ECM-TGU

11th Gen Intel® Tiger Lake U 3.5"Micro Module

User's Manual

4th Ed –27 July 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 UNDESIRED OPERATION.

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

THESE LIMITS ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINST HARMFUL INTERFERENCE WHEN THE EQUIPMENT IS OPERATED IN A COMMERCIAL ENVIRONMENT. THIS EQUIPMENT GENERATES, USES, AND CAN RADIATE RADIO FREQUENCY ENERGY AND, IF NOT 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

Trademark Acknowledgement

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Disclaimer

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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. We make no representation or warranty that such application will be suitable for the specified use without further testing or modification.

Life Support Policy

OUR PRODUCTS ARE NOT FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE PRIOR WRITTEN APPROVAL OF US.

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

Customer Services

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

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

Technical Support

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

Product Warranty

We warrant 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 us, or which have been subject to misuse, abuse, accident or improper installation. We assume no liability under the terms of this warranty as a consequence of such events. Because of our high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If any of 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, 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

ECM-TGU User's Manual

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 3.5" ECM-TGU Micro Module
- 1 x Serial ATA cable (7-pin, standard) 1 x Wire SATA power cable (15-pin, 4P/2.0mm) 1 x Flat Cable 9P(M)-PHD (10P/2.0mm)
- 1 x CPU Heatsink set
- 1 x M.2 Module bracket set

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

1.3 Document Amendment History

Revision	Date	By	Comment
1st	April 2022		Initial Release
2nd	June 2022		Update 2.3 Setting Jumpers & Connectors
3rd	July 2022		Update 2.3 Setting Jumpers & Connectors

1.4 Manual Objectives

This manual describes in details ECM-TGU 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 ECM-TGU 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 Tiger Lake U Gen 11th Intel® Core™ SoC i7/i5/i3 & Celeron®BGA Processor
BIOS	AMI uEFI BIOS, 256Mbit SPI Flash ROM
I/O Chip	iTE IT8528E
System Memory	One 260-pin DDR4 3200MHz SO-DIMM socket, supports up to 32GB Max (non ECC only.)
Watchdog Timer	H/W Reset, 1sec. – 65535sec./min.1sec. or 1min. step
H/W Status Monitor	CPU temperature monitoring Voltages monitoring CPU fan speed control
TPM	Onboard NuvoTon NPCT754AADYX support TPM 2.0
iAMT	Core i SKU CPU support iAMT Celeron SKU CPU no support iAMT
Expansion Slot	
M.2	1 x M.2 Key M support 2242 (with 1 x PCI-e Gen4 x4 signal), standard package with 60 to 42 bracket + screw set 1 x M.2 Key B 3042/2242 (with PCIe x1, SATA and USB2.0 signal, with 1 x SIM card slot) standard package with 52 to 42 bracket + screw set. Support 4G, no 5G (no USB3 signal). 1 x M.2 Key E 2230 support WiFi module (1 x PCI-e x 1 & USB 2.0 Signal)
Storage	
M.2	1 x M.2 Key M support 2242 (with 1 x PCI-e Gen4 x4 signal), standard package with 60 to 42 bracket + screw set 1 x M.2 Key B 3042/2242 (with PCIe x1, SATA and USB2.0 signal, with 1 x SIM card slot) standard package with 52 to 42 bracket + screw set
SATA	1 x SATA III
Edge I/O	
LAN	1 x Intel® I225LM/I225IT 2.5 Gigabit Ethernet 2 x Intel® I210AT/I210IT Gigabit Ethernet
USB 3.1	4 x USB 3.2 Gen 2 x1
DP	2x DP++
Audio	Support Line-out & Mic-in & audio by 2 in 1 Jack
DC Input	1 x 2 x 2 pin, pitch 4.20mm connector for power input connector
LED Indicator	Power LED /HDD LED at IO
Onboard I/O	

COM	COM 1 & COM2: - COM 1 & COM2 support RS232/422/485 connector, with / +5V & +12V Supported and RS422/485 by BIOS setting - 2 x 2 x 5 pin, pitch 2.00mm connector support RS-232/422/485 connector, Pin 9 with / +5V & +12V Supported - 2 x 2 x 3 pin, pitch 2.00mm connector, for RI/+5V/+12V Supported COM3 to 6: - 1 x 2 x 20 pin, pitch 2.00mm connector for COM3~6: support RS-232 connector
USB 2.0	2 x 2 x 5 pin, pitch 2.00mm connector (or pin header) for 4 USB 2.0
GPIO	1 x 2 x 6 pin, pitch 2.00mm connector for GPIO: 8 bits & +3.3S Level
SATA Power	1 x SATA Power, pitch 2.54mm connector
CPU/System FAN	1 x 1 x 4 pin, pitch 2.54mm CPU fan connector with smart fan function supported
Buzzer	1 x 1 x 2pin 2.0mm Wafer connector for Buzzer
Front Panel	1 x 2 x 5 pin, pitch 2.00mm connector for front panel
RTC Battery	1 x 2 Pin Pitch 1.25mm horizontal type battery connector (CR2032X Battery)
AT/ATX Selector	1 x 1 x 3 pin pitch 2.00mm connector for AT/ATX jumper
Clear CMOS	1 x 1 x 3 pin pitch 2.00mm connector
LVDS	1 x 2 x 20 pin, pitch 1.25mm connector for LVDS
LCD Inverter	1 x 1 x 5 pin, pitch 2.00mm Wafer connector for LCD inverter backlight (5V/12V)
eDP	1 x 1 x 40 pin, pitch 0.5mm IPEX connector for eDP
LPC	1 x 2 x 5 pin, pitch 1.27mm connector for LPC debug
BIOS SPI	1 x 2 x 5 pin, pitch 1.27mm connector for BIOS SPI
Audio	1 x 2 x 6 pin, pitch 2.00mm connector Support Line-out & Mic-in & audio by 2 in 1 Jack
Power Input Connector	Default: 1 x 2 x 2 pin, pitch 4.20mm connector for power input connector
Amp Connector	1 x 4 pin, pitch wafer 2.00mm connector for 3W x 2 Speaker
Display	
Graphic Chipset	Intel® Tiger Lake UP3 SoC Processor integrated Gen12 graphics
Spec. & Resolution	DP1+DP2 (DP1.4): Max: 7680 x 4320@60 Hz. Note: This resolution is actual test result, Intel spec: 2 x DP++ 1.4 : 4096 x 2304@60 Hz 1 x LVDS: 1920 x 1080 Dual channel 18/24-bits LVDS (Chrontel CH7511B eDP to LVDS) 1 x eDP 4096 x 2304@60 Hz
Multiple Display	Four Display 2 x DP++, 1 x 2CH LVDS, 1 x eDP
Audio	

Audio Codec	Tempo 92HD73C Audio Codec
Amplifier	ALC105 4Ω/3W per channel Amplifier
Ethernet	
LAN Chip	1 x Intel® I225LM/I225IT (Co-lay I225V) 2.5 Gigabit Ethernet 2 x Intel® I210AT/I2101T (Co-lay I211AT) Gigabit Ethernet
LAN Spec.	1 x 10/100/1000/2.5 Base-Tx GbE compatible 2 x 10/100/1000 Base-Tx GbE compatible
Mechanical & Environmental	
Power Requirement	DC in +12V ~ +24V
ACPI	Single power ATX Support S0,S3, S4, S5 ACPI 5.0 Compliant
Power Mode	AT / ATX mode Switchable Through Jumper
Operating Temp.	Intel® Wide Temperature CPU SKU Support: -20~60°C (-4~140°F) with 0.5m/s air flow Intel® None Wide Temperature CPU SKU support: 0~60°C (32~140°F) with 0.5m/s air flow
Storage Temp.	-40°C ~ +75°C
Operating Humidity	40°C @ 95% Relative Humidity, Non-condensing
Size (L x W)	5.7" x 4" (146mm x 101mm) (Please consult product engineers for the production feasibility if the size is larger than 410x360mm or smaller than 80x70mm)
Weight	0.40kg
Vibration Test	Package Vibration Test Reference IEC60068-2-64 Testing procedures Test Fh: Vibration broadband random Test 1. PSD: 0.026G²/Hz, 2.16 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 Random Vibration Operation Reference IEC60068-2-64 Testing procedures Test Fh : Vibration broadband random Test 1. PSD: 0.00454G²/Hz, 1.5 Grms 2. Operation mode

	3. Test Frequency : 5-500Hz
	4. Test Axis : X,Y and Z axis
	5. 30 minutes per each axis
	6. IEC 60068-2-64 Test:Fh
	<u>Random Vibration Non Operation</u>
	Reference IEC60068-2-64 Testing procedures
	Test Fh : Vibration broadband random Test
	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 minutes per each axis
	6. IEC 60068-2-64 Test:Fh
Drop Test	<u>Packing Drop</u> Reference ISTA 2A, Method : IEC-60068-2-32 Test: Ed Drop Test 1 One corner , three edges, six faces 2 ISTA 2A, IEC-60068-2-32 Test:Ed
OS Information	Win10 64bit, Linux

Note: Specifications are subject to change without notice.

User condition suggestion:

1. Tempo Semiconductor 92HD73C1T5 Audio Codec, MIC-IN OS default setting Microphone: 86 / Microphone Boost : +10%, different Microphone may have sound reception vary leading noise, customer can manually turn off boost.
2. It is required for 8K resolution by using 2 x DP simultaneously. Limitation: Black screen will be shown if close LVDS function in BIOS when using 2 x DP, with debug card code: Ad. User needs to connect one DP to OS, then connect the second DP.
3. When remove device M.2 KeyE (Intel® Wireless-AC 9560) from ECM-TGU motherboard, OS Device Manager will still show this on device item with exclamation mark「 ! 」(Code 10). It has to power off DC-In and reboot. (With system product, please request dedicated AE for OEM BIOS to enable, or customer can Enable from BIOS menu)
4. N_SIM1 and J_N_SIM1 can't be using at the same time, user can choose either one.

1.6 Architecture Overview—Block Diagram

The following block diagram shows the architecture and main components of ECM-TGU
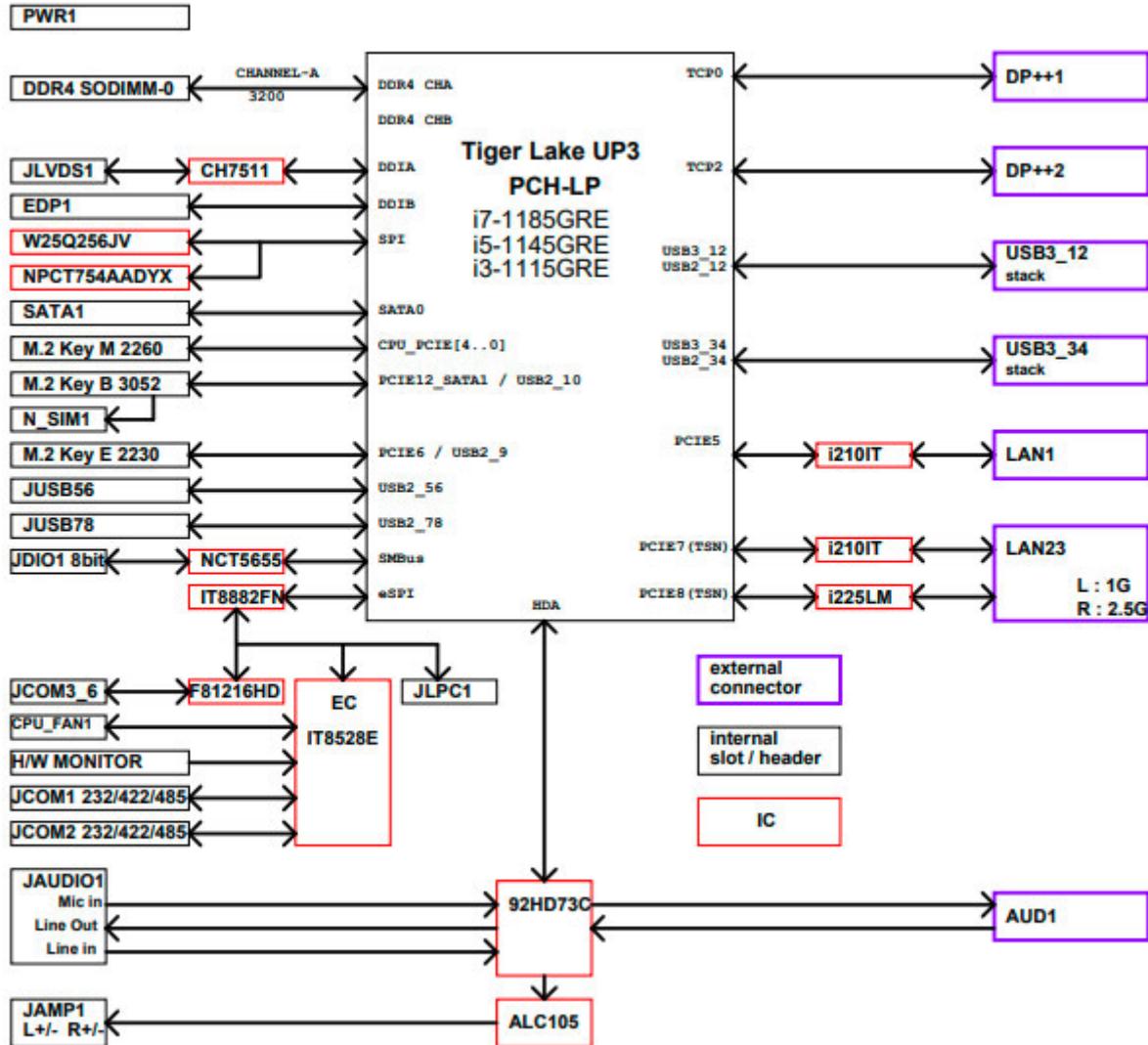
2. Hardware Configuration

2.1 Product Overview

Board layout (top side), with labels:

LED1, AUD1, USB34, USB12, DP2, DP1, NGFF_B_1, LAN1, N_SIM1, LAN23, NGFF_E_1, JRTC1, JAT1

JAUDIO1, JAMP1, JDIO1, JUSB56, JUSB78, JFP1, JCPU_FAN1

JBZ1, SO_DIMM1, JBAT1, NGFF_M_1, PWR1, SATA1, J_N_SIM1, JSATA_PWR1, JBKL1, JLVDS1, JBIOS_EC1

JCOM1, JRI1, JCOM2, JRI2, JCOM3_6, JLPC1

Board layout (bottom side):

EDP1
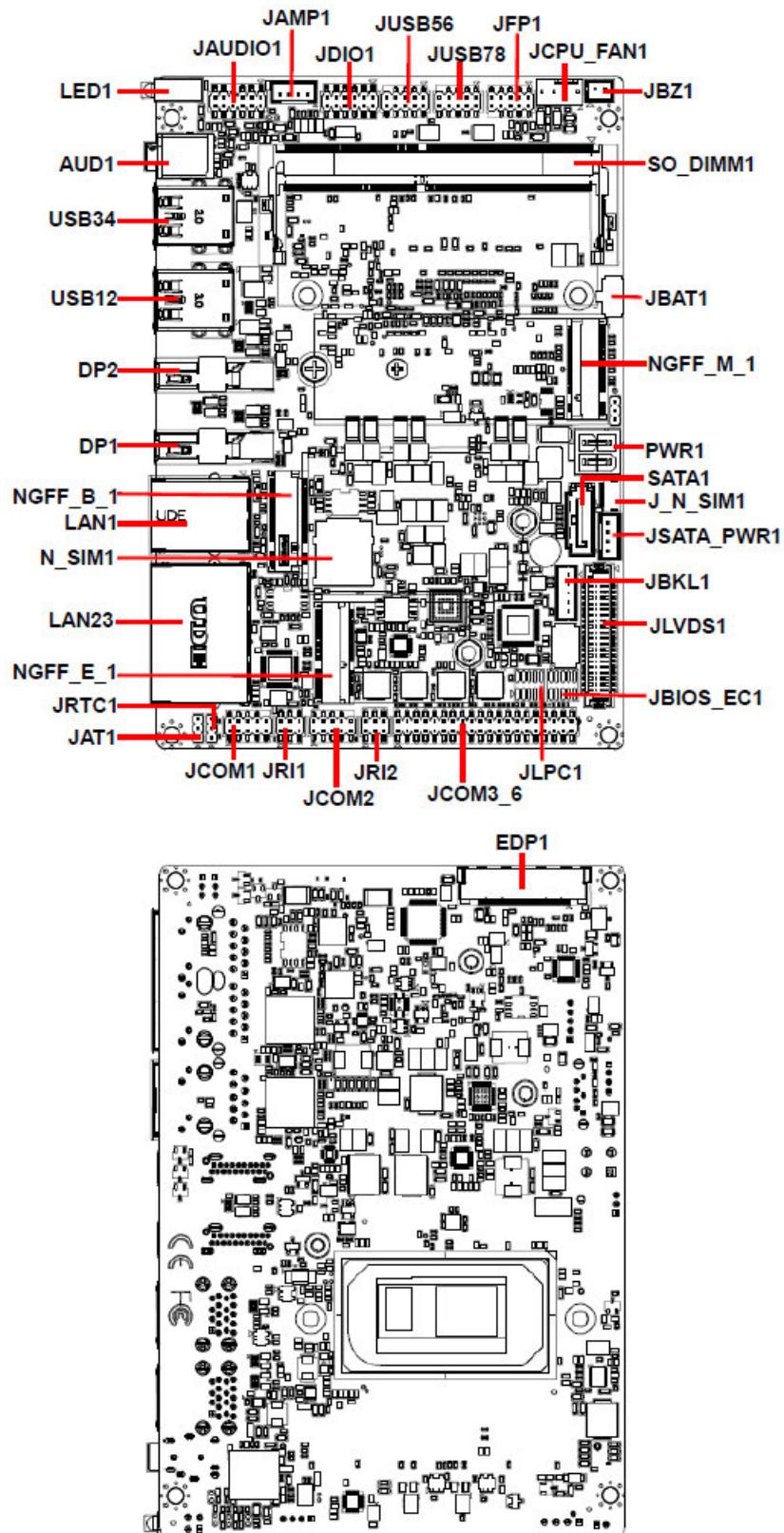
2.2 Jumper and Connector List

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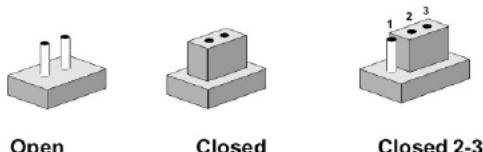
The jumper settings are schematically depicted in this manual as follows:

