ERX-W480P

Intel® 10th Gen. Core™ Processor Micro ATX Motherboard With Intel® W480E Chipset

User's Manual

3rd Ed – 01 March 2023

Part No. E2047RW4802R

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.

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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

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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.

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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

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 ERX-W480P motherboard
- 1 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
1st	February 2022	Avalue	Initial Release
2nd	January 2023	Avalue	Update Setting Jumpers & Connectors
3rd	March 2023	Avalue	Update User condition suggestion

1.4 Manual Objectives

This manual describes in details Avalue Technology ERX-W480P 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 ERX-W480P 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	Intel® Xeon® W-1200 series & 10th Gen Supports LGA 1200 CPU Up to 125W Max
BIOS	AMI uEFI BIOS, 256Mbit SPI Flash ROM
System Chipset	Intel® W480E Chipset
I/O Chip	Nuvoton® NCT6106D Fintek F81216HD
System Memory	Four 288-pin DDR4 U- DIMM socket, supports up to 128GB Max
Watchdog Timer	H/W Reset, 5~255 seconds/5~255 minutes
H/W Status Monitor	CPU temperature monitoring Voltages monitoring CPU fan speed control
RAID	Support RAID 0, 1, 5, 10
TPM	Onboard Infineon SLB9665 support TPM 2.0
iAMT	YES
Expansion Slot	
PCIe	2 x PCI-e x16 slot for 1 x PCI-e x16 or 2 x PCI-e x8 (By Auto switch IC) 2 x PCI-e x4
Storage	
M.2	1 x M.2 (2260/2280) M-Key, support SSD
SATA	4 x SATA III
Edge I/O	
COM	COM 1 by DB9 Connector at IO support RS-232
LAN	1 x Intel® I219LM Gigabit Ethernet PHY 1 x Intel® I210AT Gigabit Ethernet 2 x Intel® I225LM 2.5 Gigabit Ethernet Controller 1 x Intel® X550-AT2 10GBase-T LAN (BOM optional)
USB 3.1/ USB 2.0	4 x USB 3.2 Gen 1 connector
DP	1 x DP++
HDMI	1 x HDMI 1.4b
DVI/VGA	1 x VGA
Onboard I/O	
COM	COM 1 by DB9 Connector at IO support RS-232 COM 2~3: Support RS232/422/485 selected by BIOS selection 3 x 2 x 3 pin, pitch 2.00mm connector for COM 1~3 support RS232 with Pin 9,+5V/+12V/RI by jumper 2 x 2 x 3 pin, pitch 2.00mm connector for COM 2~3 support RS422/485 connector,

	Pin 5 with +5V 1 x 2 x 5 pin, pitch 2.00mm connector for COM 2 support RS-232 connector COM 3~6 1 x 2 x 20 pin, pitch 2.00mm connector for COM 3~6 support RS-232 connector COM 7~10 1 x 2 x 20 pin, pitch 2.00mm connector for COM 7~10: support RS-232 connector (BOM optional)
USB 2.0	1 x 1 x 5 pin, pitch 2.54mm connector for 1 x USB 2.0 3 x 2 x 5 pin, pitch 2.54mm connector for 6 x USB 2.0 1 x USB 2.0 By Vertical type A connector USB Wake up by BIOS Setting
USB 3.1	1 x 2 x 10 pin, pitch 2.00mm connector for 2 x USB 3.2 Gen 1
GPIO	1 x 2 x 10 pin, pitch 2.00mm connector for GPIO: 16 bits & +5VS Level SMBus
CPU/System FAN	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 1 x 1 x 3 pin, pitch 2.54mm System fan connector
Buzzer	1 x 4 pin, pitch 2.54mm connector for Speaker Buzzer
Front Panel	1 x 2 x 5 pin, pitch 2.54mm connector for front panel
RTC Battery	1 x Vertical type battery connector (CR2450 Battery) Co-lay 1 x 2 Pin Pitch 1.25mm horizontal type battery connector
AT/ATX Selector	1 x 1 x 3 pin pitch 2.00mm connector for AT/ATX jumper 1 x 2 x 12 pin ATX power connector 1 x 2 x 4 pin ATX 12V power connector
Clear CMOS	1 x 3 pin, pitch 2.54mm connector for CMOS clear
LVDS	1 x 2 x 20 pin, pitch 1.25mm connector for LVDS
LCD Backlight Brightness	1 x 1 x 5 pin, pitch 2.00mm Wafer connector for LCD inverter backlight connector (5V/12V) 1 x 1 x 3 pin, pitch 2.00mm connector LCD backlight brightness adjustment (PWM)
LCD Inverter	1 x 1 x 5 pin, pitch 2.00mm Wafer connector for LCD inverter backlight connector
LPC	2 x 2 x 5 pin, pitch 2.0mm connector for LPC
BIOS SPI	1 x 2 x 4 pin, pitch 2.00mm connector for BIOS SPI
Audio	1 x 2 x 5 pin, pitch 2.54mm connector for front Audio
Audio AMP	Onboard buzzer and Power good LED
Auxiliary panel	1 x 2 x 10 pin, pitch 2.54mm connector for Auxiliary panel
Others	1 x 3 pin, pitch 2.54mm connector for JME 1 x 5 pin, pitch 2.54mm connector for +3.3S Level SMBus
Display	
Graphic Chipset	Intel® 10th Generation CPU integrated
Spec. &	1 x VGA : 2048 x 1536@ 60 Hz

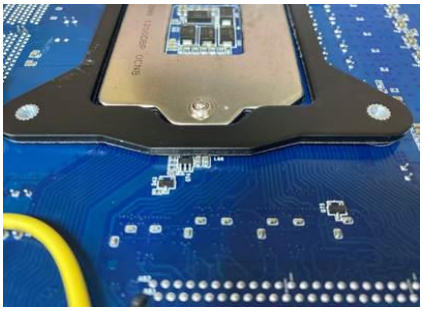
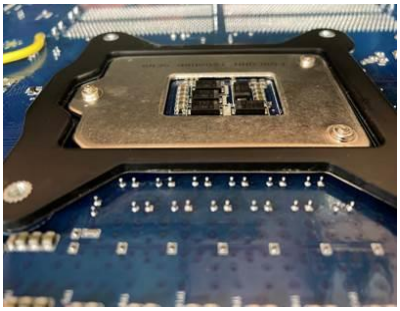
Resolution	1 x HDMI 1.4: 4096 x 2160@ 30 Hz 1 x DP++: 4096 x 2304@ 60 Hz LVDS: 1920 x 1080 Dual channel 18/24-bits LVDS (Chrontel CH7511B-BFI eDP to LVDS)
Multiple Display	Triple Display
Audio	
Audio Codec	Realtek ALC897 & ALC888S (Default: ALC888S) HD Audio Decoding Controller with 6W Amplifier
Amplifier	1 x 4 pin, pitch wafer 2.00mm connector for 6W x 2 Speaker
Ethernet	
LAN Chipset	1 x Intel® I219LM Gigabit Ethernet PHY 1 x Intel® I210AT Gigabit Ethernet 2 x Intel® I225LM 2.5 Gigabit Ethernet Controller 1 x Intel® X550-AT2 10GBase-T LAN (BOM optional)
LAN Spec.	10/100/1000/2500 Base-Tx GbE compatible, 10GBase-T LAN (BOM optional)
Mechanical & Environmental	
Power Requirement	+12V / +5V / 5VSB /+3.3V
ACPI	Single power ATX Support S0, S3, S4, S5
Power Mode	AT / ATX mode Switchable Through Jumper
Operating Temp.	0~50°C, w/HDD/SSD, ambient with 0.5 m/s Air flow
Storage Temp.	-40~ +75°C
Operating Humidity	40°C @ 95% Relative Humidity, Non-condensing
Size (L x W)	9.6" x 9.6" (243.84mm x 243.84mm)
Weight	0.60 kg
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 Random Vibration Non Operation 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	Packing Drop 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:

- It will be suggested to use CPU cooler bracket screw height is above 6mm example Avalue PNR: BCC-BRACKET-03R to evade components around CPU back plate.

Avalue PNR: BCC-BRACKET-03R

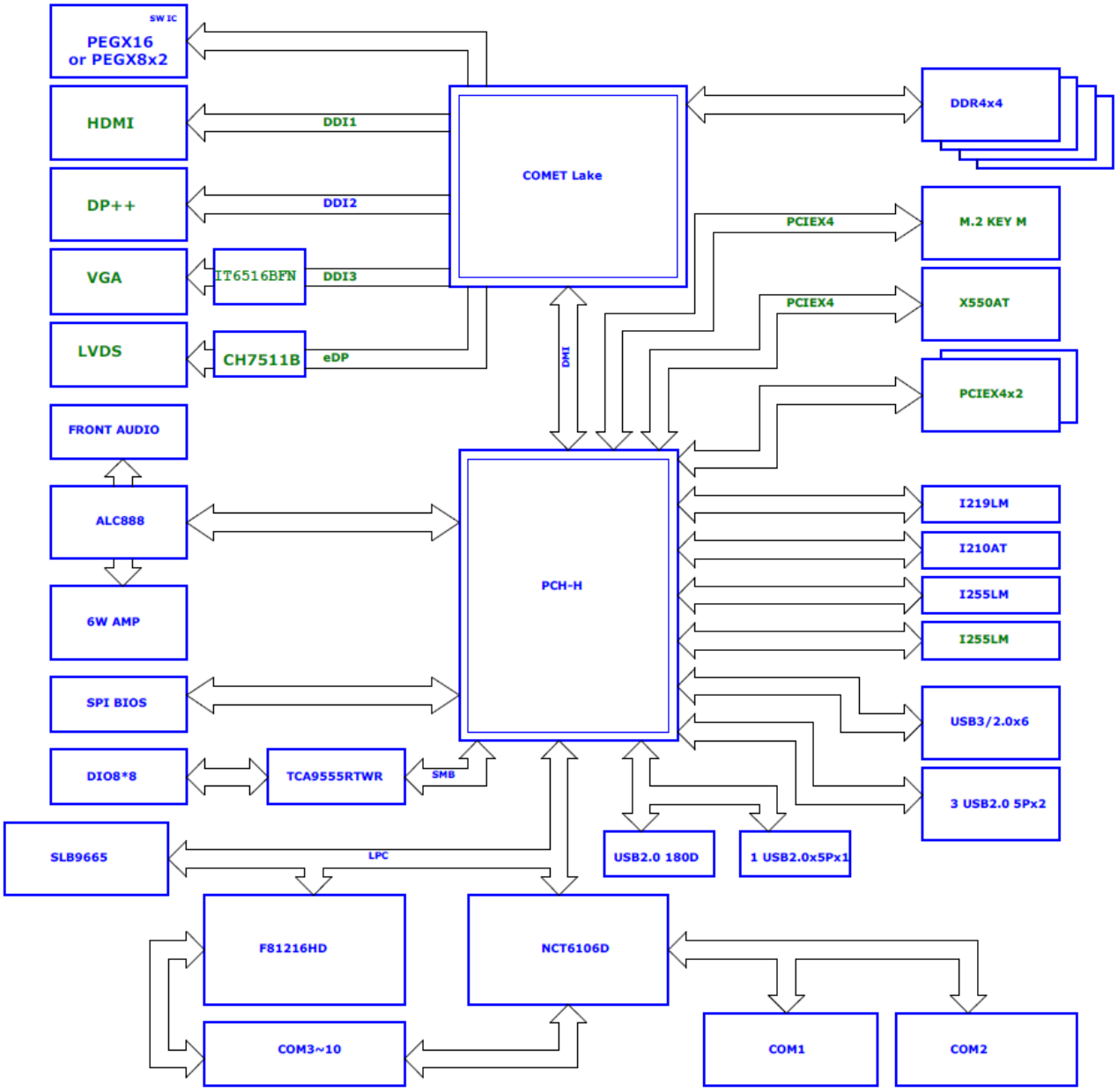
- User use PCI-e x16 slots(PEG1) need to mind about module card thickness such as Nvidia RTX 5000, may interference with connectors SATA3、SATA4、FAUD1、PCIE2 may unusable；module use at location: PEG2, may interference with SATA1、JUSB4~6.
- CPU limitation: Please be aware of IOTG CPU support list for ERX-W480P motherboard.

Intel® W480E Chipset (CPU with ECC DRAM support)	
Intel® Xeon® Processor W Family (Workstation) - 14nm Comet Lake-S	
W-1290E	O
W-1290TE	O
W-1270E	O
W-1270TE	O
W-1250E	O
W-1250TE	O
10th Generation Intel® Core™ Processors – 14nm Comet Lake Platform	
i9-10900E	
i9-10900TE	
i7-10700E	
i7-10700TE	
i5-10500E	
i5-10500TE	
i3-10100E	
i3-10100TE	

Note: "O" means support ECC

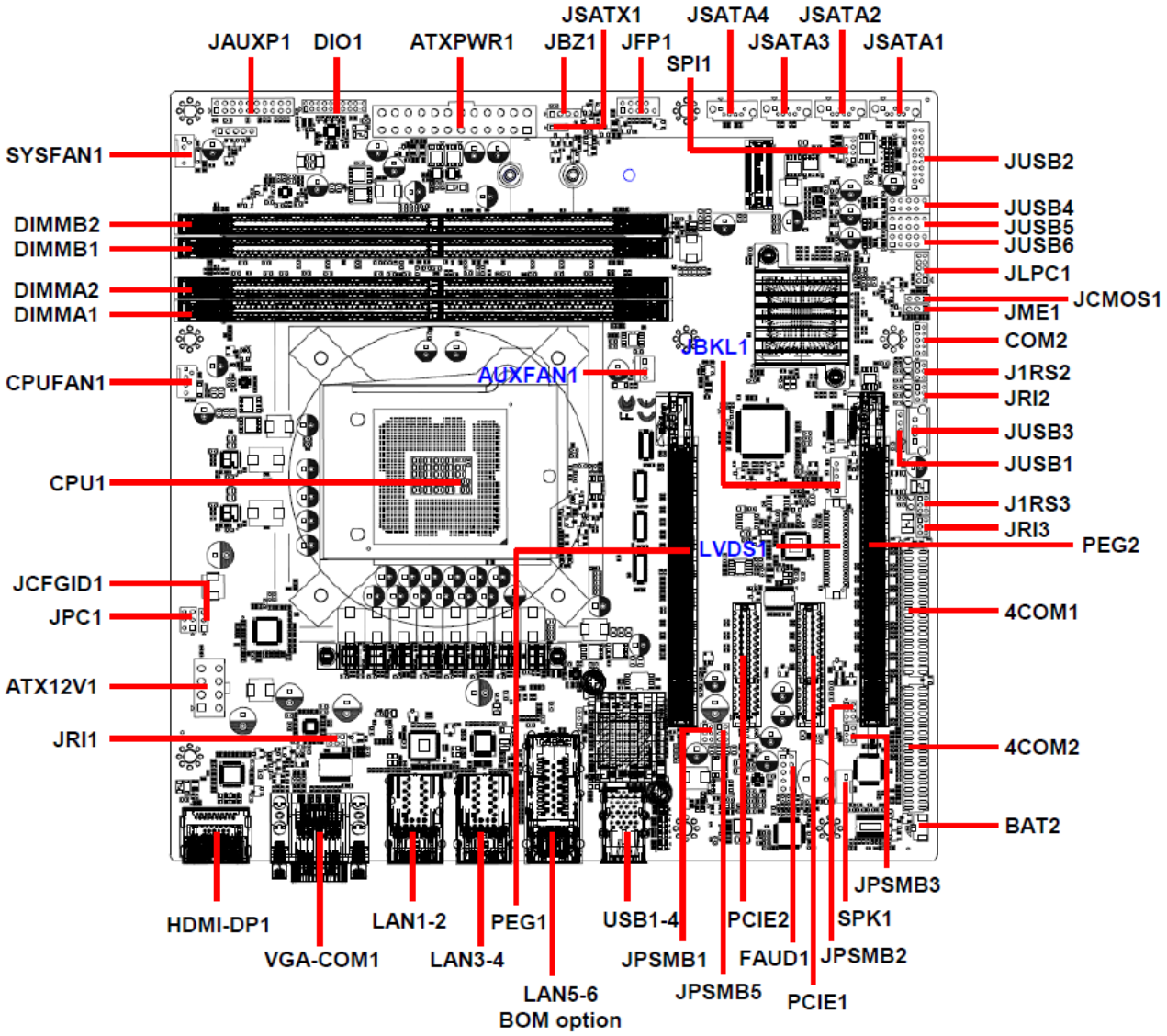
1.6 Architecture Overview—Block Diagram

The following block diagram shows the architecture and main components of ERX-W480P.



2. Hardware Configuration

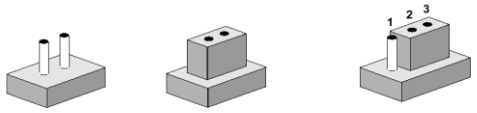
2.1 Product Overview



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.



Open Closed Closed 2-3

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

Open Closed Closed 2-3

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

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

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

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

Jumpers

Label	Function	Note
JRI1/2/3	Serial port 1/2/3 pin9 signal select	3 x 2 header, pitch 2.00mm
JSATX1	AT/ATX Power Mode Select	3 x 1 header, pitch 2.00mm
JME1	BIOS ME function configuration	3 x 1 header, pitch 2.54mm
JCFGID1	CPU TDP (Watts)	3 x 1 header, pitch 2.54mm
JPSMB1/2/3/5	PCI-e slot SMBus On off connector	3 x 2 header, pitch 2.00mm
JCMOS1	Clear CMOS	3 x 1 header, pitch 2.54mm

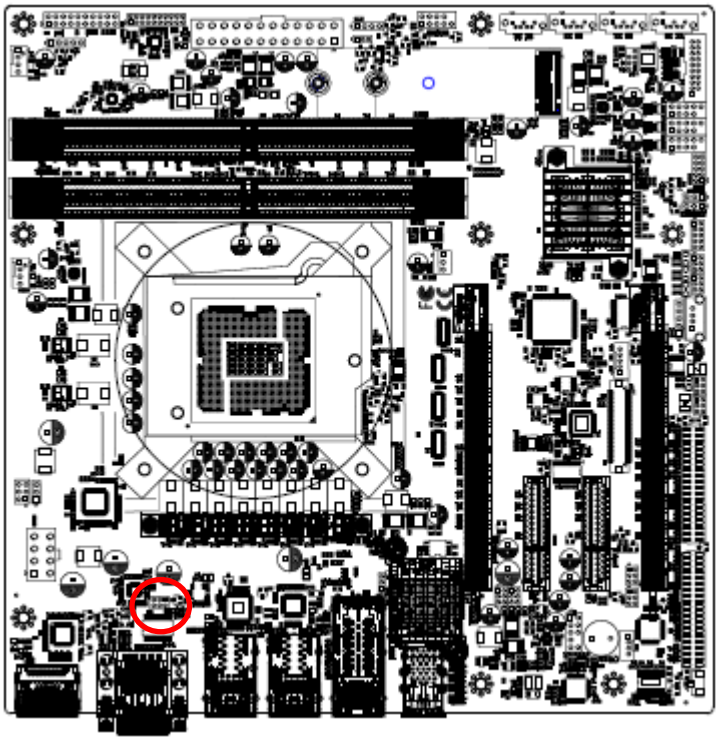
Connectors

Label	Function	Note
FAUD1	Front Audio connector	5 x 2 header, pitch 2.54mm
JBKL1	LCD Inverter connector	5 x 1 wafer, pitch 2.00mm
COM2	Serial Port 2 connector	5 x 2 header, pitch 2.00mm

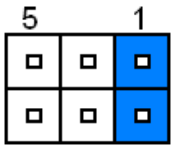
4COM1/2	Serial Port connector	20 x 2 header, pitch 2.00mm
DIO1	General purpose I/O connector	10 x 2 header, pitch 2.00mm
SPK1	Speaker connector	4 x 1 wafer, pitch 2.00mm
BAT2	Battery connector	2 x 1 wafer, pitch 1.25mm
JUSB1	USB connector	5 x 1 header, pitch 2.54mm
JUSB2	USB connector	10 x 2 header, pitch 2.00mm
JUSB3	USB connector	
JUSB4/5/6	USB connector	5 x 2 header, pitch 2.54mm
CPUFAN1	CPU fan connector	4 x 1 wafer, pitch 2.54mm
SYSFAN1	System fan connector 1 (with smart fan function supported)	4 x 1 wafer, pitch 2.54mm
JFP1	Front Panel connector	5 x 2 header, pitch 2.54 mm
DIMMA1/2	240-pin DIMM slot 1	
DIMMB1/2	240-pin DIMM slot 2	
JPC1	JPC1 connector (JPC1)	3 x 2 header, pitch 2.00 mm
JAUXP1	Auxiliary Panel connector	10 x 2 header, pitch 2.54 mm
LVDS1	LVDS connector	4 x 1 header, pitch 2.54 mm
SPI1	Miscellaneous setting connector	4 x 2 header, pitch 2.00mm
JBZ1	External Speaker connector	4 x 1 header, pitch 2.54 mm
USB1-4	USB connector1-4	
J1RS2/3	J1RS2 connector	3 x 2 header, pitch 2.00 mm
JLPC1	LPC connector	5 x 2 header, pitch 2.00mm
PCIE1/2	PCIe slot 1/2	
AUXFAN1	Auxiliary Fan connector	3 x 1 wafer, pitch 2.54mm
ATXPWR1	ATX Power connector	12 x 2 wafer, pitch 4.20mm
ATX12V1	Power connector	2 x 4 wafer, pitch 4.20mm
JSATA1/2/3/4	Serial ATA connector 1/2/3/4	
CPU	CPU connector	
PEG1/2	PCI-e x16 slots 1/2	

2.3 Setting Jumpers & Connectors

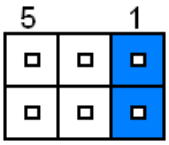
2.3.1 Serial port 1 pin9 signal select (JRI1)



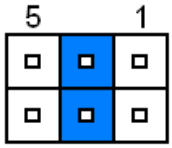
Ring*



+12V

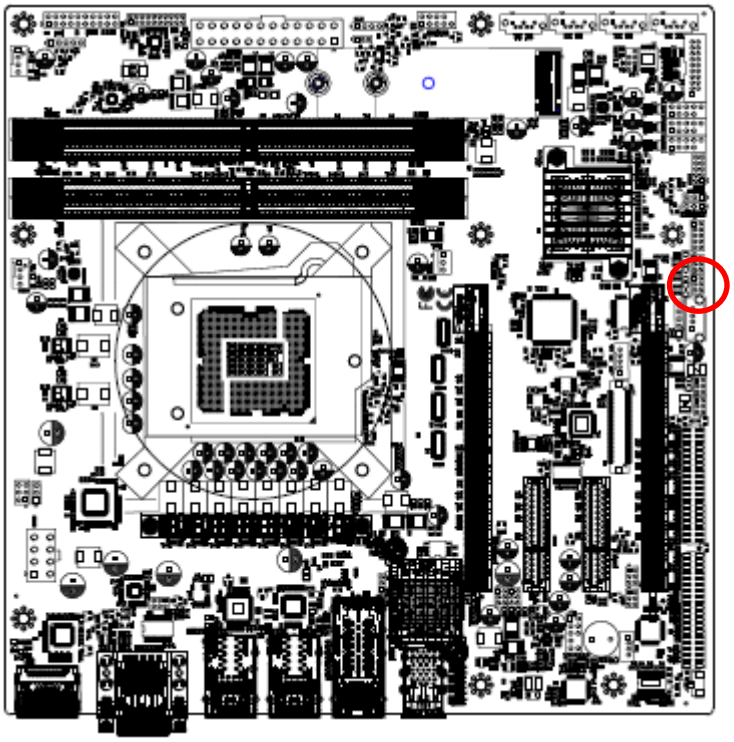


+5V



*** Default**

2.3.2 Serial port 2 pin9 signal select (JRI2)



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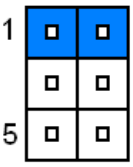
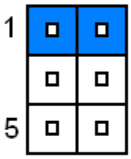
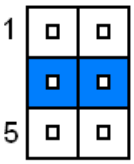


+12V

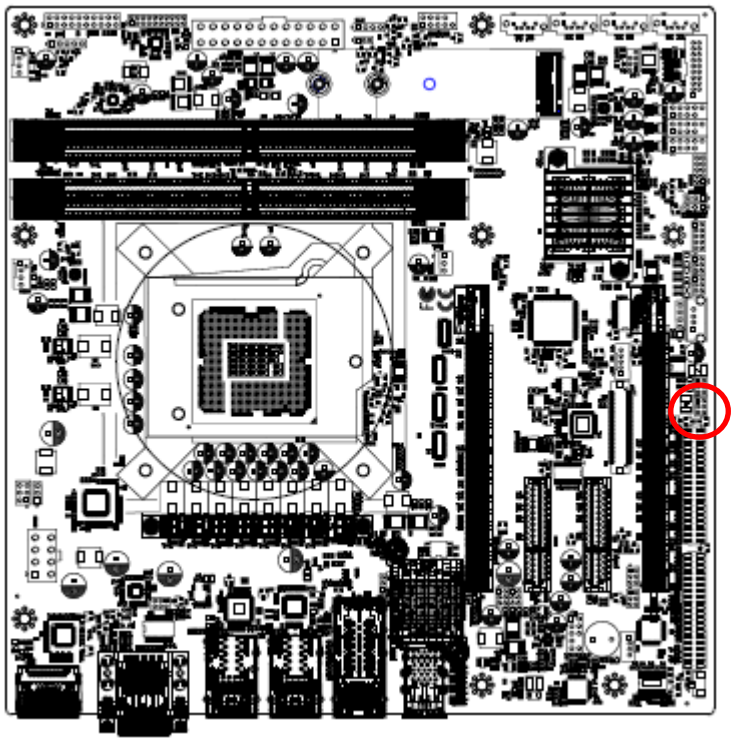


+5V

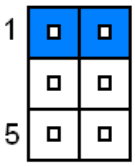


*** Default**

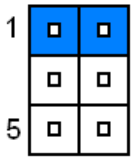
2.3.3 Serial port 3 pin9 signal select (JRI3)



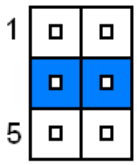
Ring*



+12V

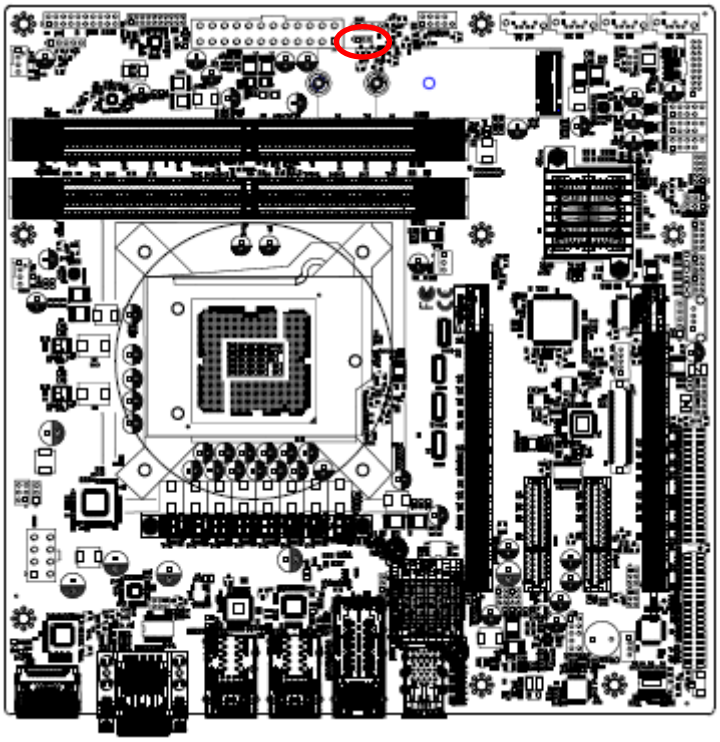


+5V

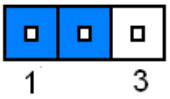


*** Default**

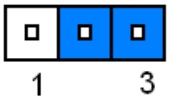
2.3.4 AT/ATX Power Mode Select (JSATX1)



AT

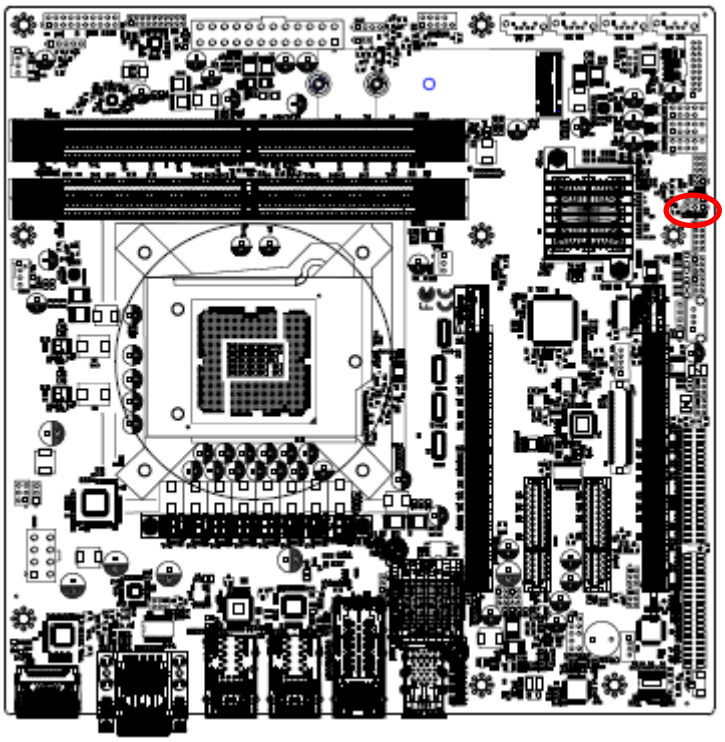


ATX*

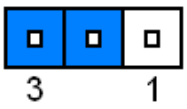


*** Default**

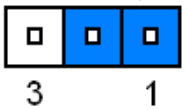
2.3.5 BIOS ME function configuration (JME1)



Enable ME *

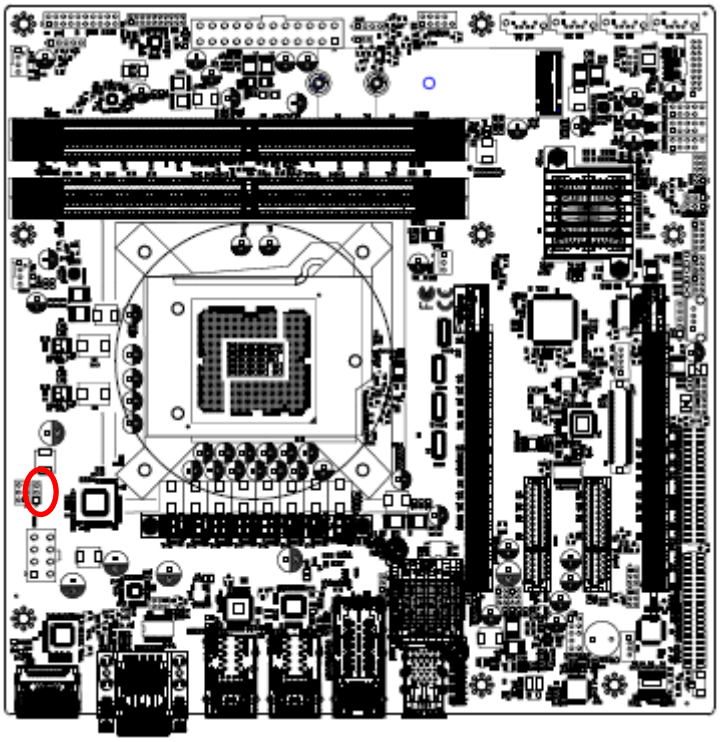


Disable ME

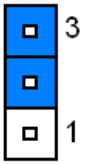


*** Default**

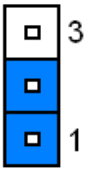
2.3.6 CPU TDP (Watts) (JCFGID1)



Config ID1 *



Config ID0

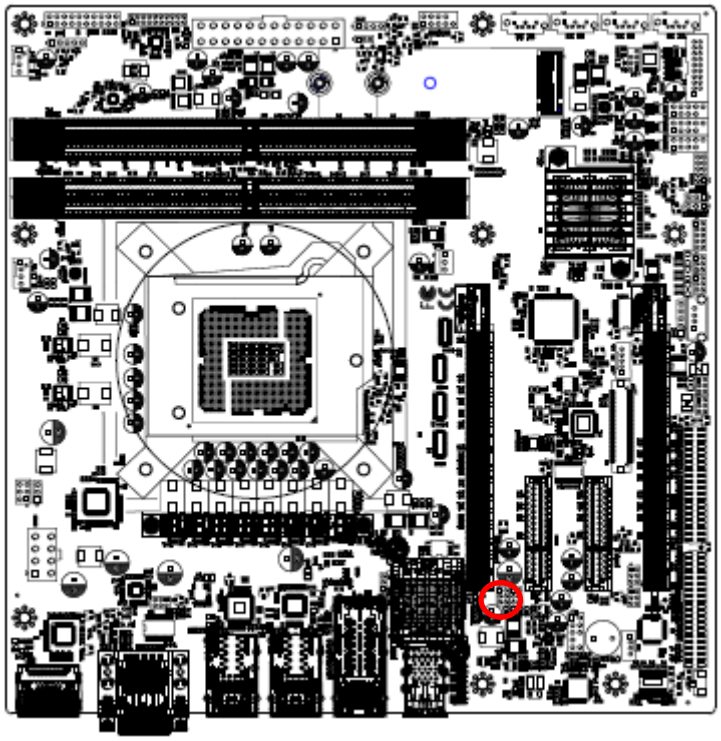


*** Default**

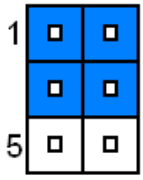
Note: Config ID0: JCFGID1(1-2) (For debug only)

Config ID1: JCFGID1(2-3) For CPU Power FW setting (Default).

