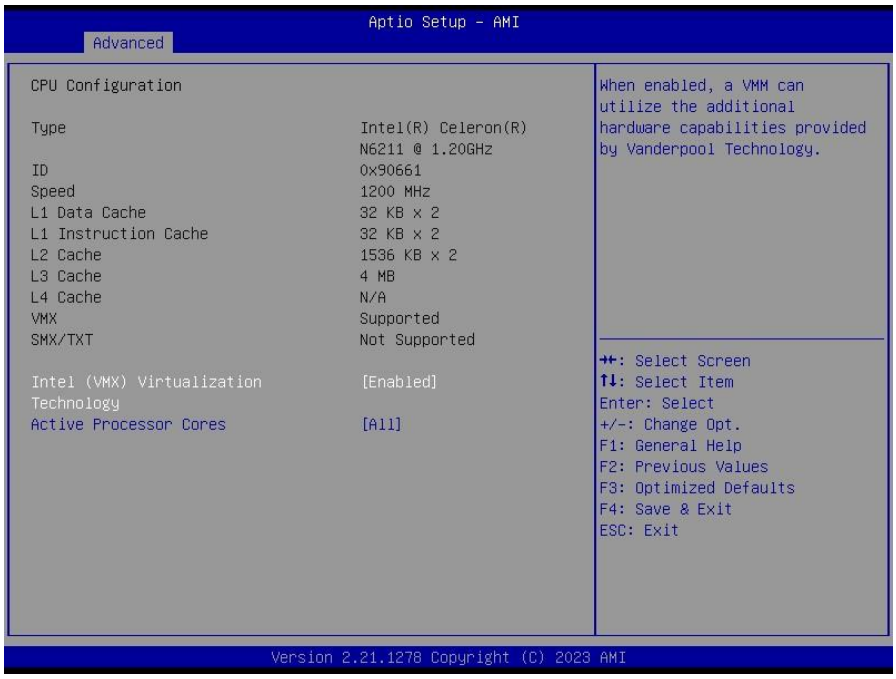
Note: The BIOS setup screens shown in this chapter are for reference purposes only, and may not exactly match what you see on your screen.
Visit the Avalue website (www.avalue.com.tw) to download the latest product and BIOS information.

3.6.2 Advanced Menu

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

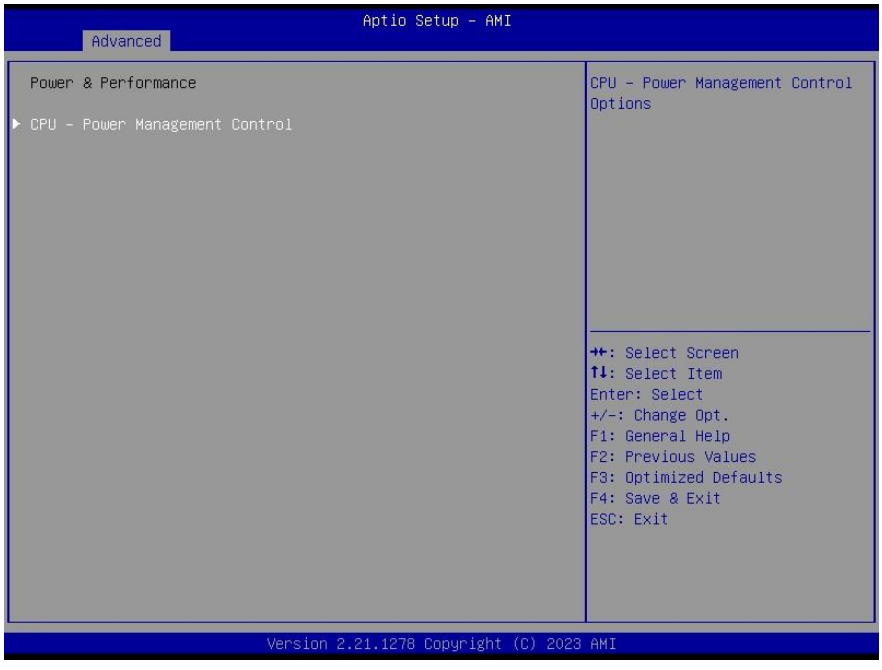


3.6.2.1 CPU Configuration

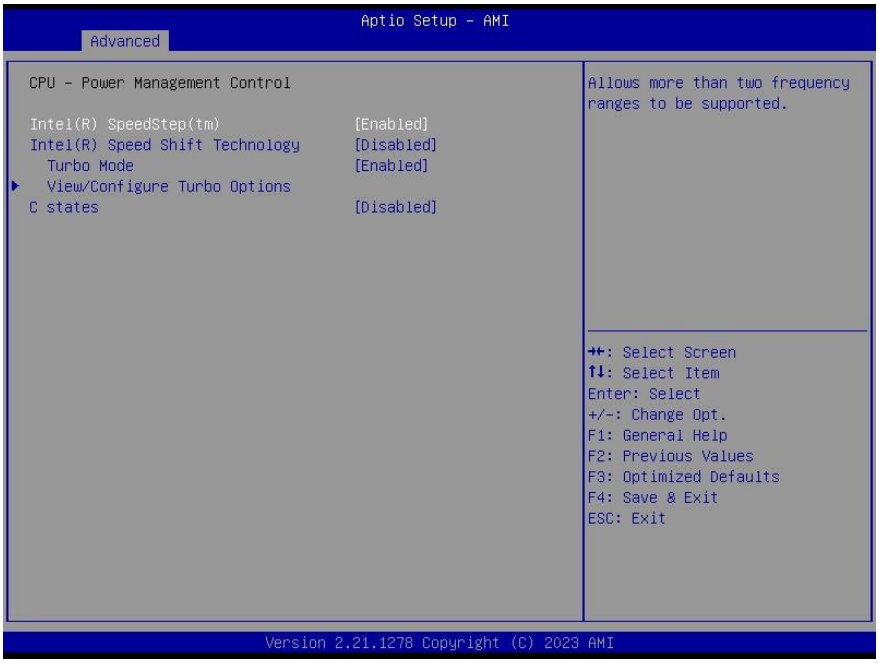


Item	Options	Description
Intel (VMX) Virtualization Technology	Disabled Enabled**[Default]**,	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.
Active Processor Cores	All**[Default]**, 1	Number of cores to enable in each processor package.

3.6.2.2 Power & Performance

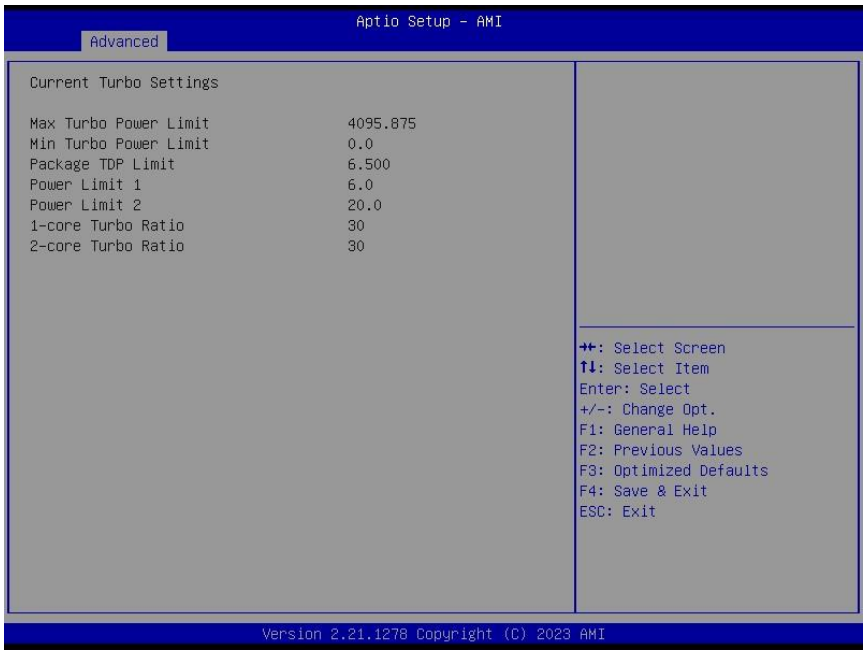


3.6.2.2.1 CPU - Power Management Control

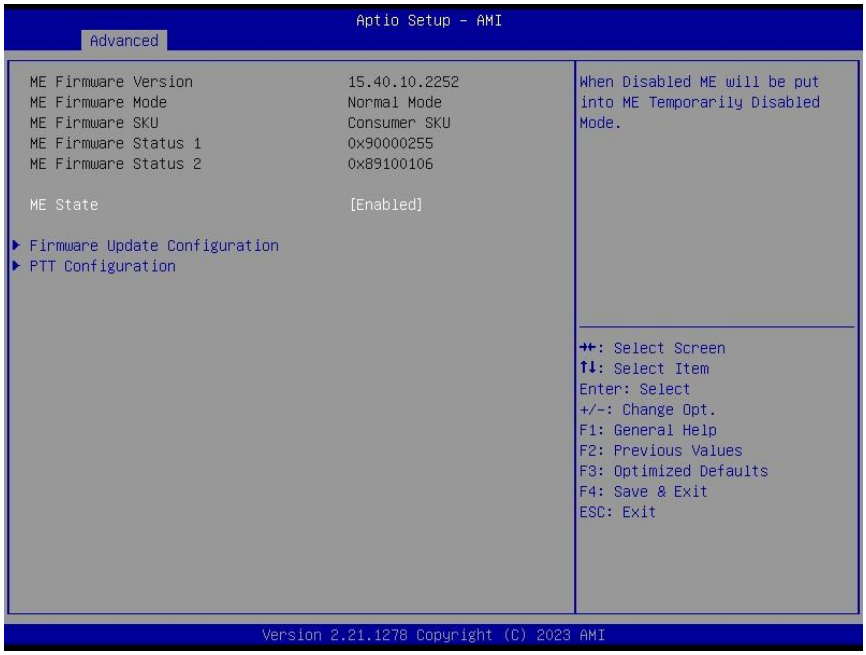


Item	Options	Description
Intel® SpeedStep™	Disabled Enabled**[Default]**,	Allows more than two frequency ranges to be supported.
Intel® Speed Shift Technology	Disabled**[Default]** Enabled,	Enable/Disable Intel(R) Speed Shift Technology support. Enabling will expose the CPPC v2 interface to allow for hardware controlled P-states.
Turbo Mode	Disabled Enabled**[Default]**,	Enable/Disable processor Turbo Mode (requires EMTTM enabled too). AUTO means enabled.
C states	Disabled**[Default]** Enabled	Enable/Disable CPU Power Management. Allows CPU to go to C states when it's not 100% utilized.

3.6.2.2.1.1 View/Configure Turbo Options

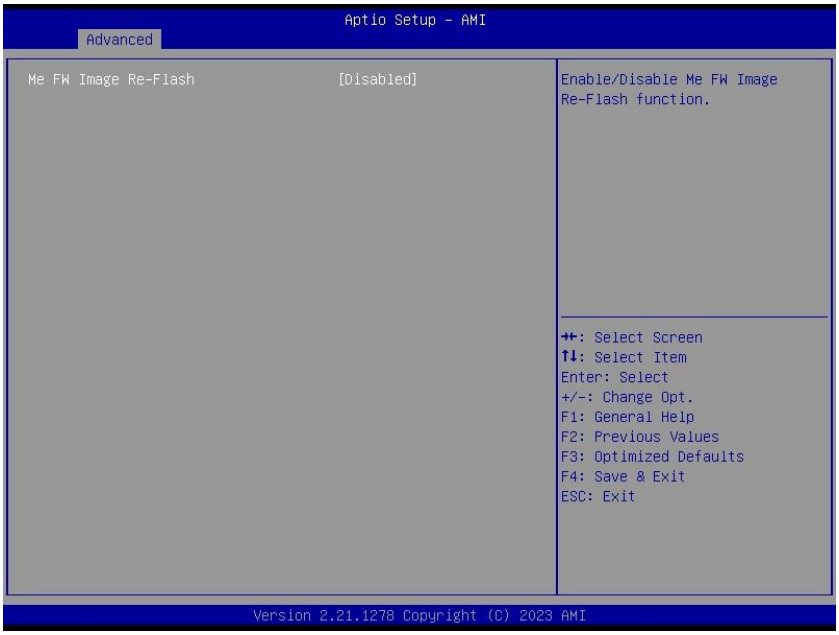


3.6.2.3 PCH-FW Configuration



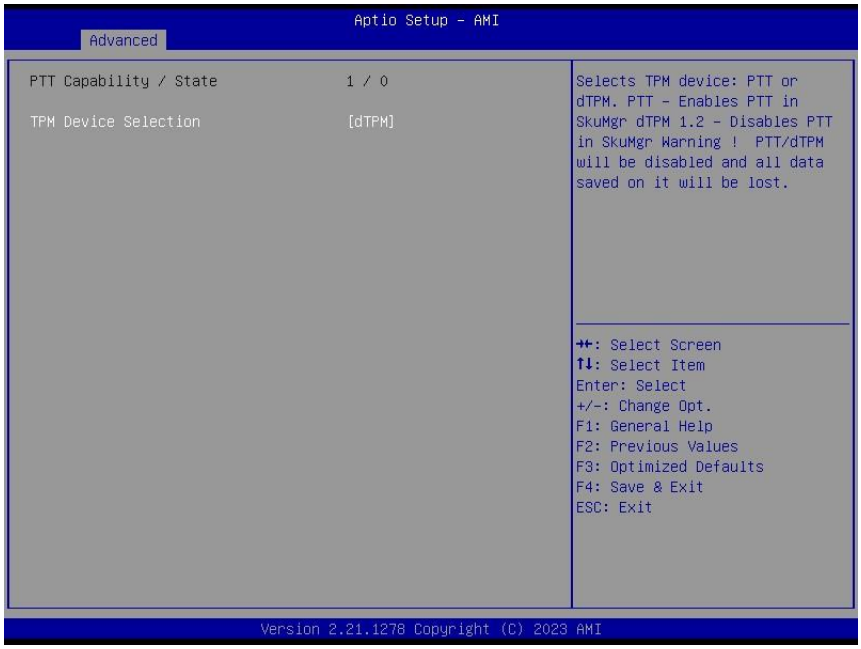
Item	Options	Description
Me State	Disabled Enabled**[Default]**,	When Disabled ME will be put into ME Temporarily Disabled Mode.

