EMX-RPLP

13th Gen Intel® Core™ SoC & Celeron Processor Mini ITX Motherboard

User's Manual

1st Ed – 15 January 2024

Part No. E2047EMRP00R

FCC Statement

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

(1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE.

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

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

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

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

Notice

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

Copyright Notice

Trademark Acknowledgement

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

Disclaimer

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

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

Life Support Policy

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

As used herein:

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

A Message to the Customer

Avalue Customer Services

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

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

Technical Support

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

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

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 EMX-RPLP motherboard
- 1 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	January 2024	Avalue	Initial Release

1.4 Manual Objectives

This manual describes in details Avalue Technology EMX-RPLP 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-RPLP 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

EMX-RPLP	
Product Features	Onboard Raptor Lake-P 13th Intel® Core™ SoC & Celeron® BGA Processor (TDP: 15~45W)
	2 x 262-Pin DDR5 4800MHz SO-DIMM Socket Supports Up to 64GB (non ECC only)
	3 x Intel® I226LM/IT 2.5 Gigabit Ethernet 1 x Intel® I219LM Gigabit Ethernet PHY (no wide Temp. IC) Realtek ALC888S audio codec (no wide Temp. IC) TI TPA3113D2PWP Stereo Class-D 6W x 2 Audio Amplifier
	2 x DP++ , 2 x DP, 1 x LVDS, 1 x eDP (Maximum: 6 for quadruple independent displays)
	2 x SATA III, 1 x SATA Power 4 x USB2.0 by pin header 2 x USB3.0 Gen1, 2 x USB 3.0 Gen2 at I/O 4 x RS-232, 2 x RS422/485 (ZT3243 for RS232, MAX13487 Transceiver & SP485 IC for RS422/485) 1 x M.2 Type B 3042/3052 (with 1 x PCI-e x1 (default), USB2.0, USB 3.2 Gen2 with 1 x SIM card slot support WWAN+GNSS 1 x M.2 Key E 2230 support Wi-Fi module and CNVi (1 x PCI-e x1 & USB 2.0 Signal) 1 x M.2 Key B 2242 (SATA Signal, shared with SATA2) slot support SSD storage 1 x M.2 Key M 2280 (PCI-e x4) slot for storage NVMe SSD H-series: 1 x PCI-e x8 Gen4 with PCI-e x8 slot P/U-series: 1 x PCI-e x4 Gen4 with PCI-e x8 slot GPIO 16bit Onboard NuvoTon NPCT750AABYX or NPCT754AABYX (wide temp) support SPI TPM 2.0 Support Line-out & Mic-in & Front audio pin-header DC in +12V~24V
Product Specification	
CPU	Onboard Raptor Lake-P 13th Intel® Core™ SoC i7/i5/i3/Celeron Processor (TDP: 15~45W) H-Series: 25~45W, P-Series: 20~28W, U-Series: 12~15W
BIOS	AMI uEFI BIOS, 256Mbit SPI Flash ROM
I/O Chip	EC-ITE: IT5782VG

	ZT3243 for RS232, MAX13487 Transceiver & SP485 IC for RS422/485
System Memory	Two 262-pin DDR5 4800MHz SO-DIMM socket, supports up to 64GB Max (non ECC only)
Watchdog Timer	H/W Reset, 1sec. – 65535sec./min.1sec. or 1min. step
H/W Status Monitor	CPU temperature monitoring Voltage monitoring CPU fan speed control
RAID	Core i SKU CPU support RAID Celeron SKU CPU no support RAID SATA1 & 2 (RAID0/1)
TPM	Onboard NuvoTon NPCT750AABYX or NPCT754AABYX (wide temp) support SPI TPM 2.0
iAMT	Yes
Expansion Slot	
M.2	1 x M.2 Type B 3042/3052 (with 1 x PCI-e x1 (default), USB2.0, USB 3.2 Gen2 with 1 x SIM card slot support WWAN+GNSS 1 x M.2 Key E 2230 support Wi-Fi module and CNVi (1 x PCI-e x1 & USB 2.0 Signal) 1 x M.2 Key B 2242 (SATA Signal, shared with SATA2) slot support SSD storage 1 x M.2 Key M 2280 (PCI-e x4) slot for storage NVMe SSD
PCIe	H-series: 1 x PCI-e x8 Gen4 with PCI-e x8 slot P/U-series: 1 x PCI-e x4 Gen4 with PCI-e x8 slot
Storage	
M.2	1 x M.2 Key B 2242 (SATA Signal, shared with SATA2) slot support SSD storage 1 x M.2 Key M 2280 (PCI-e x4) slot for storage NVMe SSD
SATA	2 x SATA III *SATA 2 share with M.2 key B SATA
Edge I/O	
LAN	1 x Intel® I219LM Gigabit Ethernet PHY (LAN1) 3 x Intel® I226LM/IT 2.5 Gigabit Ethernet (LAN2~4) *LAN3~4 for Full height
USB 3.1	2 x USB 3.0 Gen2 (USB1) (Redriver IC), 2 x USB 3.0 Gen1 (USB2) (Hub Controller)
DP	2 x DP++ (Thin Mini ITX) 2 x DP++, 2 x DP (Full height Mini ITX)
DC Input	Mini Din 4-pin DC in Jack
Onboard I/O	
COM	2 x 2 x 3 pin, pitch 2.00mm connector jumper for RS-422/485

	4 x 2 x 5 pin, pitch 2.00mm connector support RS-232 (JCOM1,JCOM2,JCOM3,JCOM4) For 2 x RS/232 (JCOM1 & JCOM2)/RS422/485, 2 x RS-232 *ZT3243 for RS232, MAX13487 Transceiver & SP485 IC for RS422/485 2 x 2 x 3 pin, pitch 2.00mm connector support RS422/485 connector (J485_1,J485_2), Pin 5 with / +5V Supported (JRI1,JRI2)
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	1 x SATA Power (SPWR1)
CPU/System FAN	1 x 1 x 4 pin, pitch 2.54mm CPU fan connector with smart fan function supported (CPU_FAN1)
Buzzer	Onboard Buzzer (BZ1)
Front Panel	2 x 2 x 5 pin, pitch 2.54mm connector for front panel
RTC Battery	2 x 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
Clear CMOS	1 x 3 pin, pitch 2.00mm connector for CMOS clear
LVDS	1 x 2 x 20 pin, pitch 1.25mm connector for LVDS
LCD Backlight Brightness	2 x 1 x 5 pin, pitch 2.00mm Wafer connector for LCD inverter backlight connector (5V/12V) (JBKL1,2) 1 x 1 x 3 pin, pitch 2.00mm connector LCD backlight brightness adjustment (PWM/DC)
LCD Inverter	2 x 1 x 5 pin, pitch 2.00mm Wafer connector for LCD inverter backlight connector
BIOS SPI	1 x 2 x 4 pin, pitch 2.00mm connector for BIOS SPI (JSPI1)
eSPI	1 x 2 x 6 pin, pitch 2.00mm connector for eSPI debug (JESPI1)
EC Debug	1 x 1 x 3 pin, pitch 2.00mm connector for EC SPI (JEC)
Audio	1 x 2 x 6 pin, pitch 2.00mm connector for front Audio (JFAUD1)
DC-Input	Mini Din 4-pin DC in Jack
Amp Connector	1 x 4 pin, pitch wafer 2.00mm connector for 6W x 2 Speaker (SPK1)
Other	1 x 2 x 10 pin, pitch 1.25mm connector for eDP 1 x 2 x 2 pin, pitch 4.20mm connector for power input connector (PWR1)
Display	
Graphic Chipset	Intel® Iris® Xe / UHD Graphics (Dependent on CPU)
Spec. & Resolution	DP1~DP4 (DP2.1): Max: 8192 x 4320@60 Hz 2 x DP++ (DP1+DP2): 1920 x 1080@60 Hz LVDS: 1920 x 1080 Dual channel 18/24-bits LVDS (Chrontel CH7511B eDP to LVDS) eDP 4096 x 2304@60 Hz

<table>
<tr><td></td><td>*2 x DP++, LVDS, eDP Default for Thin Mini ITX, Optional: DP3 and DP4 for full height
(Maximum: 6 for quadruple independent displays)</td></tr>
<tr><td>Multiple Display</td><td>Quadruple Independent Display: 2 x DP++, LVDS, eDP (Thin Mini ITX)
Six display for quadruple Independent Display : 2 x DP++, LVDS, eDP, 2 x DP
(Full height Mini ITX)</td></tr>
<tr><td colspan="2">Audio</td></tr>
<tr><td>Audio Codec</td><td>Realtek ALC888S audio codec</td></tr>
<tr><td>Amplifier</td><td>TI TPA3113D2PWP Stereo Class-D 6W x 2 Audio Amplifier</td></tr>
<tr><td colspan="2">Ethernet</td></tr>
<tr><td>LAN Chipset</td><td>1 x Intel® I219LM Gigabit Ethernet PHY (LAN1)
3 x Intel® I226LM/IT 2.5 Gigabit Ethernet (LAN2~4)
*LAN3~4 for Full height</td></tr>
<tr><td>LAN Spec.</td><td>10/100/1000 Base-Tx GbE compatible & 2.5 Gigabit Ethernet</td></tr>
<tr><td colspan="2">Mechanical & Environmental Specification</td></tr>
<tr><td>Power Requirement</td><td>DC in +12V ~ +24V</td></tr>
<tr><td>ACPI</td><td>Single power ATX Support S0, S3, S4, S5
ACPI 5.0 Compliant</td></tr>
<tr><td>Power Mode</td><td>AT / ATX mode Switchable Through Jumper</td></tr>
<tr><td>Operating Temp.</td><td>Intel@ wide temperature CPU SKU Support:
<table><tr><td>15W</td><td>-40~80°C with Fan</td></tr><tr><td>28W</td><td>-40~60°C</td></tr><tr><td>45W</td><td>-40~50°C</td></tr></table>
Intel@ standard CPU SKU support: 0~60°C
w/HDD/SSD, ambient with 0.5 m/s Air flow</td></tr>
<tr><td>Storage Temp.</td><td>-40~ +75°C</td></tr>
<tr><td>Operating Humidity</td><td>40°C @ 95% Relative Humidity, Non-condensing</td></tr>
<tr><td>Size (L x W)</td><td>6.7" x 6.7" (170mm x 170mm)</td></tr>
<tr><td>Weight</td><td>0.88lbs (0.4kg)</td></tr>
<tr><td>OS Information</td><td>Win11 64bit, Win10 64bit.
Linux</td></tr>
<tr><td>Power</td><td>DC in +12V ~ +24V</td></tr>
</table>

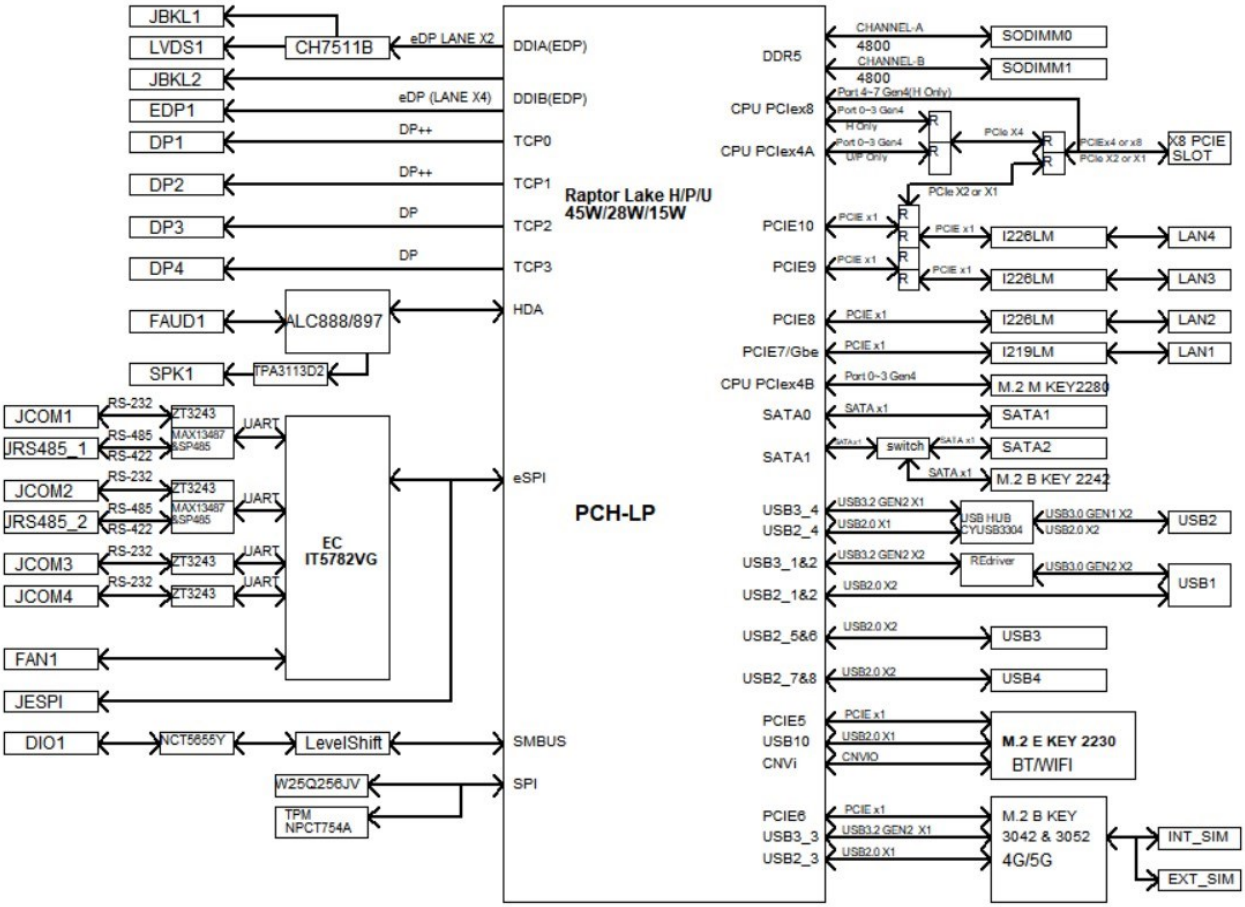
Requirement	
ACPI	Single power ATX Support S0, S3, S4, S5 ACPI 5.0 Compliant

Note:

Specifications are subject to change without notice.