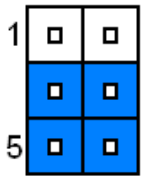
2.3.7 PCI-e slot SMBus On off connector (JPSMB1)



SMBus ON*

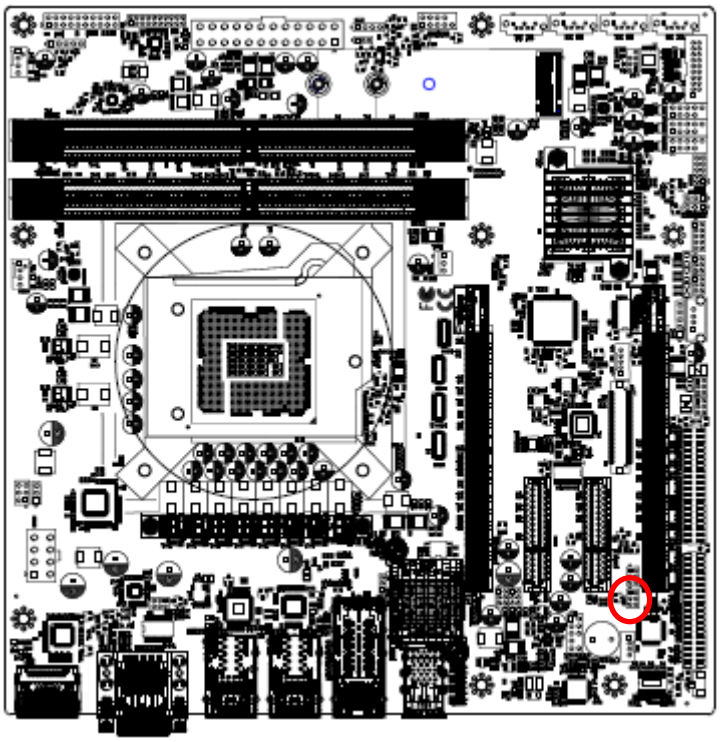


SMBus OFF

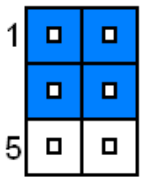


*** Default**

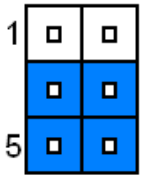
2.3.8 PCI-e slot SMBus On off connector (JPSMB2)



SMBus ON*

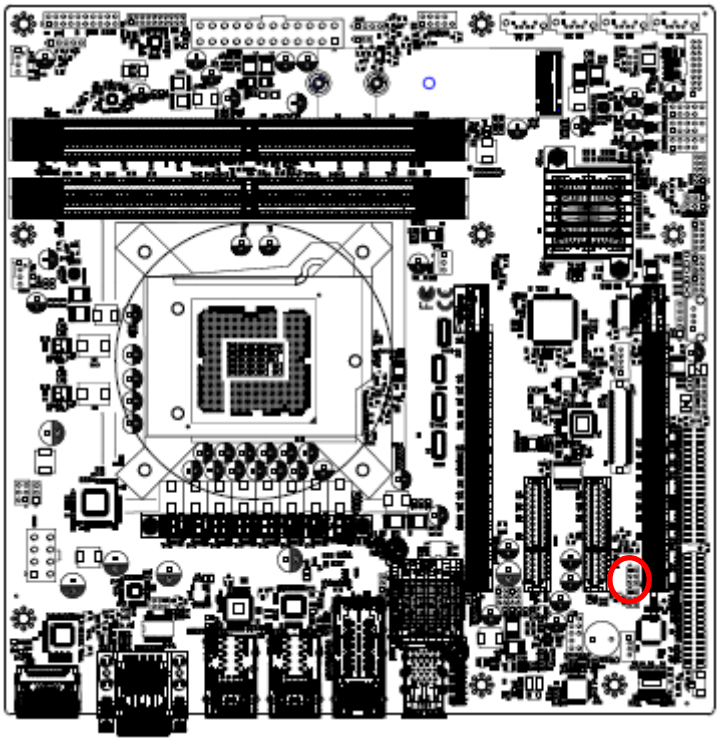


SMBus OFF

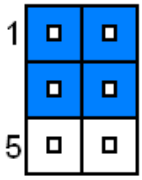


*** Default**

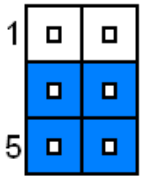
2.3.9 PCI-e slot SMBus On off connector (JPSMB3)



SMBus ON*

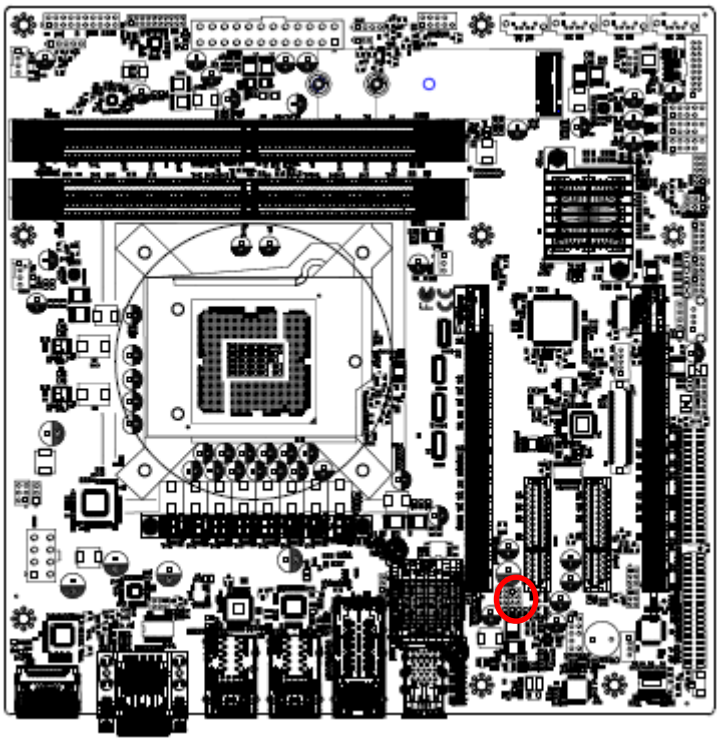


SMBus OFF

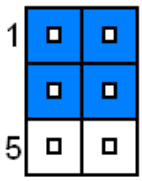


*** Default**

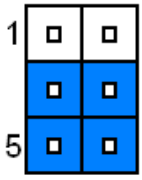
2.3.10 PCI-e slot SMBus On off connector (JPSMB5)



SMBus ON*

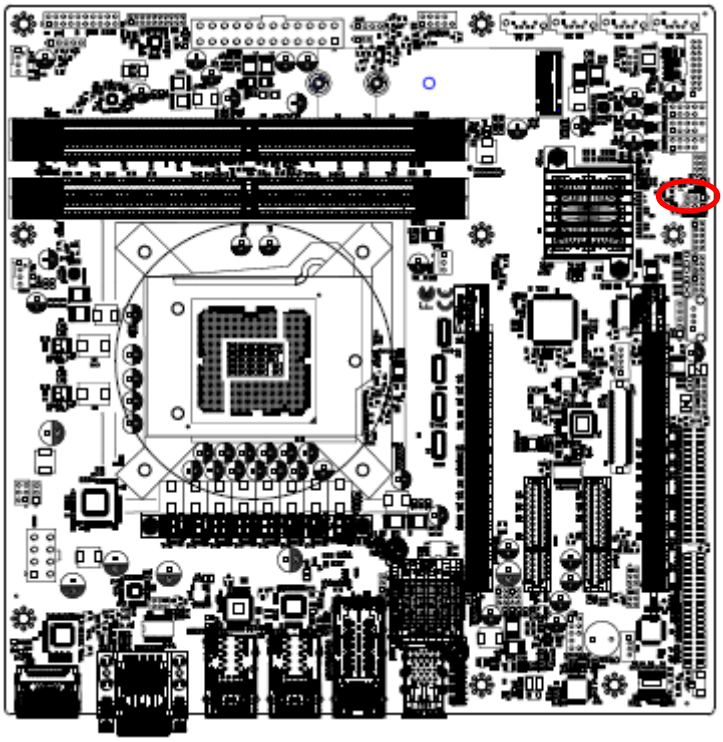


SMBus OFF

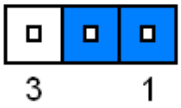


*** Default**

2.3.11 Clear CMOS (JCMOS1)



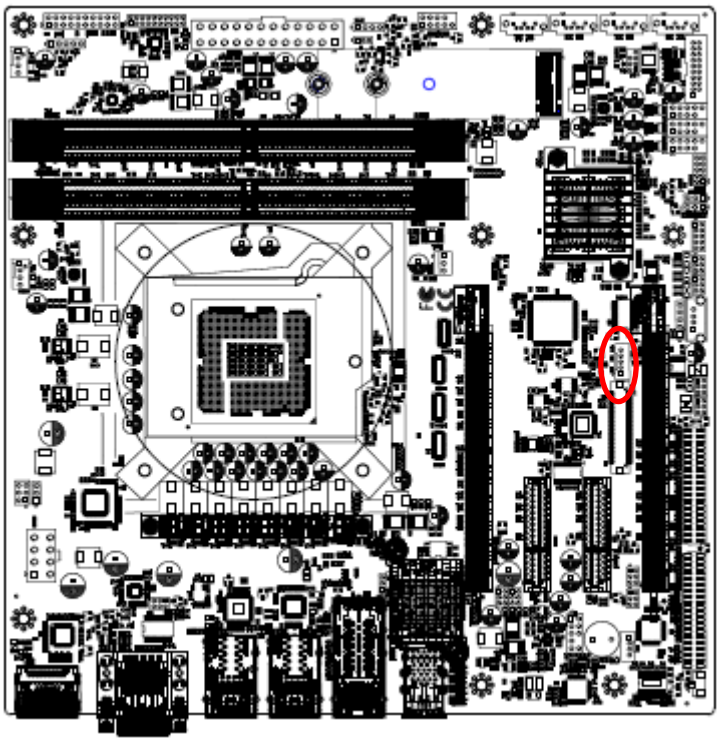
Protect*

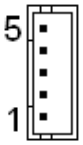


Clear CMOS

*** Default**

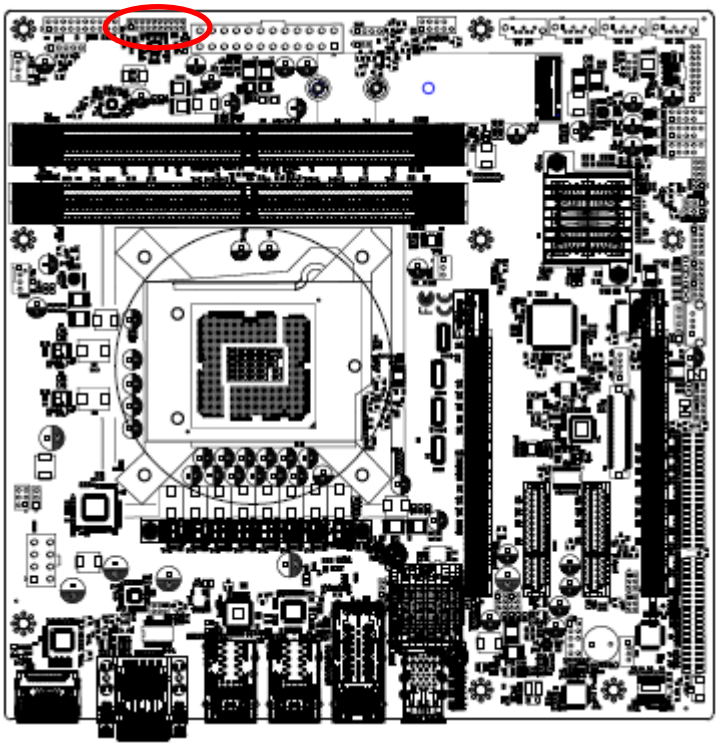
2.3.12 LCD Inverter connector (JBKL1)

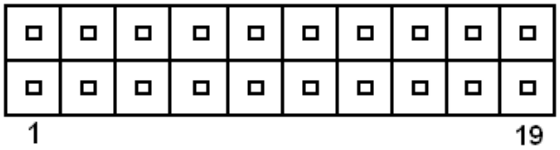




PIN	Signal
5	+5V
4	LVDS_BKLTEN
3	LVDS_BKLADJ
2	GND
1	+12V

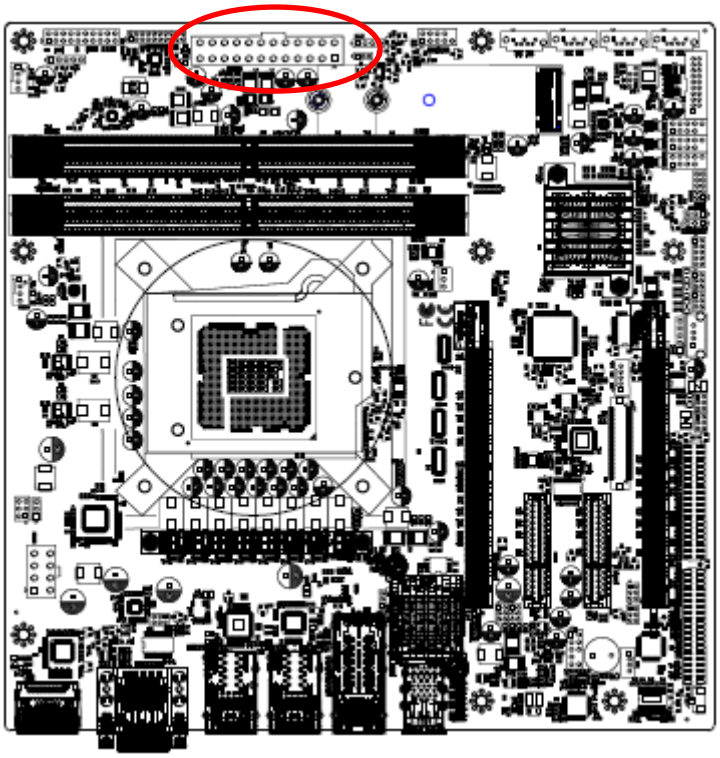
2.3.13 General purpose I/O connector (DIO1)

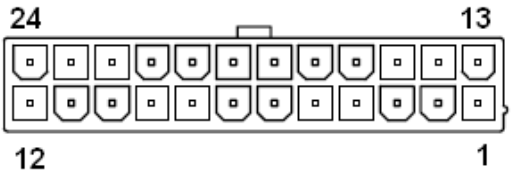




Signal	PIN	PIN	Signal
DI0	1	2	DO0
DI1	3	4	DO1
DI2	5	6	DO2
DI3	7	8	DO3
DI4	9	10	DO4
DI5	11	12	DO5
DI6	13	14	DO6
DI7	15	16	DO7
5V_SMB_CLK	17	18	5V_SMB_DATA
GND	19	20	+5V

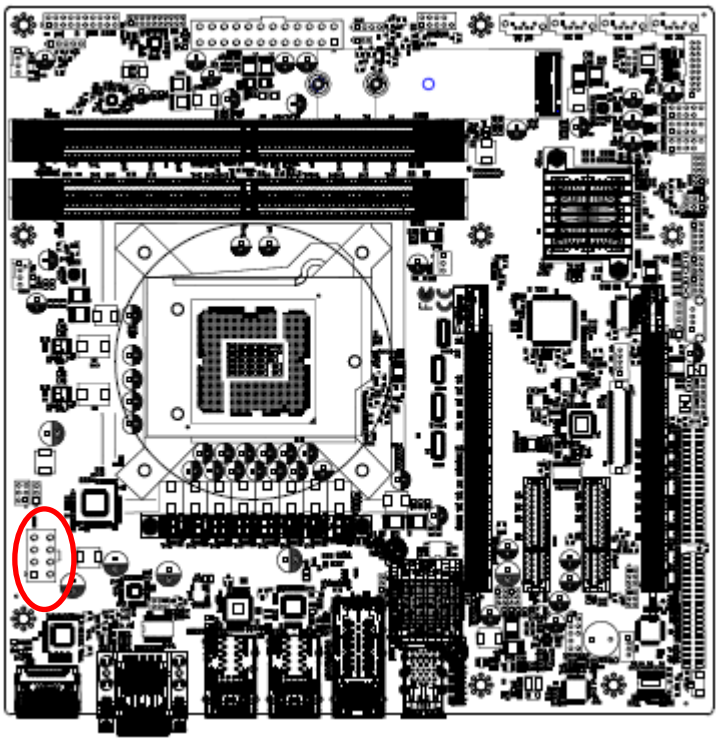
2.3.14 ATX Power connector (ATXPWR1)

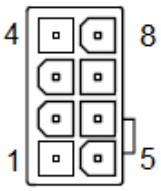




Signal	PIN	PIN	Signal
+3.3V	1	13	+3.3V
+3.3V	2	14	NC
GND	3	15	GND
+5V	4	16	ATX_PSON#
GND	5	17	GND
+5V	6	18	GND
GND	7	19	GND
ATX24_PWROK	8	20	NC
+V5A_SB	9	21	+5V
+12V	10	22	+5V
+12V	11	23	+5V
+3.3V	12	24	GND

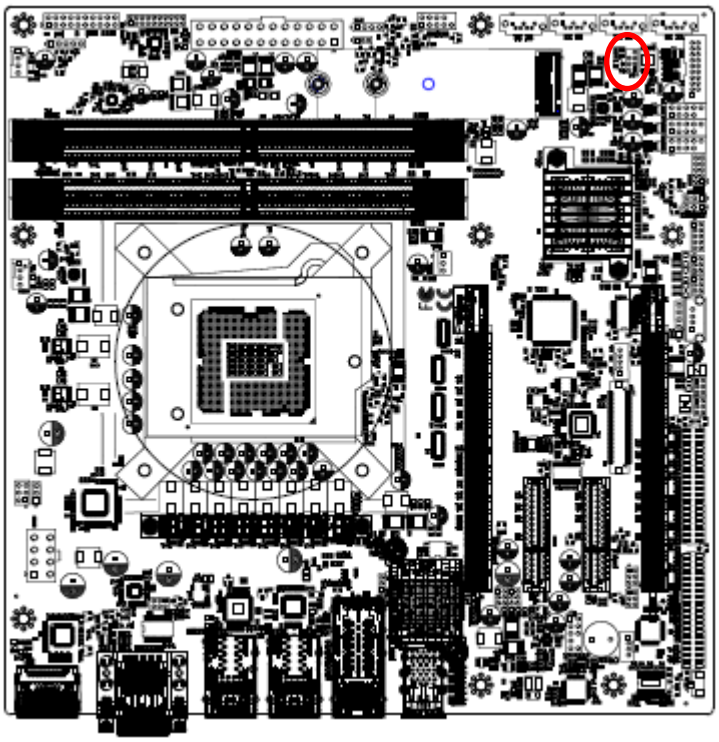
2.3.15 Power connector (ATX12V1)

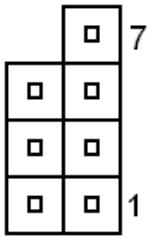




Signal	PIN	PIN	Signal
ATX_2X4_DET	4	8	+V12S_CPU
GND	3	7	+V12S_CPU
GND	2	6	+V12S_CPU
GND	1	5	+V12S_CPU

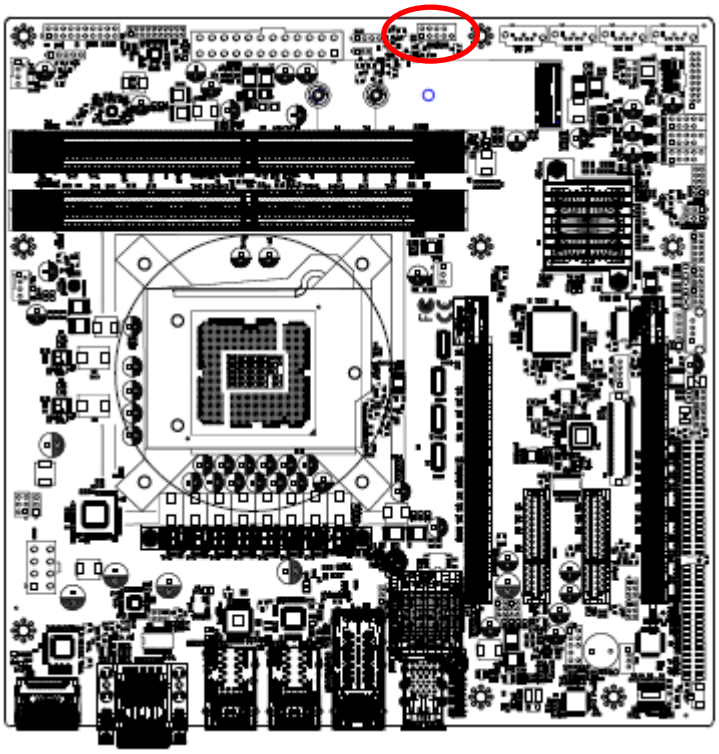
2.3.16 Miscellaneous setting connector (SPI1)

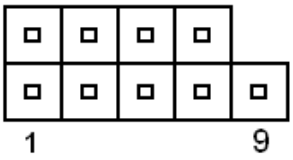




Signal	PIN	PIN	Signal
		7	SPI_HOLD#
SPI_MOSI	6	5	SPI_MISO
SPI_CLK	4	3	SPI_CS0#
GND	2	1	+ V3.3A_SPI

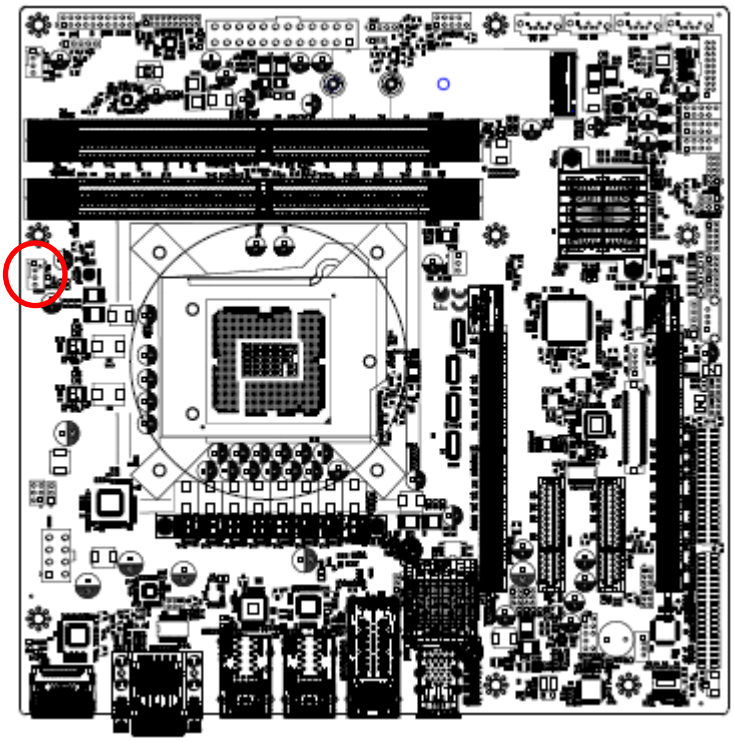
2.3.17 Front Panel connector (JFP1)

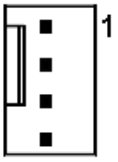




Signal	PIN	PIN	Signal
		9	NC
GND	8	7	GND
PWRBTN#	6	5	SYS_RST#
PWR_LED-	4	3	HDD_LED-
PWR_LED+	2	1	HDD_LED+

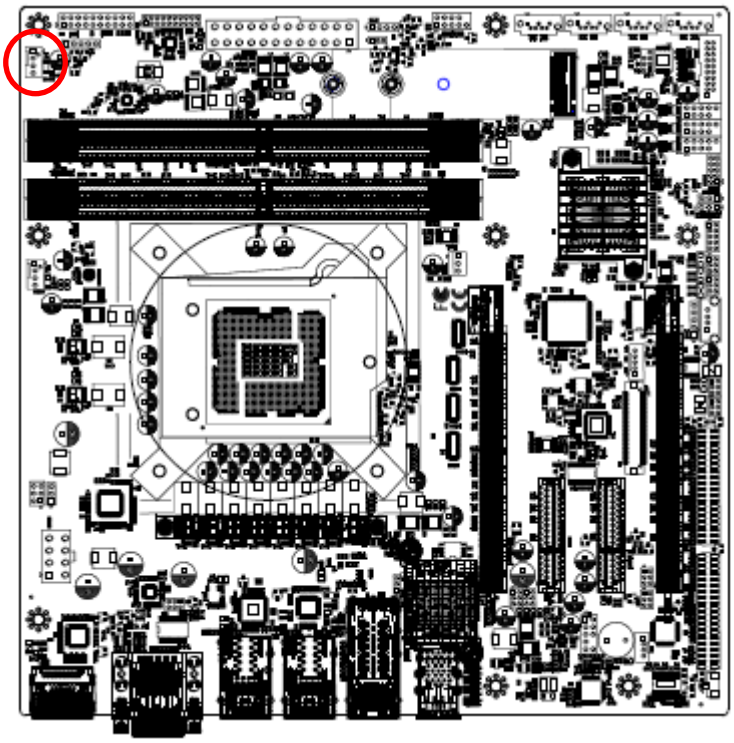
2.3.18 CPU fan connector (CPUFAN1)

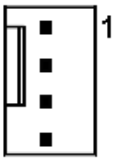




Signal	PIN
GND	1
+12V	2
CPU_ FANIN	3
CPU_FANOUT	4

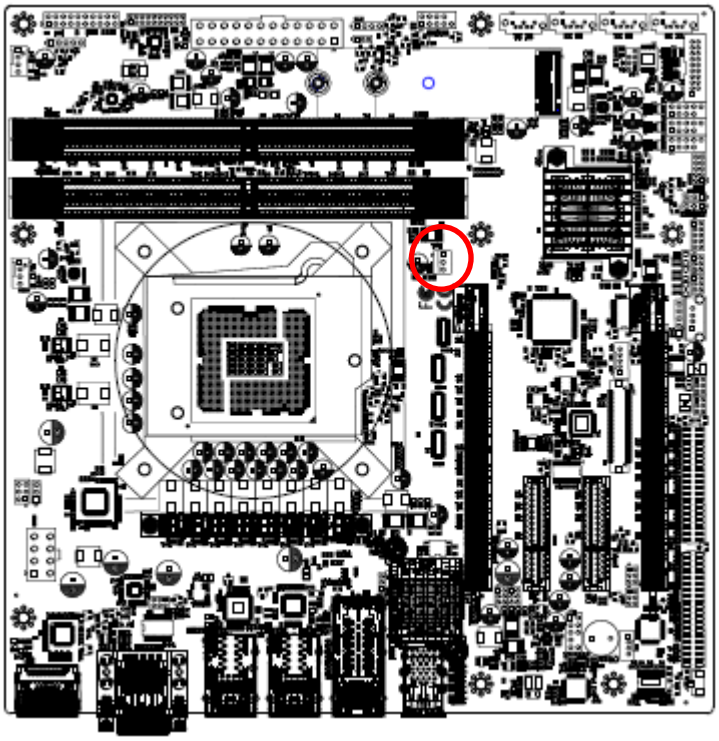
2.3.19 System fan connector 1 (SYSFAN1)

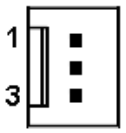




Signal	PIN
GND	1
+12V	2
SYS_ FANIN	3
SYS_FANOUT	4

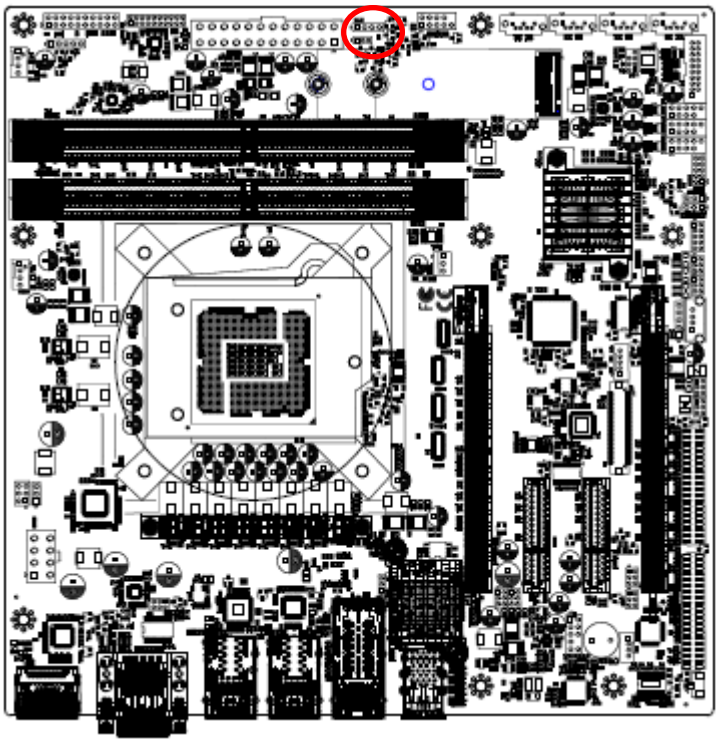
2.3.20 Auxiliary Fan connector (AUXFAN1)