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
JAT1	AT/ATX Input power select	3 x 1 header, pitch 2.00mm
JRTC1	Clear CMOS	3 x 1 header, pitch 2.00mm

Connectors

Label	Function	Note
JBKL1	LCD inverter backlight connector	5 x 1 wafer, pitch 2.00mm Matching Connector: JST PHR-5
JCPU_FAN1	CPU fan connector	4 x 1 wafer, pitch 2.54mm
JCOM1	Serial Port 1 connector	5 x 2 header, pitch 2.00mm
JCOM2	Serial Port 2 connector	5 x 2 header, pitch 2.00mm

JCOM3_6	Serial Port 3-6 connector	20 x 2 header, pitch 2.00mm
JDIO1	General purpose I/O connector	6 x 2 wafer, pitch 2.00mm
NGFF_M_1	M.2 KEY-M 2260/2242 connector	
NGFF_E_1	M.2 KEY-E 2230 connector	
NGFF_B_1	M.2 KEY-B 3042/2242 connector	
LED1	HDD/Power LED indicator	
JLVDS1	LVDS connector	DIN 40-pin wafer, pitch 1.25mm Matching Connector: Hirose DF13-40DS-1.25C
JFP1	Front Panel connector	5 x 2 header, pitch 2.00mm
USB12/34	4 x USB3.2 connector	
JUSB56	USB2.0 connector	5 x 2 header, pitch 2.00mm
JUSB78	USB2.0 connector	5 x 2 header, pitch 2.00mm
JBZ1	PC Buzzer connector	2 x 1 wafer, pitch 2.00mm
LAN1/23	RJ-45 Ethernet 1/2/3	
JBAT1	Battery connector	2 x 1 wafer, pitch 1.25mm
JLPC1	LPC connector	5 x 2 header, pitch 1.27mm
PWR1	Power connector	2 x 2 wafer, pitch 4.20mm
JBIOS_EC1	BIOS SPI connector	5 x 2 header, pitch 1.27mm
JSATA_PWR1	SATA Power connector	4 x 1 wafer, pitch 2.00mm
SATA1	Serial ATA connector	
DP1/2	2 x DP connector	
SO_DIMM1	DDR4 SODIMM socket	
AUD1	Line-out & Mic-in audio jack	
JAUDIO1	Audio connector	6 x 2 header, pitch 2.00mm
N_SIM1	SIM card slot	
J_N_SIM1	SIM card slot	10 x 1 FPC, pitch 0.50 mm
JAMP1	Amp Connector	4 x 1 wafer, pitch 2.00mm
EDP1	EDP connector	40 x 1 wafer, pitch 0.50mm

2.3 Setting Jumpers & Connectors

2.3.1   Serial port 1/2 pin9 signal select (JRI1/2)

JRI1   JRI2

Ring*

+5V

+12V
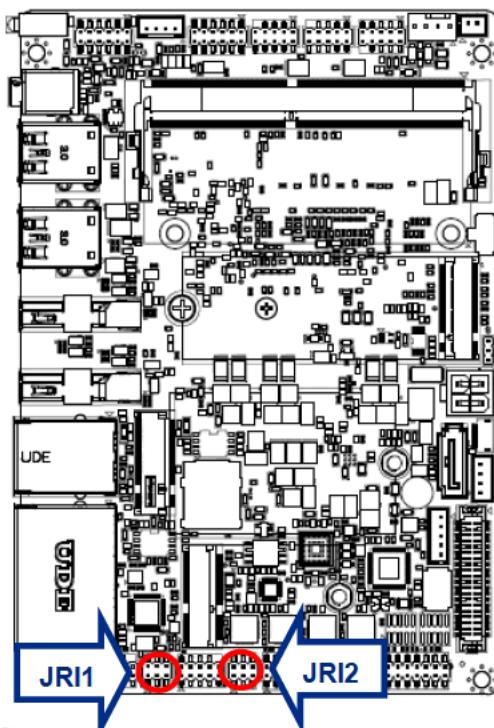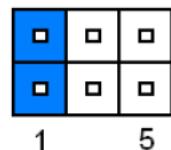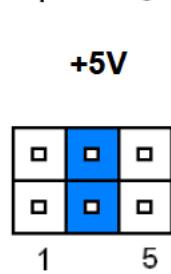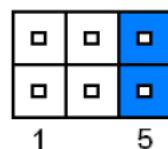
* Default

2.3.2   Clear CMOS (JRTC1)

Normal*

3

1

Clear CMOS

3

1
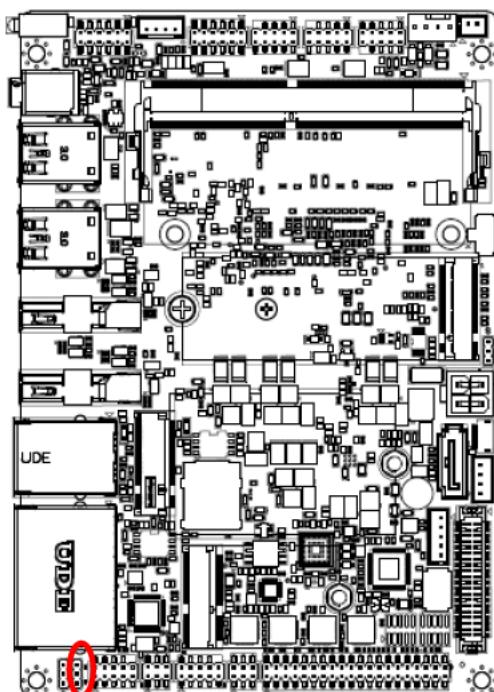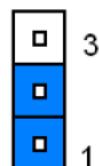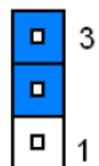
* Default

2.3.3 AT/ATX Input power select (JAT1)
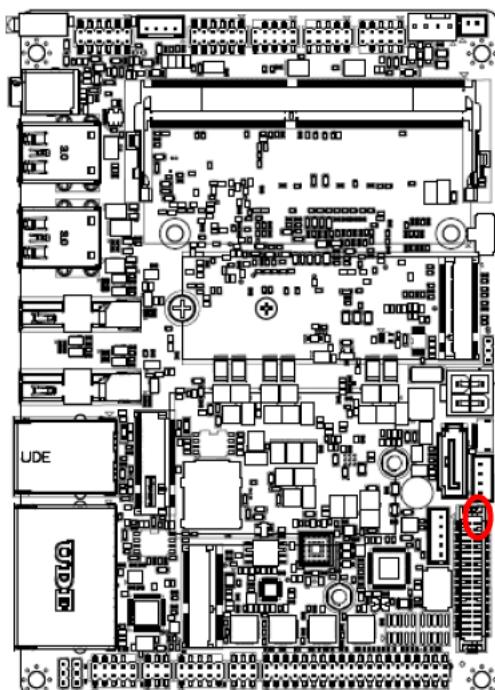
AT*
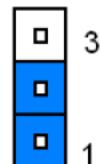
ATX
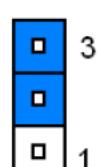
* Default

2.3.4 LCD inverter connector (JBKL1)
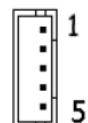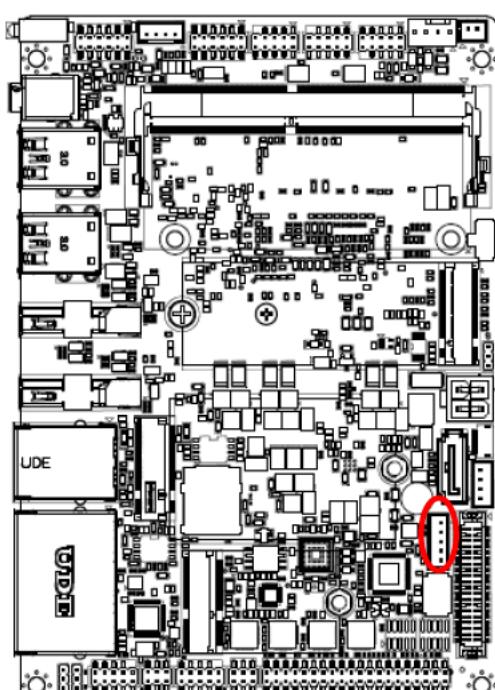
Signal	PIN
+12V	1
GND	2
BKLEN	3
VBRIGHT	4
+5V	5

2.3.5 Serial port 1 connector (JCOM1)
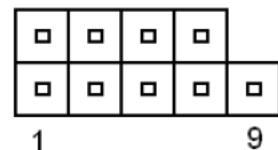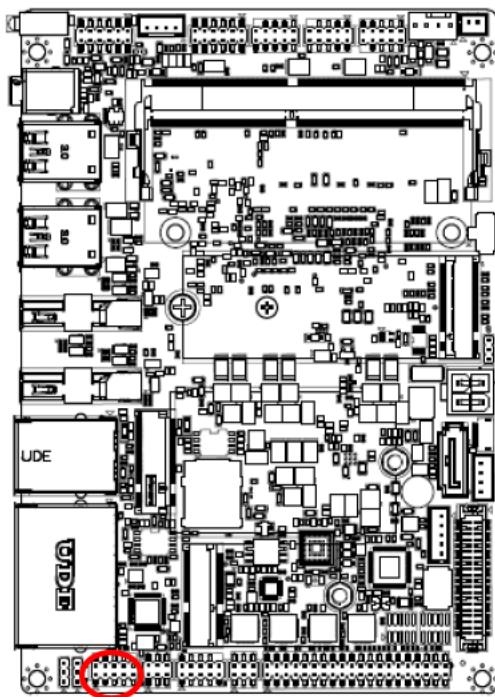
Signal	PIN	PIN	Signal
COM_DCD#_TXN_1	1	2	COM_RXD_TXP_1
COM_TXD_RXP_1	3	4	COM_DTR#_RXN_1
GND	5	6	COM_DSR#_1
COM_RTS#_1	7	8	COM_CTS#_1
+V12S_COM_RI#_1	9		

2.3.6 Serial port 2 connector (JCOM2)
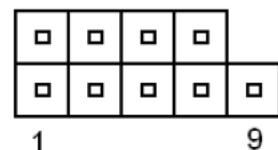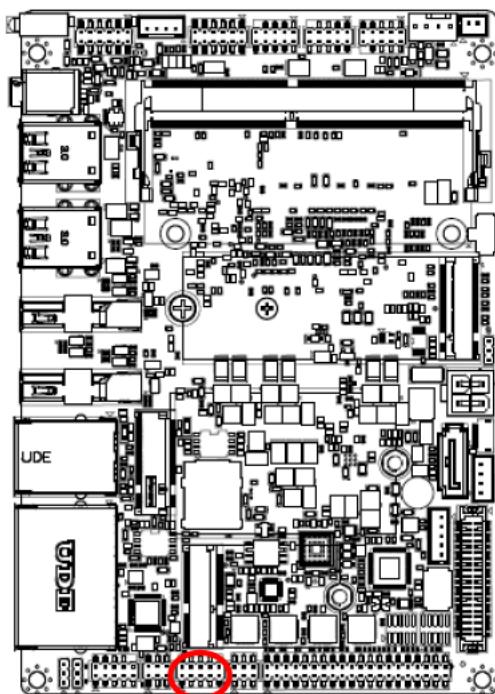
Signal	PIN	PIN	Signal
COM_DCD#_TXN_2	1	2	COM_RXD_TXP_2
COM_TXD_RXP_2	3	4	COM_DTR#_RXN_2
GND	5	6	COM_DSR#_2
COM_RTS#_2	7	8	COM_CTS#_2
+V12S_COM_RI#_2	9		

2.3.7 Serial port 3-6 connector (JCOM3_6)
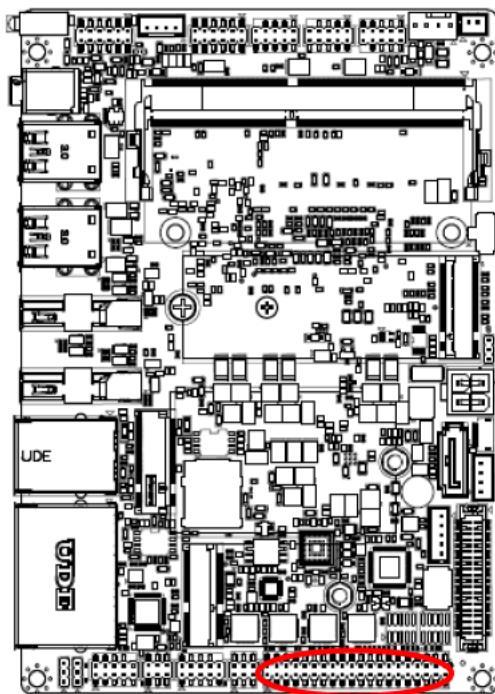
Signal	PIN	PIN	Signal
COM_DCD#_3	1	2	COM_RXD_3
COM_TXD_3	3	4	COM_DTR#_3
GND	5	6	COM_DSR#_3
COM_RTS#_3	7	8	COM_CTS#_3
COM_RI#_3	9	10	NC
COM_DCD#_4	11	12	COM_RXD_4
COM_TXD_4	13	14	COM_DTR#_4
GND	15	16	COM_DSR#_4
COM_RTS#_4	17	18	COM_CTS#_4
COM_RI#_4	19	20	NC
COM_DCD#_5	21	22	COM_RXD_5
COM_TXD_5	23	24	COM_DTR#_5
GND	25	26	COM_DSR#_5
COM_RTS#_5	27	28	COM_CTS#_5
COM_RI#_5	29	30	NC
COM_DCD#_6	31	32	COM_RXD_6
COM_TXD_6	33	34	COM_DTR#_6
GND	35	36	COM_DSR#_6
COM_RTS#_6	37	38	COM_CTS#_6
COM_RI#_6	39	40	NC
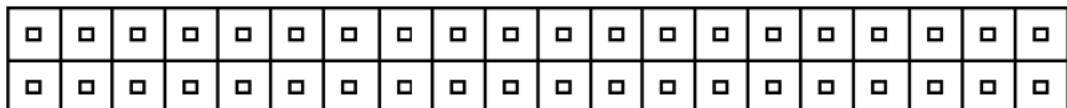
1   39

2.3.8   CPU fan connector (JCPU_FAN1)
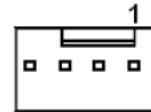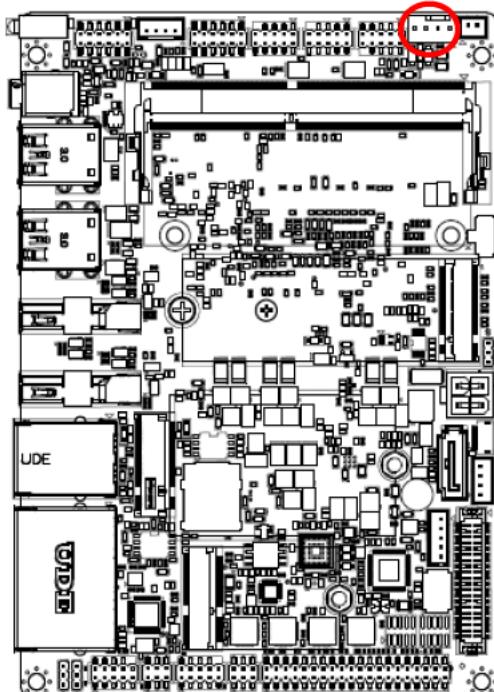
Signal	PIN
GND	1
+12V	2
CPUFAN_IN	3
CPUFAN_OUT	4

2.3.9   General purpose I/O connector (JDIO1)
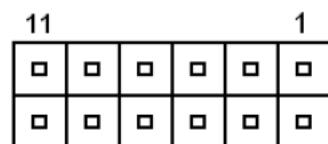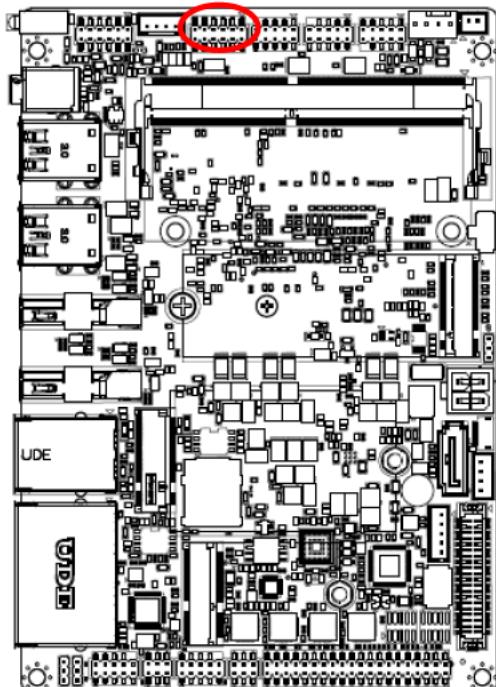
Signal	PIN	PIN	Signal
DIO_GP20	1	2	DIO_GP10
DIO_GP21	3	4	DIO_GP11
DIO_GP22	5	6	DIO_GP12
DIO_GP23	7	8	DIO_GP13
SMB_SCL_S0	9	10	SMB_SDA_S0
GND	11	12	+5V

2.3.10 SATA Power connector (JSATA_PWR1)
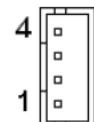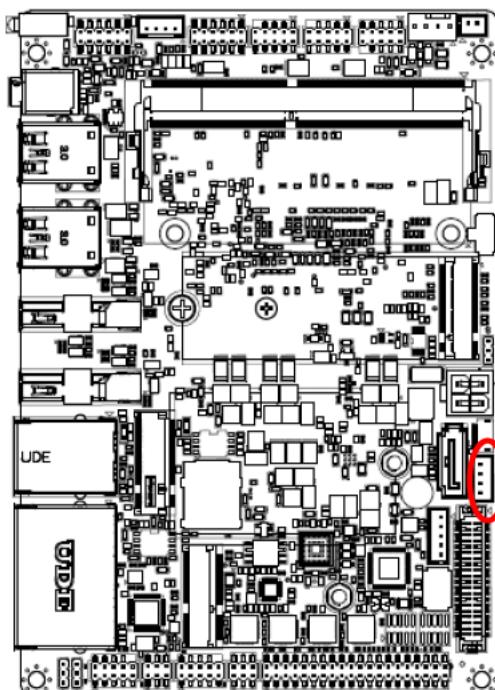
Signal	PIN
+12V	4
GND	3
GND	2
+5V	1

