EMX-EHLP

Intel® Elkhart Lake Mini ITX motherboard

User's Manual

1st Ed – 30 March 2023

Part No. E2047EMHP01R

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

Avalue Customer Services

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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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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 EMX-EHLP motherboard
- 2 x SATA cable
- 1 x SATA power 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	March 2023	Avalue	Initial Release
2nd	March 2023	Avalue	Update Architecture Overview—Block Diagram

1.4 Manual Objectives

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

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

We strongly recommend that you study this manual carefully before attempting to set up EMX-EHLP 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

Product Specification	
CPU	Intel® Atom® x6000E Series and Celeron® J Series processor Elkhart Lake Platform 4.5~12W
BIOS	AMI uEFI BIOS, 256Mbit SPI Flash ROM
I/O Chip	EC ITE IT5571
System Memory	One 260-pin DDR4 3200MHz SO-DIMM socket, supports up to 32GB Max (Only Atom® x6000E Series Processors support IBECC)
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	NuvoTon NPCT754AADYX support SPI TPM 2.0 (BOM option)
Expansion Slot	
M.2	1 x M.2 Type B slot for 3042/3052/2242/2260/2280 size with SATAIII + USB 3.1 GEN2, USB 2.0, SIM Slot for SSD/LTE/IO Cards support WWAN+GNSS and SSD *3042/2242 bridge bracket to 3052 *SATA 2 share with M.2 key B SATA * Only supports one SIM card * Does not support I2S and PCM functions 1 x M.2 Key E 2230 support WiFi module (1 x PCI-e x1 & USB 2.0 Signal) * Does not support PCM/I2S and UART functions
Storage	
M.2	1 x M.2 Type B 2242/2260/2280 SSD *SATA 2 share with M.2 key B SATA
SATA	2 x SATA III, 2 x SATA Power *SATA 2 share with M.2 key B SATA
Edge I/O	
LAN	4 x Intel® i226LM/IT(i226IT for wide temp version) 2.5 Gigabit Ethernet (BOM optional for 1 x 2 RJ45 Thin Mini ITX Cost version design SKU)
USB 2.0	2 x USB3.1 Gen2 and 2 x USB3.1 Gen1
USB 3.1	2 x USB3.1 Gen1
DP	1 x DP++
HDMI	1 x HDMI 2.0b
DC Input	1 x DC Jack lockable connector type
Onboard I/O	
COM	COM 1 & COM2:

COM	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 connector (JCOM1, JCOM2) 2 x 2 x 3 pin, pitch 2.00mm connector support RS422/485 connector, Pin 5 with / +5V Supported (J485-1,J485-2) COM3 to 6: 1 x 2 x 20 pin, pitch 2.00mm connector for COM3~6: support RS-232 connector (JCOM3_1) NuvoTon_NCT5124D
USB 2.0	2 x 2 x 5 pin, pitch 2.54mm connector for 4 USB 2.0 (JUSB3,JUSB4)
GPIO	1 x 2 x 10 pin, pitch 2.00mm connector for GPIO: 16 bits & +3.3S Level SMBus (JDIO1)
SATA Power	2 x SATA III, 2 x SATA Power
CPU/System FAN	1 x 1 x 4 pin, pitch 2.54mm CPU fan connector with smart fan function supported (JFAN1)
Buzzer	Onboard Buzzer (BZ1)
Front Panel	1 x 2 x 5 pin, pitch 2.54mm connector for front panel (JFP1)
RTC Battery	1 x 2 Pin Pitch 1.25mm horizontal type battery connector (CR2032 Battery)
AT/ATX Selector	1 x 1 x 3 pin pitch 2.54mm connector for AT/ATX jumper (JAT1)
Clear CMOS	1 x 1 x 3 pin, pitch 2.00mm connector for CMOS clear (JCMOS1)
LVDS	1 x 2 x 20 pin, pitch 1.25mm connector for LVDS (JLVDS1)
LCD Backlight Brightness	1 x 1 x 5 pin, pitch 2.00mm Wafer connector for LCD inverter backlight connector (5V/12V) (JBL1) 1 x 1 x 3 pin, pitch 2.00mm connector LCD backlight brightness adjustment (PWM/DC) (Jumper default: 1-2 for PWM) (JBLS1) 1 x 1 x 3 pin, pitch 2.00mm connector 3.3 & 5V voltage adjustment (Jumper default: 1-2 for 3.3V) (JBLP1)
LCD Inverter	JEDP_LVDS1 VDDEN : 1 x 1 x 3 pin, pitch 2.00mm connector LVDS_EDP VDDEN (Jumper default: 2-3 for LVDS) (JEDP_LVDS1)
BIOS SPI	1 x 2 x 4 pin, pitch 2.00mm connector for BIOS SPI (JBIOS1)
EC Debug	1 x 2 x 6 pin, pitch 2.00mm connector for EC SPI (JESPI)
Audio	1 x 2 x 5 pin, pitch 2.00mm connector for front Audio (JFAUD1)
DC-Input	1 x DC Jack lockable connector type
Other	1 x 2 x 10 pin, pitch 1.25mm connector for eDP (JEDP1) 1 x 4 pin, pitch wafer 2.00mm connector for 6W x 2 Speaker (JSPK1) 1 x 2 x 4 pin, pitch 2.00mm connector for LAN Activity Indicator LED (JLAN_LED1) 1 x 2 x 2 pin, pitch 4.20mm connector for power input connector (JPWR3) 1 x 1 x 3 pin, pitch 2.00mm connector for EC firmware update (JEC_ROM1)

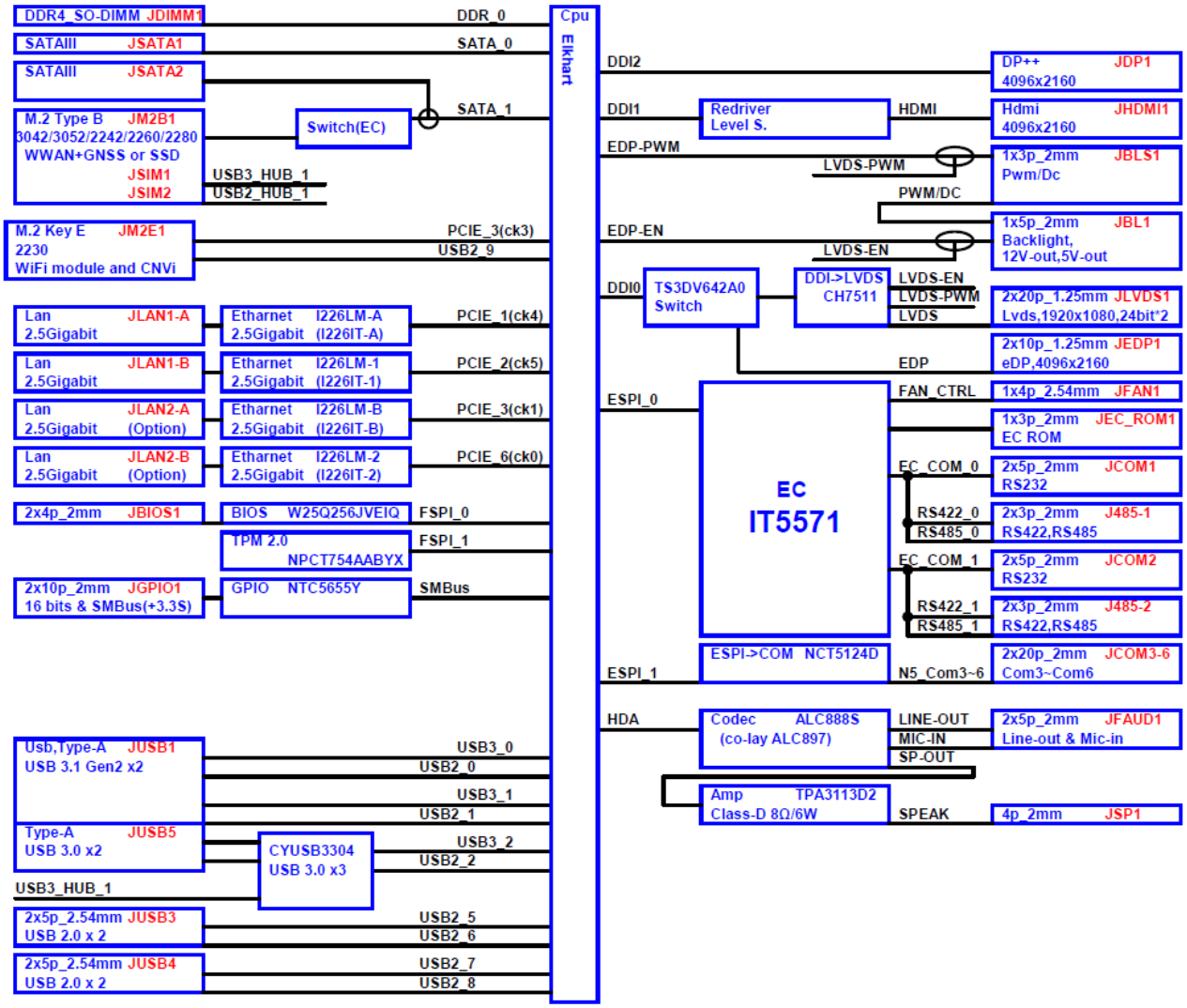
Other	1 x 1 x 3 pin, pitch 2.00mm connector for M.2 module card 3.3V and 3.8V selection (Jumper default: 1-2 for 3.3V) (JM2BP1)
Display	
Graphic Chipset	Intel® UHD Graphics for 10th Gen Intel® Processors
Spec. & Resolution	1 x DP++: 1920 x 1080@60 Hz (DP: 4096 x 2160@60Hz) 1 x HDMI 2.0b: 4096 x 2160@60 Hz LVDS: 1920 x 1080 Dual channel 18/24-bits LVDS (Chrontel CH7511B-BFI eDP to LVDS) 1 x eDP 4096 x 2160@60 Hz LVDS and eDP via switch IC, either one display is functional.
Multiple Display	Triple Display DP++, HDMI 2.0b, LVDS/eDP Note: User may experience UEFI Shell text font shrink when use single DP(4K) or HDMI(4K).
Audio	
Audio Codec	Realtek ALC888s HD Audio Decoding Controller
Amplifier	TPA3113D2 Stereo Class-D 6W
Ethernet	
LAN Chipset	4 x Intel® i226LM/IT(i226IT for wide temp version) 2.5 Gigabit Ethernet (BOM optional for 1x2 RJ45 Thin Mini ITX Cost version design SKU)
LAN Spec.	10/100/1000/2500 Base-Tx GbE compatible Gigabit Ethernet
Mechanical & Environmental Specification	
Power Requirement	DC in +12V ~ +24V (Minimum power input 11.6V)
ACPI	Single power ATX Support S0, S3, S4, S5 ACPI 5.1 Compliant
Power Mode	AT / ATX mode Switchable Through Jumper
Operating Temp.	0 ~ 60°C (32 ~ 140 °F) Intel® Celeron® J Series CPU SKU -20~60°C (-8~140°F) Intel® Atom®x6000 Series CPU SKU 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)	6.7" x 6.7" (170mm x 170mm)
Weight	0.60kg

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
Vibration Test	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.

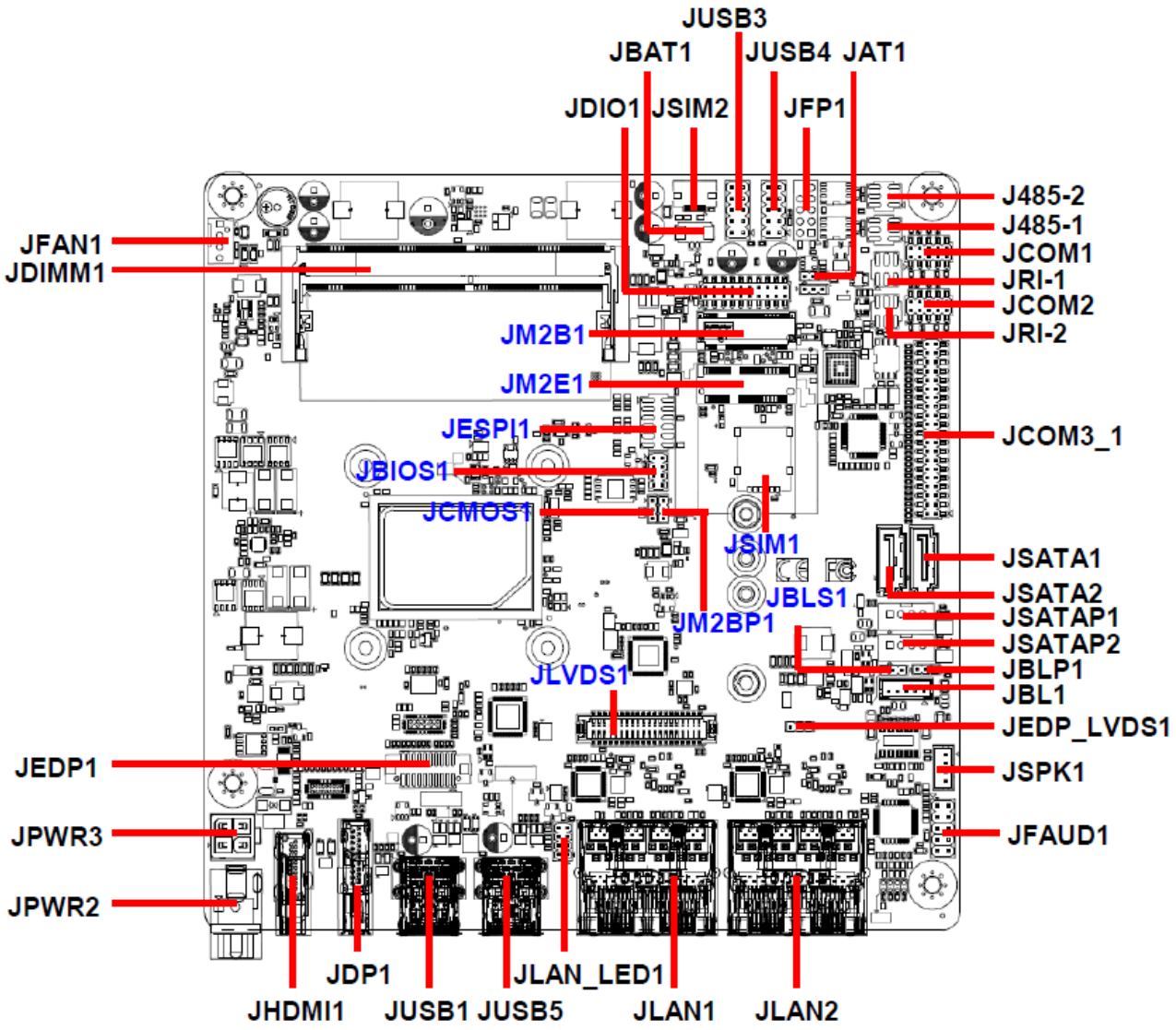
1.6 Architecture Overview—Block Diagram

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



2. Hardware Configuration

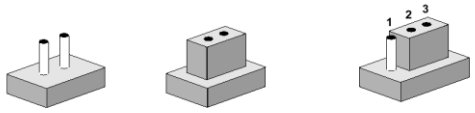
2.1 Product Overview



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	Serial port 1/2 pin9 signal select	3 x 2 header, pitch 2.00mm
JBLS1	Backlight for PWM or DC select	3 x 1 header, pitch 2.00mm
JBLP1	Backlight power for +V3.3 or +V5 select	3 x 1 header, pitch 2.00mm
JEDP_LVDS1	Panel Power	3 x 1 header, pitch 2.00mm
JAT1	AT/ATX Power Mode Select	3 x 1 header, pitch 2.00mm
JCMOS1	Clear CMOS	3 x 1 header, pitch 2.00mm
JM2BP1	M2KB1 Voltage setting	3 x 1 header, pitch 2.00mm

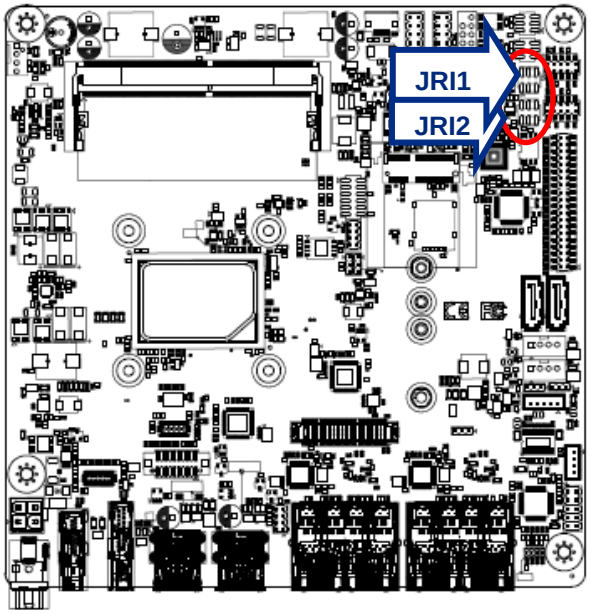
Connectors

Label	Function	Note
JFP1	Miscellaneous setting connector 1	5 x 2 header, pitch 2.54mm
JDIMM1	260-pin DDR4 SO-DIMM socket	

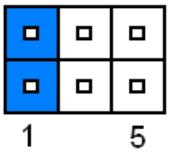
JFAUD1	Front Audio connector	5 x 2 header, pitch 2.00mm
JBL1	LCD Inverter connector	5 x 1 wafer, pitch 2.00mm
JSPI1	SPI connector	6 x 2 header, pitch 2.00mm
JBIOS	JBIOS connector	4 x 2 header, pitch 2.00mm
JCOM1/2	Serial Port 1/2 connector	5 x 2 header, pitch 2.00mm
JCOM3_1	Serial Port 3 connector	20 x 2 header, pitch 2.00mm
JDIO1	General purpose I/O connector	10 x 2 header, pitch 2.00mm
JSPK1	Speaker connector	4 x 1 wafer, pitch 2.00mm
JLVDS1	LVDS Connector	20 x 2 wafer, pitch 1.25mm
JEDP1	eDP_Panel connector	10 x 2 wafer, pitch 1.25mm
JUSB1/5	USB connector 1/5	
JUSB3/4	USB connector 3/4	5 x 2 header, pitch 2.54mm
JBAT1	Battery connector	2 x 1 wafer, pitch 1.25mm
JM2E1	M.2 2230 Type E Slot	
JM2B1	M.2 3042/2242/2260/2280 Type B Slot	
J485_1/2	Serial Port 1/2 RS485/422 Mode connector	3 x 2 header, pitch 2.00mm
JLAN_LED1	JLAN_LED connector	5 x 2 header, pitch 2.00mm
JPWR2	Power connector	
JPWR3	Power connector	2 x 2 wafer, pitch 4.20mm
JSATA1/2	Serial ATA connector 1/2	
JSATAP1/2	SATA Power connector 1/2	4 x 1 wafer, pitch 2.50mm
JSIM1	JSIM connector	
JSIM2	JSIM connector	10 x 1 header, pitch 0.50mm
JFAN1	CPU fan connector	4 x 1 wafer, pitch 2.54mm
JHDMI1	HDMI connector	
JDP1	DP connector 1	
JLAN1/2	RJ-45 Ethernet 1/2	

2.3 Setting Jumpers & Connectors

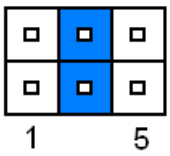
2.3.1 Serial port 1/2 pin9 signal select (JRI-1/JRI-2)



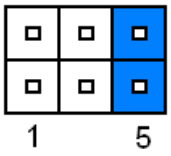
Ring*



+5V

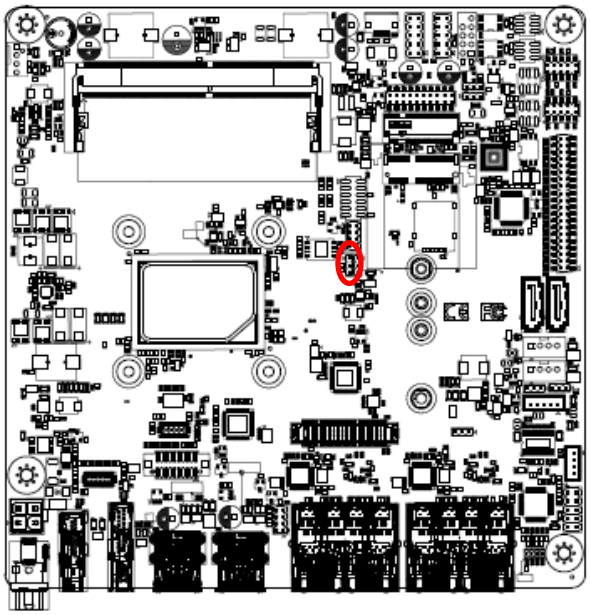


+12V

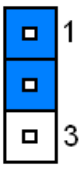


*** Default**

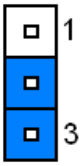
2.3.2 Clear CMOS (JCMOS1)



Protect*

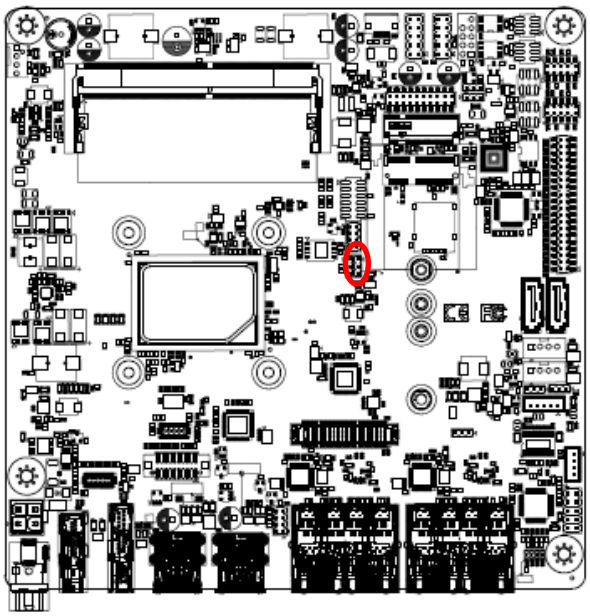


Clear CMOS

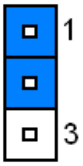


*** Default**

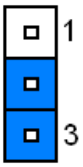
2.3.3 M2KB1 Voltage setting (JM2BP1)



