

# EMX-Q170KP-B1

Intel® Core™ Processors with Intel® Q170 Mini ITX  
Motherboard

## User's Manual



2<sup>nd</sup> Ed – 30 November 2022

## FCC Statement



THIS DEVICE COMPLIES WITH PART 15 FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS:

(1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE.

(2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRE OPERATION.

THIS EQUIPMENT HAS BEEN TESTED AND FOUND TO COMPLY WITH THE LIMITS FOR A CLASS "A" DIGITAL DEVICE, PURSUANT TO PART 15 OF THE FCC RULES.

THESE LIMITS ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINST HARMFUL INTERFERENCE WHEN THE EQUIPMENT IS OPERATED IN A COMMERCIAL ENVIRONMENT. THIS EQUIPMENT GENERATES, USES, AND CAN RADIATE RADIO FREQUENCY ENERGY AND, IF NOT INSTALLED AND USED IN ACCORDANCE WITH THE INSTRUCTION MANUAL, MAY CAUSE HARMFUL INTERFERENCE TO RADIO COMMUNICATIONS.

OPERATION OF THIS EQUIPMENT IN A RESIDENTIAL AREA IS LIKELY TO CAUSE HARMFUL INTERFERENCE IN WHICH CASE THE USER WILL BE REQUIRED TO CORRECT THE INTERFERENCE AT HIS OWN EXPENSE.

## Notice

This guide is designed for experienced users to setup the system within the shortest time. For detailed information, please always refer to the electronic user's manual.

## Copyright Notice

Copyright © 2022 Avalue Technology Inc., ALL RIGHTS RESERVED.

No part of this document may be reproduced, copied, translated, or transmitted in any form or by any means, electronic or mechanical, for any purpose, without the prior written permission of the original manufacturer.

## Trademark Acknowledgement

Brand and product names are trademarks or registered trademarks of their respective owners.

## Disclaimer

Avalue Technology Inc. reserves the right to make changes, without notice, to any product, including circuits and/or software described or contained in this manual in order to improve design and/or performance. Avalue Technology assumes no responsibility or liability for the use of the described product(s), conveys no license or title under any patent, copyright, or masks work rights to these products, and makes no representations or warranties that

these products are free from patent, copyright, or mask work right infringement, unless otherwise specified. Applications that are described in this manual are for illustration purposes only. Avalue Technology Inc. makes no representation or warranty that such application will be suitable for the specified use without further testing or modification.

### Life Support Policy

Avalue Technology's PRODUCTS ARE NOT FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE PRIOR WRITTEN APPROVAL OF Avalue Technology Inc.

As used herein:

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

### A Message to the Customer

#### *Avalue Customer Services*

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

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

#### *Technical Support*

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

To receive the latest version of the user's manual; please visit our Web site at:

<http://www.avalue.com.tw/>

## EMX-Q170KP-B1 User's Manual

### *Product Warranty*

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

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

1. Collect all the information about the problem encountered. (For example, CPU type and speed, Avalue's products model name, hardware & BIOS revision number, other hardware and software used, etc.) Note anything abnormal and list any on-screen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information available.
3. If your product is diagnosed as defective, obtain an RMA (return material authorization) number from your dealer. This allows us to process your good return more quickly.
4. Carefully pack the defective product, a complete Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

# Content

<b>1. Getting Started</b> .....	<b>8</b>
1.1 Safety Precautions .....	8
1.2 Packing List.....	8
1.3 Document Amendment History .....	9
1.4 Manual Objectives.....	10
1.5 System Specifications .....	11
1.6 Architecture Overview—Block Diagram .....	14
<b>2. Hardware Configuration</b> .....	<b>15</b>
2.1 Product Overview.....	16
2.2 Jumper and Connector List.....	17
2.3 Setting Jumpers & Connectors .....	19
2.3.1 Serial port 1 pin9 signal select (JRI1) .....	19
2.3.2 Serial port 2 pin9 signal select (JRI2) .....	19
2.3.3 AT/ATX Power Mode Select (JATATX1).....	20
2.3.4 Clear CMOS (JCMOS1).....	20
2.3.5 LCD Inverter connector (JBKL1).....	21
2.3.6 Serial port 2/3/4/5/6 connector (JCOM2/3/4/5/6) .....	21
2.3.7 COM2 RS485/422 connector (JCOM2_422_485) .....	22
2.3.8 General purpose I/O connector (JDIO1) .....	22
2.3.9 SGPIO connector (JSGPIO1) .....	23
2.3.10 ATX Power connector (ATXPWR1).....	23
2.3.11 USB 2.0 connector 1 (JUSB1).....	24
2.3.12 USB 2.0 connector 2 (JUSB2).....	24
2.3.13 USB 2.0 connector 3 (JUSB3).....	25
2.3.14 Battery connector (JBAT1) .....	25
2.3.15 LVDS connector (JLVDS1).....	26
2.3.16 Front Audio connector (JAUDIO2) .....	27
2.3.16.1 Signal Description –Audio connector 2 (JAUDIO2).....	27
2.3.17 LPC connector (JLPC1).....	27
2.3.18 SPI connector (JSPI1) .....	28
2.3.19 Amplifier connector (JSPK1) .....	28
2.3.20 Front panel setting connector (JFP1) .....	29
2.3.21 LAN1& LAN 2 active LED connector (JLANLED1).....	29
2.3.22 CPU fan connector (CPUFAN1).....	30
2.3.23 System fan connector (SYSFAN1).....	30
2.3.24 ATX 12V power connector (ATX12V1).....	31
2.3.25 Gigabit LAN (RJ-45) connector (LAN1/2).....	31

## EMX-Q170KP-B1 User's Manual

<b>3.BIOS Setup</b> .....	<b>32</b>
3.1 Introduction .....	33
3.2 Starting Setup .....	33
3.3 Using Setup .....	34
3.4 Getting Help .....	35
3.5 In Case of Problems .....	35
3.6 BIOS setup .....	36
3.6.1 Main Menu .....	36
3.6.1.1 System Language .....	37
3.6.1.2 System Date .....	37
3.6.1.3 System Time .....	37
3.6.2 Advanced Menu .....	37
3.6.2.1 Intel RC ACPI Settings .....	38
3.6.2.2 CPU Configuration .....	38
3.6.2.2.1 CPU – Power management Control .....	39
3.6.2.2.1.1 View/Configure Turbo Options .....	40
3.6.2.3 PCH-FW Configuration .....	40
3.6.2.3.1 OEM Flags Settings .....	41
3.6.2.3.2 Firmware Update Configuration .....	42
3.6.2.4 Trusted Computing .....	42
3.6.2.5 ACPI Settings .....	43
3.6.2.6 S5 RTC Wake Settings .....	44
3.6.2.7 Super IO Configuration .....	45
3.6.2.7.1 Serial Port 1 Configuration .....	46
3.6.2.7.2 Serial Port 2 Configuration .....	46
3.6.2.7.3 Serial Port 3 Configuration .....	47
3.6.2.7.4 Serial Port 4 Configuration .....	47
3.6.2.7.5 Serial Port 5 Configuration .....	48
3.6.2.7.6 Serial Port 6 Configuration .....	49
3.6.2.8 NCT6106D H/W Monitor .....	49
3.6.2.8.1 Smart Fan Configuration .....	50
3.6.2.9 Serial Port Console Redirection .....	50
3.6.2.9.1 Legacy Console Redirection Settings .....	51
3.6.2.10 Intel TXT Configuration .....	52
3.6.2.11 Network Stack Configuration .....	52
3.6.2.12 CSM Configuration .....	53
3.6.2.13 USB Configuration .....	53
3.6.3 Chipset .....	54
3.6.3.1 System Agent (SA) Configuration .....	55
3.6.3.1.1 Memory Configuration .....	55

3.6.3.1.2	Graphics Configuration.....	56
3.6.3.1.3	DMI/OPI Configuration .....	57
3.6.3.1.4	PEG Port Configuration .....	57
3.6.3.1.4.1	PEG Port Feature Configuration.....	58
3.6.3.2	PCH-IO Configuration.....	59
3.6.3.2.1	PCI Express Configuration .....	59
3.6.3.2.1.1	Intel I210 LAN Chip (PCI-E Port 8).....	60
3.6.3.2.1.2	Mini-PCIE Slot 2 (PCI-E Port 9).....	60
3.6.3.2.1.2.1	Extra options .....	61
3.6.3.2.1.3	MPCIE1/mSATA Slot (PCI-E Port 10).....	62
3.6.3.2.2	SATA And RST Configuration .....	63
3.6.3.2.3	HD Audio Configuration.....	64
3.6.4	Security .....	65
3.6.4.1	Secure Boot.....	65
3.6.4.1.1	Key Management .....	66
3.6.5	Boot .....	67
3.6.6	Save and exit.....	68
3.6.6.1	Save Changes and Reset.....	68
3.6.6.2	Discard Changes and Reset.....	68
3.6.6.3	Restore Defaults .....	69
3.6.6.4	Launch EFI Shell from filesystem device .....	69
<b>4.</b>	<b>Drivers Installation.....</b>	<b>70</b>
4.1	Install Chipset Driver .....	71
4.2	Install VGA Driver.....	72
4.3	Install SOL Driver .....	73
4.4	Install Audio Driver (For Realtek ALC892 HD Audio).....	74
4.5	Install LAN Driver .....	75
4.6	Install RST Driver .....	77
<b>5.</b>	<b>Mechanical Drawing .....</b>	<b>79</b>

# 1. Getting Started

## 1.1 Safety Precautions

### Warning!



Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.

### Caution!



Always ground yourself to remove any static charge before touching the CPU card. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components in a static-dissipative surface or static-shielded bag when they are not in the chassis.

## 1.2 Packing List

Before you begin installing your single board, please make sure that the following materials have been shipped:

- 1 x EMX-Q170KP motherboard
- 2 x SATA cable
- 1 x I/O Shield



---

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

---



### 1.3 Document Amendment History

Revision	Date	By	Comment
1 <sup>st</sup>	September 2022	Avalue	Initial Release
2 <sup>nd</sup>	November 2022	Avalue	Update System Specifications

### 1.4 Manual Objectives

This manual describes in details Avalue Technology EMX-Q170KP-B1 Single Board.

We have tried to include as much information as possible but we have not duplicated information that is provided in the standard IBM Technical References, unless it proved to be necessary to aid in the understanding of this board.

We strongly recommend that you study this manual carefully before attempting to set up EMX-Q170KP-B1 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	
<b>CPU</b>	Intel® LGA1151 Socket Supports 6/7th Generation Core™ i7/ i5/ i3 Processors (Max. TDP at 95W)
<b>BIOS</b>	AMI uEFI BIOS, 128Mbit SPI Flash ROM
<b>System Chipset</b>	Intel® Q170 Chipset
<b>I/O Chip</b>	Nuvoton® NCT6106D
<b>System Memory</b>	Two 260-pin DDR4 2400MHz SO-DIMM socket, supports up to 32GB Max
<b>Watchdog Timer</b>	H/W Reset, 5~255 seconds/5~255 minutes
<b>H/W Status Monitor</b>	CPU temperature monitoring Voltages monitoring CPU fan speed control
<b>Other</b>	EEPROM: AMI uEFI BIOS, 128Mbit SPI Flash ROM
Expansion Slot	
<b>mPCIe</b>	1 x Full Size Mini-PCI-e with mSATA Support (SATA III) 1 x Half Size Mini PCI-e
<b>PCIe</b>	1 x PCI-e x16
Storage	
<b>mSATA</b>	1 x SATA III or 1 x full size Mini PCI-e support mSATA by BIOS selection
<b>SATA</b>	5 x SATA III 1 x SATA III or 1 x full size Mini PCI-e support mSATA by BIOS selection
Edge I/O	
<b>COM</b>	COM 1 Pin9 power selection: - 1 x 2 x 3 pin, pitch 2.00mm connector for COM 1 support RS232 with Pin 9, +5V/+12V/RI
<b>LAN</b>	2 x RJ-45 with Dual deck USB 3.0 connector
<b>USB 2.0</b>	2 x USB 2.0
<b>USB 3.1</b>	4 x USB 3.0
<b>DP</b>	1 x DP++
<b>HDMI</b>	1 x HDMI
<b>VGA</b>	1 x VGA
<b>Audio</b>	Realtek ALC888S HD Audio with 6W x2 Audio amplifier
<b>PS2</b>	1 x PS/2 Keyboard or Mouse
Onboard I/O	
<b>COM</b>	COM 2: 1 x 2 x 3 pin, pitch 2.00mm connector for COM 2 support RS232 with Pin 9,+5V/+12V/RI

## EMX-Q170KP-B1 User's Manual

	1 x 2 x 3 pin, pitch 2.00mm connector for COM 2 support RS422/485 connector, Pin 5 with +5V 1 x 2 x 5 pin, pitch 2.00mm connector for COM2 support RS-232 connector COM 3~6. 4 x 2 x 5 pin, pitch 2.00mm connector for COM 3~6: support RS-232 connector
<b>USB 2.0</b>	3 x 2 x 5 pin, pitch 2.54mm connector for 6 USB 2.0
<b>GPIO</b>	1 x 2 x 6 pin, pitch 2.00mm connector for 8 bits GPIO
<b>CPU/System FAN</b>	1 x 1 x 4 pin, pitch 2.54mm CPU fan connector with smart fan function supported 1 x 1 x 4 pin, pitch 2.54mm System fan connector with smart fan function supported
<b>Buzzer</b>	Onboard
<b>Front Panel</b>	1 x 2 x 5 pin, pitch 2.54mm connector for front panel
<b>RTC Battery</b>	1 x 2 Pin Pitch 1.25mm Vertical type battery connector
<b>AT/ATX Selector</b>	1 x 1 x 3 pin pitch 2.00mm connector for AT/ATX jumper 1 x 2 x 10 pin ATX power connector 1 x 2 x 2 pin ATX 12V power connector
<b>Clear CMOS</b>	1 x 1 x 3pin, pitch 2.54mm connector for COMS Clear
<b>LVDS</b>	1 x 2 x 20 pin, pitch 1.25mm connector for LVDS
<b>LCD Inverter</b>	1 x 1 x 5 pin, pitch 2.00mm Wafer connector for LCD inverter backlight connector (5V/12V)
<b>LPC</b>	1 x 2 x 5 pin, pitch 2.00 mm connector for LPC
<b>BIOS SPI</b>	1 x 2 x 4 pin, pitch 2.00 mm connector for BIOS SPI
<b>Audio</b>	1 x 2 x 5 pin, pitch 2.54mm connector for front Audio
<b>Display</b>	
<b>Graphic Chipset</b>	Intel® Q170 chipset
<b>Spec. &amp; Resolution</b>	VGA: 2560 x 1600 @ 60 Hz HDMI: 3840 x 2160 @ 30 Hz, 2560 x 1600@ 30 Hz (Note: This resolution is actual test result. Intel resolution: 4096 x 2160 @24Hz) DP++: 4096 x 2304@60Hz
<b>Multiple Display</b>	Triple Display
<b>Audio</b>	
<b>Audio Codec</b>	Realtek ALC888S HD Audio Decoding Controller
<b>Amplifier</b>	6W Amplifier
<b>Ethernet</b>	
<b>LAN Chipset</b>	1 x Intel® I219LM Gigabit Ethernet PHY 1 x Intel® I210AT PCI-e Gigabit Ethernet
<b>Mechanical &amp; Environmental Specification</b>	
<b>Power Requirement</b>	+12V / +5V / 5VSB /+3.3V/ -12V
<b>ACPI</b>	Single power ATX Support S0, S3, S4, S5

<b>Power Mode</b>	AT / ATX mode Switchable Through Jumper
<b>Operating Temp.</b>	0~60°C (32~140°F)
<b>Storage Temp.</b>	-40~ 75°C
<b>Operating Humidity</b>	40°C @ 95% relative humidity, non-condensing
<b>Size (L x W)</b> (Please consult product engineers for the production feasibility if the size is larger than 410x360mm or smaller than 80x70mm)	6.7" x 6.7" (170mm x 170mm)
<b>Weight</b>	0.40 kg

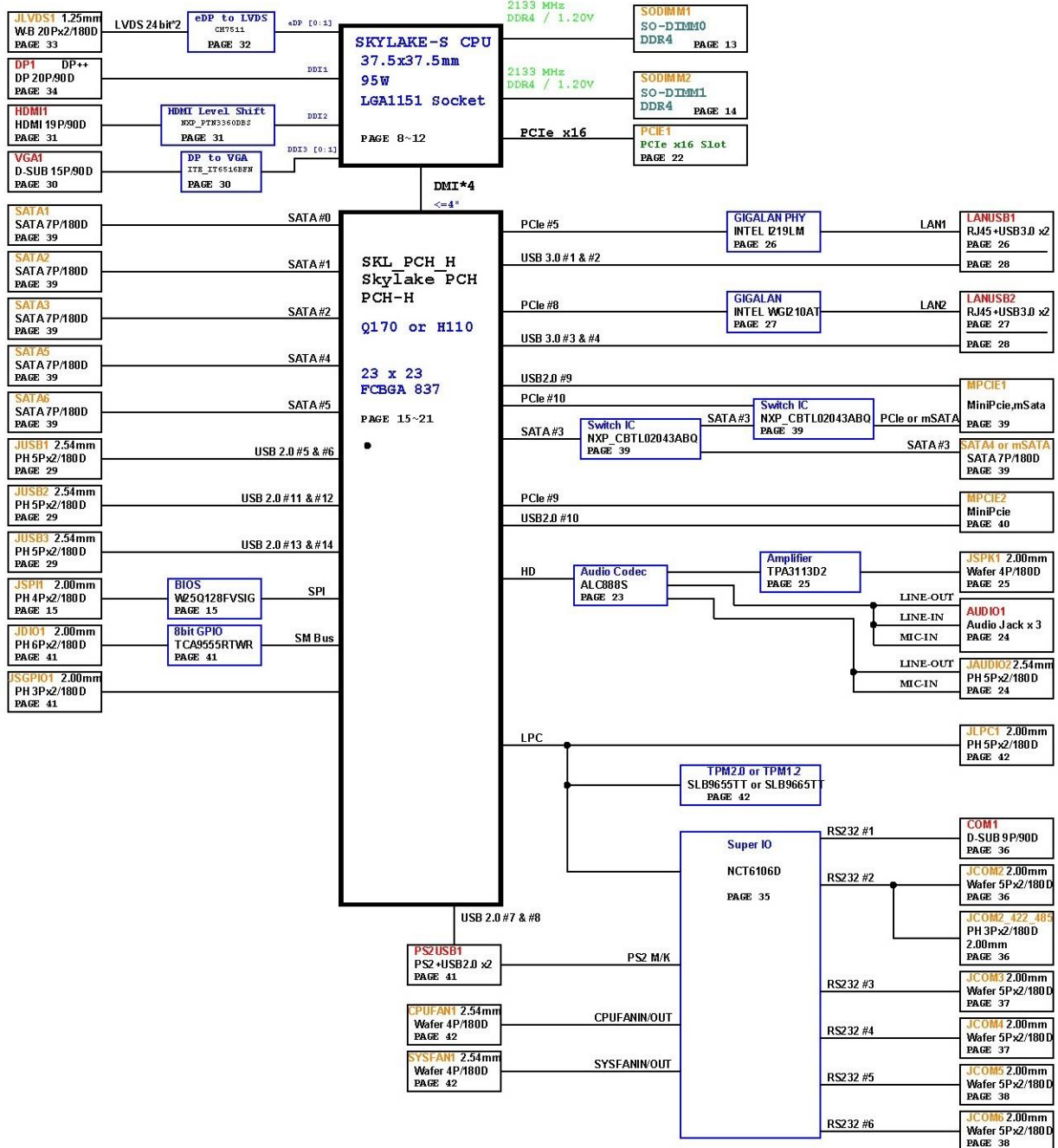


**Note:**

Specifications are subject to change without notice.

## 1.6 Architecture Overview—Block Diagram

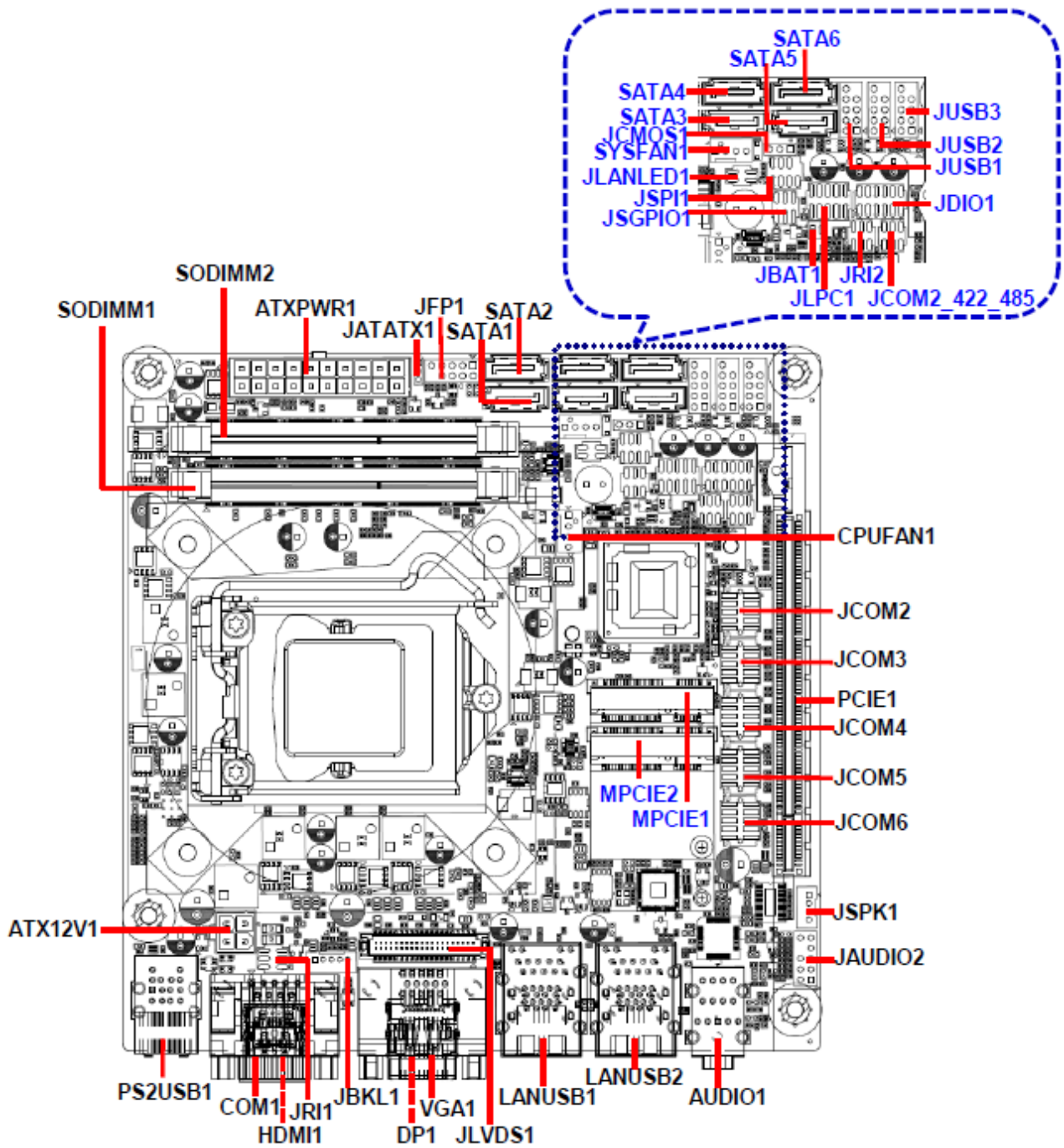
The following block diagram shows the architecture and main components of EMX-Q170KP-B1.



# 2. Hardware Configuration

---

## 2.1 Product Overview

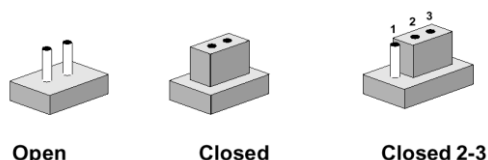




## 2.2 Jumper and Connector List

You can configure your board to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch.

It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” a jumper you connect the pins with the clip. To “open” a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2, and 3. In this case, you would connect either two pins.



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



A pair of needle-nose pliers may be helpful when working with jumpers.