3.6.2.3.1 Firmware Update Configuration



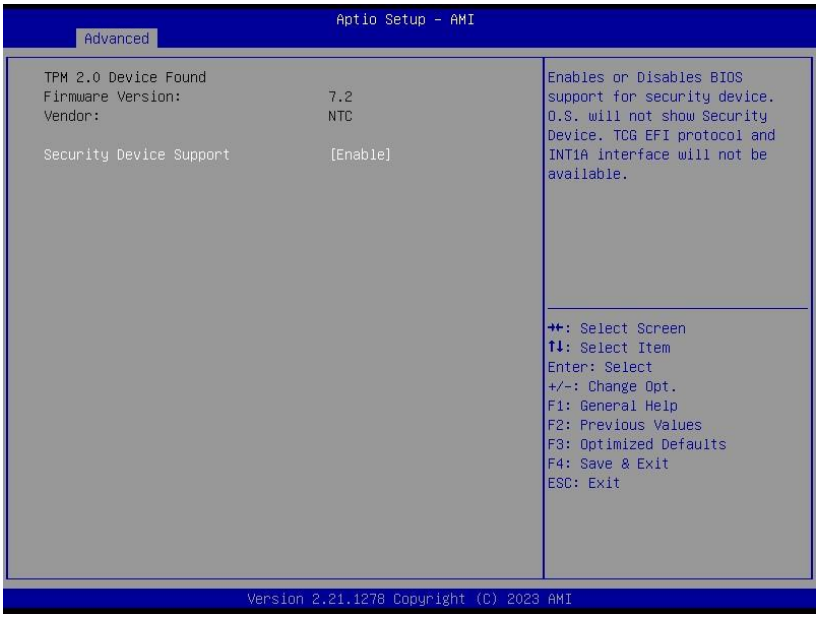
Item	Options	Description
Me FW Image Re-Flash	Disabled**[Default]**, Enabled	Enable/Disable Me FW Image Re-Flash function.

3.6.2.3.2 PTT Configuration



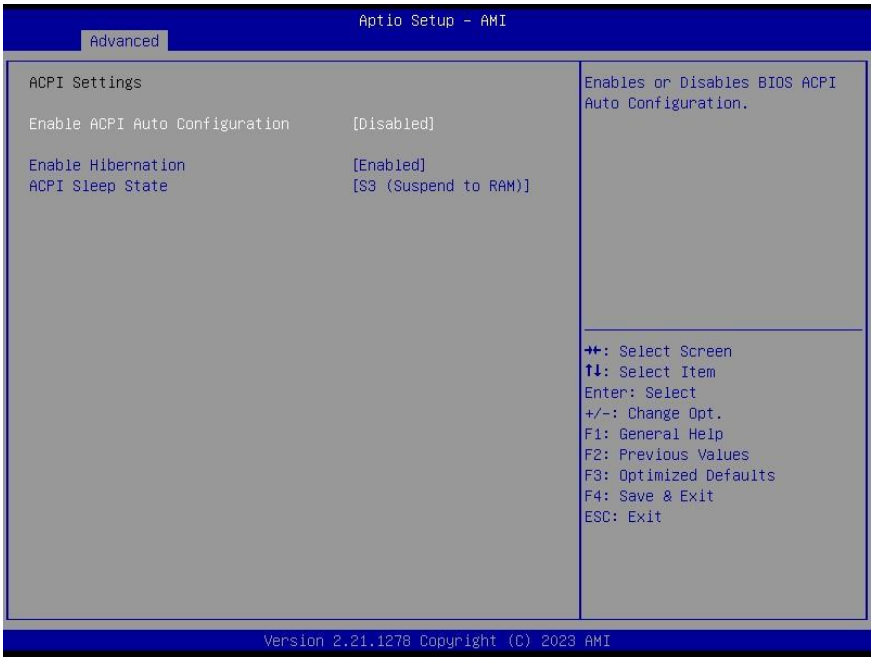
Item	Options	Description
TPM Device Selection	dTPM**[Default]**, PTT	Select TPM device: PTT or dTPM. PTT-Enables PTT in SkuMgr dTPM 1.2 – Disables PTT in SkuMgr Warning! PTT/dTPM will be disabled and all data saved on it will be lost.

3.6.2.4 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.

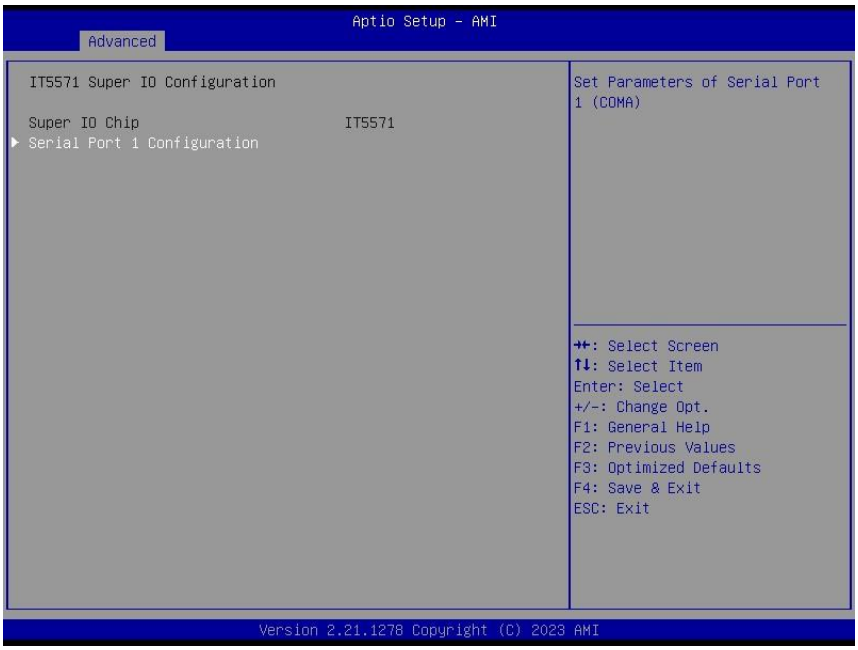
3.6.2.5 ACPI Settings



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

3.6.2.6 IT5571 Super IO Configuration

You can use this item to set up or change the IT5571 Super IO configuration for serial ports. Please refer to 3.6.2.6.1 for more information.

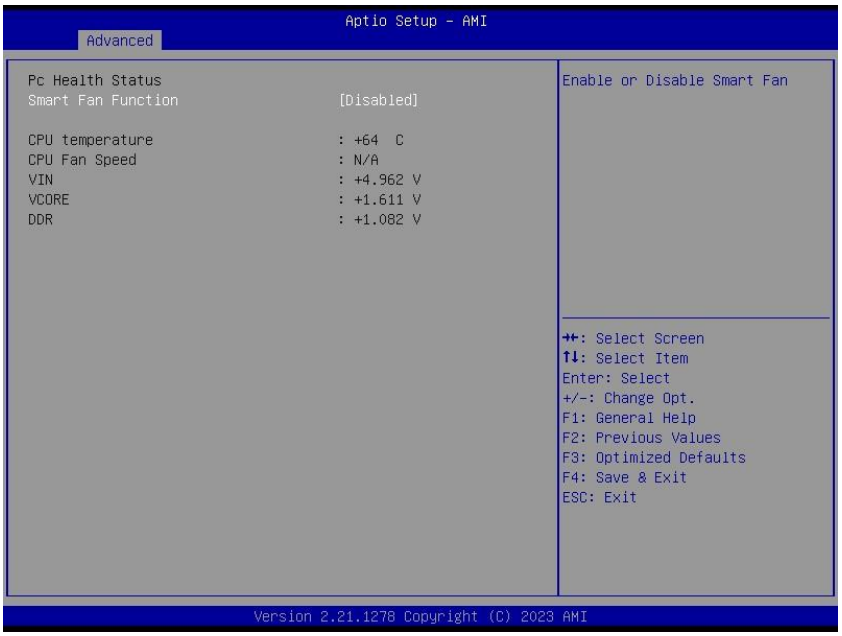


Item	Description
Serial Port 1 Configuration	Set Parameters of Serial Port 1 (COMA).

3.6.2.6.1 Serial Port 1 Configuration

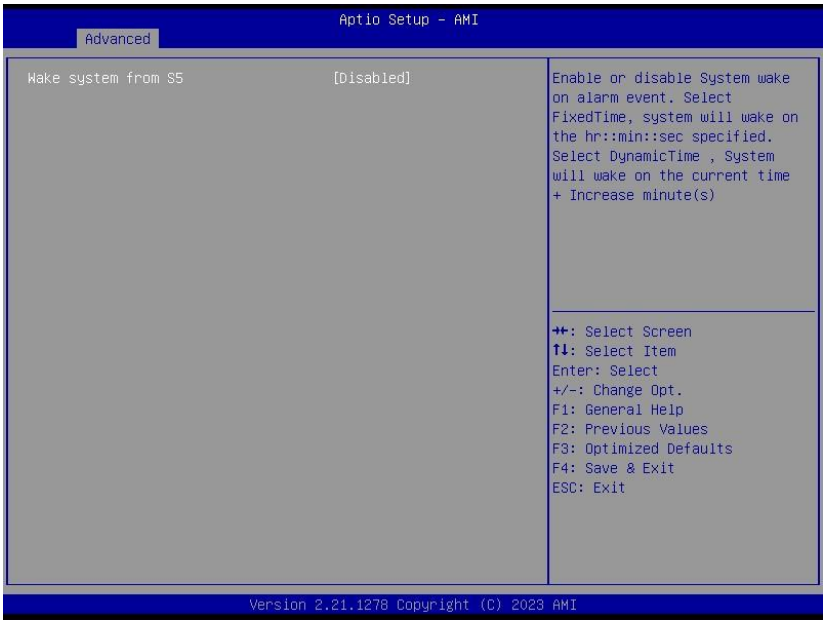
Item	Option	Description
Serial Port	Disabled Enabled**[Default]**,	Enable or Disable Serial Port (COM).

3.6.2.7 EC 5571 H/W monitor



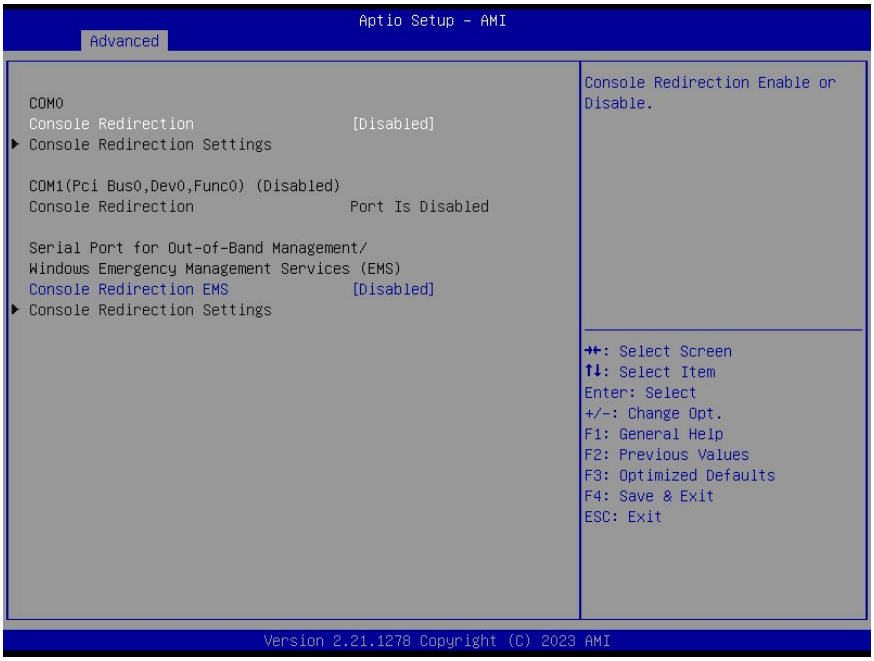
Item	Option	Description
Smart Fan Function	Disabled**[Default]**, Enabled	Enable or Disable Smart Fan.

3.6.2.8 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 FixedTime, system will wake on the hr::min::sec specified. Select DynamicTime, System will wake on the current time + Increase minutes(s).