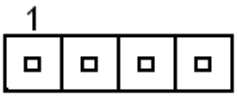




Signal	PIN
GND	1
+12V	2
AUX_R_FANIN	3

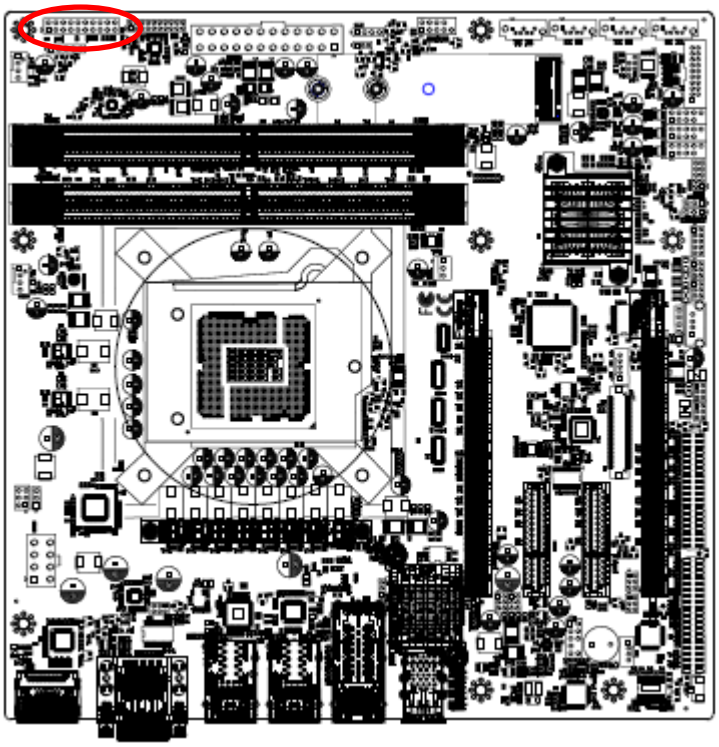
2.3.21 External Speaker connector (JBZ1)

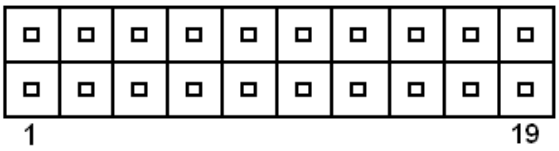




Signal	PIN
+5V	1
NC	2
NC	3
GND	4

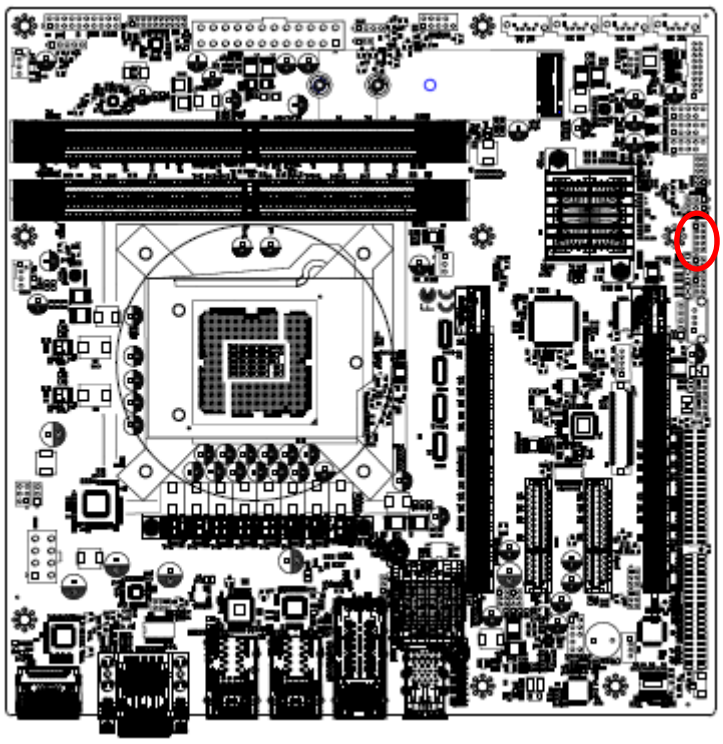
2.3.22 Auxiliary Panel connector (JAUXP1)

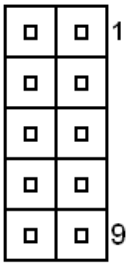




Signal	PIN	PIN	Signal
+5V	1	2	NC
NC	3	4	SMB_CLK
CASEOPEN#	5	6	NC
GND	7	8	GND
ERROR_LED+	9	10	SMB_DATA
ERROR_LED-	11	12	+5V
FRONT_LAN1_ACT	13	14	FRONT_LAN3_ACT
GND	15	16	FRONT_LAN4_ACT
FRONT_LAN2_ACT	17	18	FRONT_LAN5_ACT
GND	19	20	FRONT_LAN6_ACT

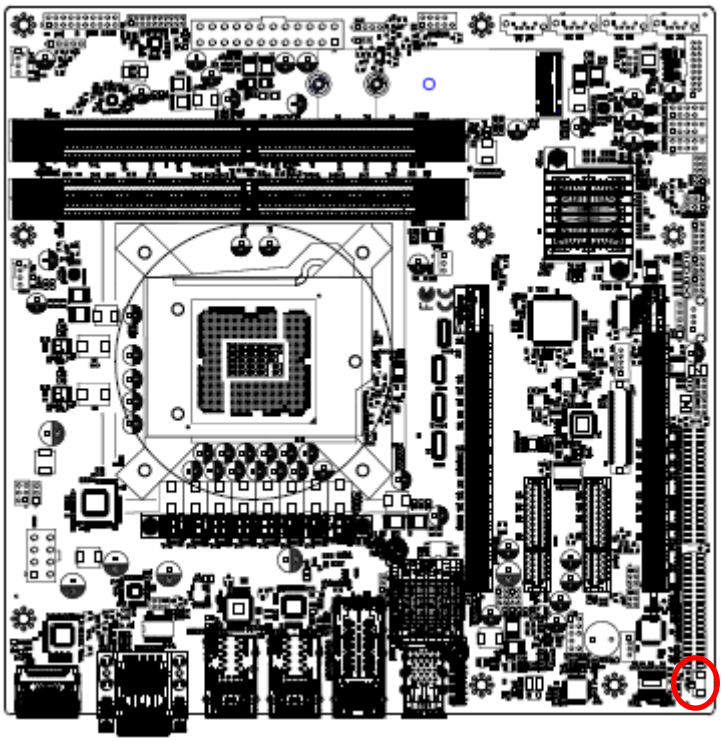
2.3.23 Serial port 2 connector (COM2)

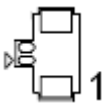




Signal	PIN	PIN	Signal
NRXDB	2	1	NDCDB#
NDTRB#	4	3	NTXDB
NDSRB#	6	5	GND
NCTSB#	8	7	NRTSB#
NC	10	9	NRIB#

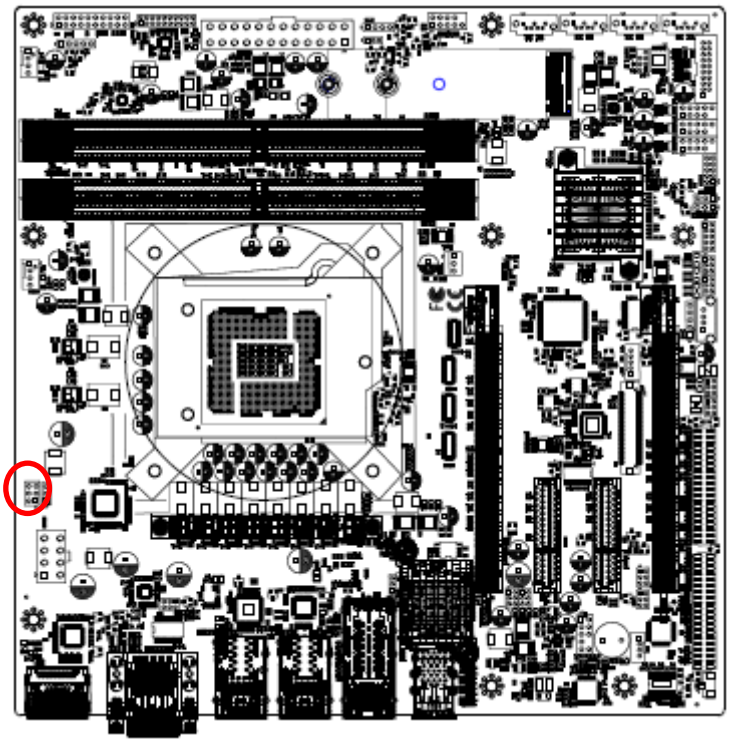
2.3.24 Battery connector (BAT2)

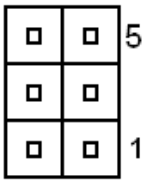




Signal	PIN
GND	1
+3.3V	2

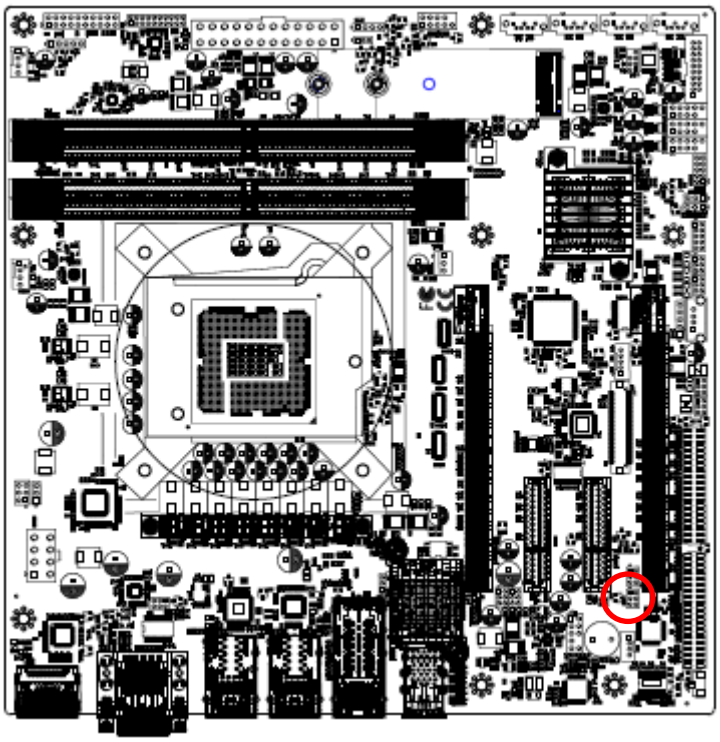
2.3.25 JPC1 connector (JPC1)





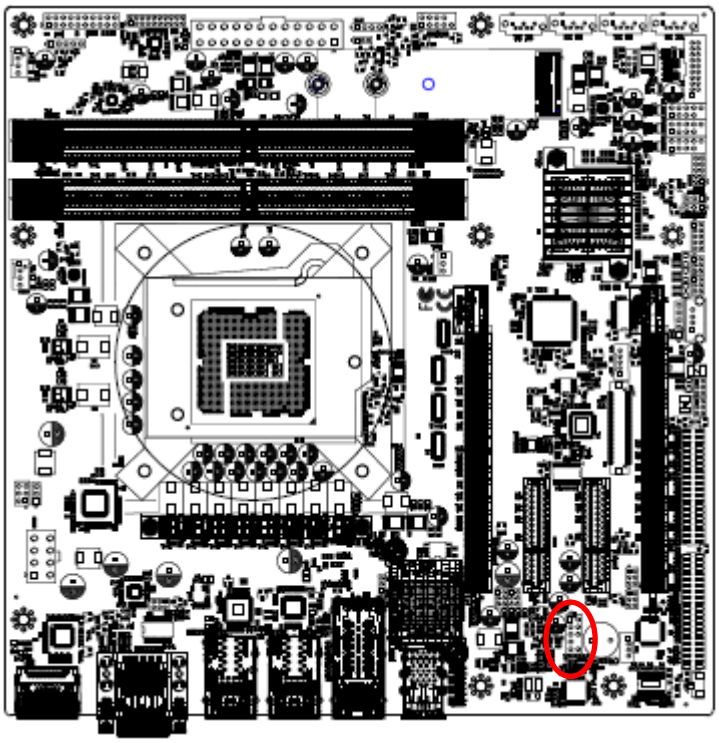
Signal	PIN	PIN	Signal
+V3.3_EXT	6	5	NC
VCCCORE_PMSCL	4	3	GND
VCCCORE_PMSDA	2	1	VCCCORE_nPMALERT

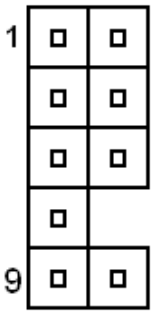
2.3.26 Speaker connector (SPK1)



Signal	PIN
LSPK+	1
LSPK-	2
RSPK+	3
RSPK-	4

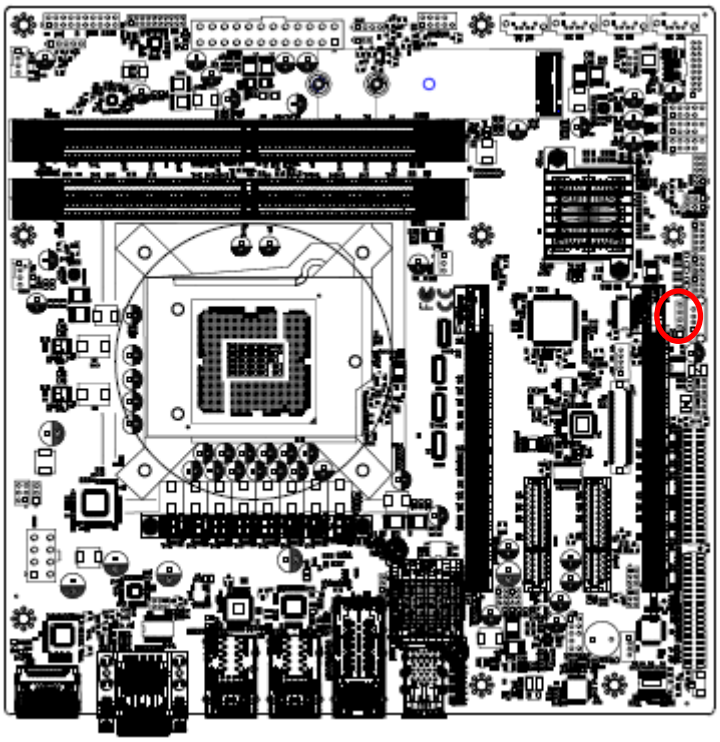
2.3.27 Front Audio connector (FAUD1)

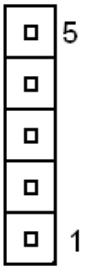




Signal	PIN	PIN	Signal
MIC_LIN	1	2	GND
MIC_RIN	3	4	ACZ_DET#
LINEOUT_R	5	6	MIC_JD
SENSE	7		
LINEOUT_L	9	10	LINEOUT_JD

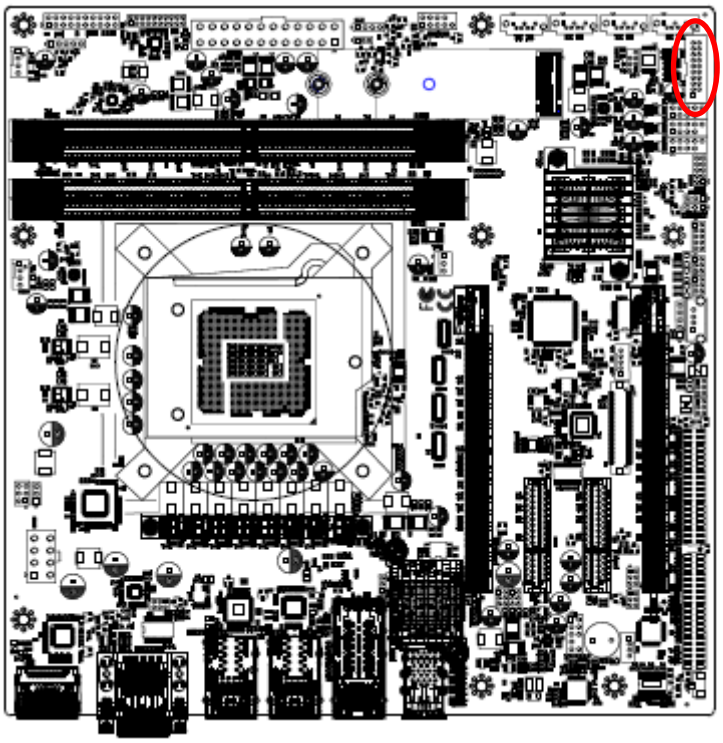
2.3.28 USB connector (JUSB1)

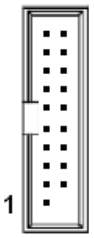




Signal	PIN
NC	5
GND	4
USB_P14	3
USB_N14	2
+V5A_USB13_14	1

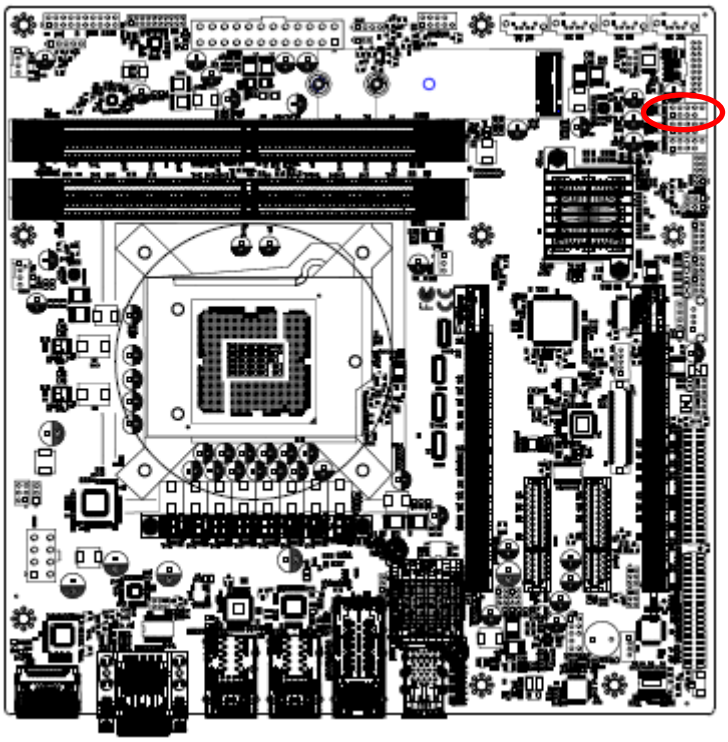
2.3.29 USB connector (JUSB2)

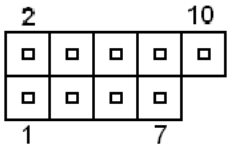




Signal	PIN	PIN	Signal
NC	10	11	USB_P5
USB_P6	9	12	USB_N5
USB_N6	8	13	GND
GND	7	14	USB31_TXP5
USB31_TXP6	6	15	USB31_TXN5
USB31_TXN6	5	16	GND
GND	4	17	USB31_RXP5
USB31_RXP6	3	18	USB31_RXN5
USB31_RXN6	2	19	+V5A_USB5_6
+V5A_USB5_6	1		

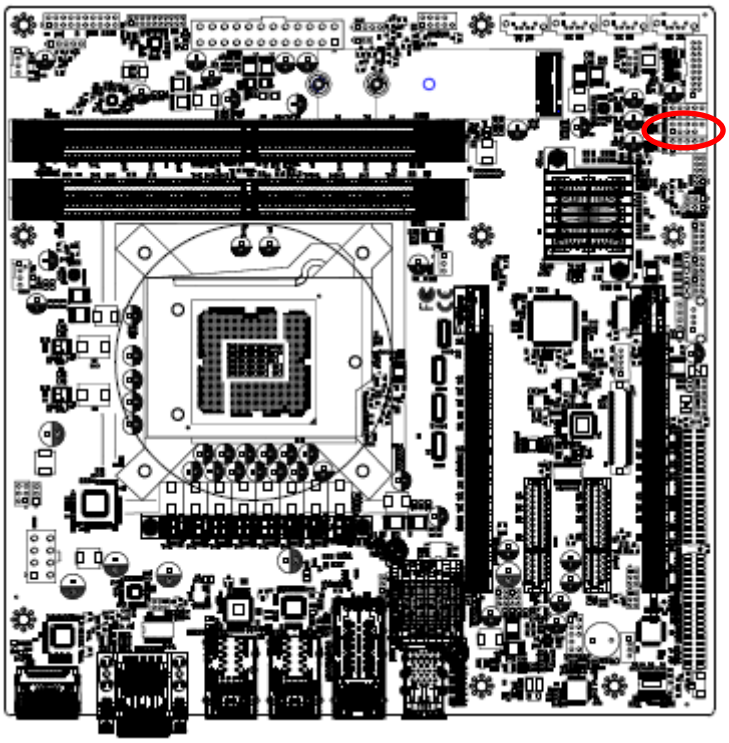
2.3.30 USB connector (JUSB4)

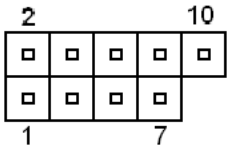




Signal	PIN	PIN	Signal
NC	10		
GND	8	7	GND
USB_8P	6	5	USB_7P
USB_8N	4	3	USB_7N
+5VA_USB78	2	1	+5VA_USB78

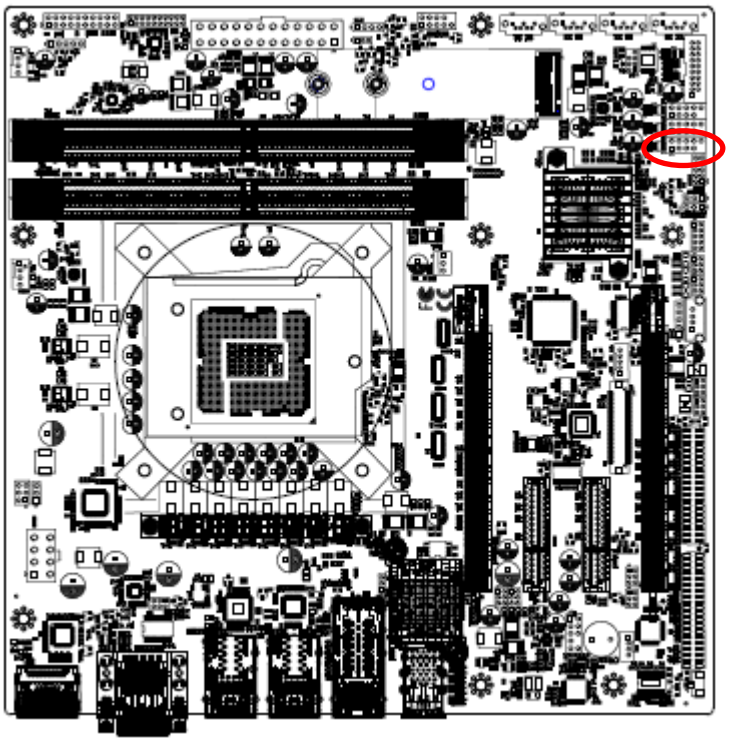
2.3.31 USB connector (JUSB5)

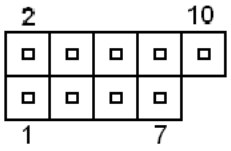




Signal	PIN	PIN	Signal
NC	10		
GND	8	7	GND
USB_8P	6	5	USB_7P
USB_8N	4	3	USB_7N
+5VA_USB78	2	1	+5VA_USB78

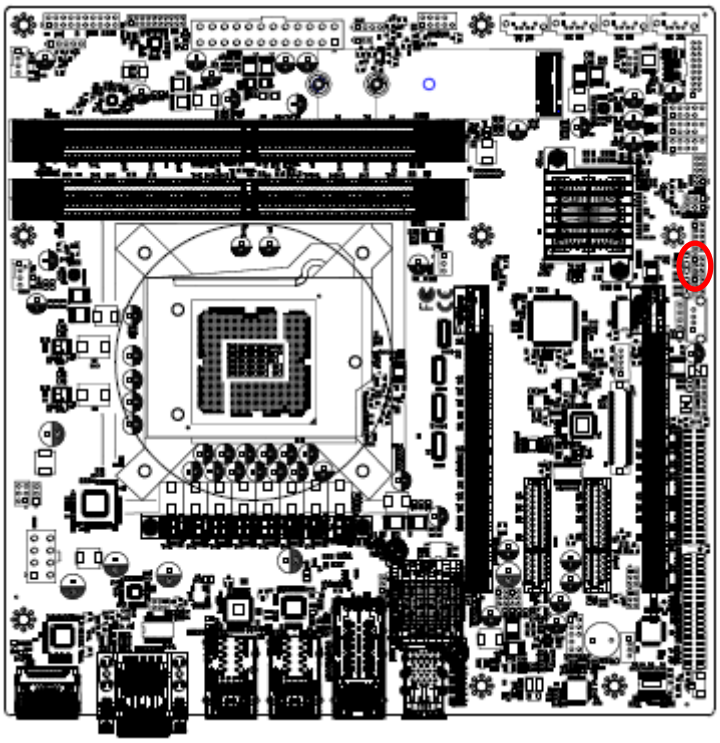
2.3.32 USB connector (JUSB6)

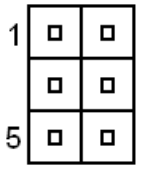




Signal	PIN	PIN	Signal
NC	10		
GND	8	7	GND
USB_11P	6	5	USB_12P
USB_11N	4	3	USB_12N
+5VA_USB11_12	2	1	+5VA_USB11_12

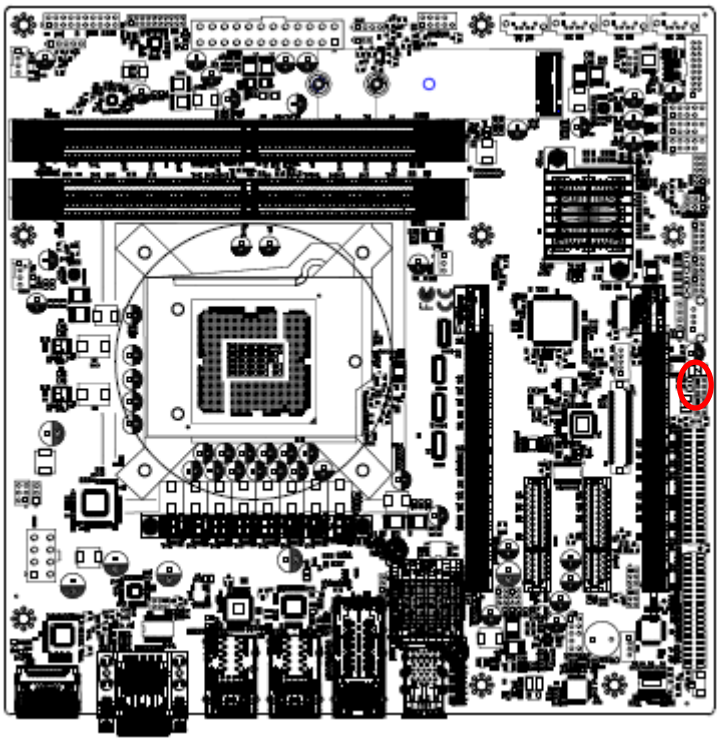
2.3.33 J1RS2 connector (J1RS2)

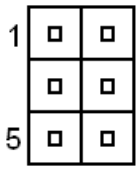




Signal	PIN	PIN	Signal
A485TX-	1	2	A422RX-
A485TX+	3	4	A422RX+
+5V	5	6	GND

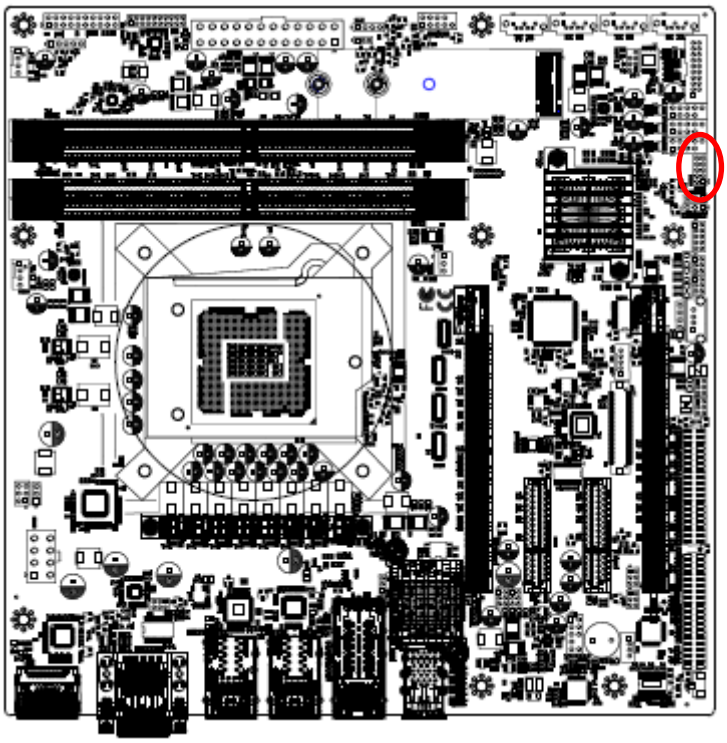
2.3.34 J1RS2 connector (J1RS3)