Connectors on the board are linked to external devices such as hard disk drives, a keyboard, or floppy drives. In addition, the board has a number of jumpers that allow you to configure your system to suit your application.

If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes.

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

### Jumpers

Label	Function	Note
JRI1/2	Serial port 1/2 pin9 signal select	3 x 2 header, pitch 2.00mm
JATATX1	AT/ATX Power Mode Select	3 x 1 header, pitch 2.00mm
JCMOS1	Clear CMOS	3 x 1 header, pitch 2.54mm

### Connectors

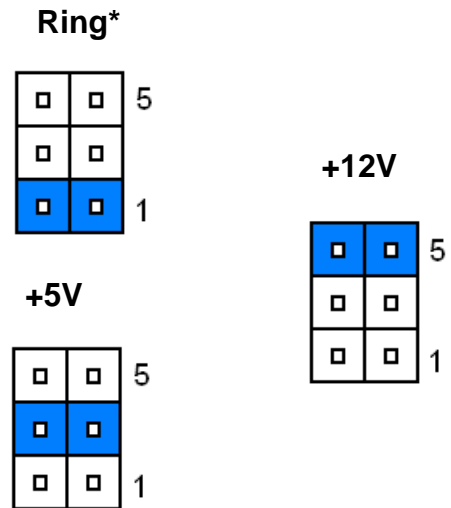
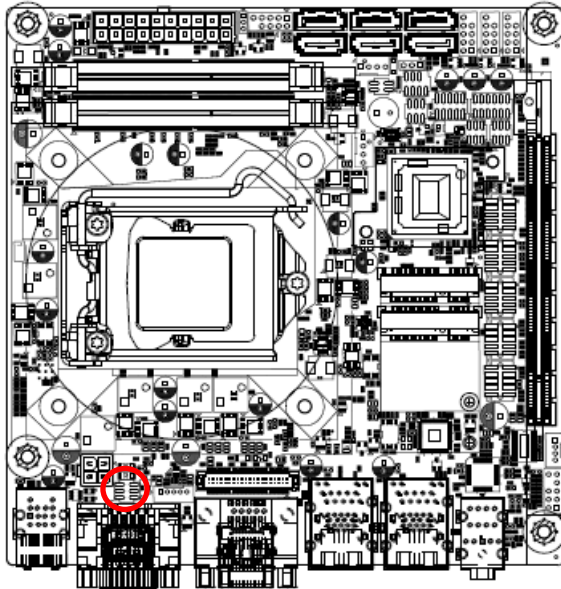
Label	Function	Note
CPUFAN1	CPU fan connector	4 x 1 wafer, pitch 2.54mm
SYSFAN1	System fan connector	4 x 1 wafer, pitch 2.54mm
JFP1	Front panel setting connector	5 x 2 header, pitch 2.54 mm
SODIMM1/2	260-pin DDR4 DIMM socket	
AUDIO1	Line out, Mic in, Line out	
JAUDIO2	Front Audio connector	5 x 2 header, pitch 2.54 mm

**EMX-Q170KP-B1 User's Manual**

<b>JBKL1</b>	LCD Inverter connector	5 x 1 wafer, pitch 2.00mm
<b>JSPI1</b>	SPI connector	4 x 2 header, pitch 2.00mm
<b>COM1</b>	Serial Port 1 connector	D-sub 9 pin, male
<b>JCOM2/3/4/5/6</b>	Serial Port 2/3/4/5/6 connector	5 x 2 wafer, pitch 2.00mm
<b>JCOM2_422_485</b>	COM2 RS485/422 connector	3 x 2 header, pitch 2.00 mm
<b>JDIO1</b>	General purpose I/O connector	6 x 2 header, pitch 2.00mm
<b>JSGPIO1</b>	SGPIO connector	3 x 2 header, pitch 2.00 mm
<b>JSPK1</b>	Amplifier connector	1 x 4 wafer, pitch 2.00 mm
<b>JLVDS1</b>	LVDS Connector	DIN 40-pin wafer, pitch 1.25mm
<b>PS2USB1</b>	PS/2 keyboard or mouse connector 2 x USB 2.0 connector	
<b>LANUSB1/2</b>	2 x RJ-45 with Dual deck USB 3.0 connector	
<b>JUSB1</b>	USB 2.0 connector 1	5 x 2 header, pitch 2.54mm
<b>JUSB2</b>	USB 2.0 connector 2	5 x 2 header, pitch 2.54mm
<b>JUSB3</b>	USB 2.0 connector 3	5 x 2 header, pitch 2.54mm
<b>JLPC1</b>	LPC connector	5 x 2 header, pitch 2.00mm
<b>PCIE1</b>	PCI-e x 16 connector	
<b>JLANLED1</b>	LAN1& LAN 2 active LED connector	2 x 2 header, pitch 2.00 mm
<b>JBAT1</b>	Battery connector	2 x 1 wafer, pitch 1.25mm
<b>MPCIE1/2</b>	Full size Mini-PCI-e connector 1 Half size Mini-PCI-e connector 2	
<b>ATXPWR1</b>	ATX Power connector	10 x 2 wafer, pitch 4.20mm
<b>ATX12V1</b>	ATX 12V power connector	2 x 2 wafer, pitch 4.20mm
<b>SATA1~6</b>	Serial ATA III connector 1~6	
<b>HDMI1</b>	HDMI connector	
<b>DP1</b>	DP connector	
<b>VGA1</b>	VGA connector	

## 2.3 Setting Jumpers & Connectors

### 2.3.1 Serial port 1 pin9 signal select (JRI1)

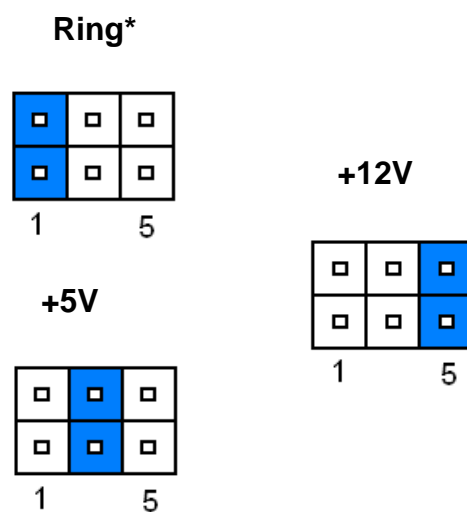
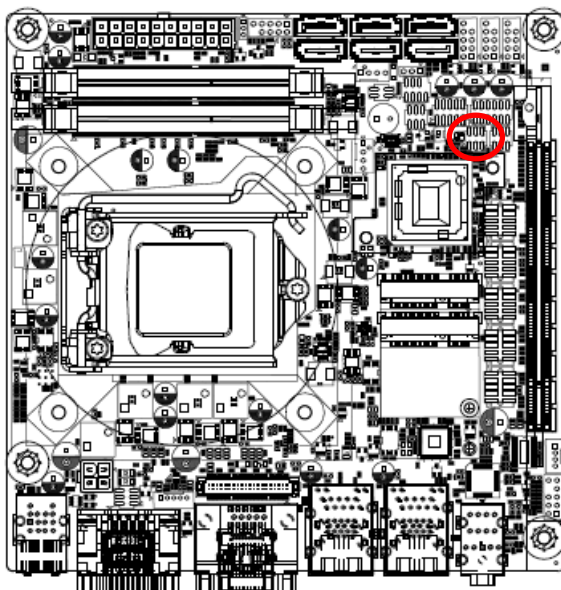


\* Default

**Note:**

Max Current 1A.

### 2.3.2 Serial port 2 pin9 signal select (JRI2)

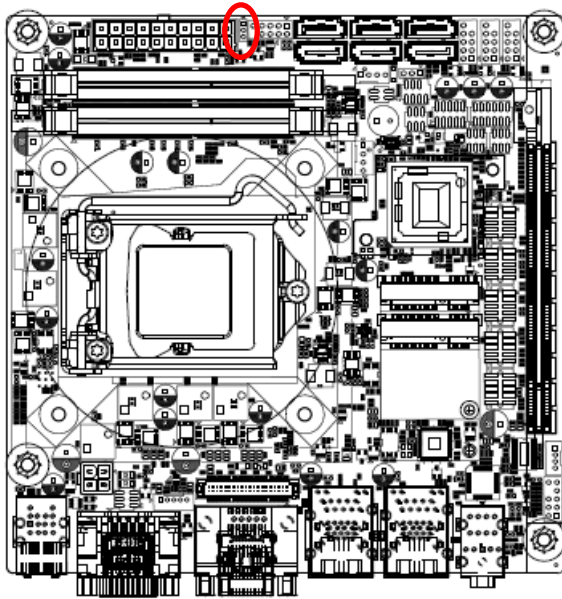


\* Default

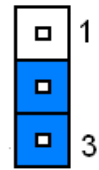
**Note:**

Max Current 1A.

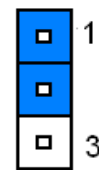
### 2.3.3 AT/ATX Power Mode Select (JATATX1)



ATX\*

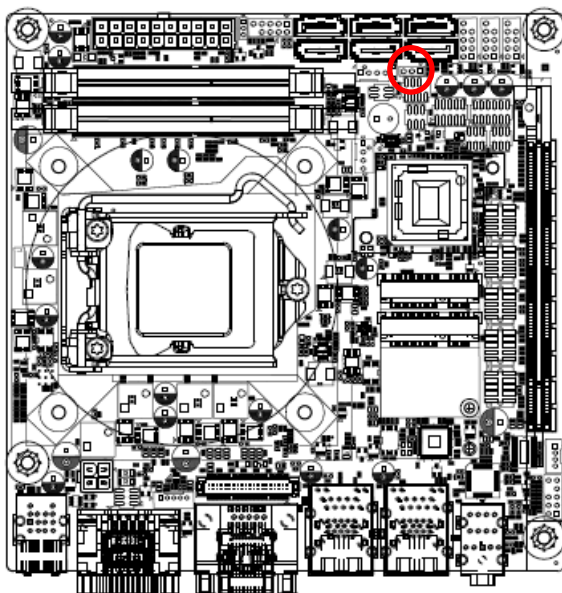


AT

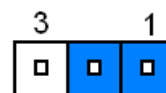


\* Default

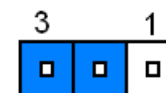
### 2.3.4 Clear CMOS (JCMOS1)



Protect\*

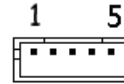
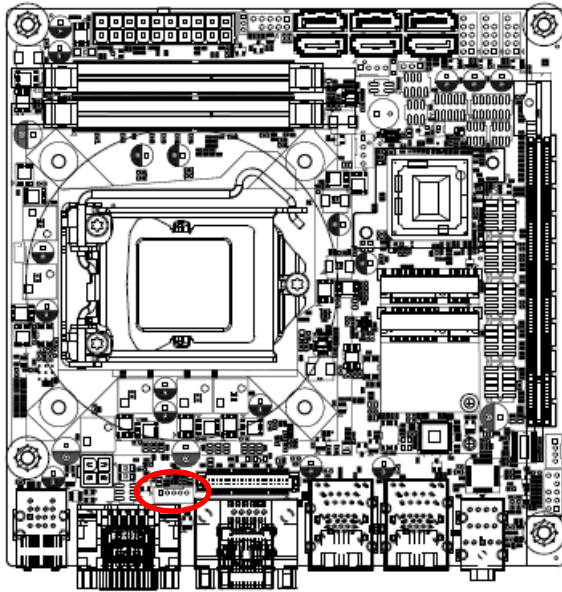


Clear CMOS



\* Default

### 2.3.5 LCD Inverter connector (JBKL1)

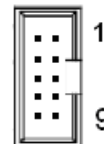
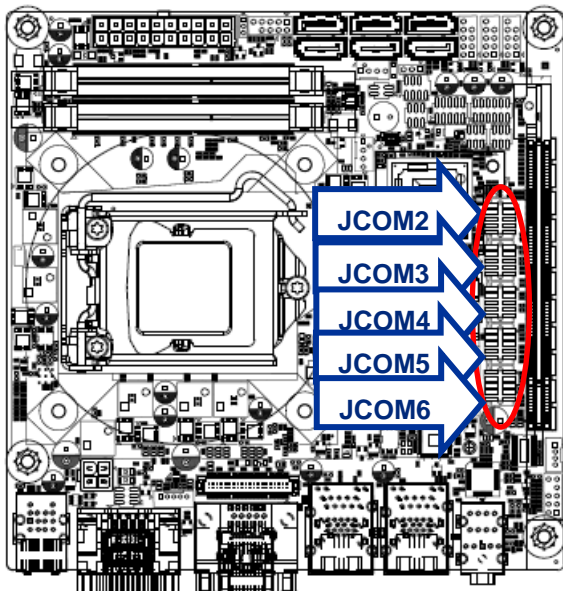


PIN	Signal	Max current
1	+12V	2A
2	GND	
3	BKLEN	
4	VBRIGHT	
5	+5V	2A

**Note:**

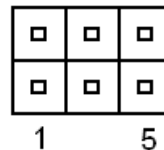
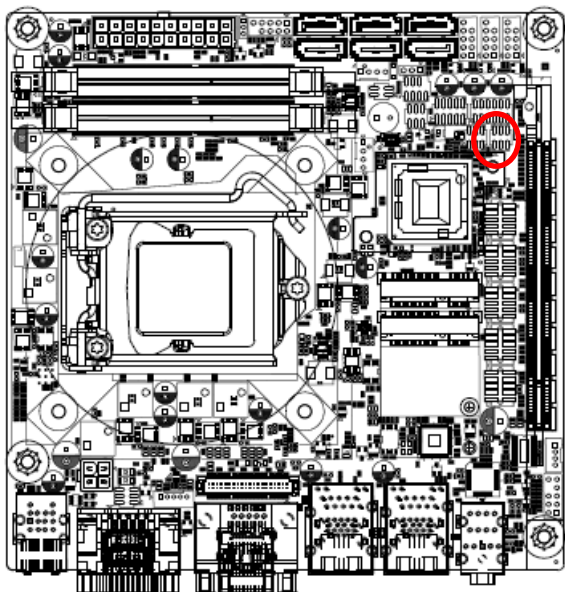
Mapping connector PHR5.

### 2.3.6 Serial port 2/3/4/5/6 connector (JCOM2/3/4/5/6)



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

2.3.7 COM2 RS485/422 connector (JCOM2\_422\_485)



RS-422

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

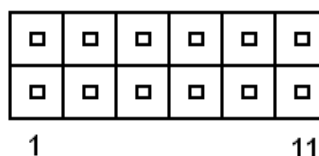
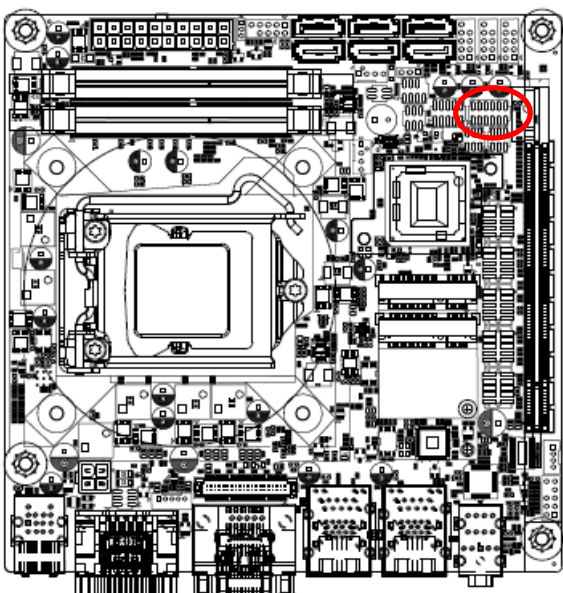
RS-485

Signal	PIN	PIN	Signal
DATA-	1	2	NC
DATA+	3	4	NC
+5V	5	6	GND

Note:

Max Current 1A.

2.3.8 General purpose I/O connector (JDIO1)



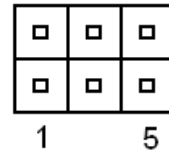
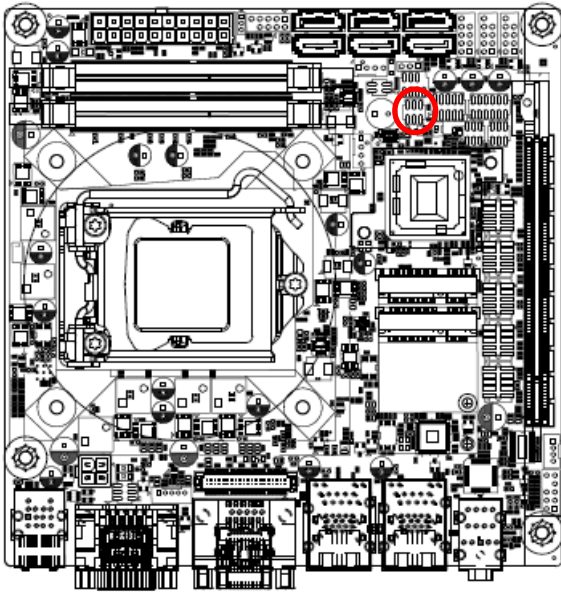
Signal	PIN	PIN	Signal
DI0	1	2	DO0
DI1	3	4	DO1
DI2	5	6	DO2
DI3	7	8	DO3
SMB_CLK_9555	9	10	SMB_DATA_9555
GND	11	12	+5V

Note:

Max Current 1A.

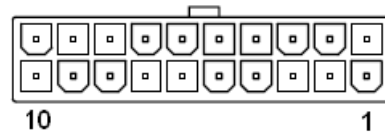
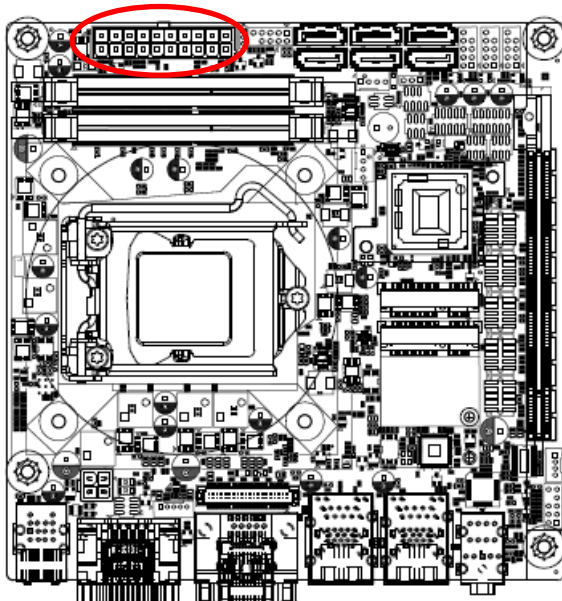


### 2.3.9 SGPIO connector (JSGPIO1)



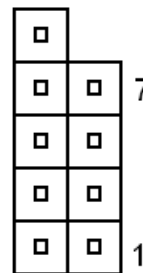
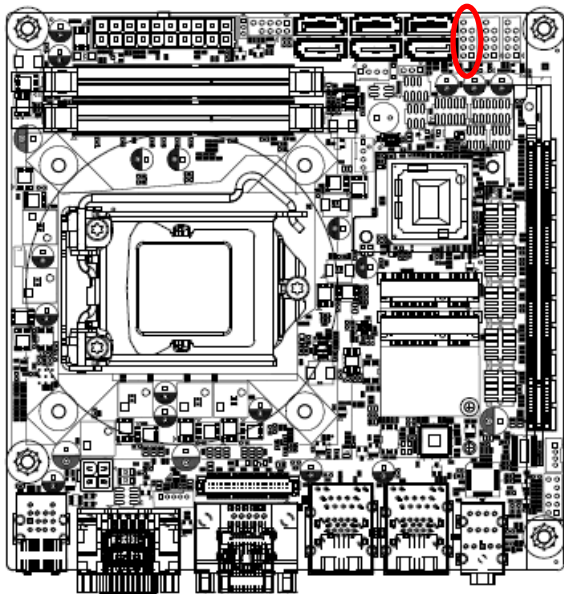
Signal	PIN	PIN	Signal
GND	1	2	GND
SGIO_LOAD	3	4	SGIO_DATOUT0
SGIO_CLK	5	6	SGIO_DATOUT1

### 2.3.10 ATX Power connector (ATXPWR1)



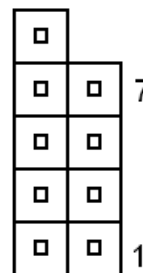
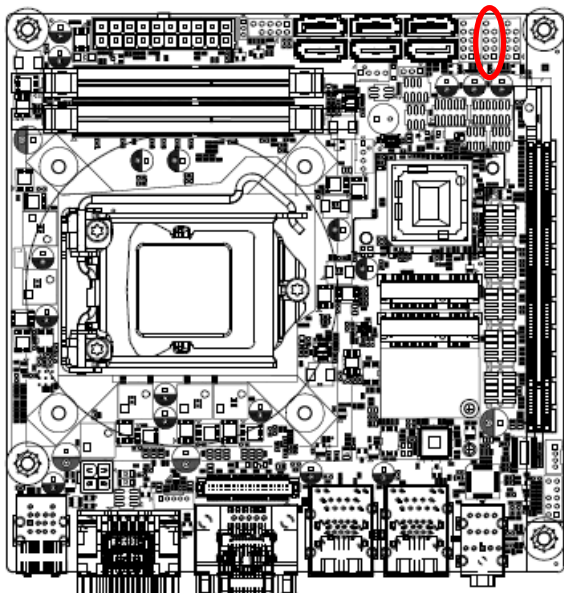
Signal	PIN	PIN	Signal
+3.3V	1	11	+3.3V
+3.3V	2	12	-12V
GND	3	13	GND
+5V	4	14	PSON#
GND	5	15	GND
+5V	6	16	GND
GND	7	17	GND
PG_ATX	8	18	-5V
+V5SB_DP	9	19	+5V
+12V	10	20	+5V

2.3.11 USB 2.0 connector 1 (JUSB1)



Signal	PIN	PIN	Signal
NC	10		
GND	8	7	GND
USB_R_DP6	6	5	USB_R_DP5
USB_R_DN6	4	3	USB_R_DN5
+5V	2	1	+5V

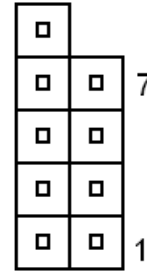
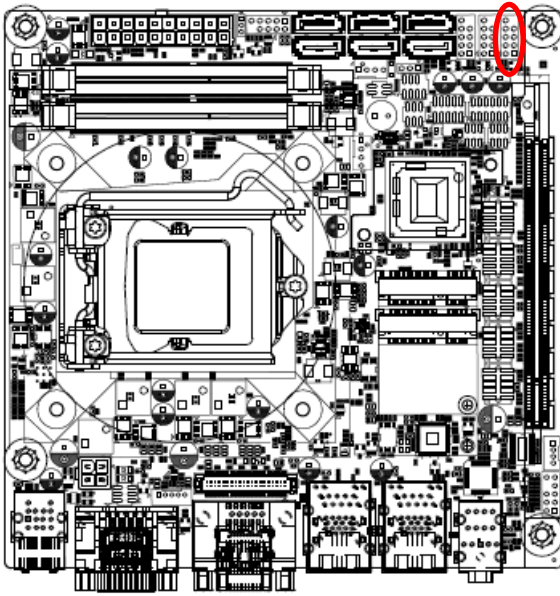
2.3.12 USB 2.0 connector 2 (JUSB2)