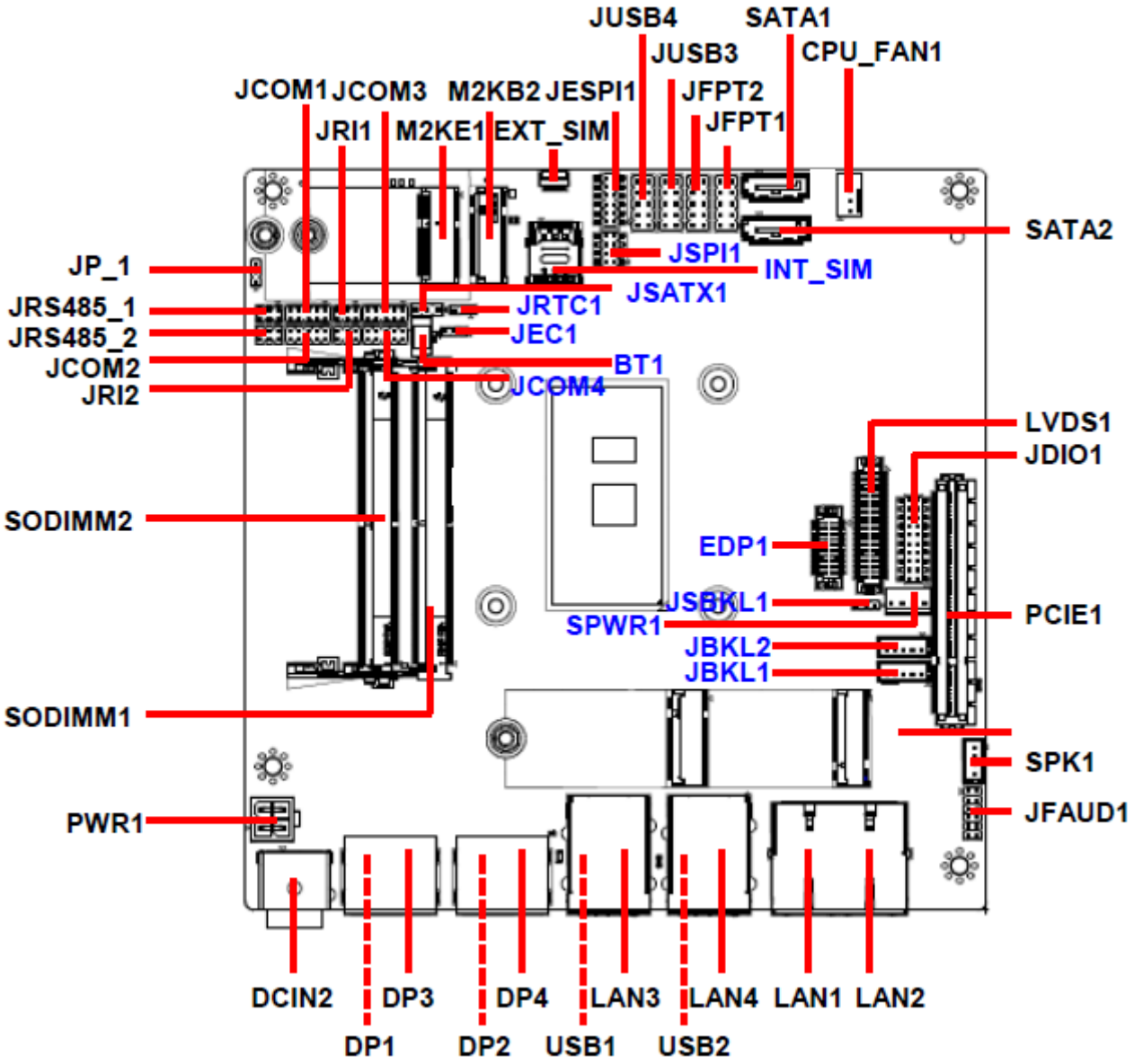
1.6 Architecture Overview—Block Diagram

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



2. Hardware Configuration

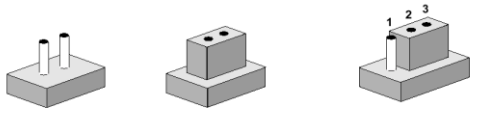
2.1 Product Overview



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
JSBKL1	LVDS Back Light power selection	3 x 1 header, pitch 2.00mm
JSATX1	AT/ATX Power Mode Select	3 x 1 header, pitch 2.54mm
JP1	M2KB2 Voltage setting	3 x 1 header, pitch 2.00mm
JRTC1	Clear CMOS	3 x 1 header, pitch 2.00mm

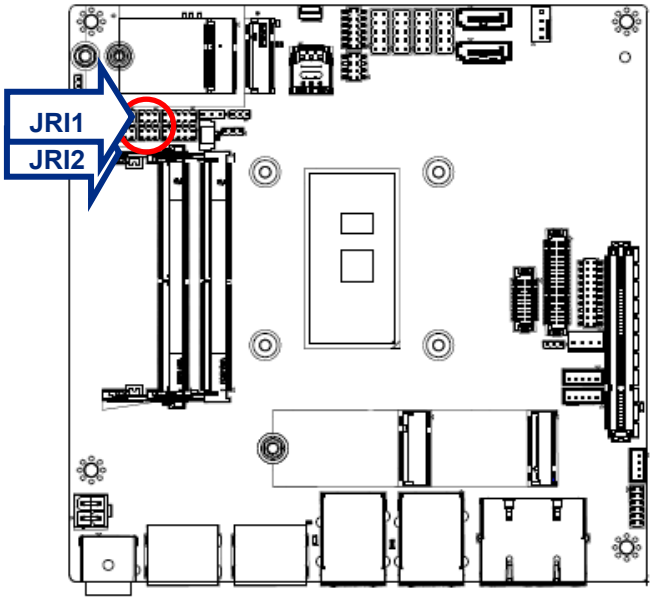
Connectors

Label	Function	Note
JFPT1/2	Miscellaneous setting connector 1/2	5 x 2 header, pitch 2.54mm
SODIMM1/2	2 x 262-Pin DDR5 4800MHz SO-DIMM Socket Supports Up to 64GB (non ECC only)	

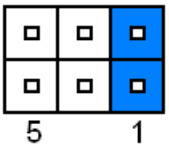
JFAUD1	Front Audio connector	6 x 2 header, pitch 2.00mm
JBKL1/2	LCD Inverter connector	5 x 1 wafer, pitch 2.00mm
JSPI1	SPI connector	4 x 2 header, pitch 2.00mm
JESPI1	JESPI connector	6 x 2 header, pitch 2.00mm
JCOM1/2/3/4	Serial Port 1/2/3/4 connector	5 x 2 header, pitch 2.00mm
JDIO1	General purpose I/O connector	10 x 2 header, pitch 2.00mm
SPK1	Speaker connector	4 x 1 wafer, pitch 2.00mm
LVDS1	LVDS Connector	20 x 2 wafer, pitch 1.25mm
EDP1	eDP_Panel connector	10 x 2 wafer, pitch 1.25mm
JUSB3/4	USB connector 3/4	5 x 2 header, pitch 2.54mm
LAN1/2/3/4	RJ-45 Ethernet 1/2/3/4	
BT1	Battery connector	2 x 1 wafer, pitch 1.25mm
M2KE1	M.2 2230 Type E Slot	
M2KM1		
M2KB1	M.2 2242 Type B Slot	
M2KB2	M.2 3052/3042/2242 Type B Slot	
DP1/2/3/4	DP connector 1/2/3/4	
JRS485_1/2	Serial Port 1/2 RS485/422 Mode connector	3 x 2 header, pitch 2.00mm
JEC1	JEC connector	3 x 1 header, pitch 2.00mm
DCIN1	DC Power-in connector	
PWR1	Power connector	2 x 2 wafer, pitch 4.20mm
SATA1/2	Serial ATA connector 1/2	
SPWR1	SATA Power connector 1	4 x 1 wafer, pitch 2.54mm
EXT_SIM	SIM card slot	Can Only use either one slot, not both at the same time.
INT_SIM	SIM card slot	
CPU_FAN1	CPU fan connector	4 x 1 wafer, pitch 2.54mm
PCIE1	PCIe connector	

2.3 Setting Jumpers & Connectors

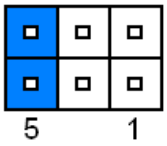
2.3.1 Serial port 1/2 pin9 signal select (JRI1/JRI2)



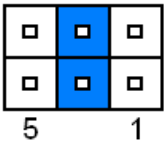
Ring*



+12V

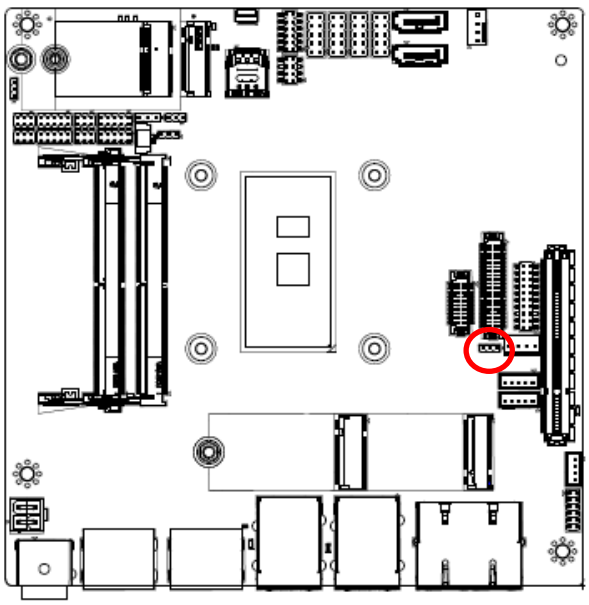


+5V



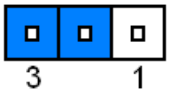
*** Default**

2.3.2 LVDS Back Light power selection (JSBKL1)



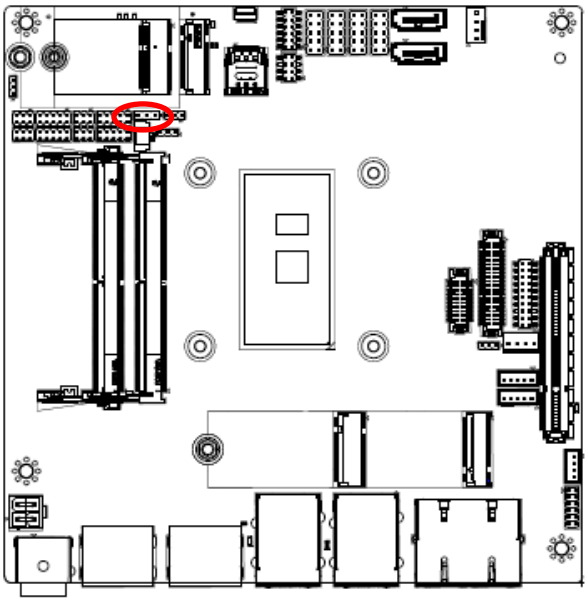
PWM Mode*

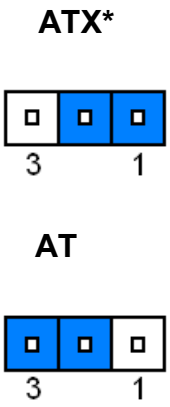
DC Mode



*** Default**

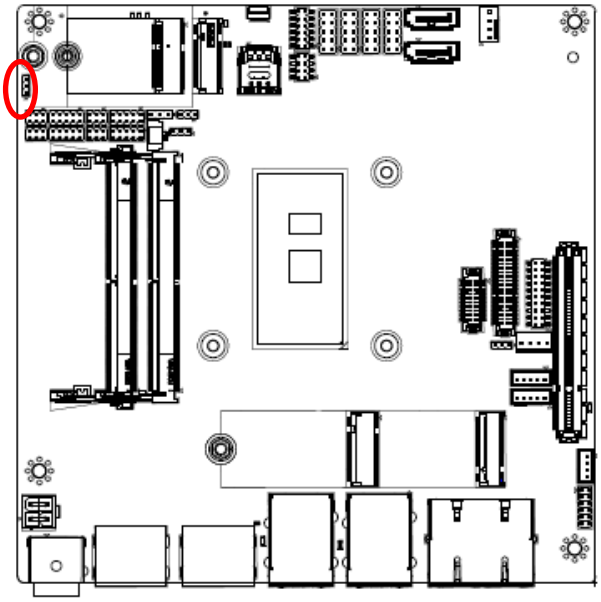
2.3.3 AT/ATX Power Mode Select (JSATX1)