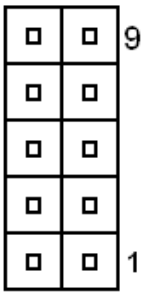




Signal	PIN	PIN	Signal
B485TX-	1	2	B422RX-
B485TX+	3	4	B422RX+
+5V	5	6	GND

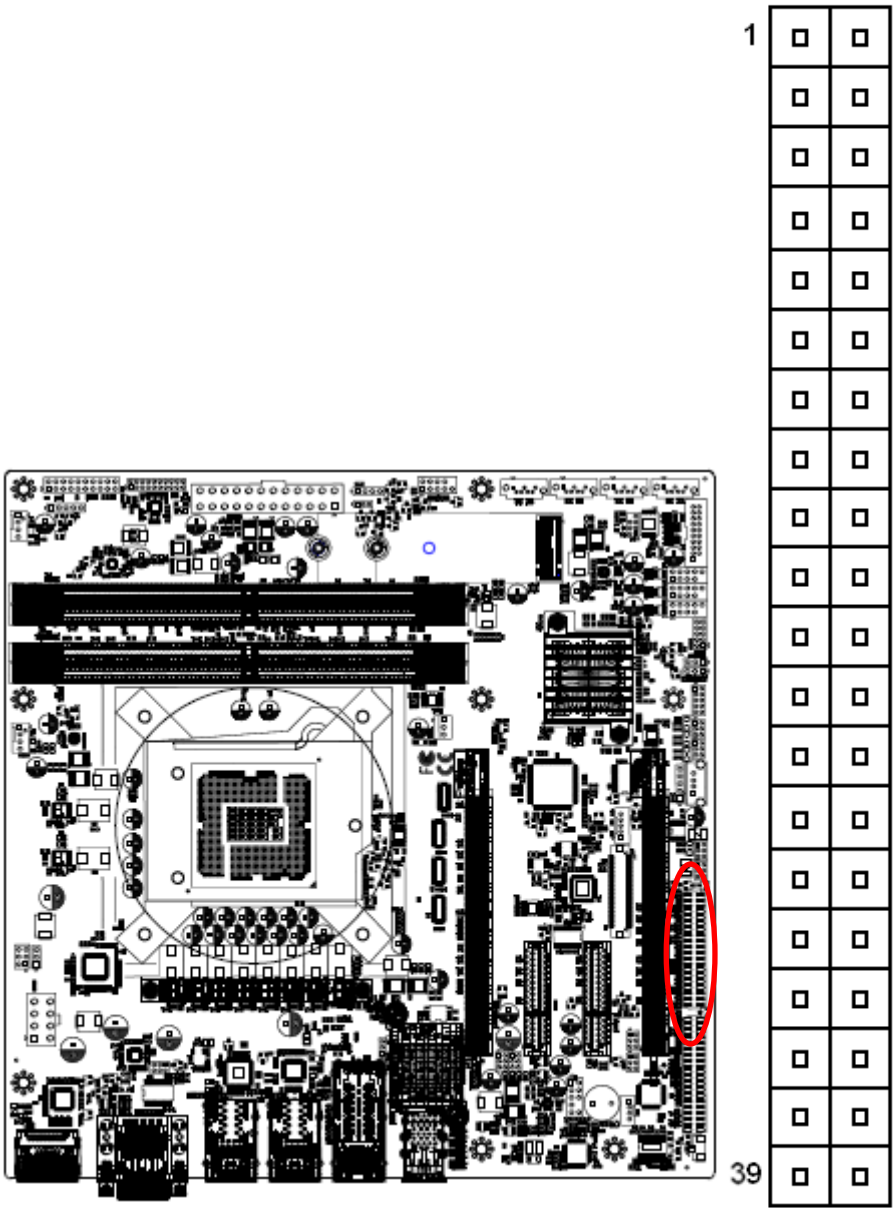
2.3.35 LPC connector (JLPC1)





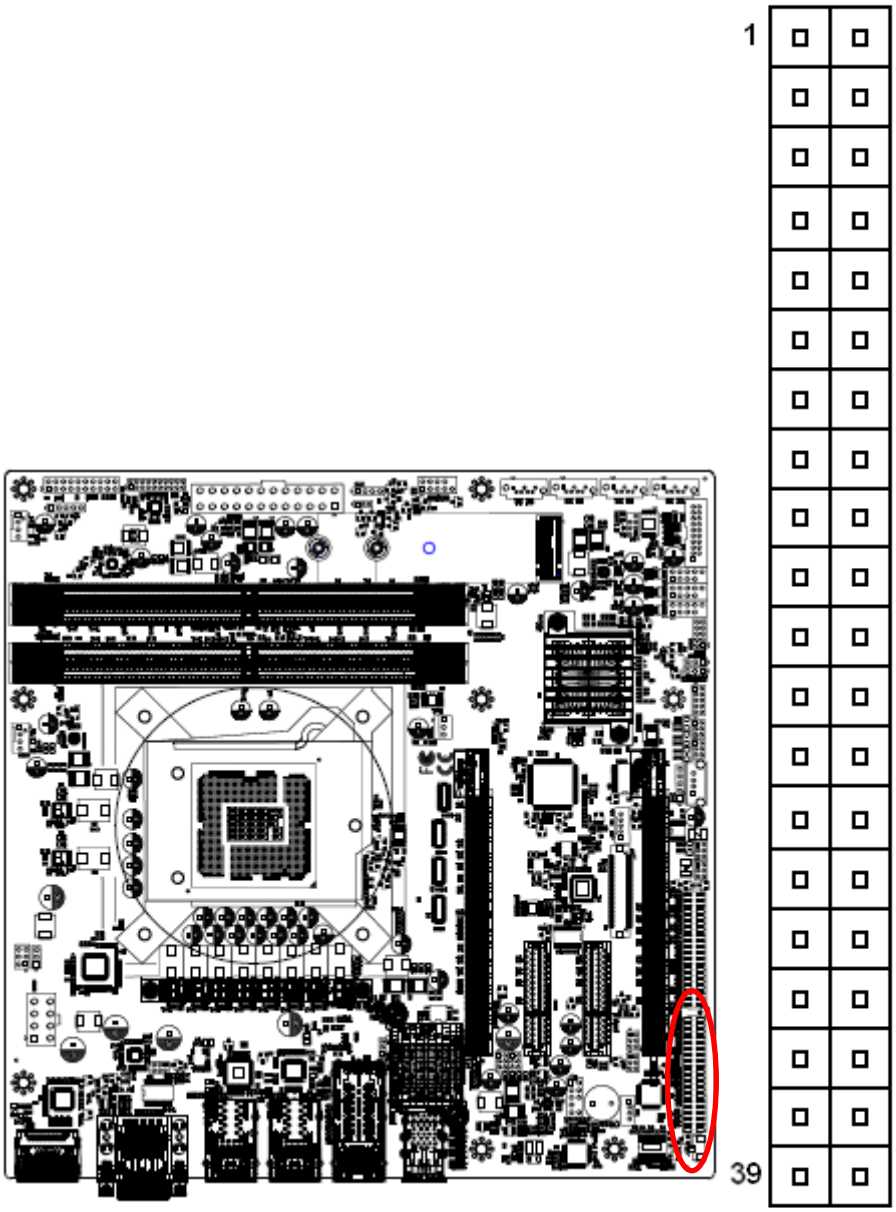
Signal	PIN	PIN	Signal
GND	10	9	LPC_SERIRQ
LPC_DEG_CLK	8	7	LPC_AD3
LPC_FRAME#	6	5	LPC_AD2
PLT_RST#_BUF	4	3	LPC_AD1
+3.3V	2	1	LPC_AD0

2.3.36 Serial port connector (4COM1)



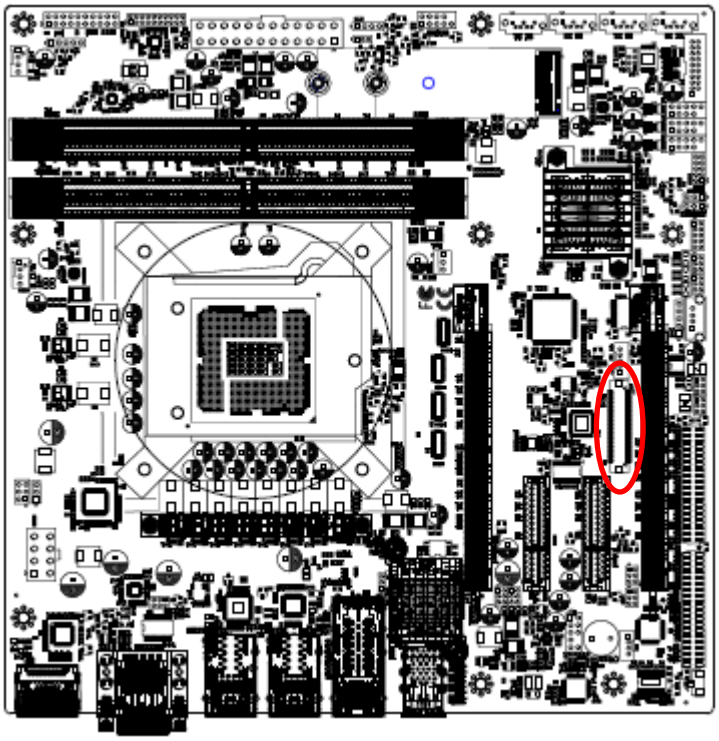
Signal	PIN	PIN	Signal
NDCDC#	1	2	NRXDC
NTXDC	3	4	NDTRC#
GND	5	6	NDSRC#
NRTSC#	7	8	NCTSC#
NRIC#	9	10	NC
NDCDD#	11	12	NRXDD
NTXDD	13	14	NDTRD#
GND	15	16	NDSRD#
NRTSD#	17	18	NCTSD#
NRID#	19	20	NC
NDCDE#	21	22	NRXDE
NTXDE	23	24	NDTRE#
GND	25	26	NDSRE#
NRTSE#	27	28	NCTSE#
NRIE#	29	30	NC
NDCDF#	31	32	NRXDF
NTXDF	33	34	NDTRF#
GND	35	36	NDSRF#
NRTSF#	37	38	NCTSF#
NRIF#	39	40	NC

2.3.37 Serial port connector (4COM2)



Signal	PIN	PIN	Signal
NDCD1#	1	2	NRXD1
NTXD1	3	4	NDTR1#
GND	5	6	NDSR1#
NRTS1#	7	8	NCTS1#
NRI1#	9	10	NC
NDCD2#	11	12	NRXD2
NTXD2	13	14	NDTR2#
GND	15	16	NDSR2#
NRTS2#	17	18	NCTS2#
NRI2#	19	20	NC
NDCD3#	21	22	NRXD3
NTXD3	23	24	NDTR3#
GND	25	26	NDSR3#
NRTS3#	27	28	NCTS3#
NRI3#	29	30	NC
NDCD4#	31	32	NRXD4
NTXD4	33	34	NDTR4#
GND	35	36	NDSR4#
NRTS4#	37	38	NCTS4#
NRI4#	39	40	NC

2.3.38 LVDS connector (LVDS1)



Signal	PIN	PIN	Signal
LVDS_VDD5	2	1	LVDS_VDD33V
LVDS_VDD5	4	3	LVDS_VDD33V
NC	6	5	NC
GND	8	7	GND
LVDS_DATAP0	10	9	LVDS_DATAP1
LVDS_DATAN0	12	11	LVDS_DATAN1
GND	14	13	GND
LVDS_DATAP2	16	15	LVDS_DATAP3
LVDS_DATAN2	18	17	LVDS_DATAN3
GND	20	19	GND
LVDS_DATAP4	22	21	LVDS_DATAP5
LVDS_DATAN4	24	23	LVDS_DATAN5
GND	26	25	GND
LVDS_DATAP6	28	27	LVDS_DATAP7
LVDS_DATAN6	30	29	LVDS_DATAN7
GND	32	31	GND
LVDS_CLK1P	34	33	LVDS_CLK2P
LVDS_CLK1N	36	35	LVDS_CLK2N
GND	38	37	GND
LVDS_VDD12V	40	39	LVDS_VDD12V

3.BIOS Setup

3.1 Introduction

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

3.2 Starting Setup

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

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

Press <Del> or <F2> to enter SETUP

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

Press F1 to Continue, DEL to enter SETUP

3.3 Using Setup

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

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

- **Navigating Through The Menu Bar**
  Use the left and right arrow keys to choose the menu you want to be in.

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

- **To Display a Sub Menu**
  Use the arrow keys to move the cursor to the sub menu you want. Then press <Enter>. A "➢" pointer marks all sub menus.

3.4 Getting Help

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

3.5 In Case of Problems

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

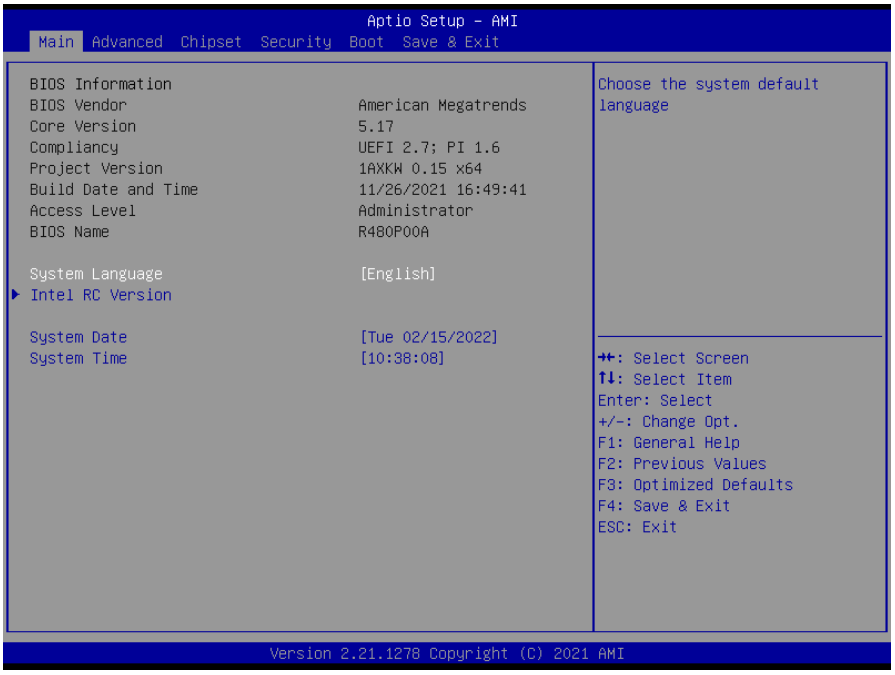
The best advice is to only alter settings which you thoroughly understand. To this end, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both BIOS Vendor and your systems manufacturer to provide the absolute maximum performance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

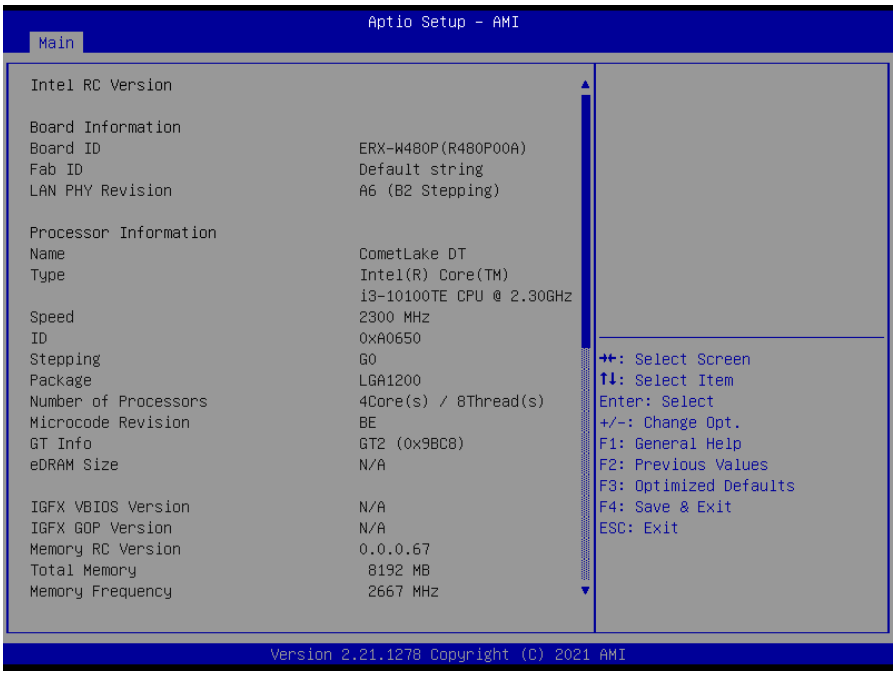
3.6 BIOS setup

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

3.6.1 Main Menu

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





3.6.1.1 System Language

This option allows choosing the system default language.

3.6.1.2 System Date

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

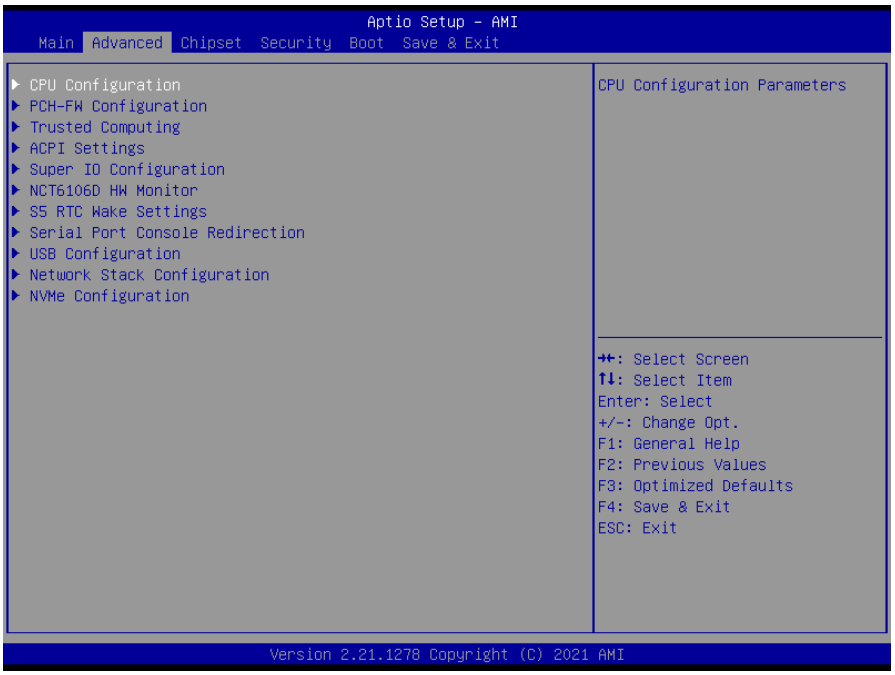
3.6.1.3 System Time

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

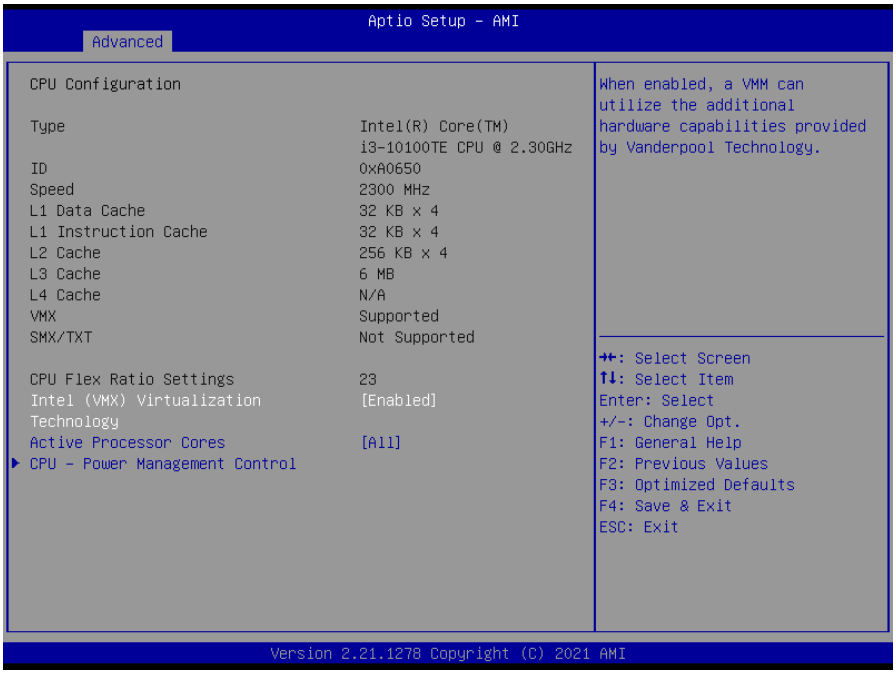
Note: The BIOS setup screens shown in this chapter are for reference purposes only, and may not exactly match what you see on your screen.
Visit the Avalue website (www.avalue.com.tw) to download the latest product and BIOS information.

3.6.2 Advanced Menu

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

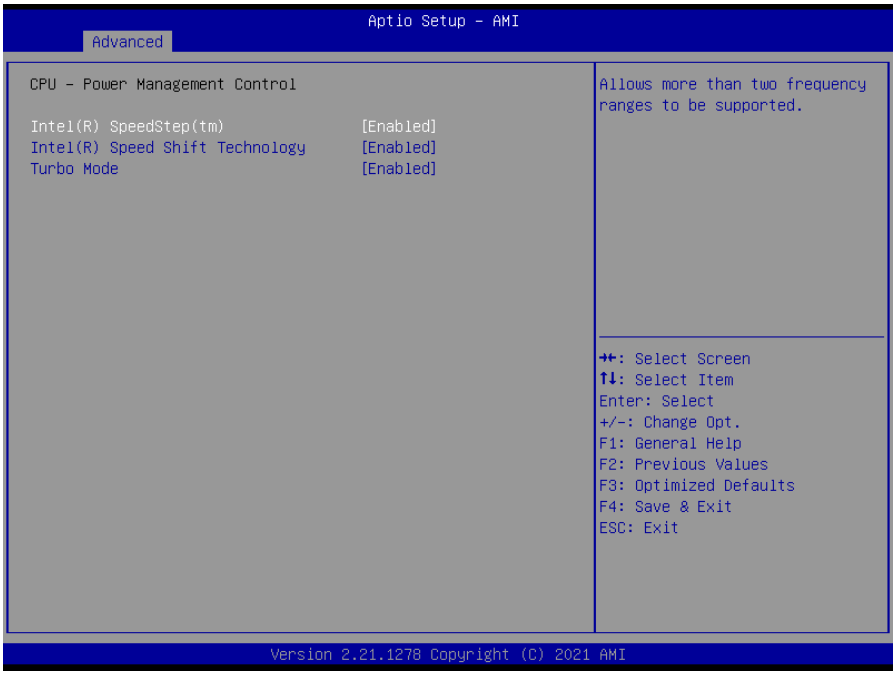


3.6.2.1 CPU Configuration



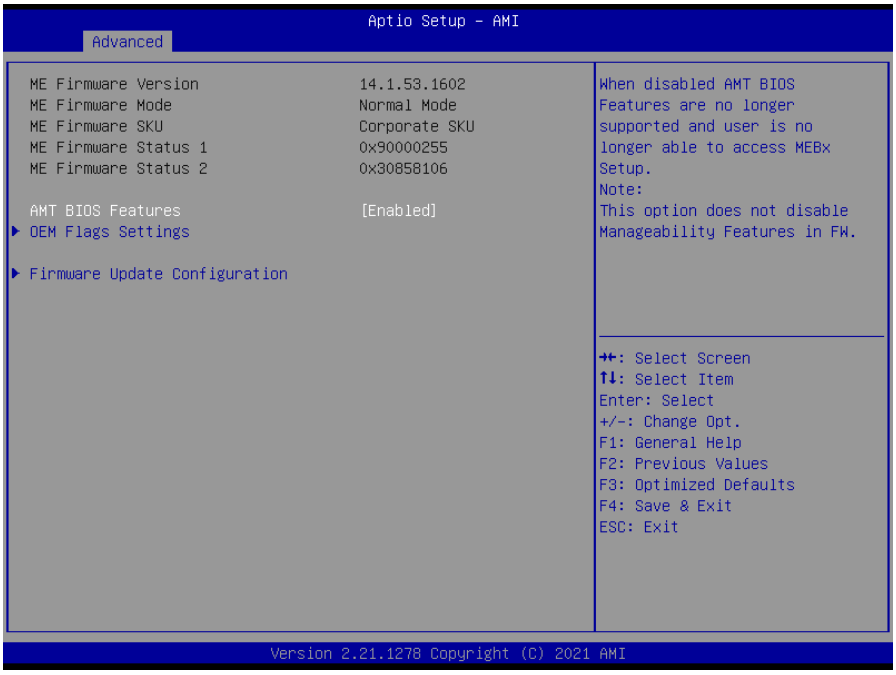
Item	Options	Description
Intel (VMX) Virtualization Technology	Disabled Enabled**[Default]**,	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.
Active Processor Cores	All**[Default]** /1/2/3/4/5/6/7/8/9	Number of cores to enable in each processor package.

3.6.2.1.1 CPU - Power Management Control



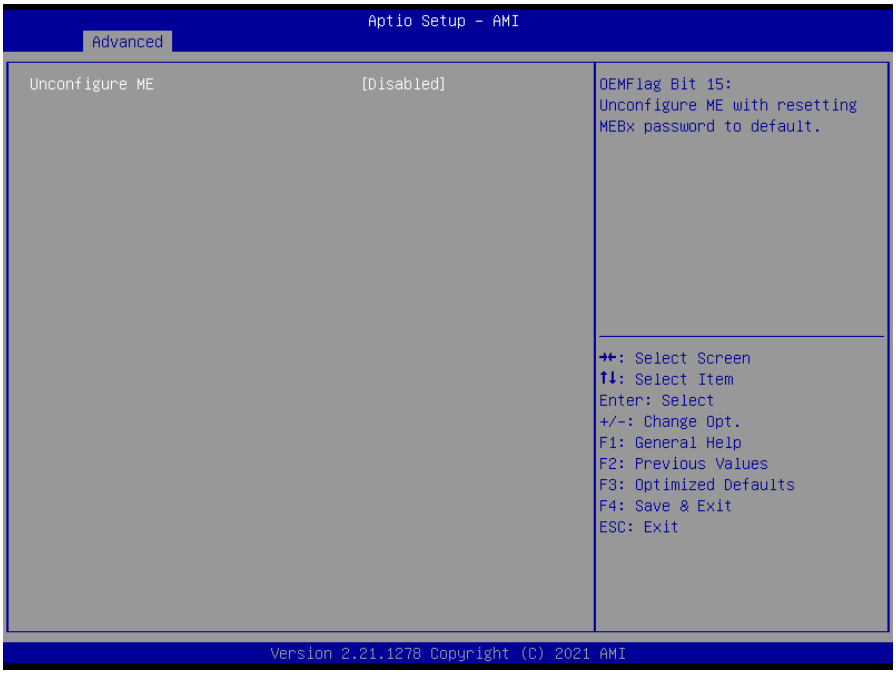
Item	Options	Description
Intel(R) SpeedStep(tm)	Disabled Enabled**[Default]**,	Allows more than two frequency ranges to be supported.
Intel(R) Speed Shift Technology	Disabled Enabled**[Default]**,	Enable/Disable Intel(R) Speed Shift Technology support. Enabling will expose the CPPC v2 interface to allow for hardware controlled P-states.
Turbo Mode	Disabled Enabled**[Default]**,	Enable/Disable processor Turbo Mode (requires Intel Speed Step or Intel Speed Shift to be available and enabled).

3.6.2.2 PCH-FW Configuration



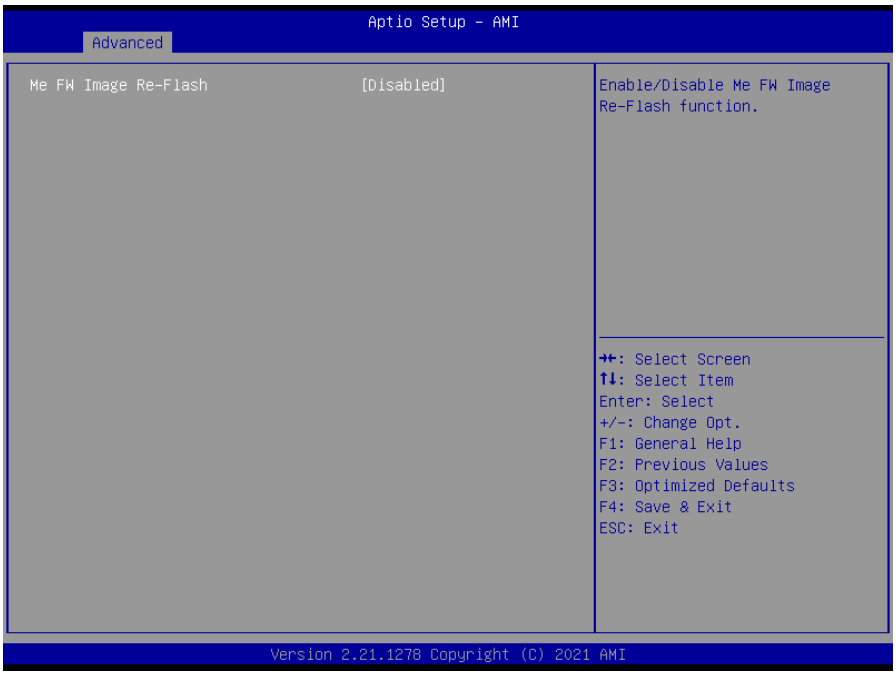
Item	Options	Description
AMT BIOS Features	Disabled Enabled**[Default]**,	When disabled AMT BIOS Features are no longer supported and user is no longer able to access MEBx Setup. Note: This option does not disable Manageability Features in FW.

3.6.2.2.1 OEM Flags Settings



Item	Options	Description
Unconfigure ME	Disabled**[Default]**, Enabled	OEMFlag Bit 15: Unconfigure ME with resetting MEBx password to default.

3.6.2.2.2 Firmware Update Configuration

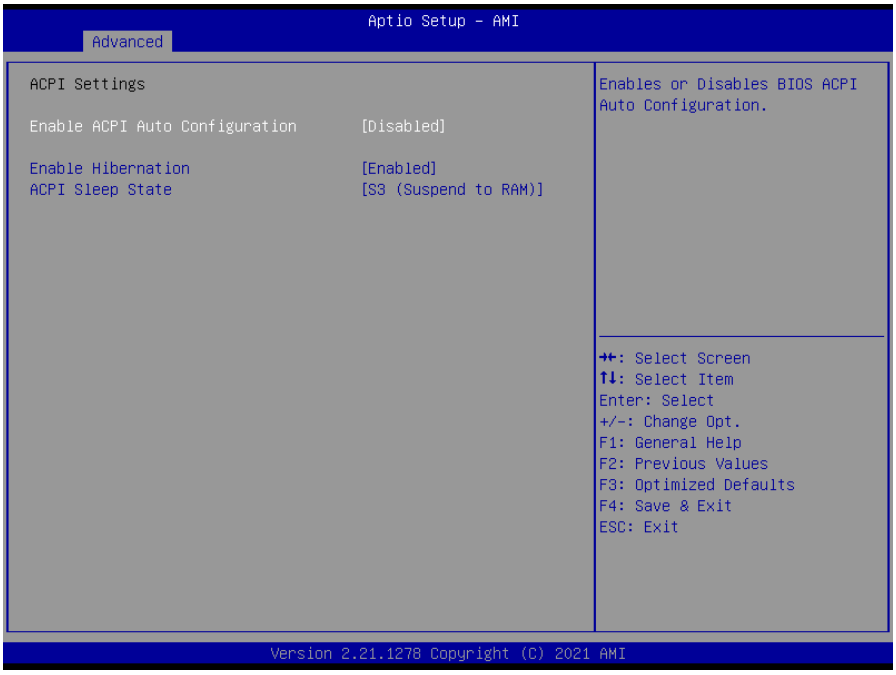


Item	Options	Description
Me FW Image Re-Flash	Disabled**[Default]**, Enabled	Enable/Disable Me FW Image Re-Flash function.