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

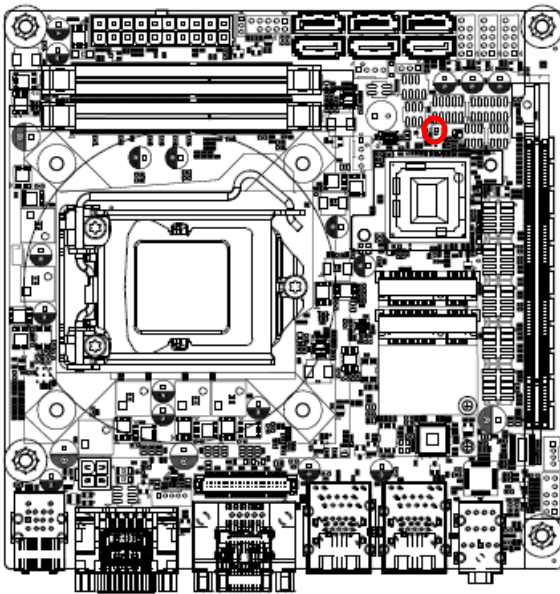


### 2.3.13 USB 2.0 connector 3 (JUSB3)



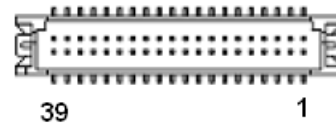
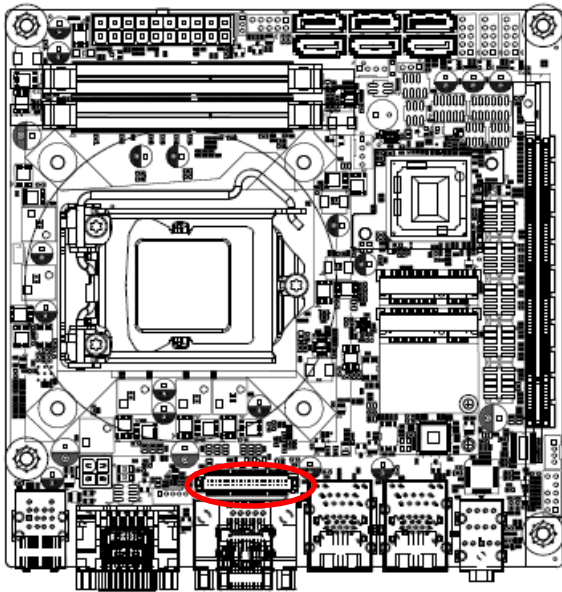
Signal	PIN	PIN	Signal
NC	10		
GND	8	7	GND
USB_R_DP14	6	5	USB_R_DP13
USB_R_DN14	4	3	USB_R_DN13
+5V	2	1	+5V

### 2.3.14 Battery connector (JBAT1)



Signal	PIN
RTC_VBAT_1	1
GND	2

2.3.15 LVDS connector (JLVDS1)

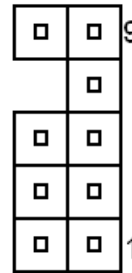
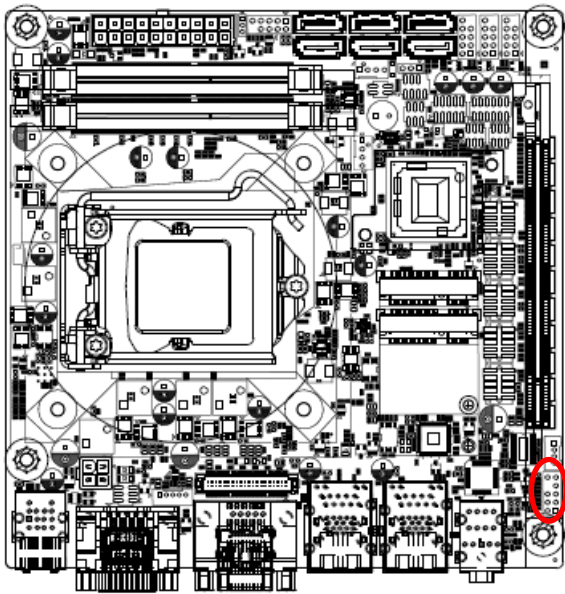


Signal	PIN	PIN	Signal
+5V	2	1	+3.3V
+5V	4	3	+3.3V
NC	6	5	NC
GND	8	7	GND
LVDS_DATA0_P	10	9	LVDS_DATA1_P
LVDS_DATA0_N	12	11	LVDS_DATA1_N
GND	14	13	GND
LVDS_DATA2_P	16	15	LVDS_DATA3_P
LVDS_DATA2_N	18	17	LVDS_DATA3_N
GND	20	19	GND
LVDS_DATA4_P	22	21	LVDS_DATA5_P
LVDS_DATA4_N	24	23	LVDS_DATA5_N
GND	26	25	GND
LVDS_DATA6_P	28	27	LVDS_DATA7_P
LVDS_DATA6_N	30	29	LVDS_DATA7_N
GND	32	31	GND
LVDS_CLK1_P	34	33	LVDS_CLK2_P
LVDS_CLK1_N	36	35	LVDS_CLK2_N
GND	38	37	GND
+12V	40	39	+12V

**Note:**

Mapping connector DF13-40DS-1.25C (1.0mm).

### 2.3.16 Front Audio connector (JAUDIO2)

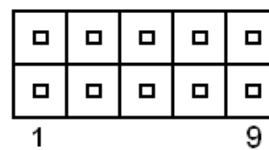
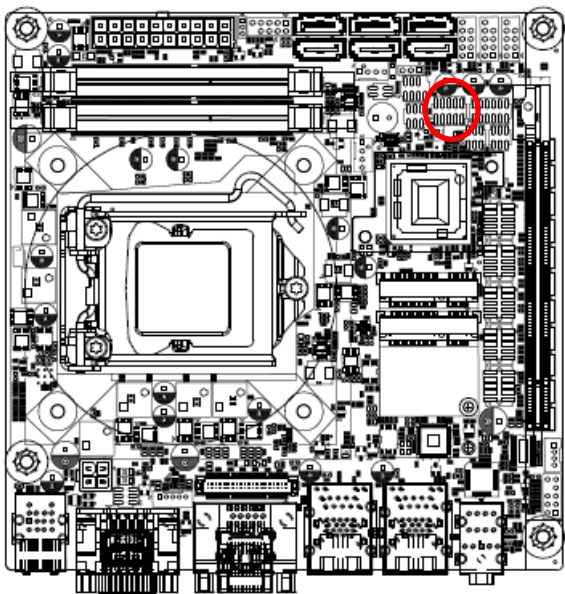


Signal	PIN	PIN	Signal
LINE2_JD	10	9	LINE2_LIN
		7	GND
MIC2_JD	6	5	LINE2_RIN
ACZ_DET#_R	4	3	MIC2_RIN
GND	2	1	MIC2_LIN

#### 2.3.16.1 Signal Description –Audio connector 2 (JAUDIO2)

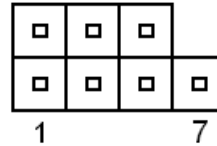
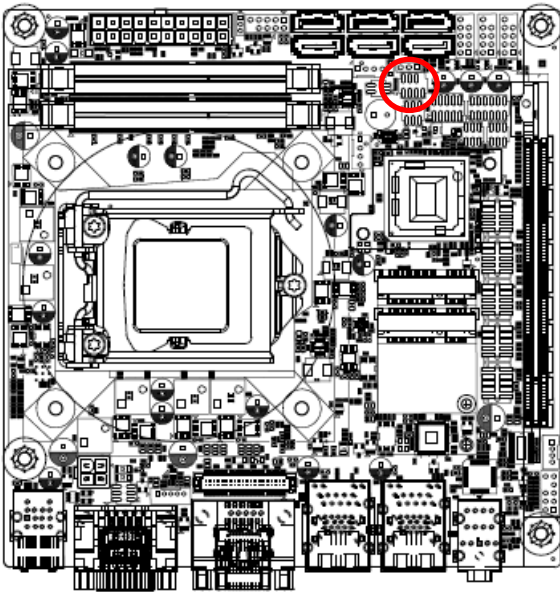
Signal	Signal Description
LINE2_JD	AUDIO IN (LINE_RIN/LIN)sense pin
MIC2_JD	MIC IN (MIC_RIN/LIN) sense pin

### 2.3.17 LPC connector (JLPC1)



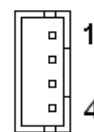
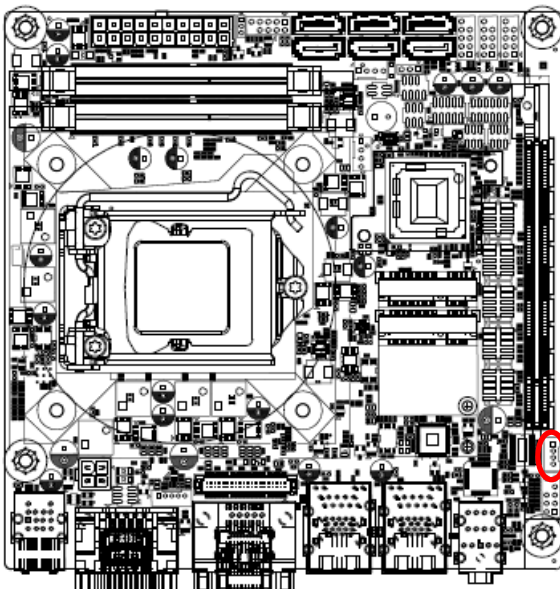
Signal	PIN	PIN	Signal
LPC_AD0	1	2	+3.3V
LPC_AD1	3	4	BUF_PLT_RST#
LPC_AD2	5	6	LPC_FRAME#
LPC_AD3	7	8	LPC_CLK
LPC_SERIRQ	9	10	GND

2.3.18 SPI connector (JSPI1)



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

2.3.19 Amplifier connector (JSPK1)

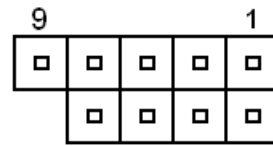
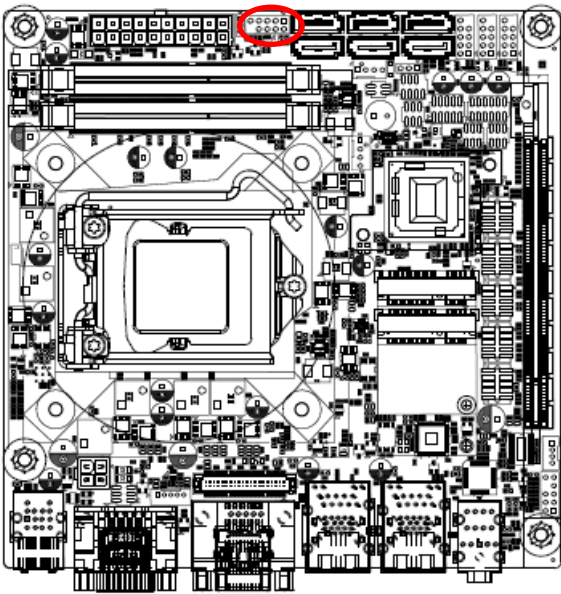


Signal	PIN
SPK_L+	1
SPK_L-	2
SPK_R+	3
SPK_R-	4

**Note:**

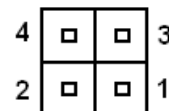
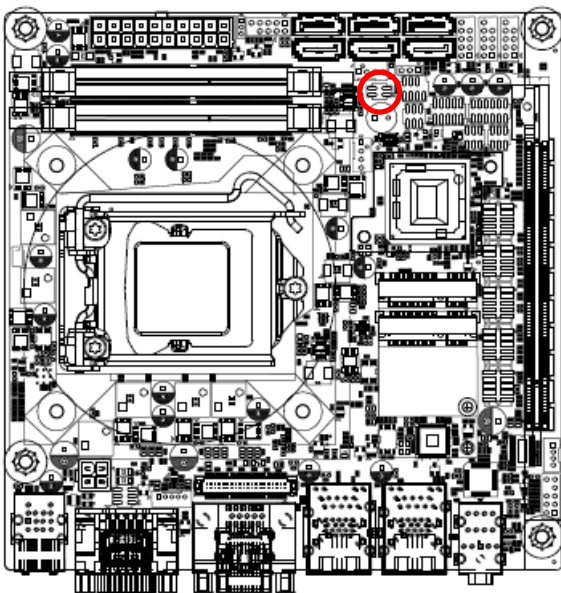
Support 6W x 2 speakers. Mapping Connector PHR-4.

### 2.3.20 Front panel setting connector (JFP1)



Signal	PIN	PIN	Signal
+HD_LED	1	2	+PWR_LED
-HD_LED	3	4	-PWE_LED
+Reset	5	6	+PWR_BNT
-Reset	7	8	-PWR_BNT
NC	9		

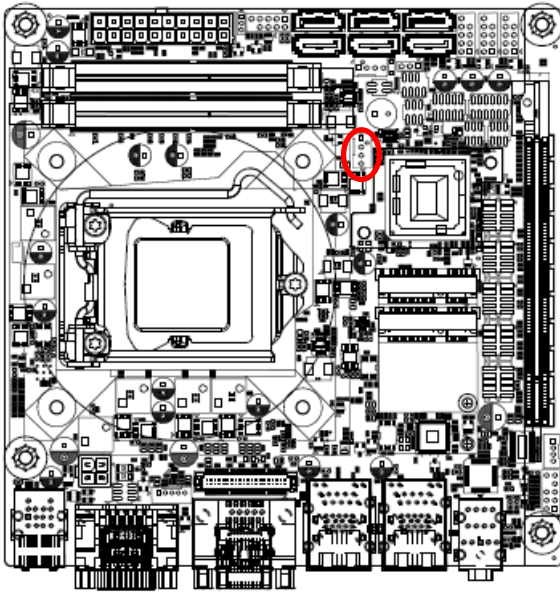
### 2.3.21 LAN1& LAN 2 active LED connector (JLANLED1)



Signal	PIN	PIN	Signal
LAN2_ACT#	4	3	LAN1_ACT#
FRONT_LAN2_ACT	2	1	FRONT_LAN1_ACT

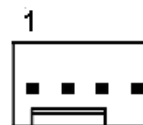
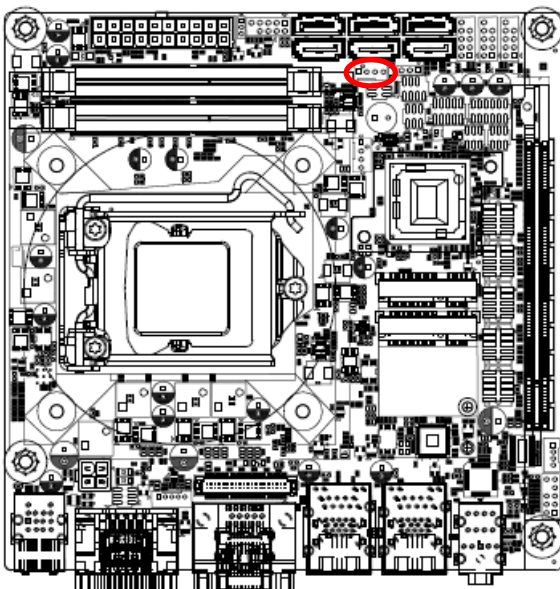


2.3.22 CPU fan connector (CPUFAN1)



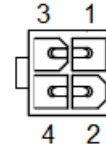
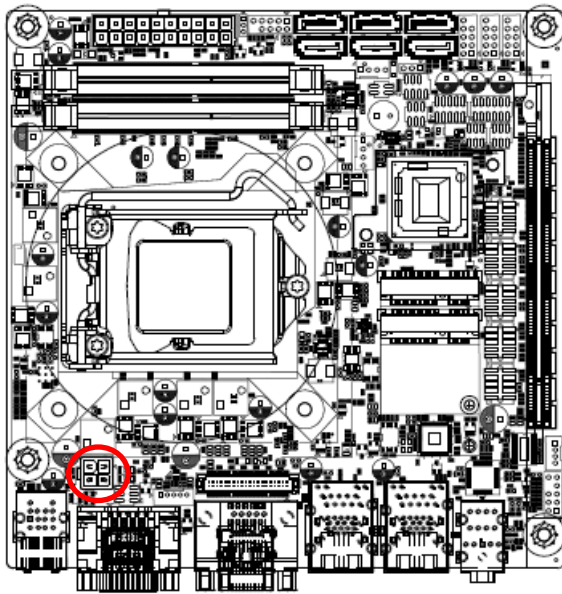
Signal	PIN
GND	1
+12V	2
CPUFANIN	3
CPUFANOUT	4

2.3.23 System fan connector (SYSFAN1)



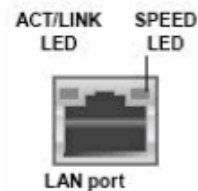
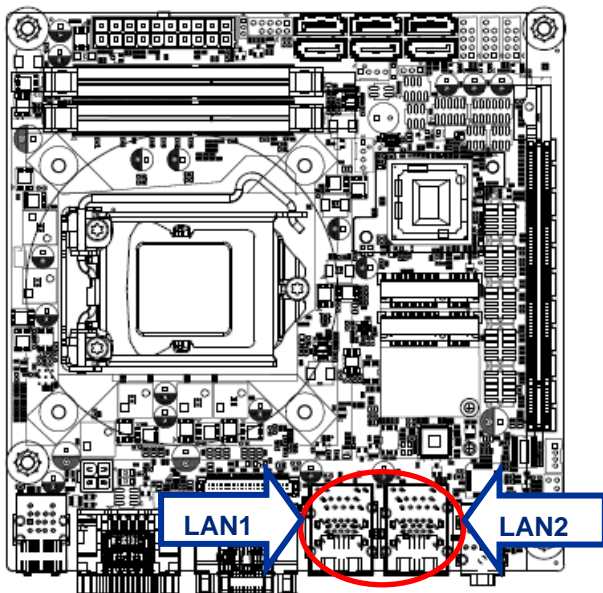
Signal	PIN
GND	1
+12V	2
SYSFANIN	3
SYSFANOUT	4

### 2.3.24 ATX 12V power connector (ATX12V1)



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

### 2.3.25 Gigabit LAN (RJ-45) connector (LAN1/2)



ACT/LINK LED		SPEED LED	
Status	Description	Status	Description
OFF	No Light	OFF	10Mbps connection
Orange	Linked	Green	100Mbps connection
Blinking	Data activity	Orange	1Gbps connection

**Note:**

This port allows Gigabit connection to a Local Area Network (LAN) through a network hub. Refer to the table below for the LAN port LED indications.

# 3. BIOS Setup

---



### 3.1 Introduction

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

### 3.2 Starting Setup

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

While the BIOS is in control, the Setup program can be activated in one of two ways:

By pressing <Del> or <F2> immediately after switching the system on, or

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

**Press <Del> or <F2> to enter SETUP**

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

**Press F1 to Continue, DEL to enter SETUP**

### 3.3 Using Setup

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

Button	Description
↑	Move to previous item
↓	Move to next item
←	Move to the item in the left hand
→	Move to the item in the right hand
Esc key	Main Menu -- Quit and not save changes into NVRAM Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
+ key	Increase the numeric value or make changes
- key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2 key	Previous Values.
F3 key	Optimized defaults
F4 key	Save & Exit Setup

- **Navigating Through The Menu Bar**

Use the left and right arrow keys to choose the menu you want to be in.



**Note:** Some of the navigation keys differ from one screen to another.

- **To Display a Sub Menu**

Use the arrow keys to move the cursor to the sub menu you want. Then press <Enter>. A “>” pointer marks all sub menus.

### 3.4 Getting Help

Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window press <Esc> or the F1 key again.

### 3.5 In Case of Problems

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

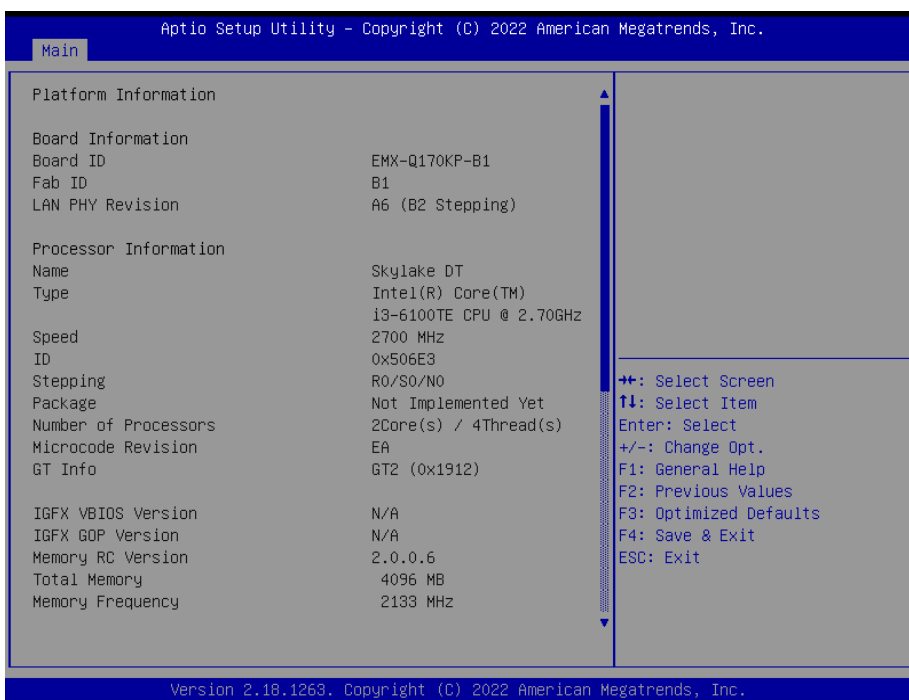
The best advice is to only alter settings which you thoroughly understand. To this end, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both BIOS Vendor and your systems manufacturer to provide the absolute maximum performance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

### 3.6 BIOS setup

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

#### 3.6.1 Main Menu

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



### 3.6.1.1 System Language

This option allows choosing the system default language.

### 3.6.1.2 System Date

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

### 3.6.1.3 System Time

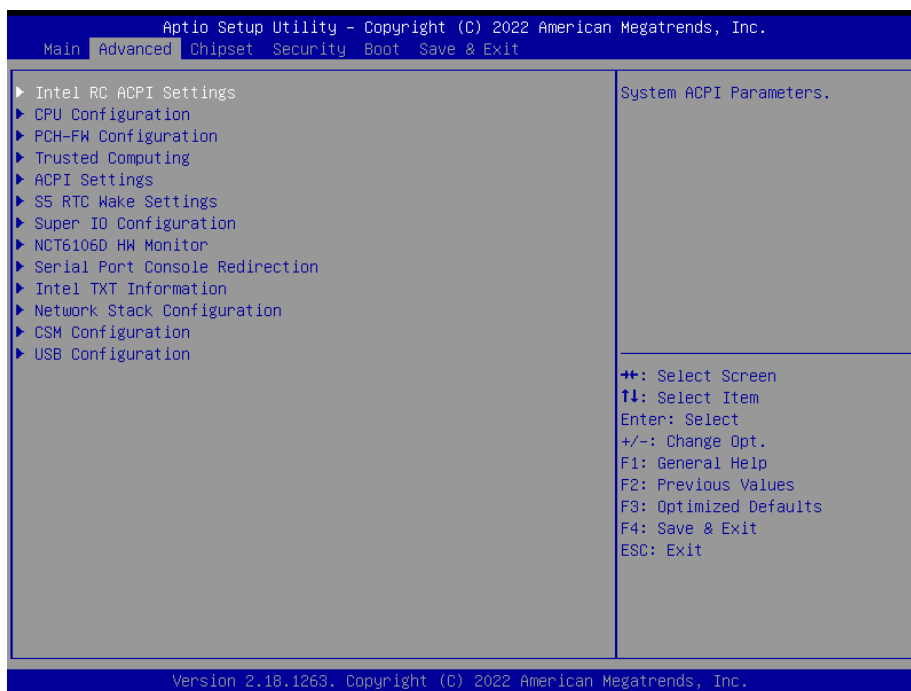
Use the system time option to set the system time. Manually enter the hours, minutes and seconds.



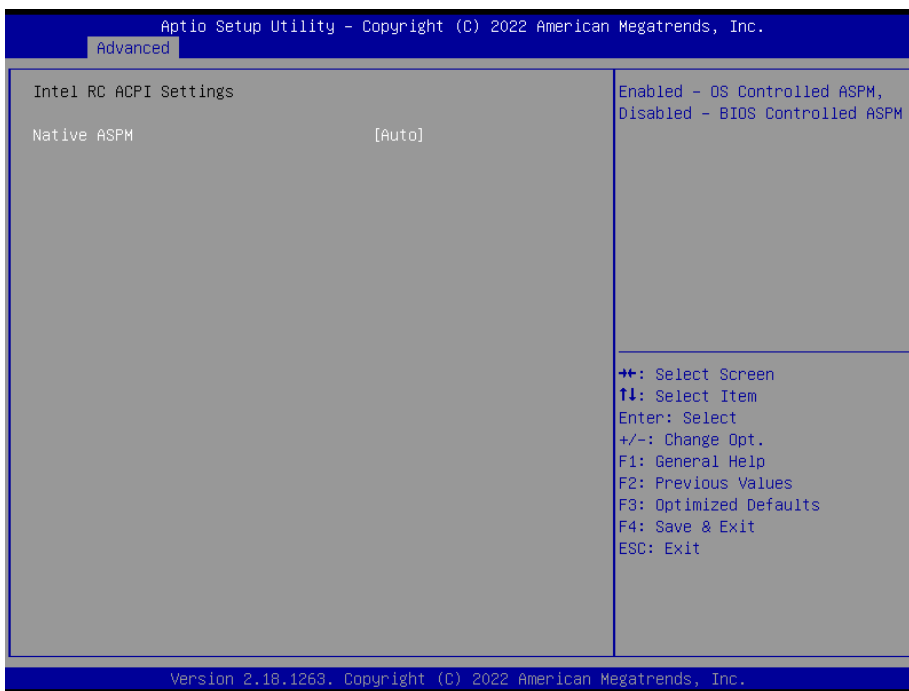
**Note:** The BIOS setup screens shown in this chapter are for reference purposes only, and may not exactly match what you see on your screen. Visit the Avalue website ([www.avalue.com.tw](http://www.avalue.com.tw)) to download the latest product and BIOS information.