+3.3V*

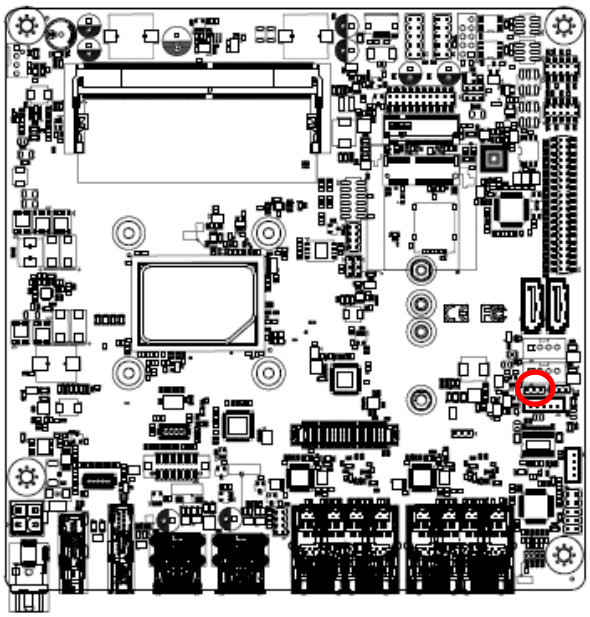


+3.8V

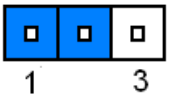


*** Default**

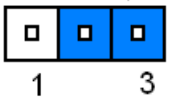
2.3.4 Backlight for PWM or DC select (JBLS1)



PWM*

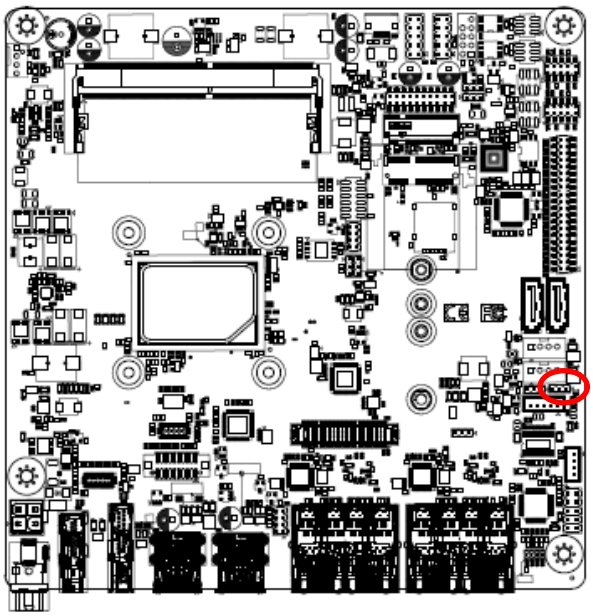


DC

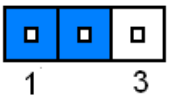


*** Default**

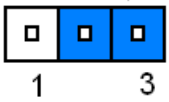
2.3.5 Backlight power for +V3.3 or +V5 select (JBLP1)



+3.3V*

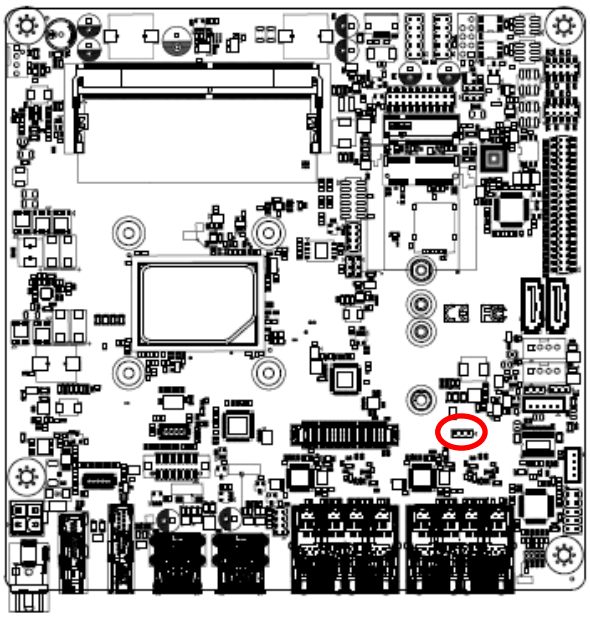


+5V

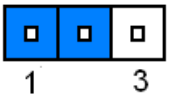


*** Default**

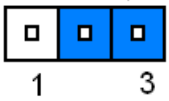
2.3.6 Panel Power (JEDP_LVDS1)



+3.3V*

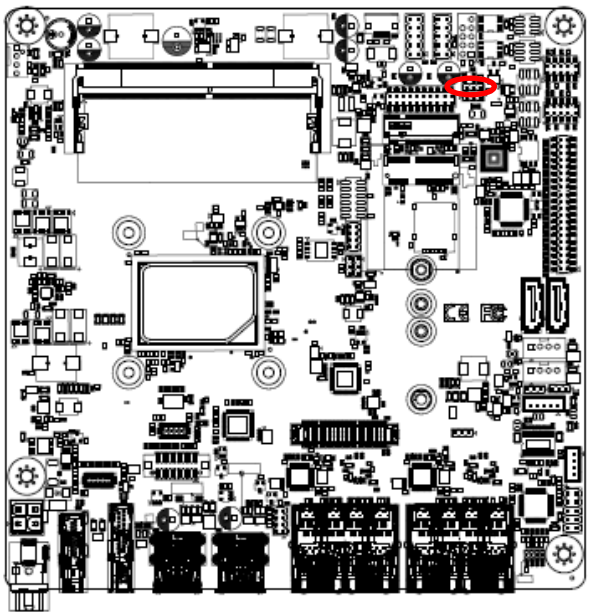


+5V

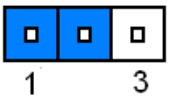


*** Default**

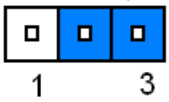
2.3.7 AT/ATX Power Mode Select (JAT1)



AT

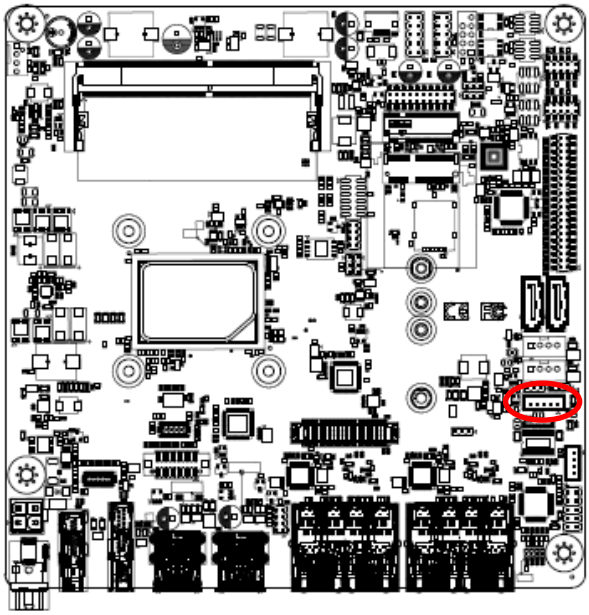


ATX*



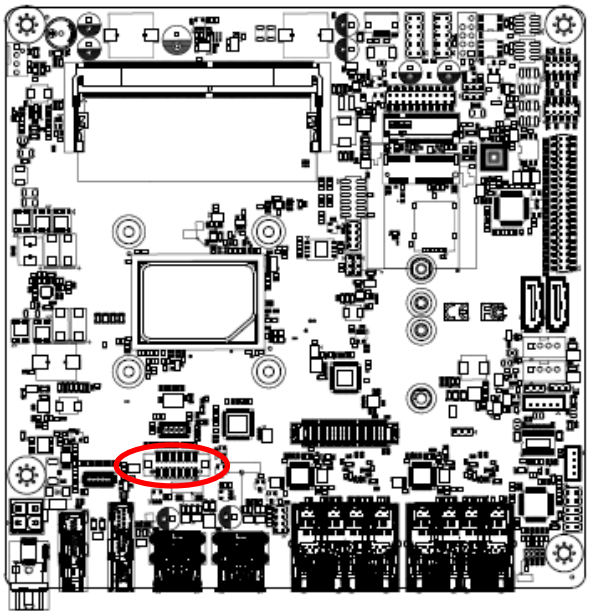
*** Default**

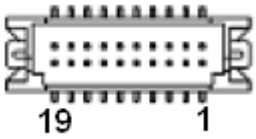
2.3.8 LCD Inverter connector (JBL1)



PIN	Signal
1	+V12S_INV
2	GND
3	BKLEN
4	VBRIGHT
5	+V5S_INV

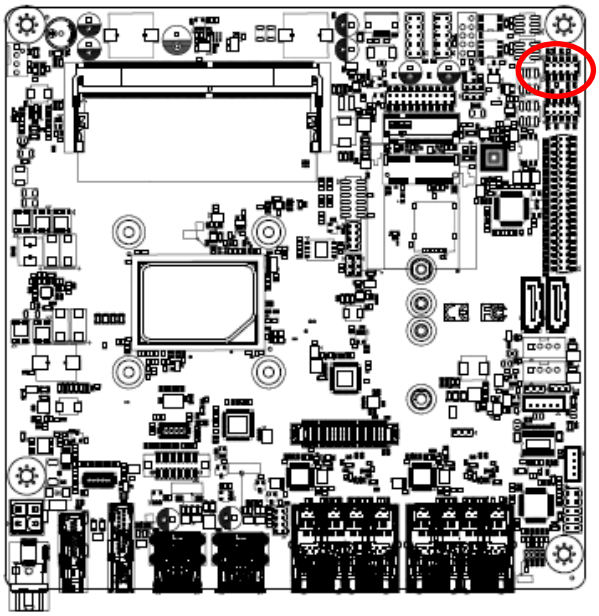
2.3.9 eDP_Panel connector (JEDP1)

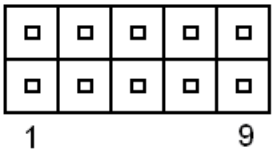




Signal	PIN	PIN	Signal
GND	1	2	GND
JEDP1_TXN0	3	4	JEDP1_TXN3
JEDP1_TXP0	5	6	JEDP1_TXP3
GND	7	8	NC
JEDP1__TXN1	9	10	GND
JEDP1__TXP1	11	12	JEDP1_AUXN
GND	13	14	JEDP1_AUXP
JEDP1__TXN2	15	16	GND
JEDP1__TXP2	17	18	JEDP1_HPD
+V12_JEDP1	19	20	+V12_JEDP1

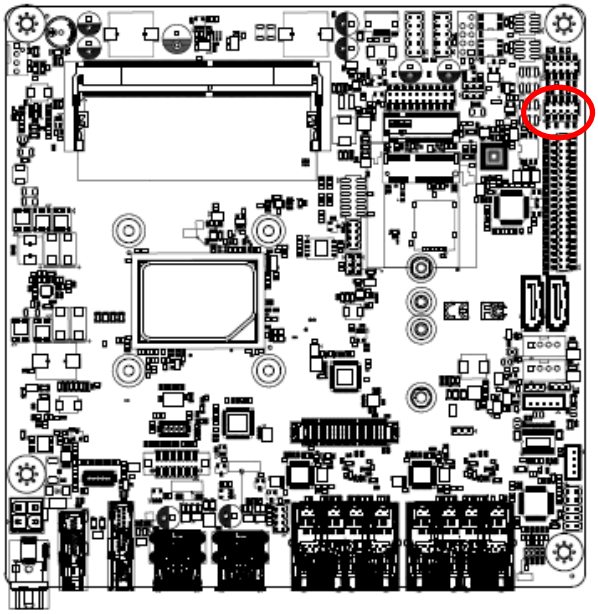
2.3.10 Serial port1 connector (JCOM1)

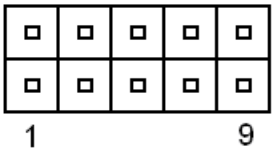




Signal	PIN	PIN	Signal
COM_DCD#1	1	2	COM_RXD1
COM_TXD1	3	4	COM_DTR#1
GND	5	6	COM_DSR#1
COM_RTS#1	7	8	COM_CTS#1
COM_PIN9_1	9	10	NC

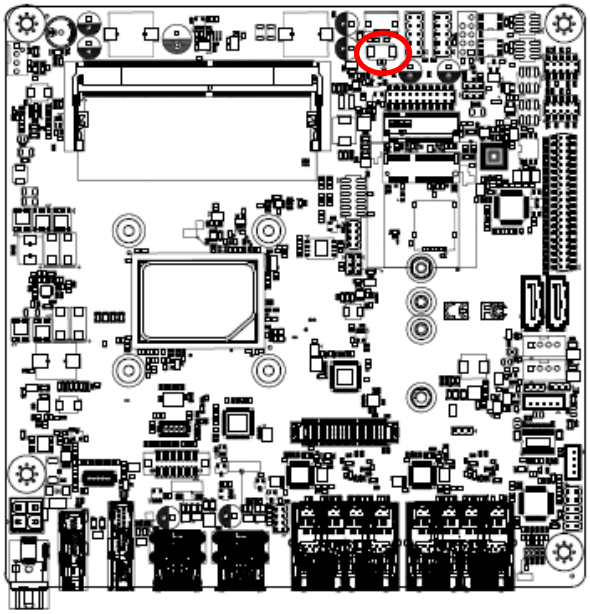
2.3.11 Serial port2 connector (JCOM2)





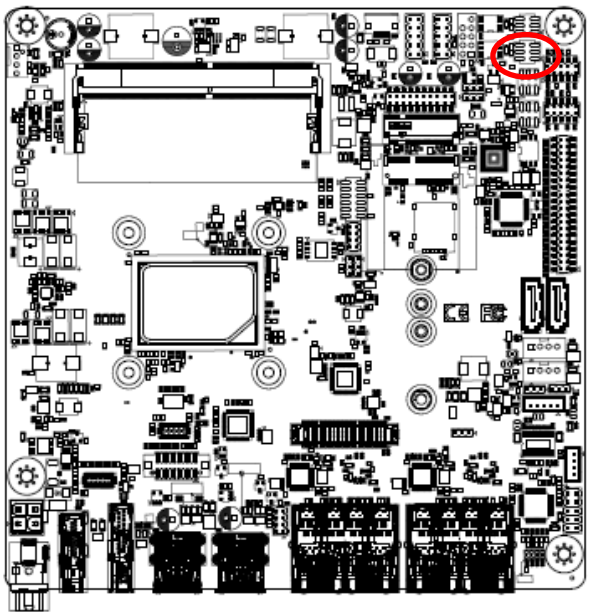
Signal	PIN	PIN	Signal
COM_DCD#2	1	2	COM_RXD2
COM_TXD2	3	4	COM_DTR#2
GND	5	6	COM_DSR#2
COM_RTS#2	7	8	COM_CTS#2
COM_PIN9_2	9	10	NC

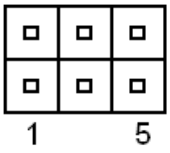
2.3.12 Battery connector (JBAT1)



PIN	Signal
1	+V3.3A_EC
2	GND

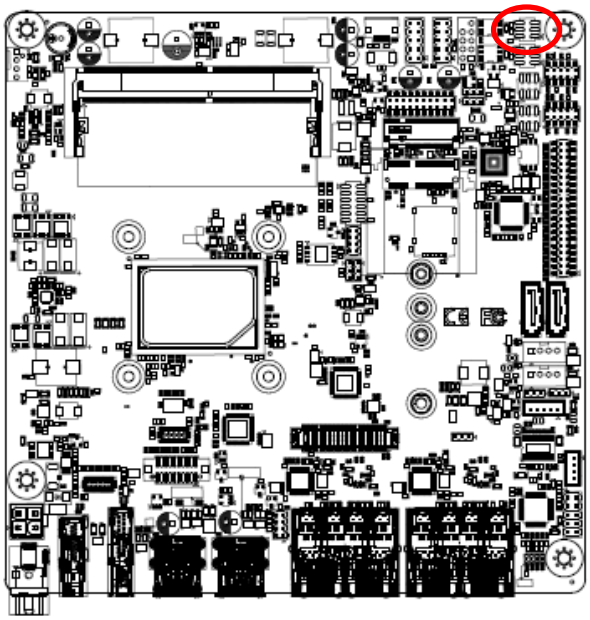
2.3.13 Serial Port 1 RS485/422 Mode connector (J485-1)

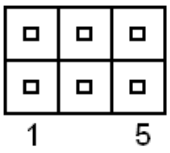




Signal	PIN	PIN	Signal
485TX-_2	1	2	485TX+_2
422RX+_2	3	4	422RX-_2
+5V	5	6	GND

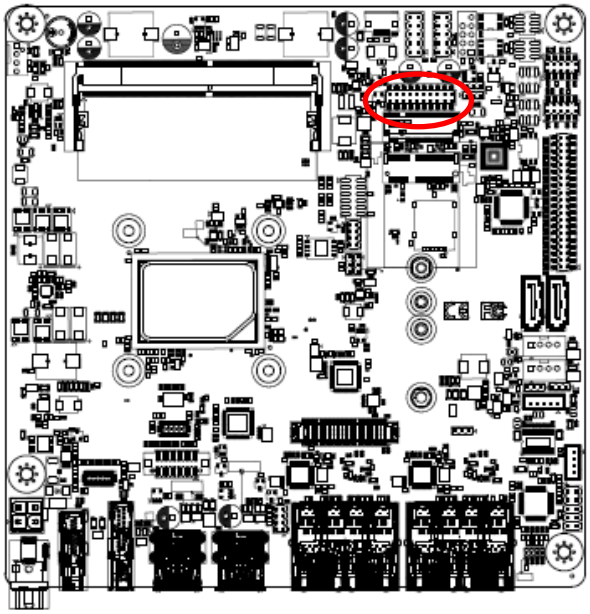
2.3.14 Serial Port 2 RS485/422 Mode connector (J485-2)

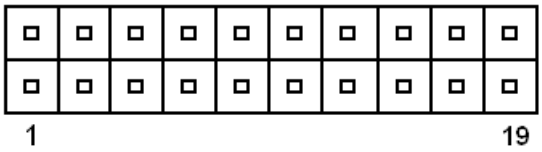




Signal	PIN	PIN	Signal
485TX-_2	1	2	485TX+_2
422RX+_2	3	4	422RX-_2
+5V	5	6	GND

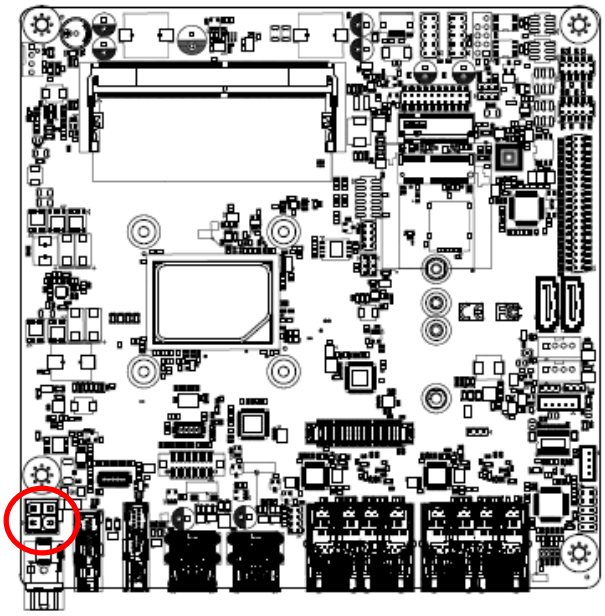
2.3.15 General purpose I/O connector (JDIO1)

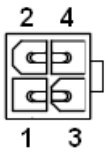




Signal	PIN	PIN	Signal
DIO_GP20	1	2	DIO_GP10
DIO_GP21	3	4	DIO_GP11
DIO_GP22	5	6	DIO_GP12
DIO_GP23	7	8	DIO_GP13
DIO_GP24	9	10	DIO_GP14
DIO_GP25	11	12	DIO_GP15
DIO_GP26	13	14	DIO_GP16
DIO_GP27	15	16	DIO_GP17
SMB_CLK_5V	17	18	SMB_DATA_5V
GND	19	20	+V5S_DIO (Max current = 0.5A)

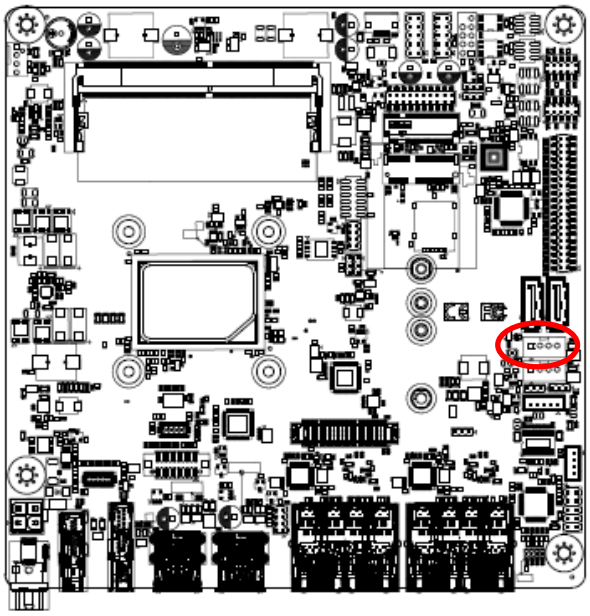
2.3.16 Power connector (JPWR3)

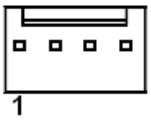




Signal	PIN	PIN	Signal
GND	2	4	+V24_DCIN
GND	1	3	+V24_DCIN

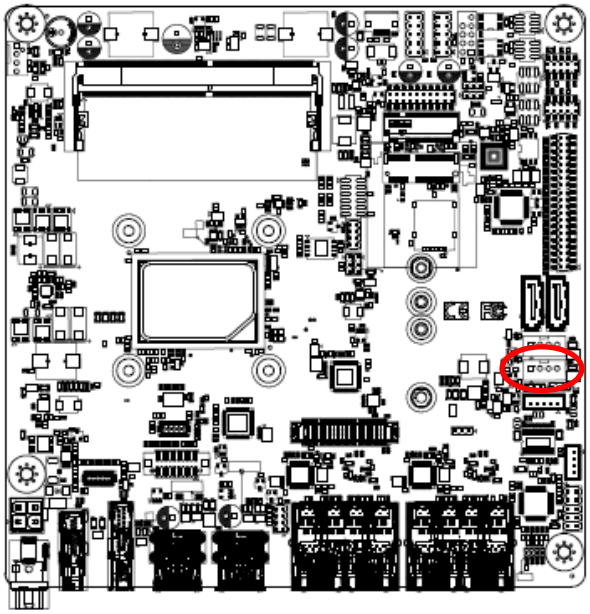
2.3.17 SATA Power connector 1 (JSATAP1)