3.6.2.3 Trusted Computing

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

3.6.2.4 ACPI Settings

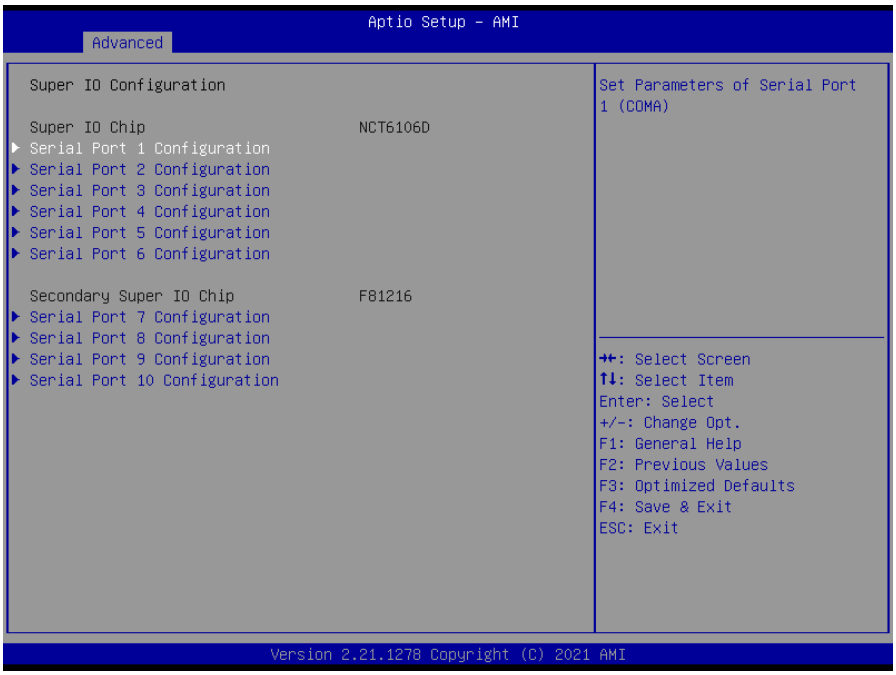


Item	Options	Description
Enable ACPI Auto	Disabled**[Default]**,	Enables or Disables BIOS ACPI Auto

Configuration	Enabled	Configuration.
Enable Hibernation	Disabled Enabled**[Default]**,	Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may not be effective with some operating systems.
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.

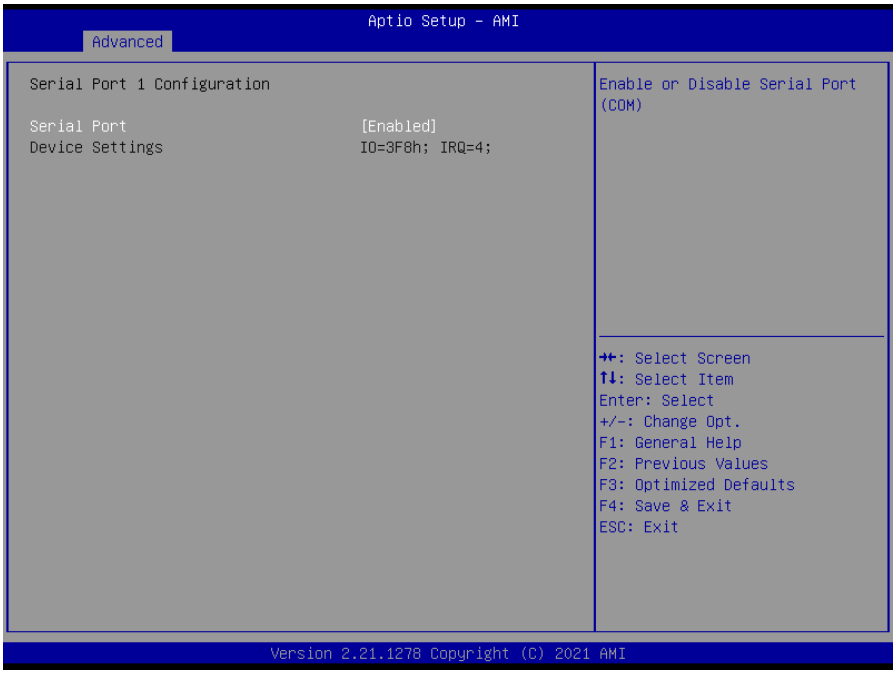
3.6.2.5 Super IO Configuration

You can use this item to set up or change the IT8528 Super IO configuration for serial ports. Please refer to 3.6.2.5.1~ 3.6.2.5.10 for more information.



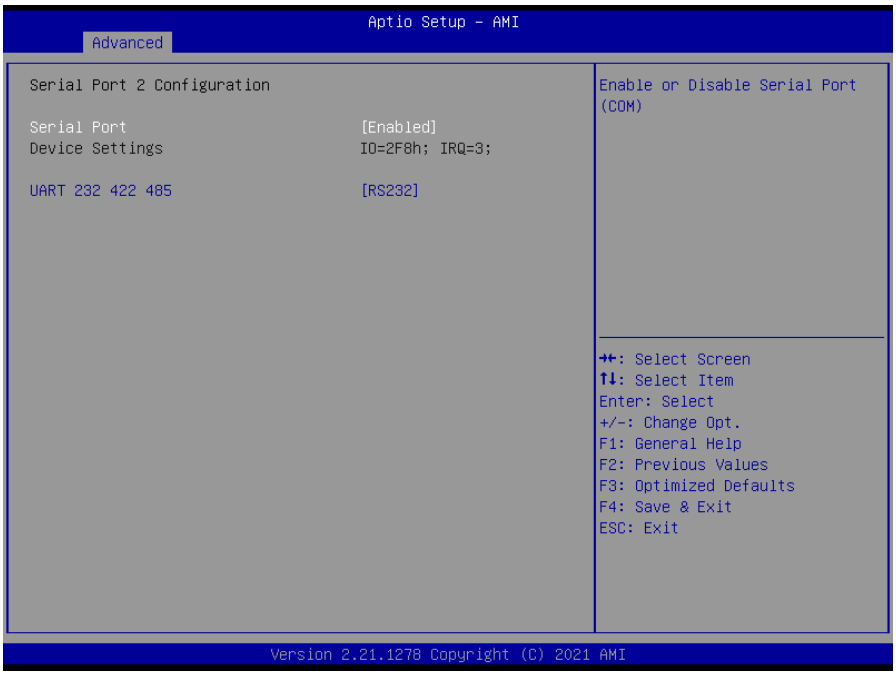
Item	Description
Serial Port 1 Configuration	Set Parameters of Serial Port 1 (COMA).
Serial Port 2 Configuration	Set Parameters of Serial Port 2 (COMB).
Serial Port 3 Configuration	Set Parameters of Serial Port 3 (COMC).
Serial Port 4 Configuration	Set Parameters of Serial Port 4 (COMD).
Serial Port 5 Configuration	Set Parameters of Serial Port 5 (COME).
Serial Port 6 Configuration	Set Parameters of Serial Port 6 (COMF).
Serial Port 7 Configuration	Set Parameters of Serial Port 3 (COMG).
Serial Port 8 Configuration	Set Parameters of Serial Port 4 (COMH).
Serial Port 9 Configuration	Set Parameters of Serial Port 5 (COMI).
Serial Port 10 Configuration	Set Parameters of Serial Port 6 (COMJ).

3.6.2.5.1 Serial Port 1 Configuration



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

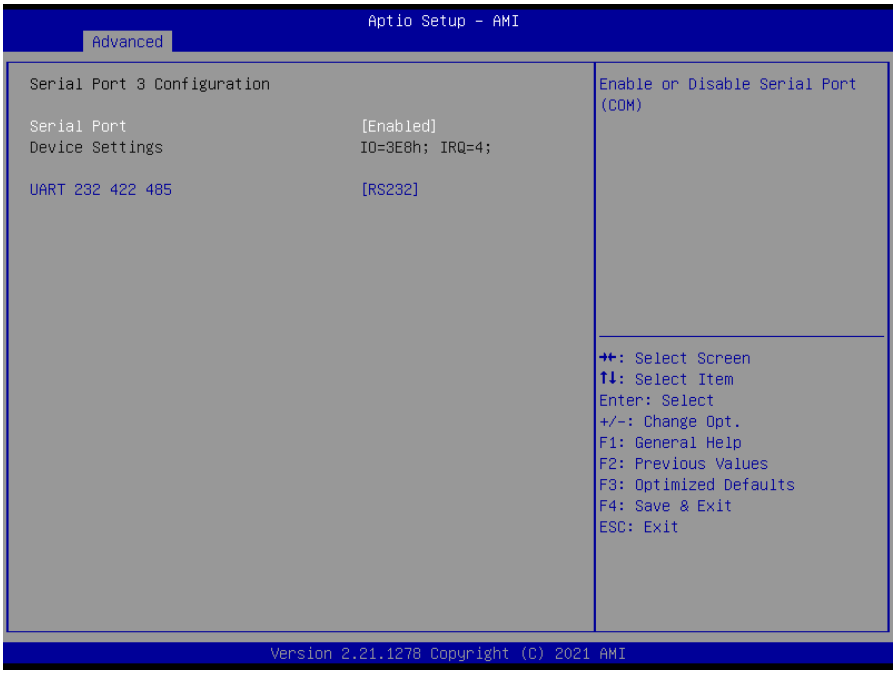
3.6.2.5.2 Serial Port 2 Configuration



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

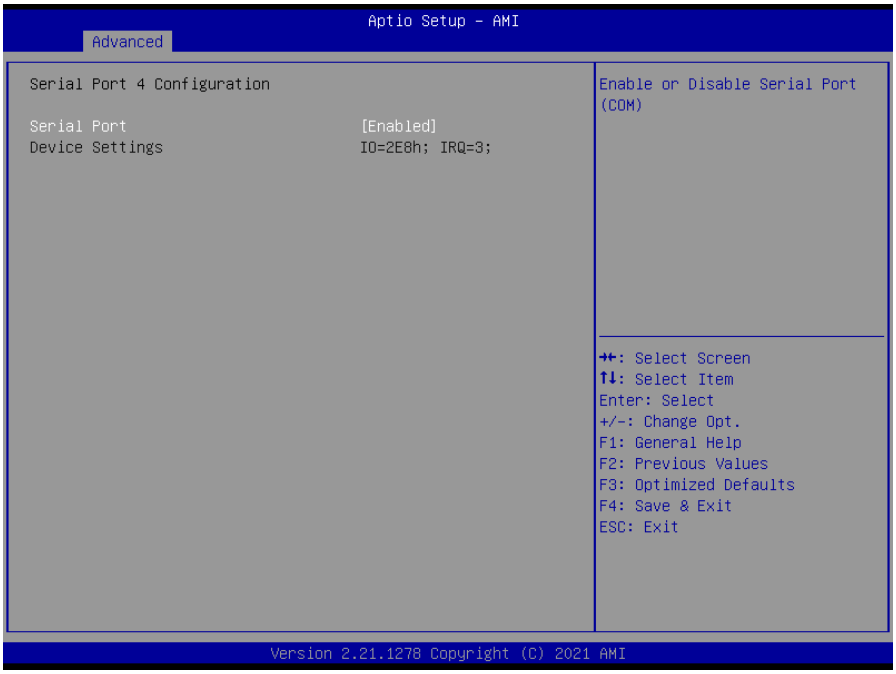
UART 232 422 485	RS232**[Default]**, RS422 RS485	Set COM Port as RS232, RS422 or RS485 mode.

3.6.2.5.3 Serial Port 3 Configuration



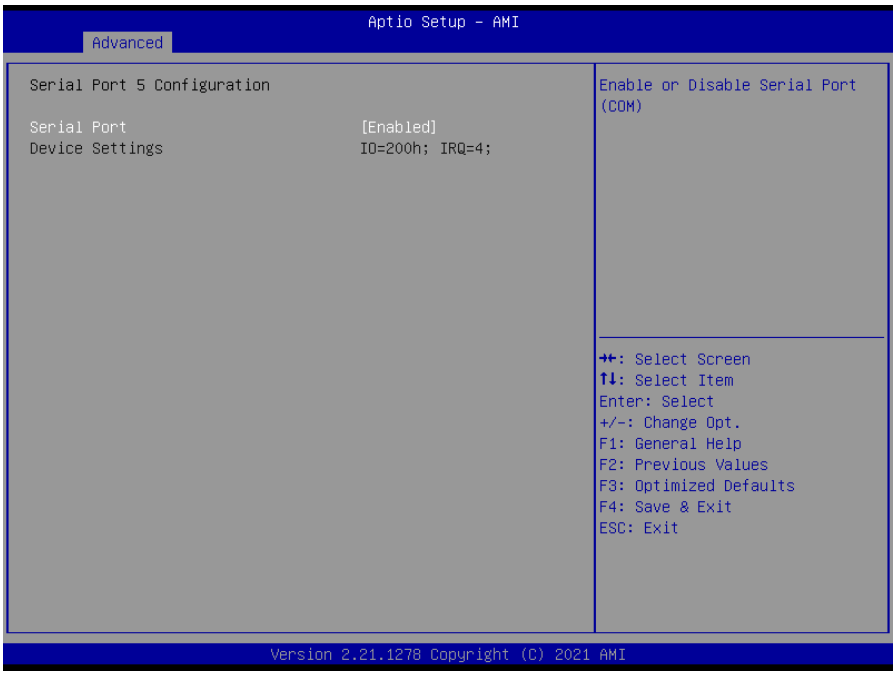
Item	Option	Description
Serial Port	Disabled Enabled**[Default]**,	Enable or Disable Serial Port(COM)
UART 232 422 485	RS232**[Default]**, RS422 RS485	Set COM Port as RS232, RS422 or RS485 mode.

3.6.2.5.4 Serial Port 4 Configuration



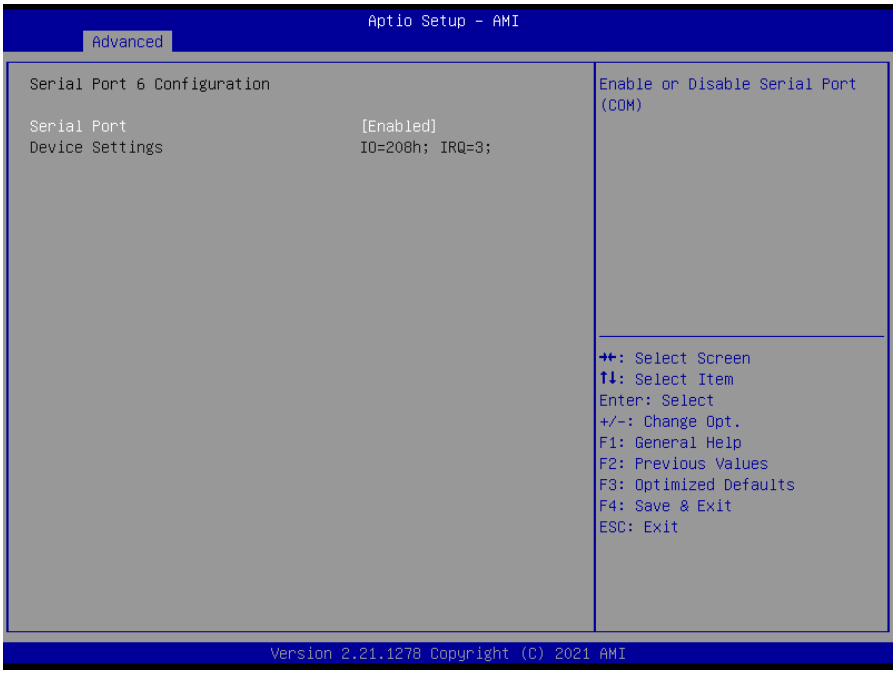
Item	Option	Description
Serial Port	Disabled Enabled**[Default]**,	Enable or Disable Serial Port(COM)

3.6.2.5.5 Serial Port 5 Configuration



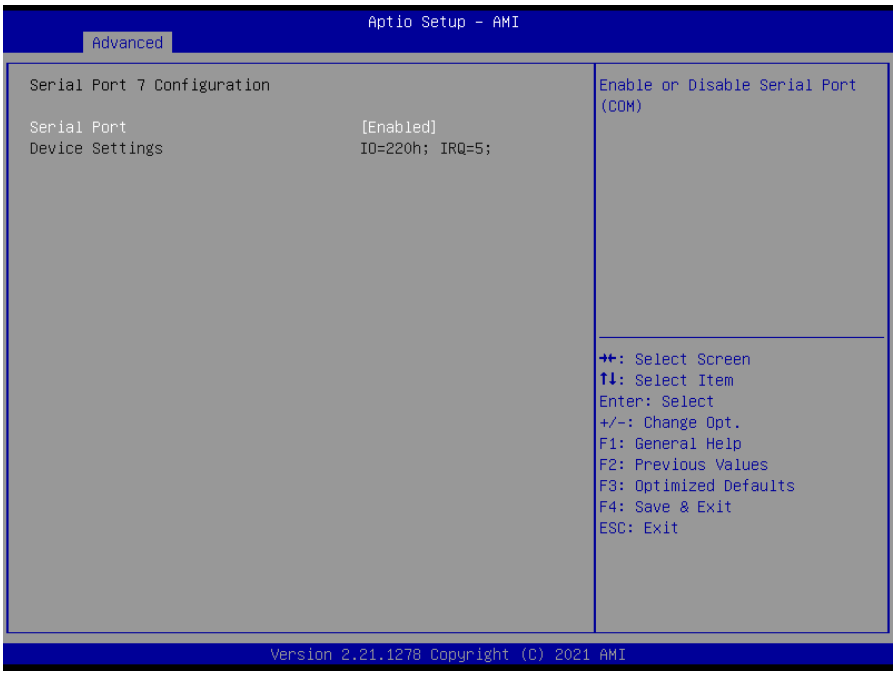
Item	Option	Description
Serial Port	Disabled Enabled**[Default]**,	Enable or Disable Serial Port(COM)

3.6.2.5.6 Serial Port 6 Configuration



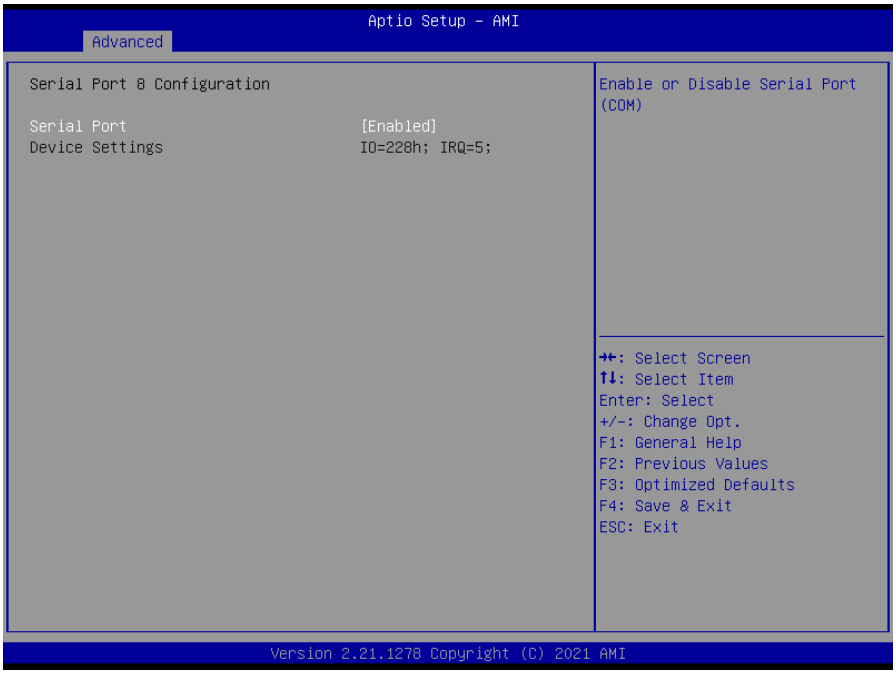
Item	Option	Description
Serial Port	Disabled Enabled**[Default]**,	Enable or Disable Serial Port(COM)

3.6.2.5.7 Serial Port 7 Configuration



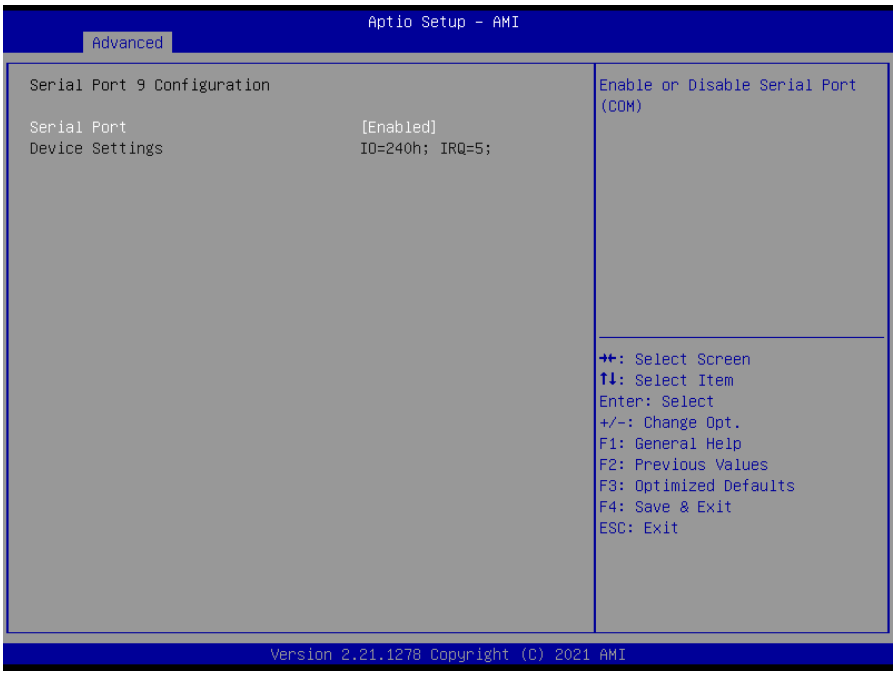
Item	Option	Description
Serial Port	Disabled Enabled**[Default]**,	Enable or Disable Serial Port(COM)

3.6.2.5.8 Serial Port 8 Configuration



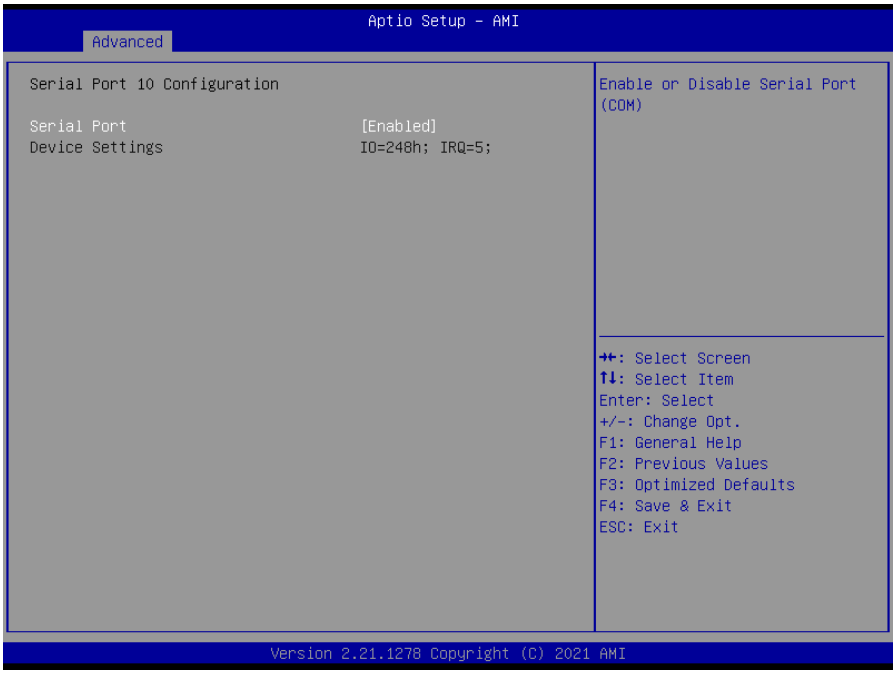
Item	Option	Description
Serial Port	Disabled Enabled**[Default]**,	Enable or Disable Serial Port(COM)

3.6.2.5.9 Serial Port 9 Configuration



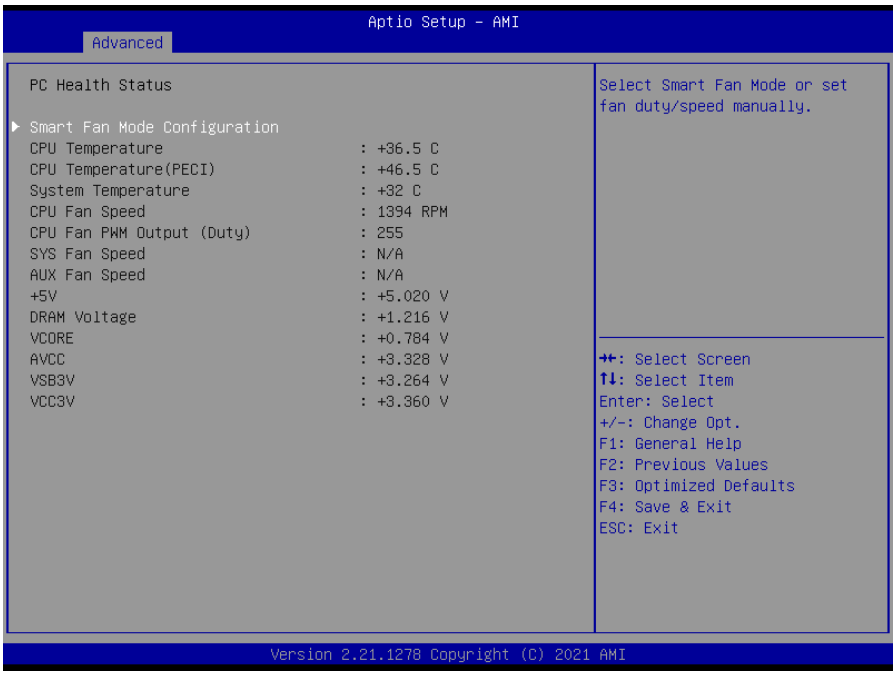
Item	Option	Description
Serial Port	Disabled Enabled**[Default]**,	Enable or Disable Serial Port(COM)

3.6.2.5.10 Serial Port 10 Configuration

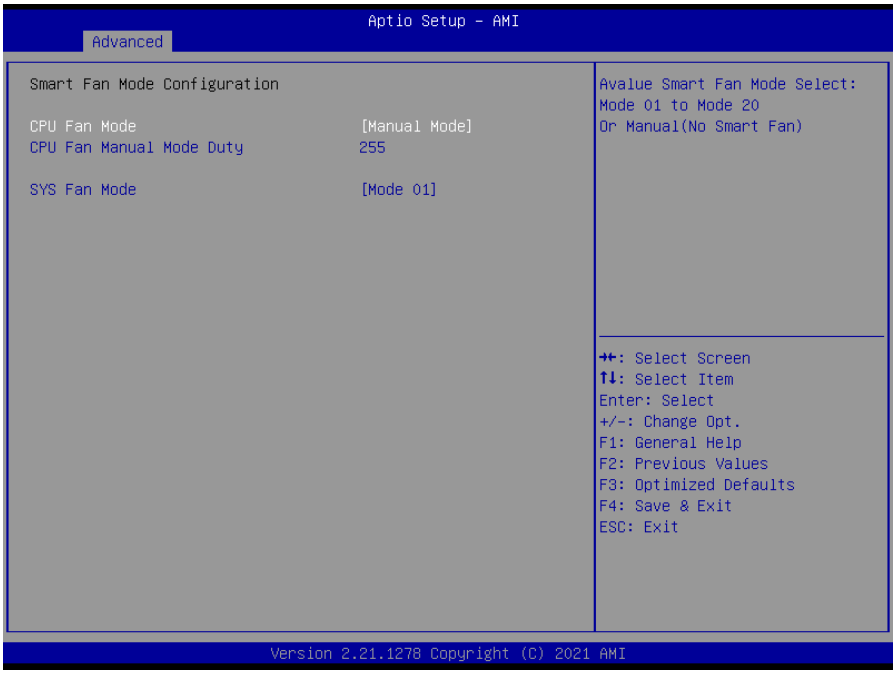


Item	Option	Description
Serial Port	Disabled Enabled**[Default]**,	Enable or Disable Serial Port(COM)

3.6.2.6 NCT6106D HW Monitor



3.6.2.6.1 Smart Fan Mode Configuration



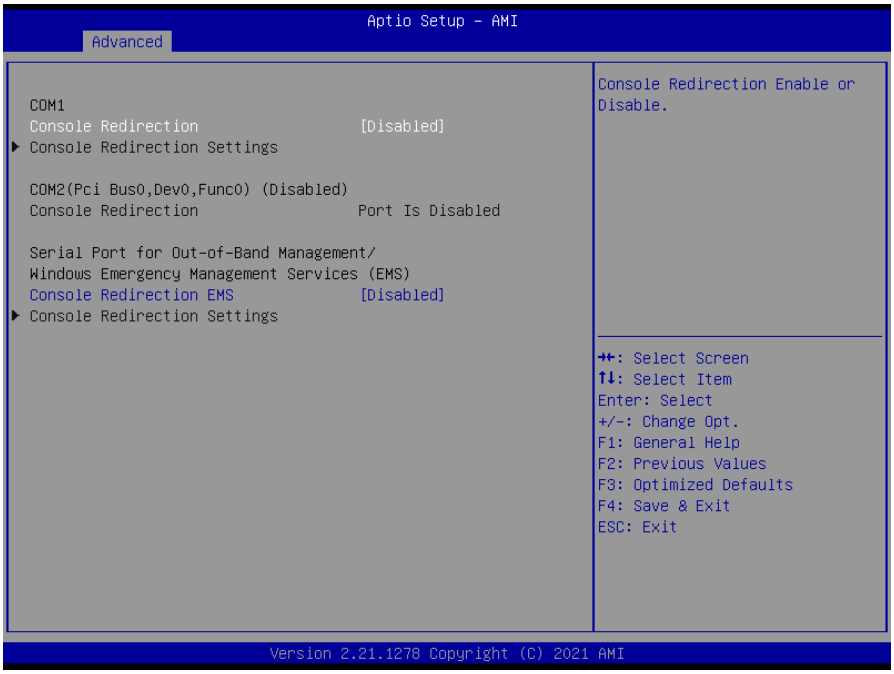
Item	Option	Description
CPU Fan Mode	Manual Mode**[Default]**, Mode 01, Mode 02, Mode 03, Mode 04, Mode 05, Mode 06, Mode 07, Mode 08, Mode 09, Mode 10, Mode 11, Mode 12, Mode 13, Mode 14, Mode 15, Mode 16, Mode 17, Mode 18, Mode 19, Mode 20	Avalue Smart Fan Mode Select: Mode 01 to Mode 20 Or Manual (No Smart Fan)
CPU Fan Manual Mode Duty	255	Set Fan Duty Manually(1~255).