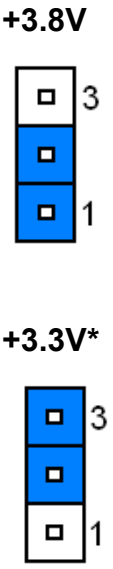




*** Default**

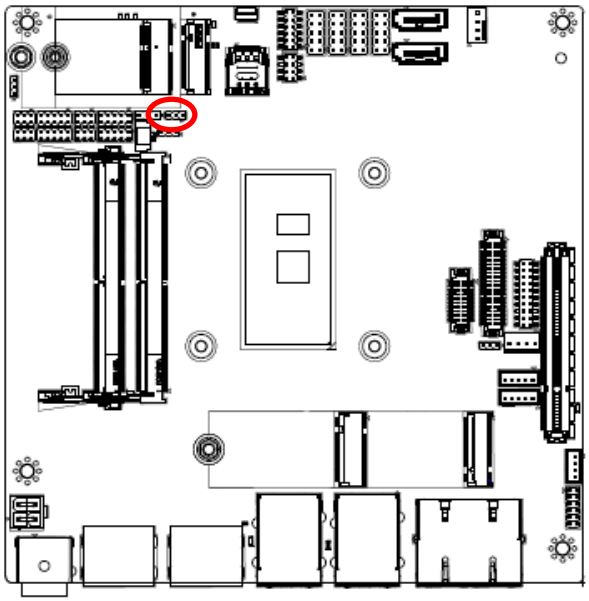
2.3.4 M2KB2 Voltage setting (JP1)



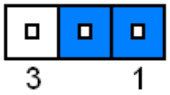


*** Default**

2.3.5 Clear CMOS (JRTC1)



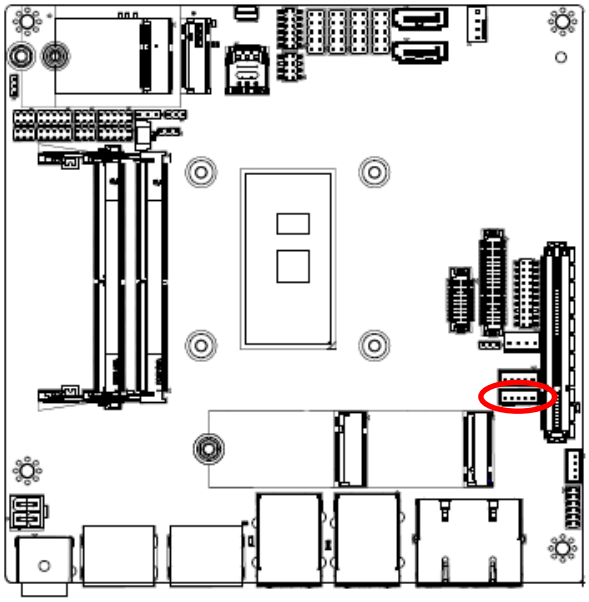
Protect*

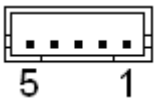


Clear CMOS

*** Default**

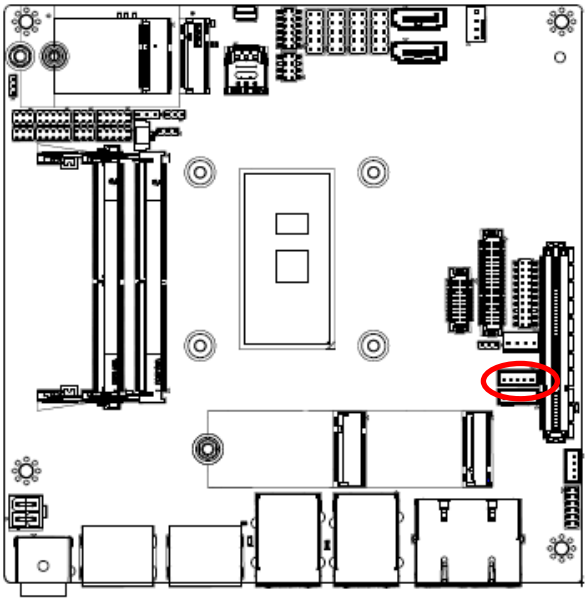
2.3.6 LCD Inverter connector (JBKL1)

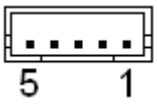




PIN	Signal
1	+12V_INV
2	GND
3	LVDS_BKLT_EN
4	LVDS_BKLTCTL
5	+5V

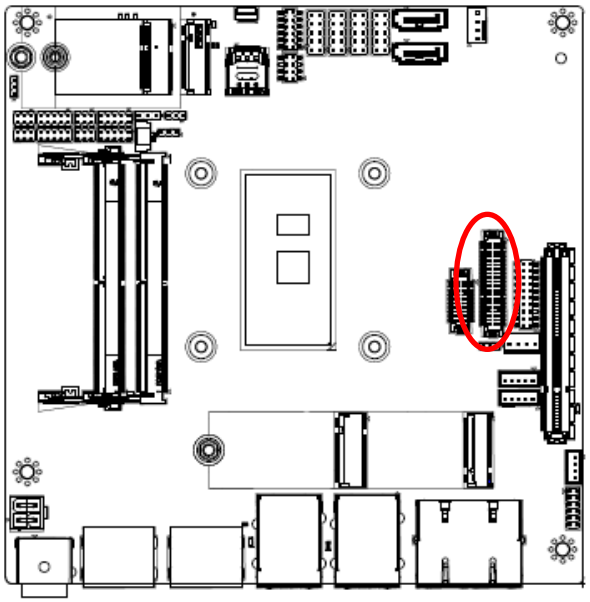
2.3.7 LCD Inverter connector (JBKL2)

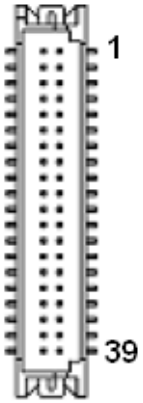




PIN	Signal
1	+12V_INV2
2	GND
3	EDP2_BKLTEN
4	EDP2_BKLT_CTL
5	+5V

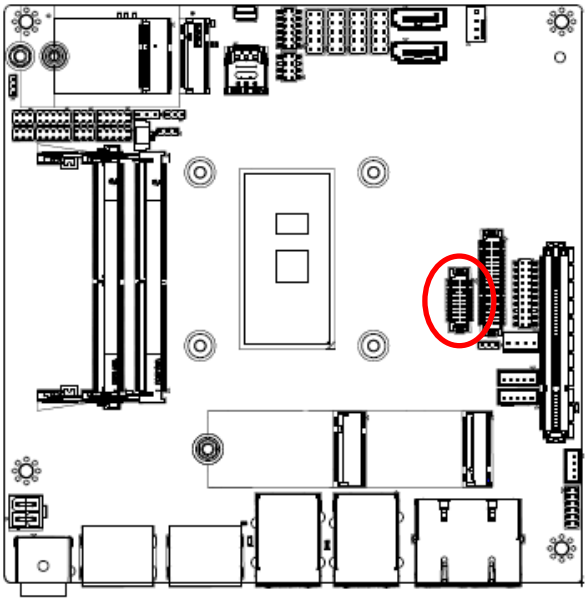
2.3.8 LVDS connector (LVDS1)

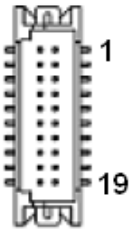




Signal	PIN	PIN	Signal
+V5S_LVDS	2	1	+ V3.3S_LVDS
+V5S_LVDS	4	3	+ V3.3S_LVDS
+V5S_LVDS	6	5	+ V3.3S_LVDS
GND	8	7	GND
LVDS_DATA0_P	10	9	LVDS_DATA1_P
LVDS_DATA0_N	12	11	LVDS_DATA1_N
GND	14	13	GND
LVDS_DATA2_P	16	15	LVDS_DATA3_P
LVDS_DATA2_N	18	17	LVDS_DATA3_N
GND	20	19	GND
LVDS_DATA4_P	22	21	LVDS_DATA5_P
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
+V12S_LVDS	40	39	+V12S_LVDS

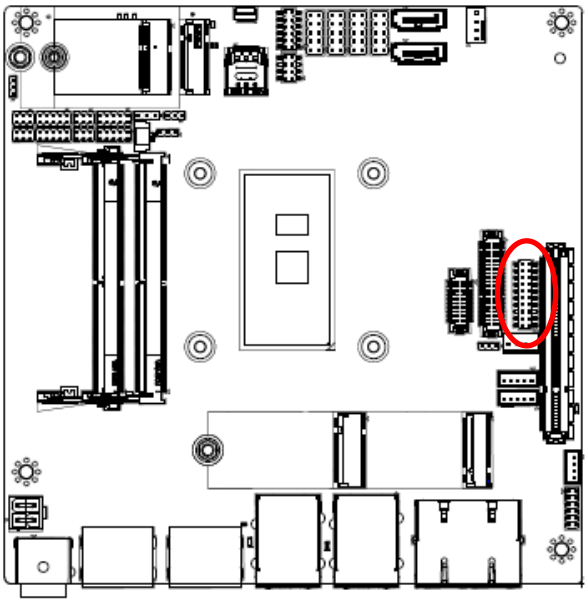
2.3.9 eDP_Panel connector (EDP1)

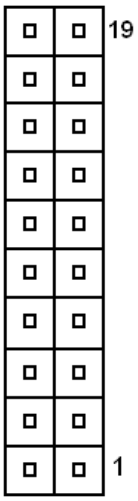




Signal	PIN	PIN	Signal
GND	2	1	GND
EDP_PANEL_TXN3	4	3	EDP_PANEL_TXN0
EDP_PANEL_TXP3	6	5	EDP_PANEL_TXP0
NC	8	7	GND
GND	10	9	EDP_PANEL_TXN1
EDP_PANEL_AUXN	12	11	EDP_PANEL_TXP1
EDP_PANEL_AUXP	14	13	GND
GND	16	15	EDP_PANEL_TXN2
EDP_PANEL_HPD	18	17	EDP_PANEL_TXP2
+V3.3V_EDP	20	19	+V3.3V_EDP

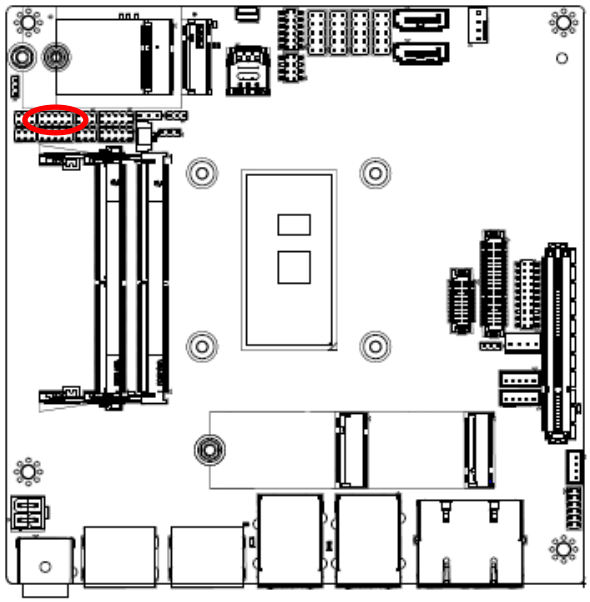
2.3.10 General purpose I/O connector (JDIO1)

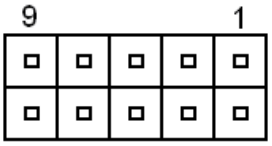




Signal	PIN	PIN	Signal
DI0	1	2	DO0
DI1	3	4	DO1
DI2	5	6	DO2
DI3	7	8	DO3
DI4	9	10	DO4
DI5	11	12	DO5
DI6	13	14	DO6
DI7	15	16	DO7
SMB_SCL_ S0_3P3EXT	17	18	SMB_SDA_ S0_3P3EXT
GND	19	20	+5V (Max current = 0.5A)

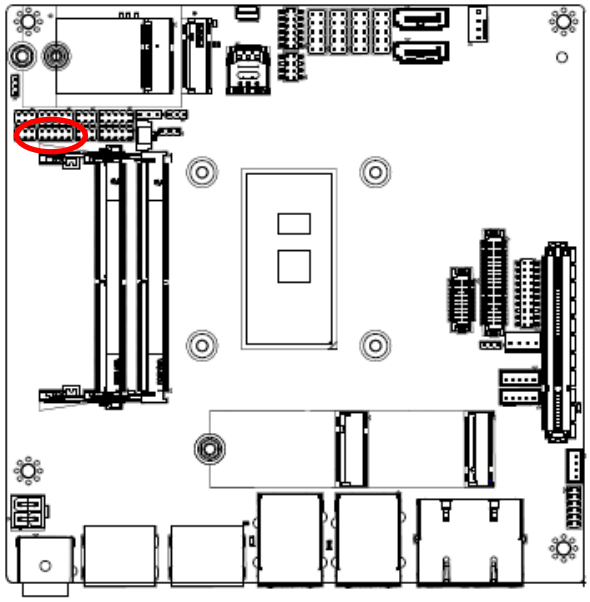
2.3.11 Serial port1 connector (JCOM1)

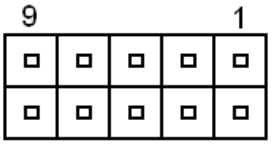




Signal	PIN	PIN	Signal
COM_DCD#_1	1	2	COM_RXD_1
COM_TXD_1	3	4	COM_DTR#_1
GND	5	6	COM_DSR#_1
COM_RTS#_1	7	8	COM_CTS#_1
COM_RI#_1	9	10	NC

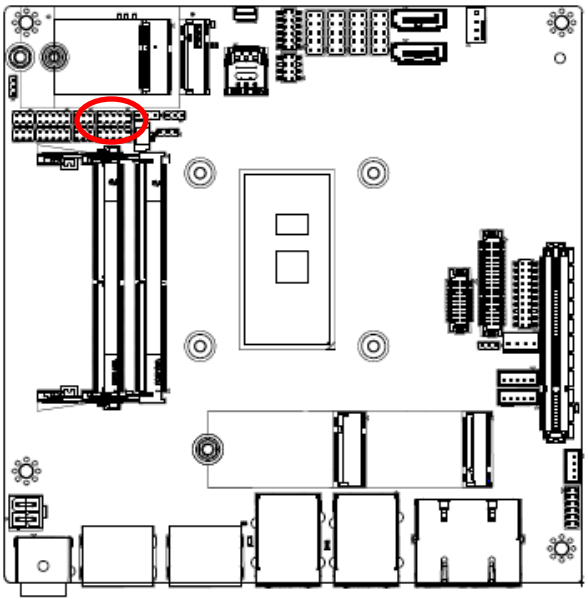
2.3.12 Serial port2 connector (JCOM2)