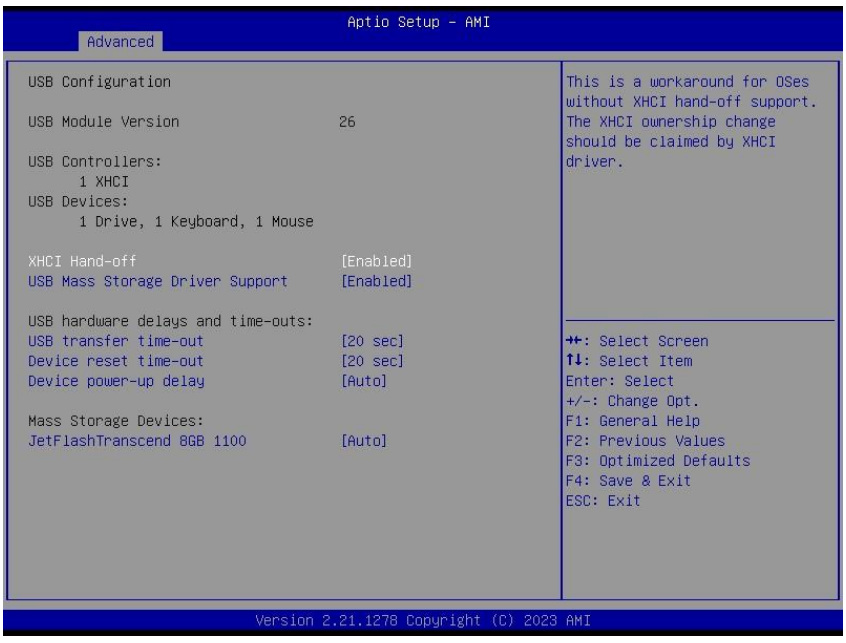
3.6.2.9 Serial Port Console Redirection



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

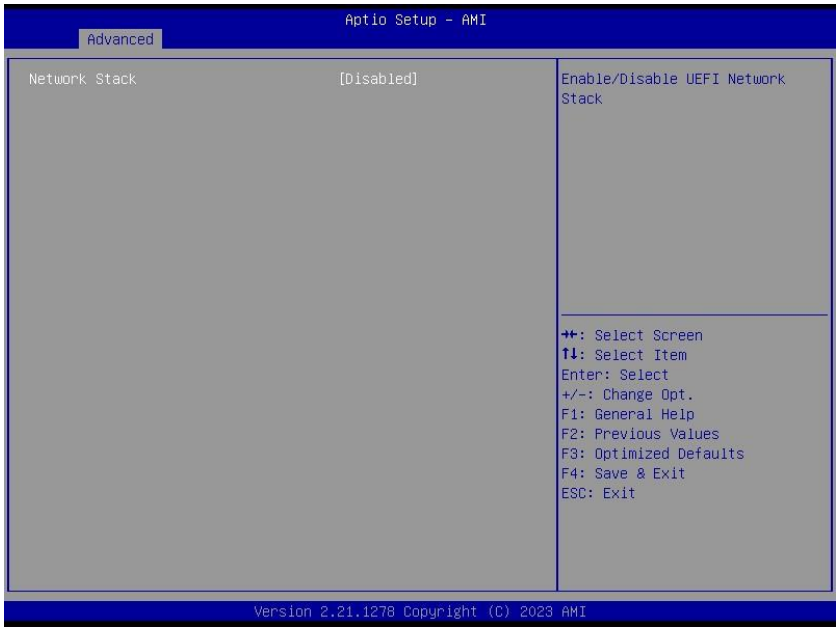
3.6.2.10 USB Configuration

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



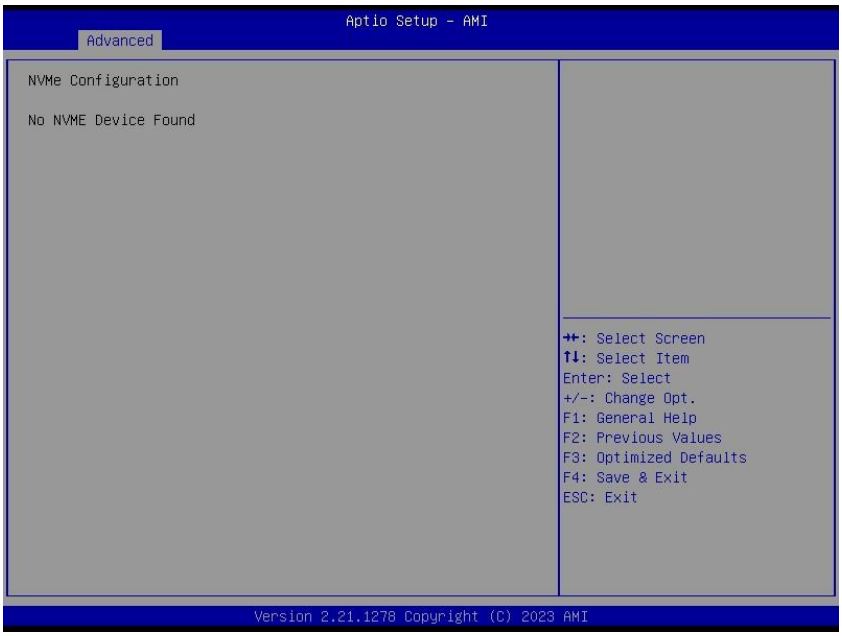
Item	Options	Description
XHCI Hand-off	Enabled**[Default]** Disabled	This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
USB Mass Storage Driver Support	Enabled**[Default]** Disabled	Enable/Disable USB Mass Storage Driver Support.
USB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

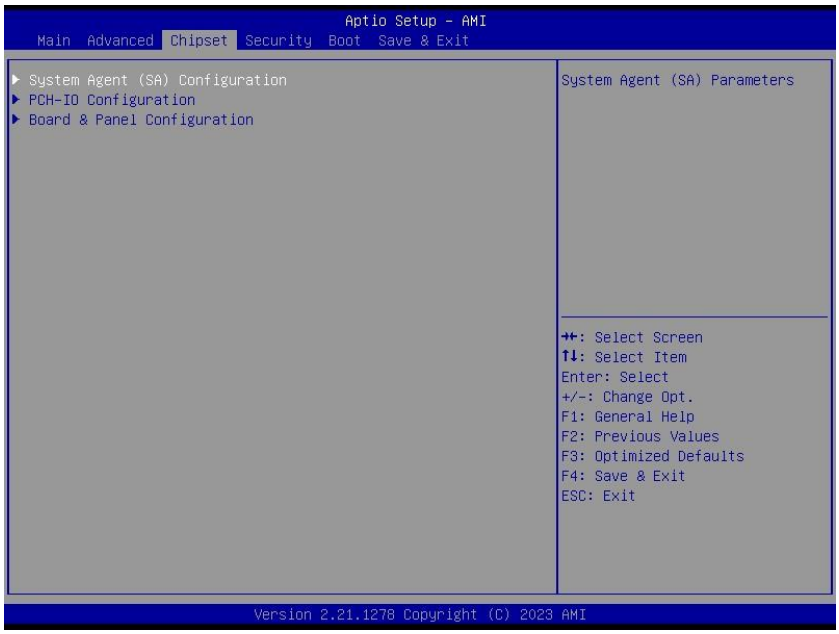


Item	Options	Description
Network Stack	Enabled Disabled**[Default]**	Enable/Disable UEFI Network Stack.

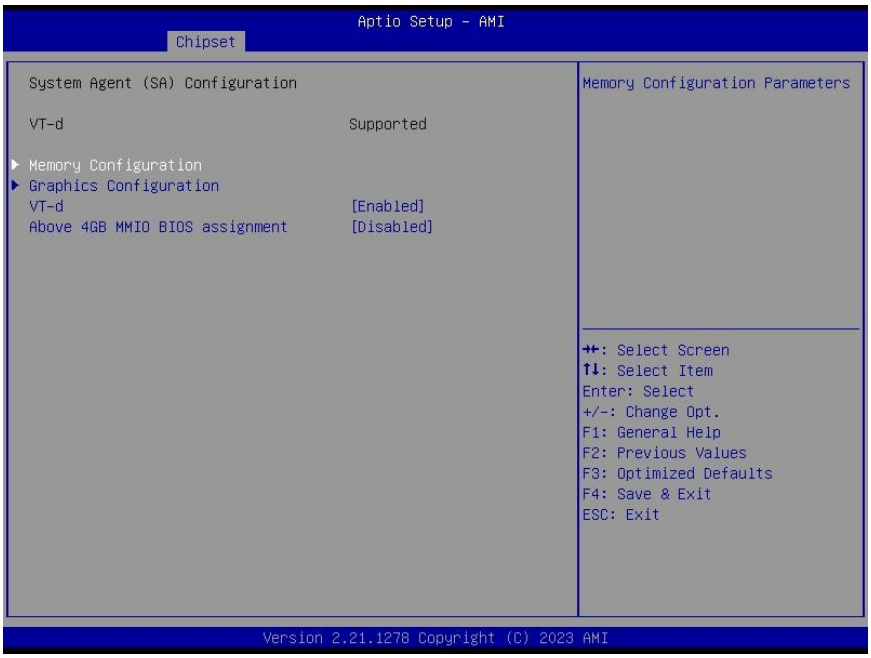
3.6.2.12 NVMe Configuration



3.6.3 Chipset

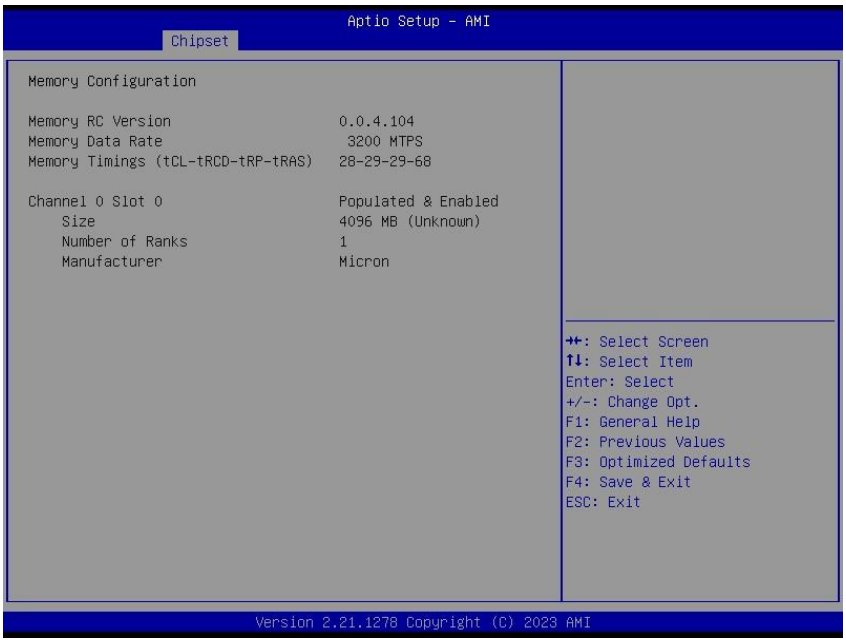


3.6.3.1 System Agent (SA) Configuration

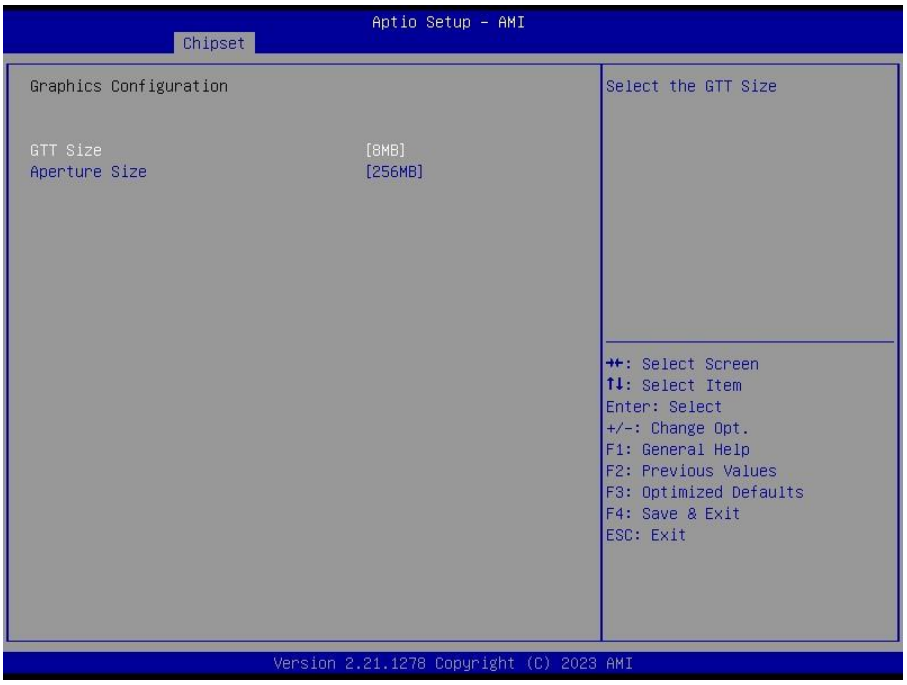


Item	Option	Description
VT-d	Disabled Enabled**[Default]**	VT-d capability.
Above 4GB MMIO BIOS assignment	Enabled Disabled**[Default]**	Enable/Disable above 4GB MemoryMapped IO BIOS assignment. This is disabled automatically when Aperture Size is set to 2048MB.