2.3.11 Power connector (PWR1)
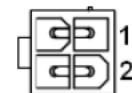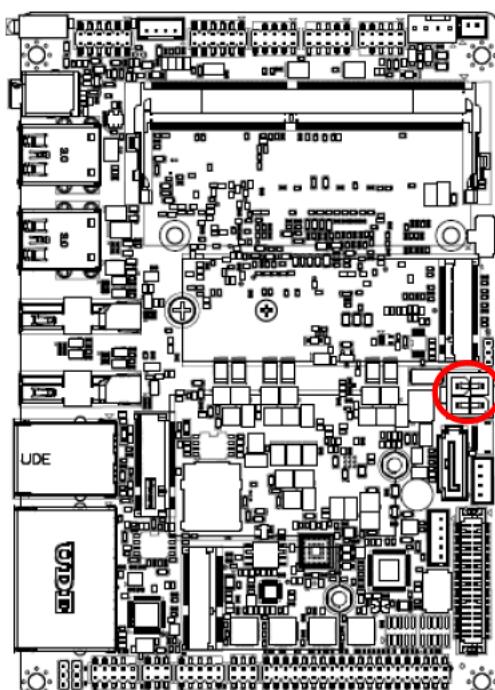
Signal	PIN	PIN	Signal
+24V	3	1	GND
+24V	4	2	GND

2.3.12　LVDS connector (JLVDS1)
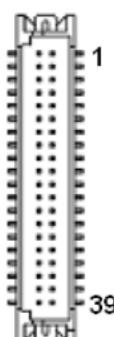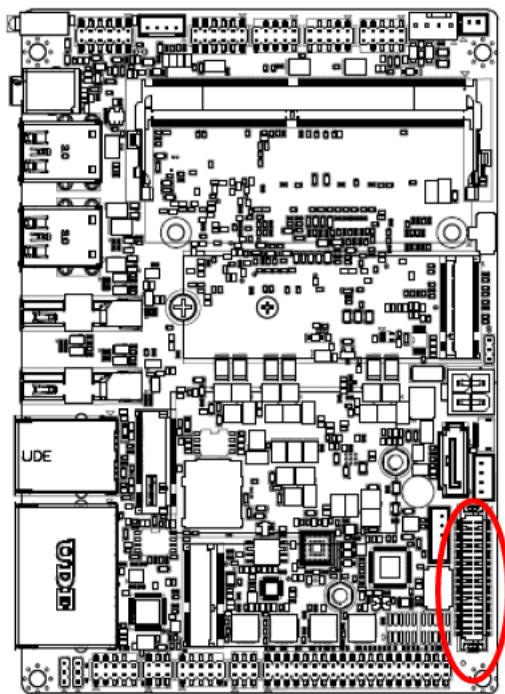
Signal	PIN	PIN	Signal
+3.3V	1	2	+5V
+3.3V	3	4	+5V
+3.3V	5	6	+5V
GND	7	8	GND
LVDS_A_DATA_P_1	9	10	LVDS_A_DATA_P_0
LVDS_A_DATA_N_1	11	12	LVDS_A_DATA_N_0
GND	13	14	GND
LVDS_A_DATA_P_3	15	16	LVDS_A_DATA_P_2
LVDS_A_DATA_N_3	17	18	LVDS_A_DATA_N_2
GND	19	20	GND
LVDS_B_DATA_P_1	21	22	LVDS_B_DATA_P_0
LVDS_B_DATA_N_1	23	24	LVDS_B_DATA_N_0
GND	25	26	GND
LVDS_B_DATA_P_3	27	28	LVDS_B_DATA_P_2
LVDS_B_DATA_N_3	29	30	LVDS_B_DATA_N_2
GND	31	32	GND
LVDS_B_CLK_P	33	34	LVDS_A_CLK_P
LVDS_B_CLK_N	35	36	LVDS_A_CLK_N
GND	37	38	GND
+12V	39	40	+12V

2.3.13   USB2.0 connector (JUSB56)
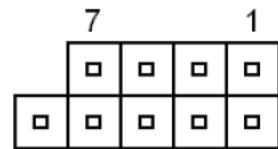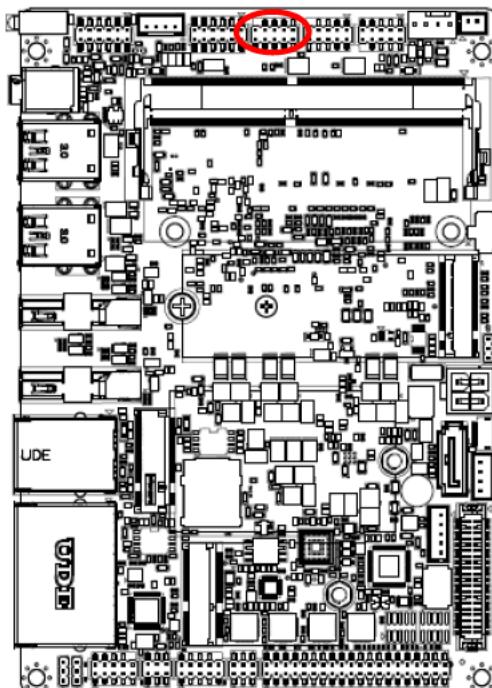
Signal	PIN	PIN	Signal
+5VSB	1	2	+5VSB
USB_R_DN5	3	4	USB_R_DN6
USB_R_DP5	5	6	USB_R_DP6
GND	7	8	GND
		10	GND

2.3.14   USB2.0 connector (JUSB78)
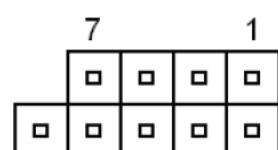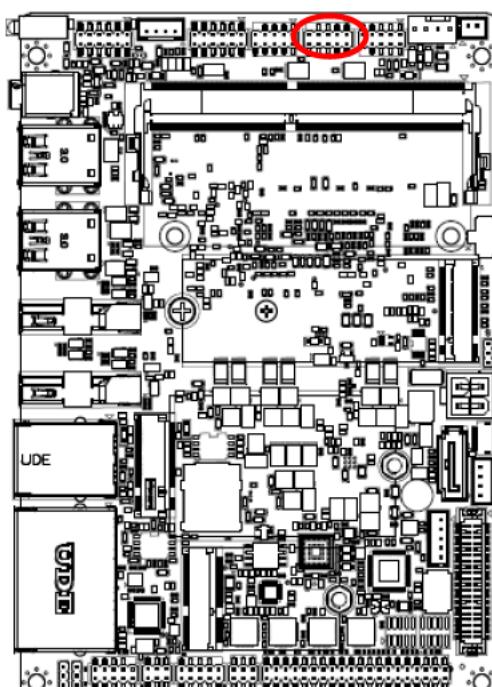
Signal	PIN	PIN	Signal
+5VSB	1	2	+5VSB
USB_R_DN7	3	4	USB_R_DN8
USB_R_DP7	5	6	USB_R_DP8
GND	7	8	GND
		10	GND

2.3.15 Battery connector (JBAT1)
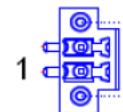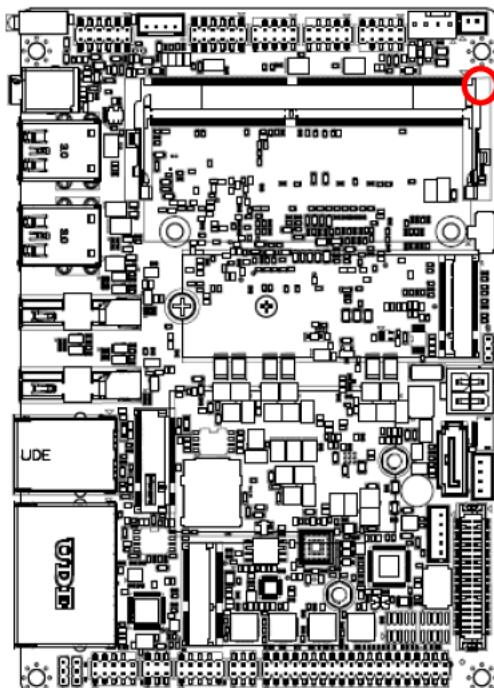
Signal	PIN
GND	2
+RTCBAT	1

2.3.16 LPC connector (JLPC1)
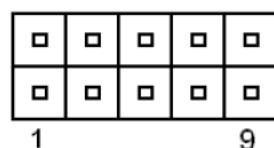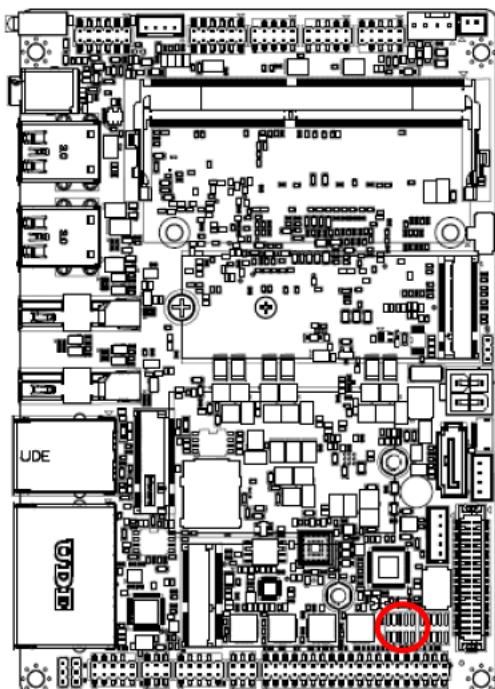
Signal	PIN	PIN	Signal
LPC_AD0	1	2	+3.3V
LPC_AD1	3	4	RST_TPM#
LPC_AD2	5	6	LPC_LFRAME#
LPC_AD3	7	8	CLK_24M_80
LPC_SERIRQ	9	10	GND

2.3.17 Front Panel connector (JFP1)
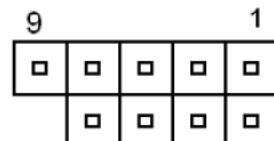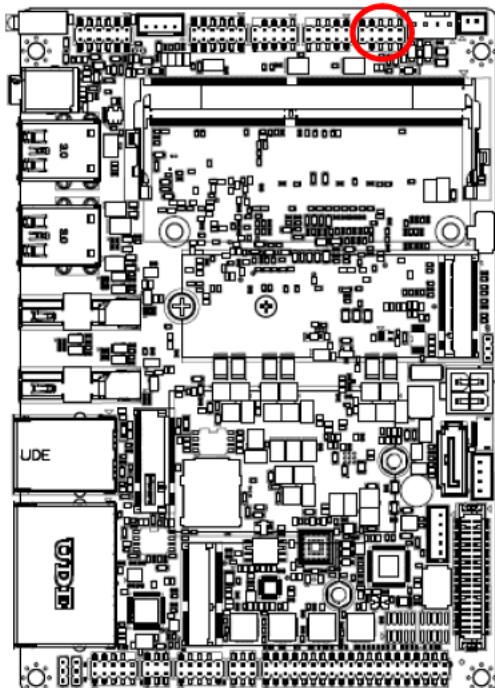
Signal	PIN	PIN	Signal
HDD_LED_P	1	2	PWR_LED_P
HDD_LED#	3	4	PWR_LED#
PM_SYSRST#	5	6	PWRBTN_IN#
GND	7	8	GND
NC	9		

2.3.18 PC Buzzer connector (JBZ1)
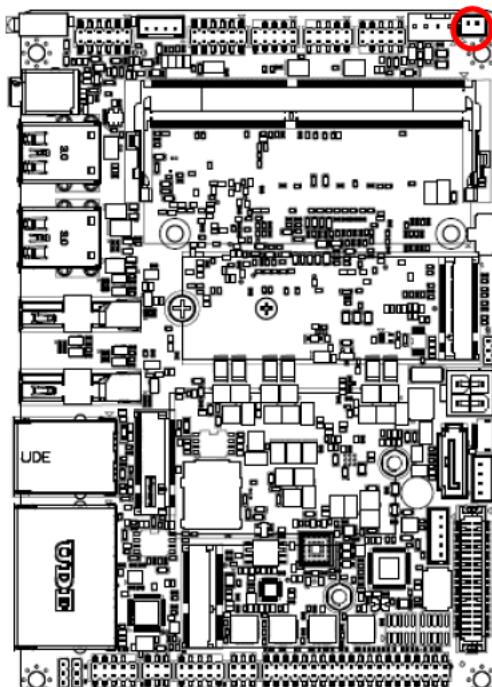
Signal	PIN
SOC_SPKR_R	1
+5V	2

2.3.19 AMP connector (JAMP1)
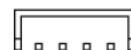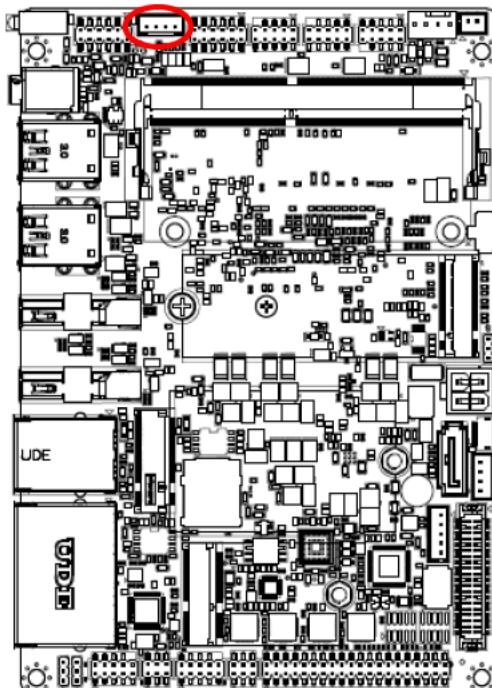
Signal	PIN
AMP_LOUT+	1
AMP_LOUT-	2
AMP_ROUT+	3
AMP_ROUT-	4

2.3.20 BIOS SPI connector (JBIOS_EC1)
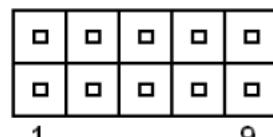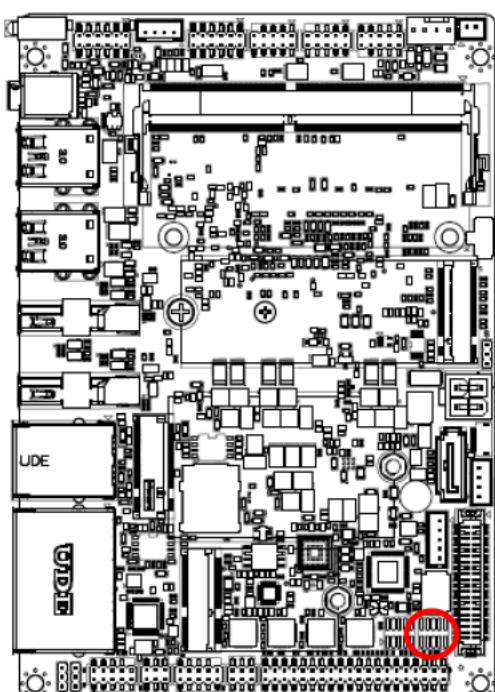
Signal	PIN	PIN	Signal
+V3.3A_SPI	1	2	GND
SPI_CS0#_ROM	3	4	SPI_CLK_ROM
SPI_MISO_ROM	5	6	SPI_MOSI_ROM
SPI_HOLD#_ROM	7	8	SPI_WP#_ROM
EC_SMCLK_DEBUG	9	10	EC_SMDAT_DEBUG

2.3.21   Audio connector (JAUDIO1)
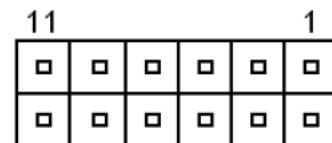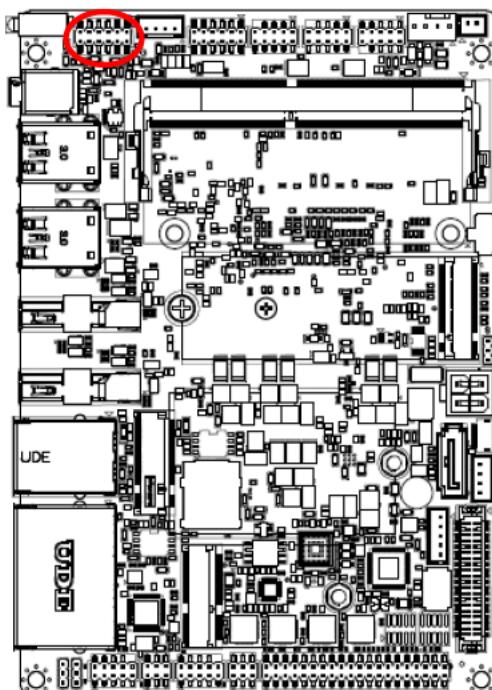
Signal	PIN	PIN	Signal
FRONT-R-OUT	1	2	FRONT-L-OUT
HD_AGND	3	4	HD_AGND
LINE1-R-IN	5	6	LINE1-L-IN
MIC1-R-IN	7	8	MIC1-L-IN
FRONT-JD	9	10	LINE1-JD
MIC1-JD	11	12	HD_AGND

2.3.21.1 Signal Description – Audio connector (JAUDIO1)

Signal	Signal Description
LINE1-JD	AUDIO IN (LINE_RIN/LIN)sense pin
FRONT-JD	AUDIO Out(ROUT/LOUT) sense pin
MIC1-JD	MIC IN (MIC_RIN/LIN) sense pin

2.3.22 SIM card slot (J_N_SIM1)
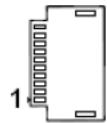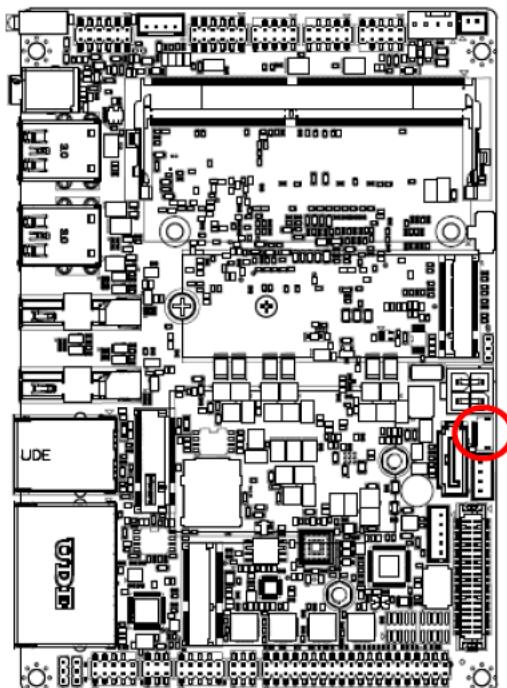
Signal	PIN
NC	10
N_SIM_CD_R	9
GND	8
UIM_DATA_R	7
UIM_CLK_R	6
GND	5
+VPP_SIM_1	4
UIM_RESET#	3
GND	2
+VCC_SIM	1

2.3.23   EDP connector (EDP1)
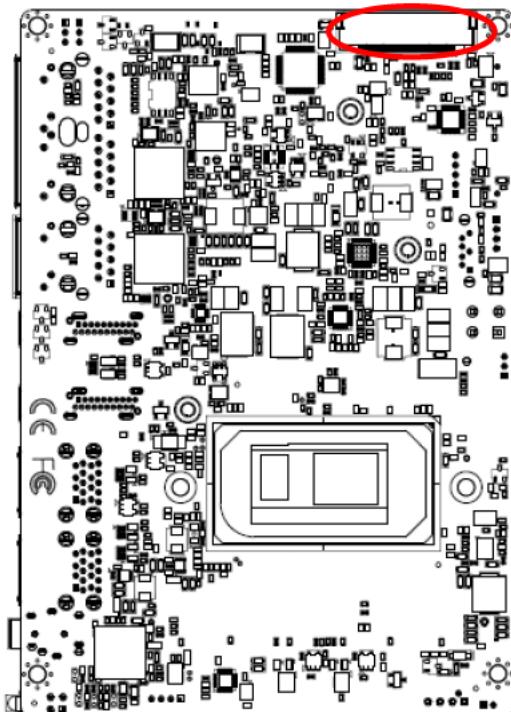
Signal	PIN
GND	11
eDP_TXN_0	12
eDP_TXP_0	13
GND	14
eDP_AUX_P	15
eDP_AUX_N	16
GND	17
+3.3V	18
+3.3V	19
+3.3V	20
+3.3V	21
NC	22
GND	23
GND	24
GND	25
GND	26
eDP_HPD_R	27
GND	28
GND	29
GND	30
GND	31
eDP_BKLTEN_R	32
eDP_VBRIGHT	33
eDP_CTRL_CLK	34
eDP_CTRL_DATA	35
+12V	36
+12V	37
+12V	38
+12V	39
NC	40

Signal	PIN
NC	1
GND	2
eDP_TXN_3	3
eDP_TXP_3	4
GND	5
eDP_TXN_2	6
eDP_TXP_2	7
GND	8
eDP_TXN_1	9
eDP_TXP_1	10

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

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

Press <ESC> or <Del> to enter SETUP

If the message disappears before you respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys.