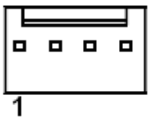




PIN	Signal
1	+V5_JSATA1
2	GND
3	GND
4	+V12_JSATA1

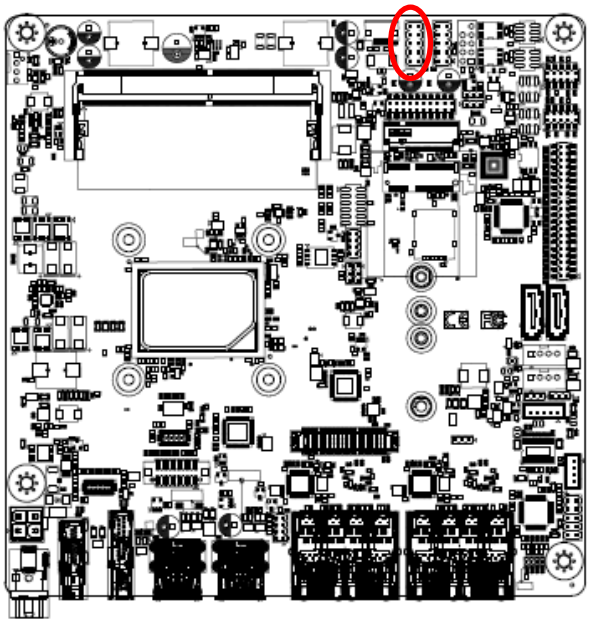
2.3.18 SATA Power connector 2 (JSATAP2)

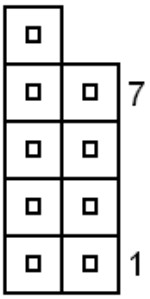




PIN	Signal
1	+V5_JSATA2
2	GND
3	GND
4	+V12_JSATA2

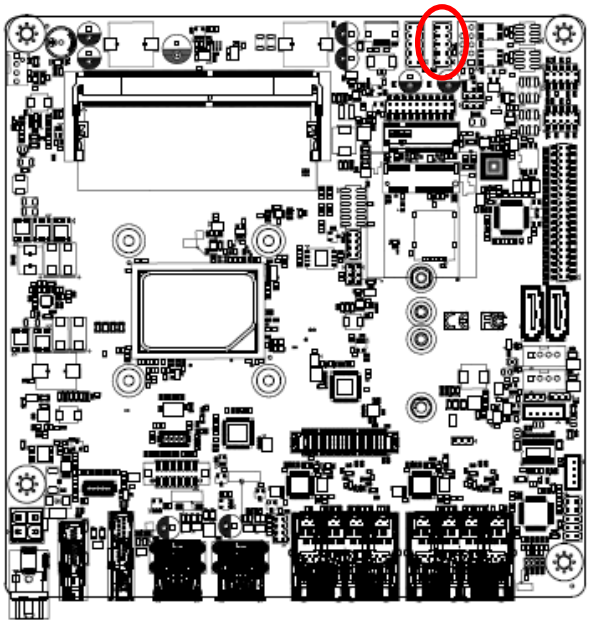
2.3.19 USB connector 3 (JUSB3)

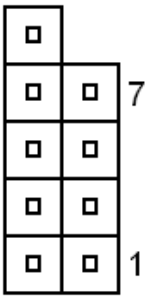




Signal	PIN	PIN	Signal
GND	10		
GND	8	7	GND
JUSB3-2_USB6P	6	5	JUSB3-1_USB5P
JUSB3-2_USB6N	4	3	JUSB3-1_USB5N
+V5+JUSB3	2	1	+V5+JUSB3

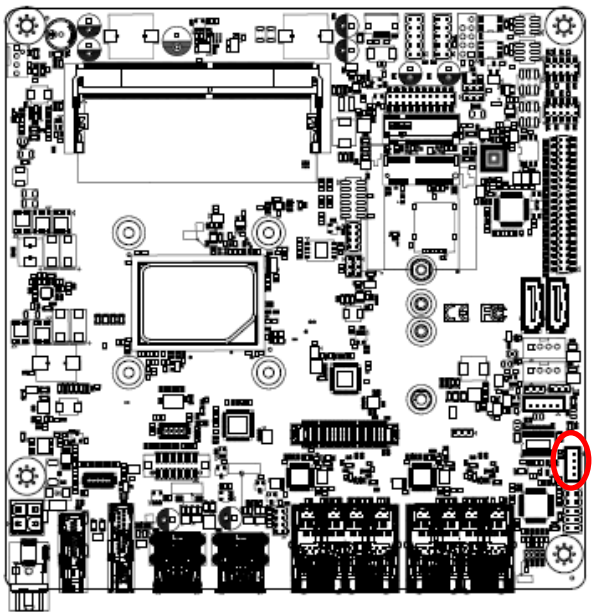
2.3.20 USB connector 4 (JUSB4)

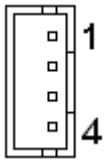




Signal	PIN	PIN	Signal
GND	10		
GND	8	7	GND
JUSB4-2_USB8P	6	5	JUSB4-1_USB7P
JUSB4-2_USB8N	4	3	JUSB4-1_USB7N
+V5+JUSB4	2	1	+V5+JUSB4

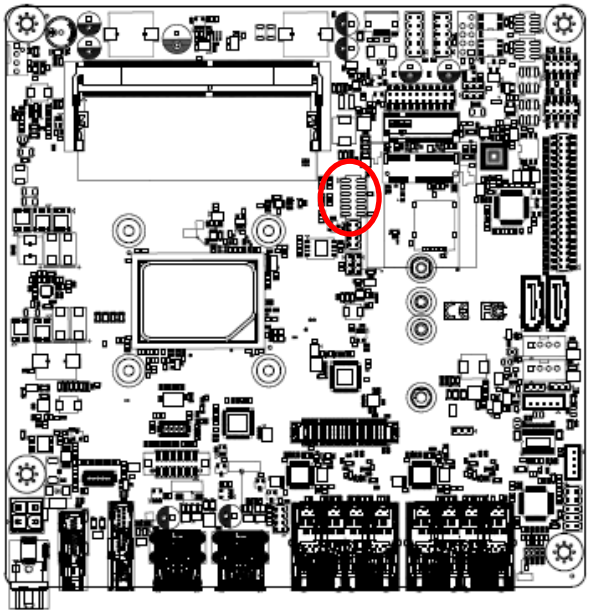
2.3.21 Speaker connector (JSPK1)

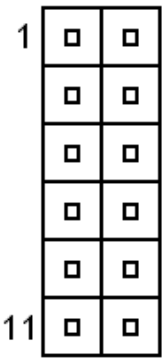




Signal	PIN
LSPK+	1
LSPK-	2
RSPK+	3
RSPK-	4

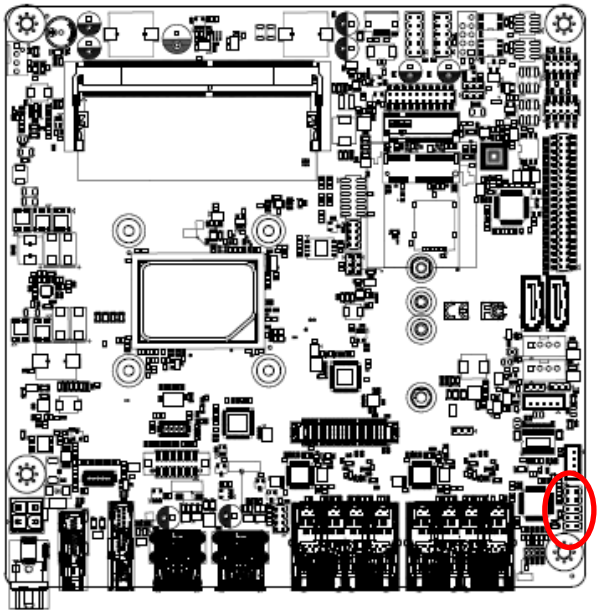
2.3.22 SPI connector (JSPI1)

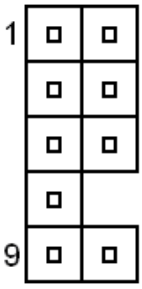




Signal	PIN	PIN	Signal
CN_ESPI_IO0	1	2	+3.3V
CN_ESPI_IO1	3	4	PLT_RST_BUF#
CN_ESPI_IO2	5	6	CPU_ESPI_CS#0
CN_ESPI_IO3	7	8	CN_ESPI_CLK
NC	9	10	GND
CPU_ESPI_RST#	11	12	CPU_ESPI_ALERT#0

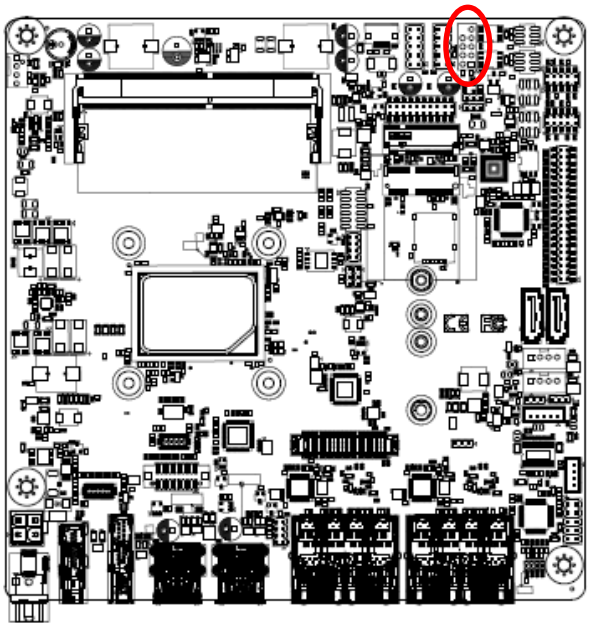
2.3.23 Audio connector (JFAUD1)

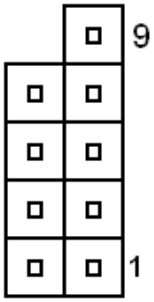




Signal	PIN	PIN	Signal
MIC2_LIN	1	2	GND
MIC2_RIN	3	4	ACZ_DET#_FRONT
LINE2_LIN	5	6	MIC2_JD
GND	7	8	
LINE2_LIN	9	10	LINE2_JD

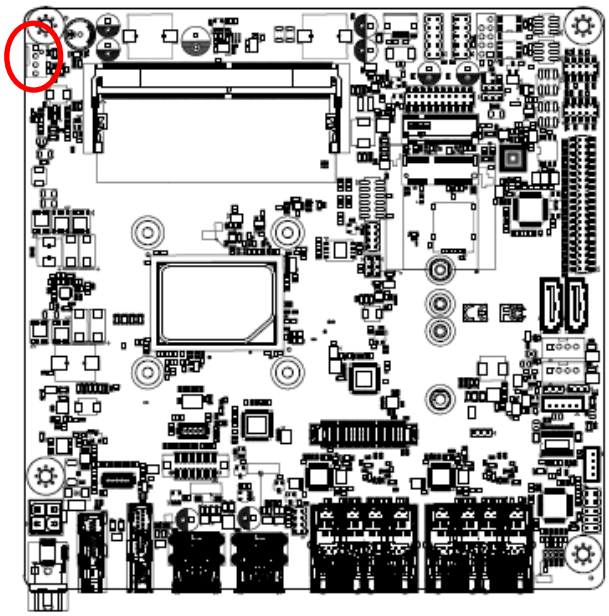
2.3.24 Miscellaneous setting connector 1 (JFP1)

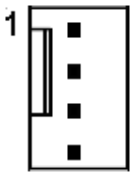




Signal	PIN	PIN	Signal
		9	NC
GND	8	7	PMC_RSTBTN#
EC_PWR_BTN_IN#	6	5	SYS_RESET#
PWR_LED#	4	3	HDD_LED-
PWR_LED+	2	1	HDD_LED+

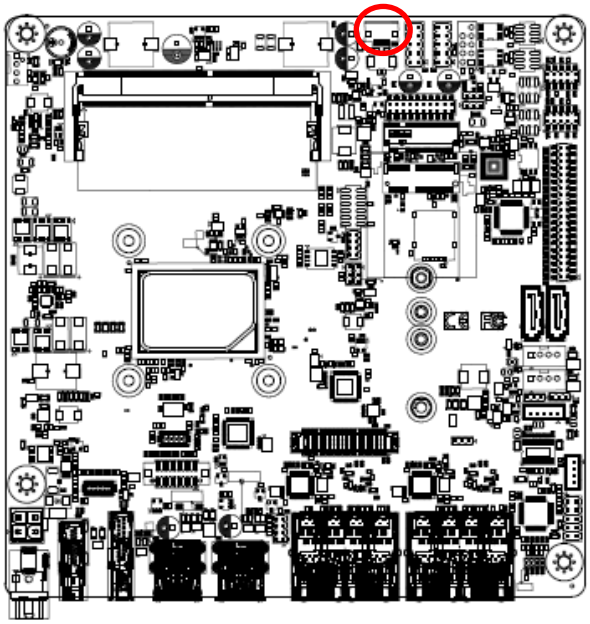
2.3.25 CPU fan connector (JFAN1)

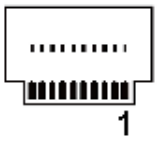




Signal	PIN
GND	1
+12V	2
EC_CFAN_IN_TECH	3
EC_CFAN_OUT_PWM	4

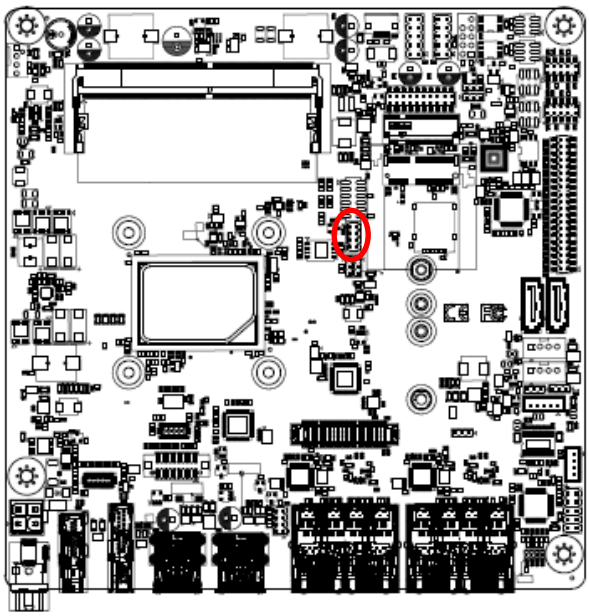
2.3.26 JSIM connector (JSIM2)

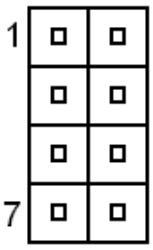




Signal	PIN
+VCC_UIM	1
GND	2
M2B_UIM_RESET#	3
VPP_JSIM2	4
GND	5
M2B_UIM_CLK	6
M2B_UIM_DATA	7
GND	8
SIM_DET1	9
SIM_DET2	10

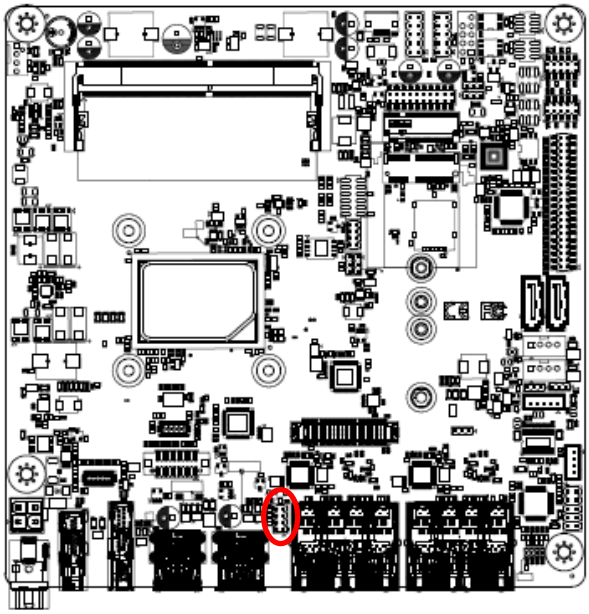
2.3.27 JBIOS connector (JBIOS)

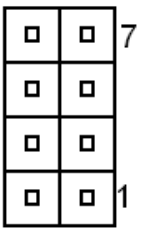




Signal	PIN	PIN	Signal
+ V3.3A_SPI	1	2	GND
SPI_CS#0	3	4	SPI_CLK
SPI_MISO	5	6	SPI_MOSI
SPI_HOLD#	7	8	SPI_WP#

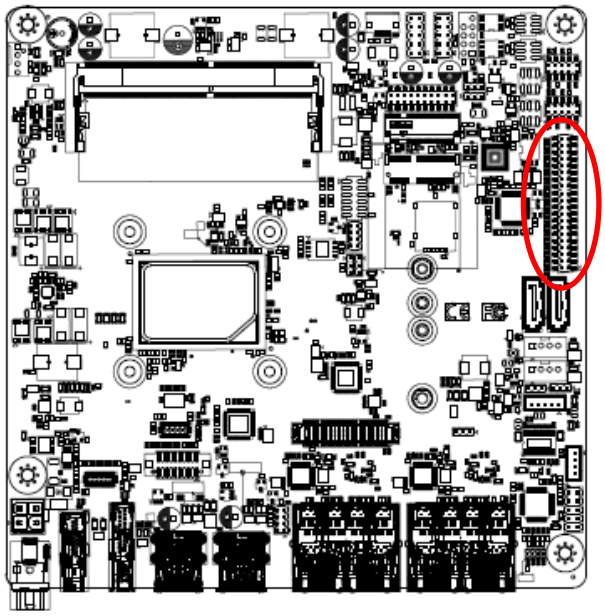
2.3.28 JLAN_LED connector (JLAN_LED1)

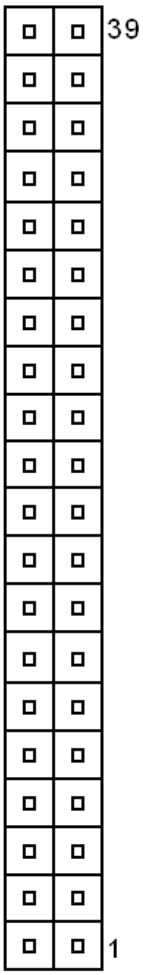




Signal	PIN	PIN	Signal
I225-2_LED_ACT_N	8	7	I225-2_LED_ACT_P
I225-B_LED_ACT_N	6	5	I225-B_LED_ACT_P
I225-1_LED_ACT_N	4	3	I225-1_LED_ACT_P
I225-A_LED_ACT_N	2	1	I225-A_LED_ACT_P

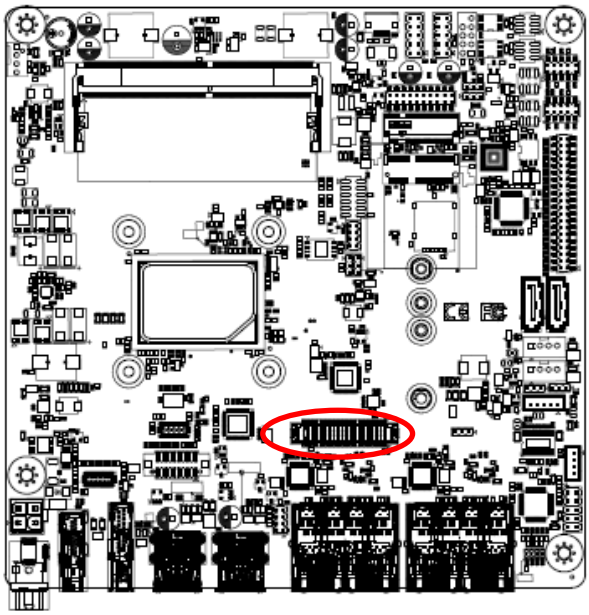
2.3.29 Serial port 3 connector (JCOM3_1)

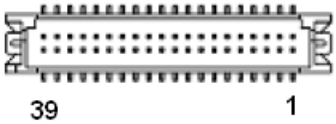




Signal	PIN	PIN	Signal
NC	40	39	COM_RI#6
COM_CTS#6	38	37	COM_RTS#6
COM_DSR#6	36	35	GND
COM_DTR#6	34	33	COM_TXD6
COM_RXD6	32	31	COM_DCD#6
NC	30	29	COM_RI#5
COM_CTS#5	28	27	COM_RTS#5
COM_DSR#5	26	25	GND
COM_DTR#5	24	23	COM_TXD5
COM_RXD5	22	21	COM_DCD#5
NC	20	19	COM_RI#4
COM_CTS#4	18	17	COM_RTS#4
COM_DSR#4	16	15	GND
COM_DTR#4	14	13	COM_TXD4
COM_RXD4	12	11	COM_DCD#4
NC	10	9	COM_RI#3
COM_CTS#3	8	7	COM_RTS#3
COM_DSR#3	6	5	GND
COM_DTR#3	4	3	COM_TXD3
COM_RXD3	2	1	COM_DCD#3

2.3.30 JLVDS connector (JLVDS1)





Signal	PIN	PIN	Signal
+V5_LVDS	2	1	+ V3.3_LVDS
+V5_LVDS	4	3	+ V3.3_LVDS
+V5_LVDS	6	5	GND
GND	8	7	GND
LVDS_DATA0_P	10	9	LVDS_DATA1_P
LVDS_DATA0_N	12	11	LVDS_DATA1_N
GND	14	13	GND
LVDS_DATA2_P	16	15	LVDS_DATA3_P
LVDS_DATA2_N	18	17	LVDS_DATA3_N
GND	20	19	GND
LVDS_DATA4_P	22	21	LVDS_DATA5_P
LVDS_DATA4_N	24	23	LVDS_DATA5_N
GND	26	25	GND
LVDS_DATA6_P	28	27	LVDS_DATA7_P
LVDS_DATA6_N	30	29	LVDS_DATA7_N
GND	32	31	GND
LVDS_CLK1_P	34	33	LVDS_CLK2_P
LVDS_ CLK1_N	36	35	LVDS_ CLK2_N
GND	38	37	GND
+V12_LVDS	40	39	+V12S_LVDS

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.