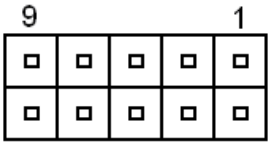




Signal	PIN	PIN	Signal
COM_DCD#_2	1	2	COM_RXD_2
COM_TXD_2	3	4	COM_DTR#_2
GND	5	6	COM_DSR#_2
COM_RTS#_2	7	8	COM_CTS#_2
COM_RI#_2	9	10	NC

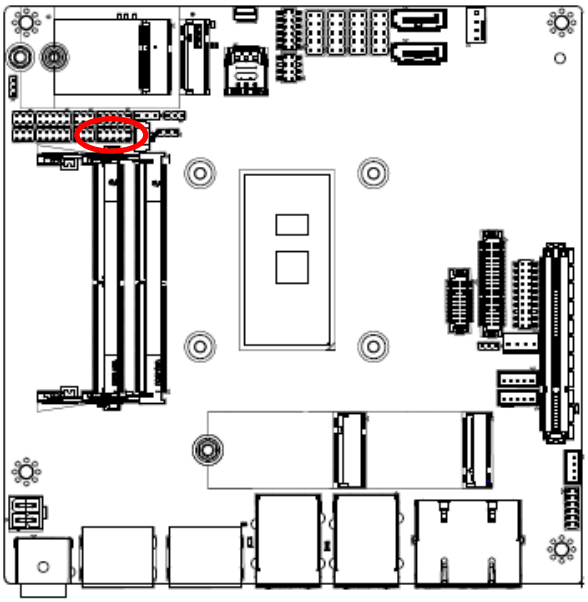
2.3.13 Serial port3 connector (JCOM3)

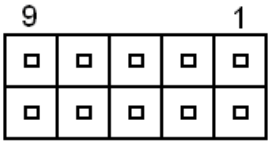




Signal	PIN	PIN	Signal
COM_DCD#_3	1	2	COM_RXD_3
COM_TXD_3	3	4	COM_DTR#_3
GND	5	6	COM_DSR#_3
COM_RTS#_3	7	8	COM_CTS#_3
COM_RI#_3	9	10	NC

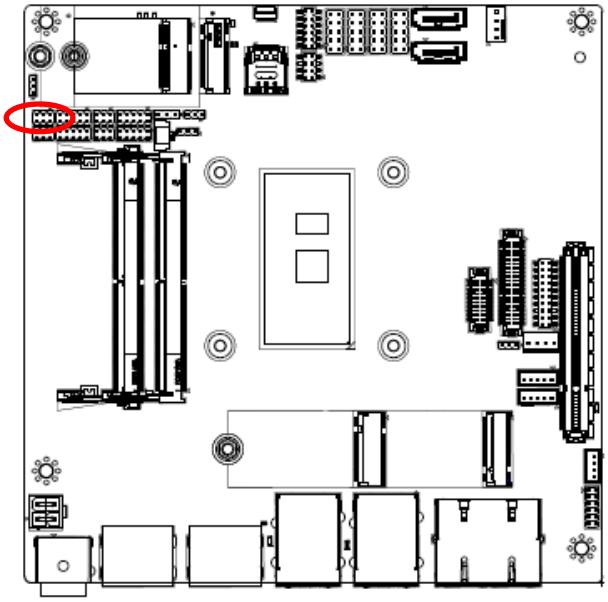
2.3.14 Serial port4 connector (JCOM4)

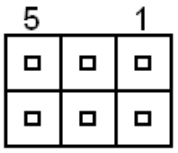




Signal	PIN	PIN	Signal
COM_DCD#_4	1	2	COM_RXD_4
COM_TXD_4	3	4	COM_DTR#_4
GND	5	6	COM_DSR#_4
COM_RTS#_4	7	8	COM_CTS#_4
COM_RI#_4	9	10	NC

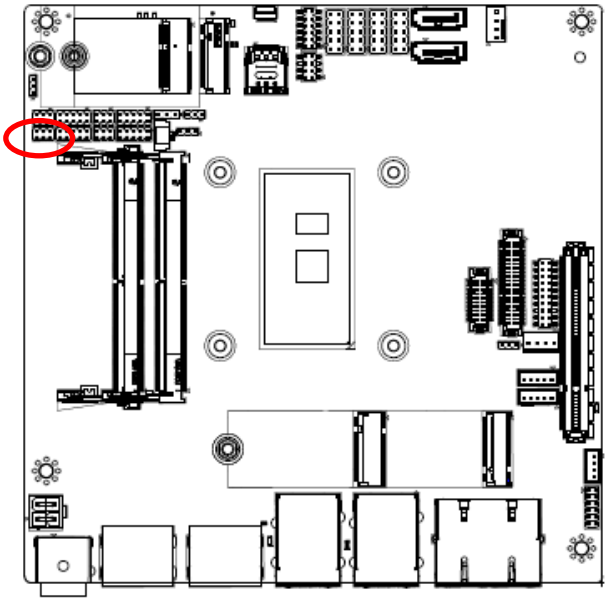
2.3.15 Serial Port 1 RS485/422 Mode connector (JRS485_1)

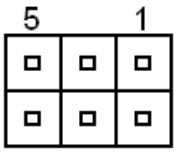




Signal	PIN	PIN	Signal
485_422TX1-	1	2	485_422TX1+
485RX1+	3	4	485RX1-
+5V (Max current = 0.5A)	5	6	GND

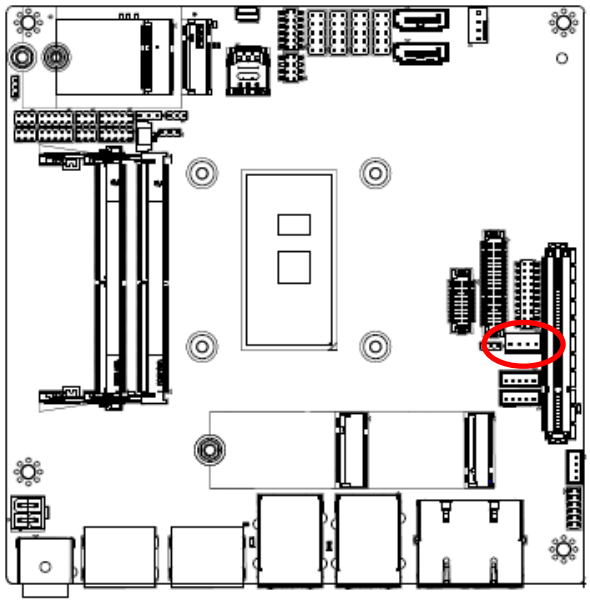
2.3.16 Serial Port 2 RS485/422 Mode connector (JRS485_2)

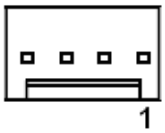




Signal	PIN	PIN	Signal
485_422TX2-	1	2	485_422TX2+
485RX2+	3	4	485RX2-
+5V	5	6	GND

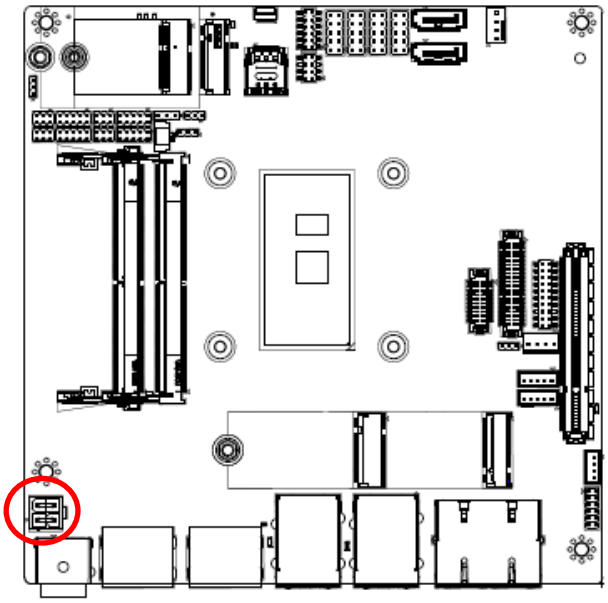
2.3.17 SATA Power connector 1 (SPWR1)

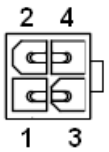




PIN	Signal
1	+5V_SATA
2	GND
3	GND
4	+12V_SATA

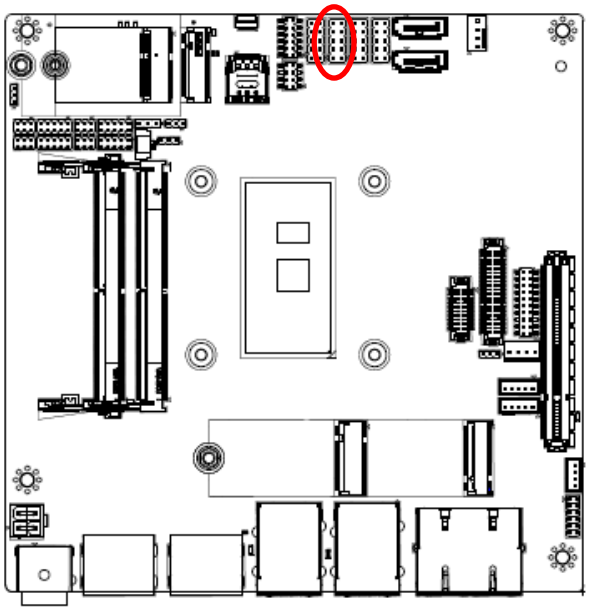
2.3.18 Power connector (PWR1)

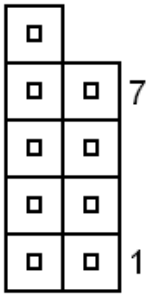




Signal	PIN	PIN	Signal
GND	2	4	+VIN
GND	1	3	+VIN

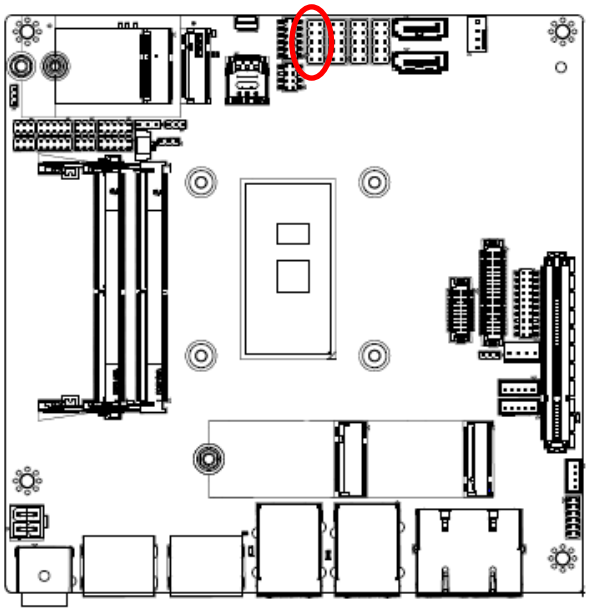
2.3.19 USB connector 3 (JUSB3)

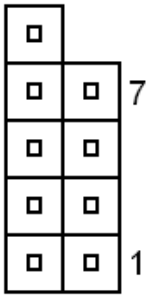




Signal	PIN	PIN	Signal
+V5A_USB56	1	2	+V5A_USB56
USB_DN5	3	4	USB_DN6
USB_DP5	5	6	USB_DP6
GND	7	8	GND
		10	GND

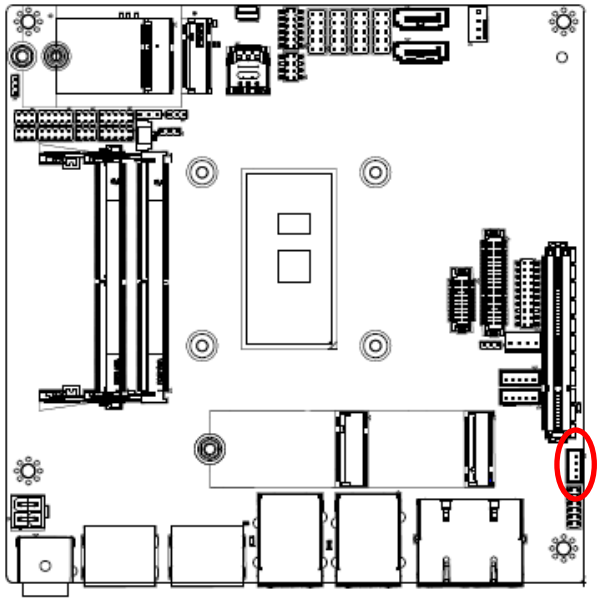
2.3.20 USB connector 4 (JUSB4)