3.3 Using Setup

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

Button	Description
↑	Move to previous item
↓	Move to next item
←	Move to the item in the left hand
→	Move to the item in the right hand
Esc key	Main Menu -- Quit and not save changes into NVRAM Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
+ key	Increase the numeric value or make changes
- key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
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 <Enter> key again.

3.5 In Case of Problems

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

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

3.6 BIOS setup

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

3.6.1 Main Menu

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

```
                          Aptio Setup - AMI
 Main Advanced Chipset Security Boot Save & Exit
 ─────────────────────────────────────────────────────────────────
 BIOS Information                                Choose the system default
 BIOS Vendor               American Megatrends   language
 Core Version              5.19
 Compliancy                UEFI 2.7; PI 1.6
 Project Version           1AXRR 0.14 x64
 Build Date and Time       04/28/2022 10:30:28
 Access Level              Administrator
 EC 8528 Firmware          07
 BIOS Name                 ECMTGUOD

 System Language           [English]
 ▶ Intel RC Version

 System Date               [Mon 05/09/2022]      →←: Select Screen
 System Time               [15:08:09]            ↑↓: Select Item
                                                 Enter: Select
                                                 +/-: Change Opt.
                                                 F1: General Help
                                                 F2: Previous Values
                                                 F3: Optimized Defaults
                                                 F4: Save & Exit
                                                 ESC: Exit

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```

```
                          Aptio Setup - AMI
 Main
 ─────────────────────────────────────────────────────────────────
 Intel RC Version

 Board Information
 Board Name                ECM-TGU(ECMTGUOD)

 Processor Information
 Name                      TigerLake ULT
 Type                      11th Gen Intel(R)
                           Core(TM) i7-1185G7E @
                           2.80GHz
 Speed                     2800 MHz
 ID                        0x806C1
 Stepping                  B0
 Package                   Not Implemented Yet   →←: Select Screen
 Number of Processors      4Core(s) / 8Thread(s) ↑↓: Select Item
 Microcode Revision        9A                    Enter: Select
 GT Info                   0x9A49                +/-: Change Opt.
                                                 F1: General Help
 IGFX GOP Version          17.0.1070             F2: Previous Values
 PCIe GEN4 Dekel FW Version 0.0                  F3: Optimized Defaults
 Memory RC Version         2.0.2.8               F4: Save & Exit
 Total Memory               4096 MB              ESC: Exit
 Memory Speed               2667 MT/s

 PCH Information

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```

3.6.1.1 System Language

This option allows choosing the system default language.

3.6.1.2 System Date

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

3.6.1.3 System Time

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

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

3.6.2 Advanced Menu

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

```
                          Aptio Setup – AMI
       Main  Advanced  Chipset  Security  Boot  Save & Exit

   ▶ Connectivity Configuration              Configure Connectivity related
   ▶ CPU Configuration                       options
   ▶ Power & Performance
   ▶ PCH-FW Configuration
   ▶ Trusted Computing
   ▶ ACPI Settings
   ▶ Super IO Configuration
   ▶ EC 8528 HW monitor
   ▶ S5 RTC Wake Settings
   ▶ Serial Port Console Redirection
   ▶ USB Configuration
   ▶ Network Stack Configuration
   ▶ NVMe Configuration
                                             ➔←: Select Screen
                                             ↑↓: Select Item
                                             Enter: Select
                                             +/-: Change Opt.
                                             F1: General Help
                                             F2: Previous Values
                                             F3: Optimized Defaults
                                             F4: Save & Exit
                                             ESC: Exit



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```

3.6.2.1 Connectivity Configuration

Item	Options	Description
CNVi Mode	Disable Integrated Auto Detection**[Default]**	This option configures Connectivity. [Auto Detection] means that if Discrete solution is discovered it will be enabled by default. Otherwise Integrated solution (CNVi) will be enabled; [Disable Integrated] disables Integrated Solution. NOTE: When CNVi is present, the GPIO pins that are used for radio.

3.6.2.2 CPU Configuration

Use the CPU configuration menu to view detailed CPU specification and configure the CPU.
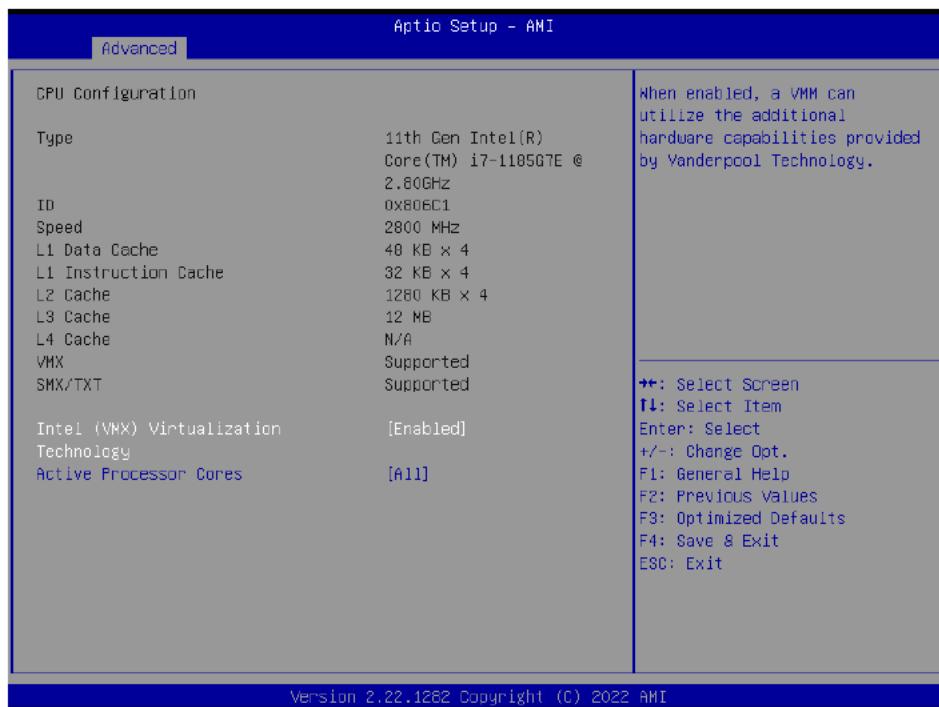
Item	Options	Description
Intel (VMX) Virtualization Technology	Disabled Enabled**[Default]**	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.
Active Processor Cores	All**[Default]** 1 2 3 4 5 6 7 8	Number of cores to enable in each processor package.

3.6.2.3 Power & Performance
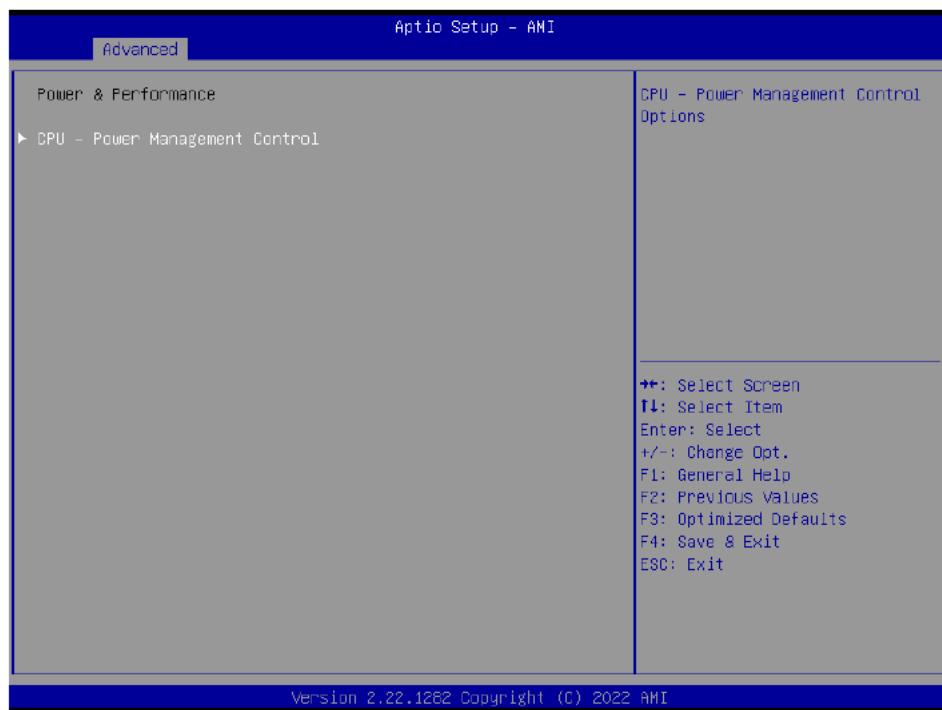
3.6.2.3.1 CPU – Power Management Control
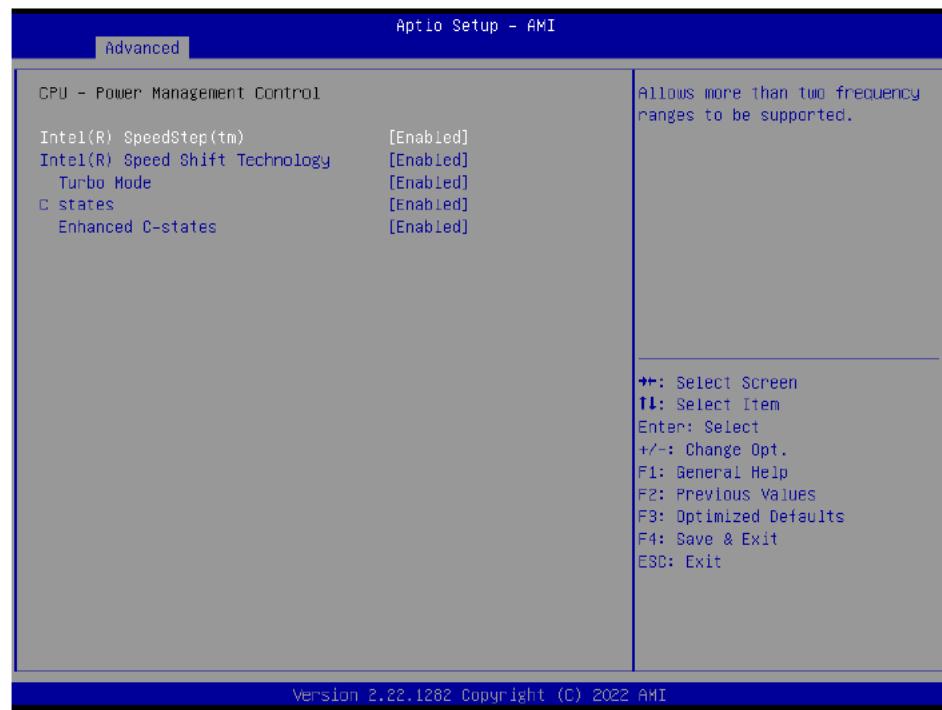
Item	Option	Description
Intel® SpeedStep™	Enabled**[Default]**, Disabled	Allows more than two frequency ranges to be supported.
Intel® Speed Shift Technology	Enabled**[Default]**, Disabled	Eanble/Disable Intel® Speed Shift Technology support. Enabling will expose the CPPC v2 interface to allow for hardware controlled P-states.

Turbo Mode	Enabled**[Default]**, Disabled	Enable/Disable processor Turbo Mode (requires Intel Speed Step or Intel Speed Shift to be available and enabled).
C States	Enabled**[Default]**, Disabled	Enable/Disable CPU Power Management.
Enhanced C-States	Enabled**[Default]**, Disabled	Enable/Disable C1E. When enabled, CPU will switch to minimum speed when all cores enter C-State.

3.6.2.4   PCH-FW Configuration

```
                              Aptio Setup – AMI
        Advanced

    ME Firmware Version         15.0.35.1951         Configure Management Engine
    ME Firmware Mode            Normal Mode          Technology Parameters
    ME Firmware SKU             Corporate SKU
    ME Firmware Status 1        0x90000255
    ME Firmware Status 2        0x3B858106

    ME State                    [Enabled]

  ▶ Firmware Update Configuration


                                                     →←: Select Screen
                                                     ↑↓: Select Item
                                                     Enter: Select
                                                     +/-: Change Opt.
                                                     F1: General Help
                                                     F2: Previous Values
                                                     F3: Optimized Defaults
                                                     F4: Save & Exit
                                                     ESC: Exit




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```

3.6.2.4.1 Firmware Update Configuration

```
                              Aptio Setup – AMI
        Advanced

    Me FW Image Re-Flash              [Disabled]     Enable/Disable Me FW Image
                                                     Re-Flash function.








                                                     →←: Select Screen
                                                     ↑↓: Select Item
                                                     Enter: Select
                                                     +/-: Change Opt.
                                                     F1: General Help
                                                     F2: Previous Values
                                                     F3: Optimized Defaults
                                                     F4: Save & Exit
                                                     ESC: Exit




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```

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

3.6.2.5 Trusted Computing
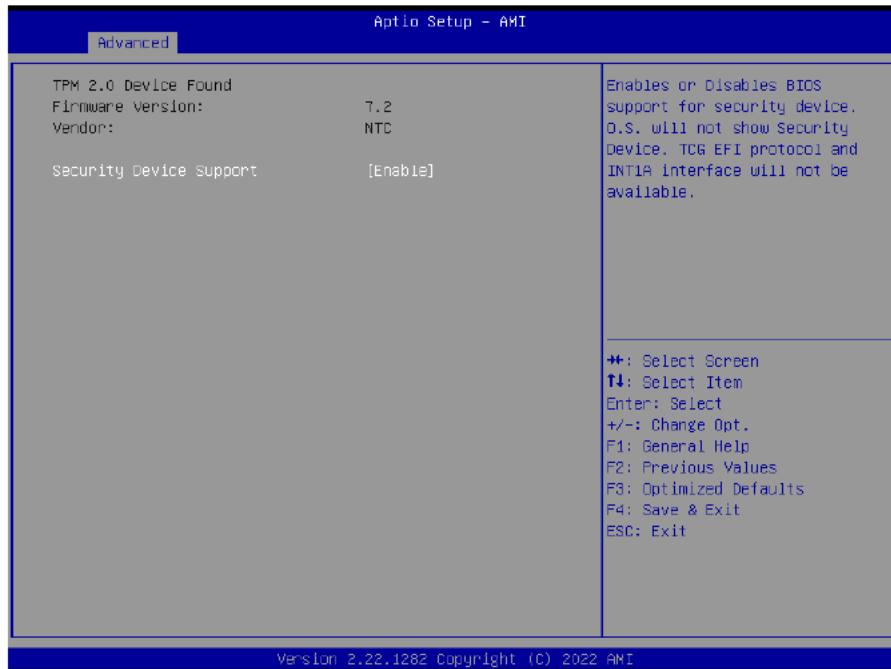
Item	Options	Description
Security Device Support	Disable, Enable**[Default]**	Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

3.6.2.6 APCI Settings

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

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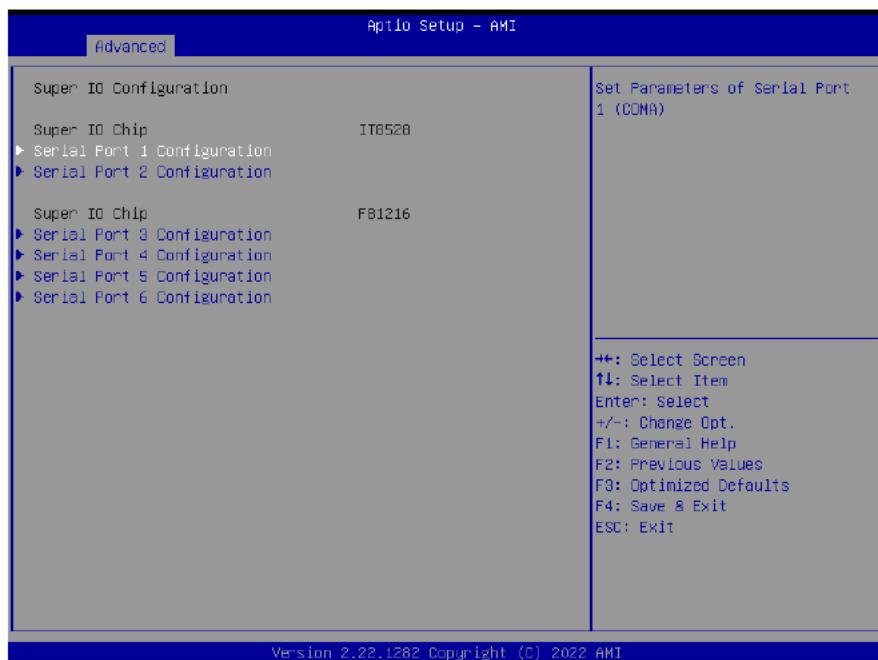
Item	Description
Serial Port 1 Configuration	Set Parameters of Serial Port 1 (COMA).
Serial Port 2 Configuration	Set Parameters of Serial Port 2 (COMB).
Serial Port 3 Configuration	Set Parameters of Serial Port 3 (COMC).
Serial Port 4 Configuration	Set Parameters of Serial Port 4 (COMD).
Serial Port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

3.6.2.7.1 Serial Port 1 Configuration
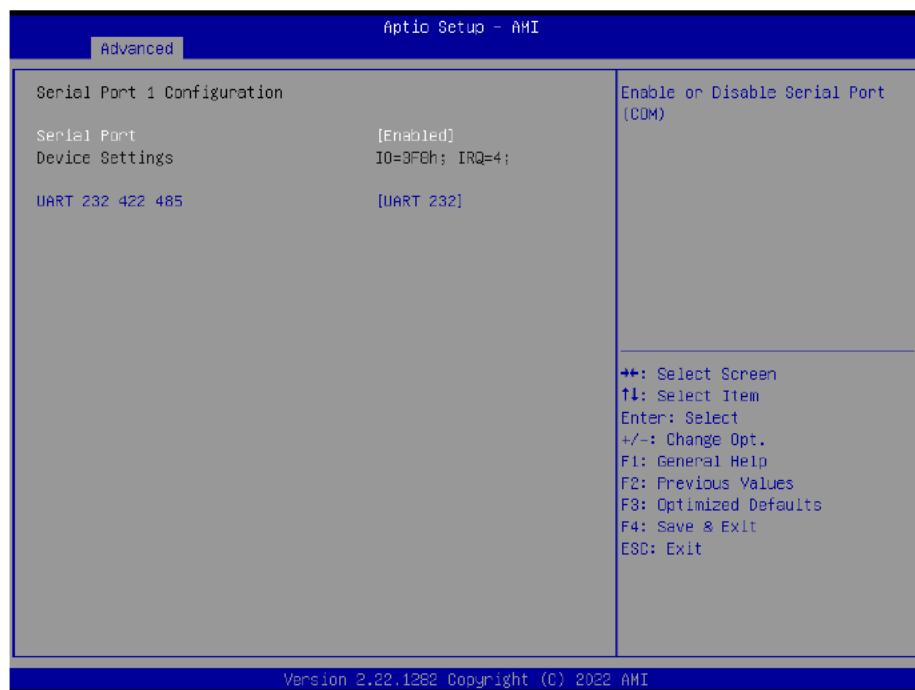
```
                          Aptio Setup - AMI
       Advanced