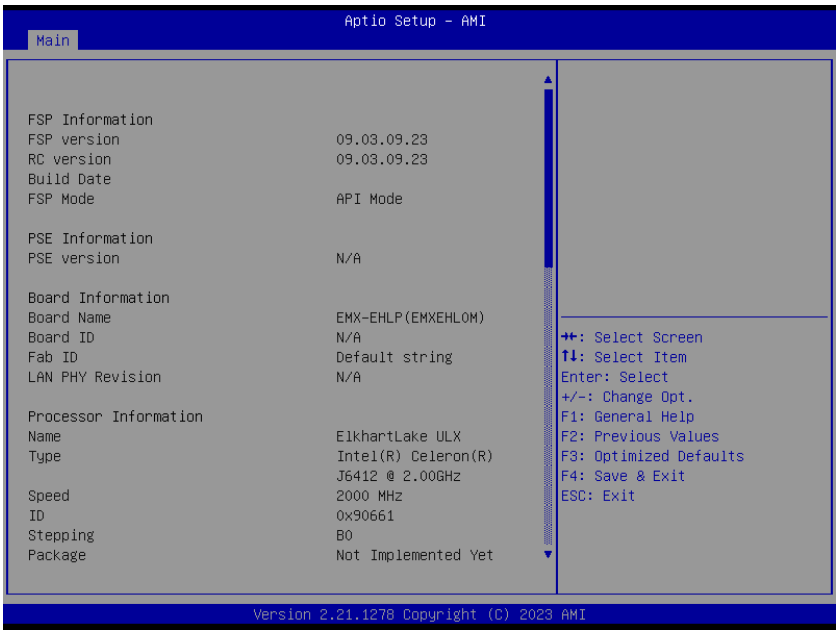
The best advice is to only alter settings which you thoroughly understand. To this end, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both BIOS Vendor and your systems manufacturer to provide the absolute maximum performance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

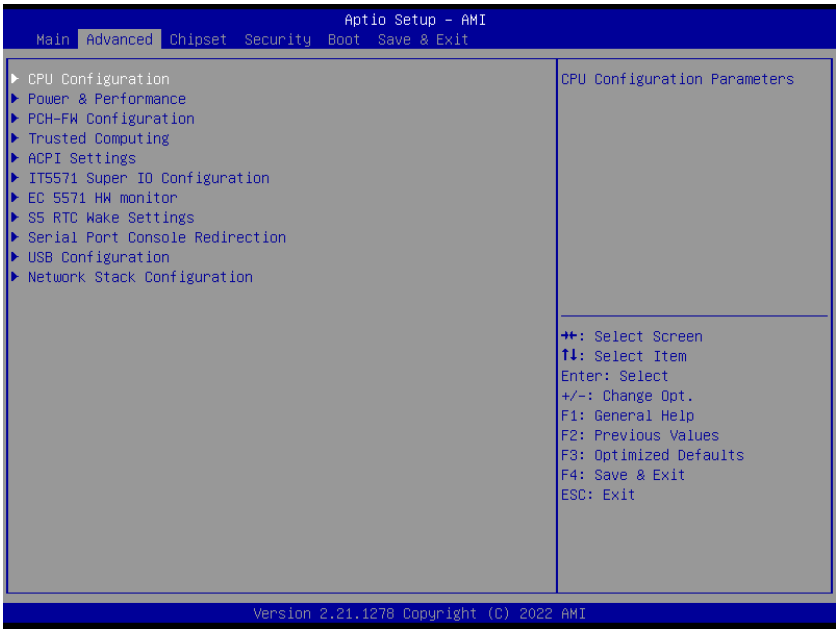
3.6.1.3 System Time

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

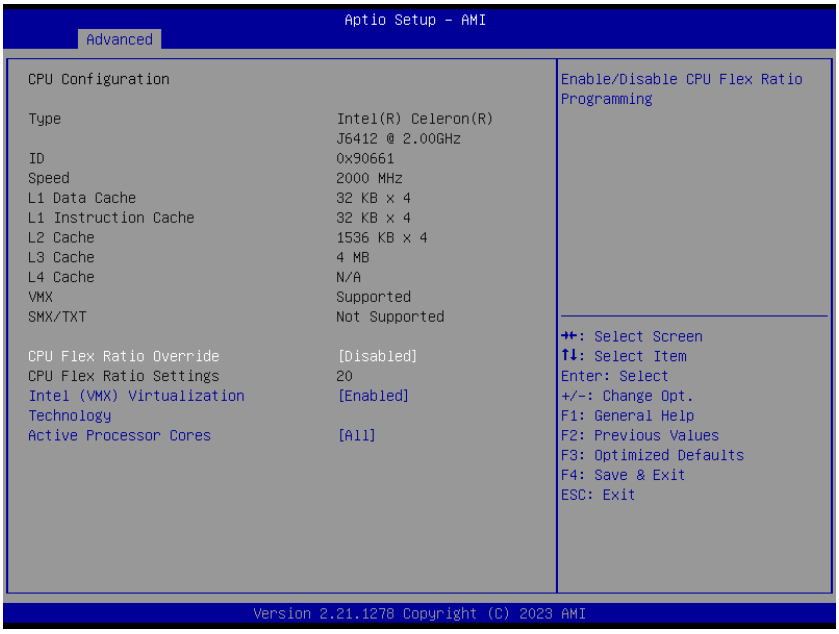
Note: The BIOS setup screens shown in this chapter are for reference purposes only, and may not exactly match what you see on your screen.
Visit the Avalue website (www.avalue.com.tw) to download the latest product and BIOS information.

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



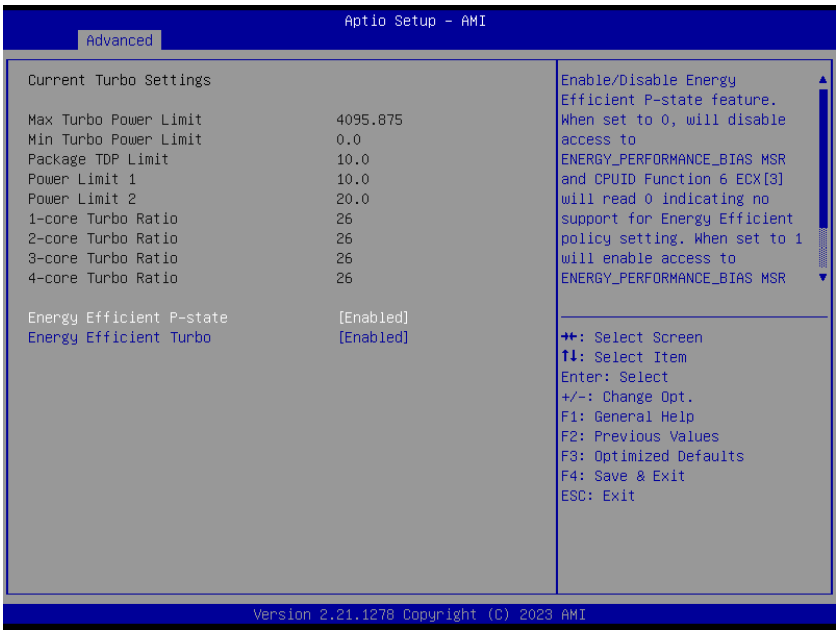
Item	Options	Description
CPU Flex Ratio Override	Disabled**[Default]**, Enabled	Enable/Disable CPU Flex Ratio Programming
Intel (VMX) Virtualization Technology	Disabled Enabled**[Default]**,	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.
Active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

3.6.2.2 Power & Performance

3.6.2.2.1 CPU - Power Management Control

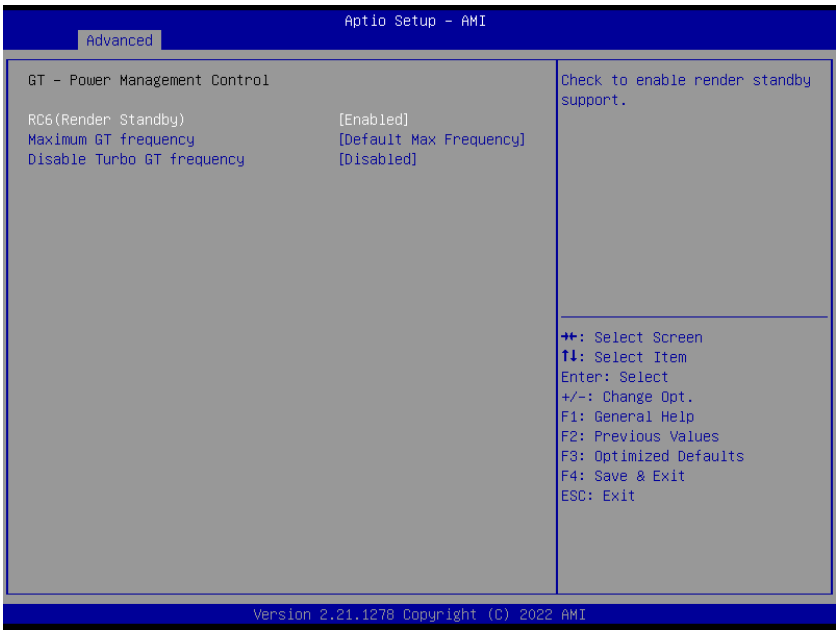
Item	Options	Description
Boot performance mode	Max Non-Turbo Performance **[Default]**, Turbo Performance	Select the performance state that the BIOS will set starting from reset vector.
Intel(R) SpeedStep(tm)	Disabled Enabled**[Default]**,	Allows more than two frequency ranges to be supported.
Intel(R) Speed Shift Technology	Disabled**[Default]**, Enabled	Enable/Disable Intel(R) Speed Shift Technology support. Enabling will expose the CPPC v2 interface to allow for hardware controlled P-states.
Turbo Mode	Disabled Enabled**[Default]**,	Enable/Disable processor Turbo Mode (requires EMTTM enabled too). AUTO means enabled.
C-states	Disabled**[Default]**, Enabled	Enable/Disable C1E. When enabled, CPU will switch to minimum speed when all cores enter C-State.

3.6.2.2.1.1 View/Configure Turbo Options



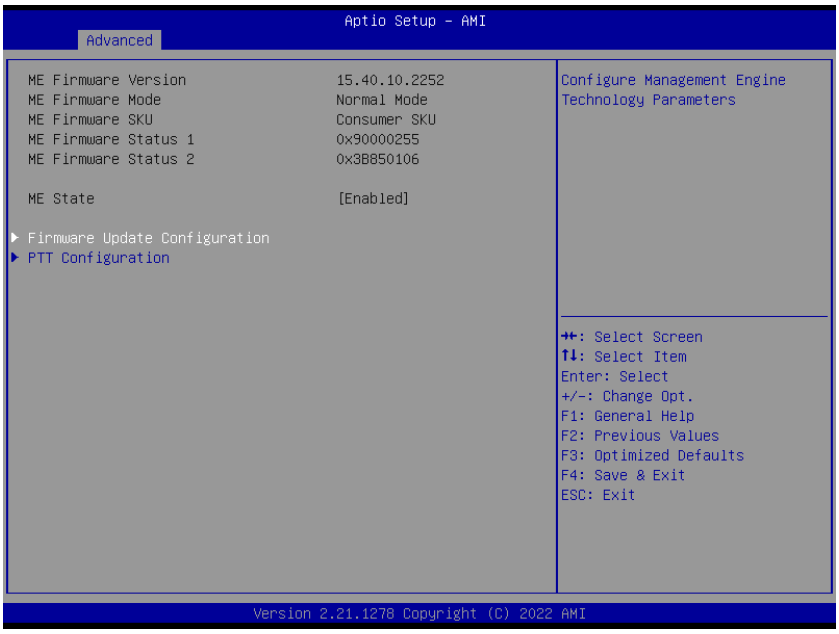
Item	Options	Description
Energy Efficient P-state	Disabled Enabled**[Default]**,	Enable/Disable Energy Efficient P-state feature. When set to 0, will disable access to ENERGY _PERFORMANCE_BIAS MSR and CPUID Function 6 ECX[3] will read 0 indicating no support for Energy Efficient policy setting. When set to 1 will enable access to ENERGY _PERFORMANCE_BIAS MSR 1BOh and
Energy Efficient Turbo	Disabled Enabled**[Default]**,	Enable/Disable Energy Efficient Turbo Feature. This feature will opportunistically lower the turbo frequency to increase efficiency. Recommended only to disable in overclocking situations where turbo frequency must remain constant. Otherwise, leave enabled.

3.6.2.2.2 GT - Power Management Control

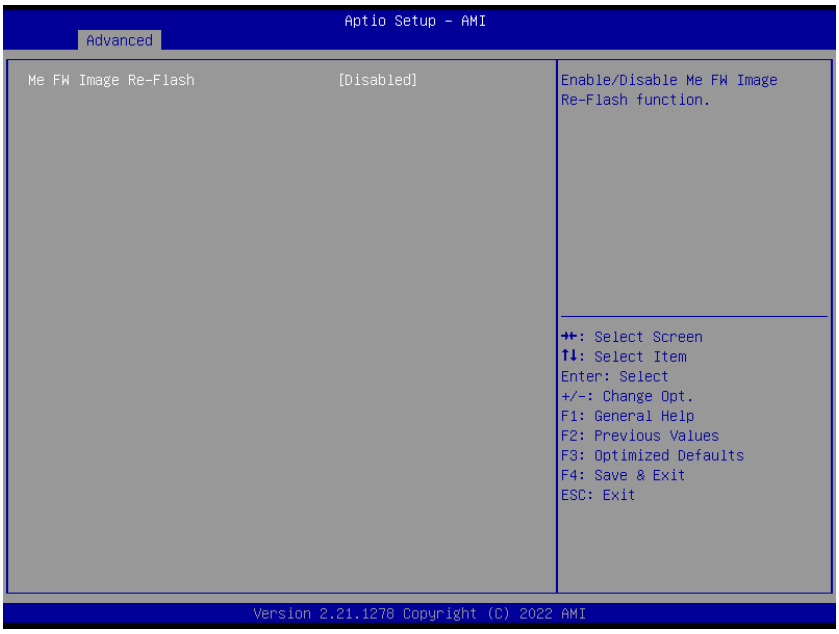


Item	Options	Description
RC6 (Render Standby)	Disabled Enabled**[Default]**,	Check to enable render standby.
Maximum GT frequency	Default Max Frequency**[Default]**, 100Mhz/150Mhz/200Mhz/250Mhz/ 300Mhz/350Mhz/400Mhz/450Mhz/ 500Mhz/550Mhz/600Mhz/650Mhz/ 700Mhz/750Mhz/800Mhz/850Mhz/ 900Mhz/950Mhz/1000Mhz/1050Mhz/ 1100Mhz/1150Mhz/1200Mhz	Auto Updated
Disable Turbo GT frequency	Disabled**[Default]**, Enabled	Enabled: Disables Turbo GT frequency is not limited

3.6.2.3 PCH-FW Configuration

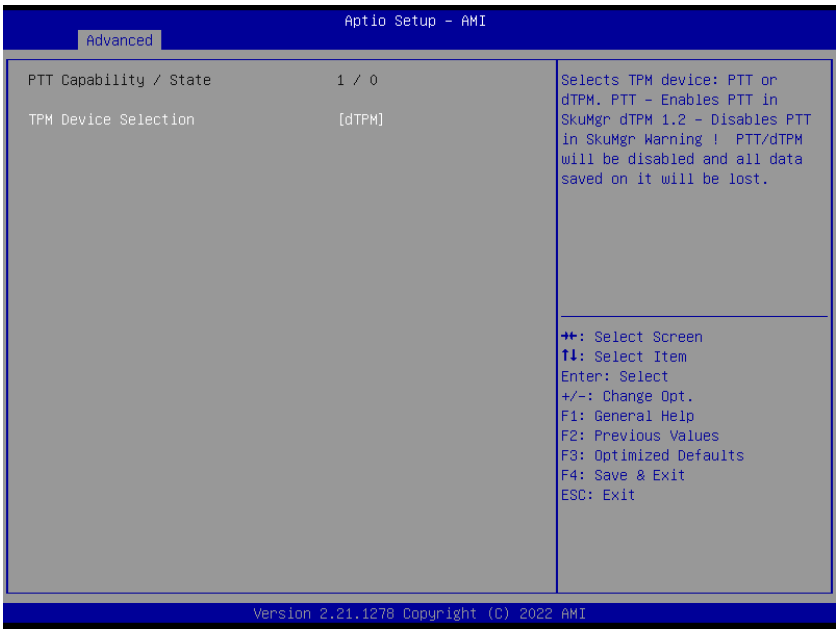


3.6.2.3.1 Firmware Update Configuration



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

3.6.2.3.2 PTT Configuration

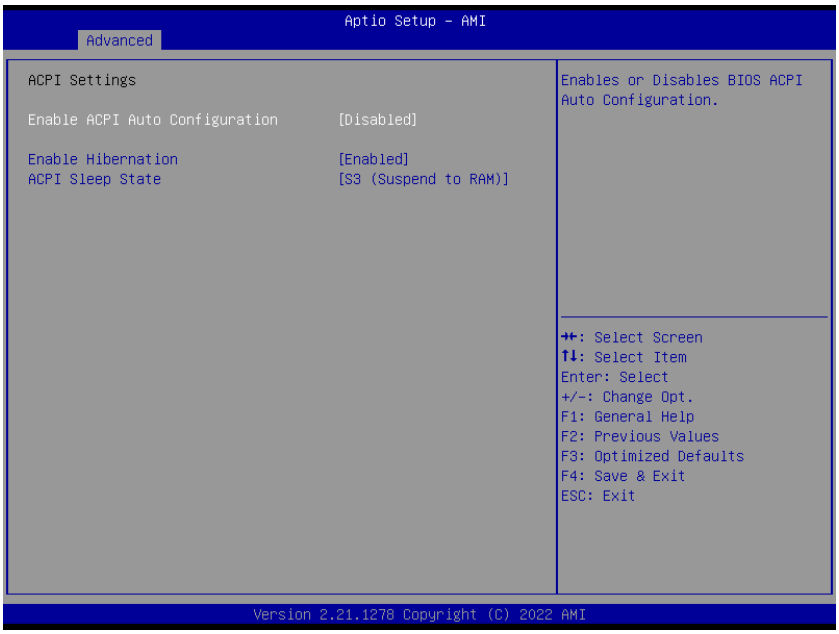


Item	Options	Description
TPM Device Selection	dTPM**[Default]**, PTT	Selects TPM device: PTT or dTPM. PTT - Enables PTT in SkuMgr dTPM 1.2 - Disables PTT in SkuMgr Warning ! PTT/dTPM will be disabled and all data saved on it will be lost

3.6.2.4 Trusted Computing

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

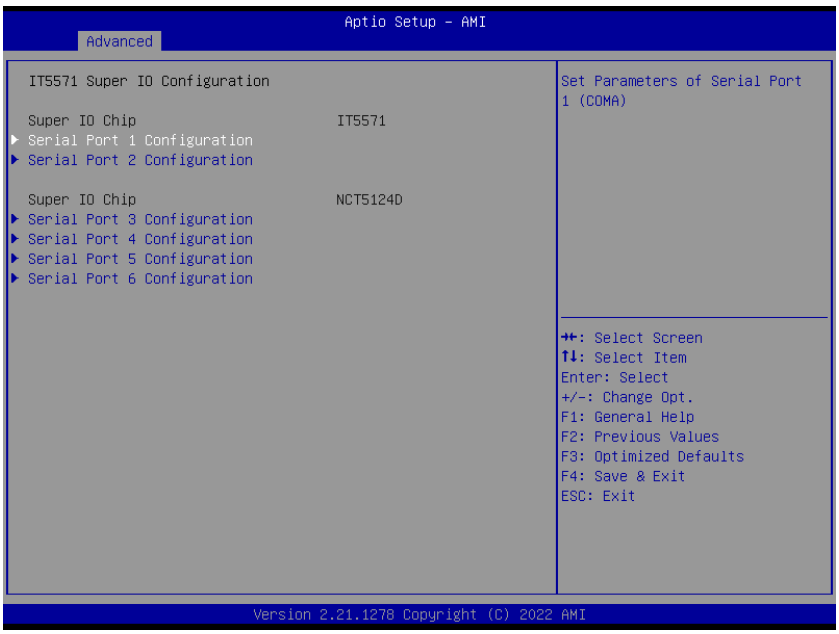
3.6.2.5 ACPI Settings



Item	Options	Description
Enable ACPI Auto Configuration	Disabled**[Default]**, Enabled	Enables or Disables BIOS ACPI Auto Configuration.
Enable Hibernation	Disabled Enabled**[Default]**,	Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may 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.

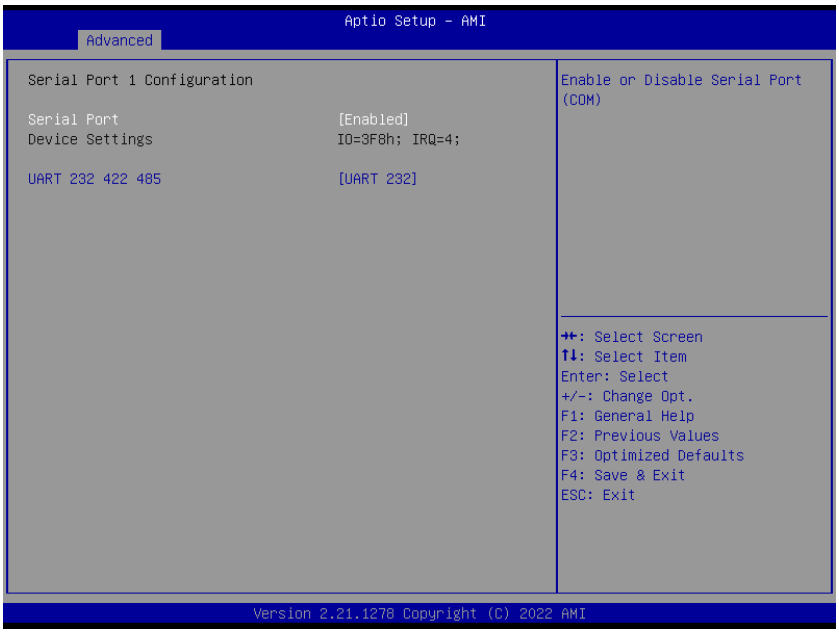
3.6.2.6 IT5571 Super IO Configuration

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~ 3.6.2.5.6 for more information.