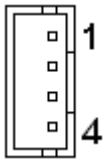




Signal	PIN	PIN	Signal
+V5A_USB78	1	2	+V5A_USB78
USB_DN7	3	4	USB2_ DN8
USB_DP7	5	6	USB2_ DP8
GND	7	8	GND
		10	GND

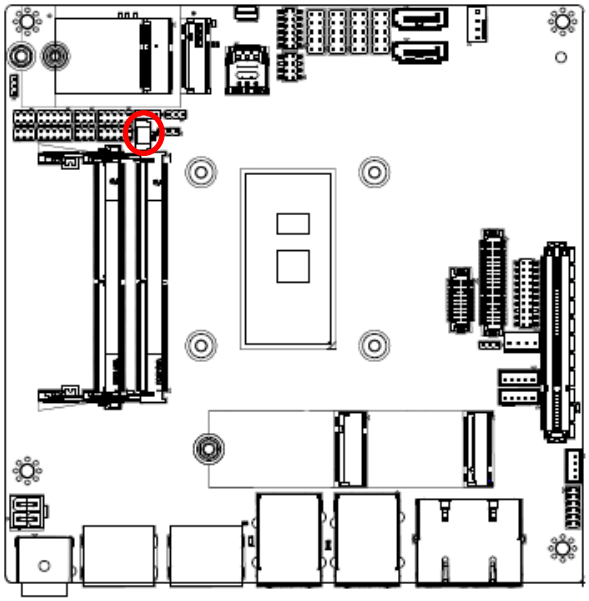
2.3.21 Speaker connector (SPK1)





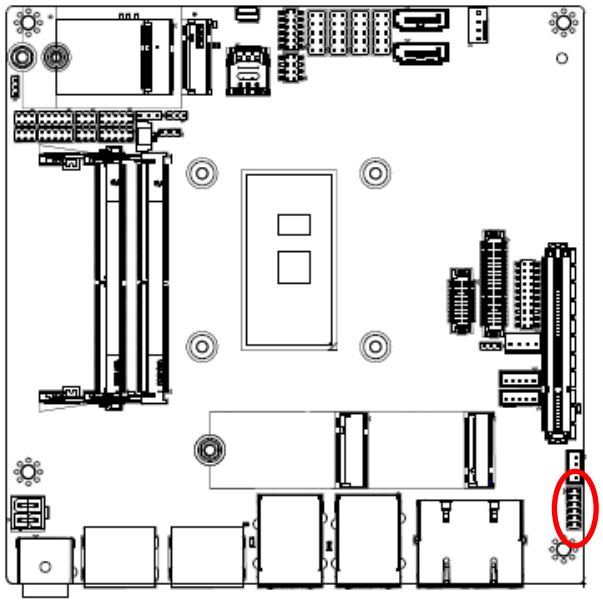
Signal	PIN
SPK_L+	1
SPK_L-	2
SPK_R+	3
SPK_R-	4

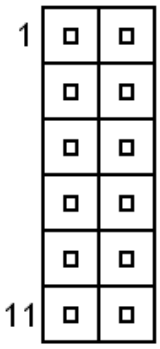
2.3.22 Battery connector (BT1)



PIN	Signal
1	+RTCBAT
2	GND

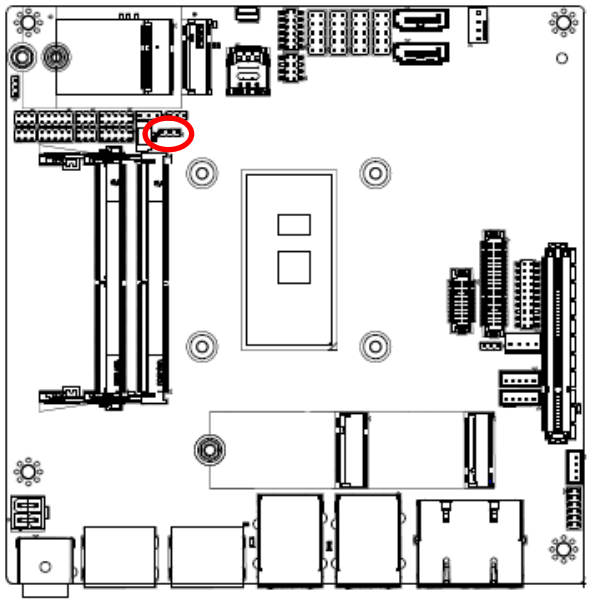
2.3.23 Audio connector (JFAUD1)

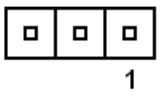




Signal	PIN	PIN	Signal
LINEOUT_R	1	2	LINEOUT_L
GND_AUD	3	4	GND_AUD
LINEIN_R	5	6	LINEIN_L
MICIN_R	7	8	MICIN_L
LINEOUT1_JD	9	10	LINE1-JD
MIC1_JD	11	12	GND_AUD

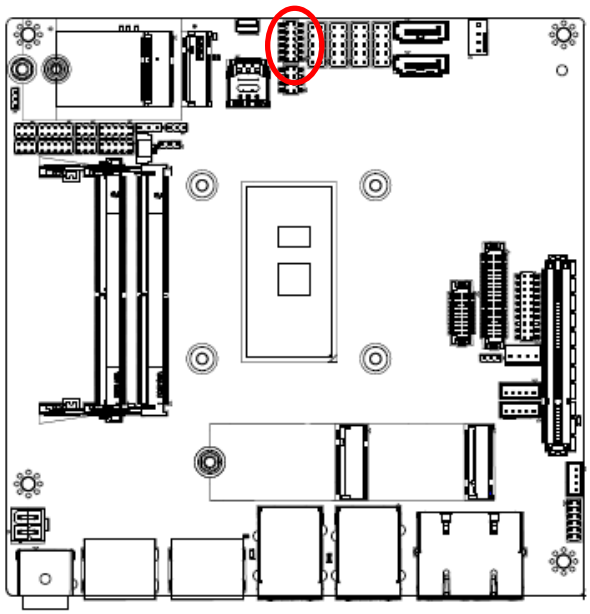
2.3.24 JEC1 connector (JEC1)

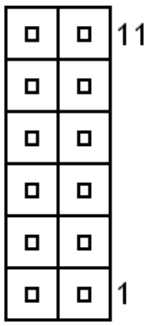




Signal	PIN
EC_SMDAT_DEBUG	1
EC_SMCLK_DEBUG	2
GND	3

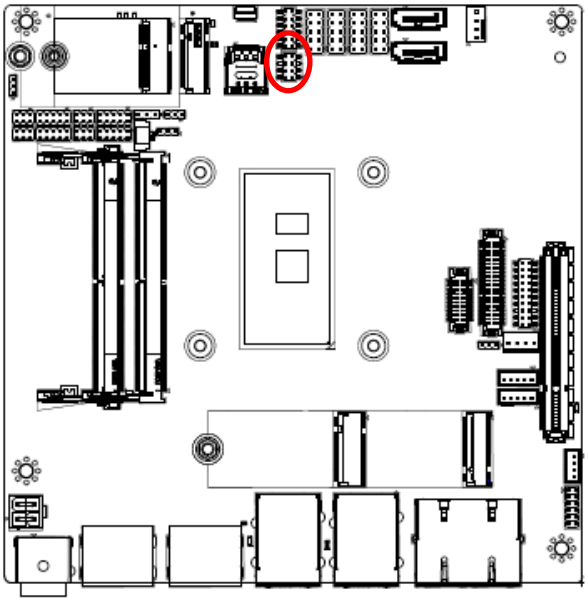
2.3.25 ESPI1 connector (JESPI1)

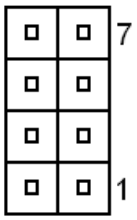




Signal	PIN	PIN	Signal
ESPI_ALER1#	12	11	ESPI_RST#
GND	10	9	ESPI_CS1#
ESPI_CLK_80P	8	7	ESPI_IO3_80P
ESPI_CS#	6	5	ESPI_IO2_80P
PLT_BUF_RST#	4	3	ESPI_IO1_80P
+3.3V	2	1	ESPI_IO0_80P

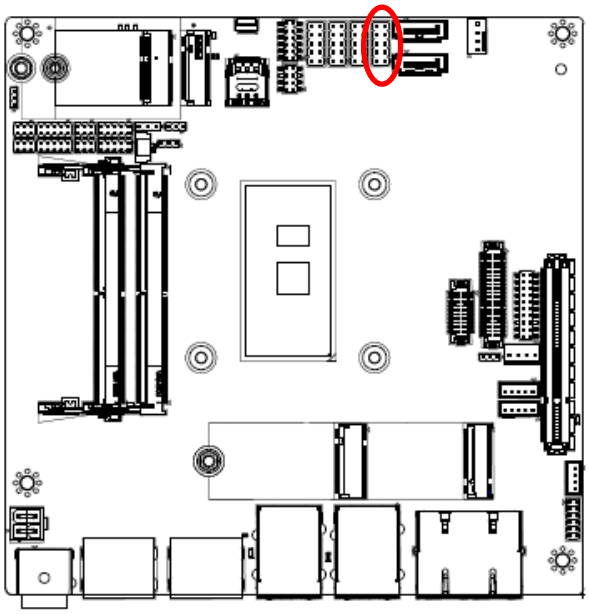
2.3.26 SPI connector (JSPI)

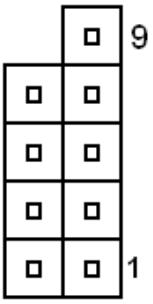




Signal	PIN	PIN	Signal
BIOS_WP#	8	7	BIOS_HOLD#
SPI0_BIOS_MOSI	6	5	SPI0_BIOS_MISO
SPI0_BIOS_CLK	4	3	SPI0_CS0#
GND	2	1	+V3.3A_1.8A_SPI

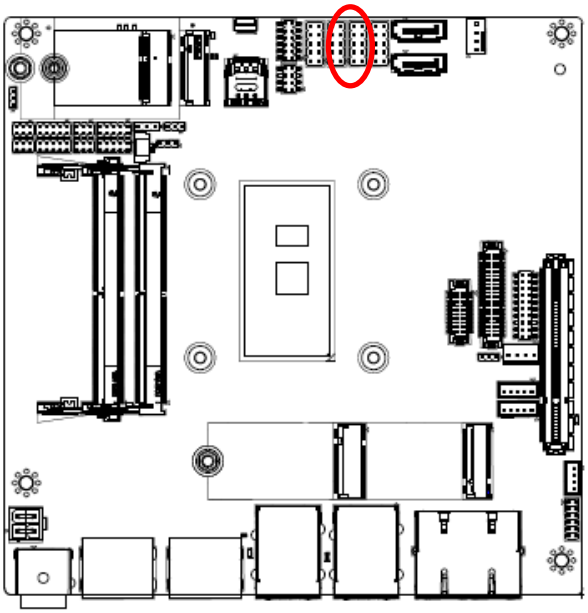
2.3.27 Miscellaneous setting connector 1 (JFPT1)

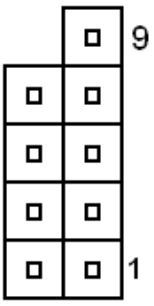




Signal	PIN	PIN	Signal
		9	NC
GND	8	7	GND
EXT_PWRBNT#	6	5	EXT_SYSRST#
PWR_LED-	4	3	HD_LED-
PWR_LED+	2	1	HD_LED+

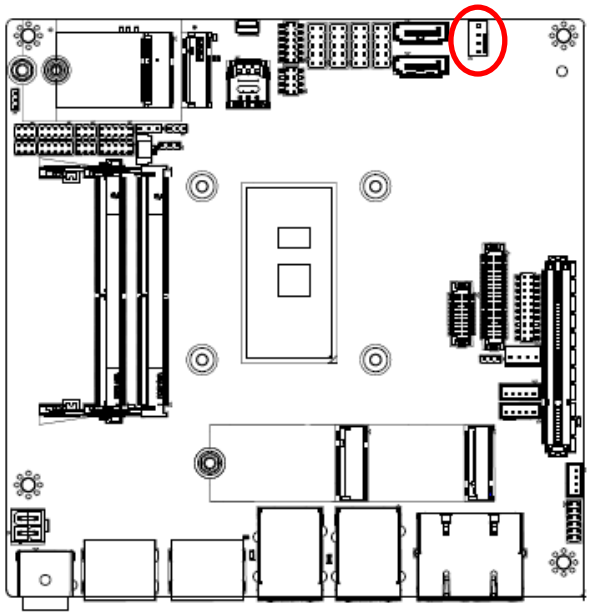
2.3.28 Miscellaneous setting connector 2 (JFPT2)

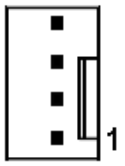




Signal	PIN	PIN	Signal
		9	NC
GND	8	7	Speaker-
BLK_DN	6	5	NC
BLK_UP	4	3	NC
BLK_VR(10K)	2	1	Speaker+

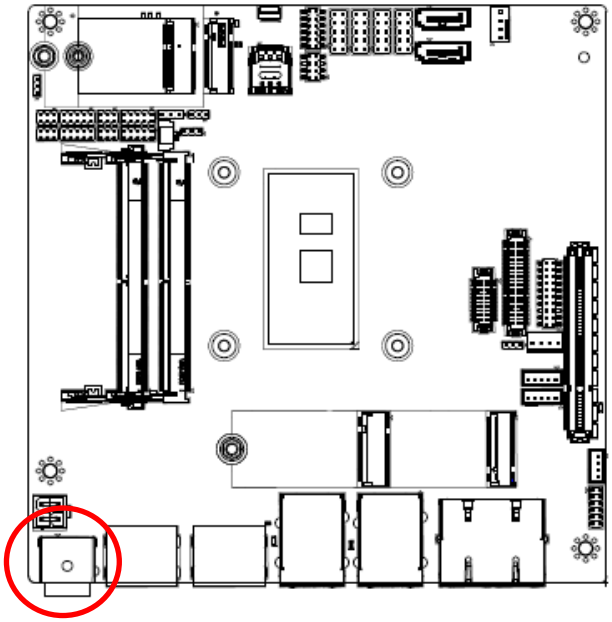
2.3.29 CPU fan connector (CPU_FAN1)





Signal	PIN
FAN_PWM0	4
CPU_FANIN	3
+12V	2
GND	1

2.3.30 Power connector (DCIN1)



Signal	PIN	PIN	Signal
+VIN_12-24V	1	2	+VIN_12-24V
GND	3	4	GND

Note: Vin = 12~24V

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.