   Serial Port 1 Configuration                        Enable or Disable Serial Port
                                                       (COM)
   Serial Port                        [Enabled]
   Device Settings                    IO=3F8h; IRQ=4;

   UART 232 422 485                   [UART 232]

                                                       �→←: Select Screen
                                                       ↑↓: Select Item
                                                       Enter: Select
                                                       +/-: Change Opt.
                                                       F1: General Help
                                                       F2: Previous Values
                                                       F3: Optimized Defaults
                                                       F4: Save & Exit
                                                       ESC: Exit

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```

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

3.6.2.7.2 Serial Port 2 Configuration
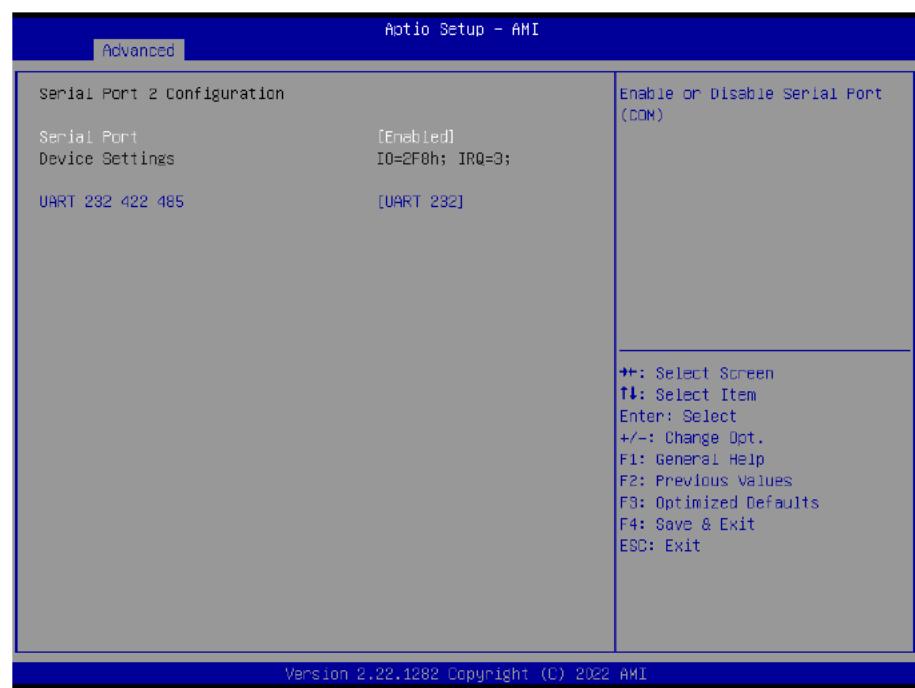
```
                          Aptio Setup - AMI
       Advanced

   Serial Port 2 Configuration                        Enable or Disable Serial Port
                                                       (COM)
   Serial Port                        [Enabled]
   Device Settings                    IO=2F8h; IRQ=3;

   UART 232 422 485                   [UART 232]

                                                       �→ ←: Select Screen
                                                       ↑↓: Select Item
                                                       Enter: Select
                                                       +/-: Change Opt.
                                                       F1: General Help
                                                       F2: Previous Values
                                                       F3: Optimized Defaults
                                                       F4: Save & Exit
                                                       ESC: Exit

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```

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

3.6.2.7.3 Serial Port 3 Configuration
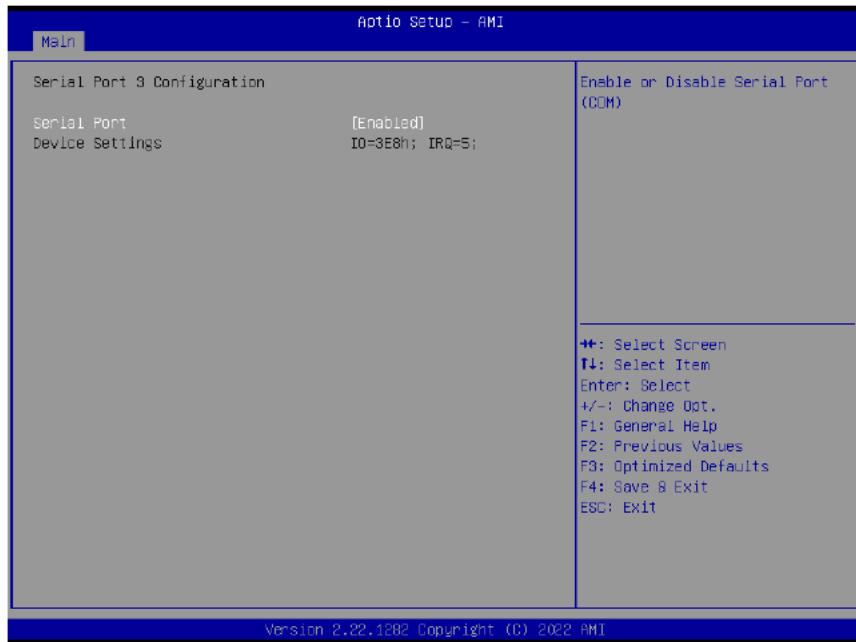
```
                        Aptio Setup - AMI
  Main

  Serial Port 3 Configuration                    Enable or Disable Serial Port
                                                 (COM)
  Serial Port                  [Enabled]
  Device Settings              IO=3E8h; IRQ=5;




                                                 ++: Select Screen
                                                 ↑↓: Select Item
                                                 Enter: Select
                                                 +/-: Change Opt.
                                                 F1: General Help
                                                 F2: Previous Values
                                                 F3: Optimized Defaults
                                                 F4: Save & Exit
                                                 ESC: Exit


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```

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

3.6.2.7.4 Serial Port 4 Configuration
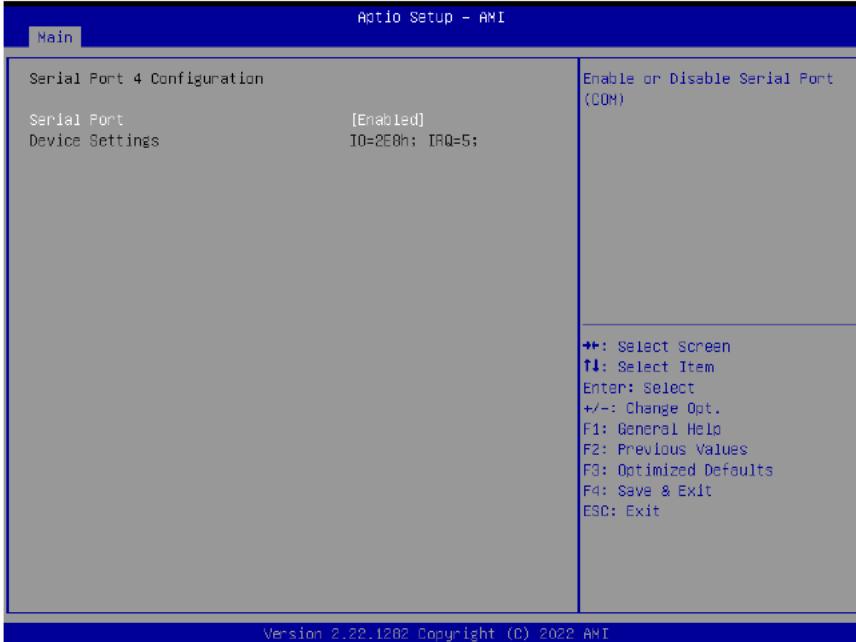
```
                        Aptio Setup - AMI
  Main

  Serial Port 4 Configuration                    Enable or Disable Serial Port
                                                 (COM)
  Serial Port                  [Enabled]
  Device Settings              IO=2E8h; IRQ=5;




                                                 ++: Select Screen
                                                 ↑↓: Select Item
                                                 Enter: Select
                                                 +/-: Change Opt.
                                                 F1: General Help
                                                 F2: Previous Values
                                                 F3: Optimized Defaults
                                                 F4: Save & Exit
                                                 ESC: Exit


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```

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

3.6.2.7.5 Serial Port 5 Configuration
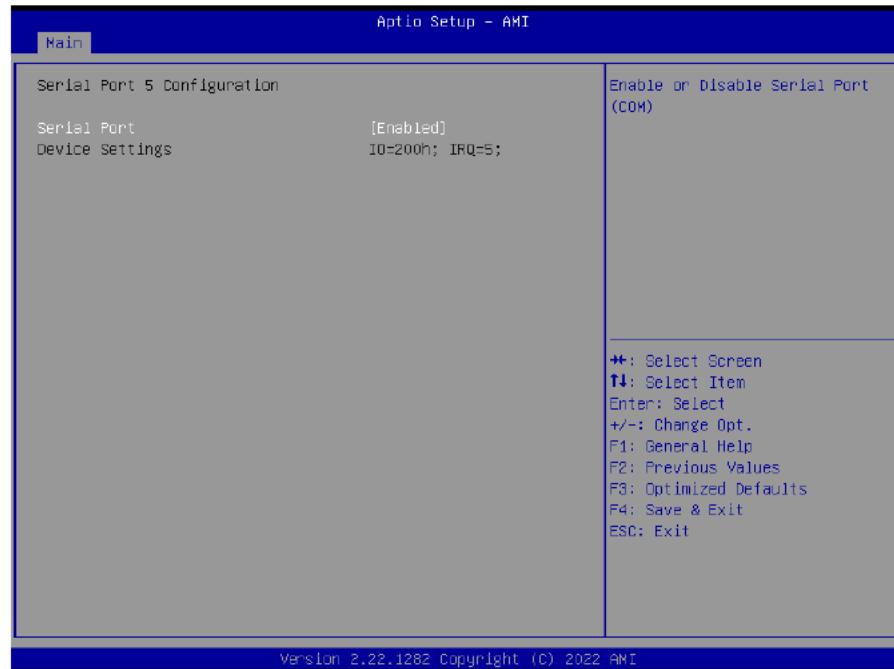
Item	Option	Description
Serial Port	Enabled**[Default]**, Disabled	Enable or Disable Serial Port (COM).

3.6.2.7.6 Serial Port 6 Configuration
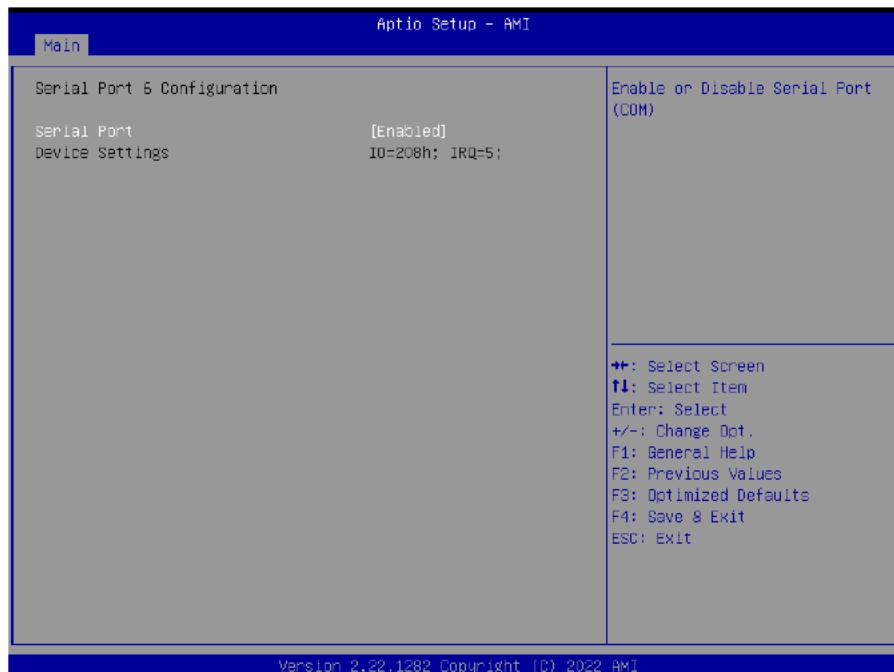
Item	Option	Description
Serial Port	Enabled**[Default]**, Disabled	Enable or Disable Serial Port (COM).

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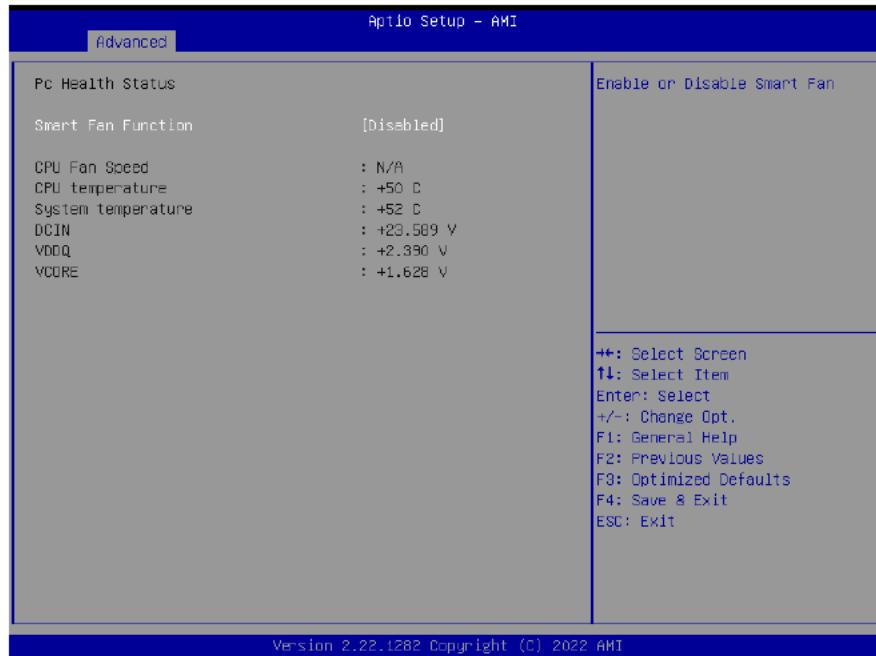
Item	Options	Description
Smart Fan Function	Enabled, Disabled**[Default]**	Enables or Disables Smart Fan.

3.6.2.9 S5 RTC Wake Settings

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

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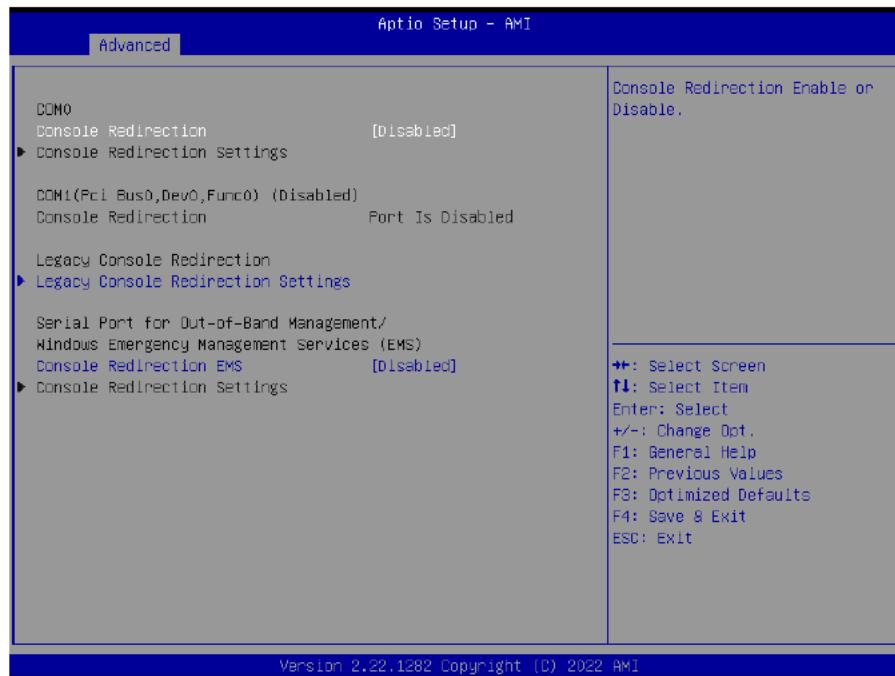
Item	Options	Description
Console Redirection	Disabled**[Default]**, Enabled	Console Redirection Enable or Disable.
Console Redirection EMS	Disabled**[Default]**, Enabled	Console Redirection Enable or Disable.

3.6.2.10.1 Legacy Console Redirection Settings