## 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.

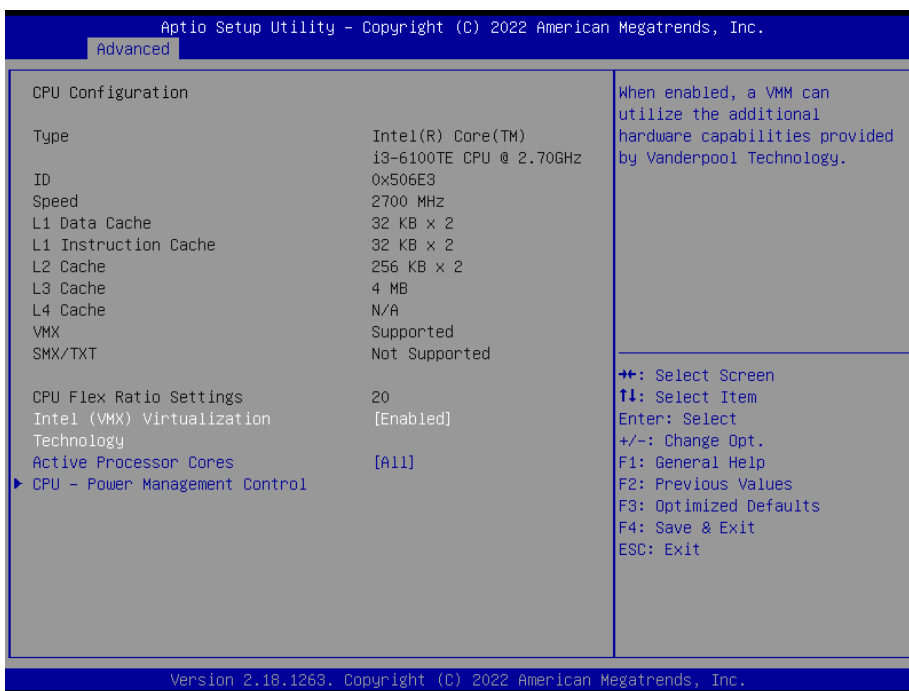


3.6.2.1 Intel RC ACPI Settings



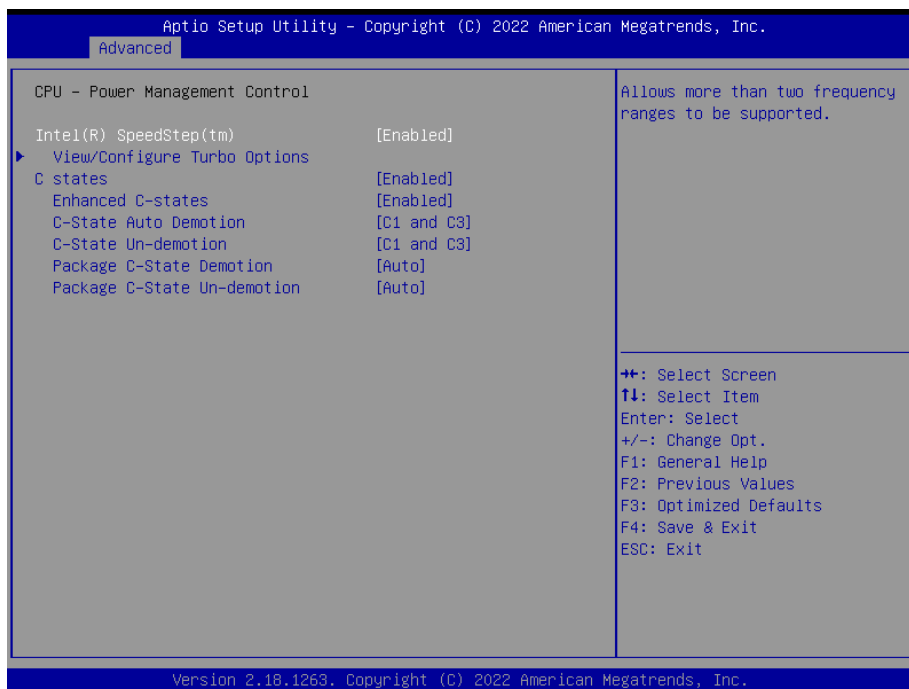
Item	Options	Description
Native ASPM	Auto <b>[Default]</b> , Enabled Disabled	Enabled – OS Controlled ASPM, Disabled – BIOS Controlled ASPM

3.6.2.2 CPU Configuration



Item	Options	Description
<b>Intel (VMX) Virtualization Technology</b>	Disabled Enabled[Default],	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.
<b>Active Processor Cores</b>	All[Default], 1 2 3	Number of cores to enable in each processor package.

### 3.6.2.2.1 CPU – Power management Control

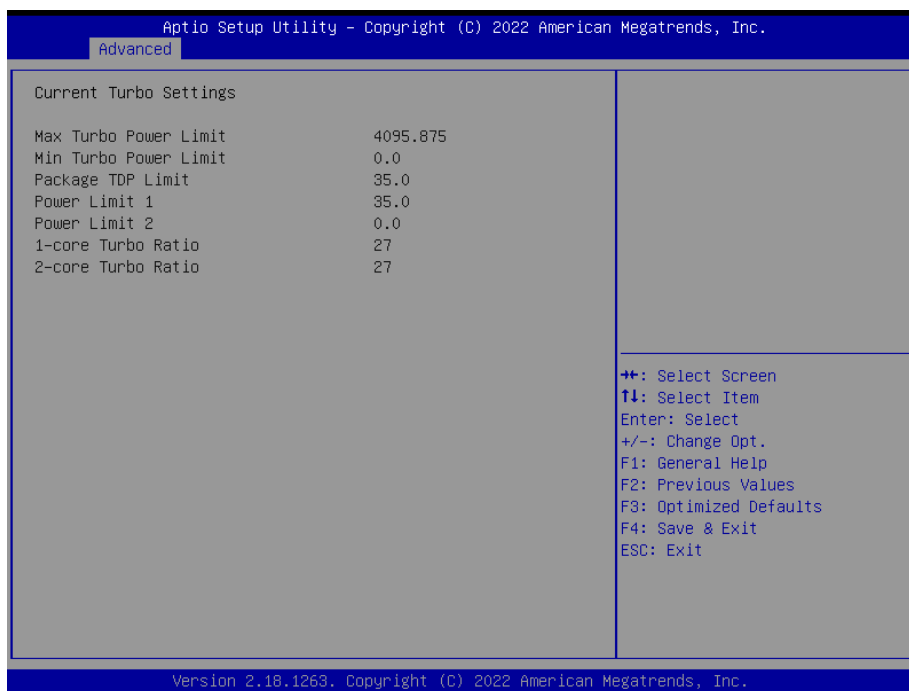


Item	Option	Description
<b>Intel® SpeedStep™</b>	Disabled, Enabled[Default]	Allows more than two frequency ranges to be supported.
<b>C states</b>	Enabled[Default] Disabled,	Enable/Disable CPU Power Management. Allows CPU to go to C states when it's not 100% utilized.
<b>Enhanced C-states</b>	Disabled, Enabled[Default]	Enable/Disable C1E. When enabled, CPU will switch to minimum speed when all cores enter C-State.
<b>C-State Auto Demotion</b>	Disabled C1 C3 C1 and C3[Default]	Configure C-State Auto Demotion
<b>C-State Un-demotion</b>	Disabled C1 C3 C1 and C3[Default]	Configure C-State Un-demotion

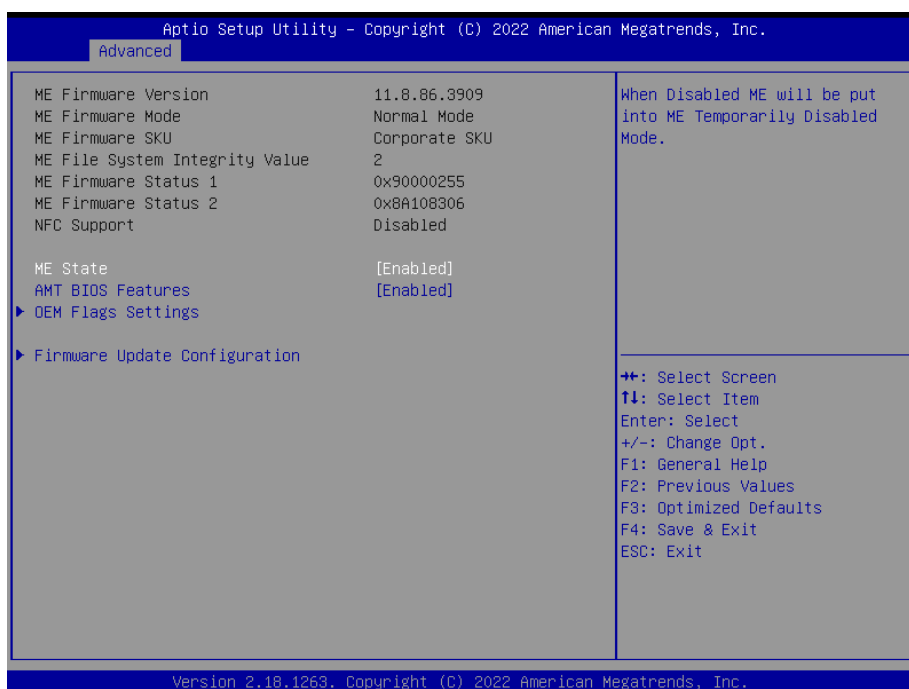
## EMX-Q170KP-B1 User's Manual

<b>Package C-State Demotion</b>	Disabled, Enabled Auto[Default]	Enable or Disable Package C-State Demotion. 0: Disable; 1: Enable; 2:Auto(Auto: Enabled for Skylake; Disabled for Kabylake)
<b>Package C-State Un-demotion</b>	Disabled, Enabled Auto[Default]	Enable or Disable Package C-State UnDemotion. 0: Disable; 1: Enable; 2:Auto (Auto: Enabled for Skylake; Disabled for Kabylake)

### 3.6.2.2.1.1 View/Configure Turbo Options



### 3.6.2.3 PCH-FW Configuration





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

### 3.6.2.3.1 OEM Flags Settings



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

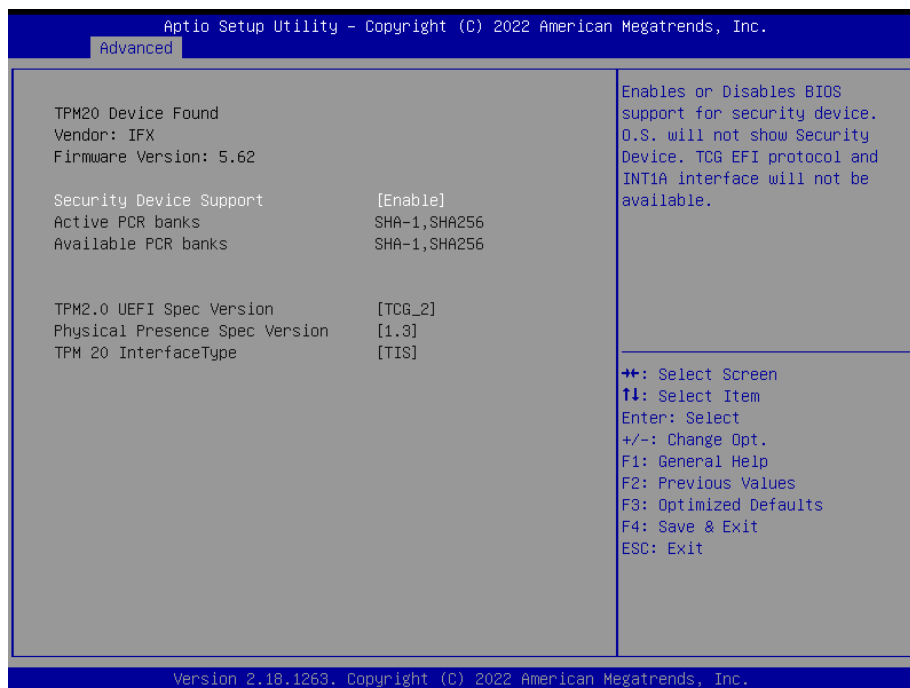
# EMX-Q170KP-B1 User's Manual

## 3.6.2.3.2 Firmware Update Configuration



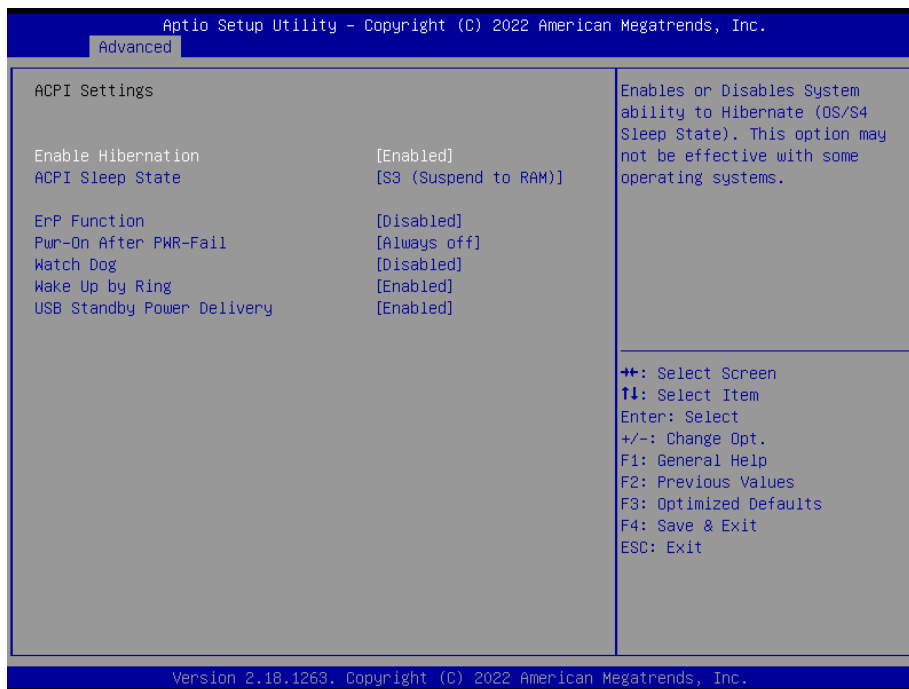
Item	Option	Description
Me FW Image Re-Flash	Disabled[Default], Enabled	Enable/Disable Me FW Image Re-Flash function.

## 3.6.2.4 Trusted Computing



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

### 3.6.2.5 ACPI Settings

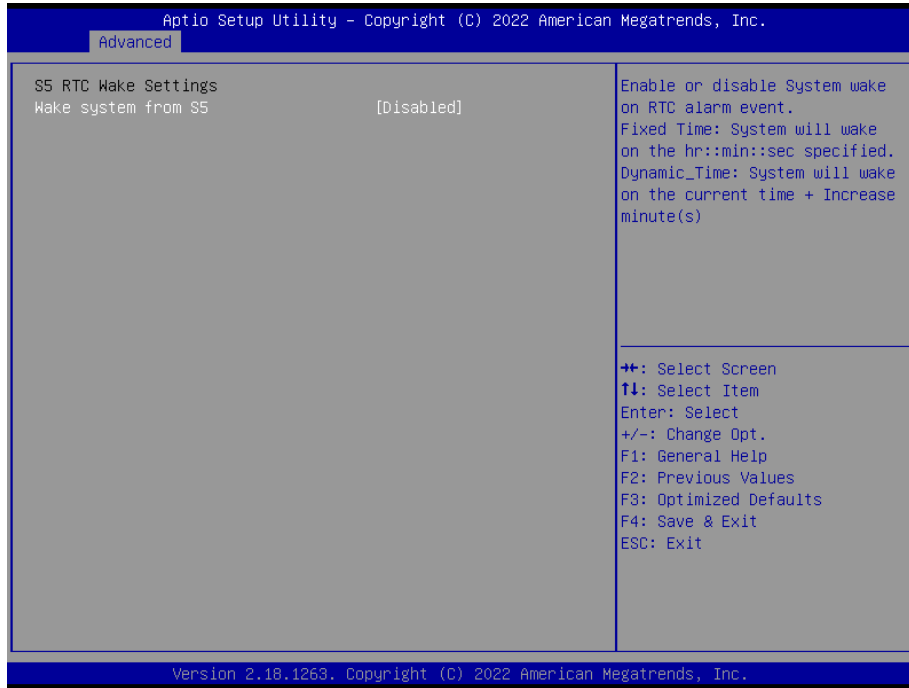


Item	Options	Description
<b>Enable Hibernation</b>	Disabled Enabled[ <b>Default</b> ],	Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some operating systems.
<b>ACPI Sleep State</b>	Suspend Disabled, S3 (Suspend to RAM)[ <b>Default</b> ]	Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.
<b>ErP Function</b>	Disabled[ <b>Default</b> ], Enabled	ErP(Dep S5) Function. Allow BIOS switching off peripheral power delivery at S5 state.
<b>Pwr-On After PWR-Fail</b>	Always Off[ <b>Default</b> ] Always On Keep Last state	Specify what state to go to when power is re-applied after a power failure (G3 state).
<b>Watch Dog</b>	Disabled[ <b>Default</b> ], 30 sec 40 sec 50 sec 1 min 2 min	Select Watch Dog Timer (WDT) Mode.

## EMX-Q170KP-B1 User's Manual

	10 min 30 min	
<b>Wake Up by Ring</b>	Disabled Enabled[ <b>Default</b> ],	Enable/Disable system waked up by Ring signal from S3(Sleep), S4(Hibernate) and S5(Soft Off) States.
<b>USB Standby Power Delivery</b>	Disabled Enabled[ <b>Default</b> ],	Enable/Disable USB Power delivery in S3 (Sleep), S4 (Hibernate) and S5 (Soft Off) States.

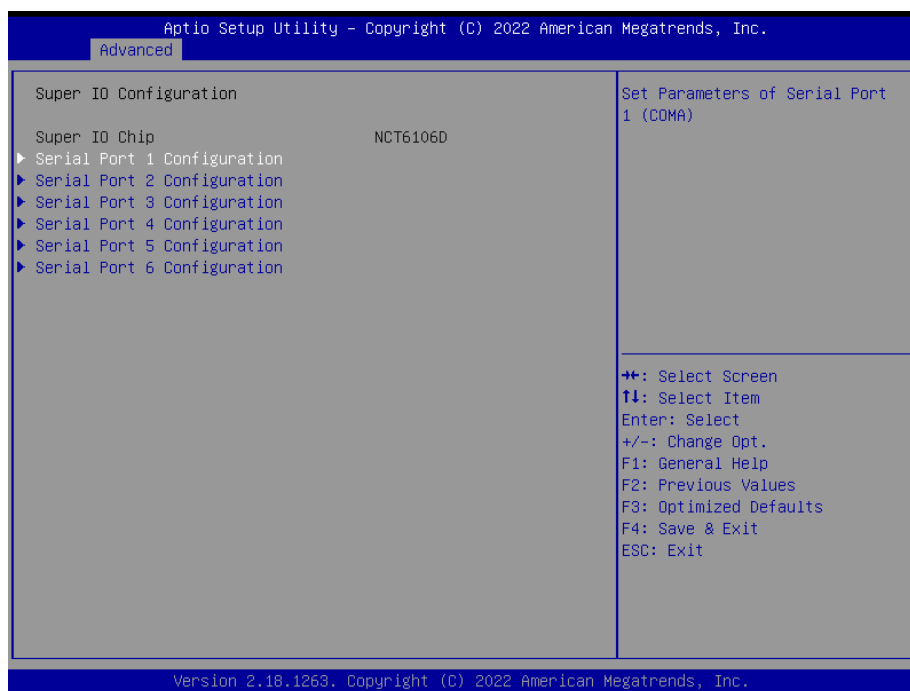
### 3.6.2.6 S5 RTC Wake Settings



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

### 3.6.2.7 Super IO Configuration

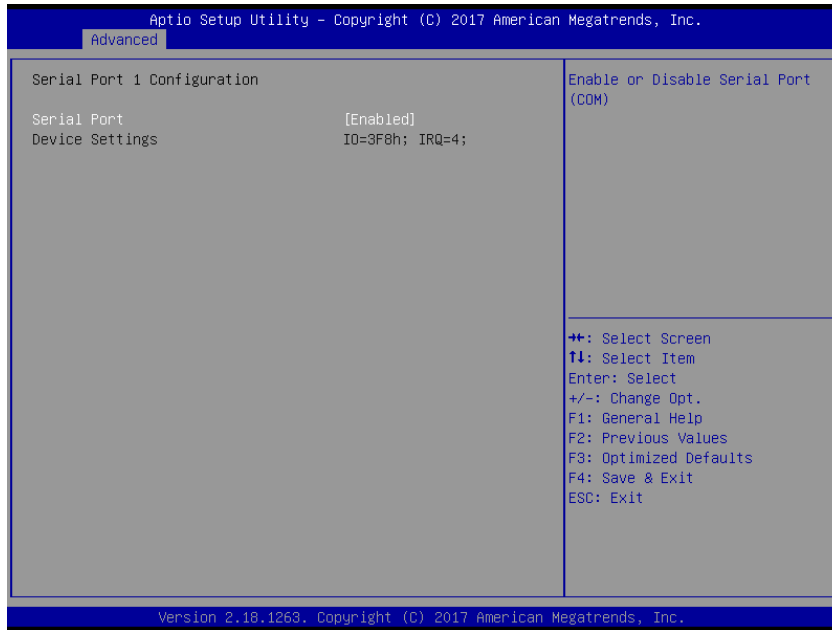
You can use this item to set up or change the Super IO configuration for serial ports. Please refer to 3.6.2.7.1~ 3.6.2.7.6 for more information.