SYS FAN Mode	Manual Mode Mode 01**[Default]**, Mode 02 Mode 03 Mode 04 Mode 05 Mode 06 Mode 07 Mode 08 Mode 09 Mode 10 Mode 11 Mode 12 Mode 13 Mode 14 Mode 15 Mode 16 Mode 17 Mode 18 Mode 19 Mode 20	Avalue Smart Fan Mode Select: Mode 01 to Mode 20 Or Manual (No Smart Fan)

3.6.2.7 S5 RTC Wake Settings

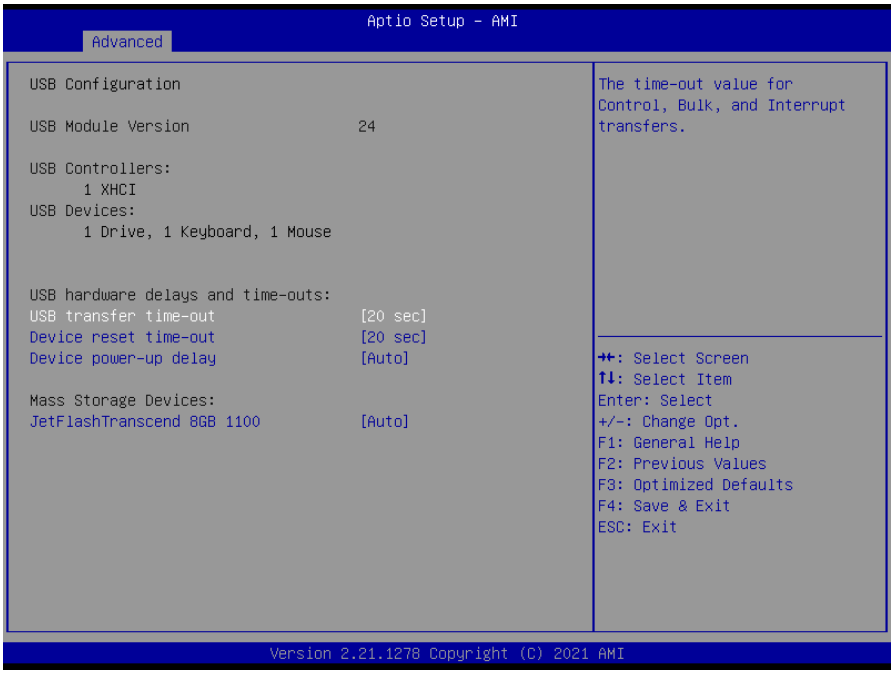
Item	Options	Description
Wake system from S5	Disabled**[Default]**, Fixed Time Dynamic Time	Enable or disable System wake on alarm event. Select FixedTime, system will wake on the hr::min::sec specified. Select DynamicTime, System will wake on the current time + Increase minute(s)

3.6.2.8 Serial Port Console Redirection



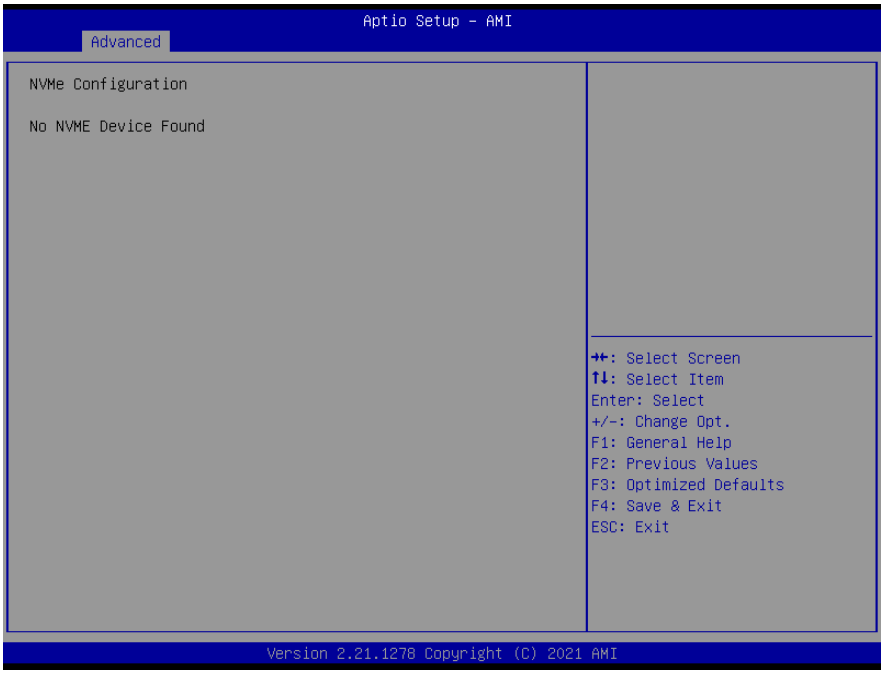
Item	Options	Description
Console Redirection	Disabled**[Default]**, Enabled	Console Redirection Enable or Disable.
Console Redirection EMS	Disabled**[Default]**, Enabled	Console Redirection Enable or Disable.

3.6.2.9 USB Configuration

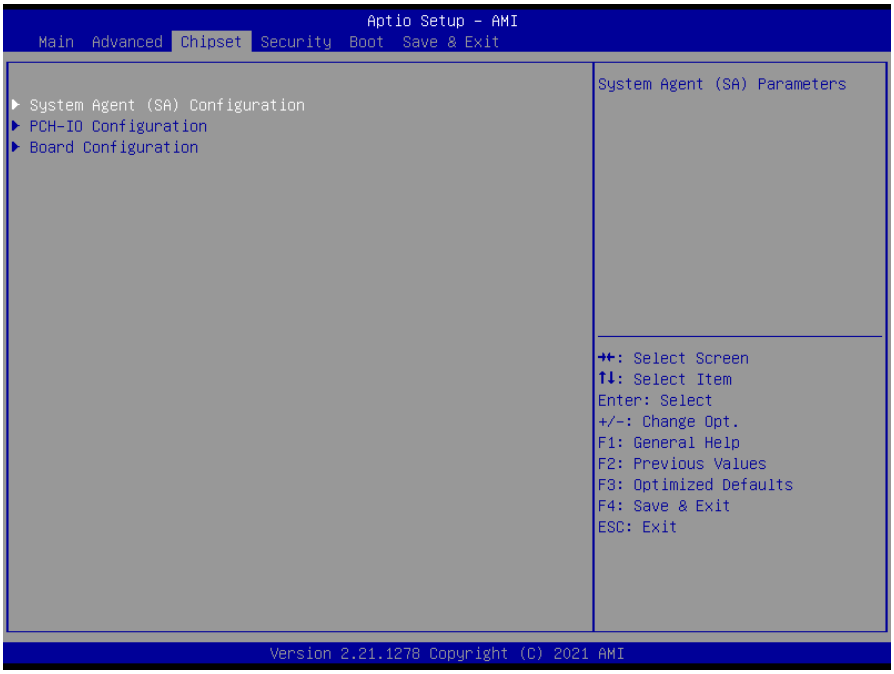


Item	Options	Description
USB transfer time-out	1 sec 5 sec 10 sec 20 sec**[Default]**,	The time-out value for Control, Bulk, and Interrupt transfers.
Device reset time-out	10 sec 20 sec 30 sec 20 sec**[Default]**,	USB mass storage device Start Unit command time-out.
Device power-up delay	Auto**[Default]**, 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 100 ms, for a Hub port the delay is taken from Hub descriptor.
JetFlashTranscend 8GB 1100	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.

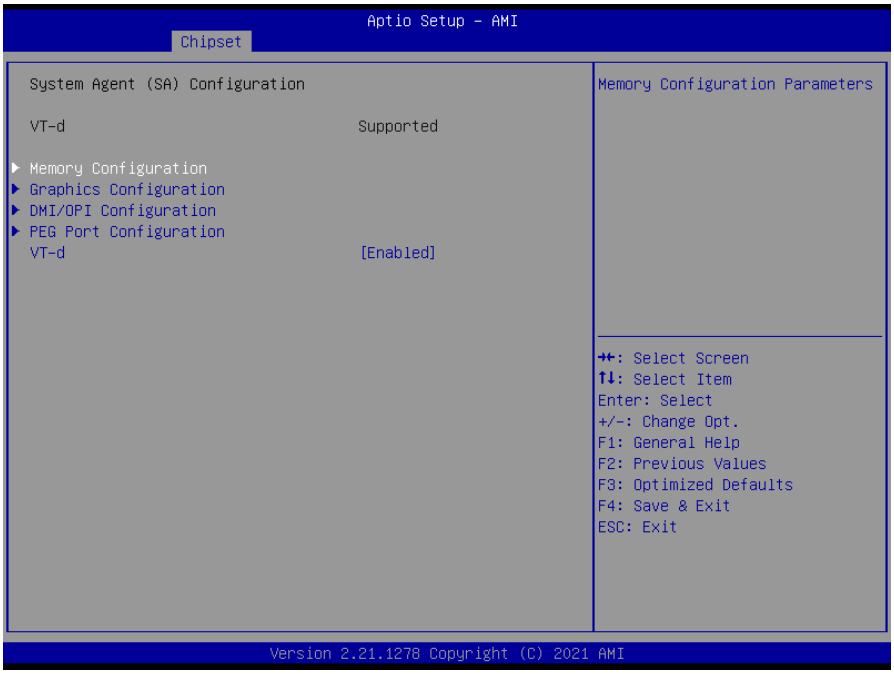
3.6.2.10 NVMe Configuration



3.6.3 Chipset

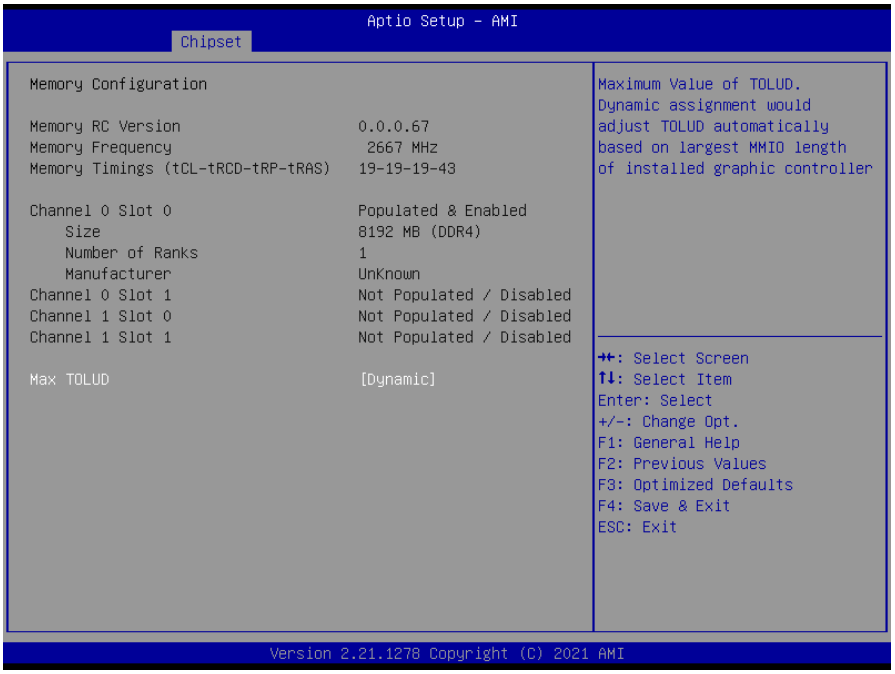


3.6.3.1 System Agent (SA) Configuration



Item	Options	Description
VT-d	Disabled Enabled**[Default]**,	VT-d capability

3.6.3.1.1 Memory Configuration

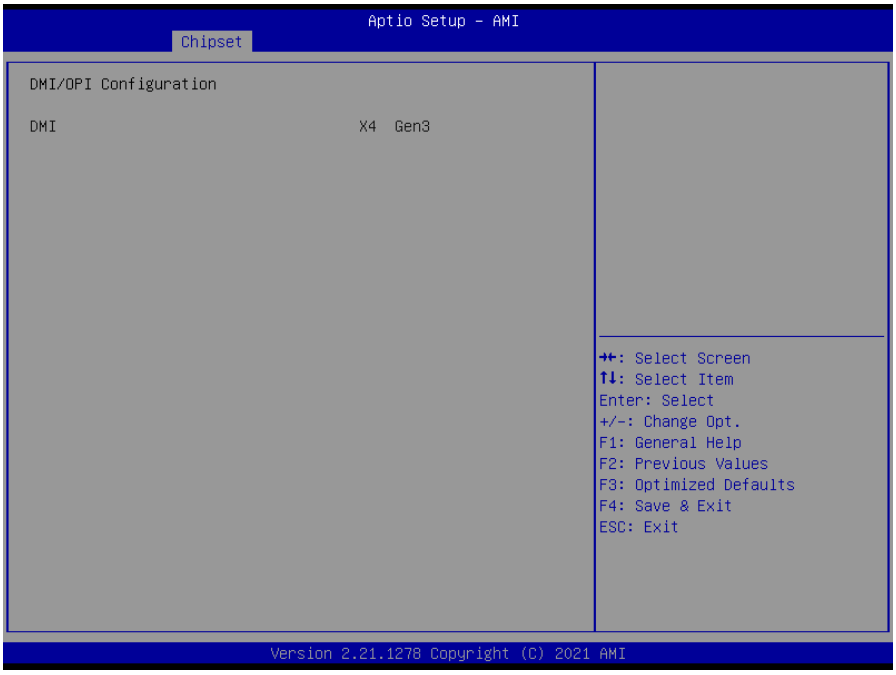


Item	Option	Description
Max TOLUD	Dynamic**[Default]** 1GB 1.25 GB 1.5 GB 1.75 GB 2 GB 2.25 GB 2.5 GB 2.75 GB 3 GB	Maximum Value of TOLUD. Dynamic assignment would adjust TOLUD automatically based on largest MMIO length of installed graphic controller

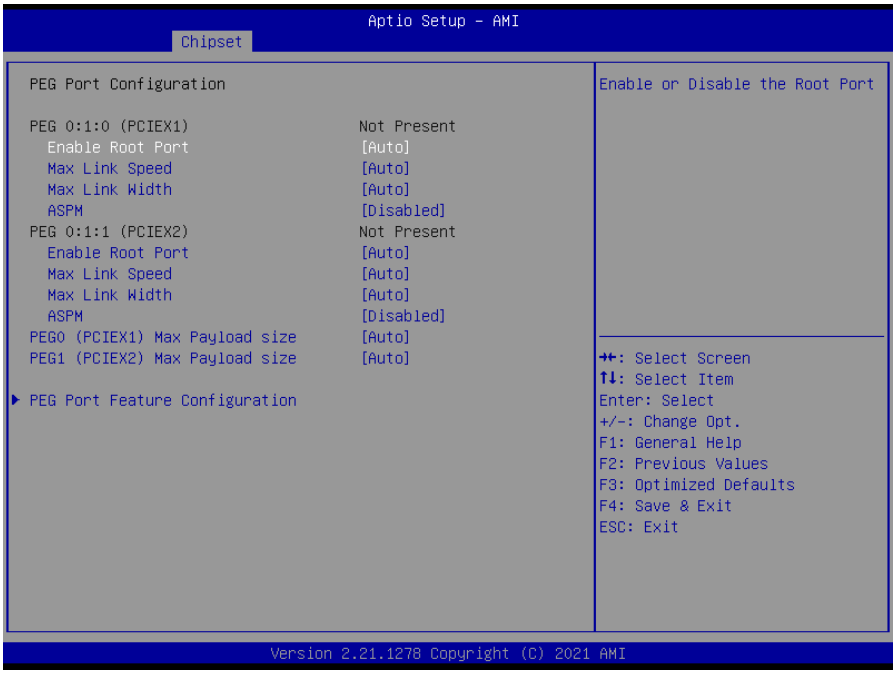
3.6.3.1.2 Graphics Configuration

Item	Option	Description
Primary Display	Auto**[Default]** IGFX PEG	Select which of IGFX/PEG Graphics device should be Primary Display.
GTT Size	2MB 4MB 8MB**[Default]**	Select the GTT Size

3.6.3.1.3 DMI/OPI Configuration



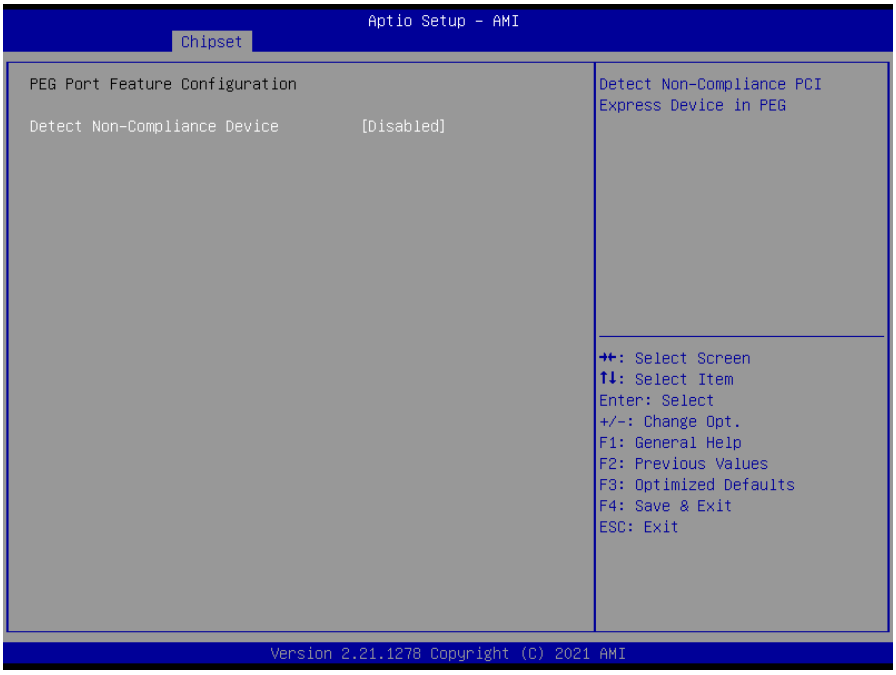
3.6.3.1.4 PEG Port Configuration



Item	Option	Description
Enable Root Port	Disabled Enabled Auto**[Default]**	Enable or Disable the Root Port.
Max Link Speed	Auto**[Default]** Gen1 Gen2 Gen3	Configure PEG 0:1:0 Max Speed
Max Link Width	Auto**[Default]** Force X1 Force X2 Force X4 Force X8	Force PEG link to retrain to X1/2/4/8
ASPM	Disabled**[Default]** Auto ASPM L0s ASPM L1 ASPM L0sL1	Control ASPM support for the PEG 0. This has no effect if PEG is not the currently active device.
Enable Root Port	Disabled Enabled Auto**[Default]**	Enable or Disable the Root Port.
Max Link Speed	Auto**[Default]** Gen1 Gen2 Gen3	Configure PEG 0:1:1 Max Speed
Max Link Width	Auto**[Default]** Force X1 Force X2	Force PEG link to retrain to X1/2/4/8

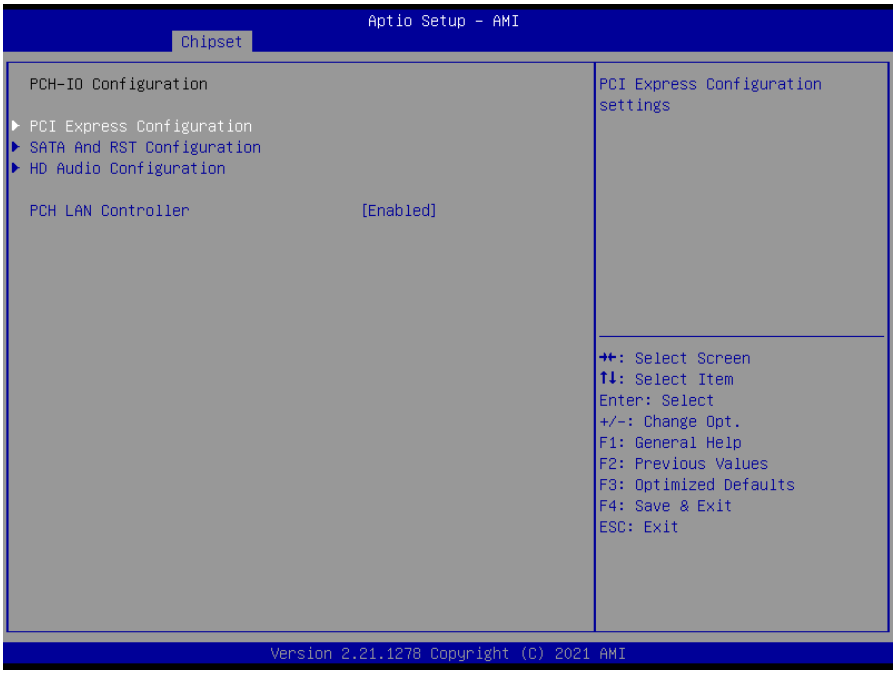
	Force X4	
ASPM	Disabled**[Default]** Auto ASPM L0s ASPM L1 ASPM L0sL1	Control ASPM support for the PEG1. This has no effect if PEG is not the currently active device.
PEG0 (PCIEX1) Max Payload size	Auto**[Default]** 128 256 TLP	Select PEG0 Max Payload size; Choose Auto(Default Device Capability) or force to 128/256 Bytes
PEG1 (PCIEX2) Max Payload size	Auto**[Default]** 128 256 TLP	Select PEG1 Max Payload size; Choose Auto(Default Device Capability) or force to 128/256 Bytes

3.6.3.1.4.1 PEG Port Feature Configuration



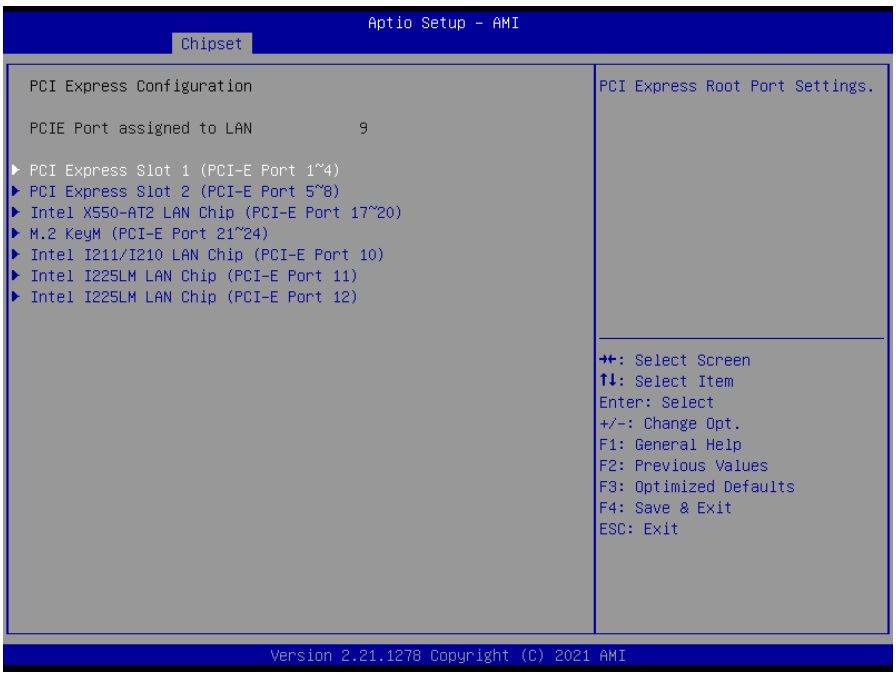
Item	Option	Description
Detect Non-Compliance Device	Disabled**[Default]** Enabled	Detect Non-Compliance PCI Express Device in PEG

3.6.3.2 PCH-IO Configuration

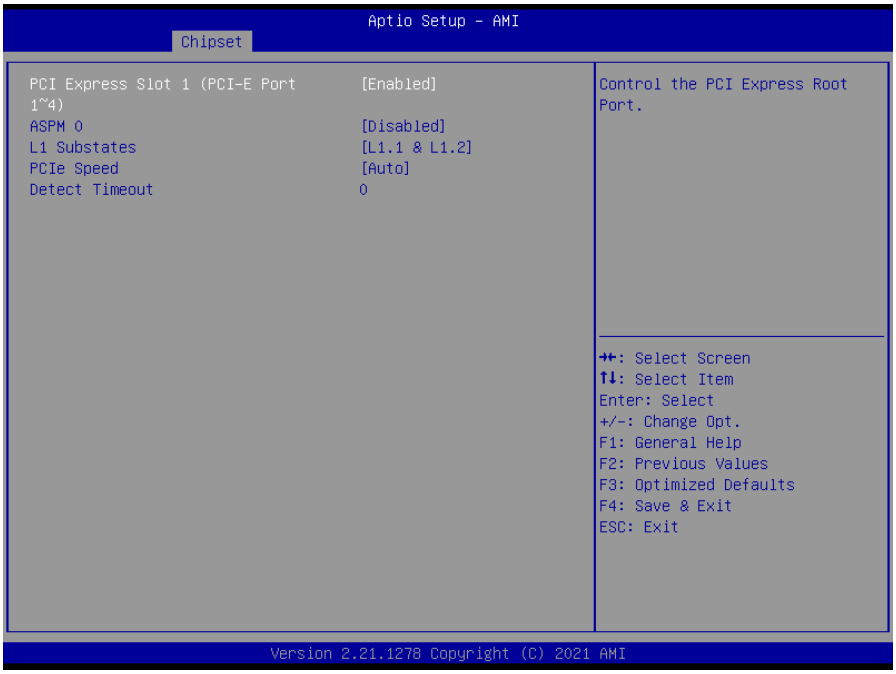


Item	Options	Description
PCH LAN Controller	Disabled Enabled**[Default]**,	Enable/Disable onboard NIC.

3.6.3.2.1 PCI Express Configuration

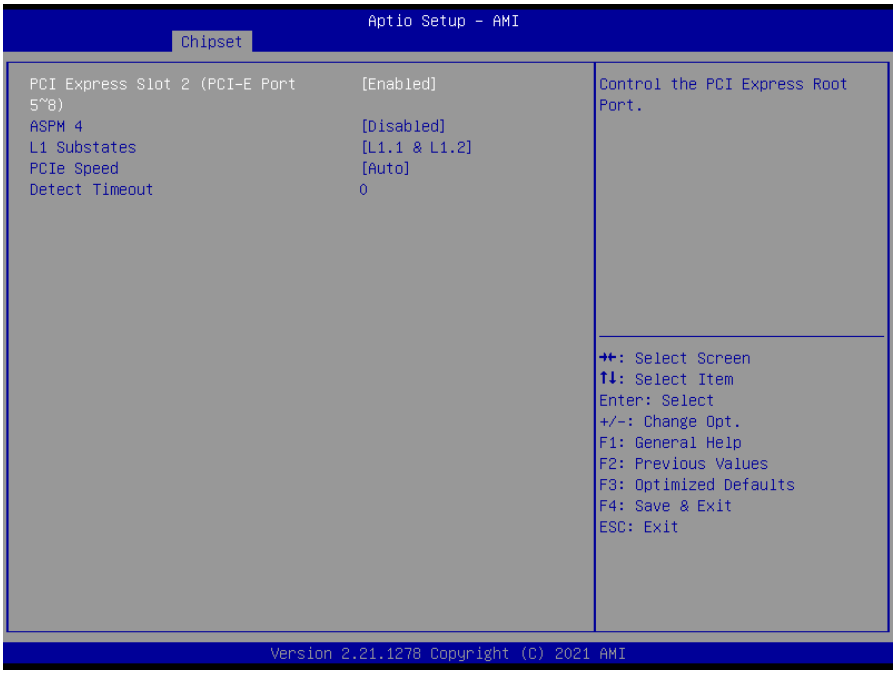


3.6.3.2.1.1 PCI Express Slot 1 (PCI-E Port 1~4)



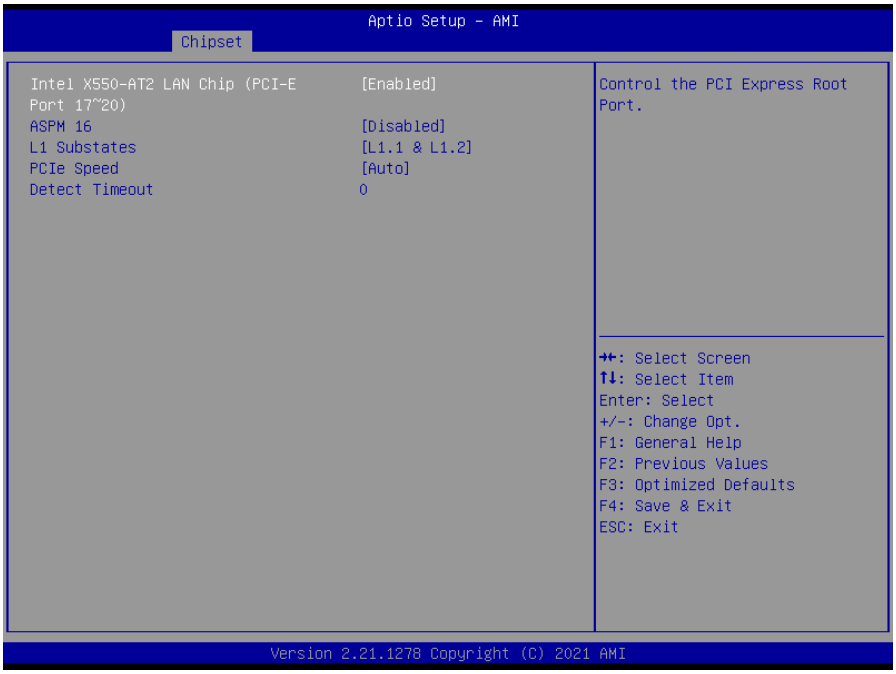
Item	Options	Description
PCI Express Slot 1 (PCI-E Port 1~4)	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM 0	Disabled**[Default]** L0s L1 L0sL1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled L1.1 L1.1 & L1.2**[Default]**	PCI Express L1 Substates settings.
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3	Configure PCIe Speed
Detect Timeout	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 PCI Express Slot 2 (PCI-E Port 5~8)



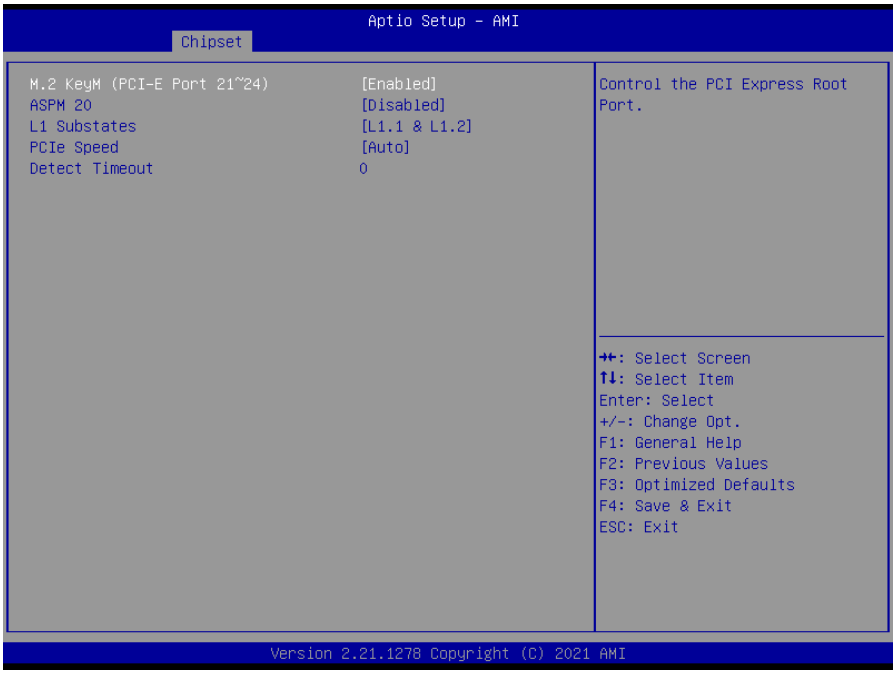
Item	Options	Description
PCI Express Slot 2 (PCI-E Port 5~8)	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM 4	Disabled**[Default]** L0s L1 L0sL1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled L1.1 L1.1 & L1.2**[Default]**	PCI Express L1 Substates settings.
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3	Configure PCIe Speed
Detect Timeout	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.