3.6.3.1.1 Memory Configuration

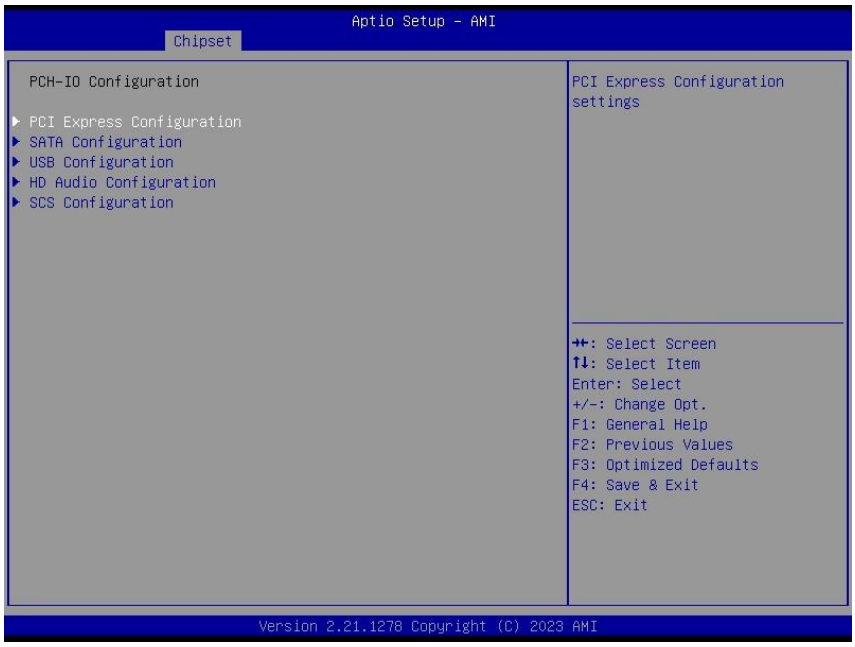


3.6.3.1.2 Graphics Configuration

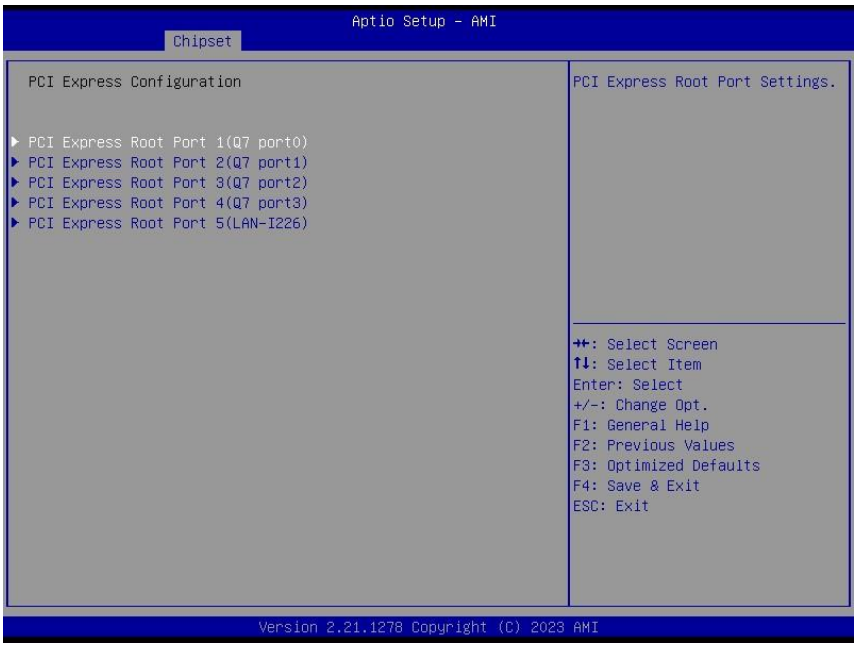


Item	Option	Description
GTT Size	2MB 4MB 8MB**[Default]**	Select the GTT Size.
Aperture Size	128MB 256MB**[Default]** 512MB 1024MB	Select the Aperture Size. Note: Above 4GB MMIO BIOS assignment is automatically enabled when selecting 2048MB aperture. To use this feature, please disable CSM Support.

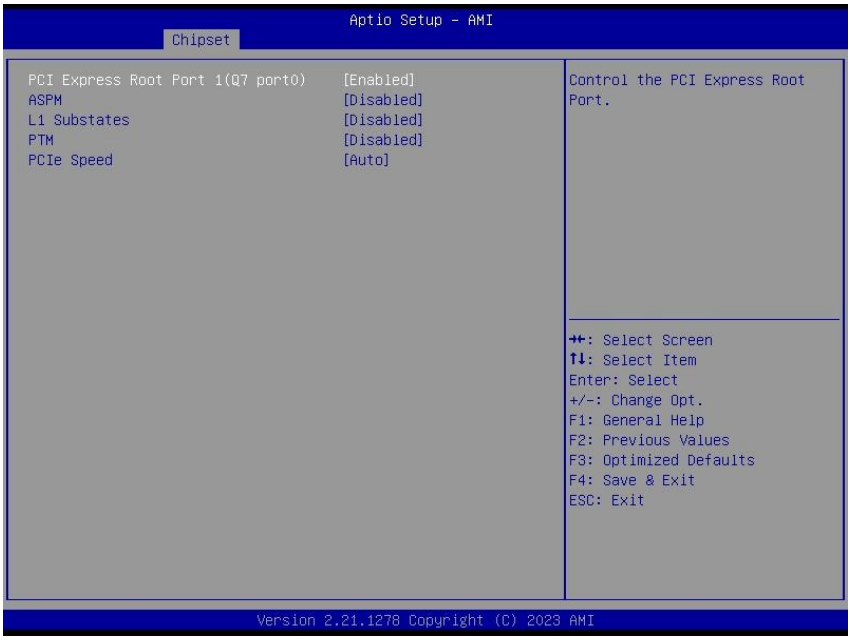
3.6.3.2 PCH-IO Configuration



3.6.3.2.1 PCI Express Configuration

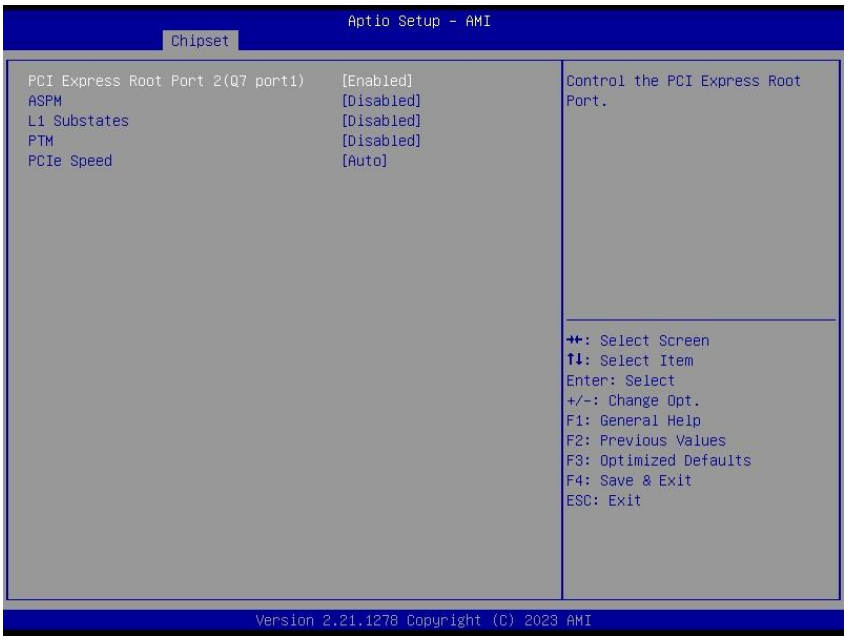


3.6.3.2.1.1 PCI Express Root Port 1(Q7 port0)



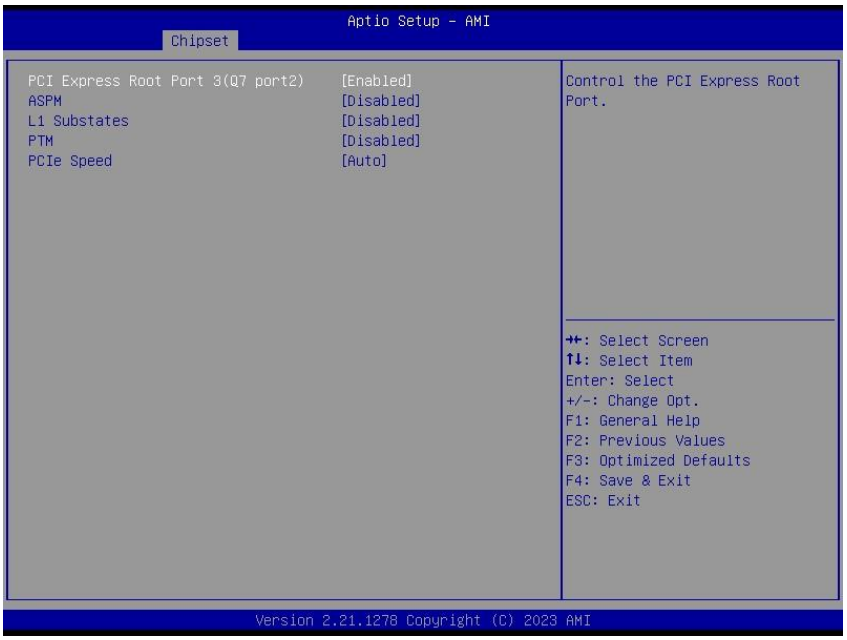
Item	Option	Description
PCI Express Root Port 1(Q7 port0)	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM	Disabled**[Default]** L0s L1 L0sL1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled**[Default]**, L1.1 L1.1 & L1.2	PCI Express L1 Substates settings.
PTM	Disabled**[Default]**, Enabled,	Enable/Disable Precision Time Measurement.
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3	Select PCIe speed.

3.6.3.2.1.2 PCI Express Root Port 2(Q7 port1)



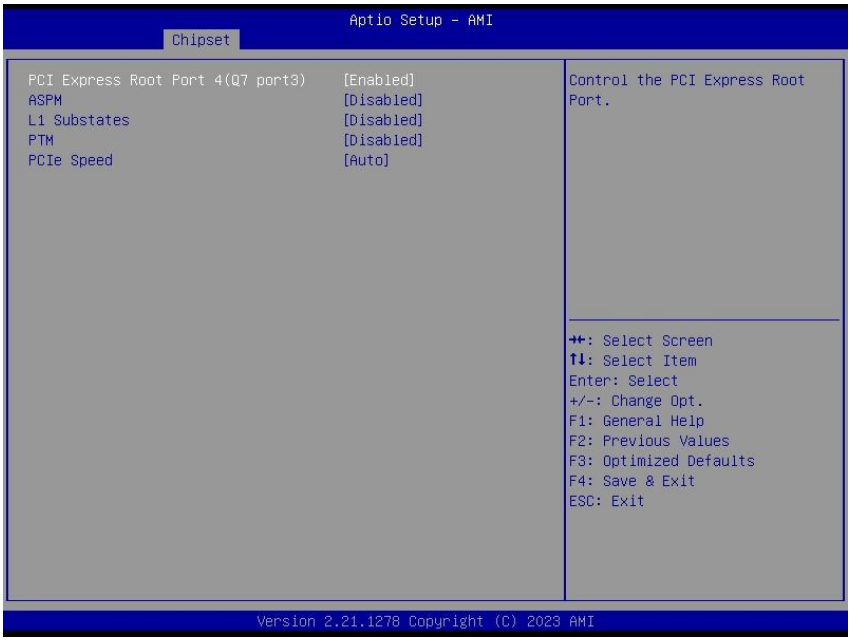
Item	Option	Description
PCI Express Root Port 2(Q7 port1)	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM	Disabled**[Default]** L0s L1 L0sL1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled**[Default]**, L1.1 L1.1 & L1.2	PCI Express L1 Substates settings.
PTM	Disabled**[Default]**, Enabled,	Enable/Disable Precision Time Measurement.
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3	Select PCIe speed.