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

# EMX-Q170KP-B1 User's Manual

## 3.6.2.7.1 Serial Port 1 Configuration



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

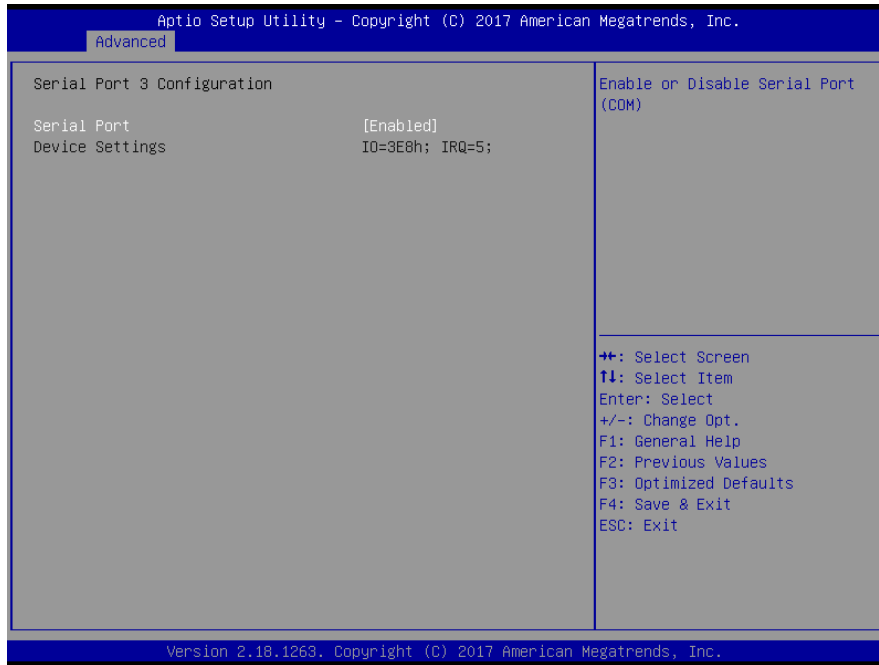
## 3.6.2.7.2 Serial Port 2 Configuration



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

<p>UART 232 422 485</p>	<p>RS232[Default] RS422 RS485</p>	<p>Set COM Port as RS232, RS422 or RS485 mode.</p>
-------------------------	---	--

### 3.6.2.7.3 Serial Port 3 Configuration



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

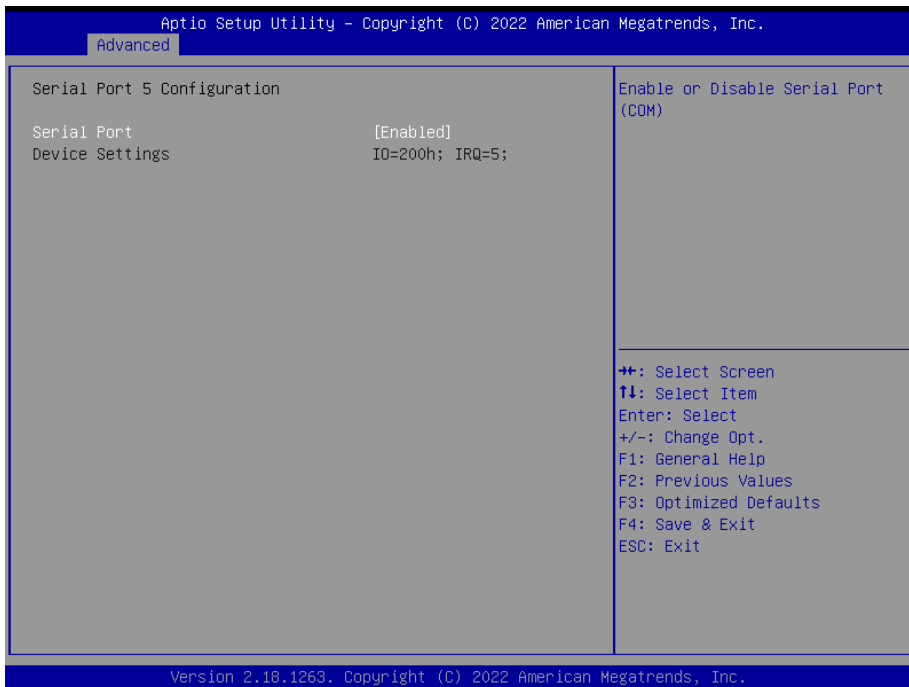
### 3.6.2.7.4 Serial Port 4 Configuration



## EMX-Q170KP-B1 User's Manual

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

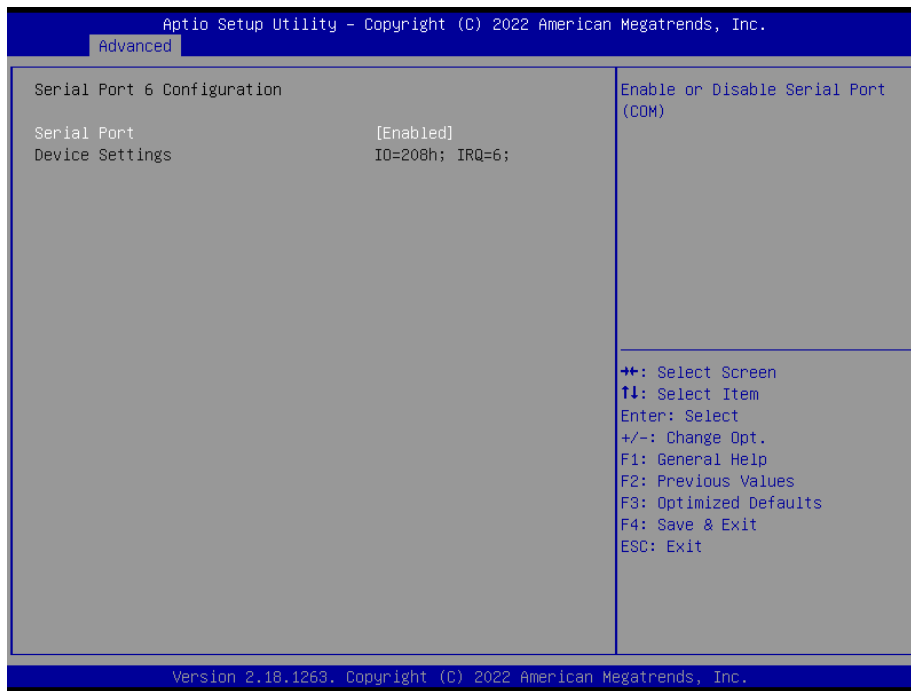
### 3.6.2.7.5 Serial Port 5 Configuration



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

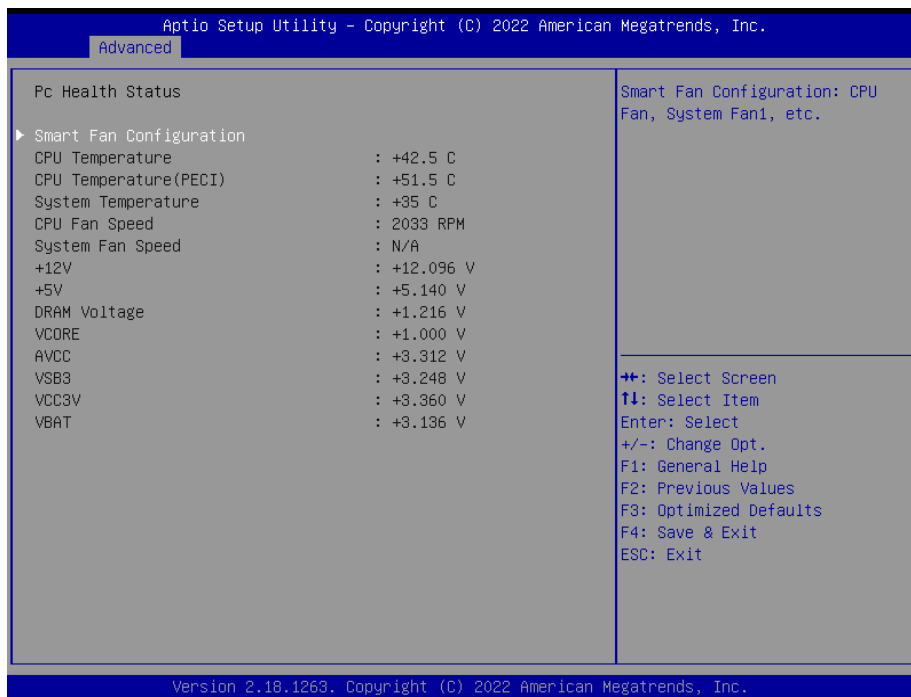


### 3.6.2.7.6 Serial Port 6 Configuration



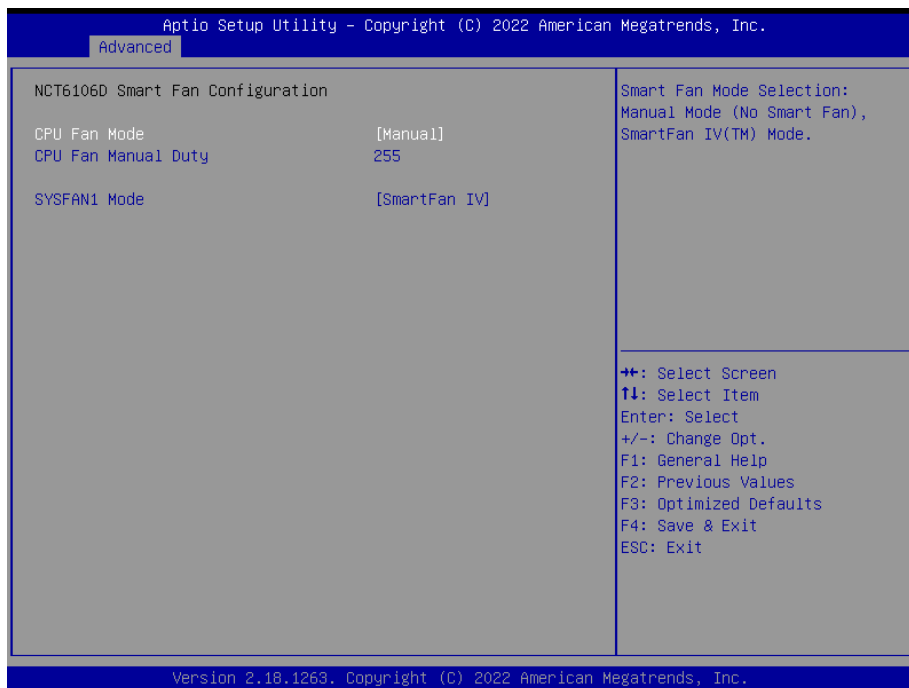
Item	Option	Description
Serial Port	Disabled Enabled[Default],	Enable or Disable Serial Port (COM).

### 3.6.2.8 NCT6106D H/W Monitor



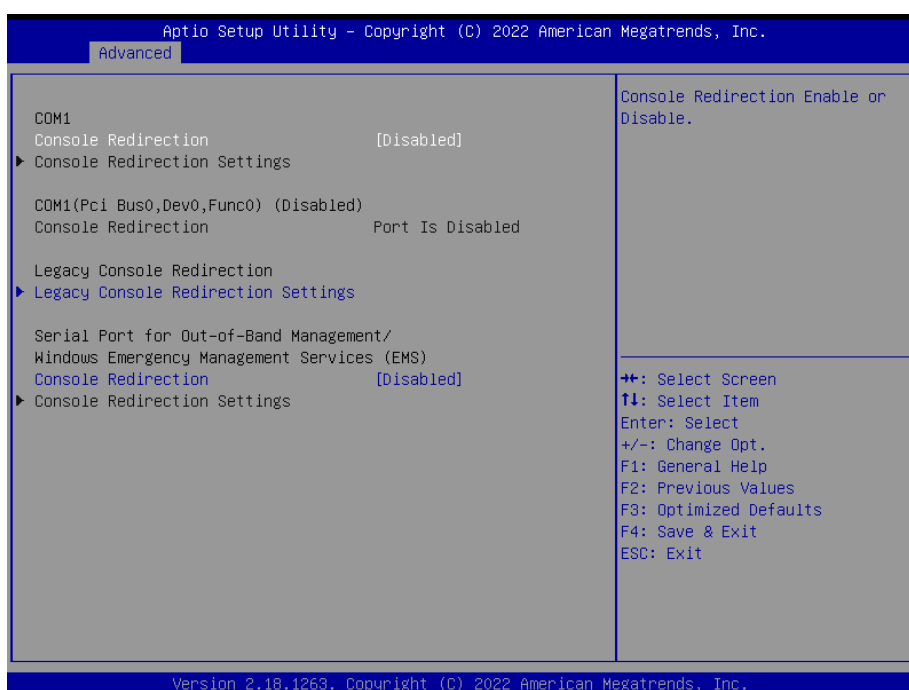
# EMX-Q170KP-B1 User's Manual

## 3.6.2.8.1 Smart Fan Configuration



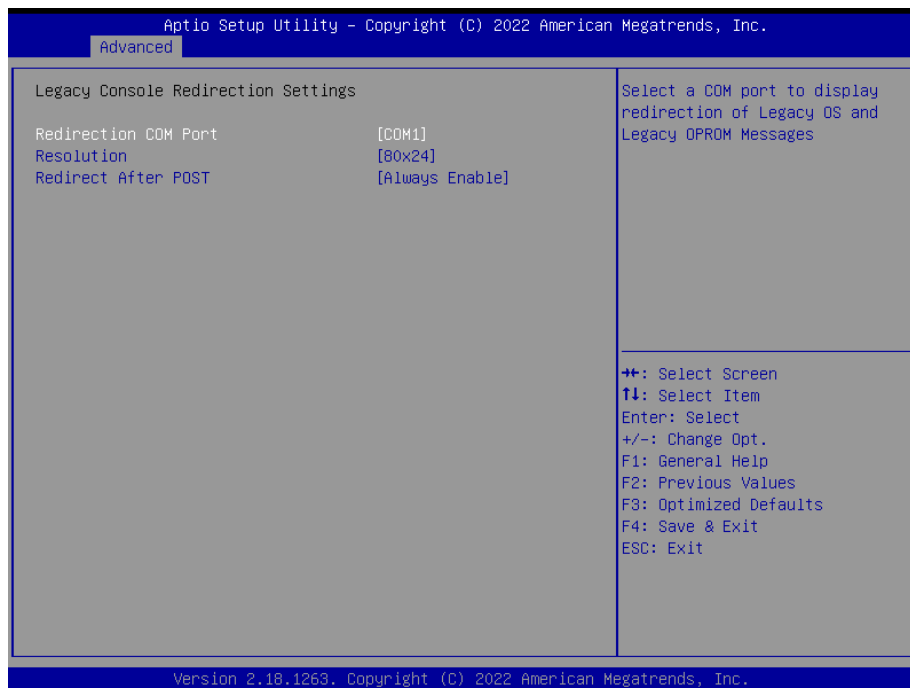
Item	Option	Description
CPU Fan Mode	Manual[Default], SmartFan IV	Smart Fan Mode Selection: Manual Mode (No Smart Fan), SmartFan IV™ Mode.
CPU Fan Manual Duty	255	CPU Fan manual output duty: 0 to 255.
SYSFAN1 Mode	Manual SmartFan IV[Default],	Smart Fan Mode Selection: Manual Mode (No Smart Fan), SmartFan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

## 3.6.2.9 Serial Port Console Redirection



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

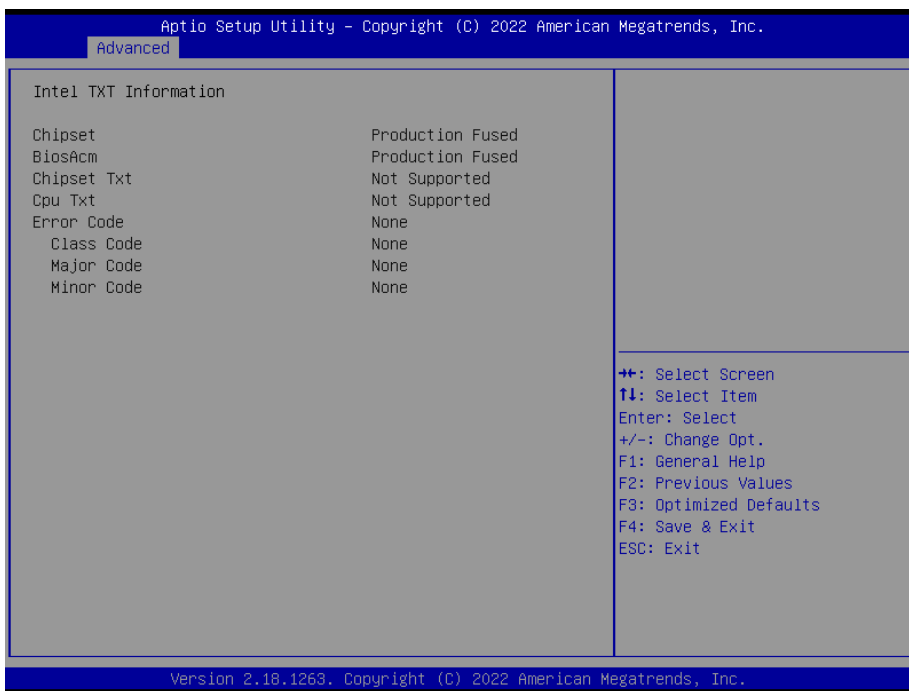
### 3.6.2.9.1 Legacy Console Redirection Settings



Item	Option	Description
Redirection COM Port	COM1	Select a COM port to display redirection of Legacy OS and Legacy OPROM Messages
Resolution	80X24[Default] 80X25	On Legacy OS, the Number of Rows and Columns supported redirection
Redirect After POST	Always Enable[Default] BootLoader	When Bootloader is selected, then Legacy Console Redirection is disabled before booting to legacy OS. When Always Enable is selected, then Legacy Console Redirection is enabled for legacy OS. Default setting for this option is set to Always Enable.

# EMX-Q170KP-B1 User's Manual

## 3.6.2.10 Intel TXT Configuration

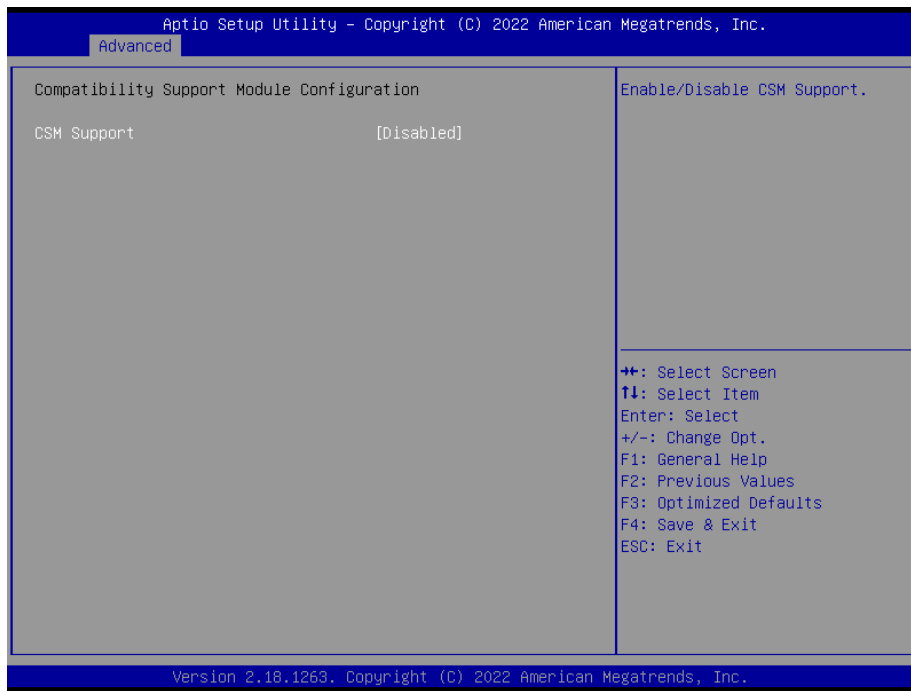


## 3.6.2.11 Network Stack Configuration



Item	Options	Description
<b>Network Stack</b>	Disabled <b>[Default]</b> Enabled	Enable/Disable UEFI Network Stack

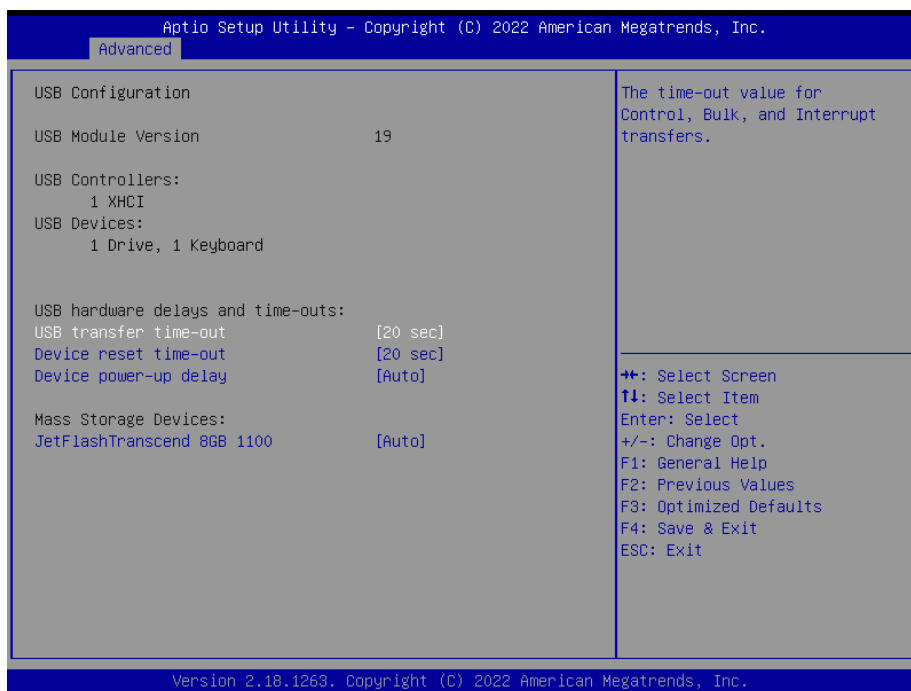
### 3.6.2.12 CSM Configuration



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

### 3.6.2.13 USB Configuration

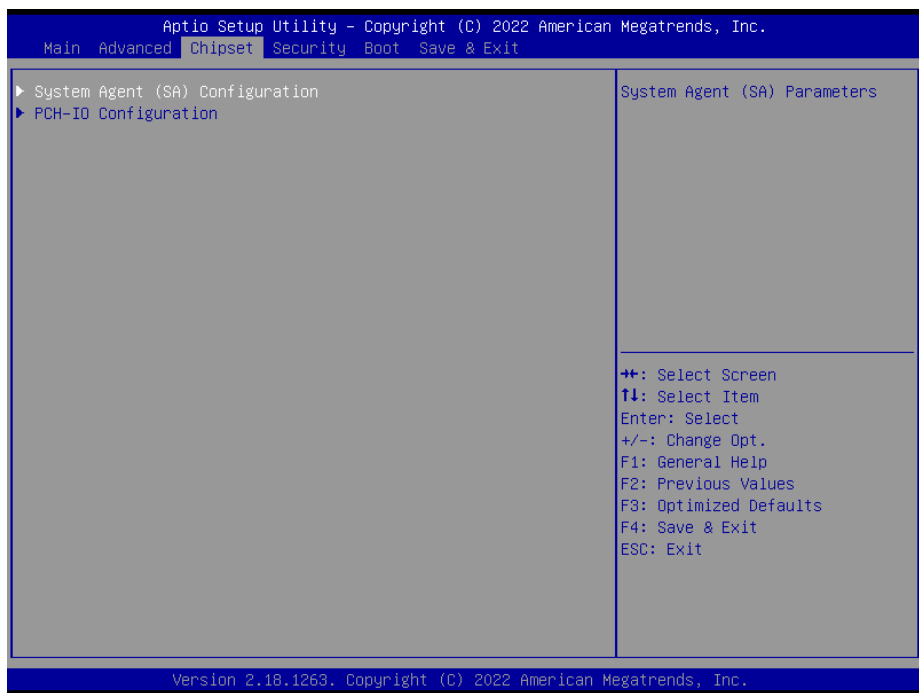
The USB Configuration menu helps read USB information and configures USB settings.



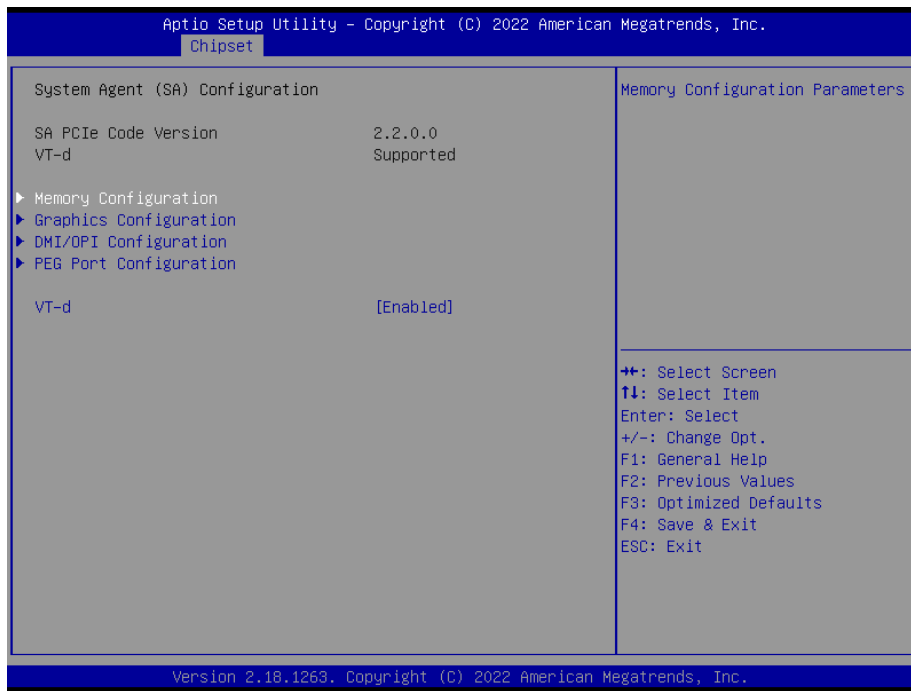
## EMX-Q170KP-B1 User's Manual

Item	Options	Description
<b>USB transfer time-out</b>	1 sec 5 sec 10 sec 20 sec <b>[Default]</b>	The time-out value for Control, Bulk, and Interrupt transfers.
<b>Device reset time-out</b>	10 sec 20 sec <b>[Default]</b> 30 sec 40 sec	USB mass storage device Start Unit command time-out.
<b>Device power-up delay</b>	Auto <b>[Default]</b> 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 100 ms, for a Hub port the delay is taken from Hub descriptor.
<b>Mass Storage Devices</b>	Auto <b>[Default]</b> Floppy Forced FDD Hard Disk CD-ROM	Mass storage device emulation type. 'AUTO' enumerates devices according to their media format. Optical drives are emulated as 'CDROM', drives with no media will be emulated according to a drive type.