3.6.3.2.1.3 Intel X550-AT2 LAN Chip (PCI-E Port 17~20)



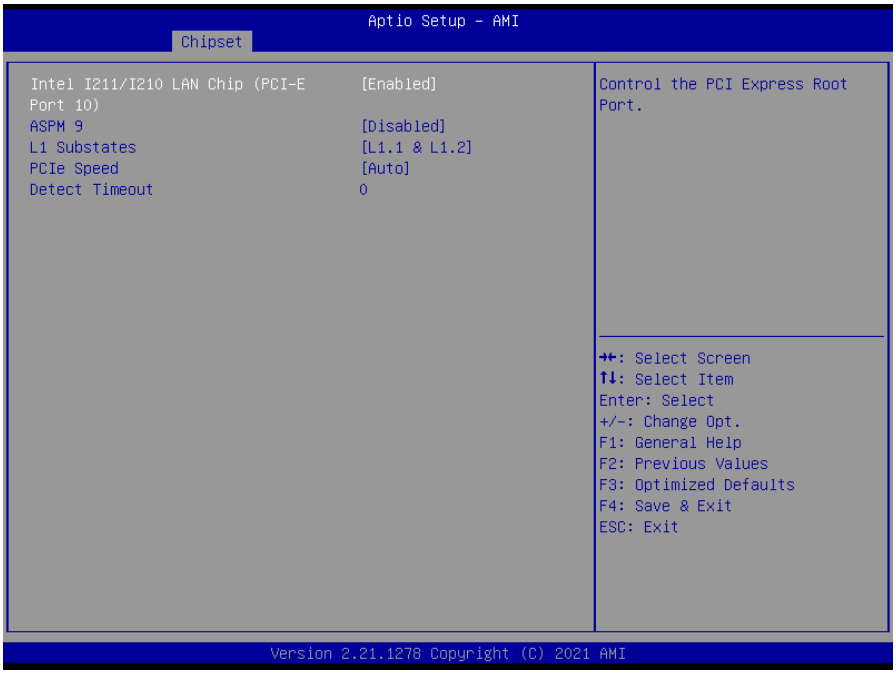
Item	Options	Description
Intel X550-AT2 LAN Chip (PCI-E Port 17~20)	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM 16	Disabled**[Default]** L0s L1 L0sL1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled L1.1 L1.1 & L1.2**[Default]**	PCI Express L1 Substates settings.
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3	Configure PCIe Speed
Detect Timeout	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.

3.6.3.2.1.4 M.2 KeyM (PCI-E Port 21~24)



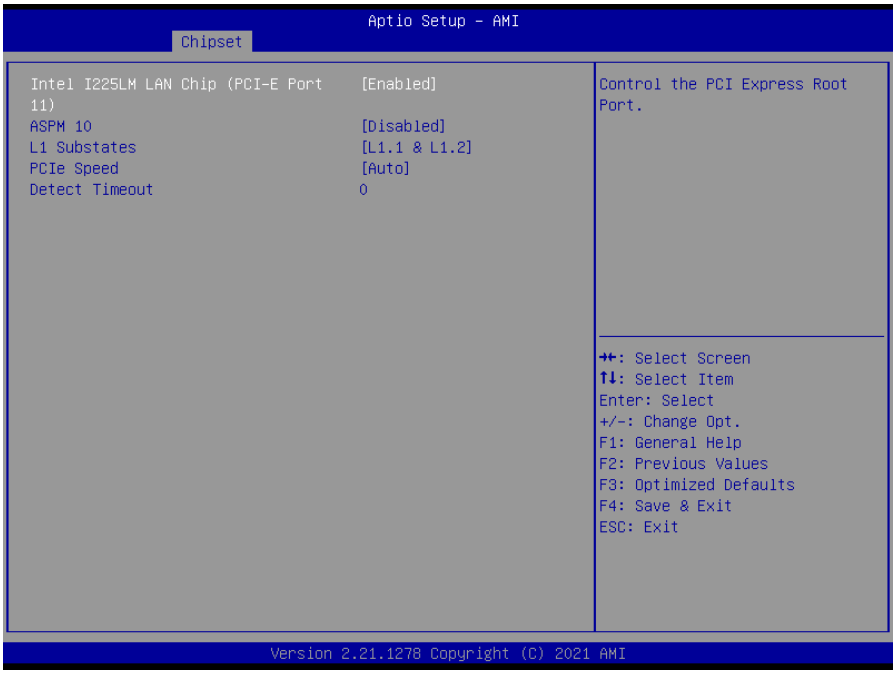
Item	Options	Description
M.2 KeyM (PCI-E Port 21~24)	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM 20	Disabled**[Default]** L0s L1 L0sL1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled L1.1 L1.1 & L1.2**[Default]**	PCI Express L1 Substates settings.
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3	Configure PCIe Speed
Detect Timeout	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.

3.6.3.2.1.5 Intel I211/I210 LAN Chip (PCI-E Port 10)



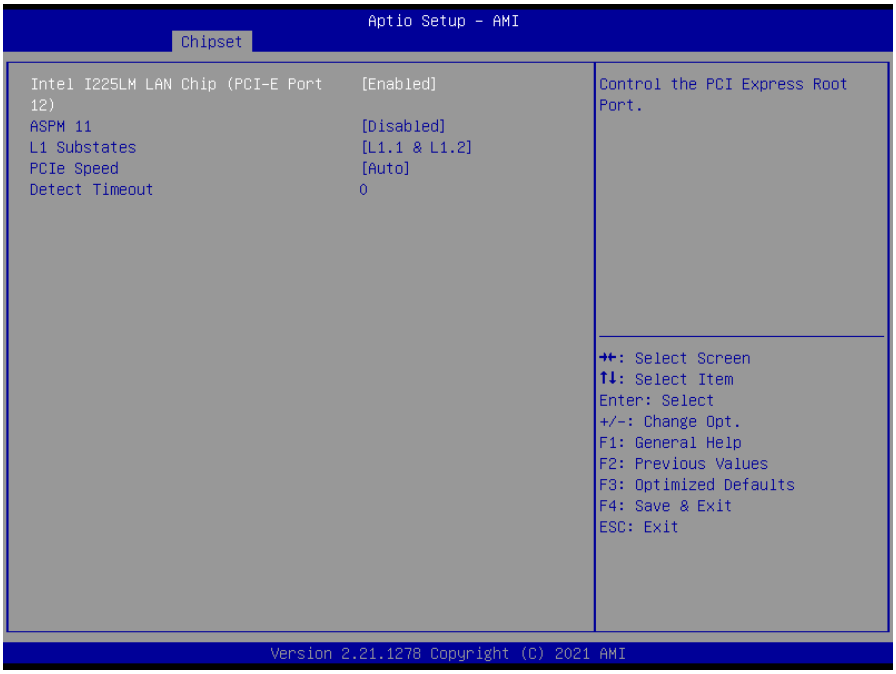
Item	Options	Description
Intel I211/I210 LAN Chip (PCI-E Port 10)	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM 9	Disabled**[Default]** L0s L1 L0sL1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled L1.1 L1.1 & L1.2**[Default]**	PCI Express L1 Substates settings.
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3	Configure PCIe Speed
Detect Timeout	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.

3.6.3.2.1.6 Intel I225LM LAN Chip (PCI-E Port 11)



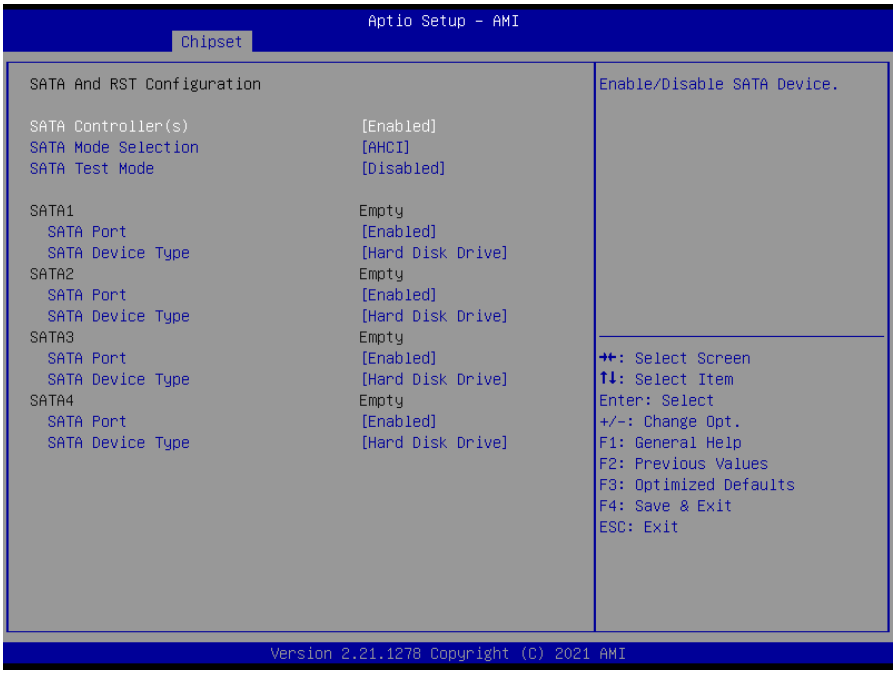
Item	Options	Description
Intel I225LM LAN Chip (PCI-E Port 11)	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM 10	Disabled**[Default]** L0s L1 L0sL1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled L1.1 L1.1 & L1.2**[Default]**	PCI Express L1 Substates settings.
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3	Configure PCIe Speed
Detect Timeout	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.

3.6.3.2.1.7 Intel I225LM LAN Chip (PCI-E Port 12)



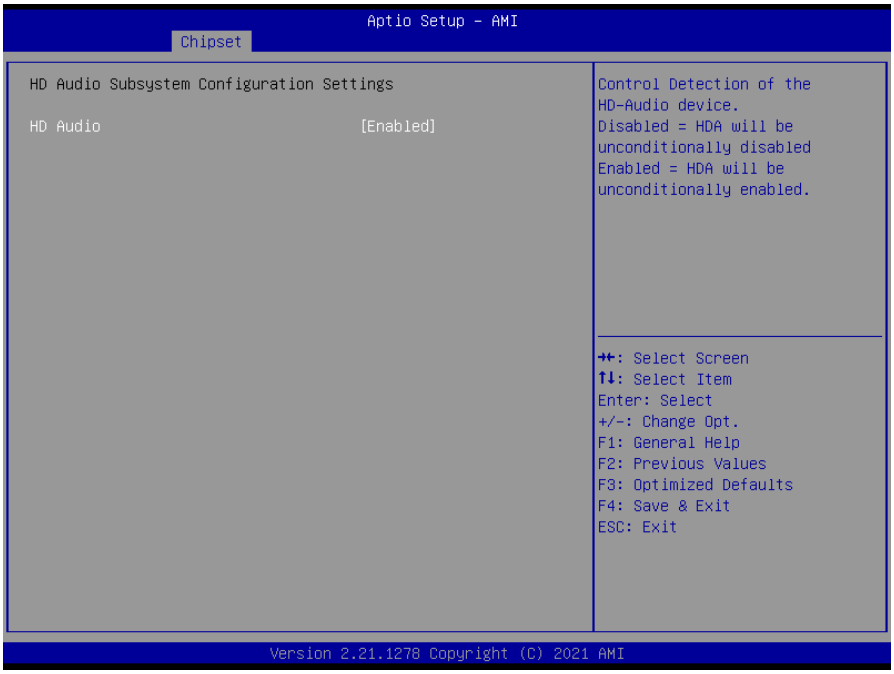
Item	Options	Description
Intel I225LM LAN Chip (PCI-E Port 12)	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM 11	Disabled**[Default]** L0s L1 L0sL1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled L1.1 L1.1 & L1.2**[Default]**	PCI Express L1 Substates settings.
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3	Configure PCIe Speed
Detect Timeout	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



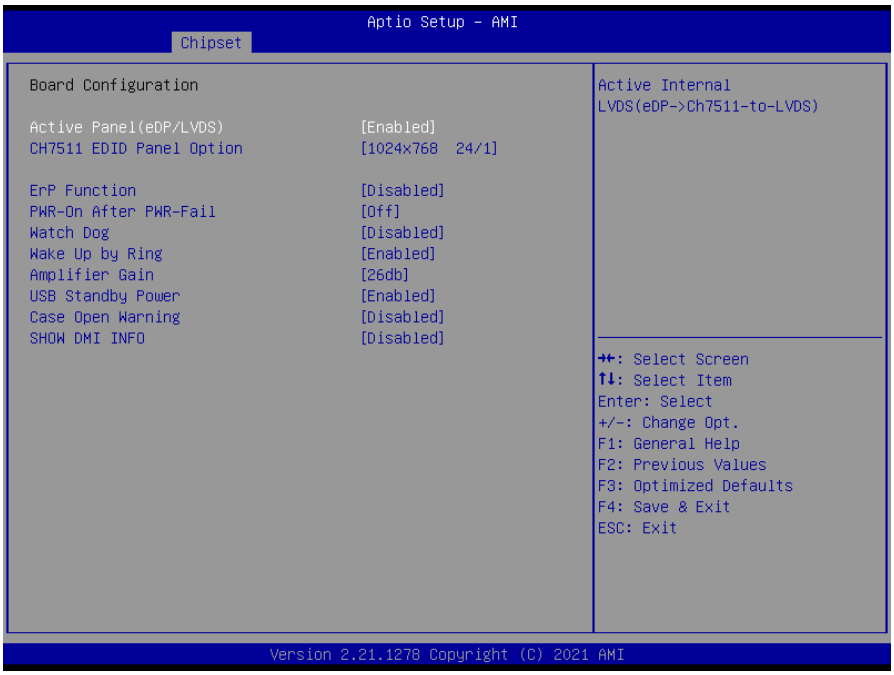
Item	Options	Description
SATA Configuration(S)	Enabled**[Default]**, Disabled	Enable/Disable SATA Device.
SATA Mode Selection	AHCI**[Default]**, RAID	Determines how SATA controller(s) operate.
SATA Test Mode	Enabled Disabled**[Default]**,	Test Mode Enable/Disable (Loop Back).
SATA Port	Disabled Enabled**[Default]**,	Enable or Disable SATA Port
SATA Device Type	Hard Disk Drive**[Default]**, Solid State Drive	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.

3.6.3.2.3 HD Audio Configuration



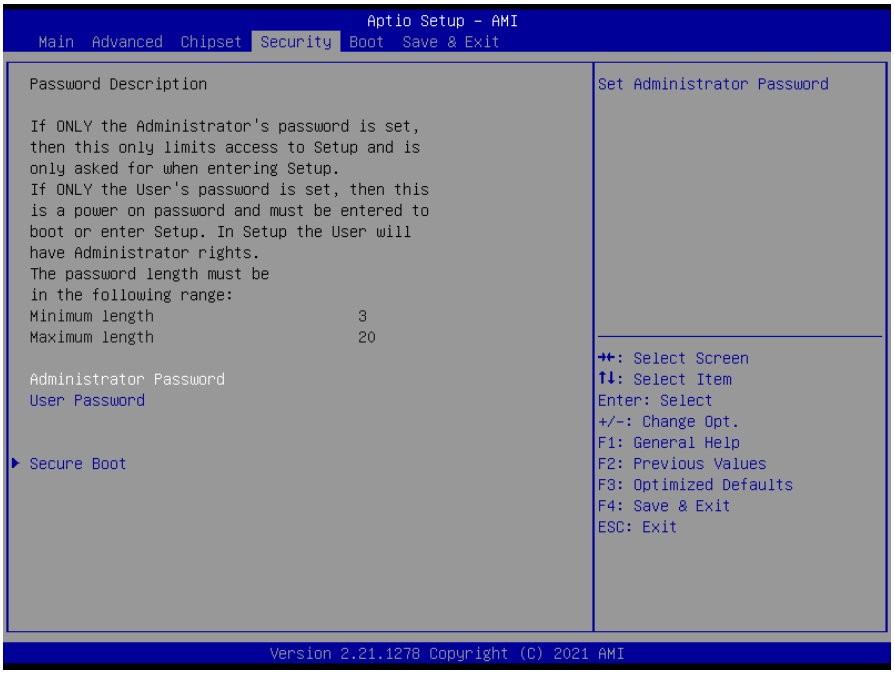
Item	Options	Description
HD Audio	Enabled**[Default]**, Disabled	Control Detection of the HD-Audio device. Disabled = HDA will be unconditionally disabled Enabled = HDA will be unconditionally enabled.

3.6.3.3 Board Configuration



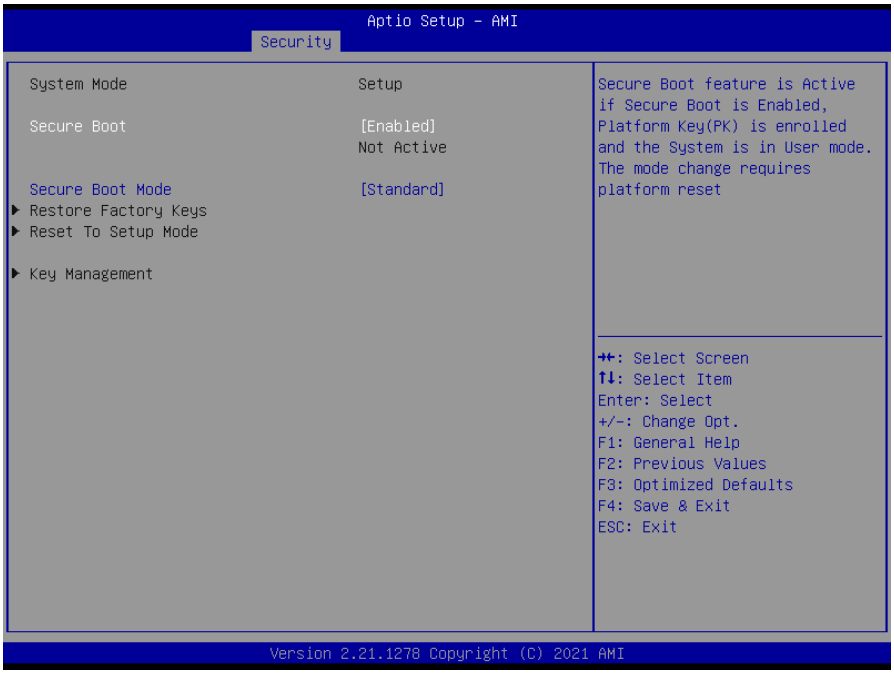
Item	Options	Description
Active Panel(eDP/LVDS)	Disabled Enabled**[Default]**,	Active Internal LVDS(eDP->Ch7511-to-LVDS)
CH7511 EDID Panel Option	1024x768 24/1**[Default]**, 800x600 18/1 1024x768 18/1 1366x768 18/1 1024x600 18/1 1280x800 18/1 1920x1200 24/2 1920x1080 18/2 1280x1040 24/2 1440x900 18/2 1600x1200 24/2 1920x1080 24/2 1680x1050 24/2	Port1-EDP to LVDS(Chrotel 7511) Panel EDID Option
ErP Function	Disabled Enabled**[Default]**,	ErP Function (Deep S5).
PWR-On After PWR-Fail	Off**[Default]**, On Last state	AC loss resume.
Watch Dog	Disabled**[Default]**, 30 sec 40 sec 50 sec 1 min 2 min 10 min 30 min	Select WatchDog.
Wake Up by Ring	Disabled Enabled**[Default]**,	Wake Up by Ring from S3/S4/S5
Amplifier Gain	20db 26db**[Default]**, 32db 36db	Amplifier Gain
USB Standby Power	Disabled Enabled**[Default]**,	Enable/Disable USB Standby Power during S3/S4/S5
Case Open Warning	Disabled**[Default]**, Enabled	Enable/Disable Case Open Warning.
SHOW DMI INFO	Disabled**[Default]**, Enabled	SHOW DMI INFO

3.6.4 Security



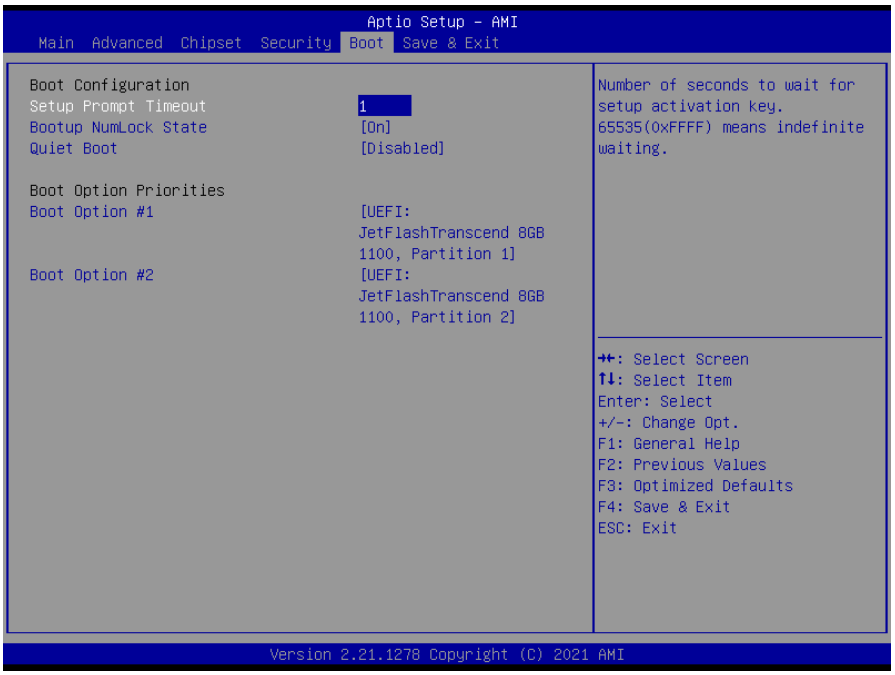
Item	Description
Administrator Password	Set Administrator Password
User Password	Set User Password

3.6.4.1 Secure Boot



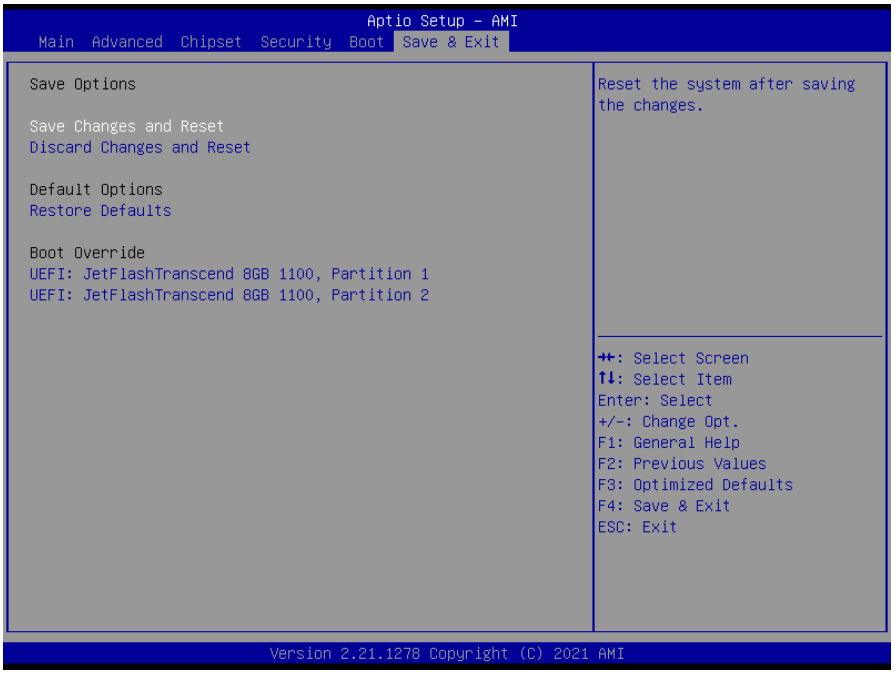
Item	Option	Description
Secure Boot	Disabled Enabled**[Default]**,	Secure Boot feature is Active if Secure Boot is Enabled, Platform Key(PK) is enrolled and the System is in User mode. The mode change requires platform reset
Secure Boot Mode	Standard**[Default]**, Custom	Secure Boot mode options: Standard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

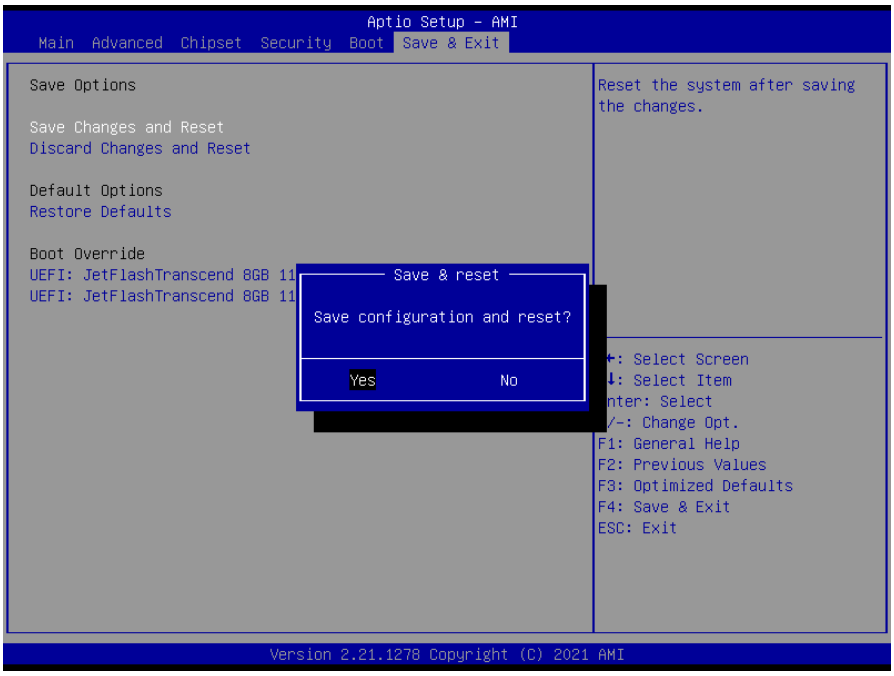
3.6.5 Boot



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

3.6.6 Save & 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.avalue.com.tw**.

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

Step1. Click **Next**.

Step 3. Click **Install**.

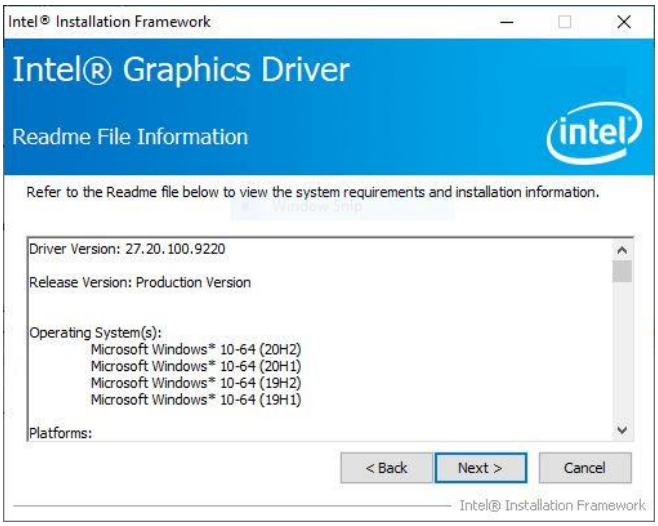
Step 2. Click **Accept**.

Step 4. Click **Finish**.

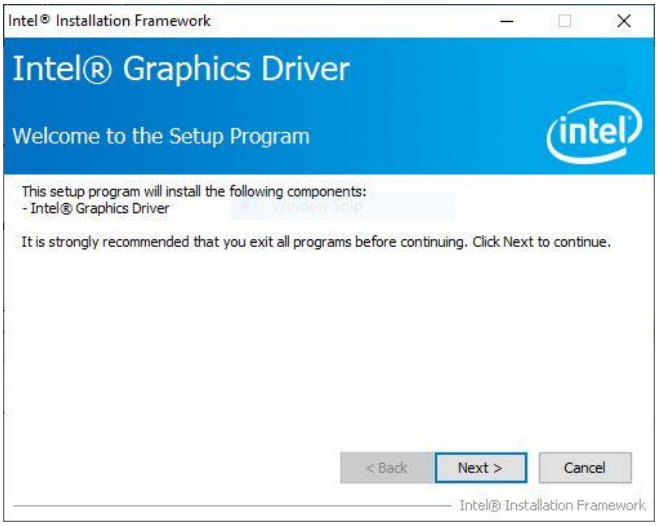
4.2 Install VGA Driver

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

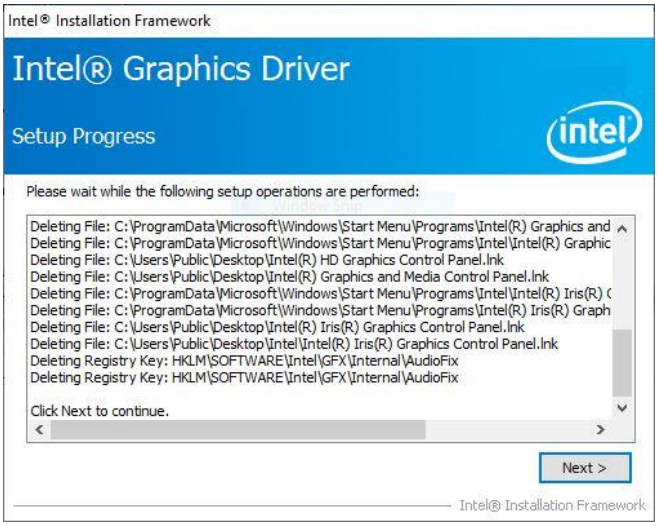
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system.



Step 3. Click **Next**.



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



Step 4. Click **Next**.

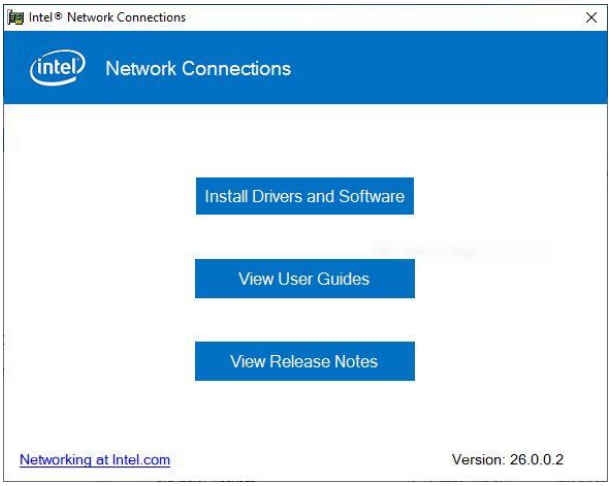
Step 2. Click **Yes**.