3.6.3.2.1.3 PCI Express Root Port 3(Q7 port2)



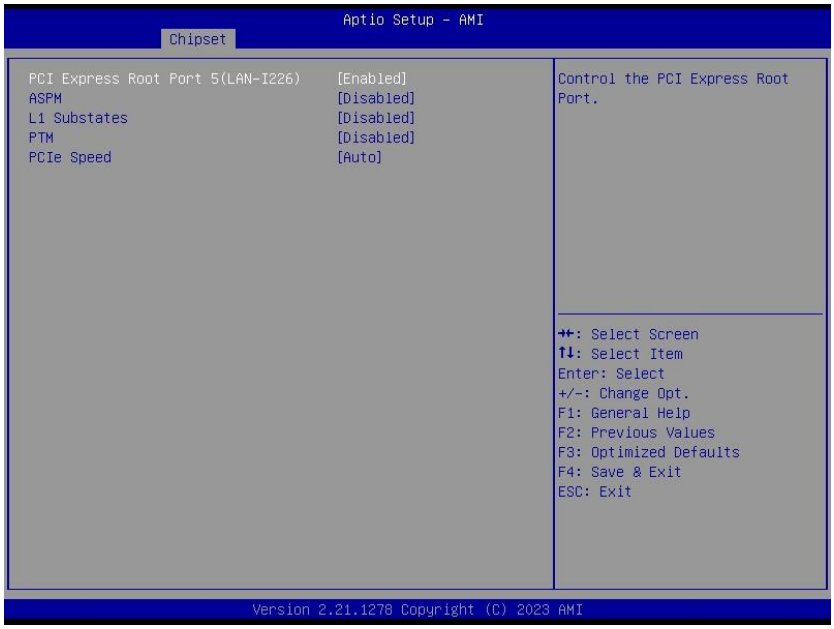
Item	Option	Description
PCI Express Root Port 3(Q7 port)	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM	Disabled**[Default]** L0s L1 L0sL1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled**[Default]**, L1.1 L1.1 & L1.2	PCI Express L1 Substates settings.
PTM	Disabled**[Default]**, Enabled,	Enable/Disable Precision Time Measurement.
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3	Select PCIe speed.

3.6.3.2.1.4 PCI Express Root Port 4(Q7 port3)



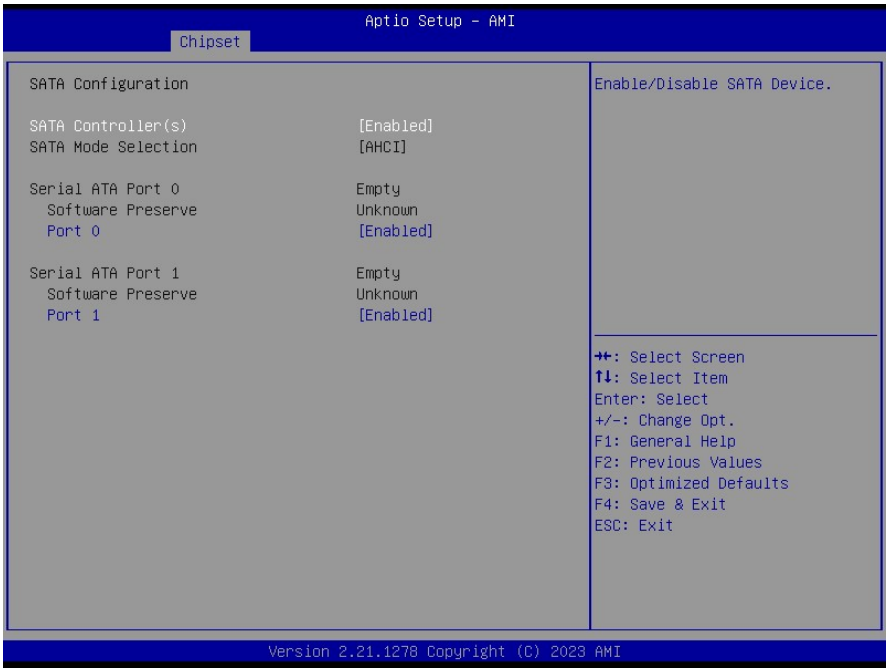
Item	Option	Description
PCI Express Root Port 4(Q7 port3)	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM	Disabled**[Default]** L0s L1 L0sL1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled**[Default]**, L1.1 L1.1 & L1.2	PCI Express L1 Substates settings.
PTM	Disabled**[Default]**, Enabled,	Enable/Disable Precision Time Measurement.
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3	Select PCIe speed.

3.6.3.2.1.5 PCI Express Root Port 5(LAN-I226)



Item	Option	Description
PCI Express Root Port 5(LAN-I226)	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM	Disabled**[Default]** L0s L1 L0sL1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled**[Default]**, L1.1 L1.1 & L1.2	PCI Express L1 Substates settings.
PTM	Disabled**[Default]**, Enabled,	Enable/Disable Precision Time Measurement.
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3	Select PCIe speed.

3.6.3.2.2 SATA And RST Configuration



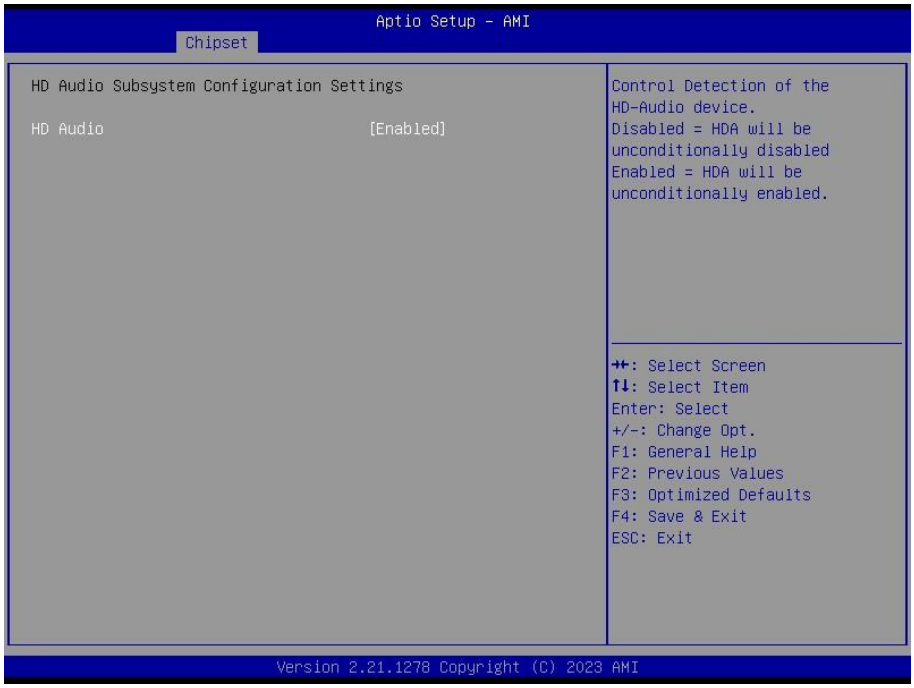
Item	Option	Description
SATA Controller(s)	Disabled Enabled**[Default]**,	Enable/Disable SATA Device.
Port 0	Disabled Enabled**[Default]**,	Enable or Disable SATA Port
Port 1	Disabled Enabled**[Default]**,	Enable or Disable SATA Port

3.6.3.2.3 USB Configuration

EQM-EHL

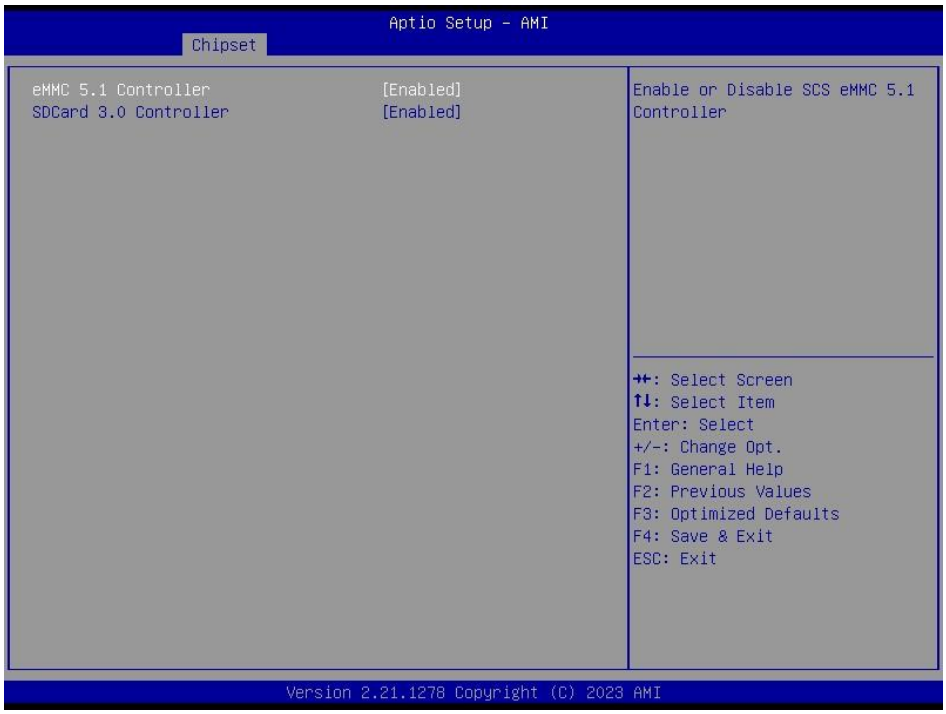
Item	Option	Description
XHCI Compliance Mode	Disabled**[Default]** Enabled,	Option to enable Compliance Mode. Defaults is to disable Compliance Mode. Change to enabled for Compliance Mode testing.

3.6.3.2.4 HD Audio Configuration



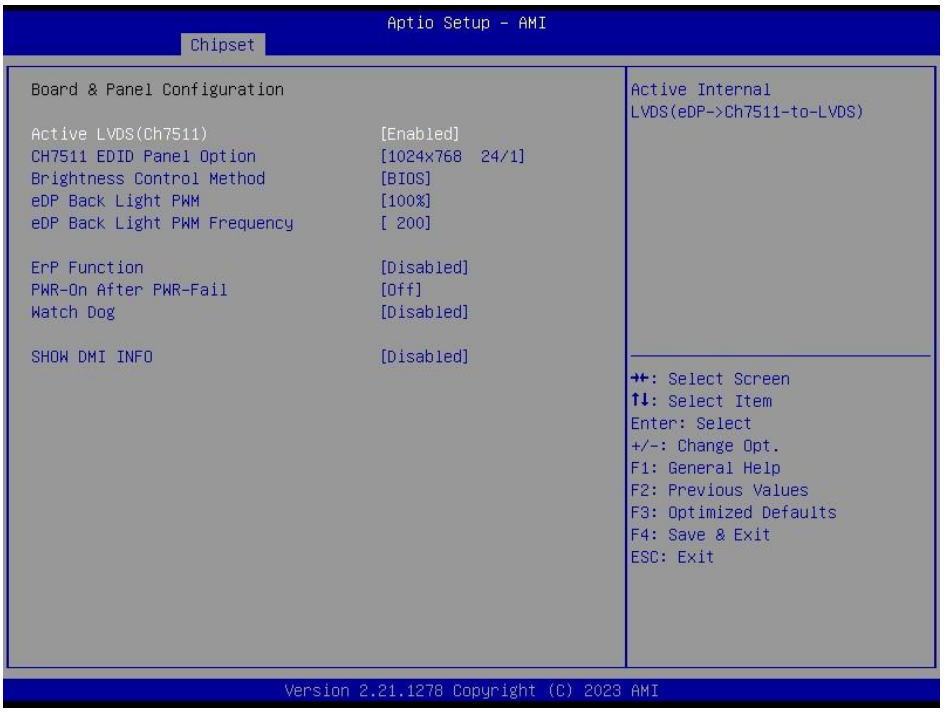
Item	Option	Description
HD Audio	Disabled Enabled**[Default]**,	Control Detection of the HD-Audio device. Disable = HDA will be unconditionally disabled Enabled = HDA will be unconditionally enabled.

3.6.3.2.5 SCS Configuration



Item	Option	Description
eMMC 5.1 Controller	Disabled Enabled**[Default]**,	Enable or Disable SCS eMMC 5.1 Controller.
SDCard 3.0 Controller	Disabled Enabled**[Default]**,	Enable or Disable SCS SDHC 3.0 Controller.