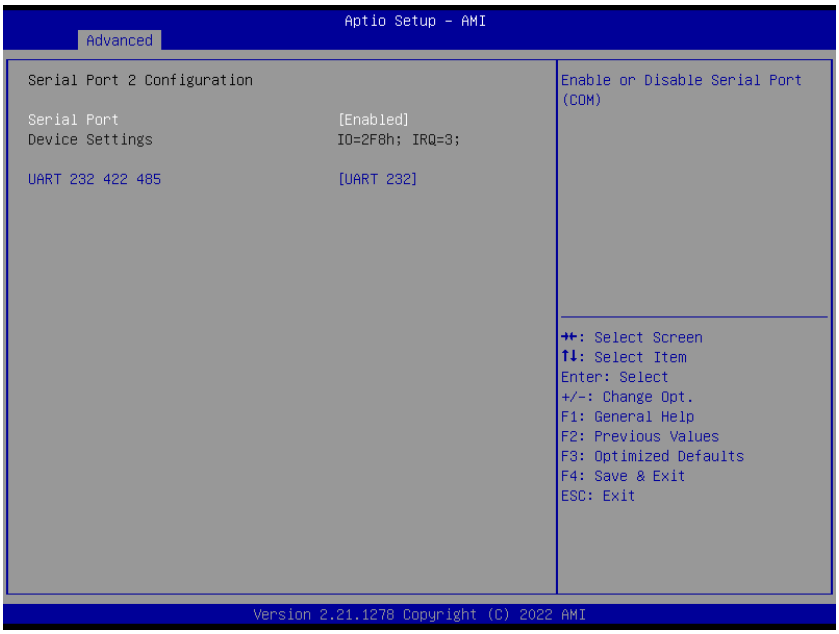
Item	Description
Serial Port 1 Configuration	Set Parameters of Serial Port 1 (COMA).
Serial Port 2 Configuration	Set Parameters of Serial Port 2 (COMB).
Serial Port 3 Configuration	Set Parameters of Serial Port 3 (COMC).
Serial Port 4 Configuration	Set Parameters of Serial Port 4 (COMD).
Serial Port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

3.6.2.6.1 Serial Port 1 Configuration



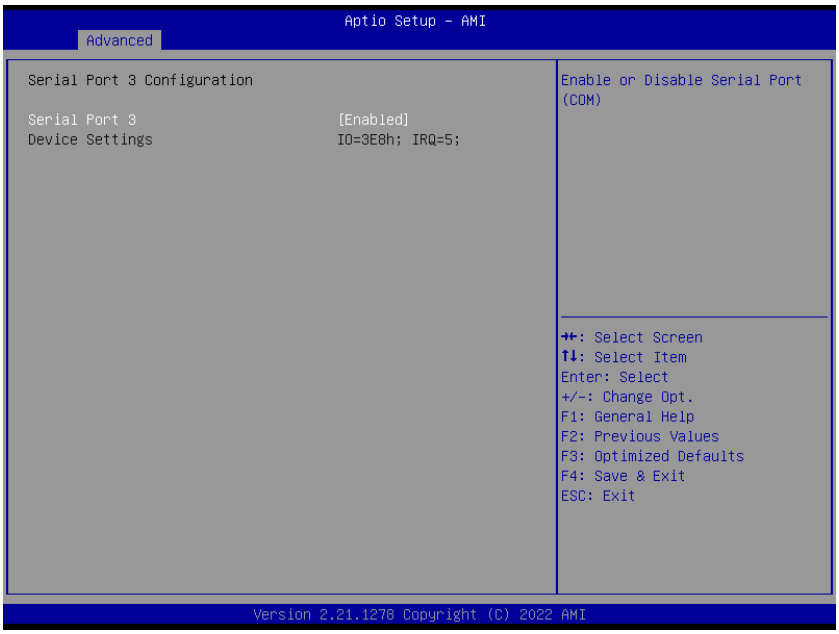
Item	Option	Description
Serial Port	Disabled Enabled**[Default]**,	Enable or Disable Serial Port (COM).
UART 232 422 485	UART 232**[Default]**, UART 422, UART 485	Change the Serial Port as RS232/422/485.

3.6.2.6.2 Serial Port 2 Configuration



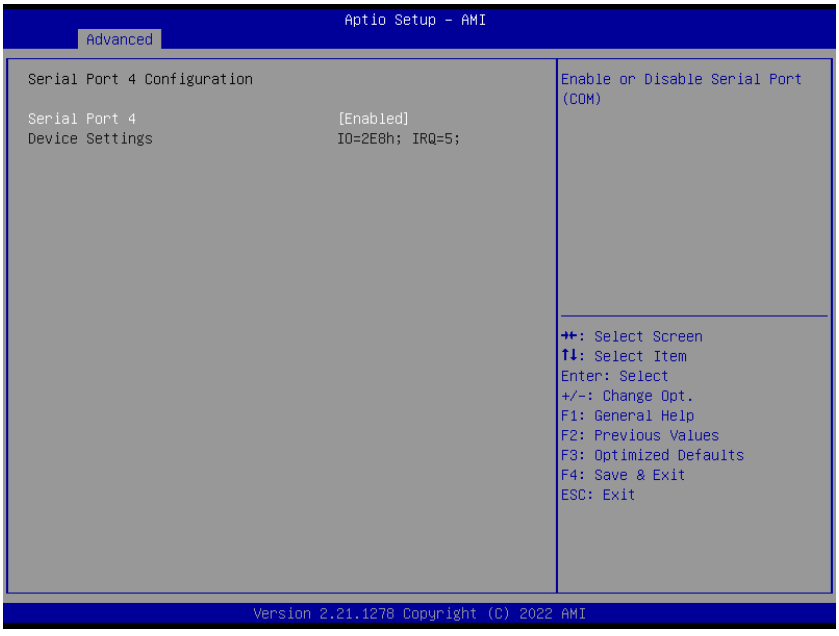
Item	Option	Description
Serial Port	Disabled Enabled**[Default]**,	Enable or Disable Serial Port (COM).
UART 232 422 485	UART 232**[Default]**, UART 422, UART 485	Change the Serial Port as RS232/422/485.

3.6.2.6.3 Serial Port 3 Configuration



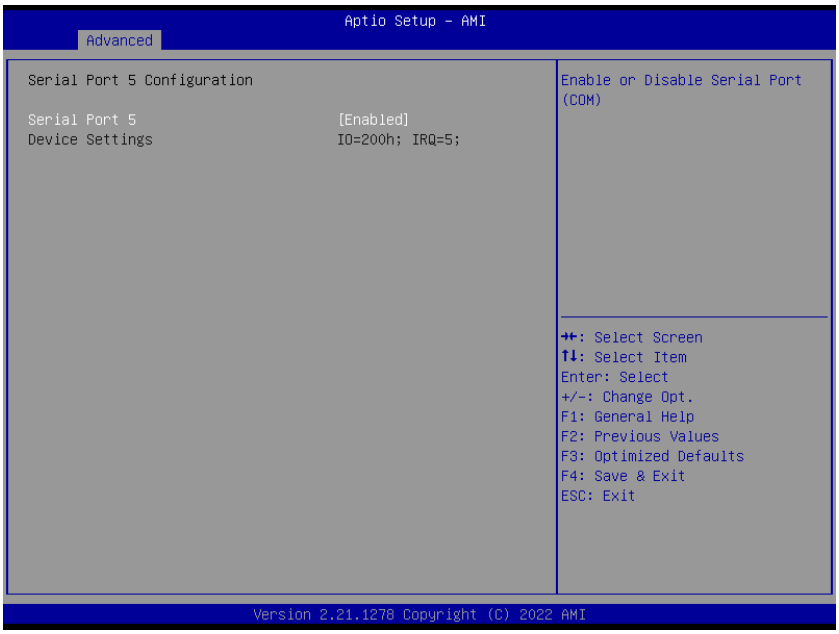
Item	Option	Description
Serial Port	Disabled Enabled**[Default]**,	Enable or Disable Serial Port (COM).

3.6.2.6.4 Serial Port 4 Configuration



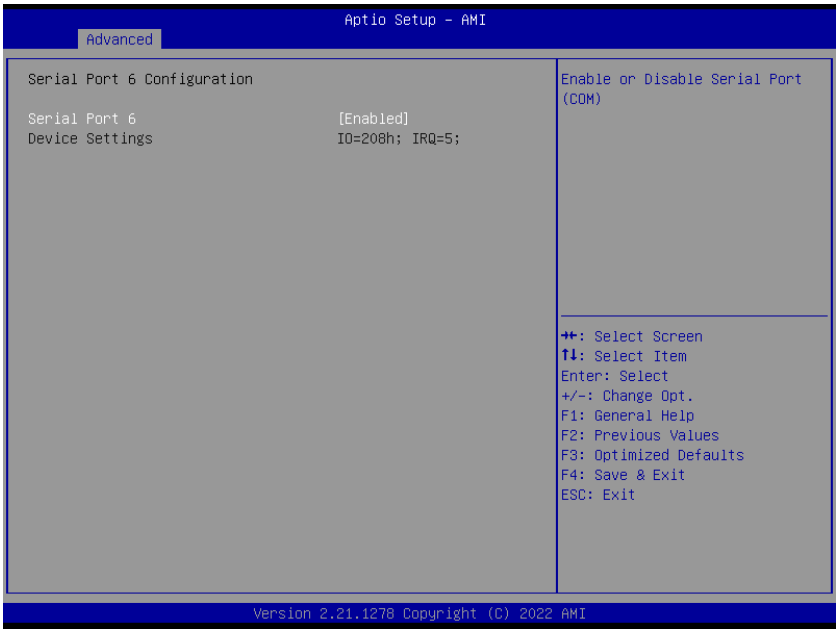
Item	Option	Description
Serial Port	Disabled Enabled**[Default]**,	Enable or Disable Serial Port (COM).

3.6.2.6.5 Serial Port 5 Configuration



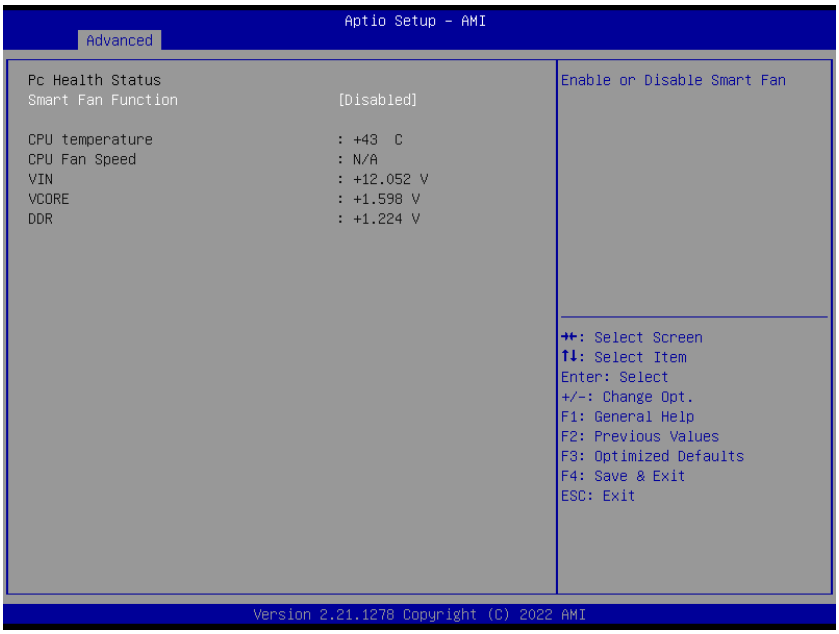
Item	Option	Description
Serial Port	Disabled Enabled**[Default]**,	Enable or Disable Serial Port (COM).

3.6.2.6.6 Serial Port 6 Configuration



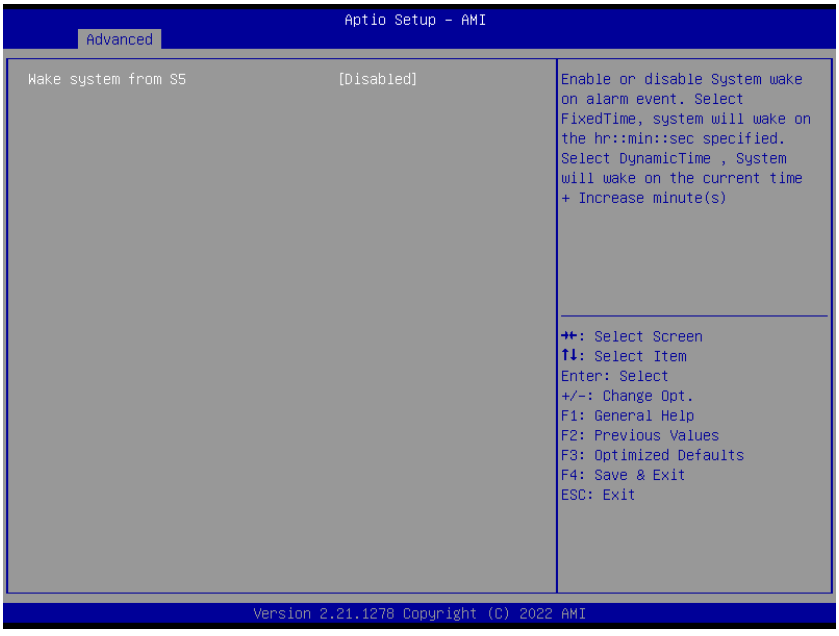
Item	Option	Description
Serial Port	Disabled Enabled**[Default]**,	Enable or Disable Serial Port (COM).

3.6.2.7 EC 8528 H/W monitor



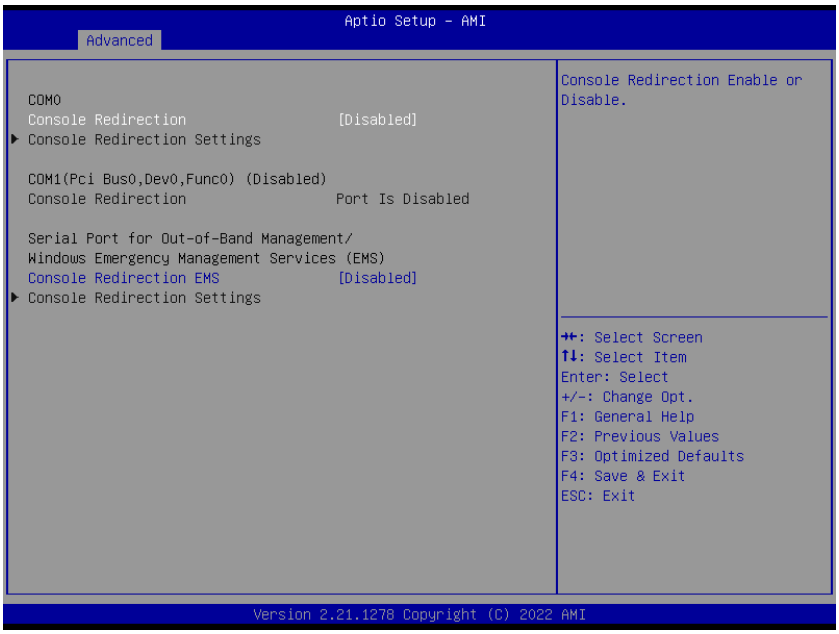
Item	Option	Description
Smart Fan Function	Disabled**[Default]**, Enabled	Enable or Disable Smart Fan.

3.6.2.8 S5 RTC Wake Settings



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

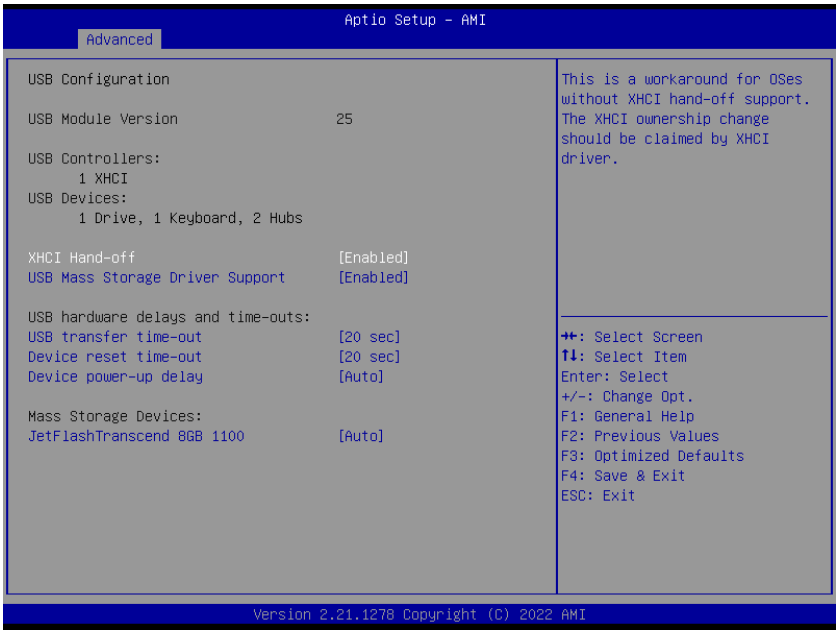
3.6.2.9 Serial Port Console Redirection



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

3.6.2.10 USB Configuration

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



Item	Option	Description
XHCI Hand-off	Enabled**[Default]**, Disabled	This is a workaround for OSes without XHCI hand -off support. The XHCI ownership change should be claimed by XHCI driver.
USB Mass Storage Driver Support	Disabled Enabled**[Default]**,	Enable/Disable USB Mass Storage Driver Support
USB transfer time-out	1 sec 5 sec 10 sec 20 sec**[Default]**	The time-out value for Control, Bulk, and Interrupt transfers.
Device reset time-out	10 sec 20 sec**[Default]** 30 sec 40 sec	USB mass storage device Start Unit command time-out.
Device power-up delay	Auto**[Default]** Manual	Maximum time the device will take before it properly reports itself to the Host Controller. 'Auto' uses default value: for a Root port it is 100ms, for a Hub port the delay is taken form Hub descriptor.
Mass Storage Devices	Auto**[Default]** Floppy Forced FDD Hard Disk CD-ROM	Mass storage device emulation type. 'AUTO' enumerates devices according to their media format. Optical drives are emulated as 'CDROM', drives with no media will be emulated according to a drive type.

3.6.2.11 Network Stack Configuration

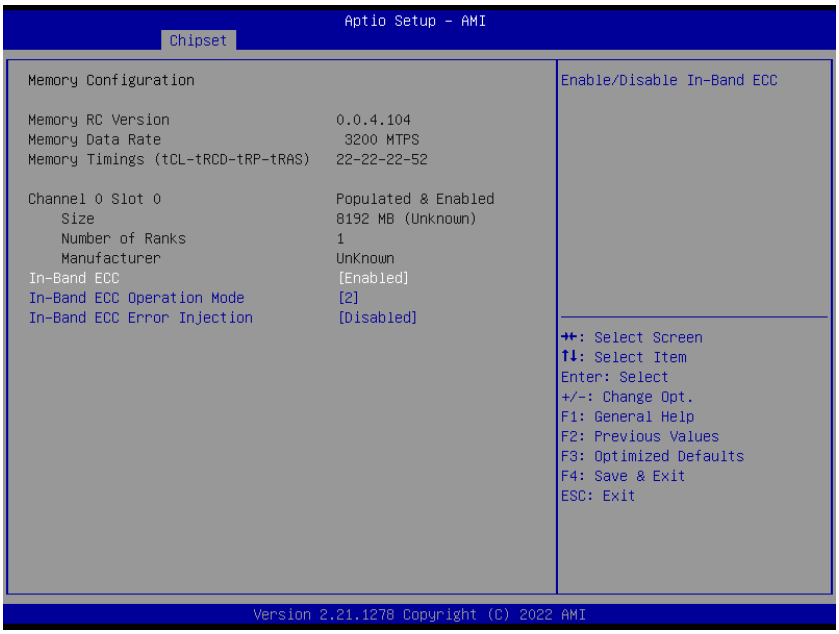
Item	Option	Description
Network Stack	Disabled**[Default]** Enabled	Enable/Disable UEFI Network Stack.

3.6.3 Chipset

3.6.3.1 System Agent (SA) Configuration

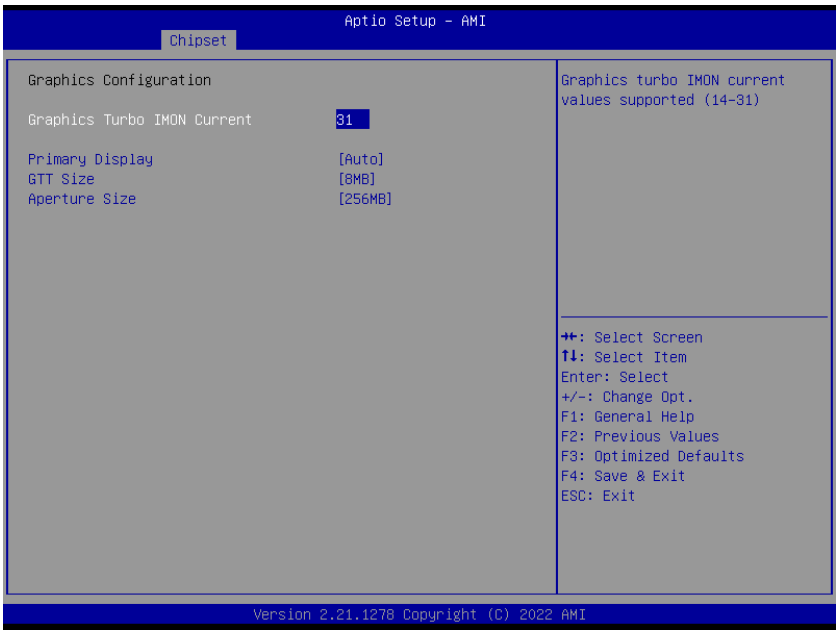
Item	Option	Description
VT-d	Disabled Enabled**[Default]**	VT-d capability.
Above 4GB MMIO BIOS assignment	Enabled**[Default]**, Disabled	Enable/Disable above 4GB MemoryMappedIO BIOS assignment This is enabled automatically when Aperture Size is set to 2048MB.