### 3.6.3 Chipset

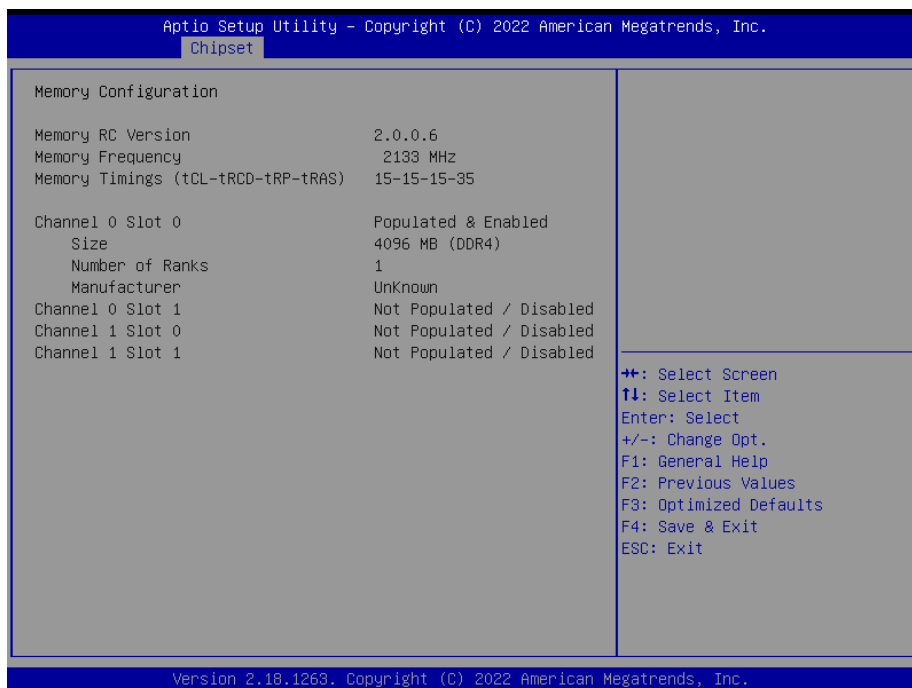


### 3.6.3.1 System Agent (SA) Configuration

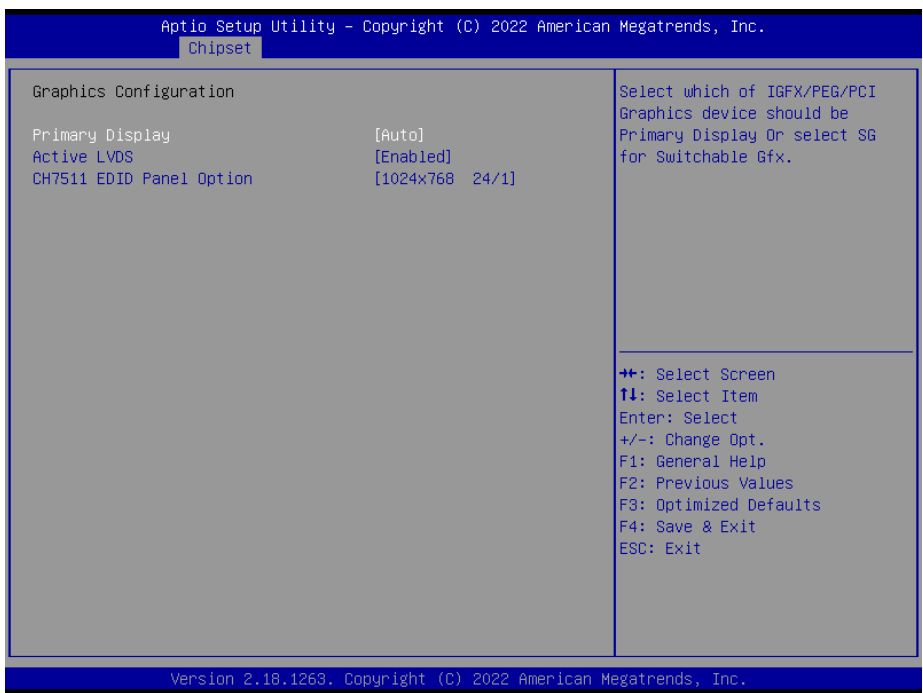


Item	Option	Description
VT-d	Disabled Enabled[Default]	VT-d capability.

#### 3.6.3.1.1 Memory Configuration



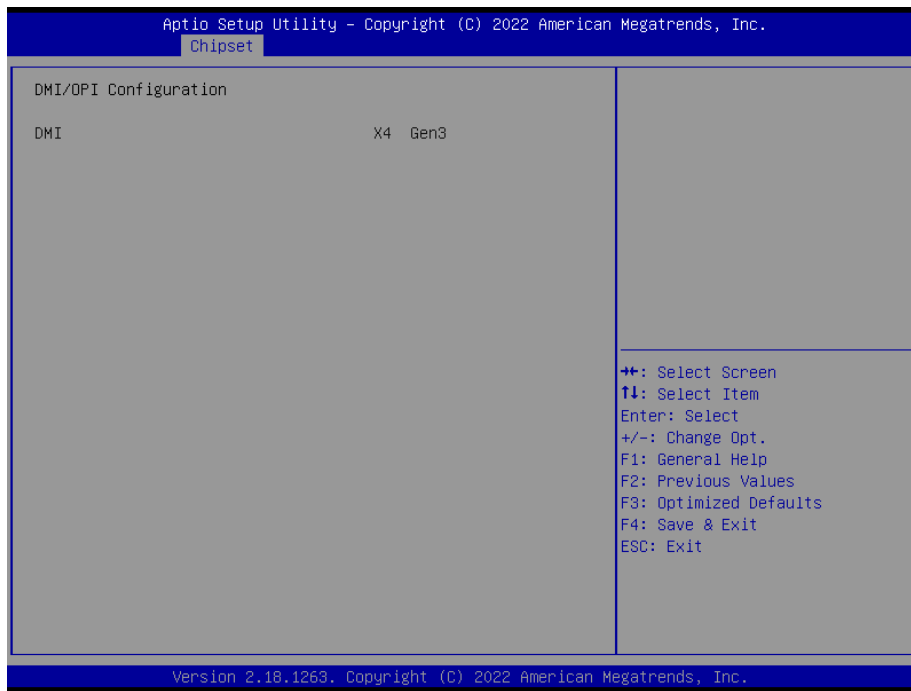
3.6.3.1.2 Graphics Configuration



Item	Option	Description
Primary Display	Auto[Default] IGFX PEG	Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select SG for Switchable Gfx.
Active LVDS	Disabled Enabled[Default]	Active on-board eDP to LVDS Converter
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	Set which panel resolution EDID reported by CH7511.



### 3.6.3.1.3 DMI/OPI Configuration



### 3.6.3.1.4 PEG Port Configuration

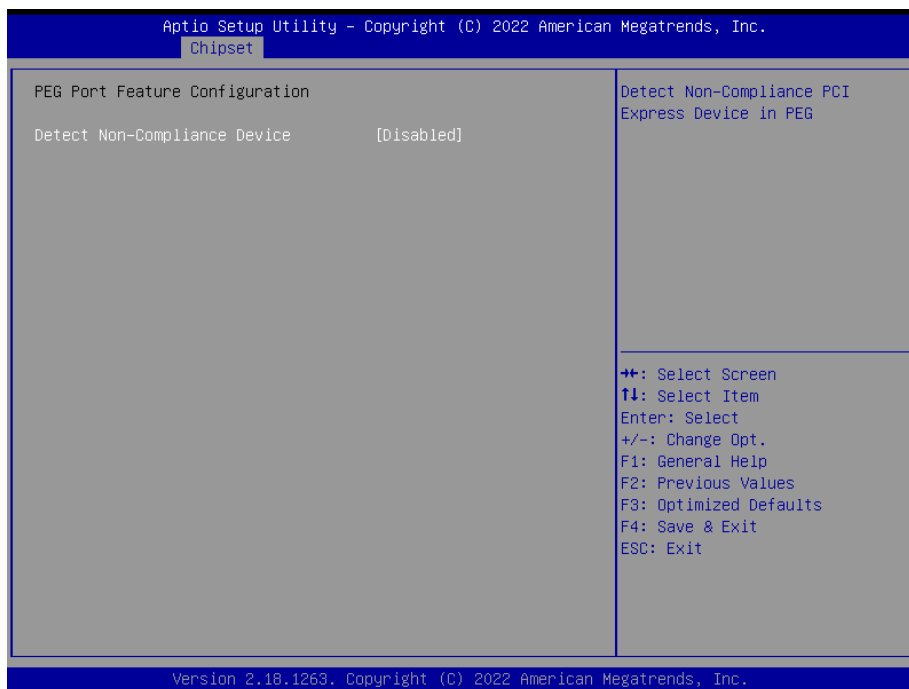


Item	Option	Description
Enable Root Port	Disabled Enabled Auto[Default]	Enable or Disable the Root Port
Max Link Speed	Auto[Default] Gen1	Configure PEG 0:1:0 Max Speed

## EMX-Q170KP-B1 User's Manual

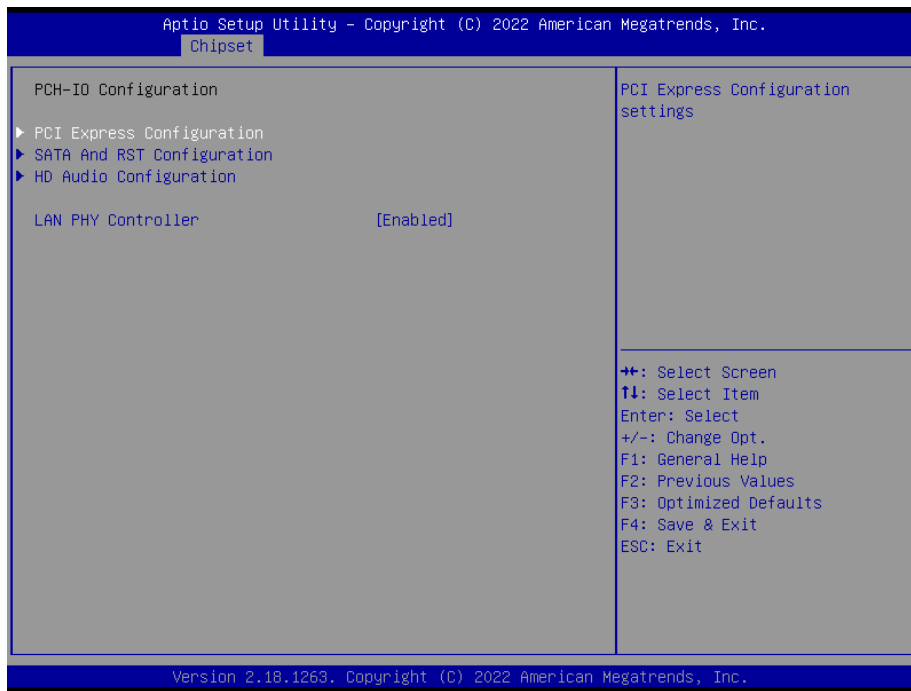
	Gen2 Gen3	
<b>Max TLP payload size</b>	128 TLP 256 TLP[Default]	Select PCI Express Max Transaction Layer Packet payload size.
<b>Program PCIe ASPM after OpROM</b>	Disabled[Default] Enabled	Enabled: PCIe ASPM will be programmed after OpROM. Disabled: PCIe ASPM will be programmed before OpROM.

### 3.6.3.1.4.1 PEG Port Feature Configuration



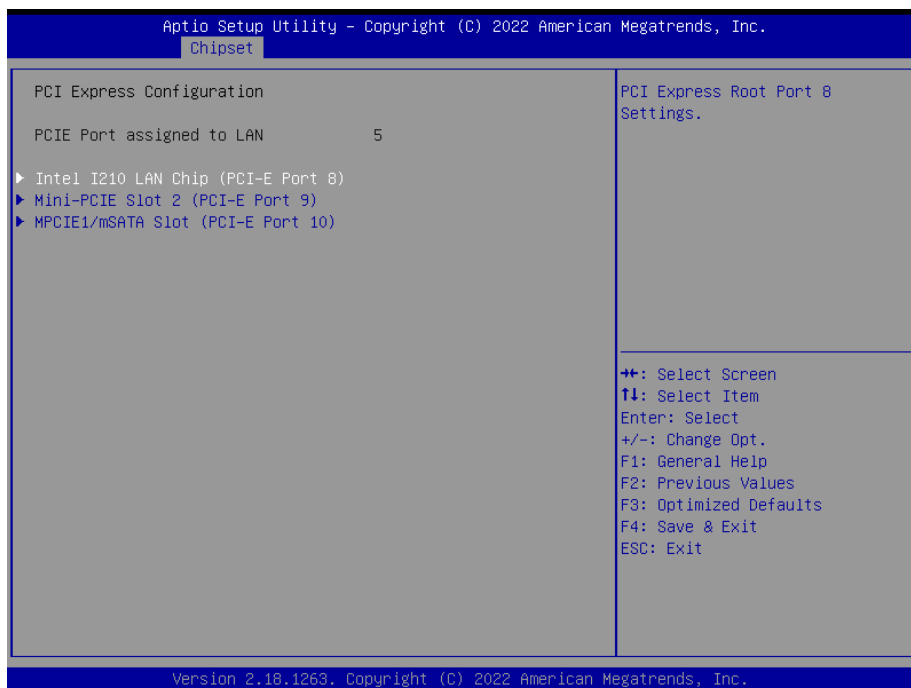
Item	Option	Description
<b>Detect Non-Compliance Device</b>	Disabled[Default] Enabled	Detect Non-Compliance PCI Express Device in PEG.

### 3.6.3.2 PCH-IO Configuration

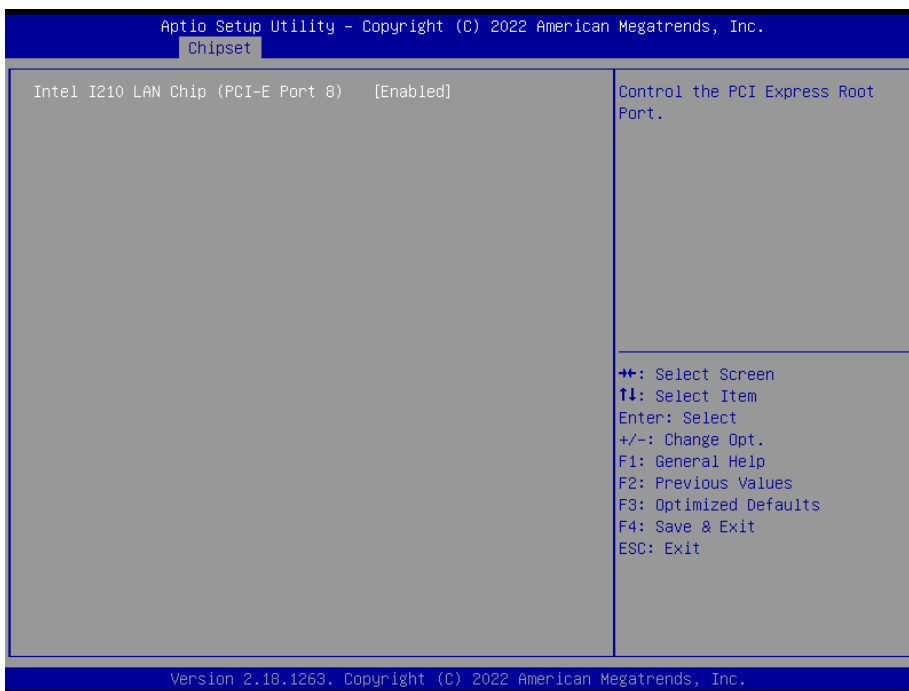


Item	Option	Description
<b>LAN PHY Controller</b>	Disabled Enabled[ <b>Default</b> ]	Enable or disable OnBoard PCH LAN PHY Controller.

#### 3.6.3.2.1 PCI Express Configuration

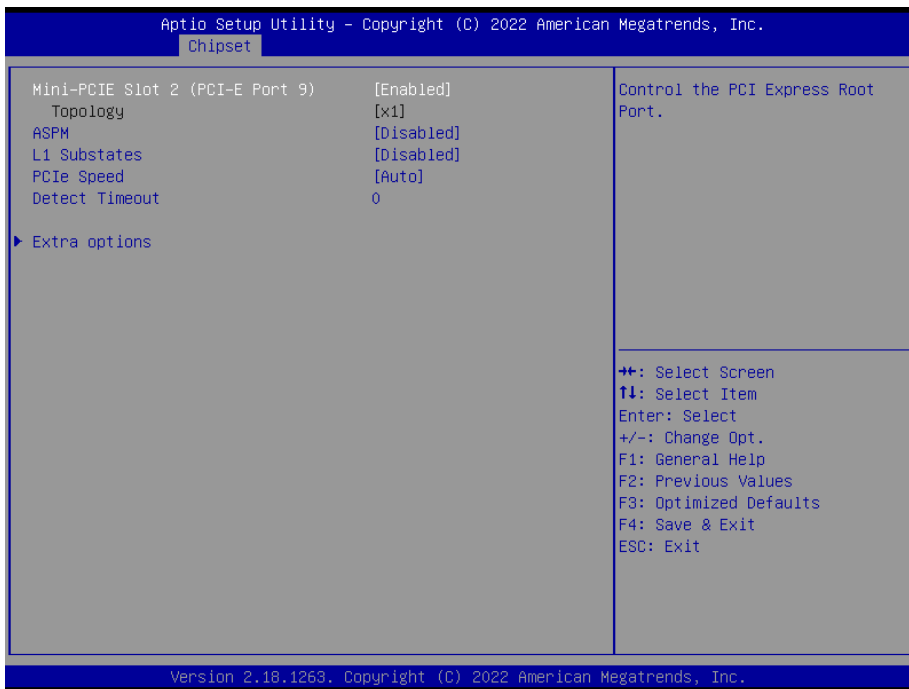


3.6.3.2.1.1 Intel I210 LAN Chip (PCI-E Port 8)



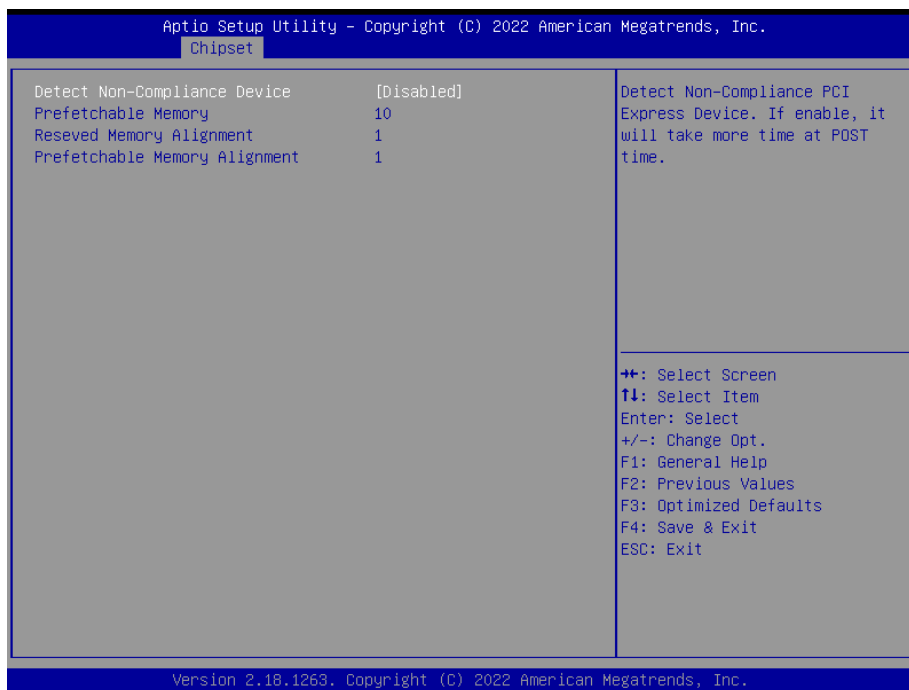
Item	Option	Description
Intel I211 LAN Chip (PCI-E Port 8)	Disabled Enabled[Default]	Control the PCI Express Root Port.

3.6.3.2.1.2 Mini-PCIE Slot 2 (PCI-E Port 9)



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

### 3.6.3.2.1.2.1 Extra options

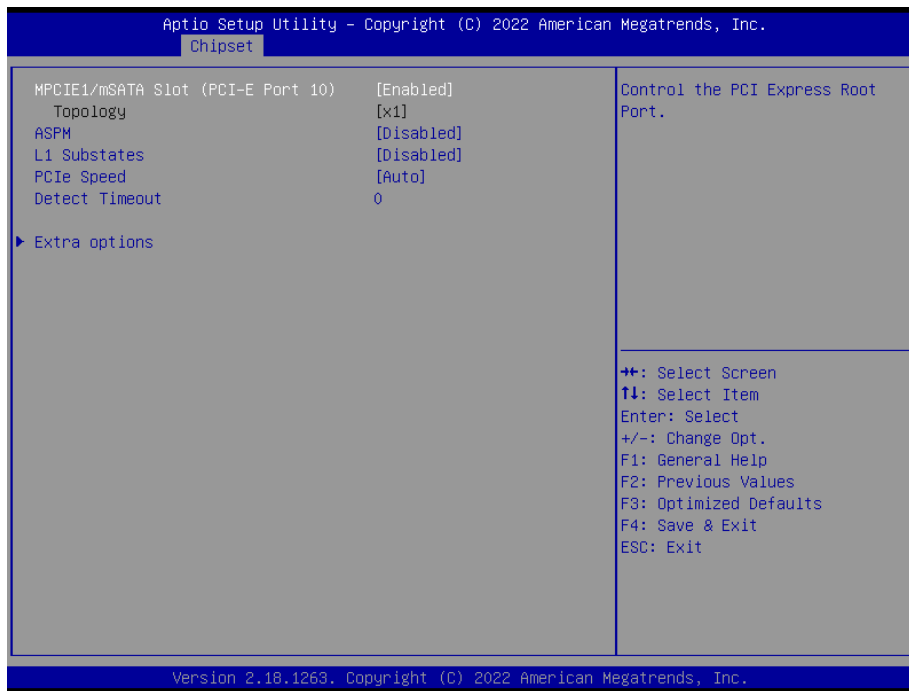


Item	Option	Description
<b>Detect Non-Compliance Device</b>	Disabled[ <b>Default</b> ] Enabled	Detect Non-Compliance PCI Express Device. If enable, it will take more time at POST time.
<b>Prefetchable Memory</b>	10	Prefetchable Memory Range for this Root Bridge.