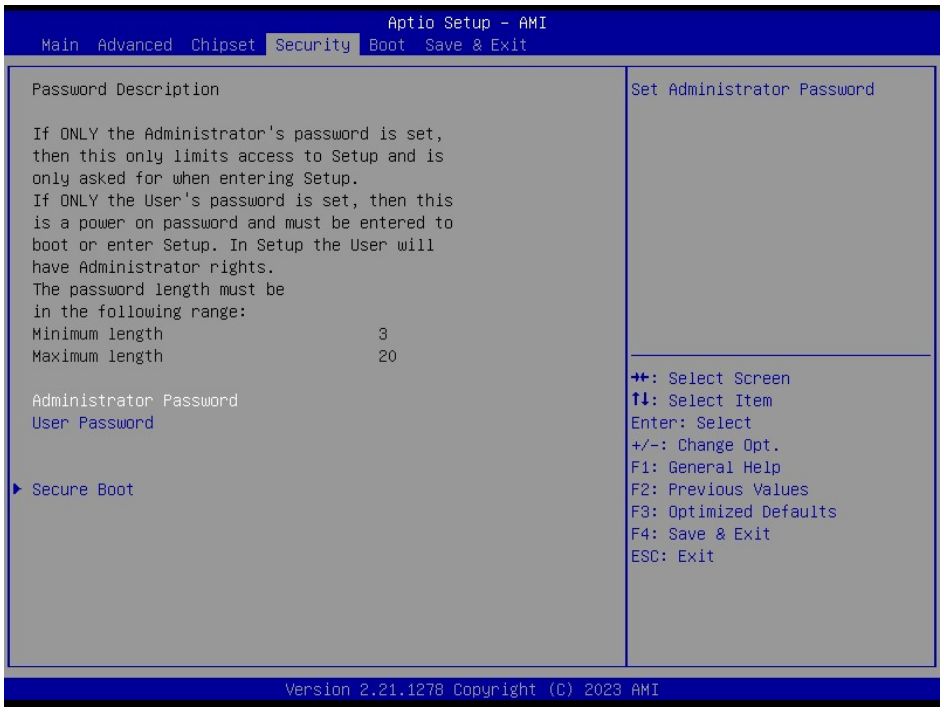
3.6.3.3 Board & Panel Configuration



EQM-EHL

Item	Option	Description
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.
Brightness Control Method	BIOS**[Default]** OS Driver	eDP Brightness Control Method. 1.BIOS 2.OS Driver
eDP Back Light PWM	00% 25% 50% 75% 100%**[Default]**	Select eDP back light PWM duty.
eDP Back Light PWM Frequency	200**[Default]** 300 400 500 700 1k 2k 3k 5k 10k 20k	Select eDP back light PWM Frequency
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.
SHOW DMI INFO	Disabled**[Default]**, Enabled	SHOW DMI INFO

3.6.4 Security



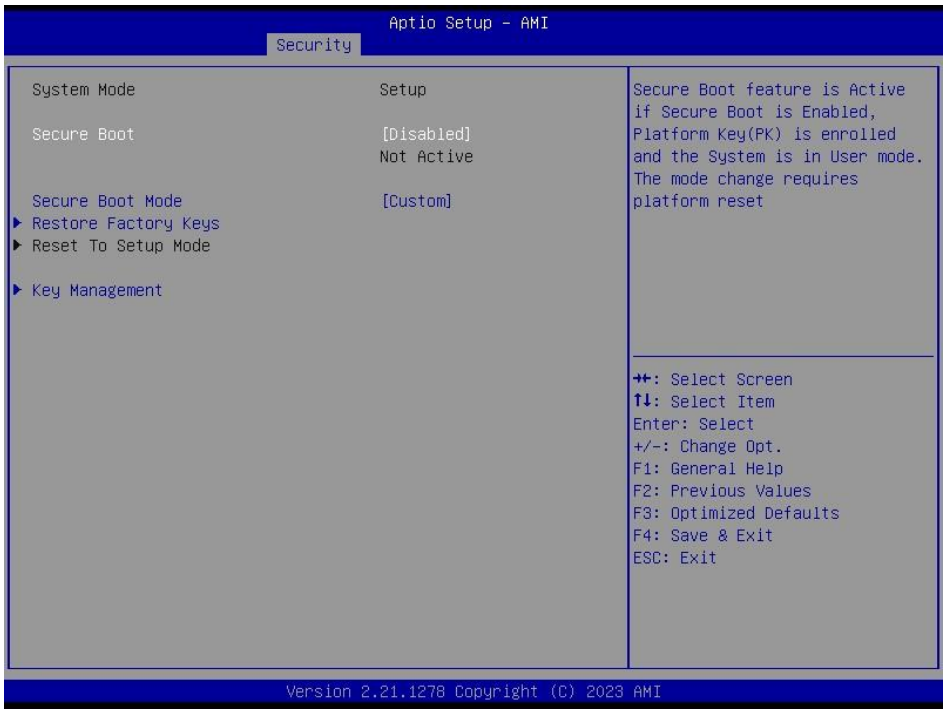
- **Administrator Password**

Set setup Administrator Password

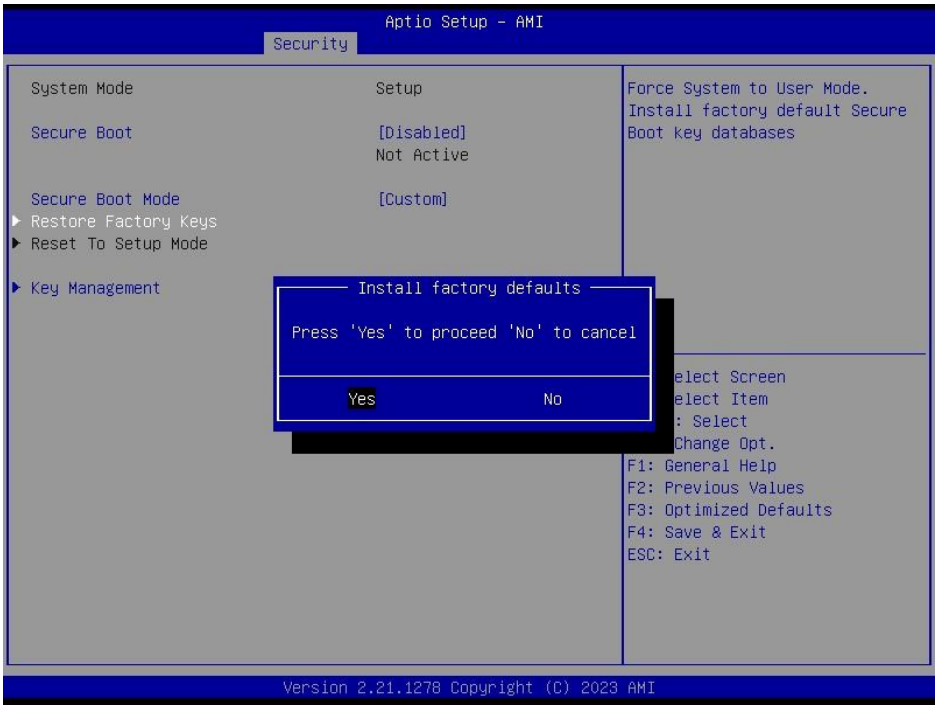
- **User Password**

Set User Password

3.6.4.1 Secure Boot

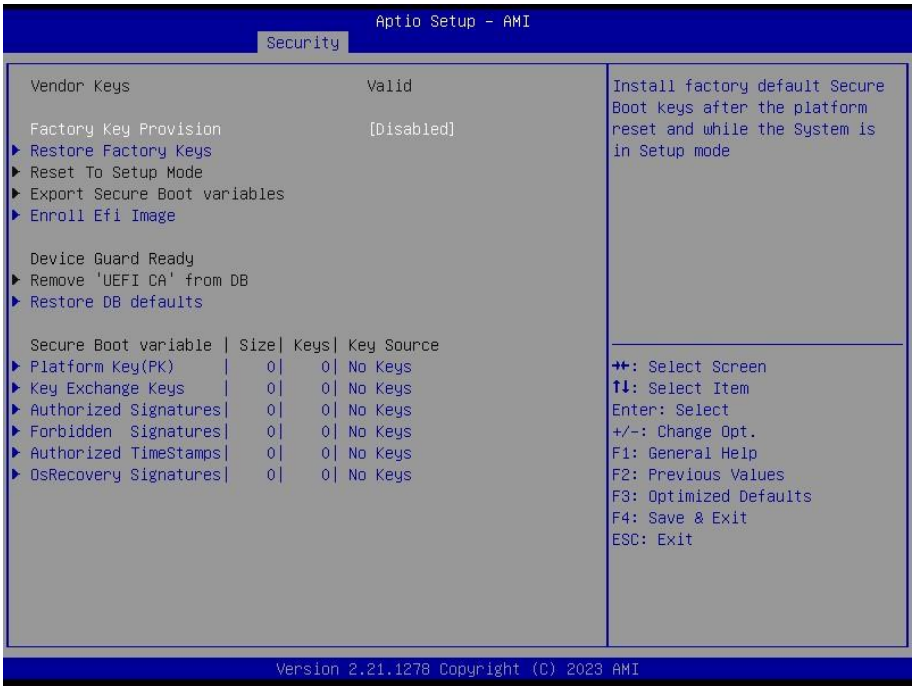


EQM-EHL



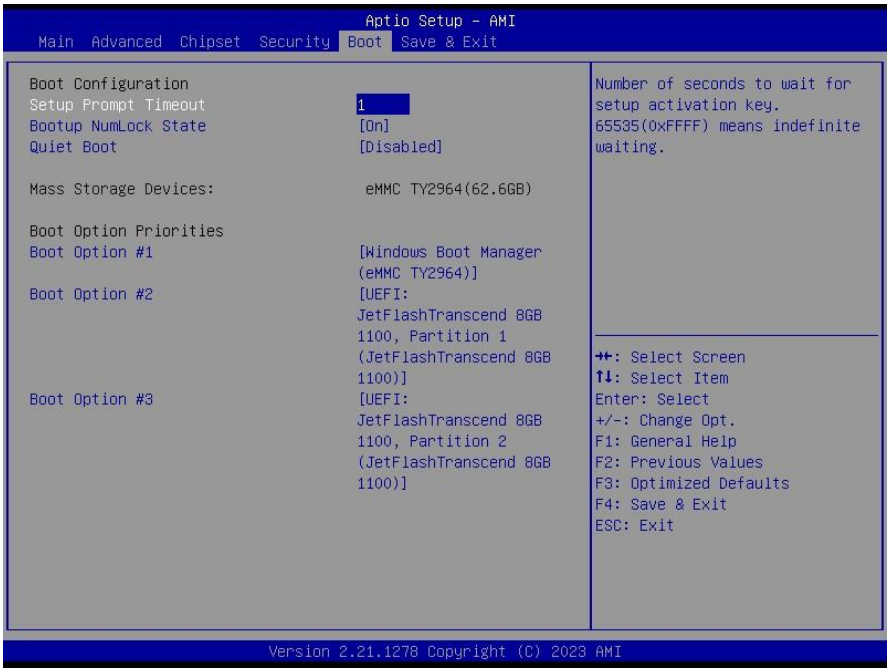
Item	Option	Description
Secure Boot	Disabled**[Default]** Enabled	Secure Boot feature is Active if Secure Boot is Enabled, Platform Key(PK) is enrolled and the System is in User mode. The mode change requires platform reset
Secure Boot Mode	Standard Custom**[Default]**	Secure Boot mode options: Standard or Custom. In Custom mode, Secure Boot Policy variables can be configured by a physically present user without full authentication

3.6.4.1.1 Key Management



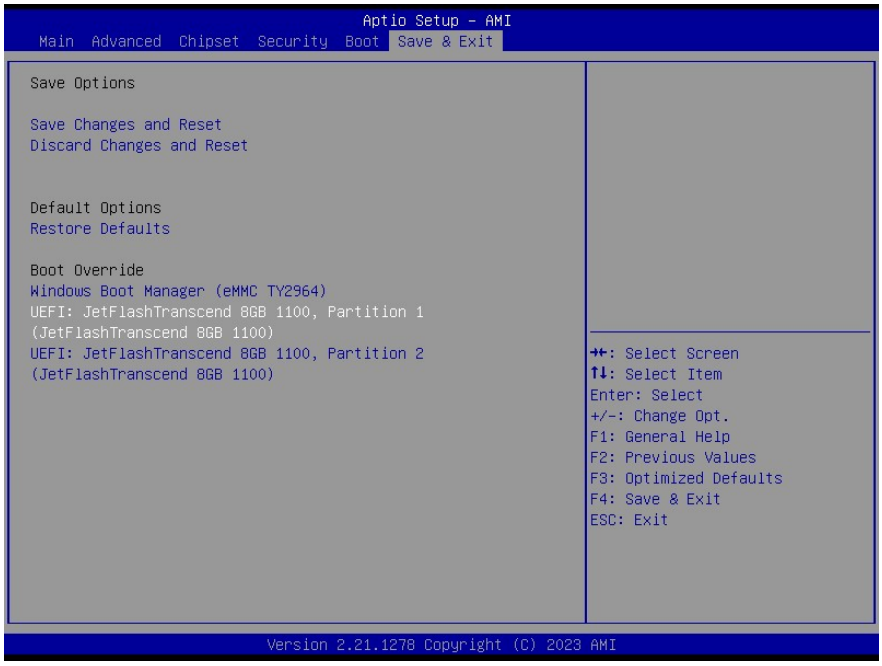
Item	Option	Description
Provision Factory Default Keys	Disable**[Default]** Enable	Allow to provision factory default Secure Boot keys when System is in Setup Mode.

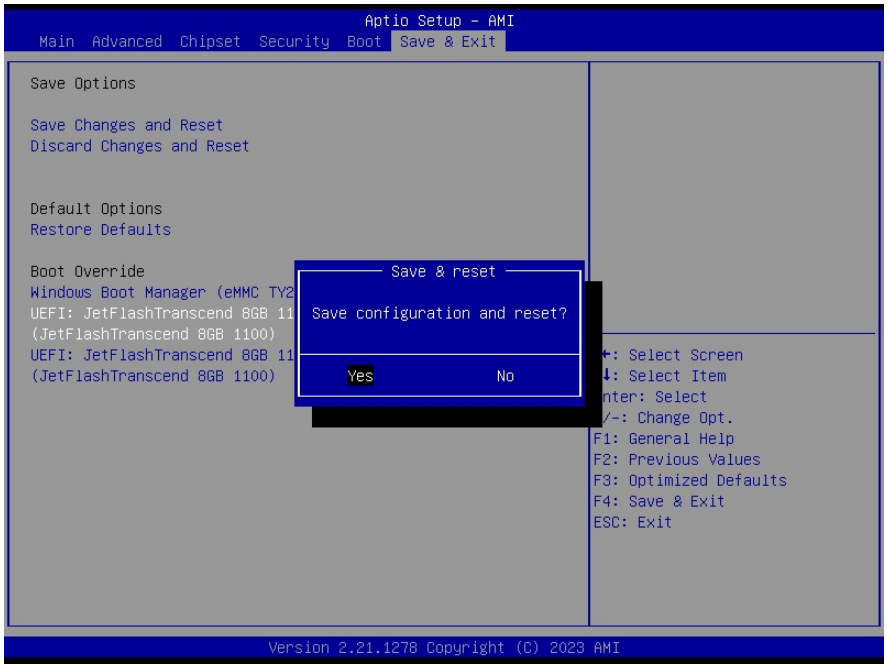
3.6.5 Boot



Item	Option	Description
Setup Prompt Timeout	1	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 #1/2/3	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

Reset system setup without saving any changes.