Step 5. Click **Finish**.

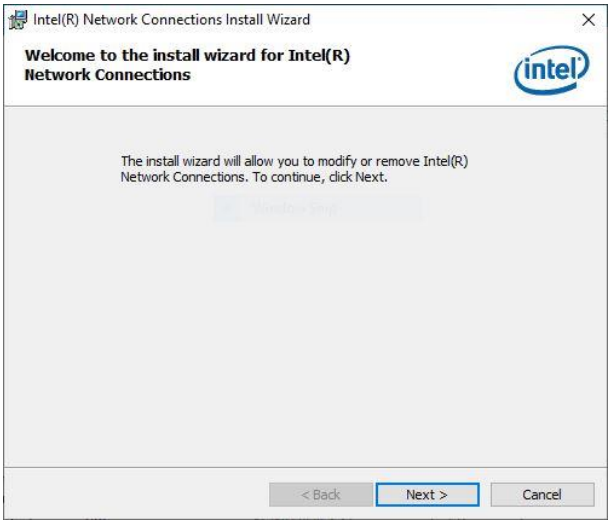
4.3 Install Lan Driver

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

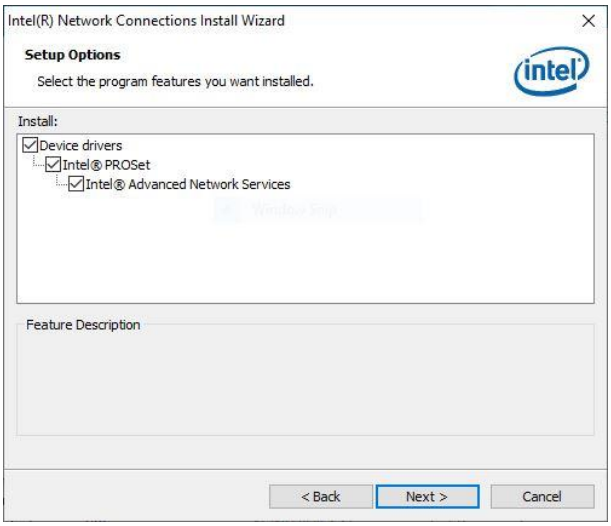
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system.



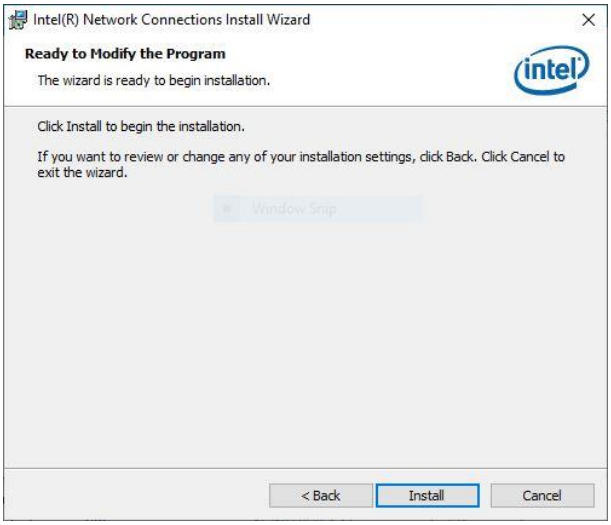
Step 1. Click **Install Drivers and Software**



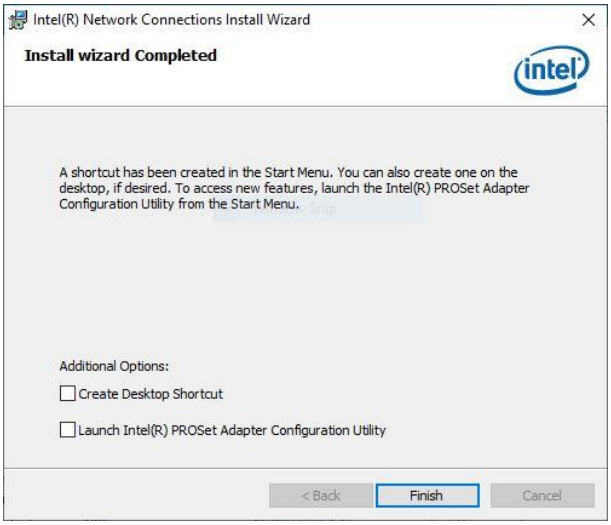
Step 2. Click **Next** to continue installation.



Step 3. Click **Next.**



Step 4. Click **Next**.

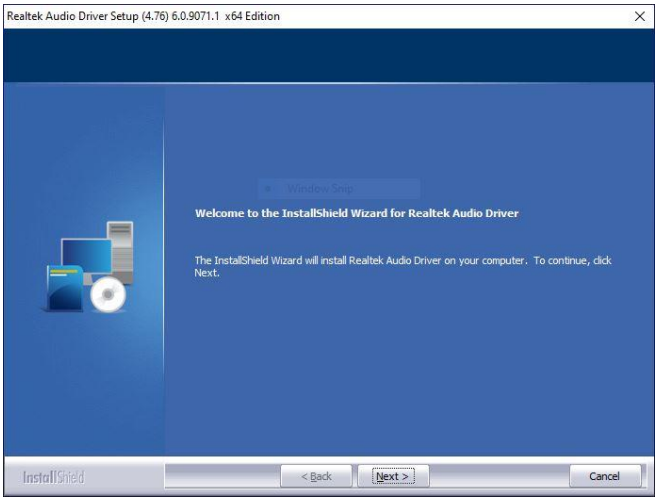


Step 5. Click **Finish** to complete setup.

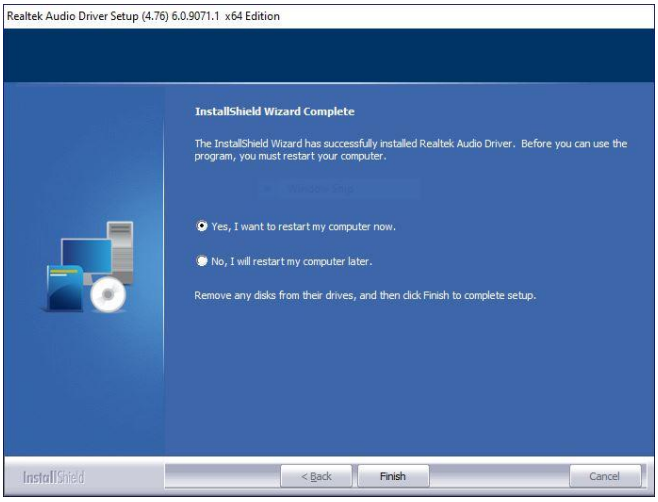
4.4 Install Audio Driver (For Realtek ALC897 and ALC888S HD Audio)

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. If the warning message appears while the installation process, click Continue to go on.



Step1. Click **Next** to Install.

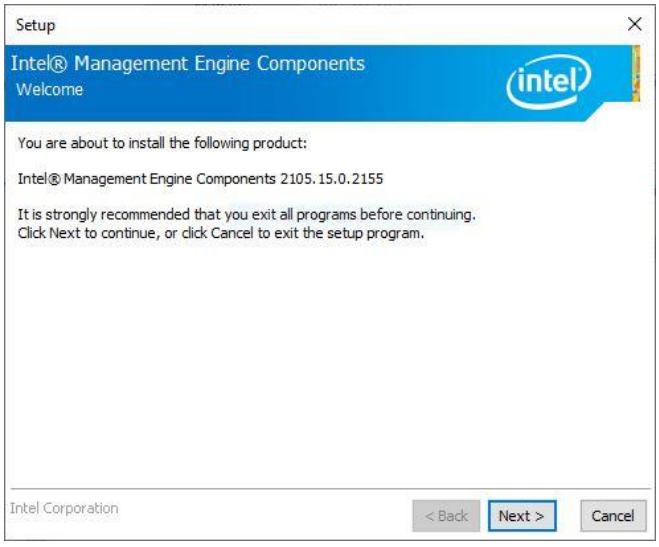


Step 2. Click **Finish** to complete setup.

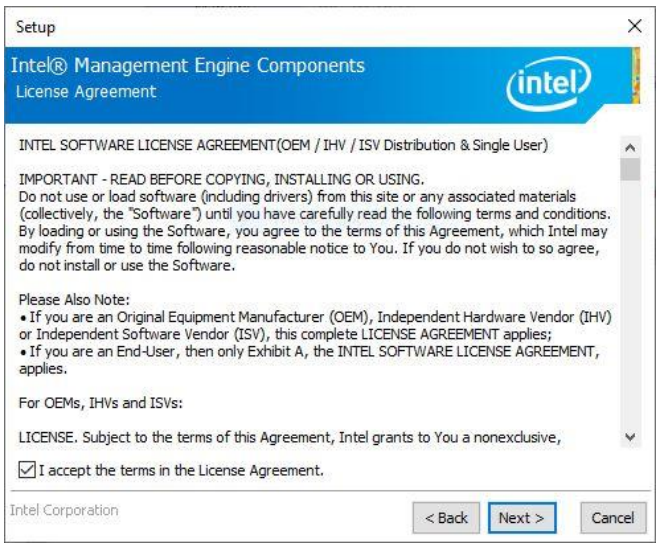
4.5 Install ME Driver

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

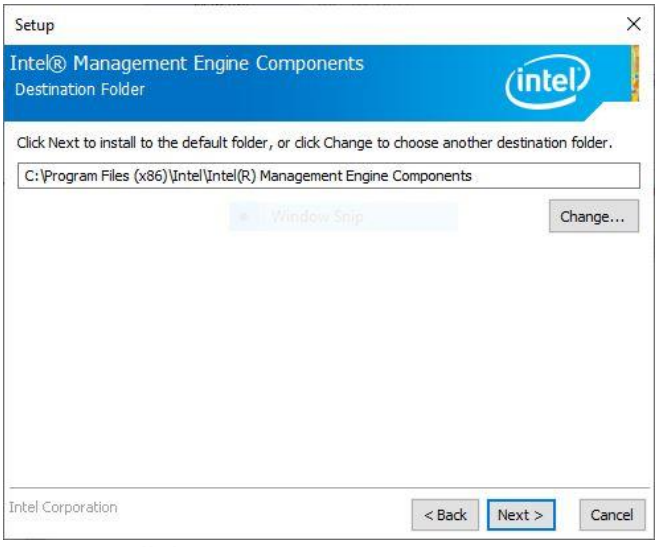
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system. If the warning message appears while the installation process, click Continue to go on.



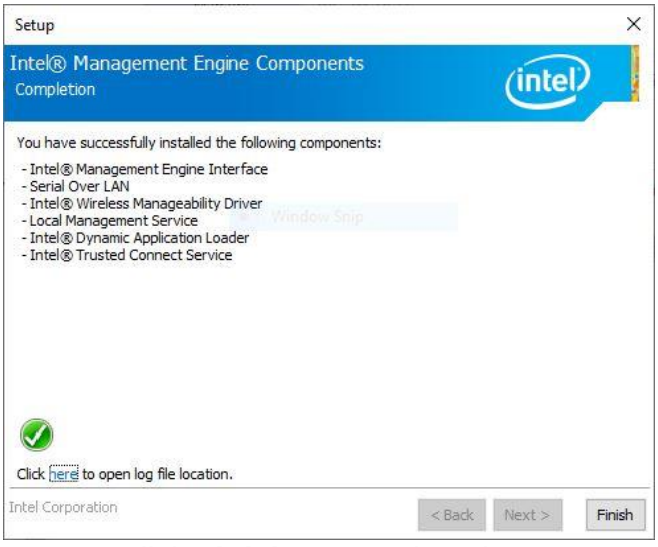
Step 1. Click **Next** to continue setup.



Step 2. Click **Next**.



Step 3. Click **Next**

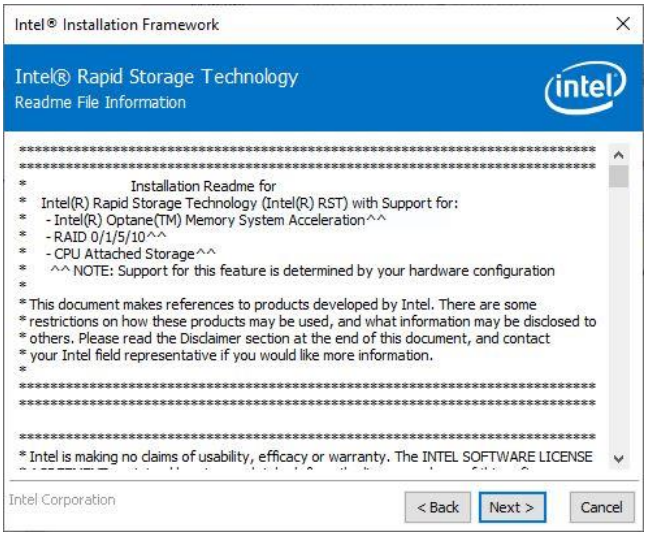


Step 4. Click **Finish** to complete the setup

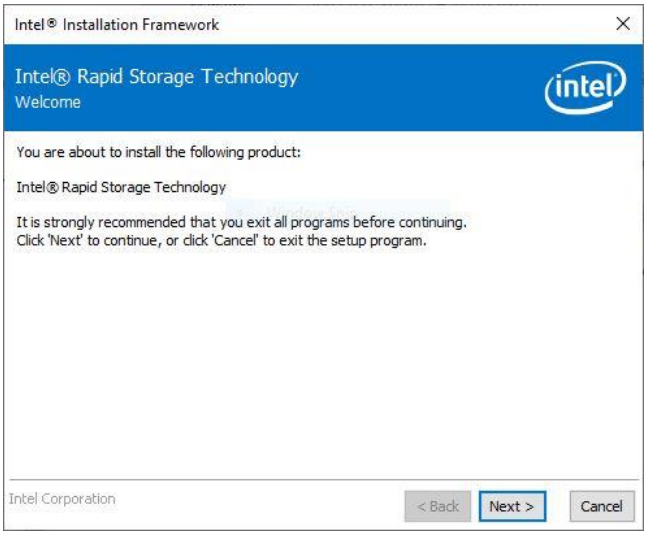
4.6 Install RST Driver

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

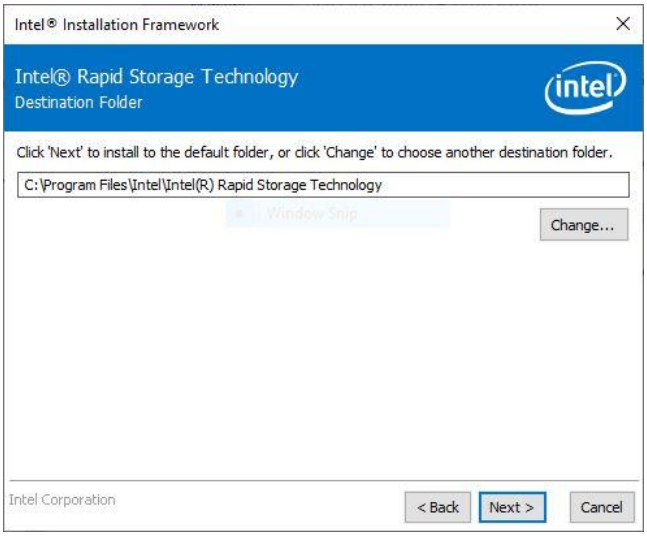
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system.



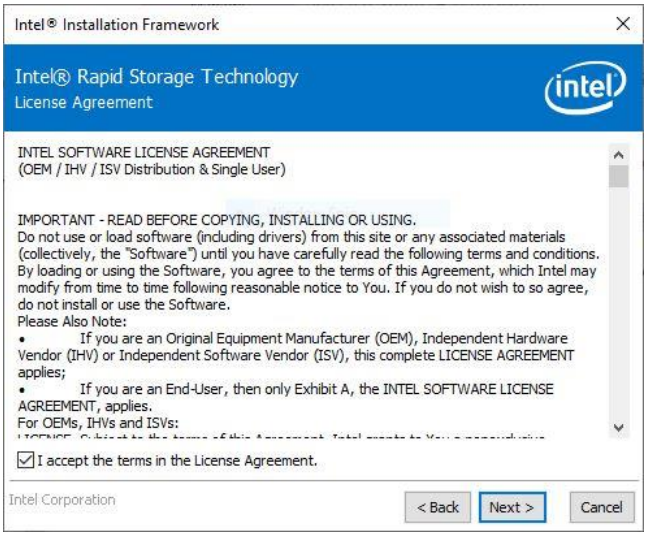
Step 3. Click **Next.**



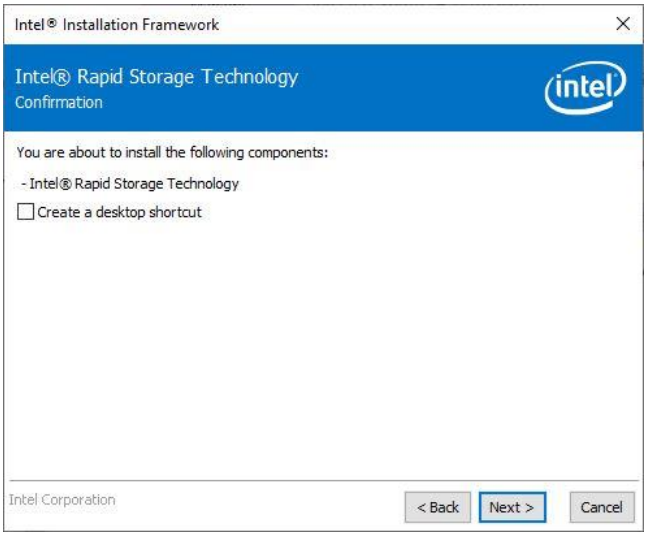
Step 1. Click **Next** to continue installation.



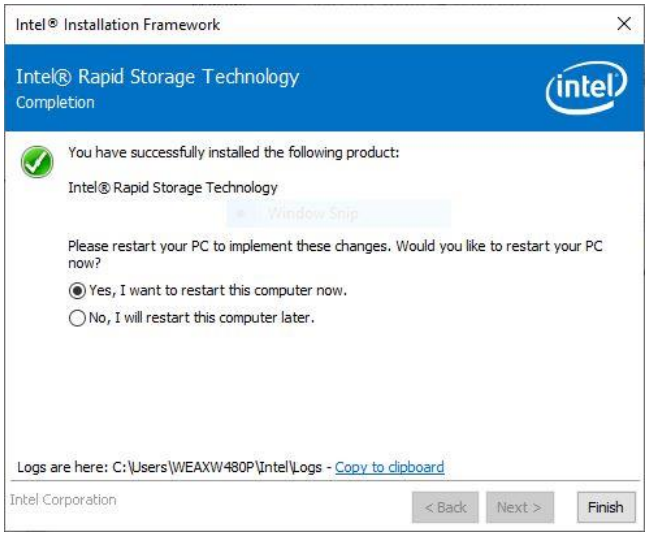
Step 4. Click **Next**.



Step 2. Click **Next**.



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

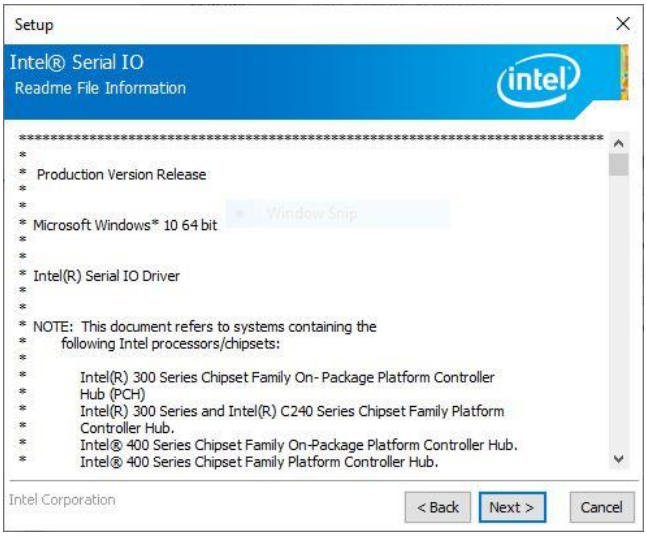


Step 6. Click **Finish** to complete setup.

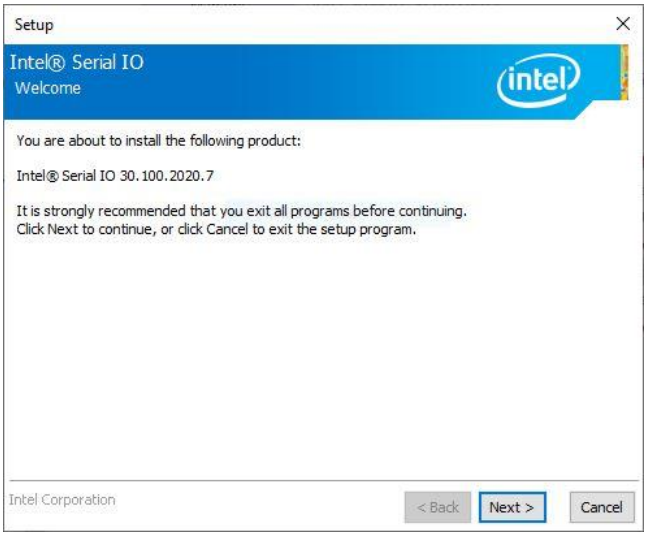
4.7 Install Serial IO Driver

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

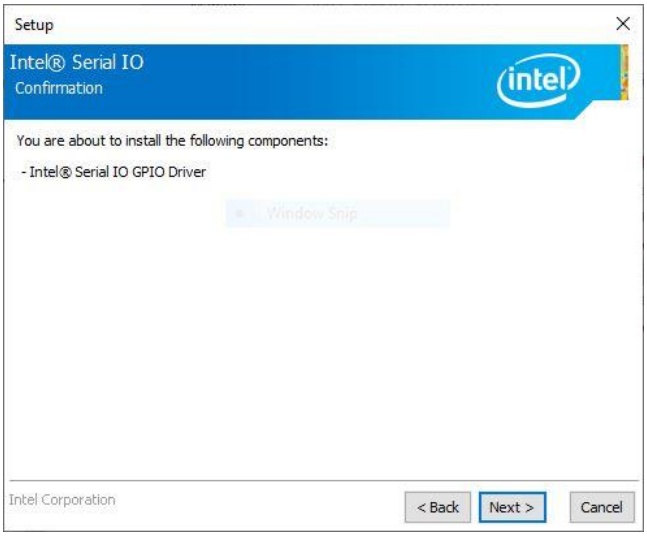
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system.



Step 3. Click **Next.**

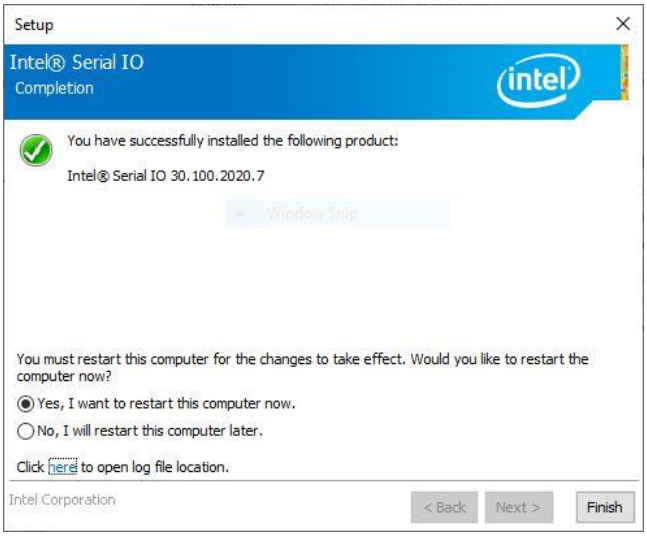


Step 1. Click **Next** to continue installation.



Step 4. Click **Next**.

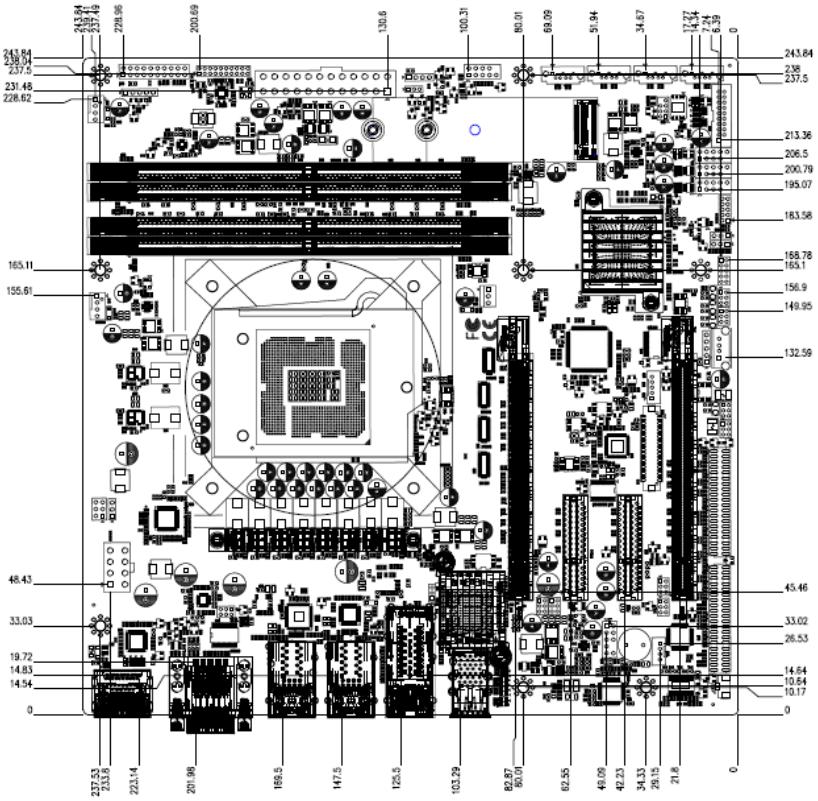
Step 2. Click **Next**.

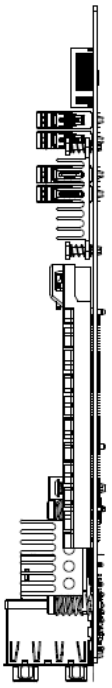


Step 5. Click **Finish** to complete setup.

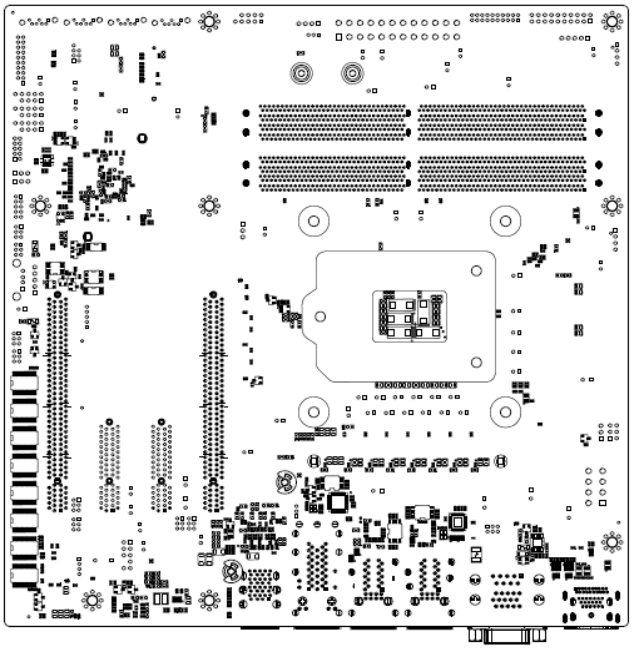
5. Mechanical Drawing

5.1 This is 6 LAN (with 10G LAN) version.



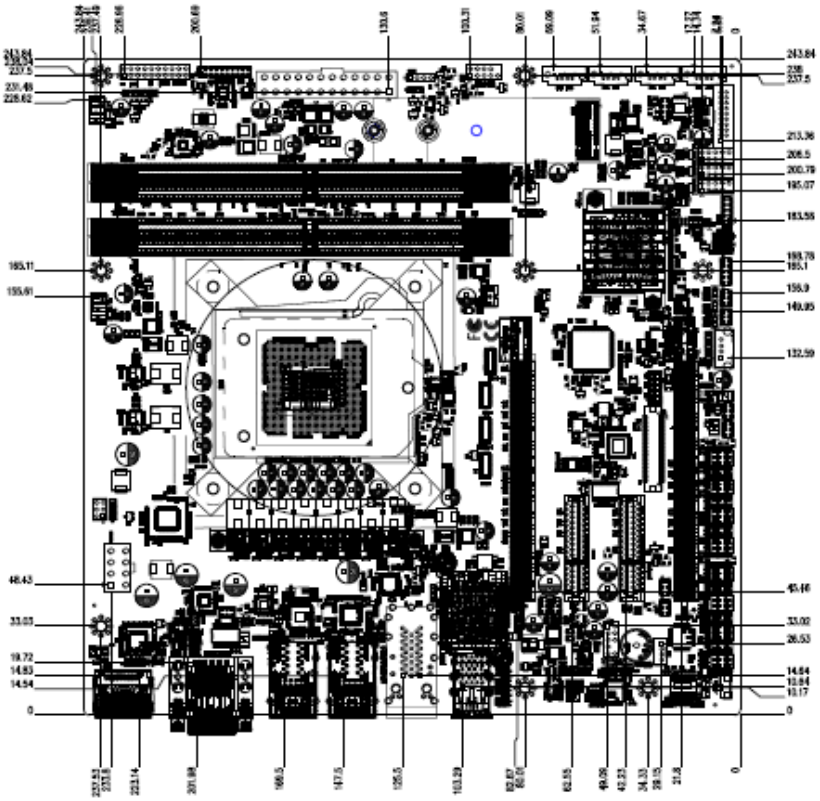


Unit: mm

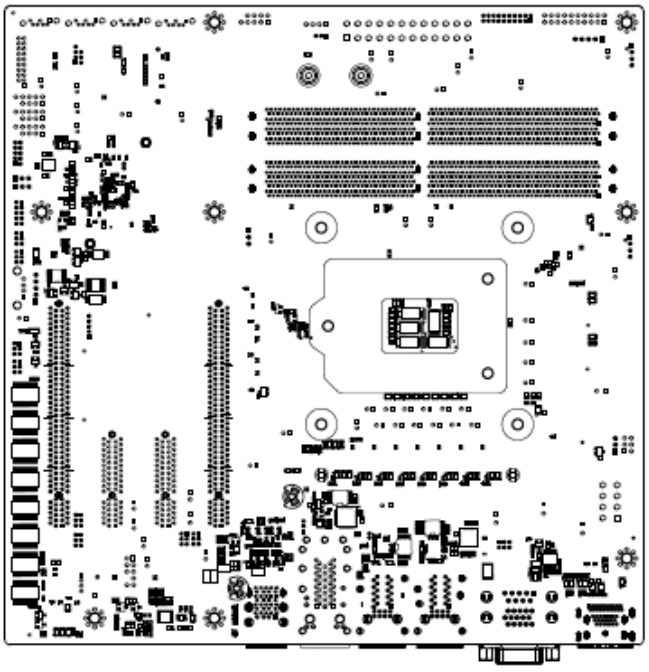


Unit: mm

5.2 This is 4 LAN (without 10G LAN) version.



Unit: mm



Unit: mm