## EMX-Q170KP-B1 User's Manual

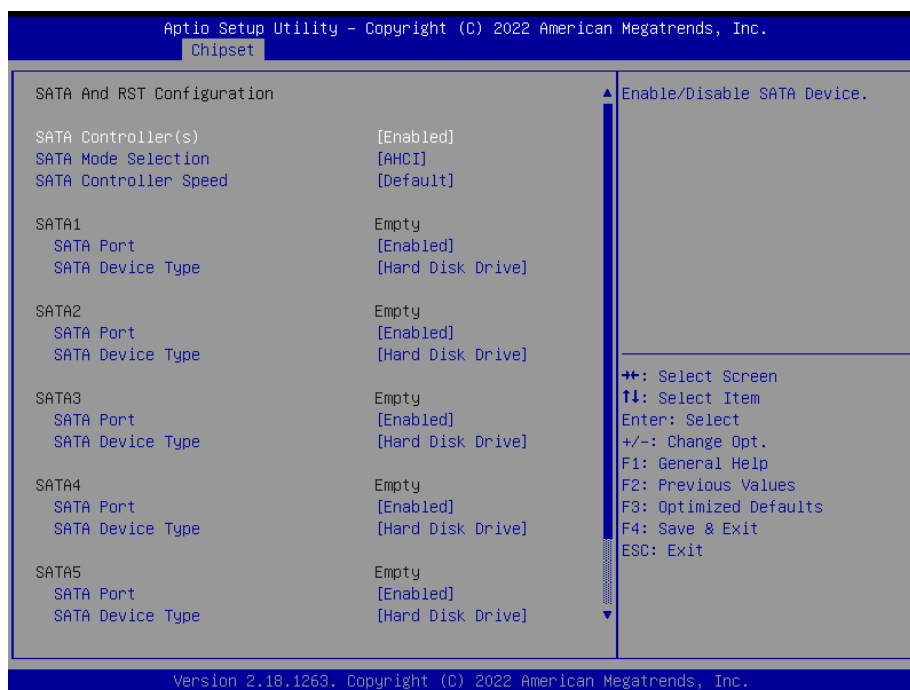
<b>Reseved Memory Alignment</b>	1	Reseved Memory Alignment (0-31 bits)
<b>Prefetchable Memory Alignment</b>	1	Prefetchable Memory Alignment (0-31 bits)

### 3.6.3.2.1.3 MPCIE1/mSATA Slot (PCI-E Port 10)



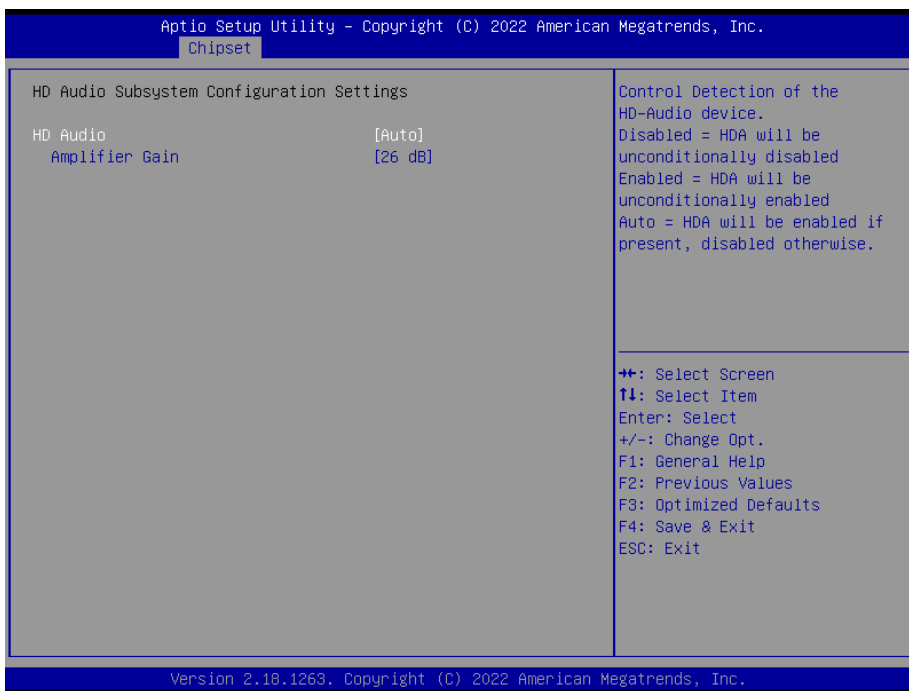
Item	Option	Description
<b>MPCIE1/mSATA Slot (PCI-E Port 10)</b>	Disabled Enabled[ <b>Default</b> ]	Control the PCI Express Root Port.
<b>ASPM</b>	Auto L0sL1 L1 L0s Disabled[ <b>Default</b> ]	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM
<b>L1 Substates</b>	Disabled[ <b>Default</b> ] L1.1 L1.2 L1.1 & L1.2	PCI Express L1 Substates settings.
<b>PCIe Speed</b>	Auto[ <b>Default</b> ] Gen1 Gen2	Configure PCIe Speed
<b>Detect Timeout</b>	0	The number of milliseconds reference code will wait for link to exit Detect state for enabled ports before assuming there is no device and potentially disabling the port.

### 3.6.3.2.2 SATA And RST Configuration



Item	Option	Description
<b>SATA Controller(s)</b>	Enabled[ <b>Default</b> ], Disabled	Enable/Disable SATA Device.
<b>SATA Mode Selection</b>	AHCI[ <b>Default</b> ], RAID	Determines how SATA controller(s) operate.
<b>SATA Controller Speed</b>	Default[ <b>Default</b> ], Gen1 Gen2 Gen3	Indicates the maximum speed the SATA controller can support.
<b>SATA Port</b>	Disabled Enabled[ <b>Default</b> ],	Enable or Disable SATA Port.
<b>SATA Device Type</b>	Hard Disk Drive[ <b>Default</b> ] Solid State Drive	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.

3.6.3.2.3 HD Audio Configuration



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

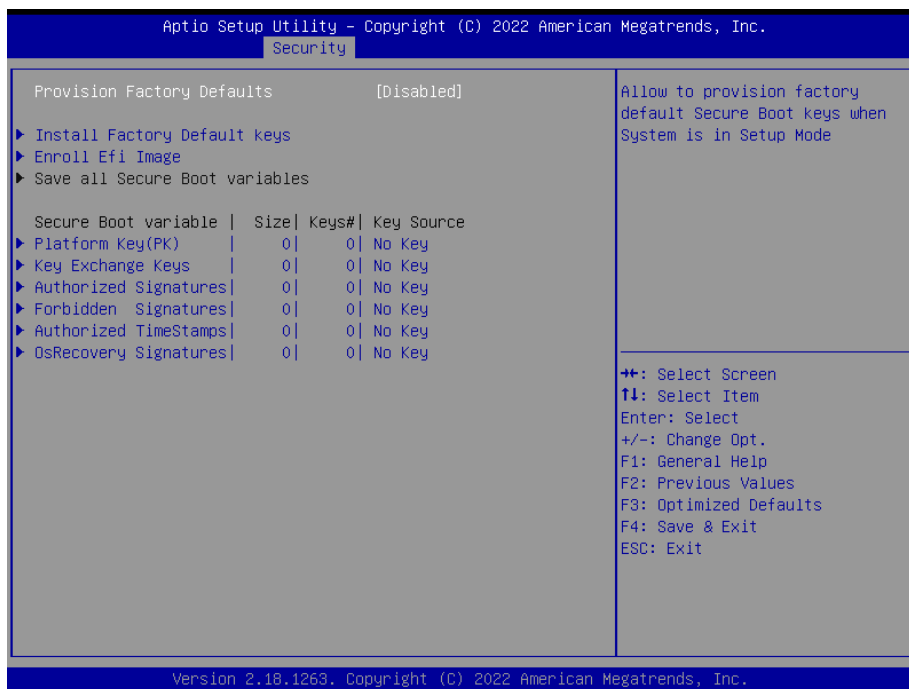




## EMX-Q170KP-B1 User's Manual

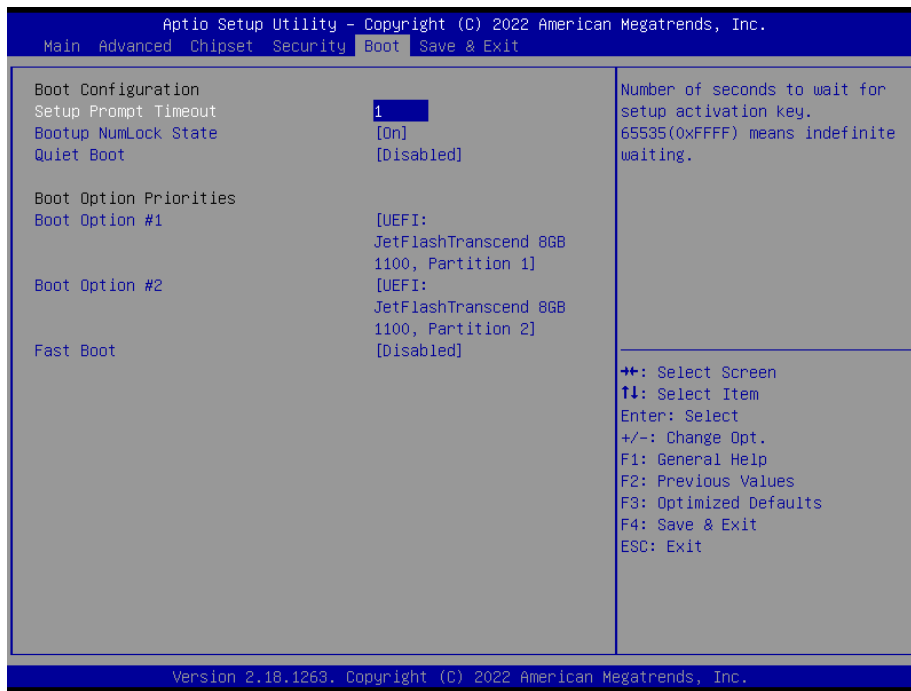
Item	Option	Description
<b>Attempt Secure Boot</b>	Disabled[Default] Enabled	Secure Boot activated when Platform Key(PK) is enrolled, System mode is User/Deployed, and CSM function is disabled
<b>Secure Boot Mode</b>	Standard Custom[Default]	Secure Boot mode selector : Standard/Custom. In Custom mode Secure Boot Variables can be configured without authentication

### 3.6.4.1.1 Key Management



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

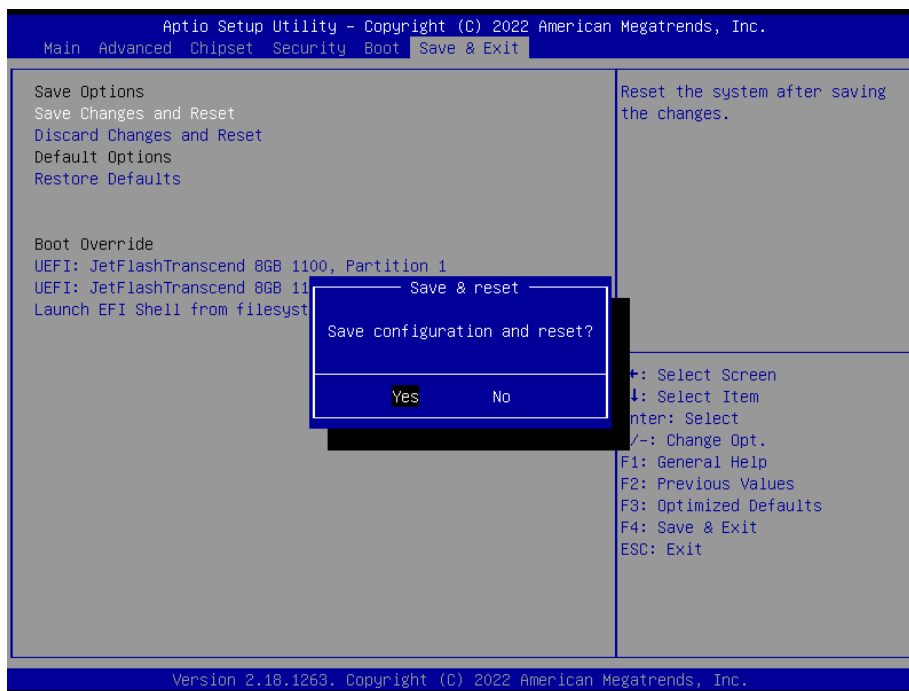
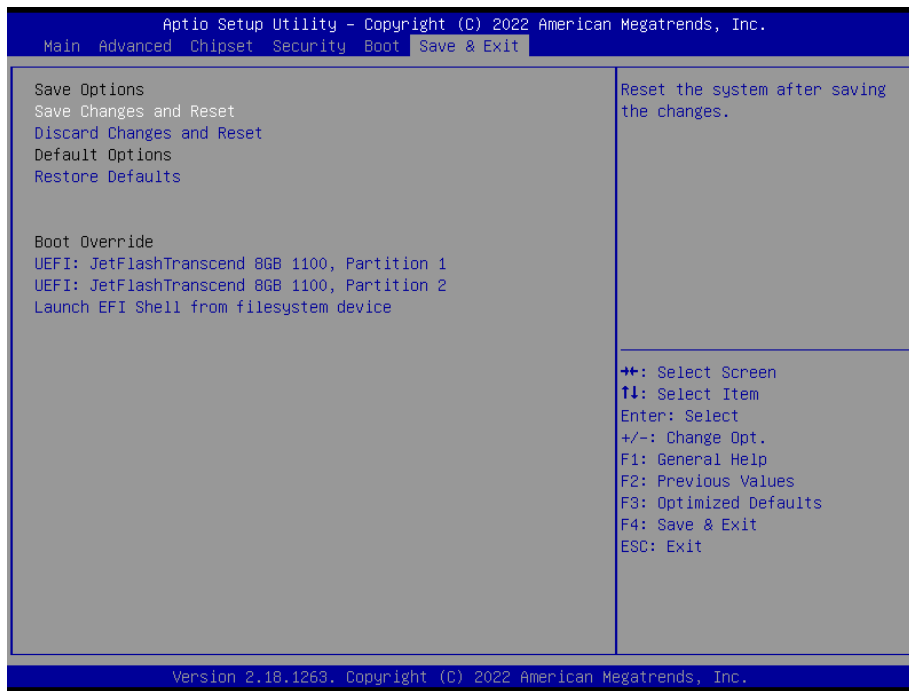
### 3.6.5 Boot



Item	Option	Description
<b>Setup Prompt Timeout</b>	1~ 65535	Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.
<b>Bootup NumLock State</b>	On[Default] Off	Select the keyboard NumLock state
<b>Quiet Boot</b>	Disabled[Default] Enabled	Enables or disables Quiet Boot option
<b>Fast Boot</b>	Disabled[Default] Enabled	Enables or disables boot with initialization of a minimal set of devices required to launch active boot option. Has no effect for BBS boot options.
<b>Boot Option #1</b>	Set the system boot order.	

# EMX-Q170KP-B1 User's Manual

## 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.

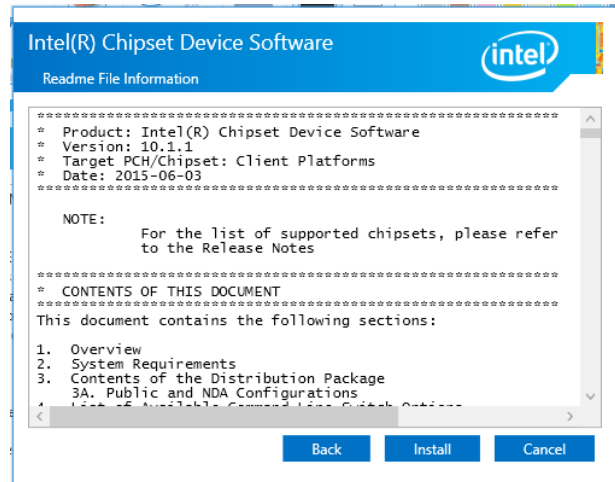
## 4.1 Install Chipset Driver

All drivers can be found on the Avalue Official Website:

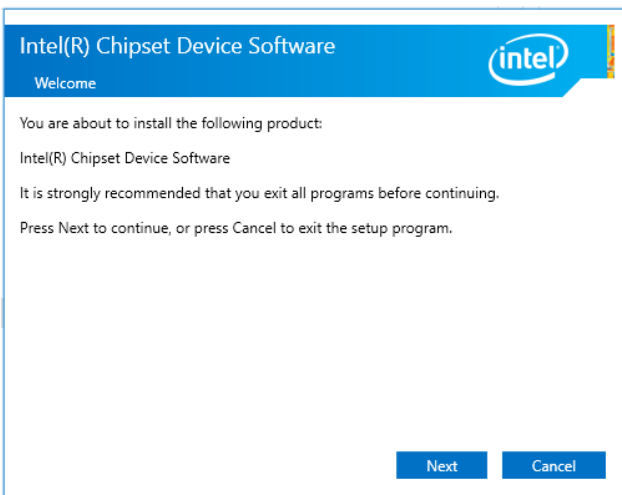
<http://www.avalu.com.tw>.



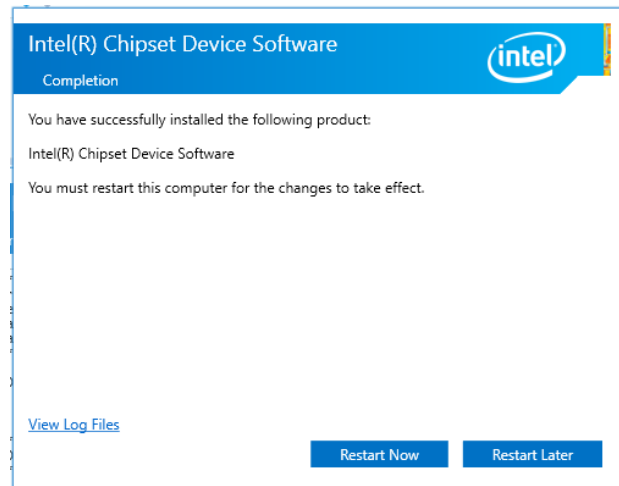
**Note:** The installation procedures and screen shots in this section are based on Windows 10 operation system.



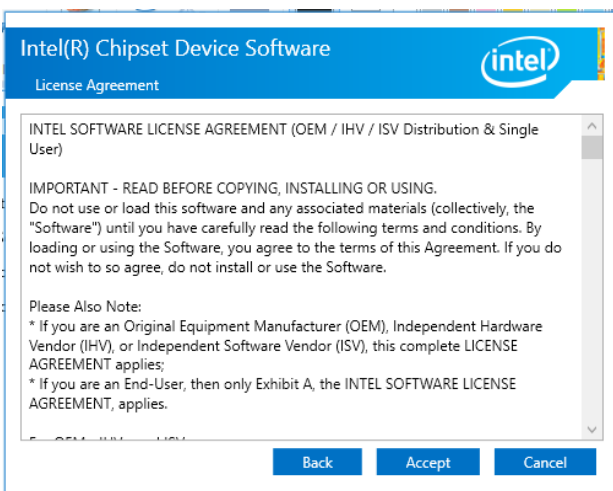
**Step 3. Click Install.**



**Step1. Click Next.**



**Step 4. Complete setup.**



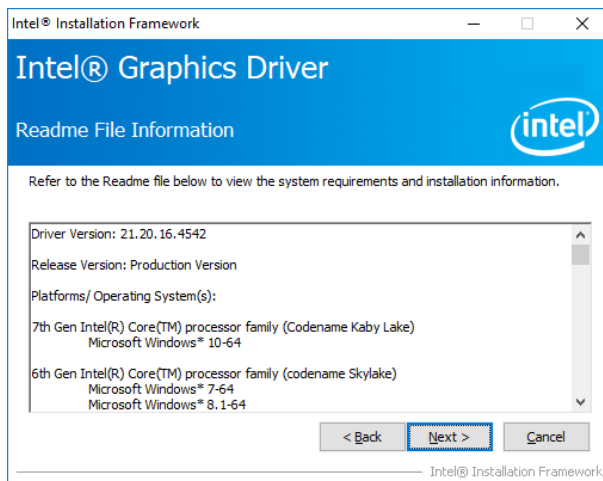
**Step 2. Click Accept.**

## 4.2 Install VGA Driver

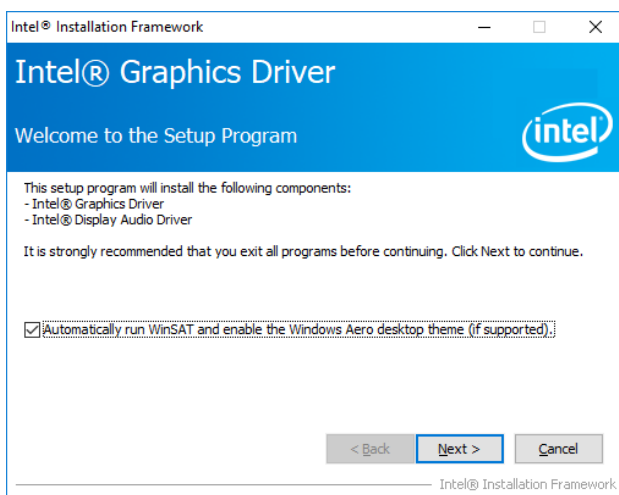
All drivers can be found on the Avalue Official Website:  
<http://www.avalue.com.tw>.



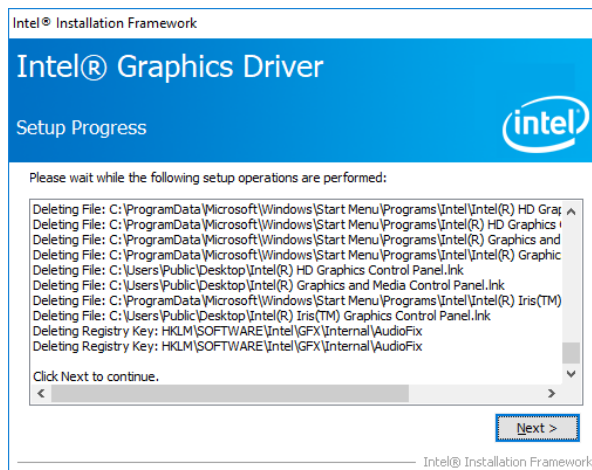
**Note:** The installation procedures and screen shots in this section are based on Windows 10 operation system.



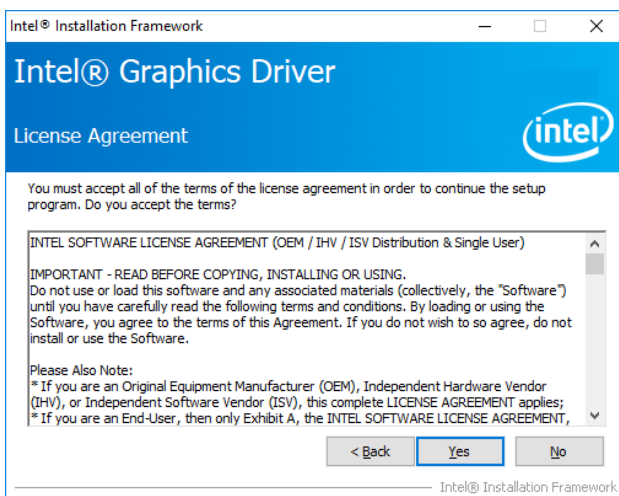
**Step 3. Click Next.**



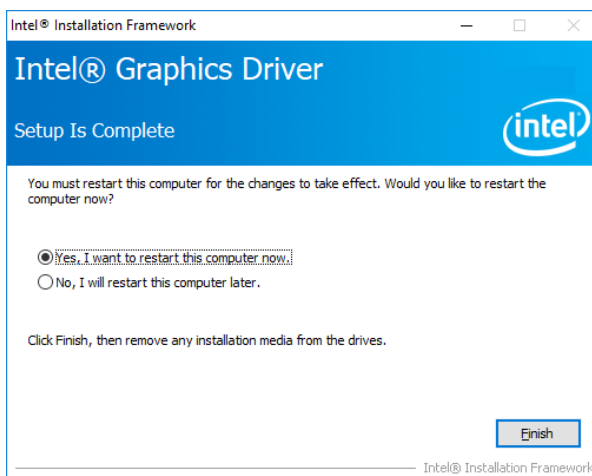
**Step 1. Click Next** to continue installation.