3.6.6.3 Restore Defaults

Restore/Load Default values for all the setup options.

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.

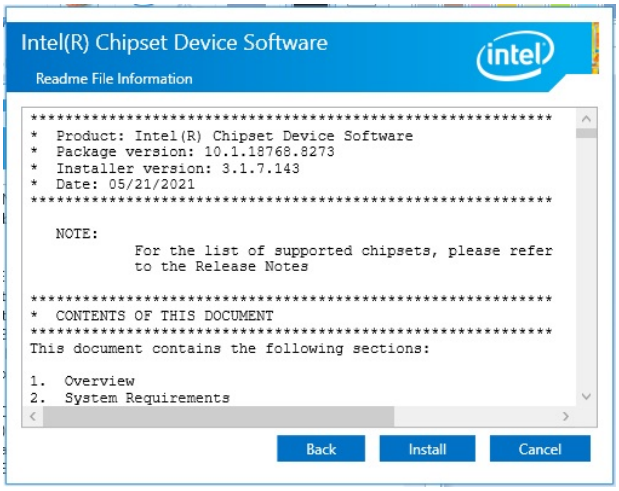
4. Drivers Installation

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

All drivers can be found on the Avalue Official Website: http://www.avalue.com.tw.

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



Step 3. Click **Install**.

Step1. Click **Next**.

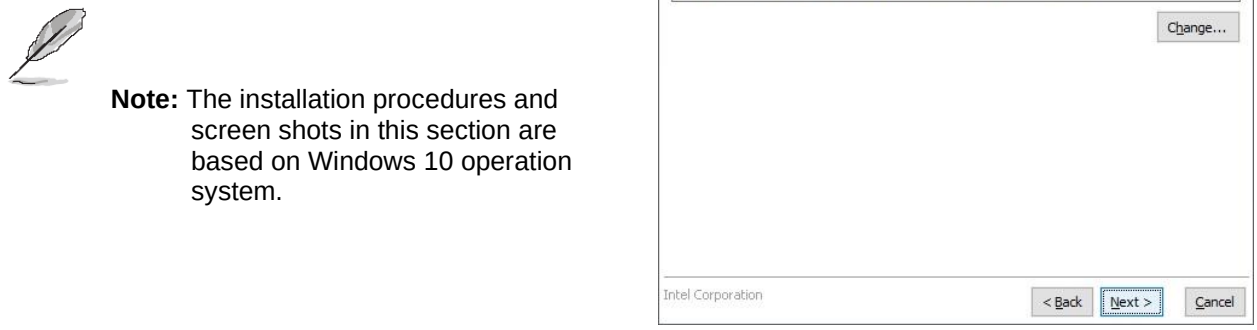
Step 4. Complete setup.

Step 2. Click **Accept**.

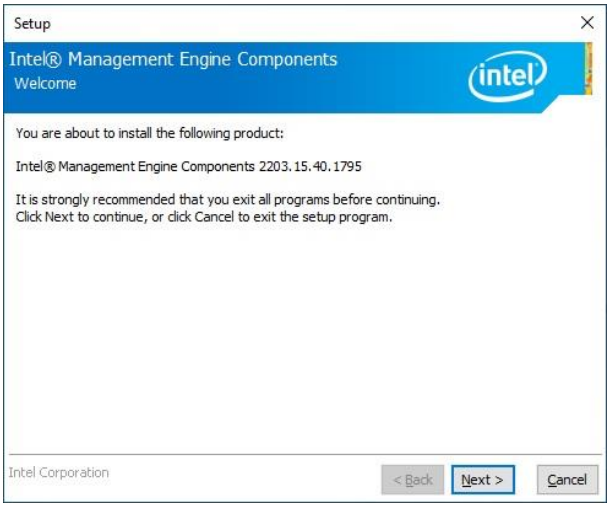
4.2 Install ME Driver

All drivers can be found on the Avalue Official Website: http://www.avalue.com.tw.

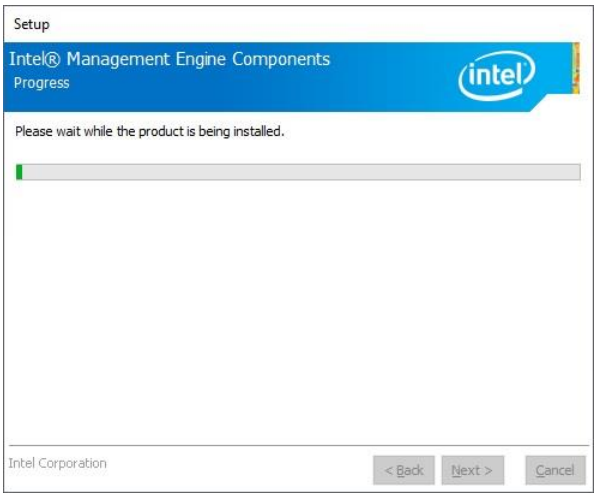
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system.



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

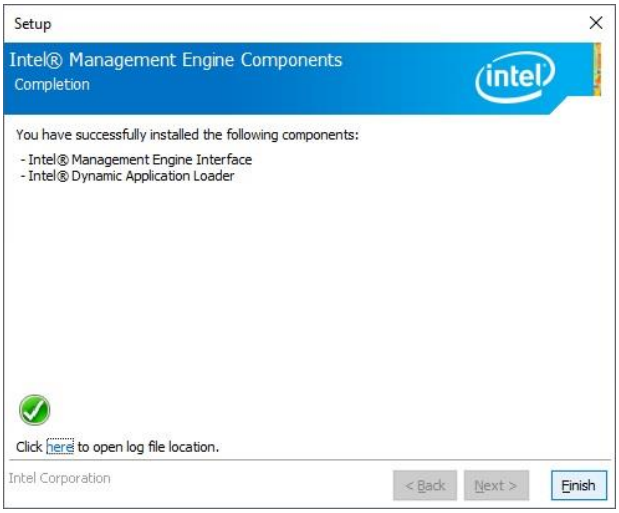


Step1. Click **Next** to start installation.



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

Step 2. Click **Next**.

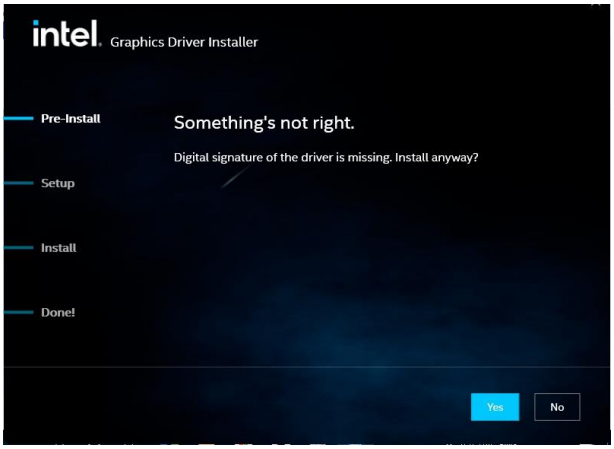


Step 5. Click **Finish** to complete setup.

4.3 Install VGA Driver

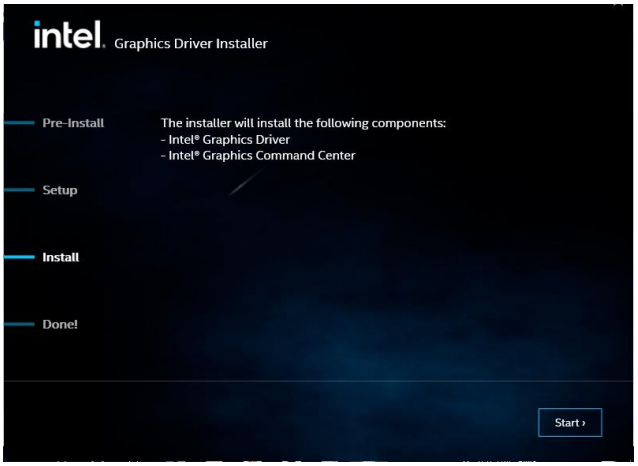
All drivers can be found on the Avalue Official Website: http://www.avalue.com.tw.

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

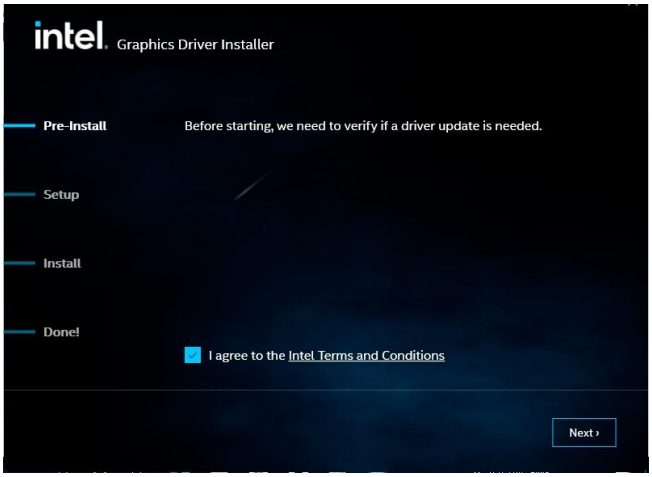


Step 3. Click **Yes**.

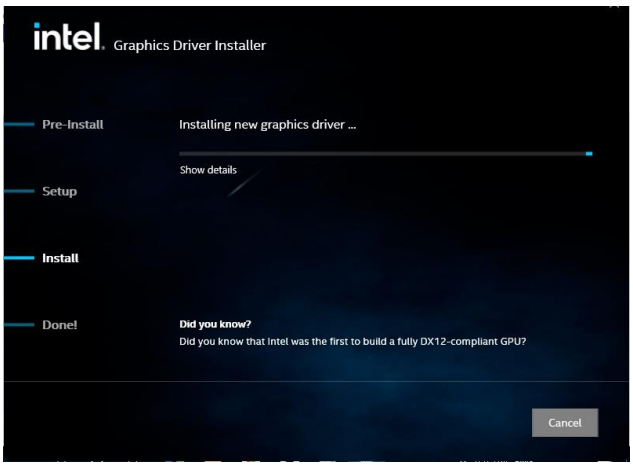
Step 1. Click **Begin installation**.



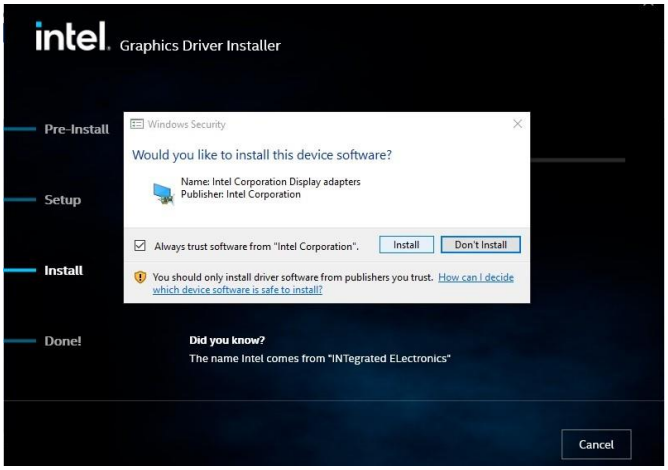
Step 4. Click **Start**.



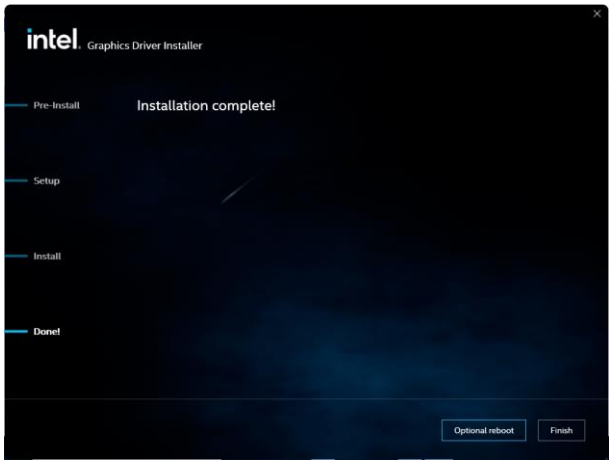
Step 2. Click **Next**.



Step 5. Click **Cancel**.



Step 6. Click **Cancel**.