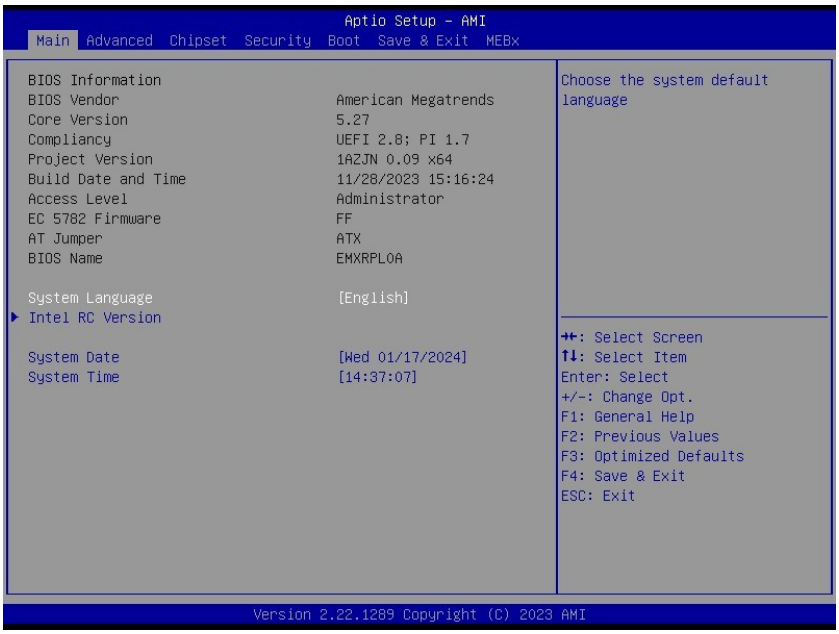
The best advice is to only alter settings which you thoroughly understand. To this end, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both BIOS Vendor and your systems manufacturer to provide the absolute maximum performance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

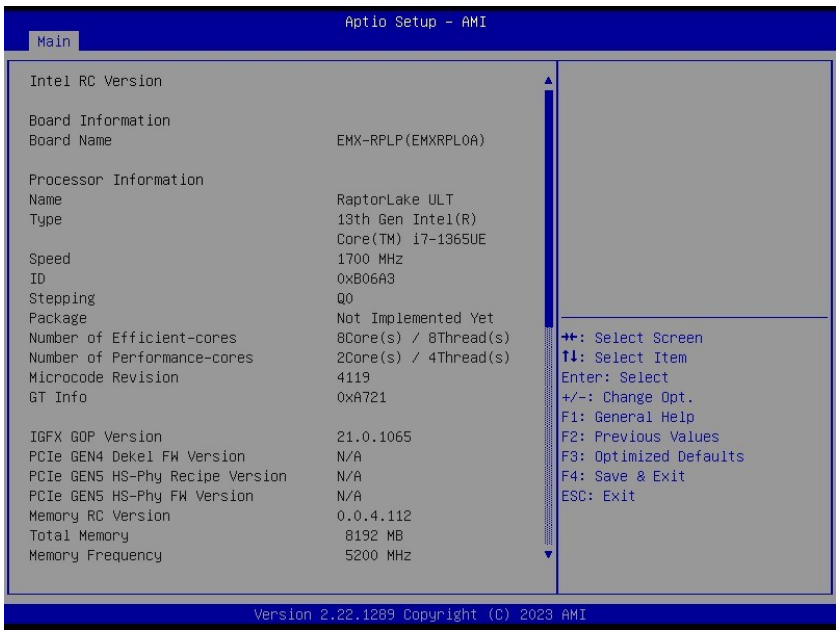
3.6 BIOS setup

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.

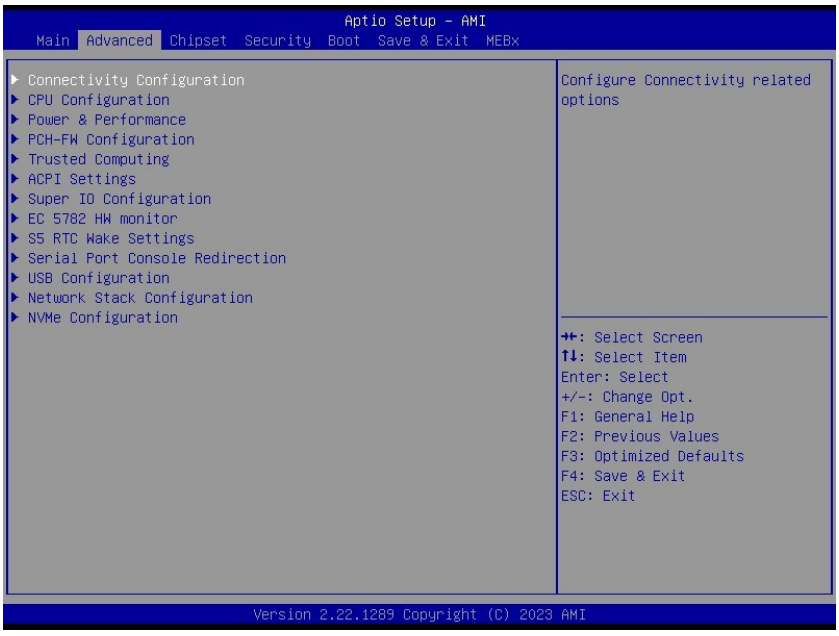
3.6.1.3 System Time

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

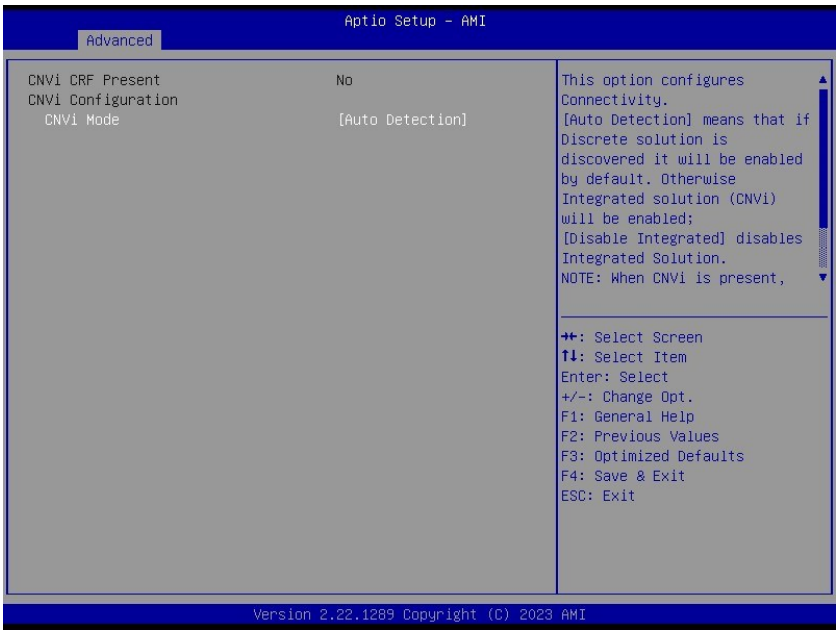
Note: The BIOS setup screens shown in this chapter are for reference purposes only, and may not exactly match what you see on your screen.
Visit the Avalue website (www.avalue.com.tw) to download the latest product and BIOS information.

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 Connectivity Configuration

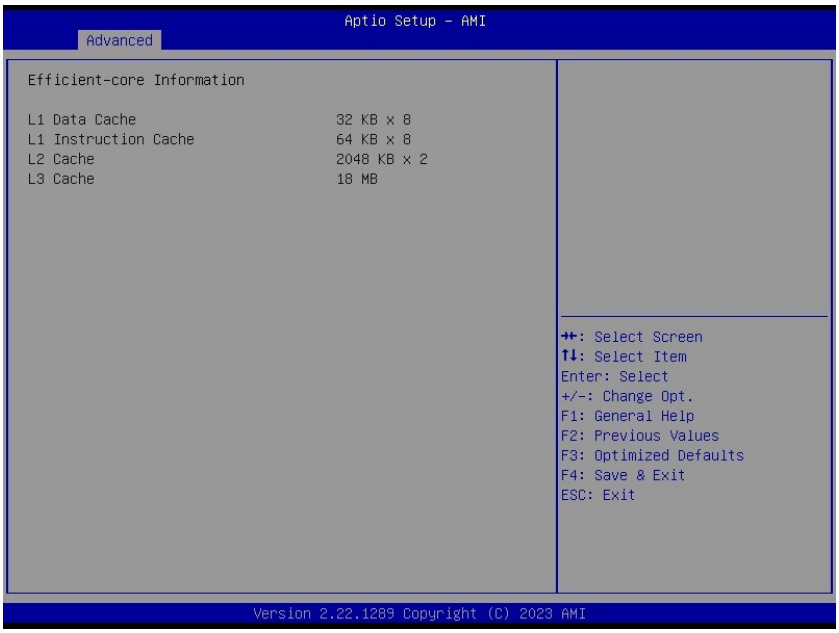


Item	Options	Description
CNVi Mode	Disable Integrated Auto Detection**[Default]**	This option configures Connectivity. [Auto Detection] means that if Discrete solution is discovered it will be enabled by default. Otherwise Integrated solution (CNVi) will be enabled; [Disable Integrated] disables Integrated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

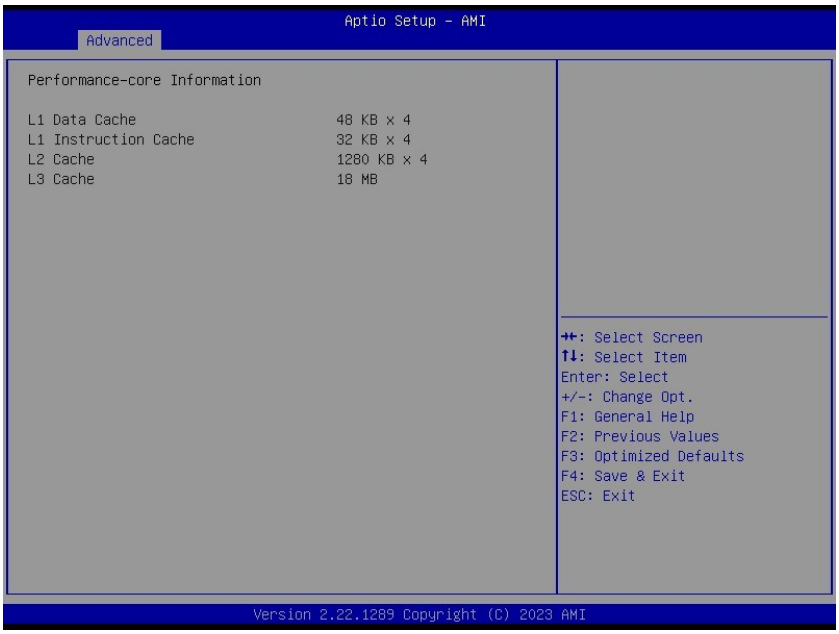
3.6.2.2 CPU Configuration

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]**, 7/6/5/4/3/2/1	Number of cores to enable in each processor package. Note: Number of Cores and E-cores are looked at together. When both are {0,0}, Pcode will enable all cores.
Active Efficient-cores	All**[Default]**, 15/14/13/12/11/10/ 9/8/7/6/5/4/3/2/1/0	Number of E-cores to enable in each processor package. Note: Number of Cores and E-cores are looked at together. When both are {0,0}, Pcode will enable all cores.