**Step 4. Click Next.**



**Step 2.**  
 Click **Yes** to accept license agreement.



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



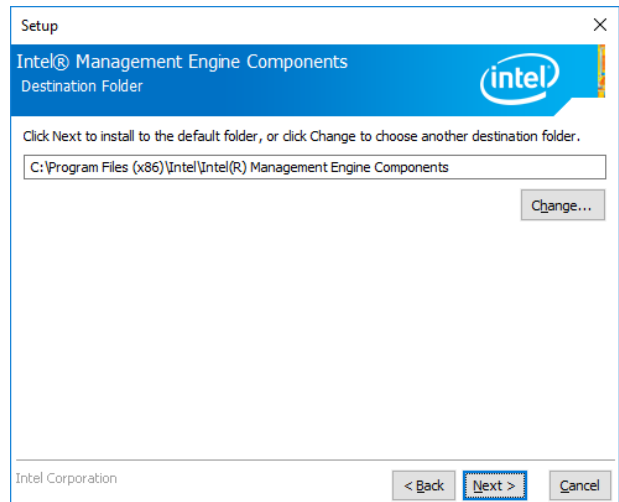
## 4.3 Install SOL Driver

All drivers can be found on the Avalue Official Website:

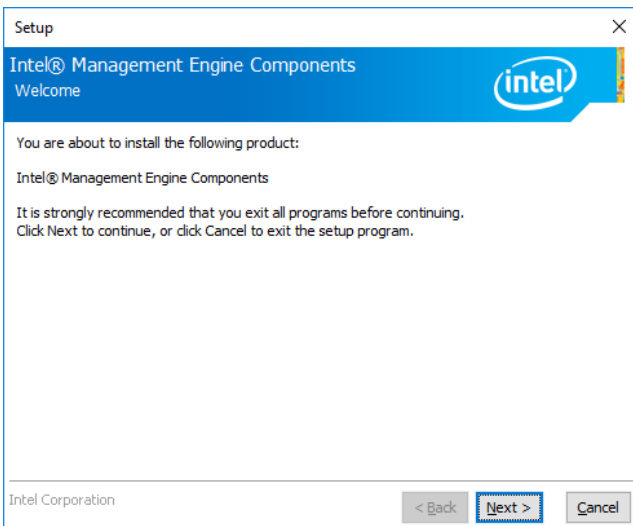
<http://www.avalue.com.tw>.



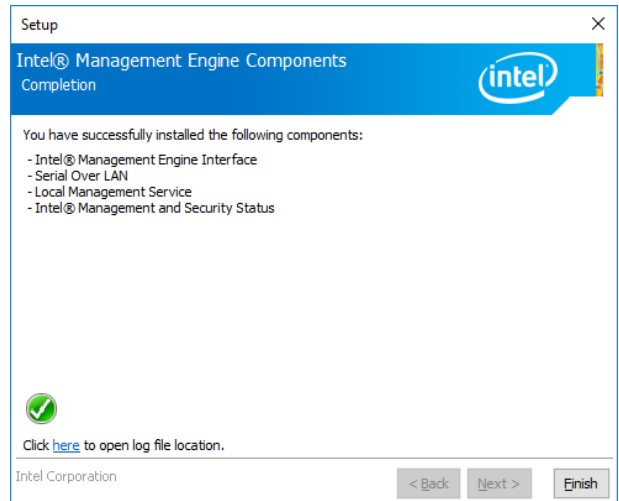
**Note:** The installation procedures and screen shots in this section are based on Windows 10 operation system.



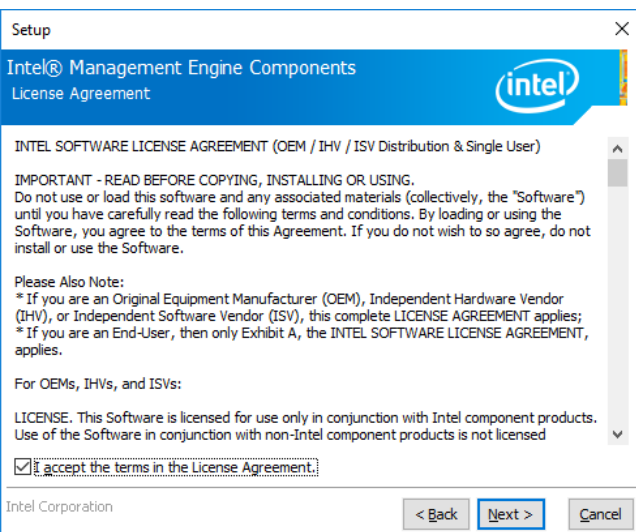
**Step 3. Click Next**



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



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



**Step 2. Click Next.**

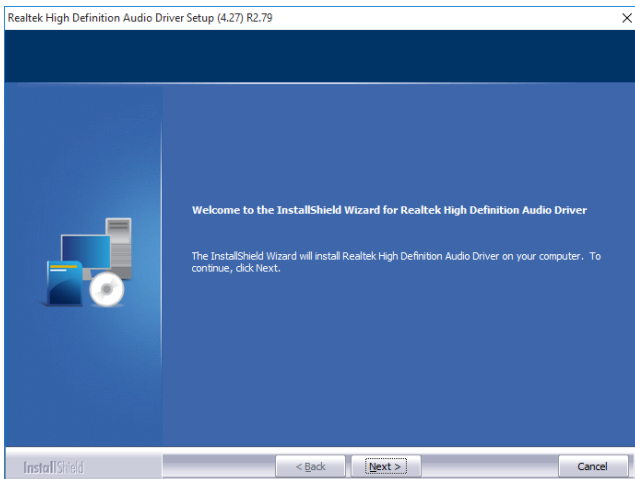
## 4.4 Install Audio Driver (For Realtek ALC892 HD Audio)

All drivers can be found on the Avalue Official Website:

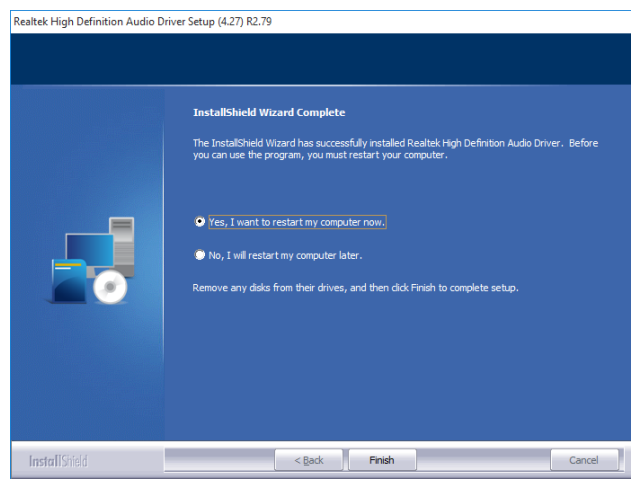
<http://www.avalue.com.tw>.



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



**Step1.** Click **Next** to Install.



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

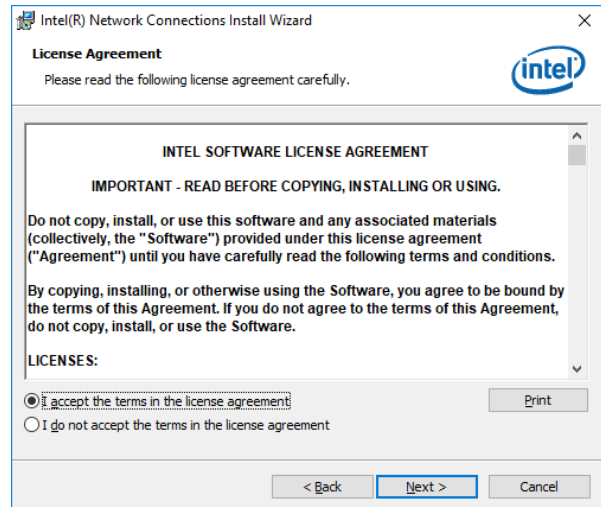
## 4.5 Install LAN Driver

All drivers can be found on the Avalue Official Website:

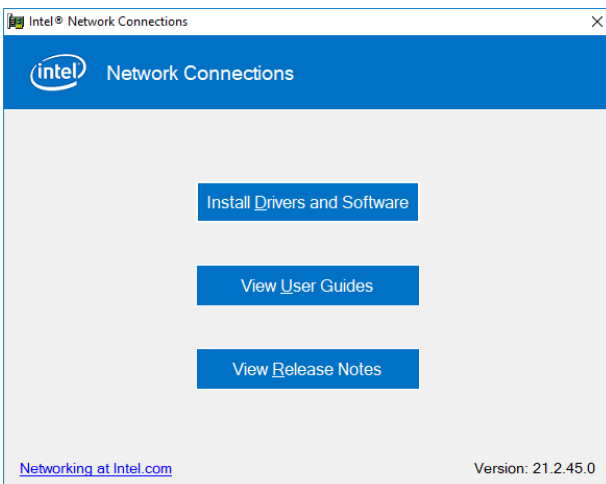
<http://www.avalue.com.tw>.



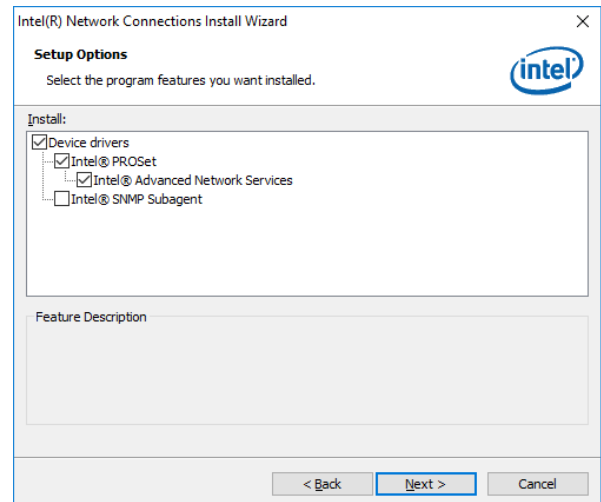
**Note:** The installation procedures and screen shots in this section are based on Windows 10 operation system.



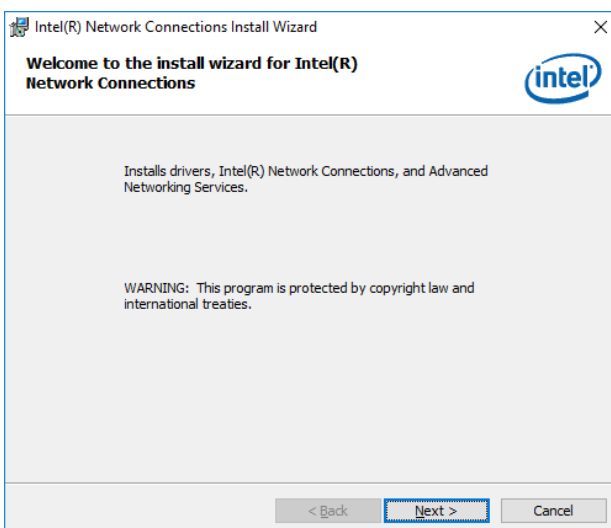
**Step 3. Click Next.**



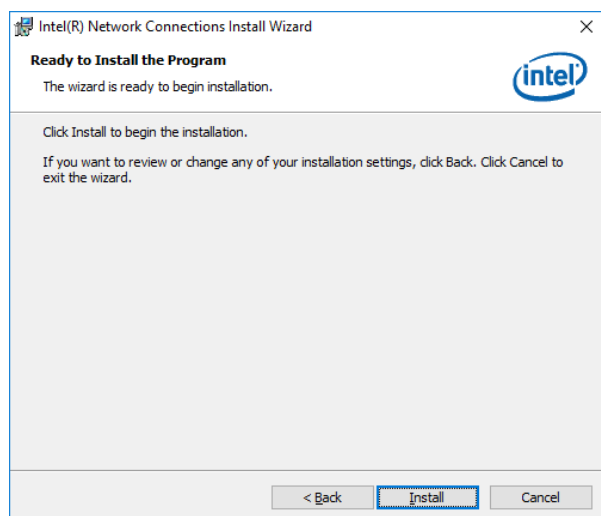
**Step 1. Click Install Drivers and Software.**



**Step 4. Click Next.**

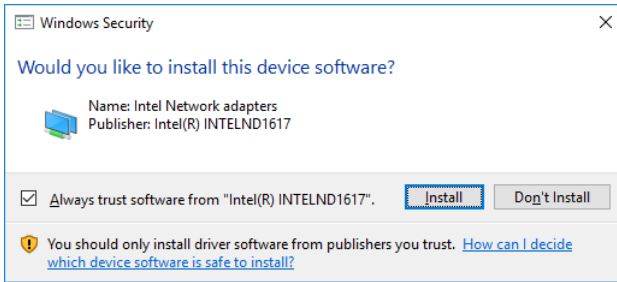


**Step 2. Click Next.**

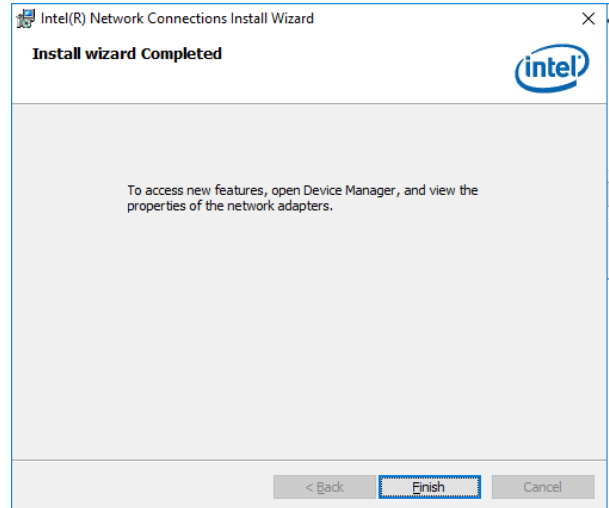


**Step 5. Click Install.**

## EMX-Q170KP-B1 User's Manual



**Step 6. Click Install.**



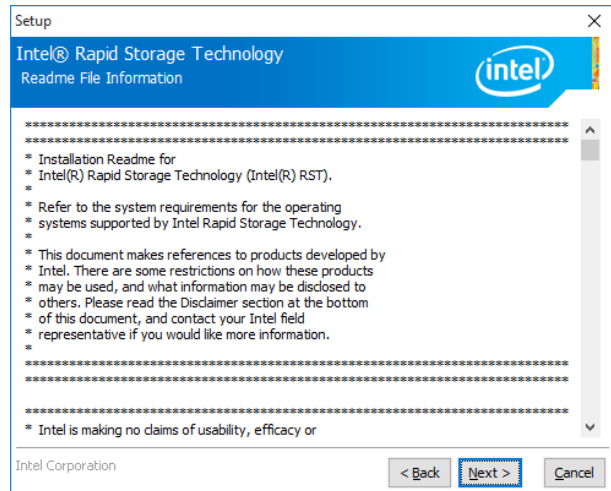
**Step 7. Click Finish to complete setup.**

## 4.6 Install RST Driver

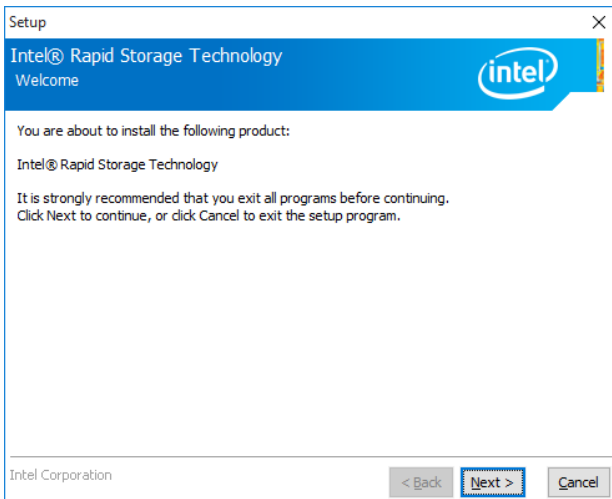
All drivers can be found on the Avalue Official Website:  
<http://www.avalue.com.tw>.



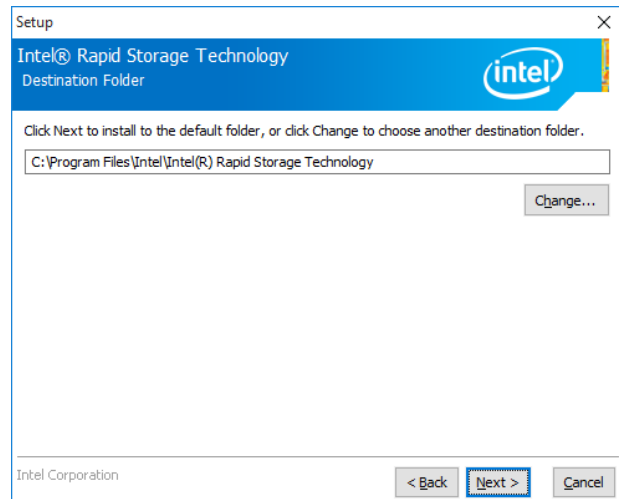
**Note:** The installation procedures and screen shots in this section are based on Windows 10 operation system.



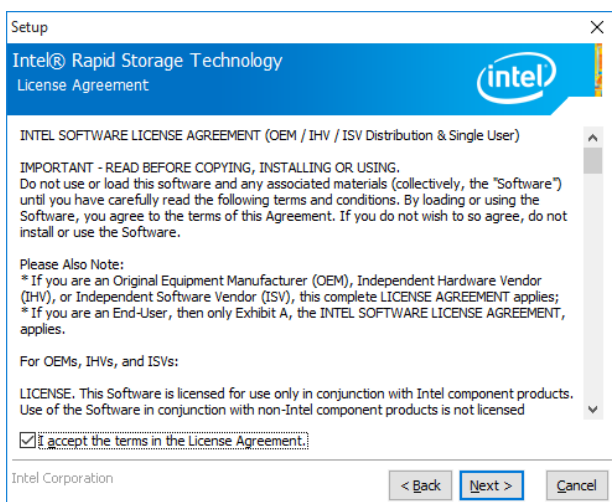
**Step 3. Click Next.**



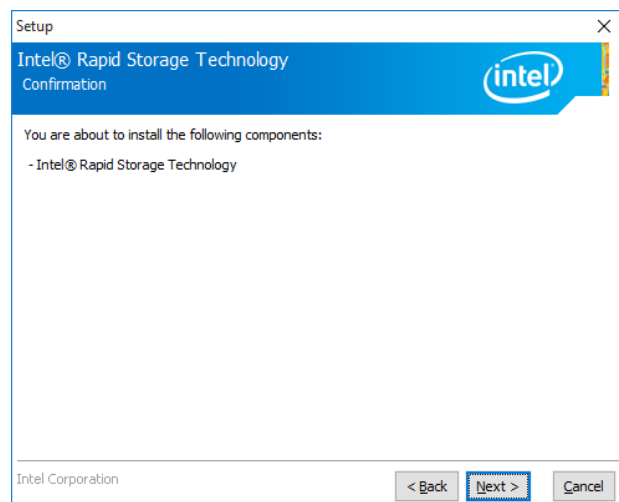
**Step 1. Click Next** to continue installation.



**Step 4. Click Next.**



**Step 2. Click Next.**



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

## EMX-Q170KP-B1 User's Manual

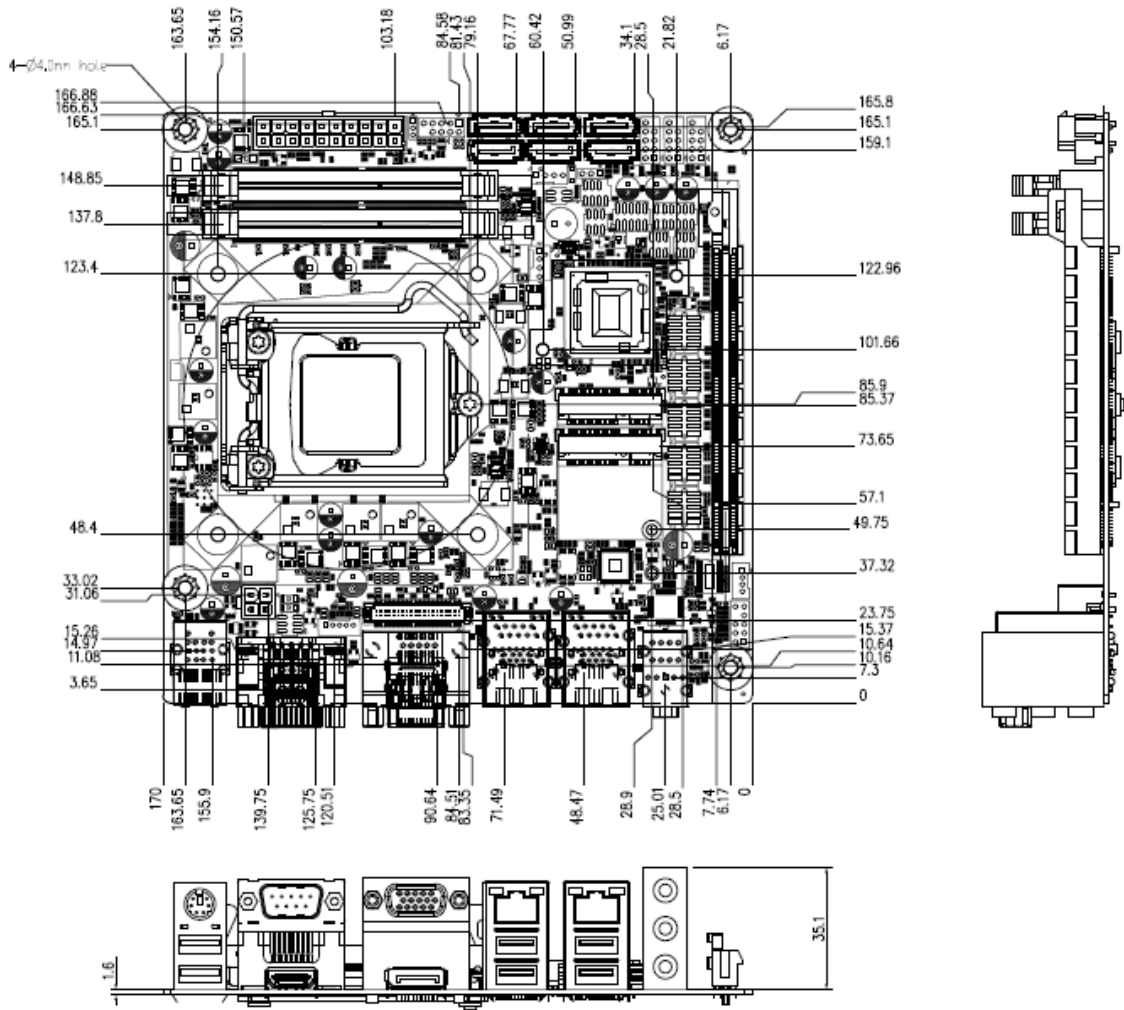


**Step 6.** Click **Finish** to complete setup.

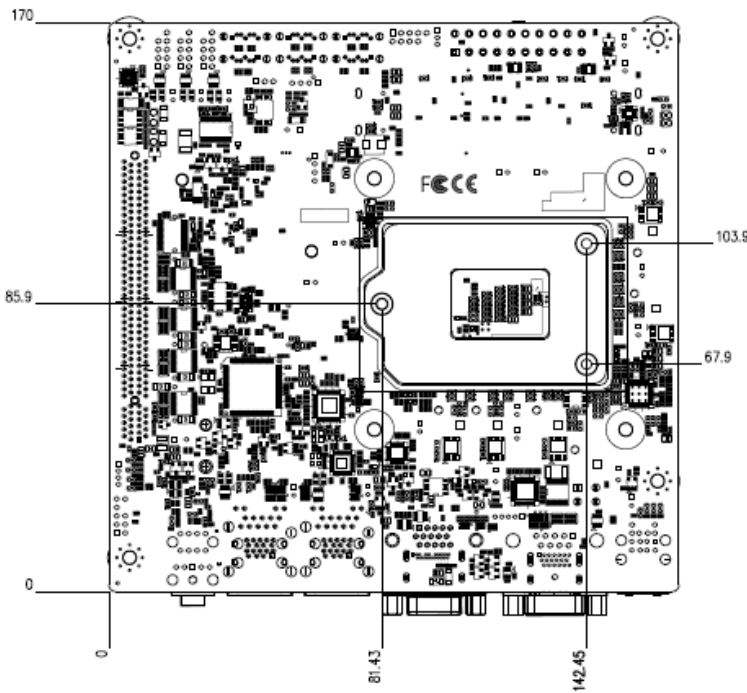
# 5. Mechanical Drawing



# EMX-Q170KP-B1 User's Manual



Unit: mm



Unit: mm