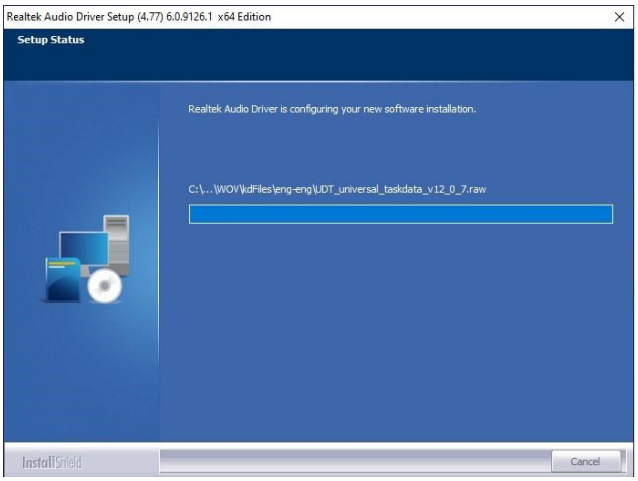


Step 7. Click **Finish** to complete setup.

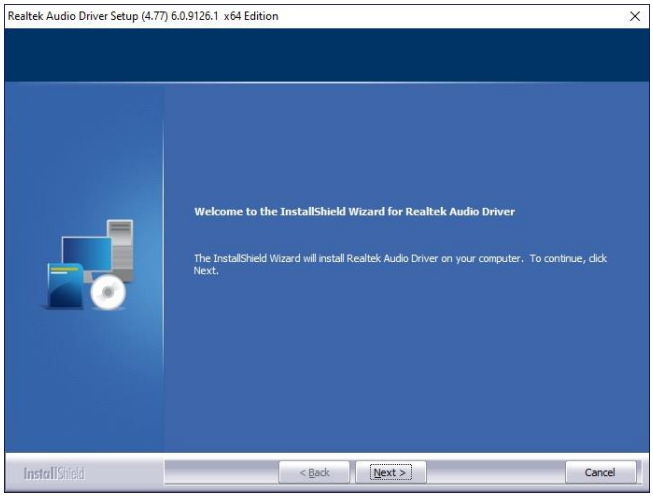
4.4 Install Audio Driver

All drivers can be found on the Avalue Official Website: http://www.avalue.com.tw.

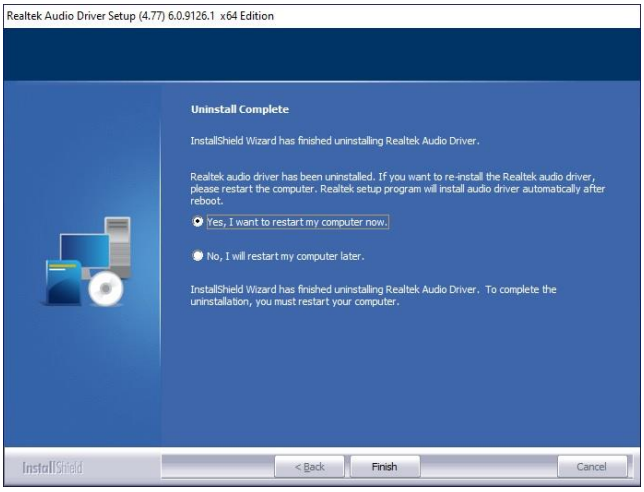
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system.



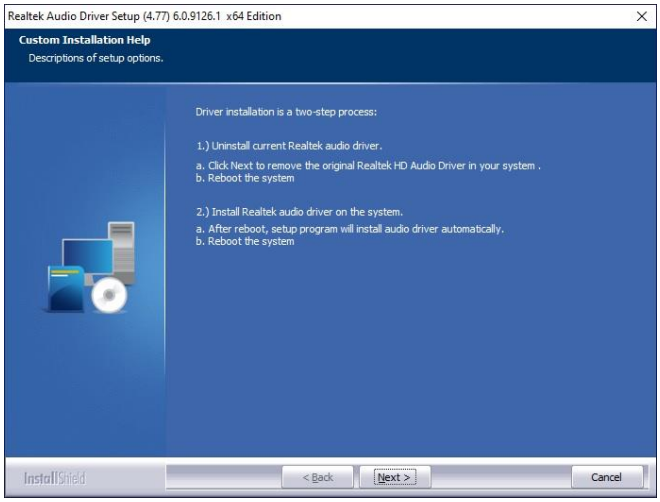
Step 3. Installing.



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



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

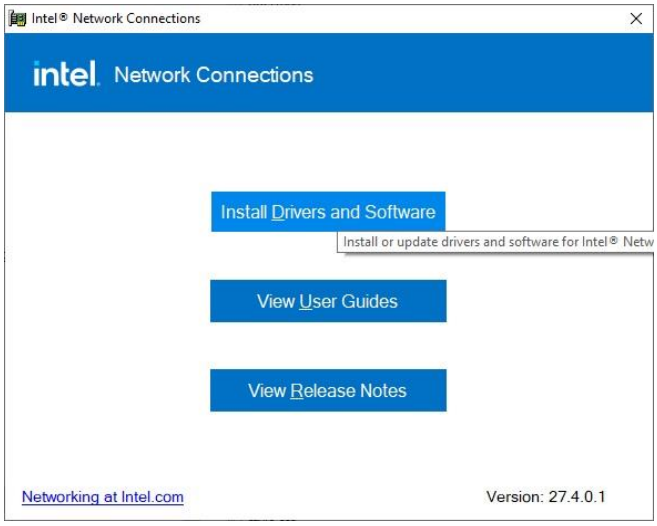


Step 2. Click **Cancel**.

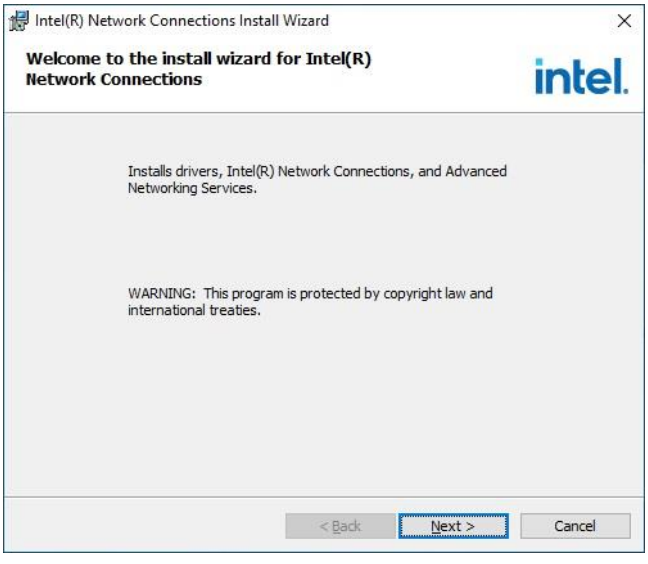
4.5 Install Ethernet Driver

All drivers can be found on the Avalue Official Website: http://www.avalue.com.tw.

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

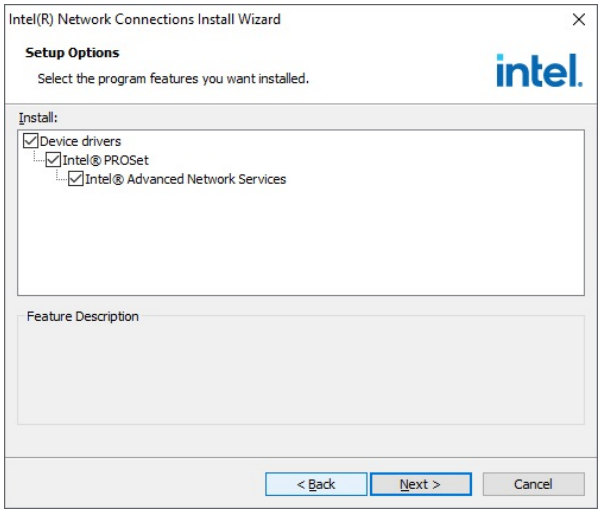


Step 1. Click **Install Drivers and Software**.

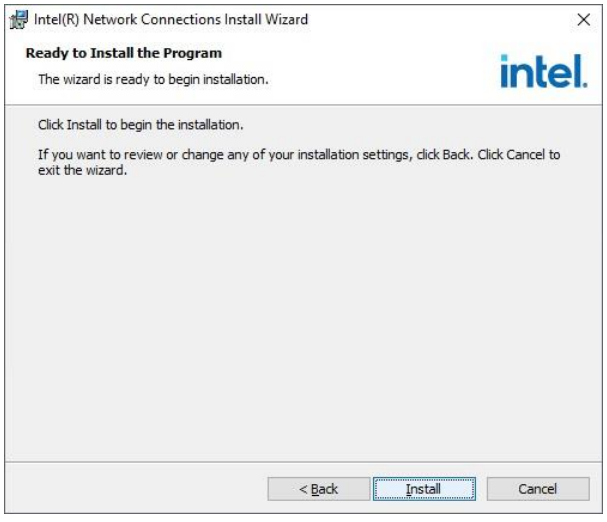


Step 2. Click **Next**.

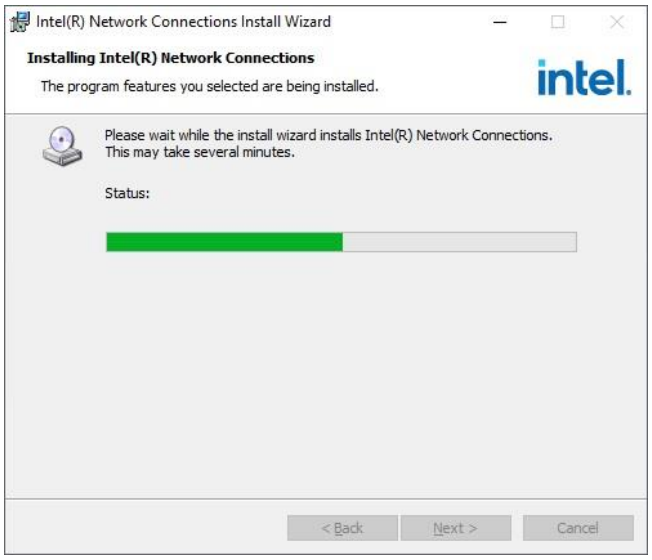
Step 3. Click **Next** to continue setup.



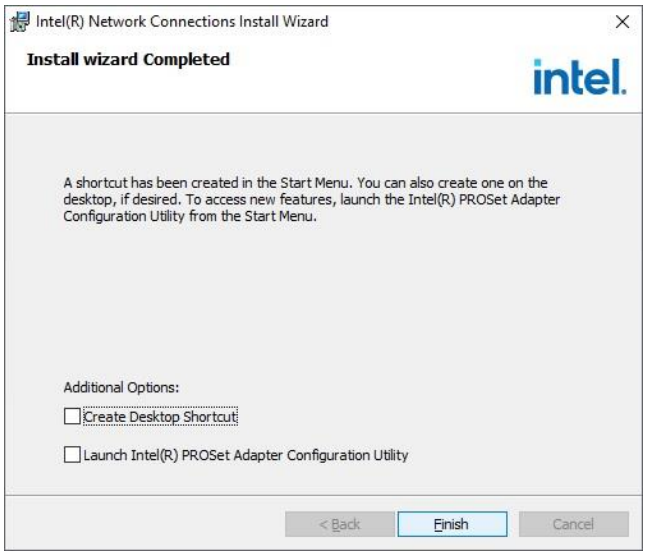
Step 4. Click **Next**.



Step 5. Click **Install**.

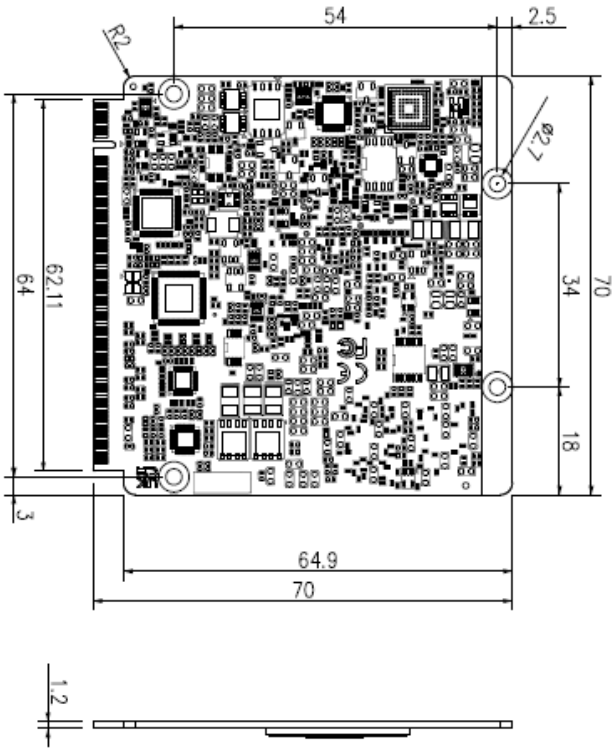


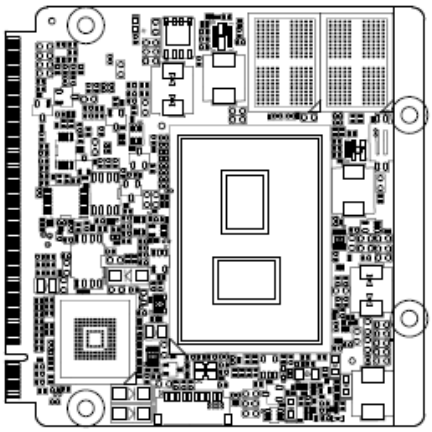
Step 6. Installing.



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

5. Mechanical Drawing





Unit: mm