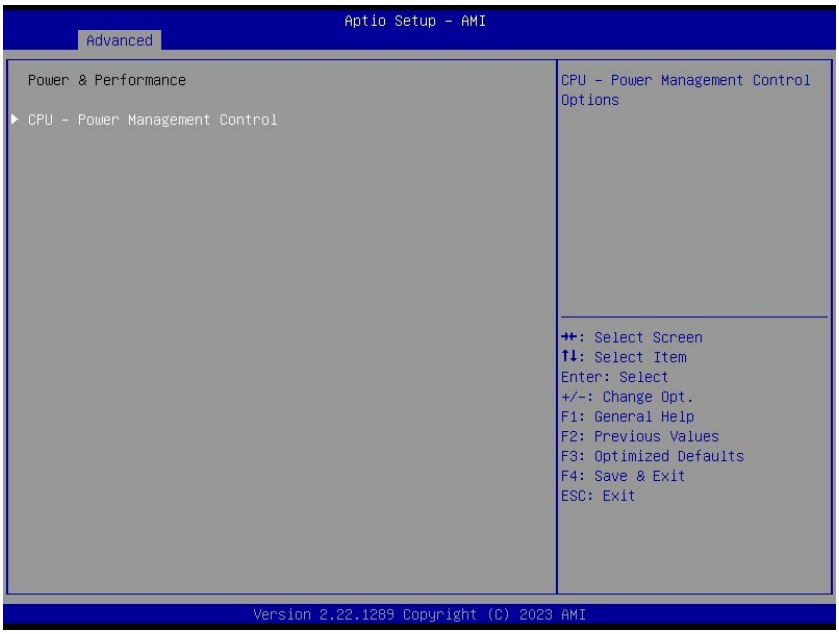
3.6.2.2.1 Efficient-core Information



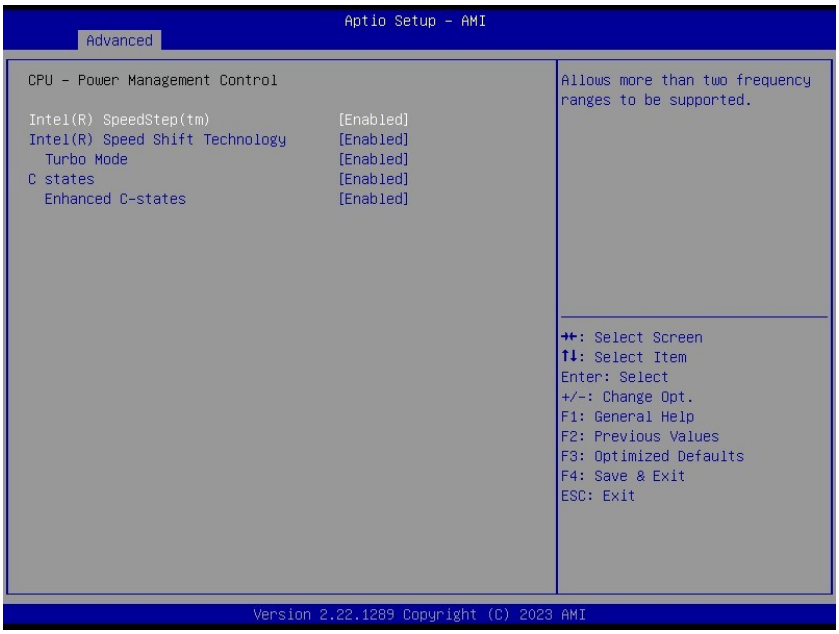
3.6.2.2.2 Performance-core Information



3.6.2.3 Power & Performance



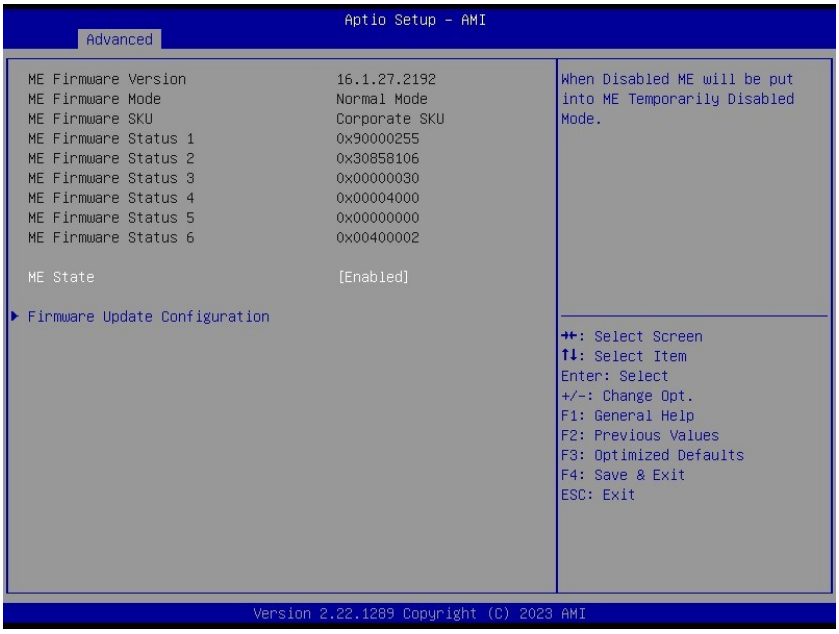
3.6.2.3.1 CPU - Power Management Control



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 EMTTM enabled too). AUTO means enabled.

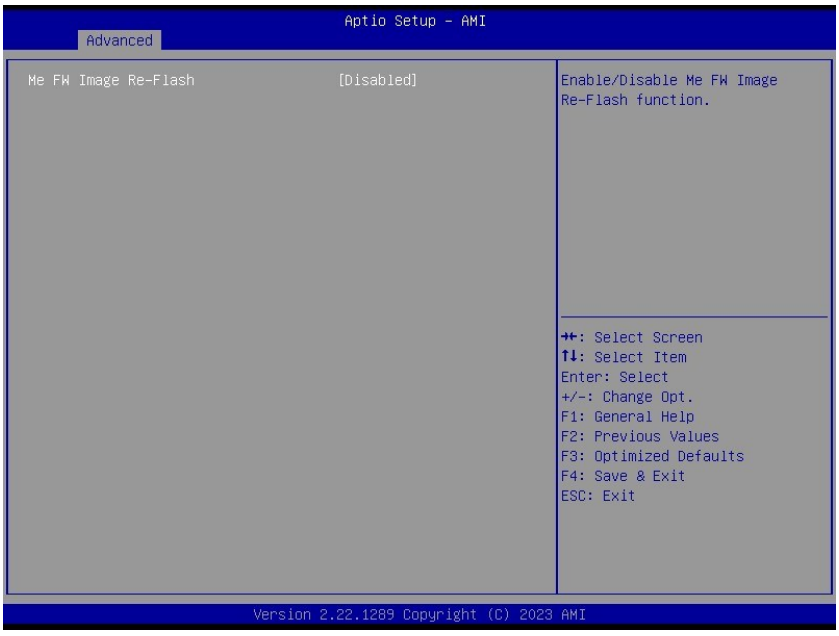
C states	Disabled Enabled**[Default]**,	Enable/Disable CPU Power Management. Allows CPU to go to C states when it's not 100% utilized.
Enhanced C-states	Disabled Enabled**[Default]**,	Enable/Disable C1E. When enabled, CPU will switch to minimum speed when all cores enter C-State.

3.6.2.4 PCH-FW Configuration



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

3.6.2.4.1 Firmware Update Configuration

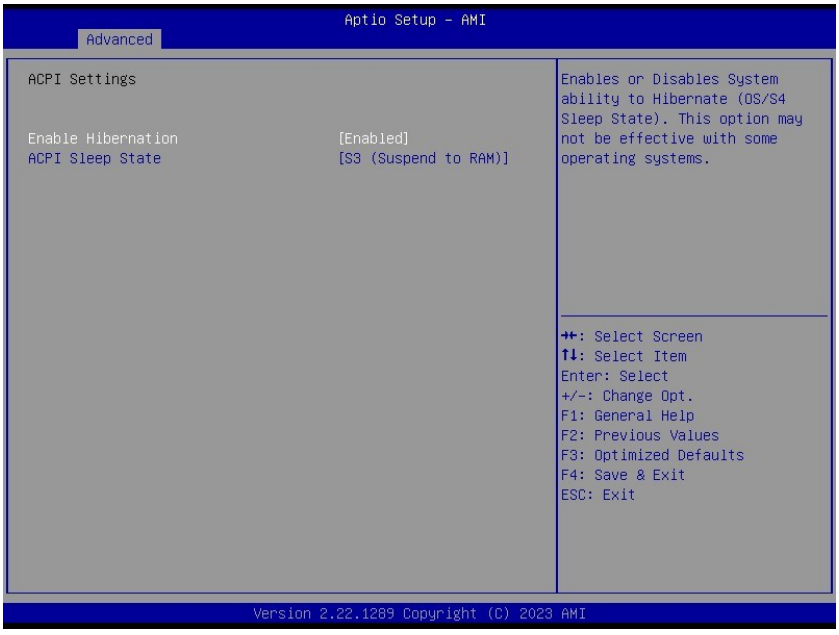


Item	Options	Description
Me FW Image Re-Flash	Disabled**[Default]**, Enabled	Enable/Disable Me FW Image Re-Flash function.

3.6.2.5 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.

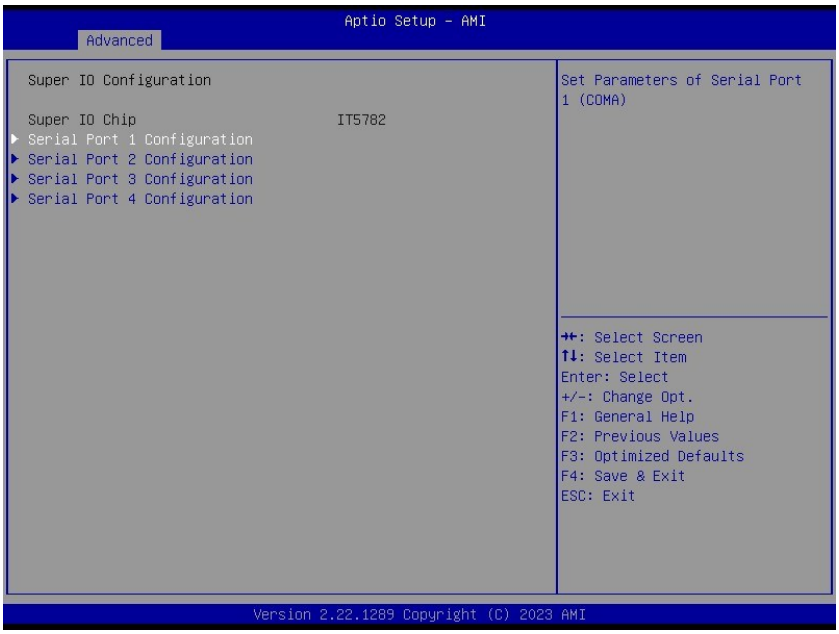
3.6.2.6 ACPI Settings



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

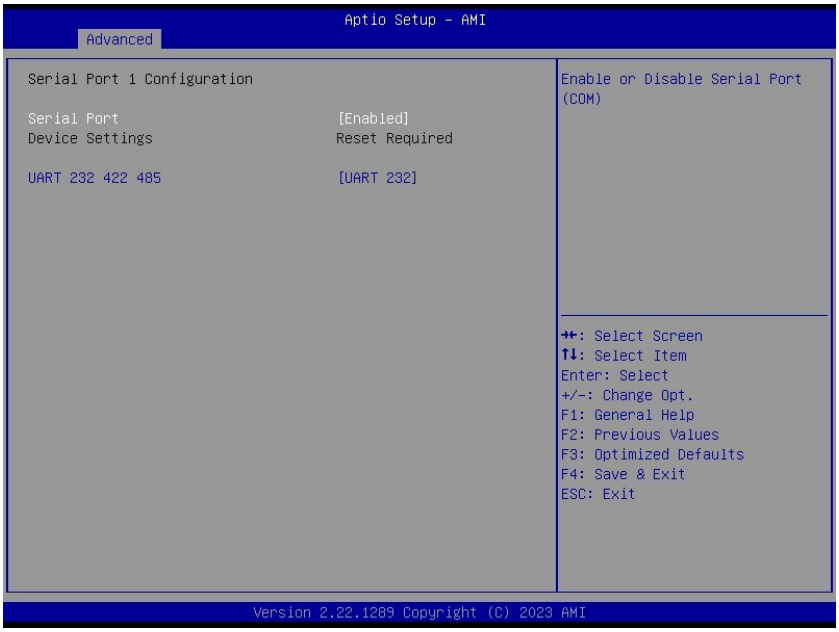
3.6.2.7 Super IO Configuration

You can use this item to set up or change the IT5782 Super IO configuration for serial ports. Please refer to 3.6.2.7.1~ 3.6.2.7.4 for more information.



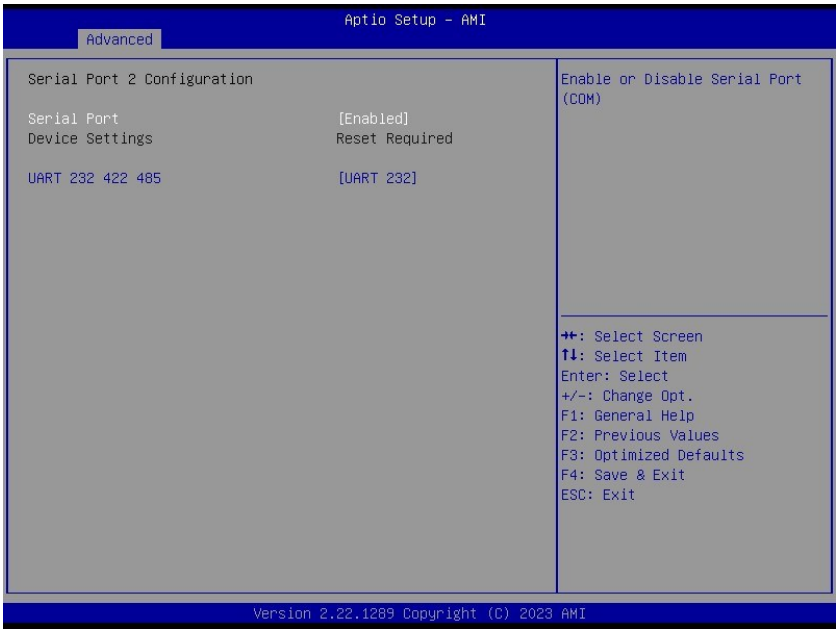
Item	Description
Serial Port 1 Configuration	Set Parameters of Serial Port 1 (COMA).
Serial Port 2 Configuration	Set Parameters of Serial Port 2 (COMB).
Serial Port 3 Configuration	Set Parameters of Serial Port 3 (COMC).
Serial Port 4 Configuration	Set Parameters of Serial Port 4 (COMD).

3.6.2.7.1 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.