```
                         Aptio Setup - AMI
     Advanced

 Legacy Console Redirection Settings          Select a COM port to display
                                              redirection of Legacy OS and
 Redirection COM Port          [COM0]         Legacy OPROM Messages




                                              →←: Select Screen
                                              ↑↓: Select Item
                                              Enter: Select
                                              +/-: Change Opt.
                                              F1: General Help
                                              F2: Previous Values
                                              F3: Optimized Defaults
                                              F4: Save & Exit
                                              ESC: Exit




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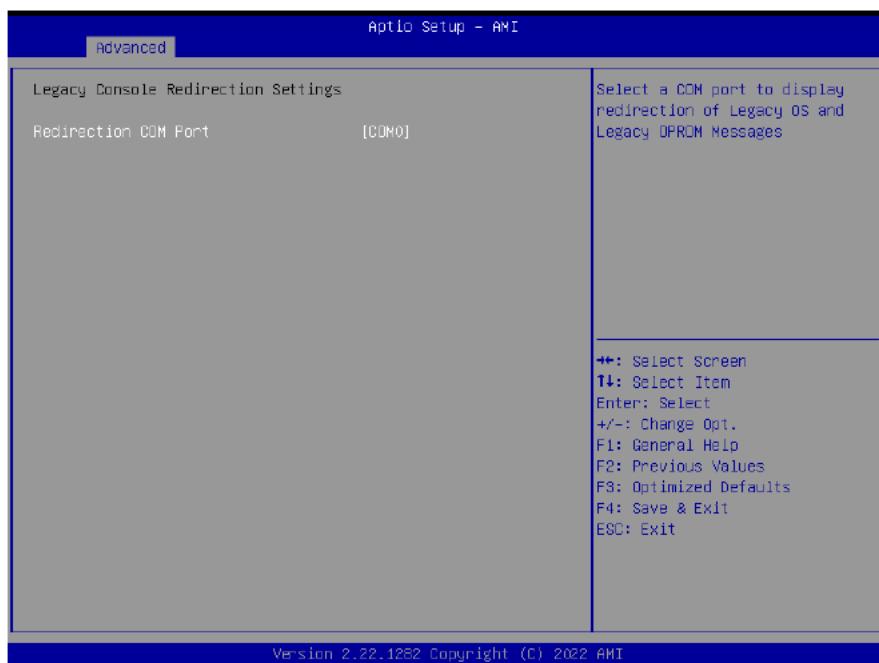
Item	Option	Description
Redirection COM Port	COM0[Default]	Select a COM port to display redirection of Legacy OS and Legacy OPROM Messages.

3.6.2.11 USB Configuration

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

```
                         Aptio Setup - AMI
     Advanced

 USB Configuration                            The time-out value for
                                              Control, Bulk, and Interrupt
 USB Module Version            26             transfers.

 USB Controllers:
      2 XHCIs
 USB Devices:
      1 Drive, 1 Keyboard, 1 Mouse


 USB hardware delays and time-outs:
 USB transfer time-out         [20 sec]
 Device reset time-out         [20 sec]
 Device power-up delay         [Auto]        →←: Select Screen
                                              ↑↓: Select Item
 Mass Storage Devices:                        Enter: Select
 JetFlashTranscend 8GB 1100    [Auto]         +/-: Change Opt.
                                              F1: General Help
                                              F2: Previous Values
                                              F3: Optimized Defaults
                                              F4: Save & Exit
                                              ESC: Exit




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```

Item	Options	Description
USB transfer time-out	1 sec 5 sec	The time-out value for Control, Bulk, and Interrupt transfers.

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

3.6.2.12 Network Stack Configuration

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

3.6.2.13 NVMe Configuration

```
                          Aptio Setup - AMI
        Advanced

  NVMe Configuration                                    |
                                                        |
  No NVME Device Found                                  |
                                                        |
                                                        |
                                                        |
                                                        |
                                                        |
                                                        |----------------------
                                                        | ↔: Select Screen
                                                        | ↑↓: Select Item
                                                        | Enter: Select
                                                        | +/-: Change Opt.
                                                        | F1: General Help
                                                        | F2: Previous Values
                                                        | F3: Optimized Defaults
                                                        | F4: Save & Exit
                                                        | ESC: Exit
                                                        |
                                                        |

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```

3.6.3   Chipset

```
                          Aptio Setup - AMI
     Main  Advanced  Chipset  Security  Boot  Save & Exit

  ▶ System Agent (SA) Configuration       | System Agent (SA) Parameters
  ▶ PCH-IO Configuration                  |
  ▶ Board & Panel Configuration           |
                                          |
                                          |
                                          |
                                          |
                                          |
                                          |
                                          |
                                          |
                                          |----------------------
                                          | ↔: Select Screen
                                          | ↑↓: Select Item
                                          | Enter: Select
                                          | +/-: Change Opt.
                                          | F1: General Help
                                          | F2: Previous Values
                                          | F3: Optimized Defaults
                                          | F4: Save & Exit
                                          | ESC: Exit
                                          |
                                          |

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```

3.6.3.1 System Agent (SA) Configuration

```
                          Aptio Setup - AMI
          Chipset

  System Agent (SA) Configuration                    Memory Configuration Parameters

  VT-d                          Supported

▶ Memory Configuration
▶ VMD setup menu

  VT-d                          [Enabled]

                                                 ↔: Select Screen
                                                 ↑↓: Select Item
                                                 Enter: Select
                                                 +/-: Change Opt.
                                                 F1: General Help
                                                 F2: Previous Values
                                                 F3: Optimized Defaults
                                                 F4: Save & Exit
                                                 ESC: Exit

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```

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

3.6.3.1.1 Memory Configuration

```
                          Aptio Setup - AMI
          Chipset

  Memory Configuration

  Memory RC Version            2.0.2.8
  Memory Speed                  2667 MT/s
  Memory Timings (tCL-tRCD-tRP-tRAS)  19-19-19-43
  Controller 0 Channel 0 Slot 0  Populated & Enabled
      Size                     4096 MB (DDR4)
      Number of Ranks          1
      Manufacturer             Kingston

                                                 ↔: Select Screen
                                                 ↑↓: Select Item
                                                 Enter: Select
                                                 +/-: Change Opt.
                                                 F1: General Help
                                                 F2: Previous Values
                                                 F3: Optimized Defaults
                                                 F4: Save & Exit
                                                 ESC: Exit

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```

3.6.3.1.2 VMD setup menu Graphics Configuration

```
                        Aptio Setup - AMI
        Chipset

   VMD Configuration                                   Enable/Disable to VMD
                                                       controller
   Enable VMD controller              [Disabled]




                                                       →←: Select Screen
                                                       ↑↓: Select Item
                                                       Enter: Select
                                                       +/-: Change Opt.
                                                       F1: General Help
                                                       F2: Previous Values
                                                       F3: Optimized Defaults
                                                       F4: Save & Exit
                                                       ESC: Exit



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```
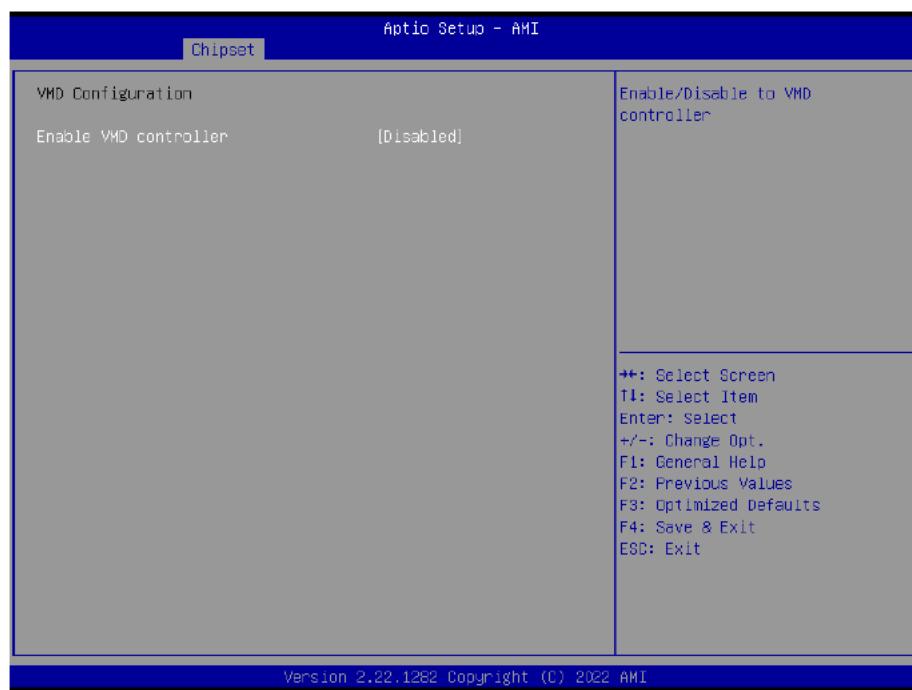
Item	Option	Description
Enable VMD controller	Enabled Disabled**[Default]**	Enable/Disable VMD controller.

3.6.3.2   PCH-IO Configuration

```
                        Aptio Setup - AMI
        Chipset

   PCH-IO Configuration                                PCI Express Configuration
                                                       settings
 ▶ PCI Express Configuration
 ▶ SATA And RST Configuration
 ▶ HD Audio Configuration




                                                       →←: Select Screen
                                                       ↑↓: Select Item
                                                       Enter: Select
                                                       +/-: Change Opt.
                                                       F1: General Help
                                                       F2: Previous Values
                                                       F3: Optimized Defaults
                                                       F4: Save & Exit
                                                       ESC: Exit



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```

3.6.3.2.1 PCI Express Configuration
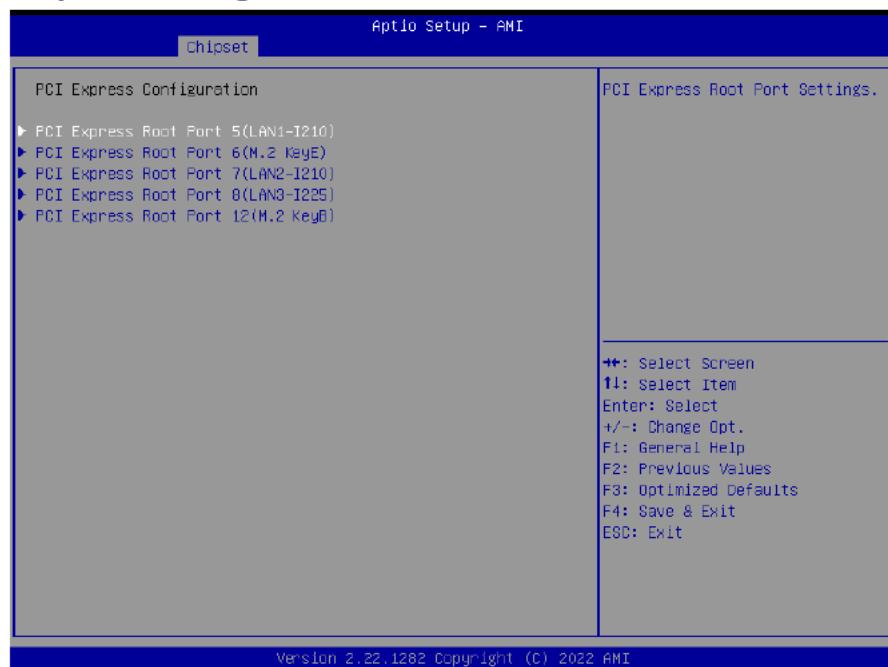
3.6.3.2.1.1 PCI Express Root Port 5(LAN1-I210)
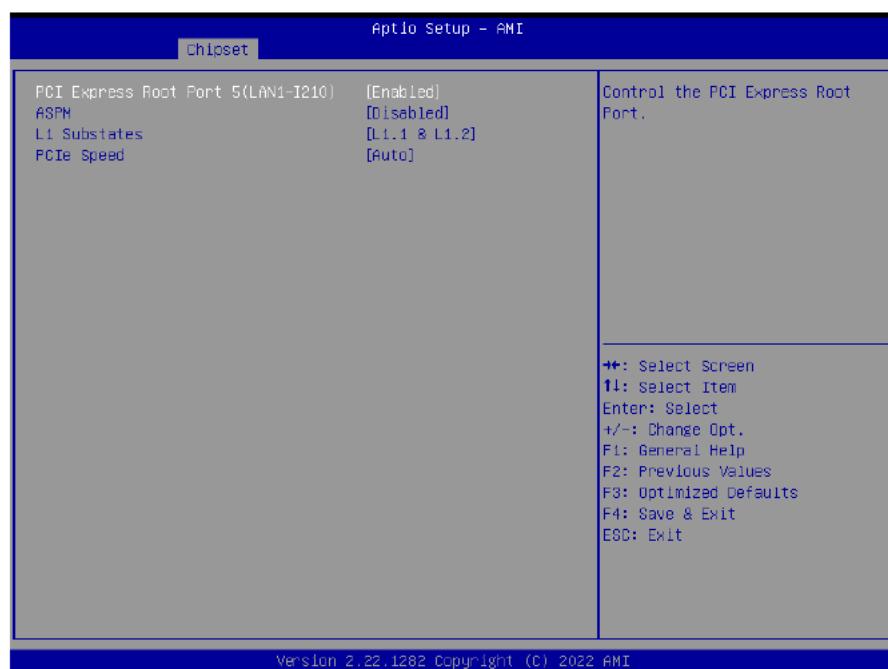
| Item	Option	Description
PCI Express Root Port 5(LAN1-I210)	Enabled[Default], Disabled	Control the PCI Express Root Port.
ASPM	Disabled[Default], L0s, L1, L0sL1, Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.

L1 Substates	Disabled, L1.1 L1.1 & L1.2**[Default]**	PCI Express L1 Substates settings.
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3	Configure PCIe Speed.

3.6.3.2.1.2 PCI Express Root Port 6(M.2 KeyE)

Item	Option	Description
PCI Express Root Port 6(M.2 KeyE)	Enabled**[Default]**, Disabled	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, L1.1 L1.1 & L1.2**[Default]**	PCI Express L1 Substates settings.
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3	Configure PCIe Speed.

3.6.3.2.1.3 PCI Express Root Port 7(LAN2-I210)

Item	Option	Description
PCI Express Root Port 7(LAN2-I210)	Enabled**[Default]**, Disabled	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, L1.1, L1.1 & L1.2**[Default]**	PCI Express L1 Substates settings.
PCIe Speed	Auto**[Default]**, Gen1, Gen2, Gen3	Configure PCIe Speed.

3.6.3.2.1.4 PCI Express Root Port 8(LAN3-I225)

Item	Option	Description
PCI Express Root Port 8(LAN3-I225)	Enabled**[Default]**, Disabled	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, L1.1 L1.1 & L1.2**[Default]**	PCI Express L1 Substates settings.
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3	Configure PCIe Speed.

3.6.3.2.1.5 PCI Express Root Port 12(M.2 KeyB)

Item	Option	Description
PCI Express Root Port 12(M.2 KeyB)	Enabled**[Default]**, Disabled	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, L1.1, L1.1 & L1.2**[Default]**	PCI Express L1 Substates settings.
PCIe Speed	Auto**[Default]**, Gen1, Gen2, Gen3	Configure PCIe Speed.

3.6.3.2.2 SATA And RST Configuration

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

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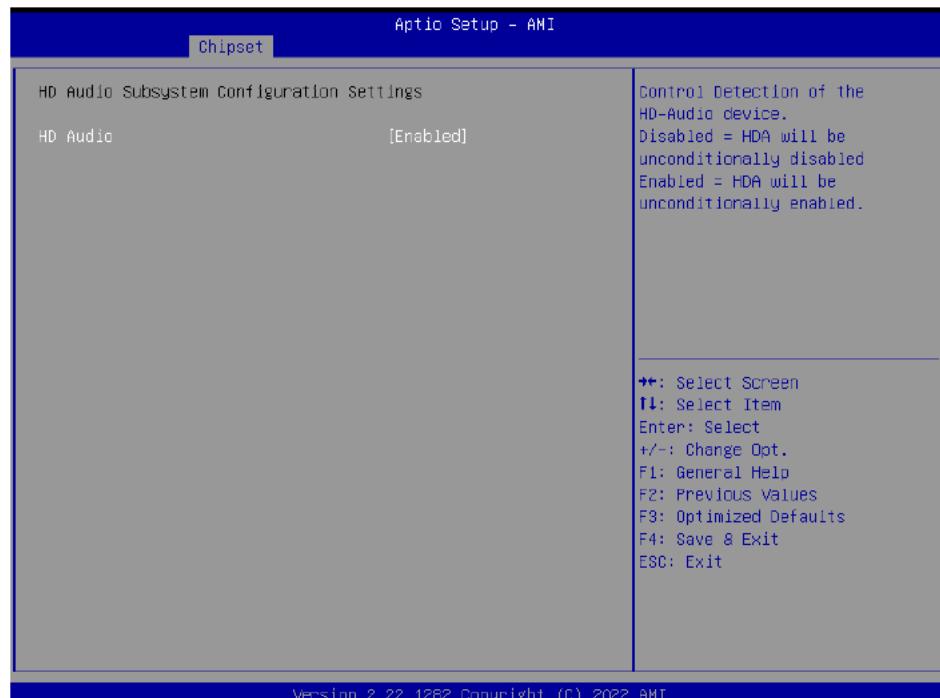
Item	Option	Description
HD Audio	Disabled Enabled[Default]	Control Detection of the HD-Audio device. Disable = HDA will be unconditionally disabled Enabled = HDA will be unconditionally enabled.

3.6.3.3 Board & Panel Configuration