3.6.3.1.1 Memory Configuration



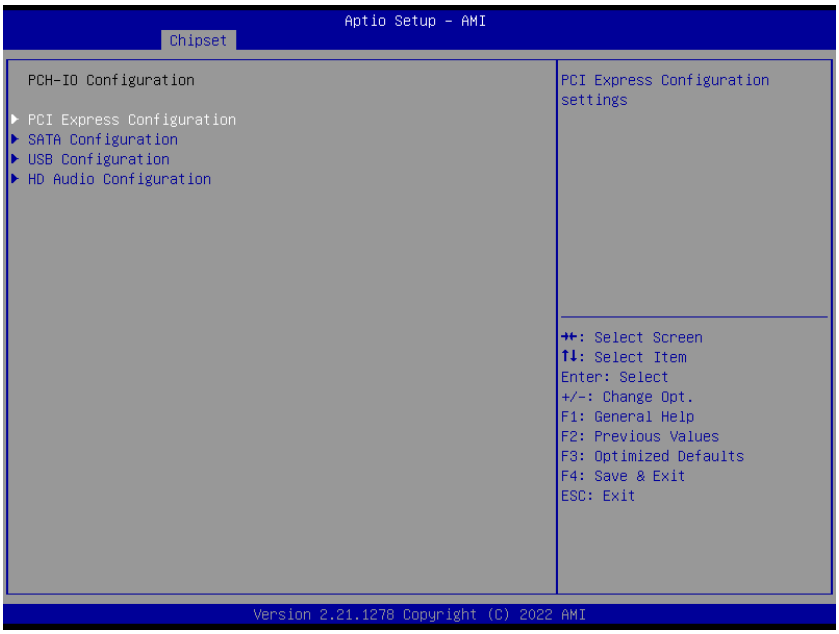
Item	Option	Description
In-Band ECC	Enabled**[Default]**, Disabled	Enable/Disable In-Band ECC
In-Band ECC Operation Mode	0 1 2**[Default]**,	0:Functional Mode protects requests based on the address range, 1:Makes all requests non protected and ignore range checks, 2:Makes all requests protected and ignore range checks
In-Band ECC Error Injection	Enabled Disabled**[Default]**,	By enabling this Error Injection Enabling feature, the user acknowledges the security risks. Enabling Error Injection allows attackers who have access to the Host Operating System to inject IBECC errors that can cause unintended memory corruption and enable the leak of security data in the BIOS stolen

3.6.3.1.2 Graphics Configuration

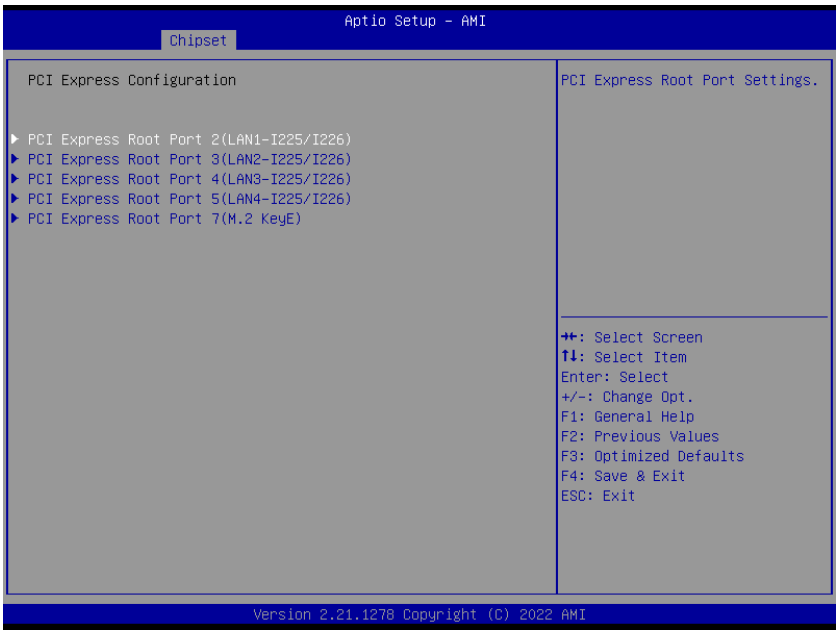


Item	Option	Description
Graphics Turbo IMON Current	31	Graphics Turbo IMON Current values supported (14-31)
Primary Display	Auto**[Default]** IGFX	Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select HG for Hybrid Gfx.
GTT Size	2MB/4MB/ 8MB**[Default]**	Select the GTT Size
Aperture Size	128MB 256MB**[Default]** 512MB 1024MB	Select the Aperture Size Note : Above 4GB MMIO BIOS assignment is automatically enabled when selecting 2048MB aperture. To use this feature, please disable CSM Support.

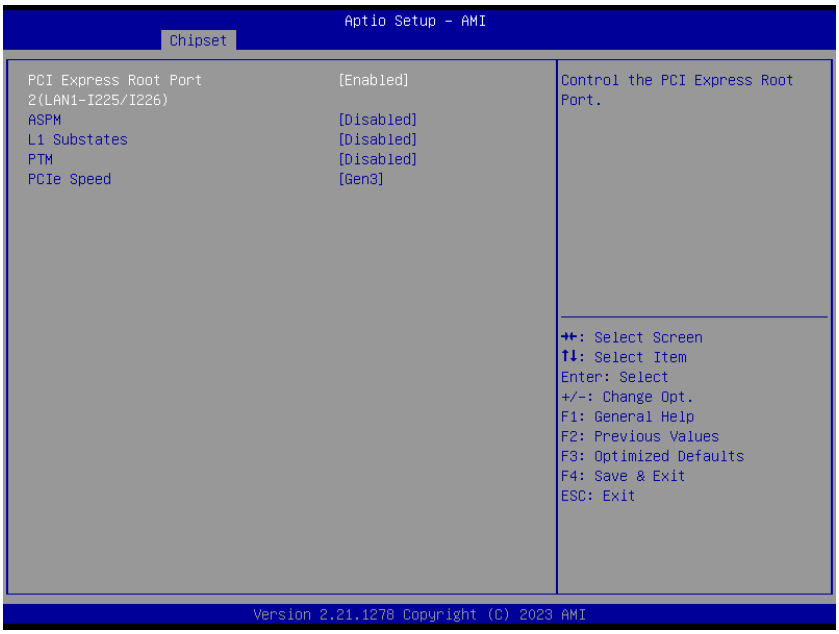
3.6.3.2 PCH-IO Configuration



3.6.3.2.1 PCI Express Configuration

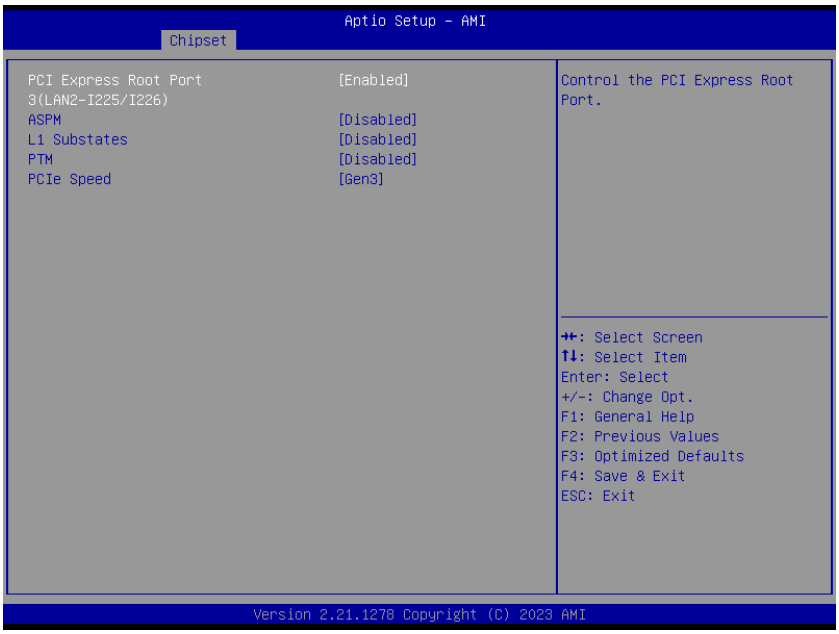


3.6.3.2.1.1 PCI Express Root Port 2(LAN1-I225/I226)



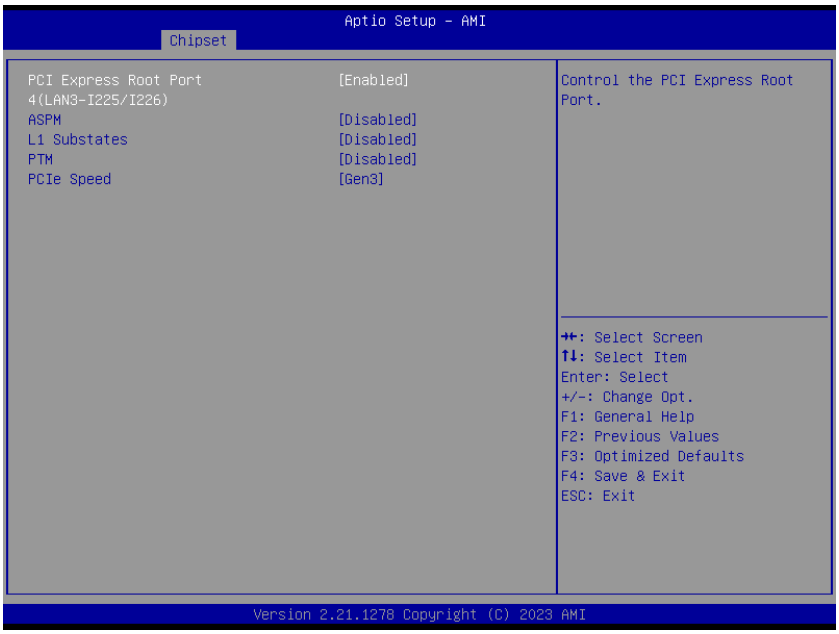
Item	Option	Description
PCI Express Root Port2 (LAN1-I225/I226)	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM	Disabled**[Default]** L0s L1 L0sL1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled**[Default]** L1.1 L1.1 & L1.2,	PCI Express L1 Substates settings.
PTM	Disabled**[Default]**, Enabled	Enable/Disable Precision Time Measurement.
PCIe Speed	Auto Gen1 Gen2 Gen3**[Default]**	Select PCIe speed.

3.6.3.2.1.2 PCI Express Root Port 3(LAN2-I225/I226)



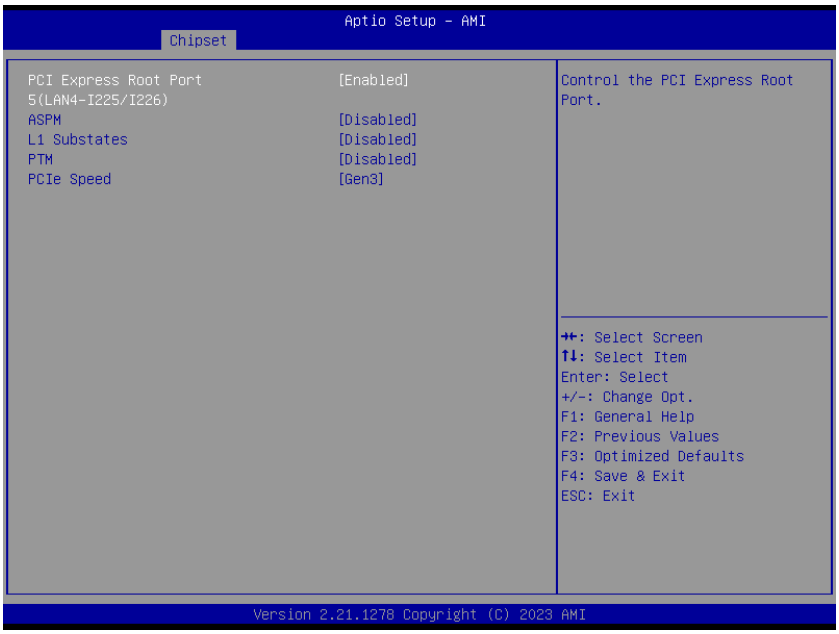
Item	Option	Description
PCI Express Root Port 3 (LAN2-I225/I226)	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM	Disabled**[Default]** L0s L1 L0sL1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled**[Default]**, L1.1 L1.1 & L1.2	PCI Express L1 Substates settings.
PTM	Disabled**[Default]**, Enabled	Enable/Disable Precision Time Measurement.
PCIe Speed	Auto Gen1 Gen2 Gen3**[Default]**	Select PCIe speed.

3.6.3.2.1.3 PCI Express Root Port 4(LAN3-I225/I226)



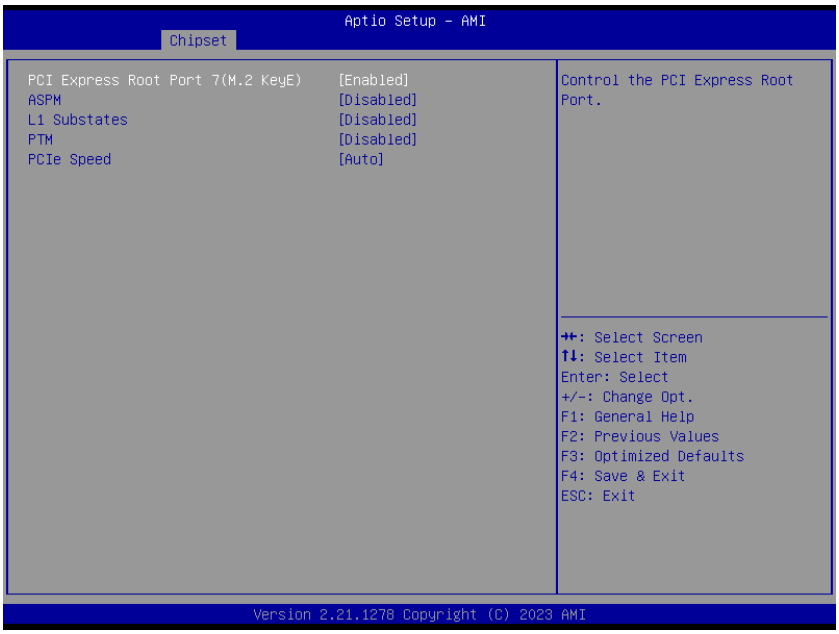
Item	Option	Description
PCI Express Root Port 4 (LAN3-I225/I226)	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM	Disabled**[Default]** L0s L1 L0sL1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled**[Default]**, L1.1 L1.1 & L1.2	PCI Express L1 Substates settings.
PTM	Disabled**[Default]**, Enabled	Enable/Disable Precision Time Measurement.
PCIe Speed	Auto Gen1 Gen2 Gen3**[Default]**,	Select PCIe speed.

3.6.3.2.1.4 PCI Express Root Port 5(LAN4-I225/I226)



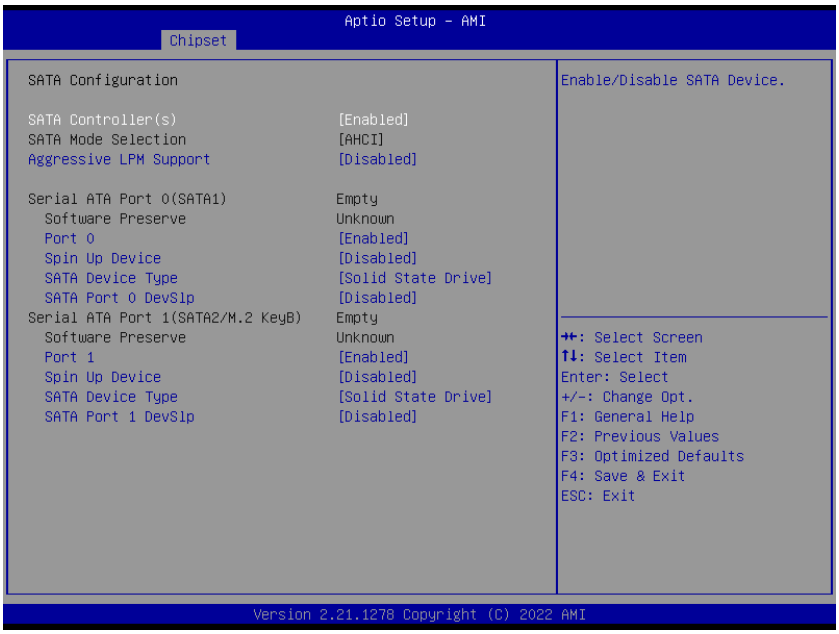
Item	Option	Description
PCI Express Root Port 5 (LAN4-I225/I226)	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM	Disabled**[Default]** L0s L1 L0sL1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled**[Default]**, L1.1 L1.1 & L1.2	PCI Express L1 Substates settings.
PTM	Disabled**[Default]**, Enabled	Enable/Disable Precision Time Measurement.
PCIe Speed	Auto Gen1 Gen2 Gen3**[Default]**	Select PCIe speed.

3.6.3.2.1.5 PCI Express Root Port 7(M.2 KeyE)



Item	Option	Description
PCI Express Root Port 7 (M.2 KeyE)	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM	Disabled**[Default]** L0s L1 L0sL1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled**[Default]**, L1.1 L1.1 & L1.2	PCI Express L1 Substates settings.
PTM	Disabled**[Default]**, Enabled	Enable/Disable Precision Time Measurement.
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3	Select PCIe speed.

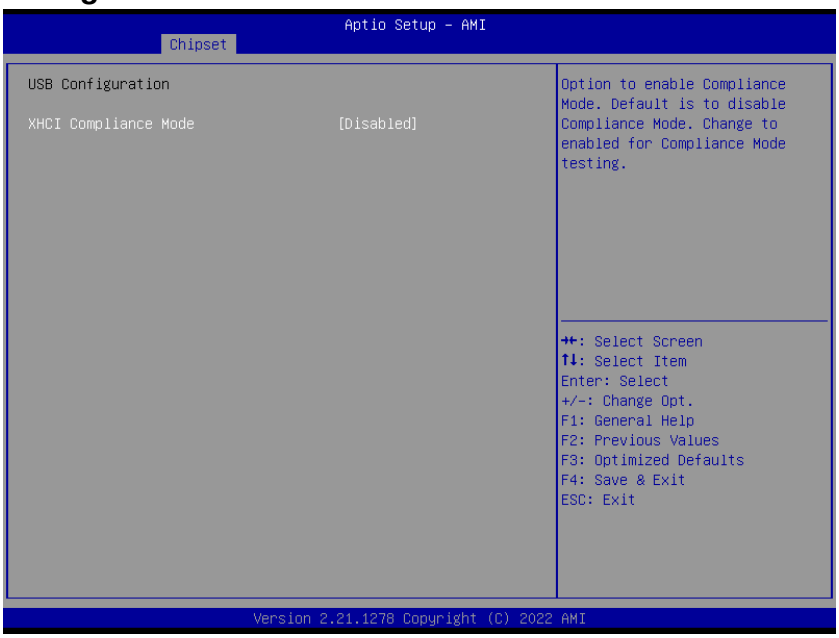
3.6.3.2.2 SATA And RST Configuration



Item	Option	Description
SATA Controller(s)	Enabled**[Default]**, Disabled	Enable/Disable SATA Device.
Aggressive LPM Support	Disabled**[Default]**, Enabled	Enable PCH to aggressively enter link power state.
Port 0	Disabled Enabled**[Default],**	Enable or Disable SATA Port
Spin Up Device	Disabled**[Default]**, Enabled	If enabled for any of ports Staggerred Spin Up will be performed and only the drives which have this option enabled will spin up at boot. Otherwise all drives spin up at boot.
SATA Device Type	Hard Disk Drive Solid State Drive**[Default],**	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive
SATA Port 0 DevSlp	Disabled**[Default]**, Enabled	Enable/Disable SATA Port 0 DevSlp. For DevSlp to work, both hard drive and SATA port need to support DevSlp function, otherwise an unexpected behavior might happen. Please check board design before enabling it.
Port 1	Disabled Enabled**[Default],**	Enable or Disable SATA Port
Spin Up Device	Disabled**[Default],** Enabled	If enabled for any of ports Staggerred Spin Up will be performed and only the drives which have this option enabled will spin up at boot. Otherwise all drives spin up at boot.
SATA Device Type	Hard Disk Drive Solid State Drive**[Default],**	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive

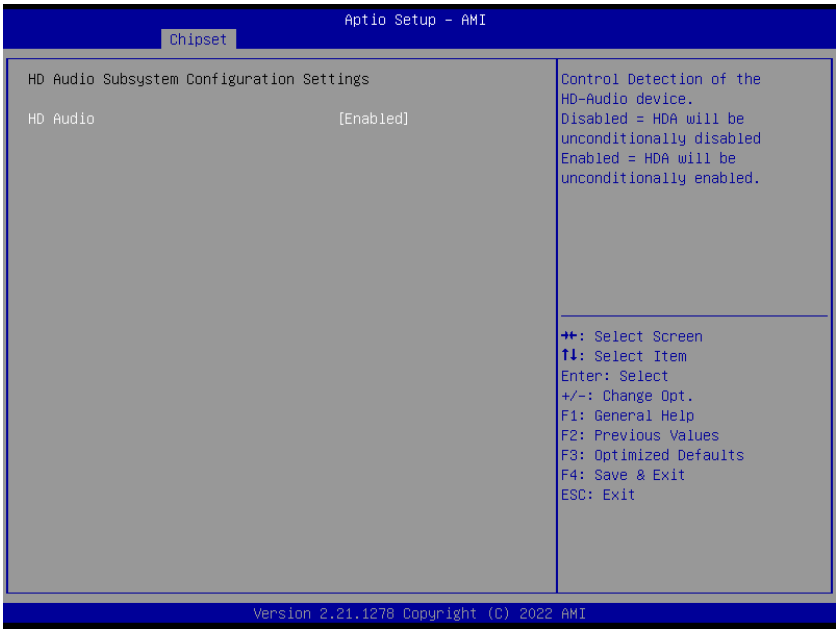
SATA Port 1 DevSlp	Disabled**[Default]**, Enabled	Enable/Disable SATA Port 1 DevSlp. For DevSlp to work, both hard drive and SATA port need to support DevSlp function, otherwise an unexpected behavior might happen. Please check board design before enabling it.