```
                              Aptio Setup - AMI
            Chipset

    Board & Panel Configuration                        Active Internal
                                                       LVDS(eDP->Ch7511-to-LVDS)
    LVDS
    Active Panel                    [Enabled]
    CH7511 EDID Panel Option        [1024x768  24/1]
    Panel Brightness Control Method [BIOS]
    Panel Brightness                [100%]
    Panel Back Light PWM Frequency  [ 200]

    eDP
    Panel Brightness Control Method [BIOS]
    Panel Brightness                [100%]
    Panel Back Light PWM Frequency  [ 200]
                                                       ←→: Select Screen
    ErP Function                    [Disabled]         ↑↓: Select Item
    PWR-On After PWR-Fail           [Off]              Enter: Select
    Wake Up by Ring                 [Enabled]          +/-: Change Opt.
    Watch Dog                       [Disabled]         F1: General Help
    USB Standby Power(Rear)         [Enabled]          F2: Previous Values
    USB Standby Power(Internal)     [Enabled]          F3: Optimized Defaults
                                                       F4: Save & Exit
 ▶  SHOW DMI INFO                                      ESC: Exit


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```

Item	Option	Description
Active Panel	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 1366x768 24/1 1920x1080 24/2 1680x1050 24/2	Port-EDP to LVDS(Chrotel 7511) Panel EDID Option.
Panel Brightness Control Method	BIOS[Default] OS Driver	Panel Brightness Control Method. 1.BIOS 2.OS Driver.
Panel Brightness	00% 25% 50% 75% 100%[Default]	Select Panel(eDP/LVDS) back light PWM duty.
Panel Back Light PWM	200[Default]	Select Panel(eDP/LVDS) back light PWM

Frequency	300	Frequency.
	400	
	500	
	700	
	1k	
	2k	
	3k	
	5k	
	10k	
	20k	
ErP Function	Disabled**[Default]**	ErP Function (Deep S5).
	Enabled	
PWR-On After PWR-Fail	Off**[Default]**	AC loss resume.
	On	
	Last state	
Wake Up by Ring	Disabled	Wake Up by Ring from S3/S4/S5.
	Enabled**[Default]**	
Watch Dog	Disabled**[Default]**	Select WatchDog.
	30 sec	
	40 sec	
	50 sec	
	1 min	
	2 min	
	10 min	
	30 min	
USB Standby Power(Rear)	Disabled	Enable/Disabled USB Standby Power during S3/S4/S5.
	Enabled**[Default]**	
USB Standby Power(Internal)	Disabled	Enable/Disabled USB Standby Power during S3/S4/S5.
	Enabled**[Default]**	