3.6.3.2.3 USB Configuration



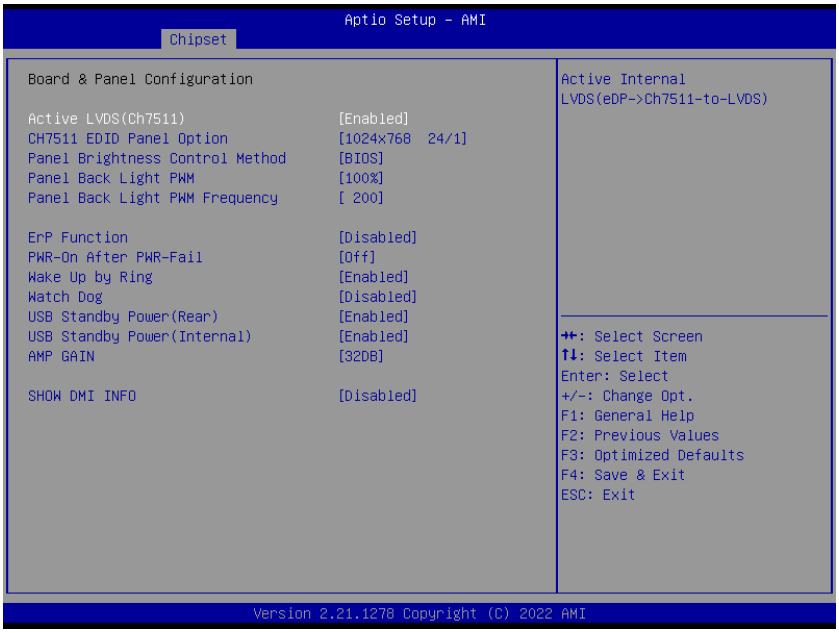
Item	Option	Description
XHCI Compliance Mode	Disabled**[Default]**, Enabled	Option to enable Compliance Mode. Default is to disable Compliance Mode. Change to enabled for Compliance Mode testing.

3.6.3.2.4 HD Audio Configuration



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

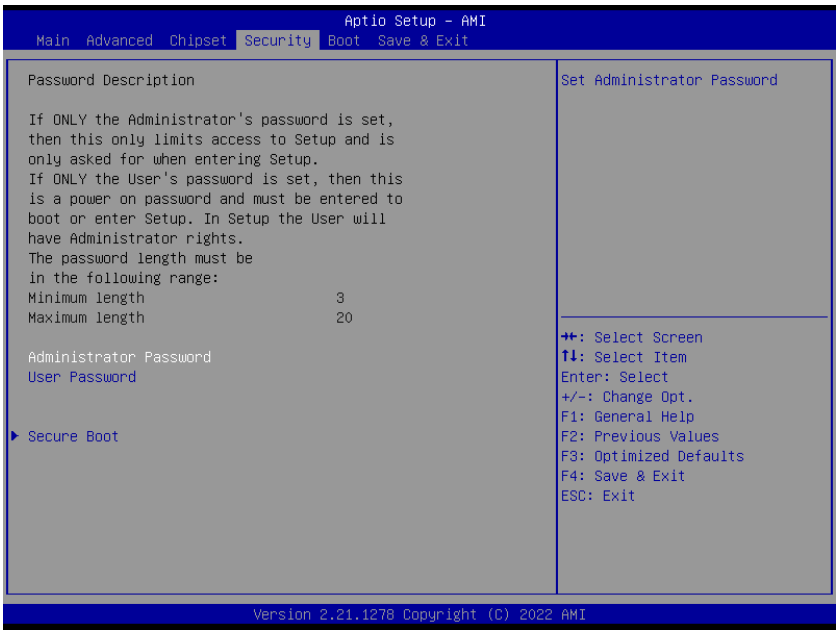
3.6.3.2.5 Board & Panel Configuration



Item	Option	Description
Active Panel	Enabled**[Default]** Disabled	Active Internal LVDS(eDP->Ch7511-to-LVDS)
CH7511 EDID Panel Option	1024 x 768 24/1**[Default]** 800 x 600 18/1 1024 x 768 18/1 1366 x 768 18/1 1024 x 600 18/1 1280 x 800 18/1 1920 x 1200 24/2 1920 x 1080 18/2 1280 x 1024 24/2 1440 x 900 18/2 1600 x1200 24/2 1366 x768 24/1 1920 x1080 24/2 1680 x1050 24/2	Port1-EDP to LVDS(Chrotel 7511)Panel EDID Option
Panel Brightness Control Method	BIOS**[Default]** OS Driver	Panel Brightness Control Method. 1.BIOS 2. Brightness Button
Panel Back Light PWM	00% 25% 50% 75% 100%**[Default]**	Select Panel back light PWM duty.

Panel Back Light PWM Frequency	200**[Default]/** 300/400/500/700/1k/ 2k/3k/5k/10k/20k	Select Panel back light PWM Frequency.
ErP Function	Disabled**[Default]**, Enabled	ErP Function (Deep S5).
PWR-On After PWR-Fail	Off**[Default]**, On Last State	AC loss resume.
Wake Up by Ring	Disabled Enabled**[Default]**,	Wake Up by Ring from S3/S4/S5
Watch Dog	Disabled**[Default]**,/ 30 sec/40 sec/50 sec/ 1 min/2 min/10 min/30 min	Select WatchDog.
USB Standby Power(Rear)	Disabled Enabled**[Default]**,	Enabled/Disabled JUSB1, JUSB2 Standby Power during S3/S4/S5
USB Standby Power(Internal)	Disabled Enabled**[Default]**,	Enabled/Disabled JUSB3, JUSB4 Standby Power during S3/S4/S5
AMP GAIN	32DB	Select AMP GAIN.
SHOW DMI INFO	Disabled**[Default]**, Enabled	SHOW DMI INFO

3.6.4 Security



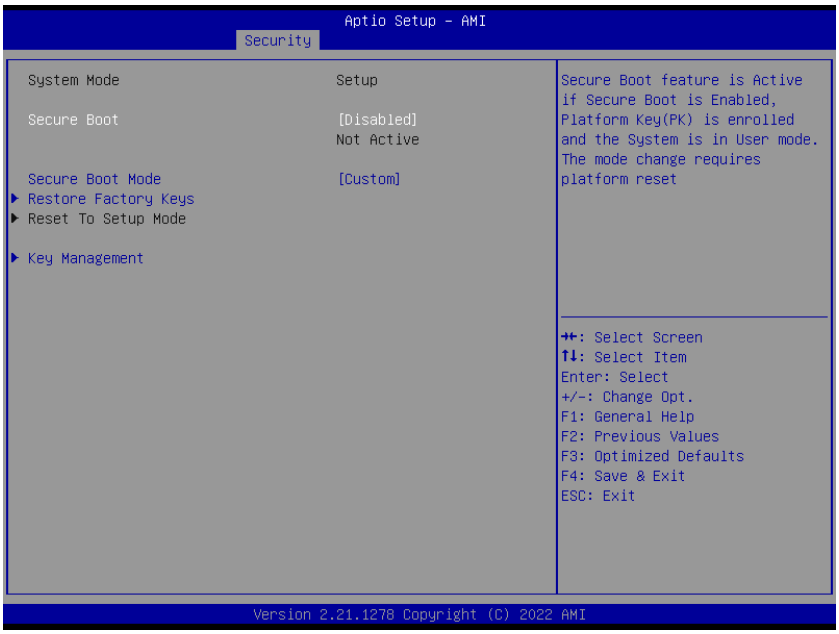
- **Administrator Password**

Set setup Administrator Password

- **User Password**

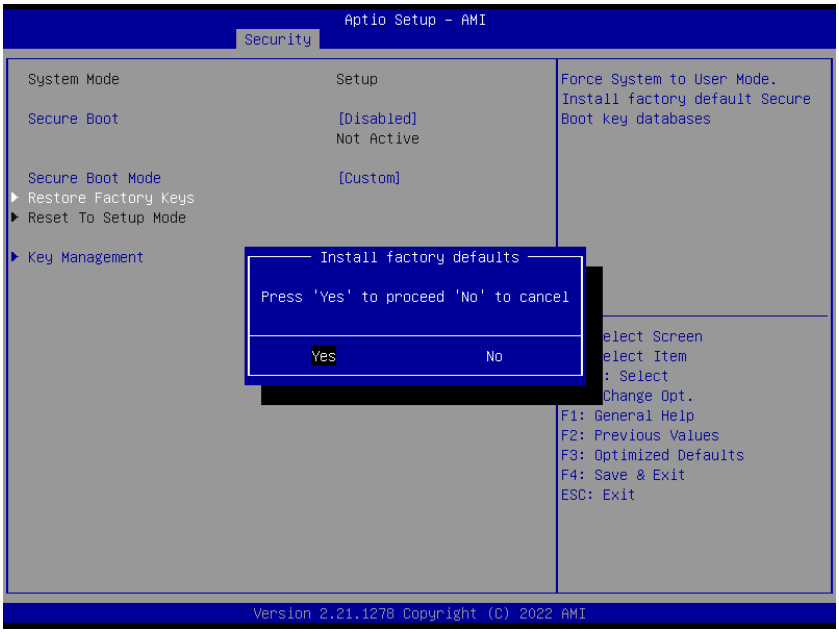
Set User Password

3.6.4.1 Secure Boot menu

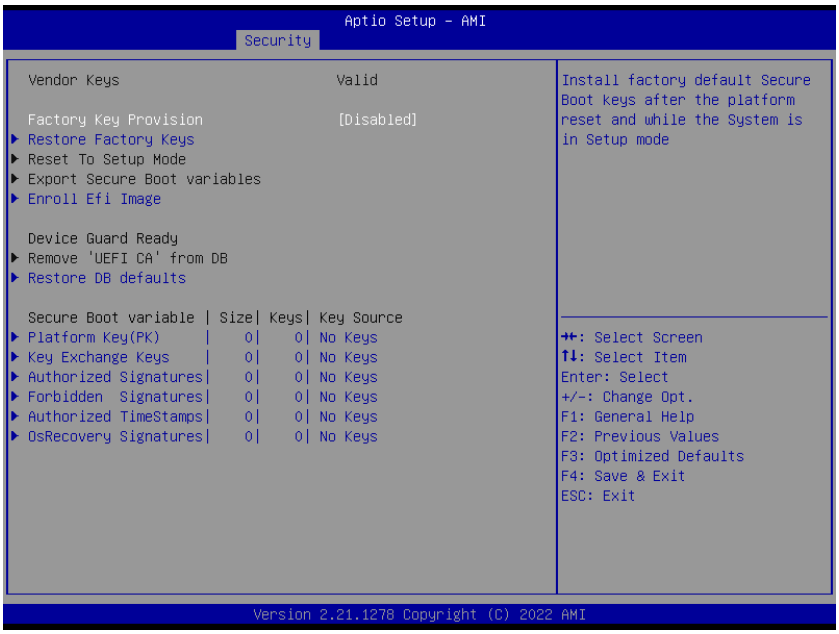


Item	Option	Description
Secure Boot	Disabled Enabled**[Default]**	Secure Boot feature is Active if Secure Boot is Enabled, Platform Key(PK) is enrolled and the System is in User mode. The mode change requires platform reset
Secure Boot Mode	Standard**[Default]** Custom	Secure Boot mode options: Standard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

3.6.4.1.1 Restore Factory Keysestore Factory Keys

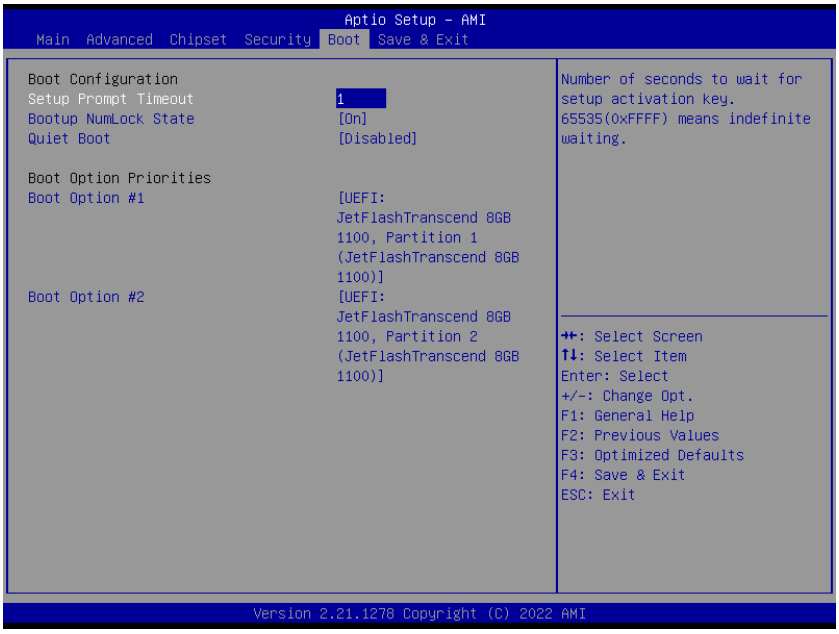


3.6.4.1.2 Key Management



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

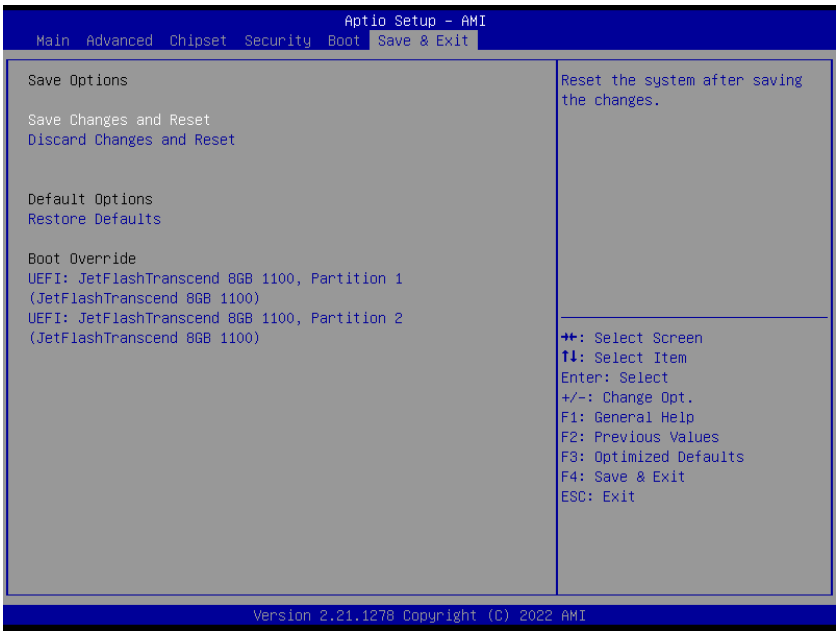
3.6.5 Security

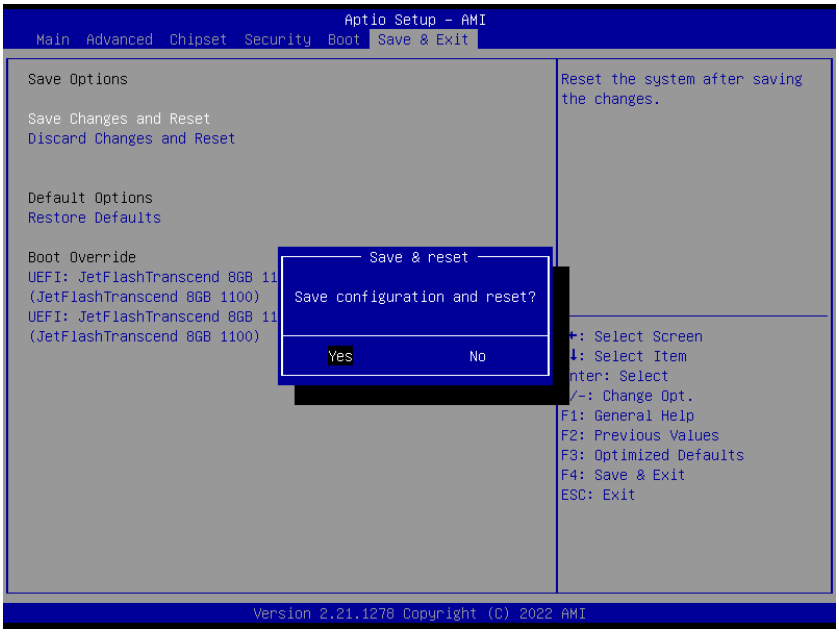


Item	Option	Description
Setup Prompt Timeout	1	Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.
Bootup NumLock State	On**[Default]** Off	Select the Keyboard NumLock state

Quiet Boot	Disabled**[Default]** Enabled	Enables or disables Quiet Boot option
Boot Option #1	Set the system boot order.	
Boot Option #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

Reset system setup without saving any changes.

3.6.6.3 Restore Defaults

Restore/Load Default values for all the setup options.

3.6.6.4 Launch EFI Shell from filesystem device

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

4. Drivers Installation

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

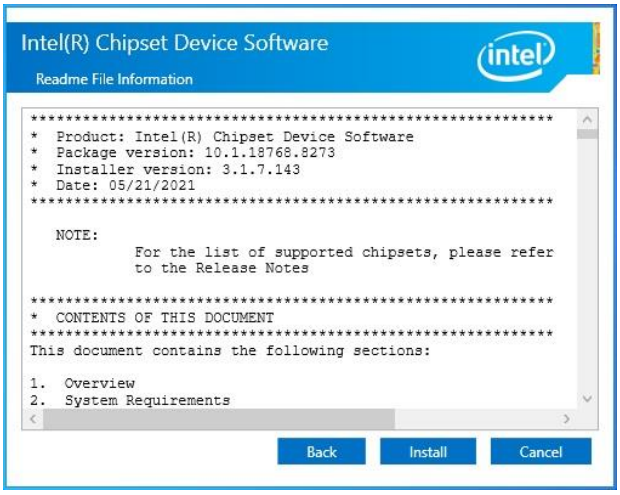
4.1 Install Chipset Driver

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

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

Step1. Click **Next**.

Step 2. Click **Accept**.



Step 3. Click **Install**.

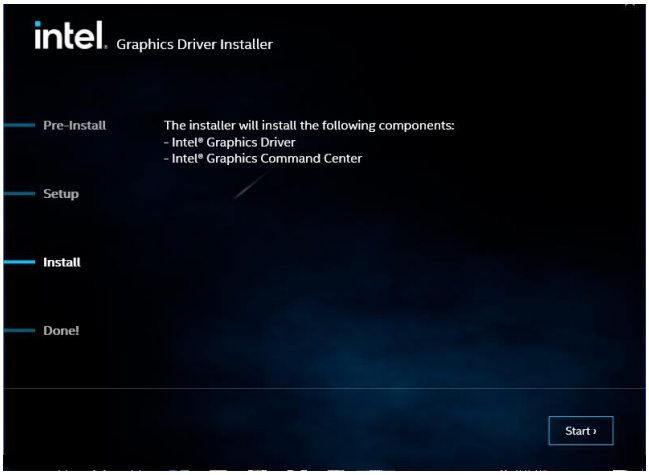
Step 4. Setup completed.

4.2 Install VGA Driver

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

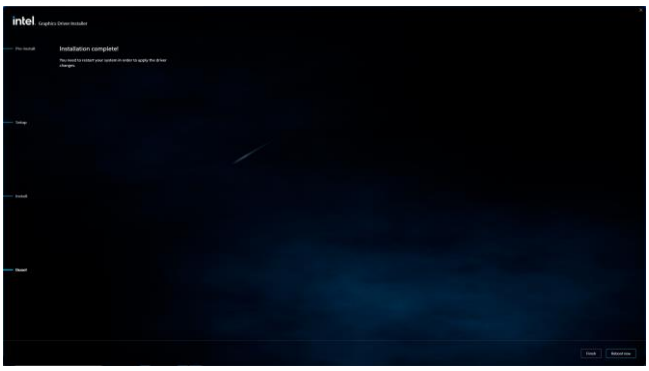
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system.

Step 1. Click **Begin installation**.



Step 3. Click **Start**.

Step 2. Click **Next**.

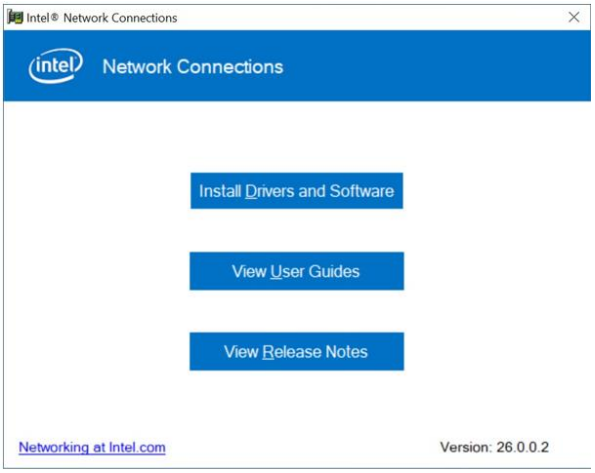


Step 4. Click **Finish** to complete setup.

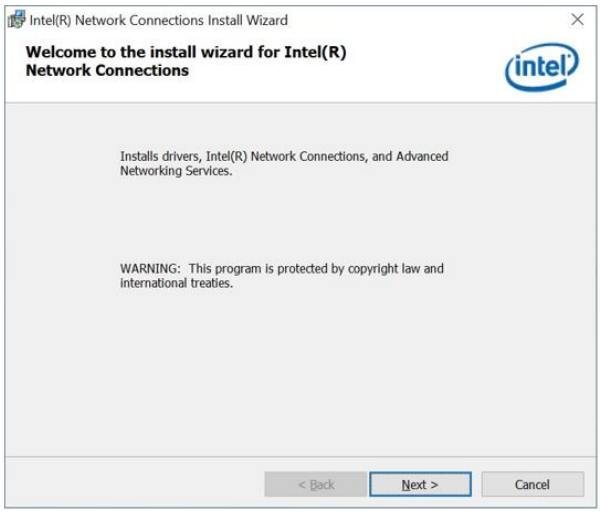
4.3 Install Ethernet Driver

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

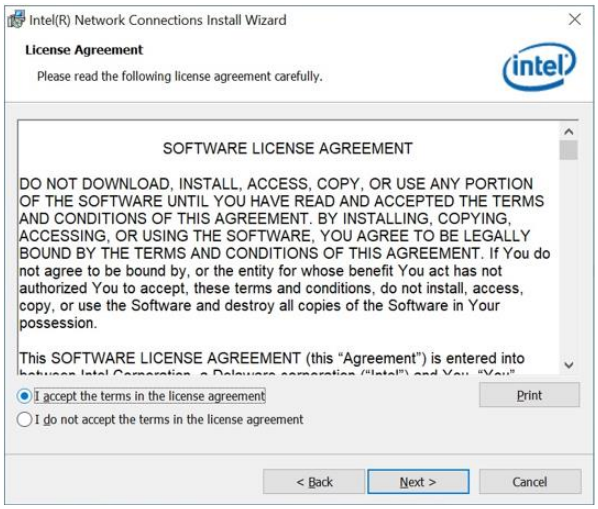
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system.