3.6.3.3.1 SHOW DMI INFO


```
                          Aptio Setup - AMI
         Chipset

   SHOW DMI INFO

   System Manufacturer            Default string
   System Product                 Default string
   System Serial Number           Default string
   System SKU Number              Default string
   Baseboard Version              Default string
   Baseboard Serial Number        Default string


                                              →←: Select Screen
                                              ↑↓: Select Item
                                              Enter: Select
                                              +/-: Change Opt.
                                              F1: General Help
                                              F2: Previous Values
                                              F3: Optimized Defaults
                                              F4: Save & Exit
                                              ESC: Exit


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```

3.6.4 Security

- ● **Administrator Password**

Set setup Administrator Password

- ● **User Password**

Set User Password

3.6.4.1 Secure Boot
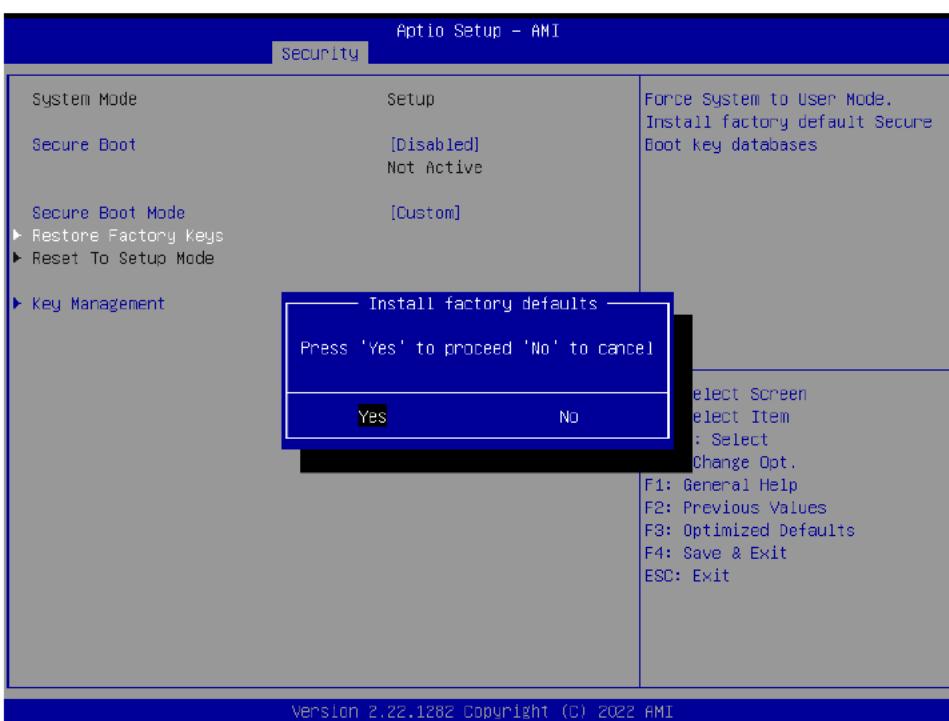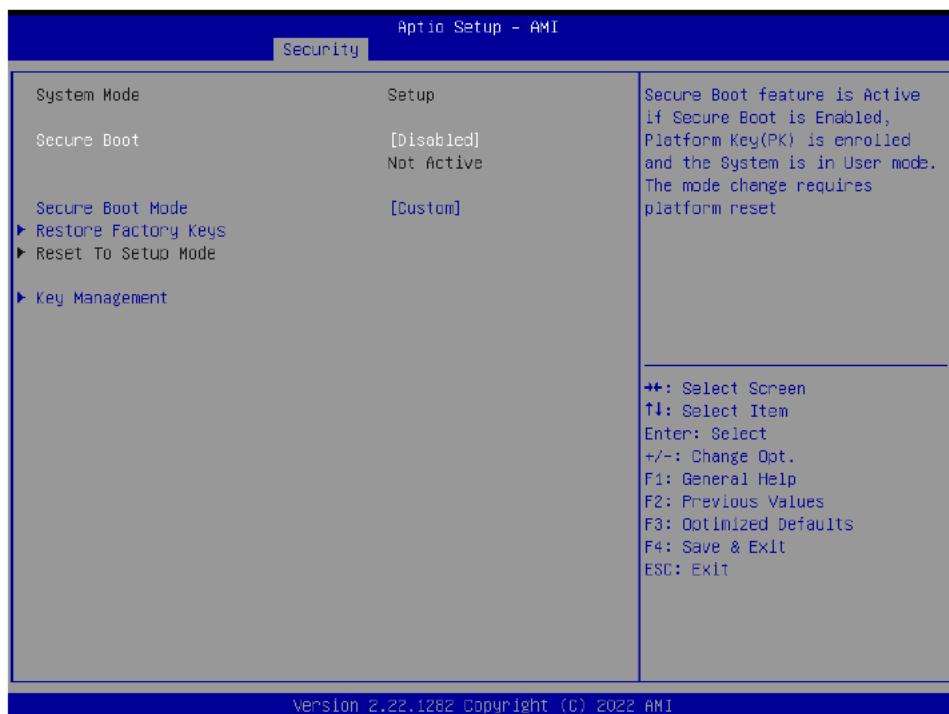
Item	Option	Description
Secure Boot	Disabled**[Default]** Enabled	Secure Boot feature is Active if Secure Boot is Enable, Platform Key(PK) is enrolled and the System is in User mode. The mode change requires platform reset.
Secure Boot Mode	Standard Custom**[Default]**	Secure Boot mode selector: Standard/Custom. In Custom mode Secure Boot Variables can be configured without authentication.

3.6.4.1.1 Key Management
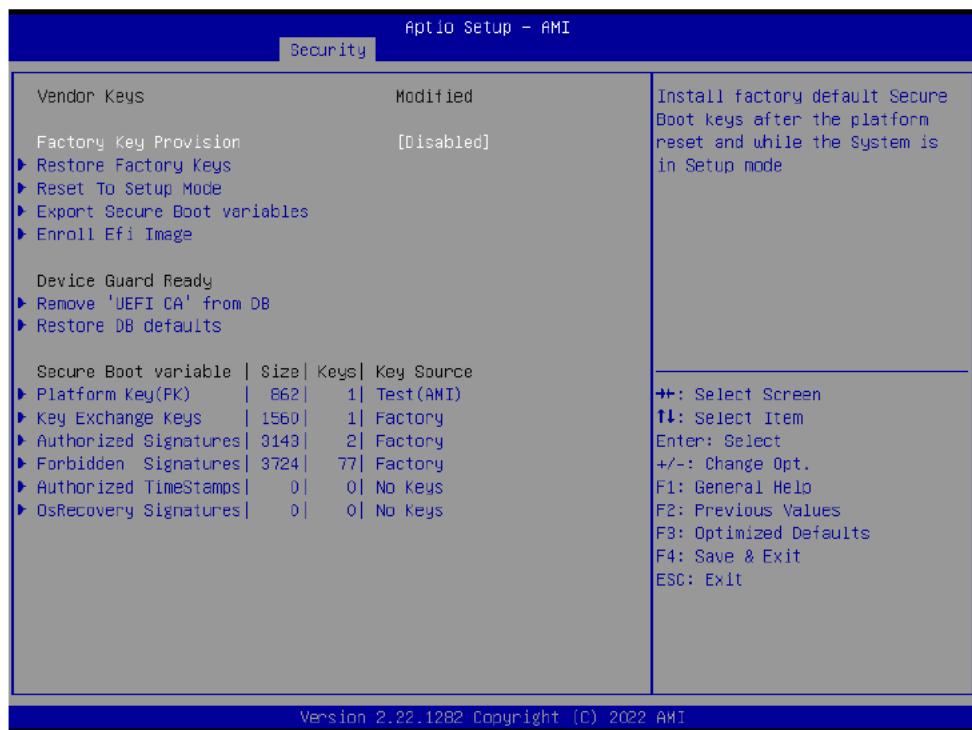
Item	Option	Description
Factory Key Provision	Disabled**[Default]** Enabled	Install factory default Secure Boot keys after the platform reset and while the System is in Setup mode.

3.6.5 Boot
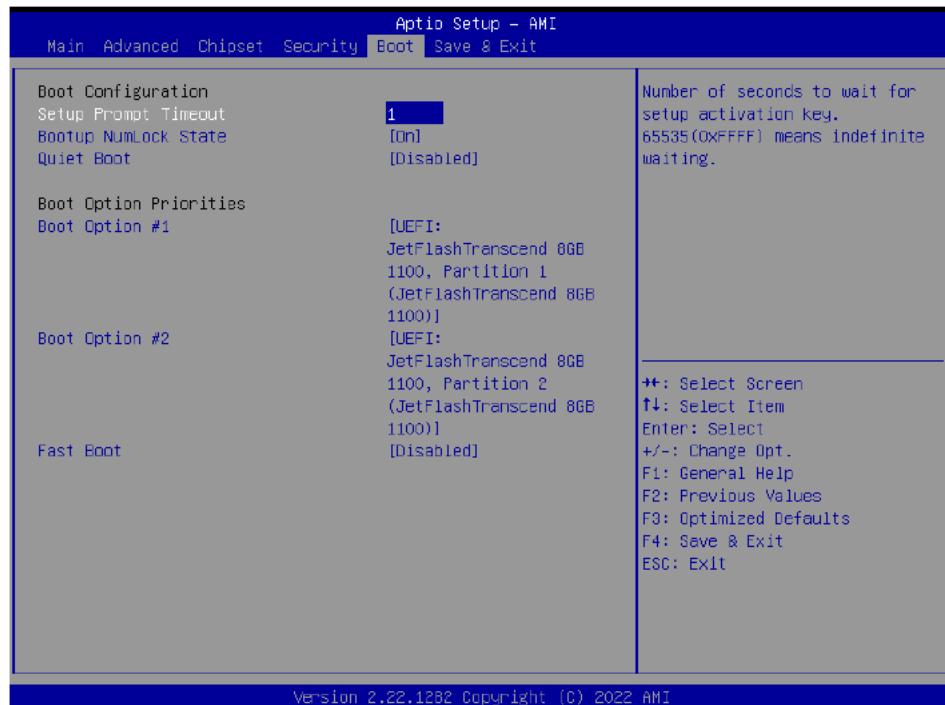
Item	Option	Description
Setup Prompt Timeout	1~ 65535	Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.
Bootup NumLock State	On**[Default]** Off	Select the keyboard NumLock state
Quiet Boot	Disabled**[Default]** Enabled	Enables or disables Quiet Boot option
Fast Boot	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 optios.
Boot Option #1/2	Set the system boot order.	

3.6.6   Save and exit
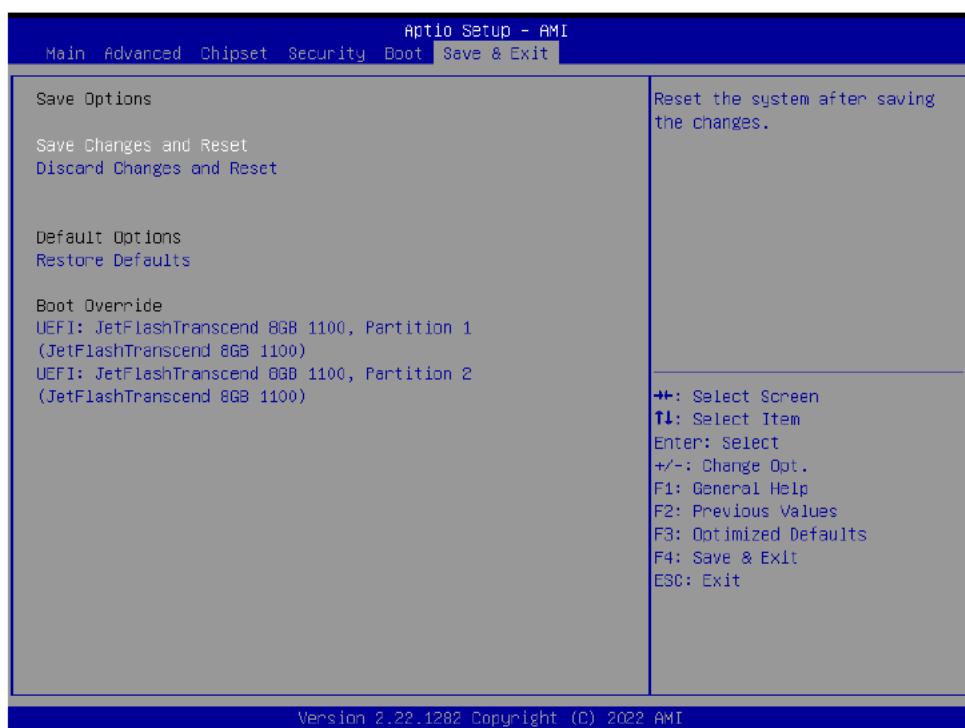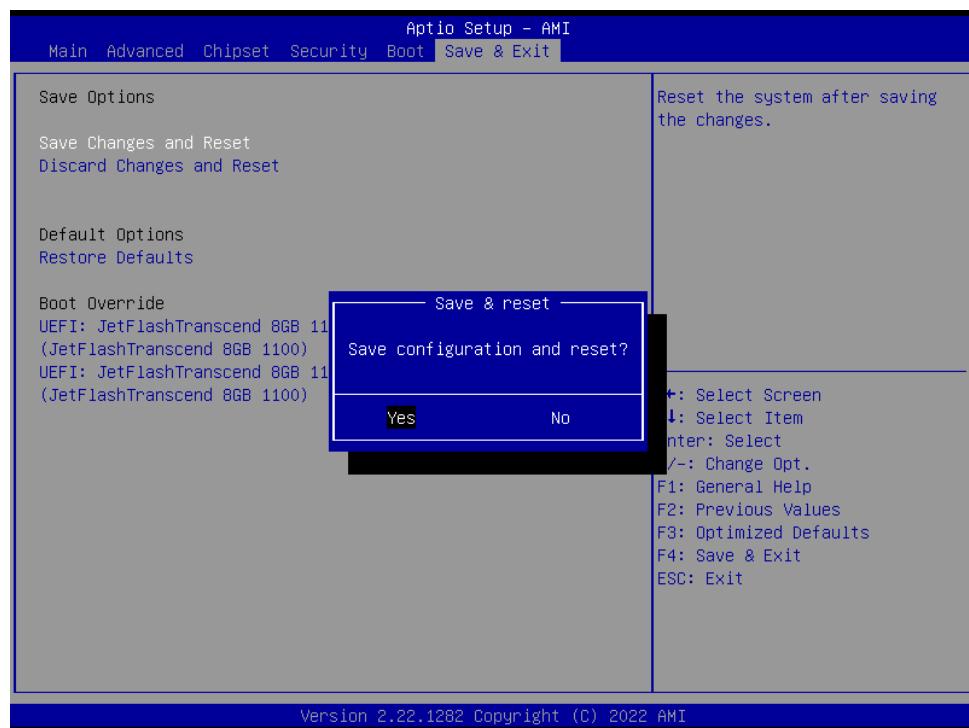
3.6.6.1 Save Changes and Reset

Reset the system after saving the changes.

3.6.6.2 Discard Changes and Reset

Any changes made to BIOS settings during this session of the BIOS setup program are discarded. The setup program then exits and reboots the controller.

3.6.6.3 Restore Defaults

This option restores all BIOS settings to the factory default. This option is useful if the controller exhibits unpredictable behavior due to an incorrect or inappropriate BIOS setting.

3.6.6.4 Launch EFI Shell from filesystem device

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

4. Drivers Installation

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

4.1 Install Chipset Driver

Note: The installation procedures and screen shots in this section are based on Windows 10 operation system. If the warning message appears while the installation process, click Continue to go on.
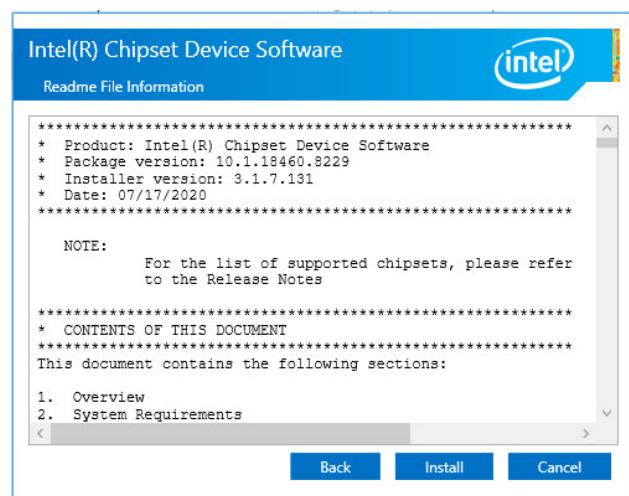
**Step 3.** Click **Install**.
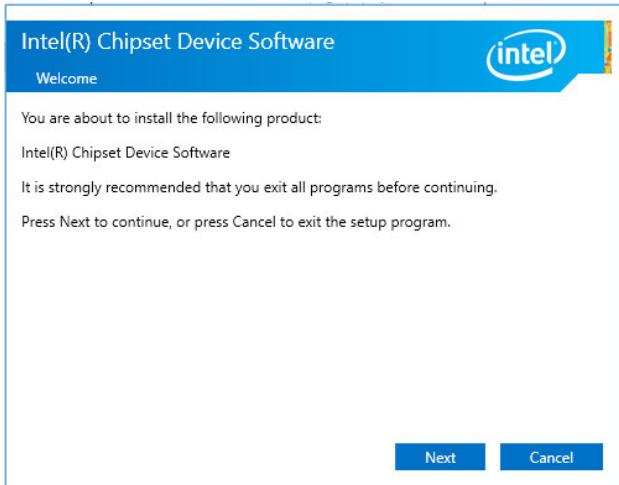
Step1. Click **Next**.

Step 4. Complete setup.
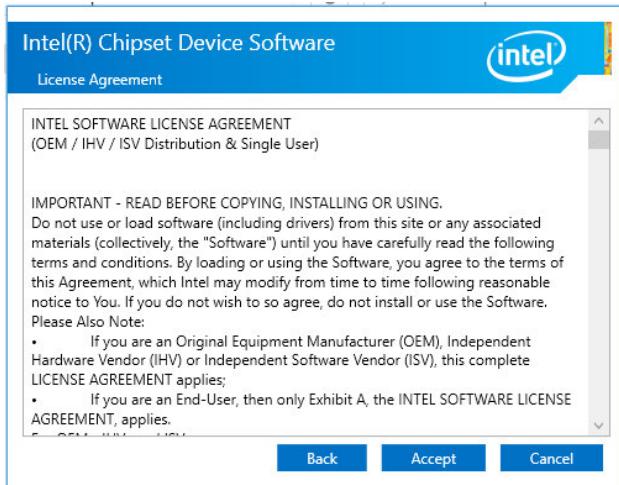
Step 2. Click **Accept**.

4.2 Install VGA Driver

Note: The installation procedures and screen shots in this section are based on Windows 10 operation system. If the warning message appears while the installation process, click Continue to go on.
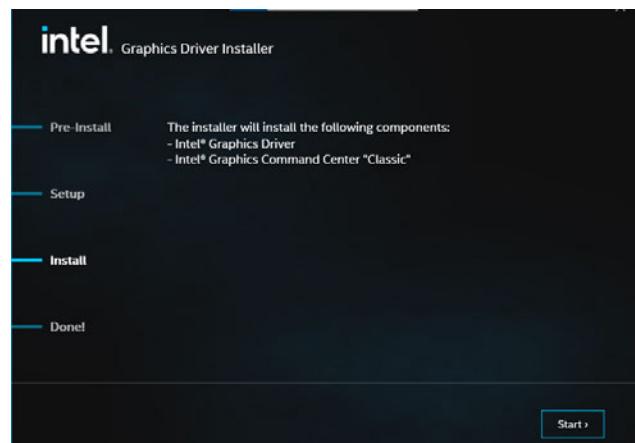
Step 3. Click **Start.**

Step 1. Click **Begin installation**.
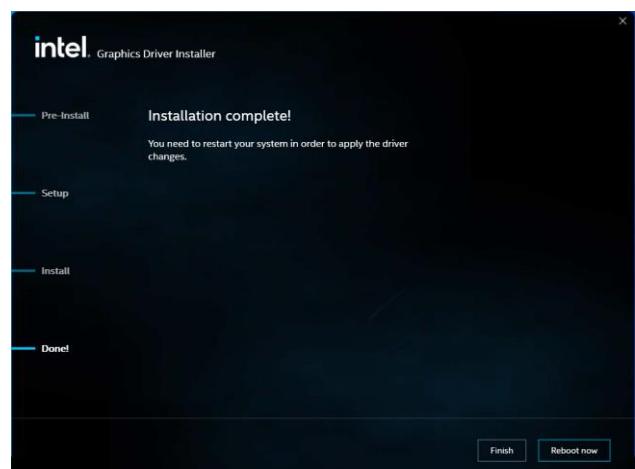
Step 4. Click **Reboot now.**
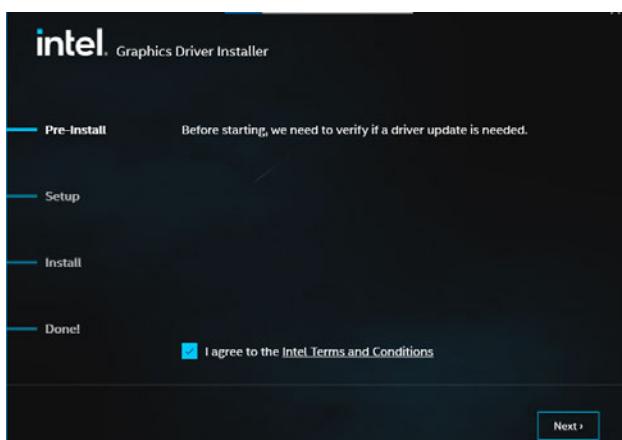
Step 2.

Click **Next** to accept license agreement.

4.3 Install ME Driver

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

Step 3. Click **Next**.

Step 1. Click **Next** to continue setup.
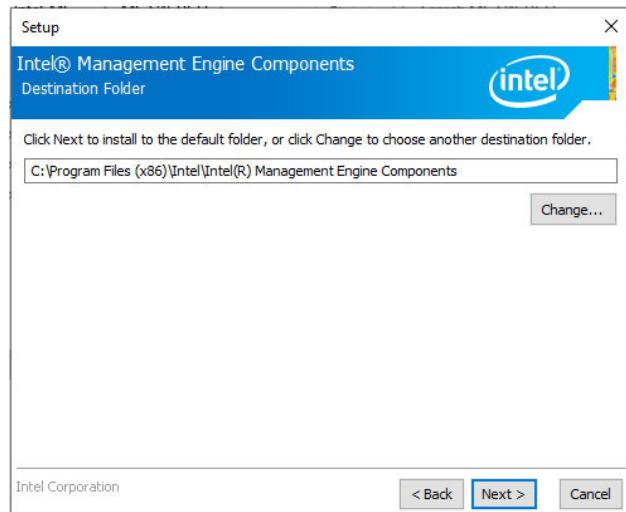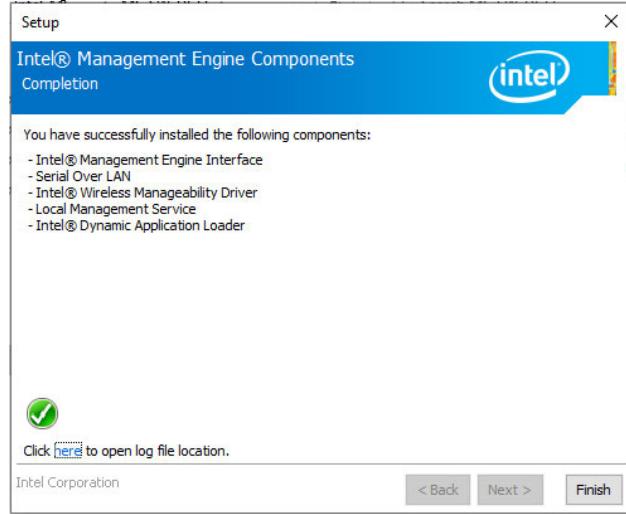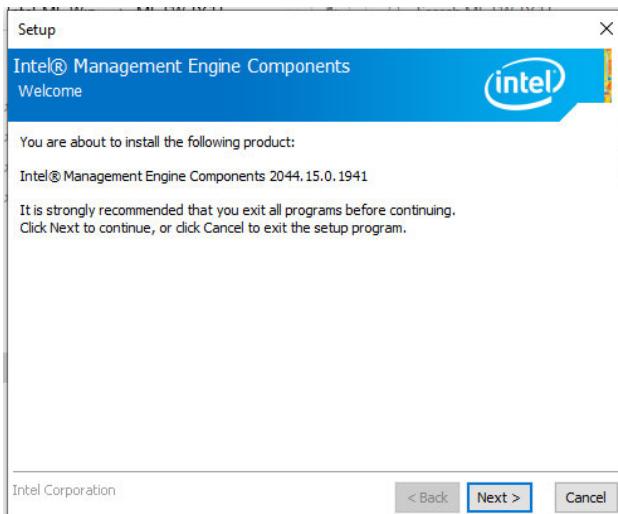
Step 4. Click **Finish** to complete setup.

Step 2. Click **Next**.

4.4 Install LAN Driver

Note: The installation procedures and screen shots in this section are based on Windows 10 operation system. If the warning message appears while the installation process, click Continue to go on.
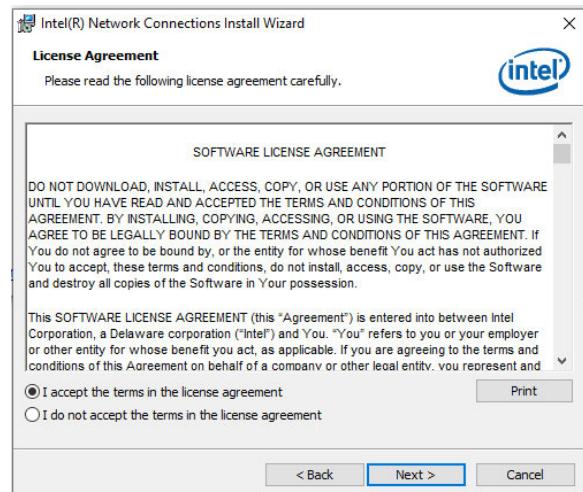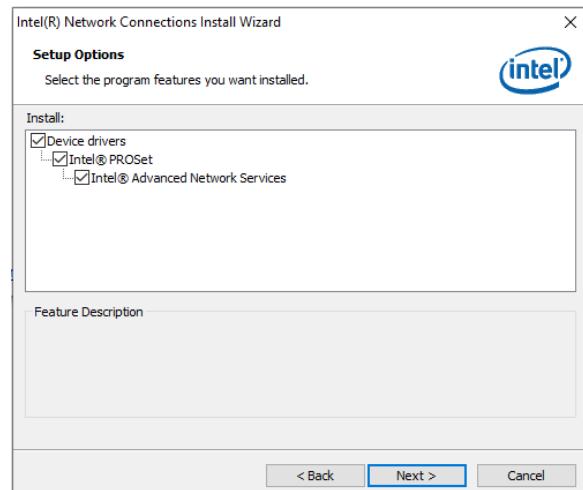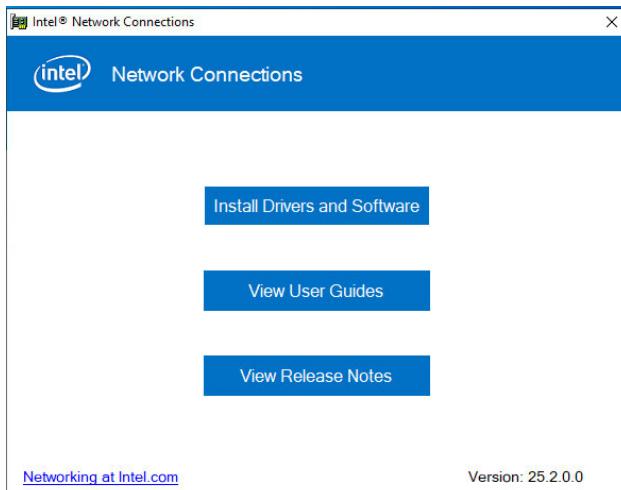
Step 3. Click **Next**.


Step 1. Click **Next** to continue installation.
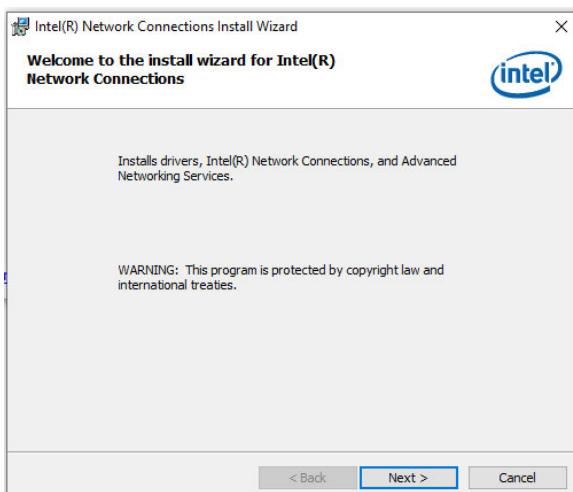
**Step 4.** Click **Yes**.
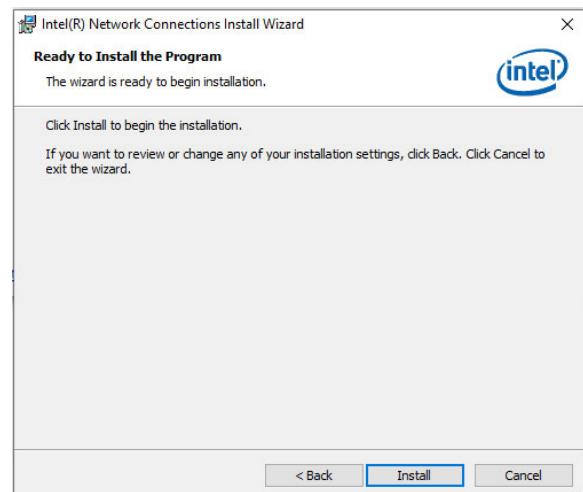
Step 2. Click **Next**.

Step 5. Click **Install**.
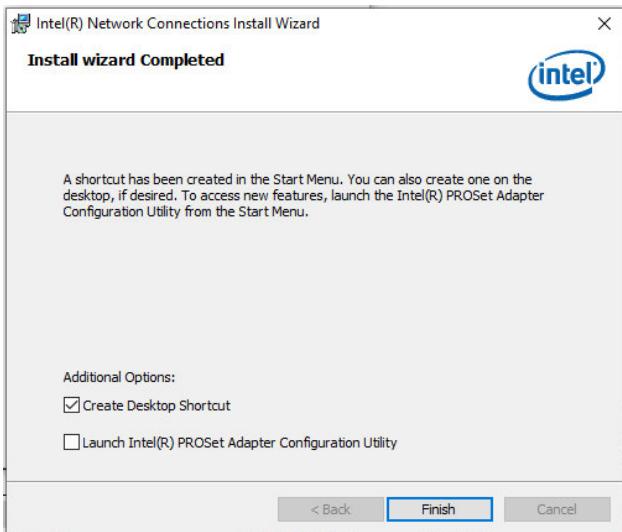
Step 6. Click **Finish** to complete setup.

5. Mechanical Drawing
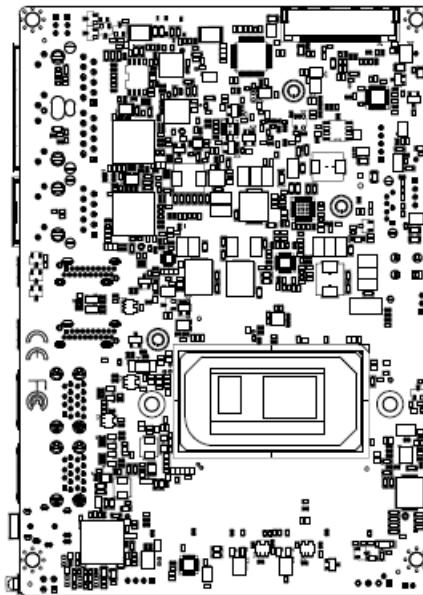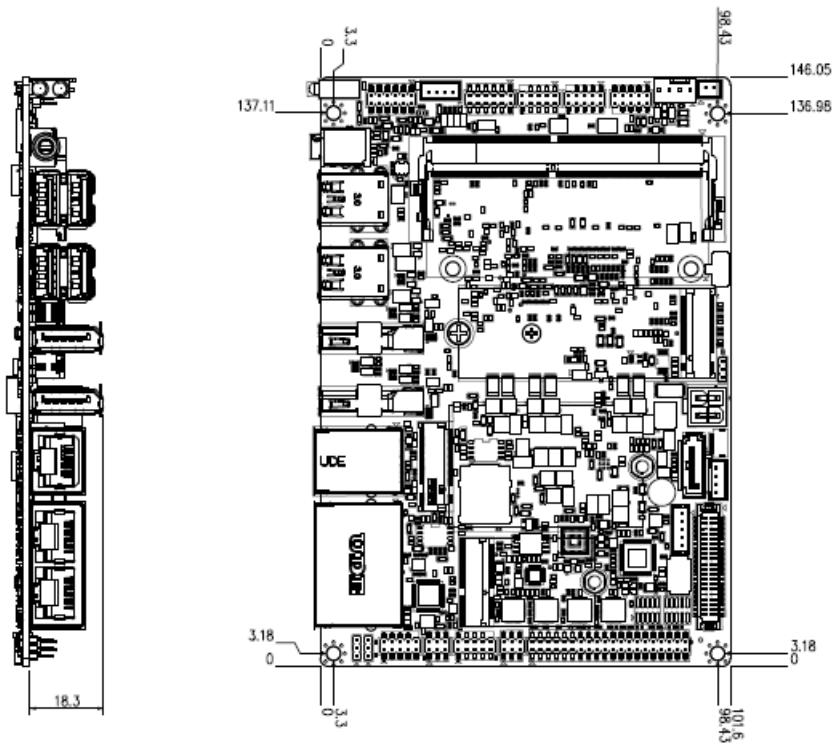
Unit: mm

Thermal Solutions:

ECM-TGU standard package with heatsink (BIOS TDP: 15W), we also design cooler (BIOS TDP: 28W) solution for customer optional purchase.

Cooler set for 15W upgrade to 28W: E1756211300R
(For optional purchase, not in standard package)

15W Heatsink + screw set:
E1961211150026R (In standard package)