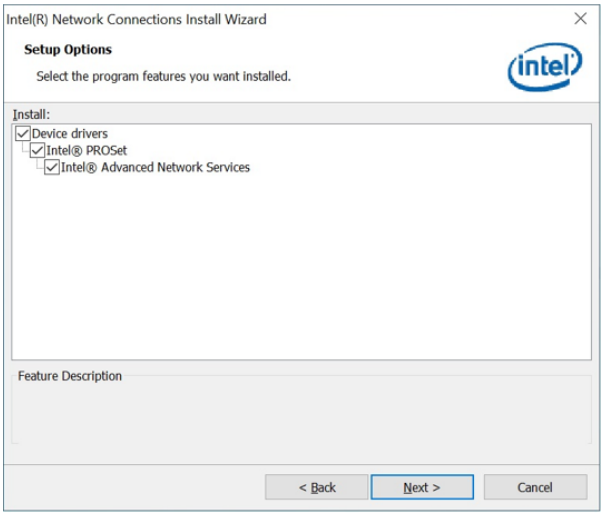
Step 1. Click **Install Drivers and Software** to continue installation.



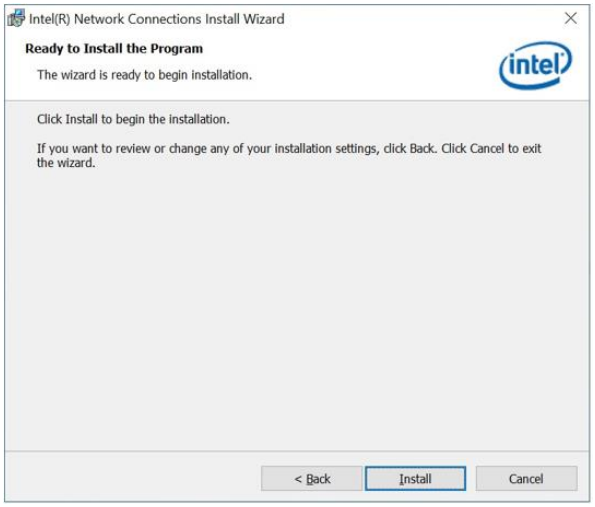
Step 2. Click **Next**.



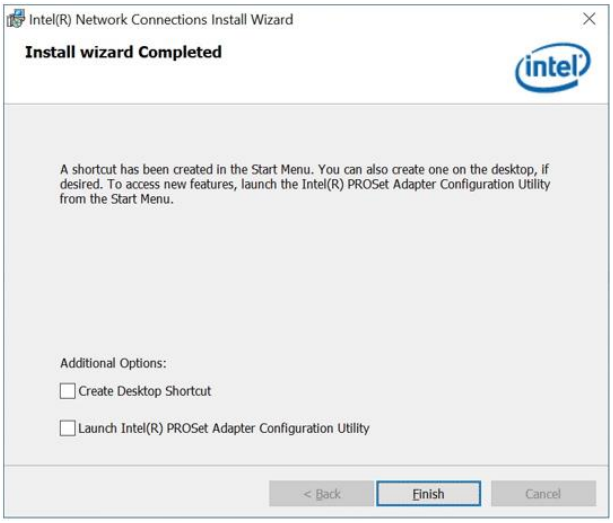
Step 3. Click **Next.**



Step 4. Click **Next.**



Step 5. Click **Install**.



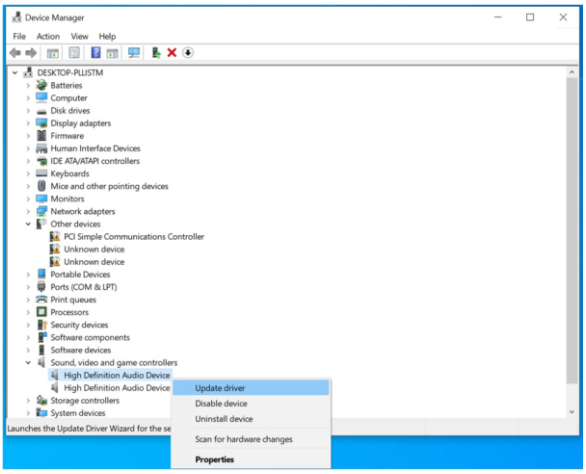
Step 6. Click **Finish** to complete setup.

4.4 Install Display Audio Driver

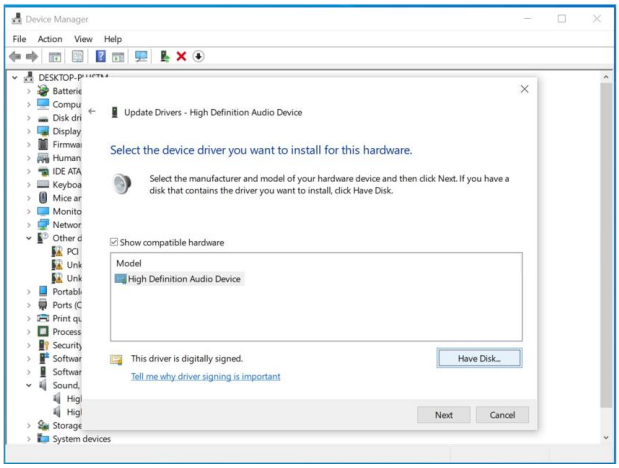
All drivers can be found on the Avalue Official Website: http://www.avalue.com.tw.

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

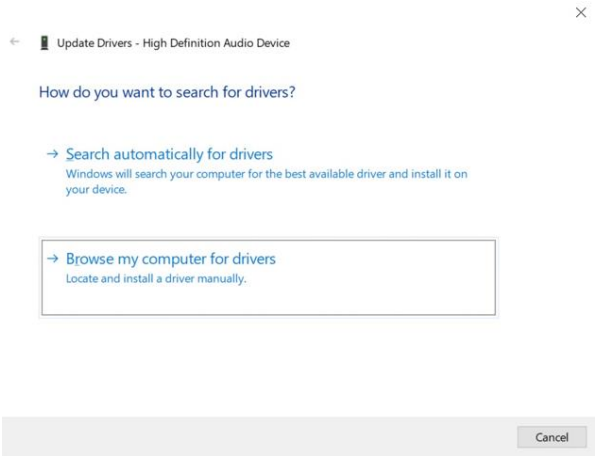
Step 3. Click **Next**.



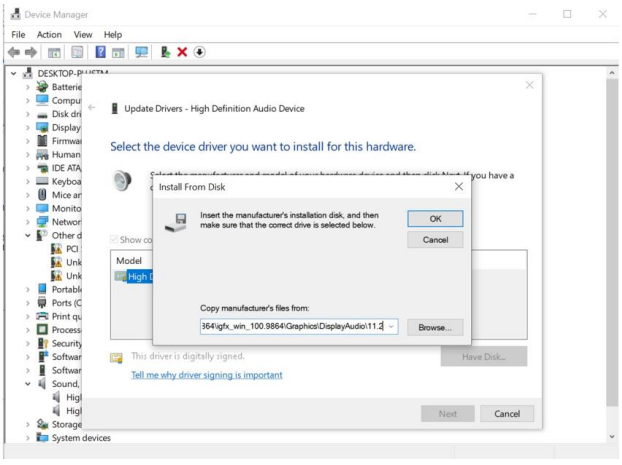
Step 1. Click **Update Drivers**.



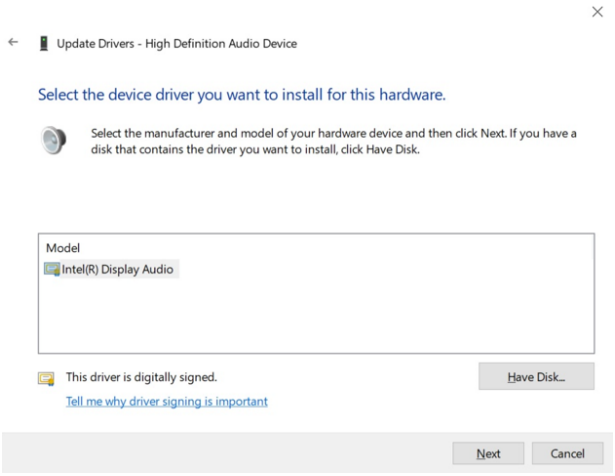
Step 4. Click **Next**.



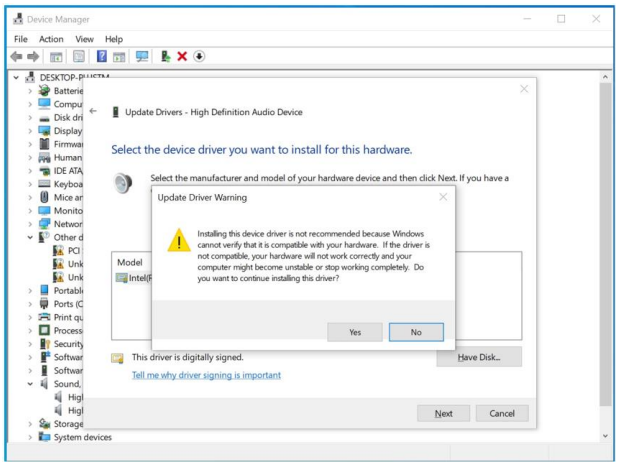
Step 2. Click **Browse my computer for drivers**.



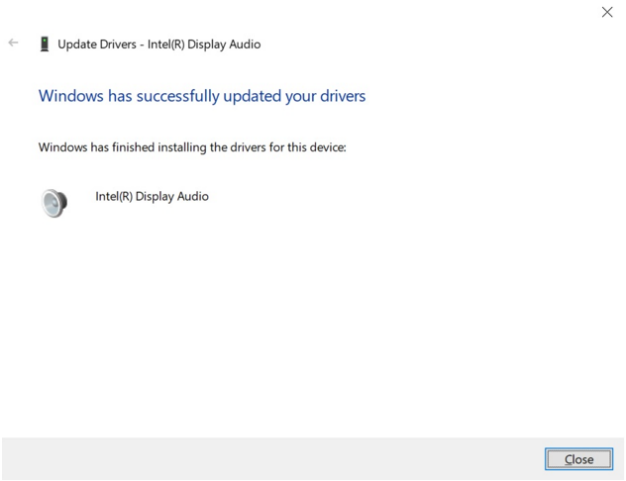
Step 5. Click **OK**.



Step 6. Click **Next**.



Step 7. Click **Yes**.

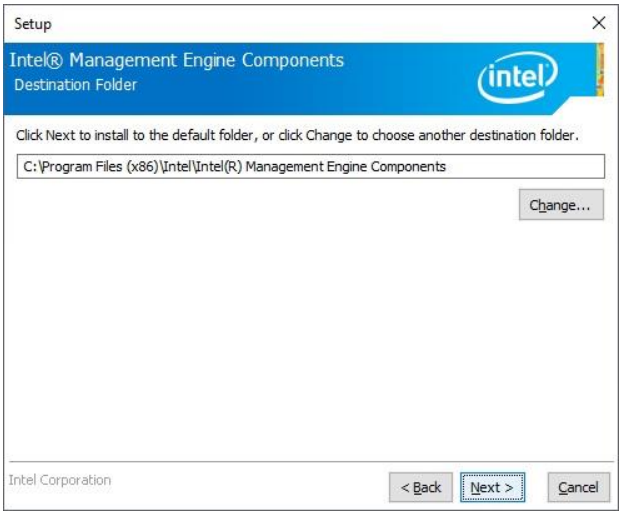


Step 8. Install complete.

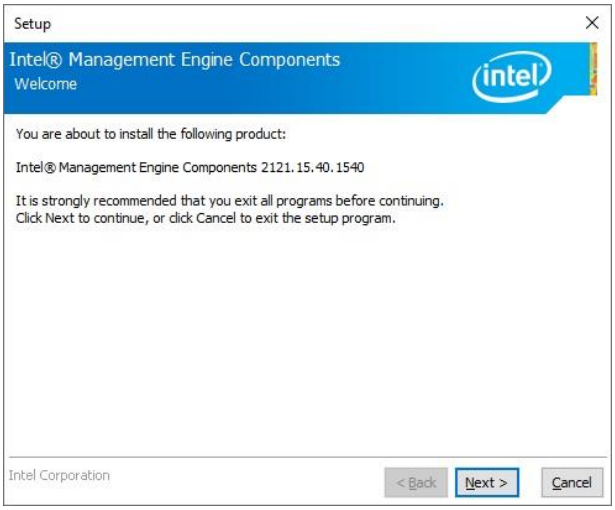
4.5 Install ME Driver

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

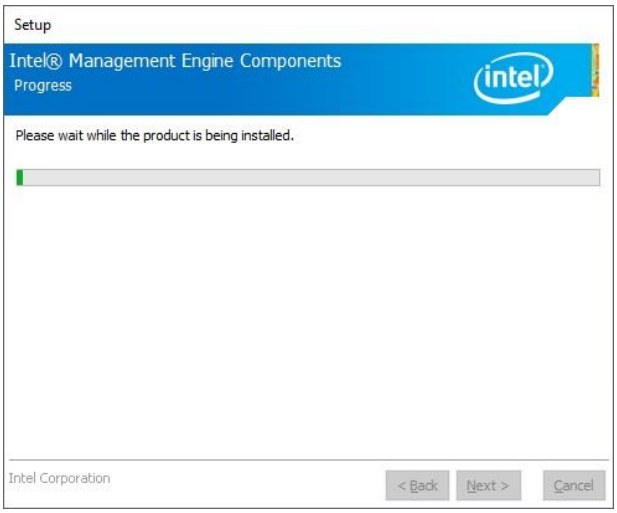
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system. If the warning message appears while the installation process, click Continue to go on.



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

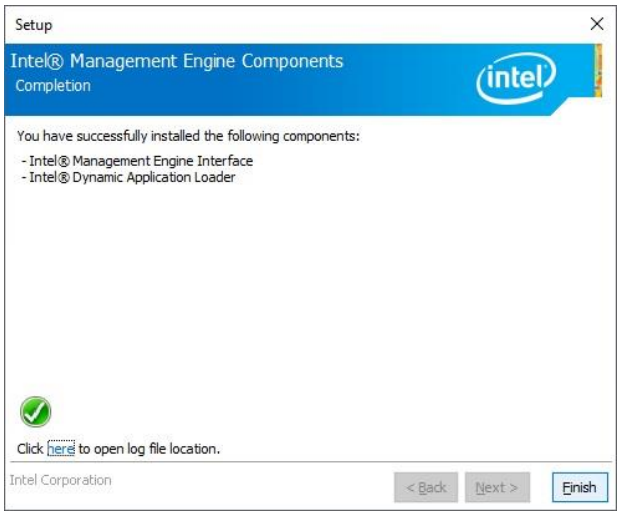


Step1. Click **Next** to start installation.



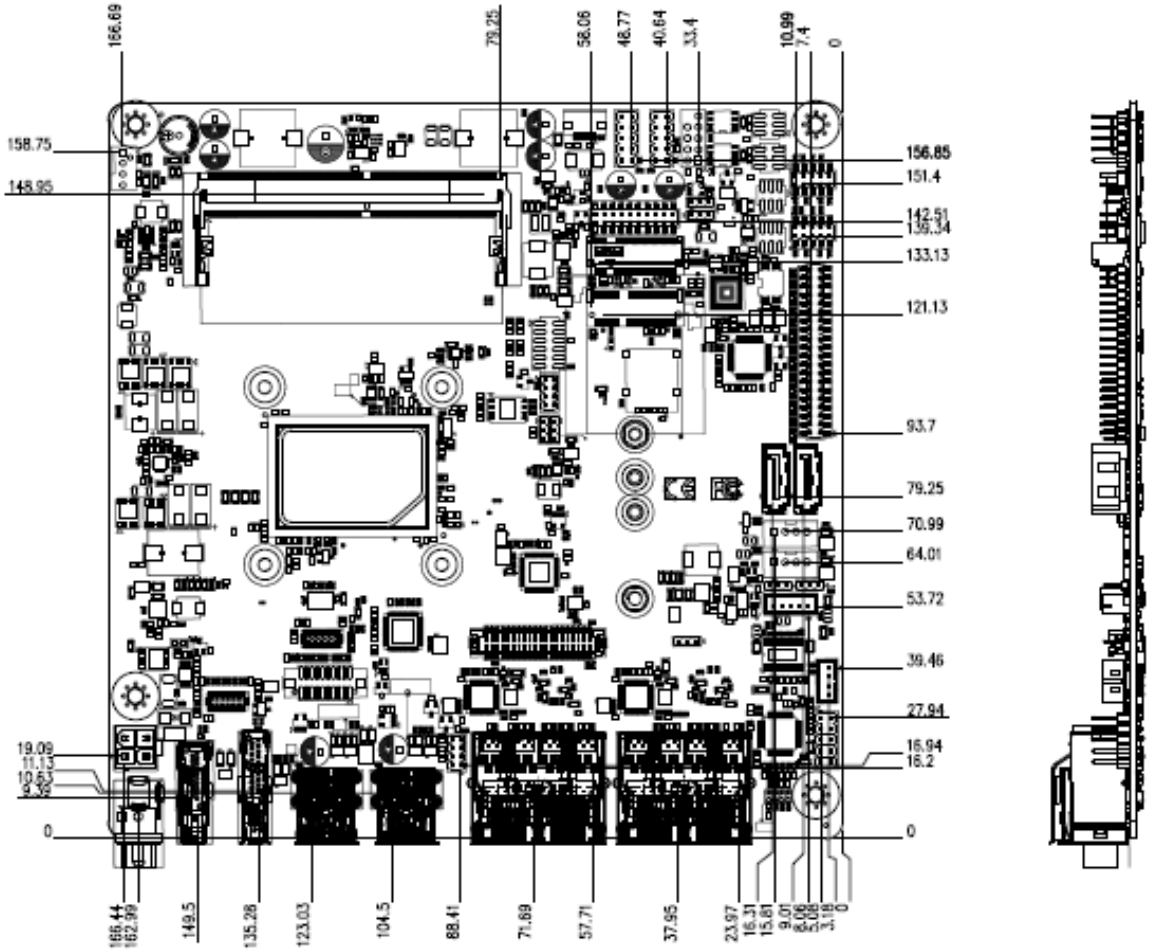
Step 4. Installing.

Step 2. Click **Next**.



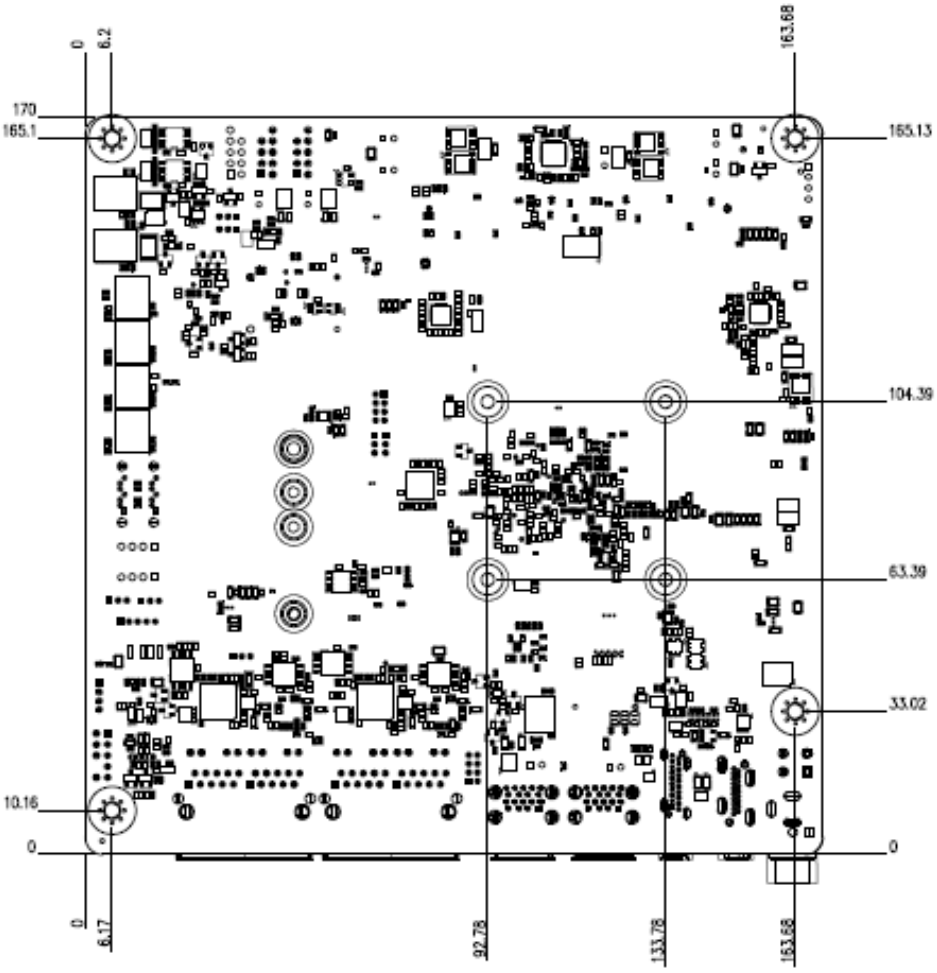
Step 5. Click **Finish** to complete setup.

5. Mechanical Drawing


166.69
79.25
58.06
48.77
40.64
33.4
10.99
7.4
0
158.75
148.95
156.85
151.4
142.51
139.34
133.13
121.13
93.7
79.25
70.99
64.01
53.72
39.46
27.94
16.94
16.2
0
19.09
11.13
10.67
0
166.44
162.99
149.5
135.28
123.03
104.5
88.41
71.89
57.71
37.95
23.97
16.31
15.81
9.01
6.08
5.08
3.18
0


18.3

Unit: mm


0
6.2
163.68
170
165.1
165.13
104.39
63.39
33.02
10.16
0
0
0
6.17
92.78
133.76
163.68

Unit: mm