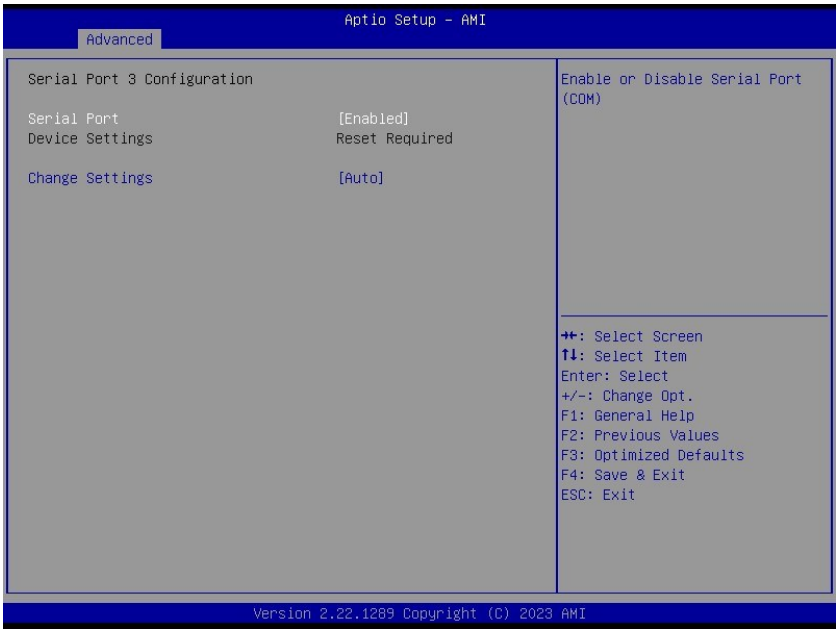
3.6.2.7.2 Serial Port 2 Configuration



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

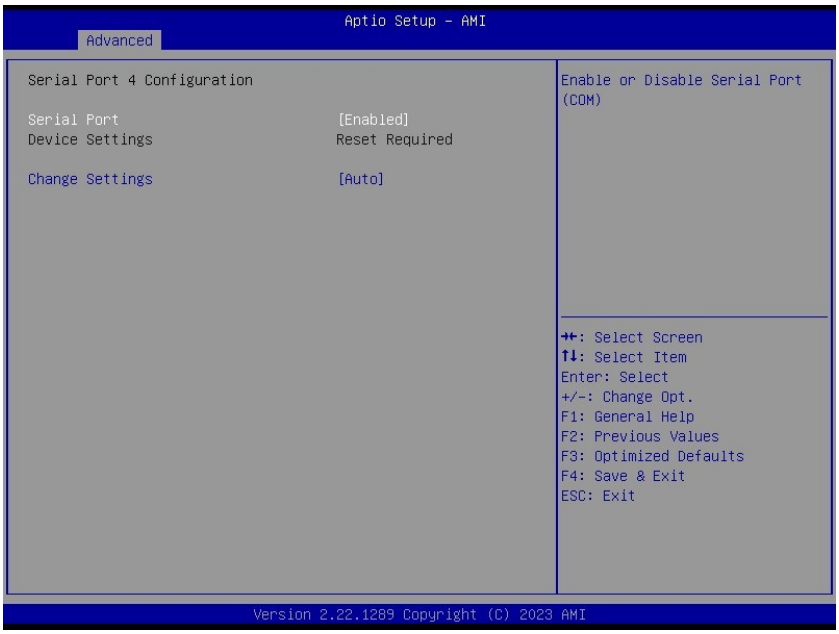
UART 232 422 485	UART 232**[Default]**, UART 422, UART 485	Change the Serial Port as RS232/422/485.

3.6.2.7.3 Serial Port 3 Configuration



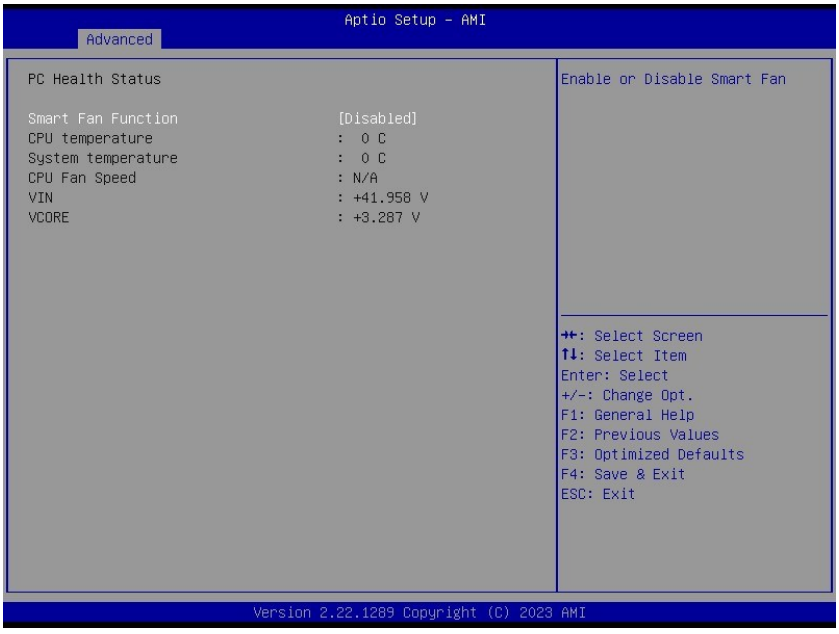
Item	Option	Description
Serial Port	Disabled Enabled**[Default]**,	Enable or Disable Serial Port (COM).
Change Settings	Auto**[Default]**, IO=3E8h;IRQ=7; IO=3E8h;IRQ=3,4,5,6,7,9,10,11 IO=2E8h;IRQ=3,4,5,6,7,9,10,11 IO=2F0h;IRQ=3,4,5,6,7,9,10,11 IO=2E0h;IRQ=3,4,5,6,7,9,10,11	Select an optimal settings for Super IO Device

3.6.2.7.4 Serial Port 4 Configuration



Item	Option	Description
Serial Port	Disabled Enabled**[Default]**,	Enable or Disable Serial Port (COM).
Change Settings	Auto**[Default]**, IO=3E8h;IRQ=7; IO=3E8h;IRQ=3,4,5,6,7,9,10,11 IO=2E8h;IRQ=3,4,5,6,7,9,10,11 IO=2F0h;IRQ=3,4,5,6,7,9,10,11 IO=2E0h;IRQ=3,4,5,6,7,9,10,11	Select an optimal settings for Super IO Device

3.6.2.8 EC 5782 HW monitor

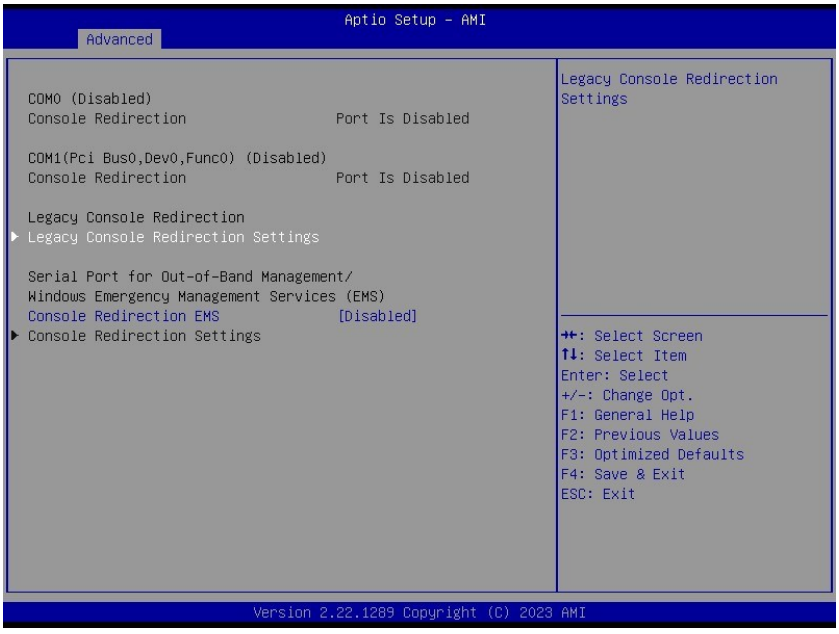


Item	Options	Description
Smart Fan Function	Disabled**[Default]**, Enabled	Enable or disable Smart Fan Function

3.6.2.9 S5 RTC Wake Settings

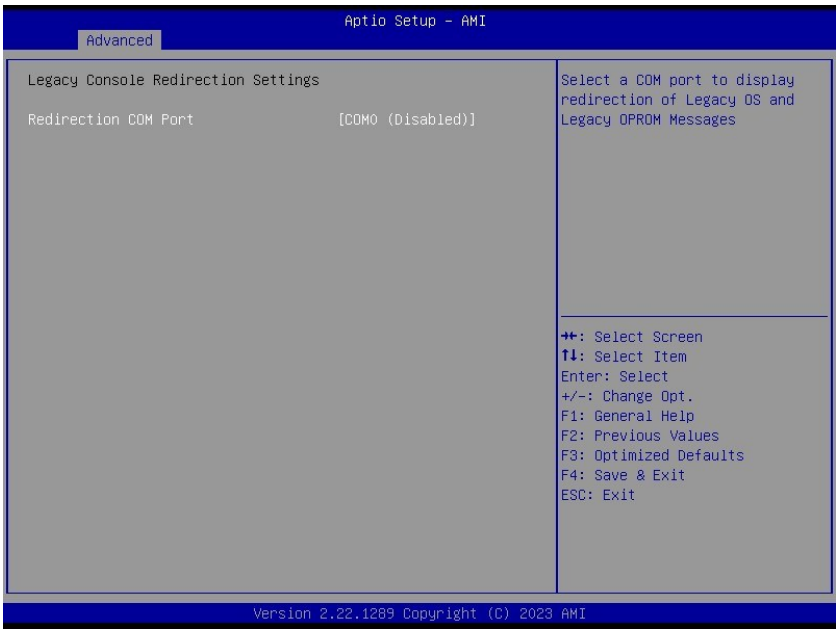
Item	Options	Description
Wake system from S5	Disabled**[Default]**, Fixed Time Dynamic Time	Enable or disable System wake on alarm event. Select FixedTime, system will wake on the hr::min::sec specified. Select DynamicTime, System will wake on the current time + Increase minutes(s).

3.6.2.10 Serial Port Console Redirection



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

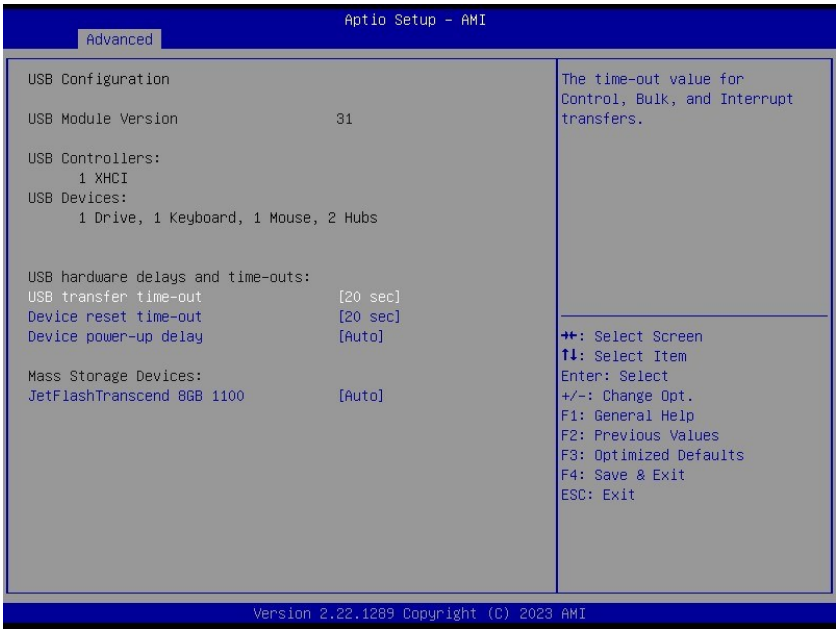
3.6.2.10.1 Legacy Console Redirection Settings



Item	Options	Description
Redirection COM Port	COM0	Select a COM port to display redirection of Legacy OS and Legacy OPROM Messages

3.6.2.11 USB Configuration

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

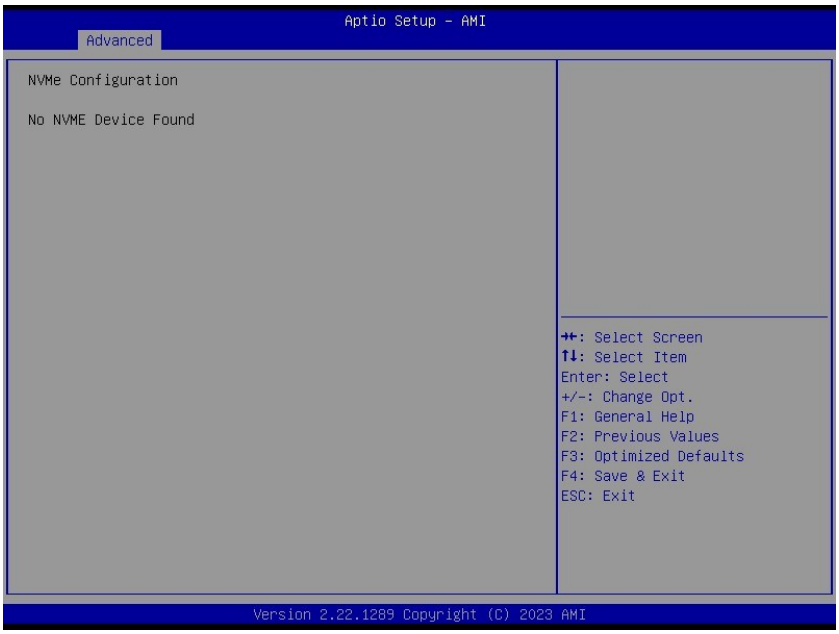


tem	Options	Description
USB transfer time-out	1 sec 5 sec 10 sec 20 sec**[Default]**	The time-out value for Control, Bulk, and Interrupt transfers.
Device reset time-out	10 sec 20 sec**[Default]** 30 sec 40 sec	USB mass storage device Start Unit command time-out.
Device power-up delay	Auto**[Default]** 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.
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.

3.6.2.12 Network Stack Configuration

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

3.6.2.13 NVMe Configuration

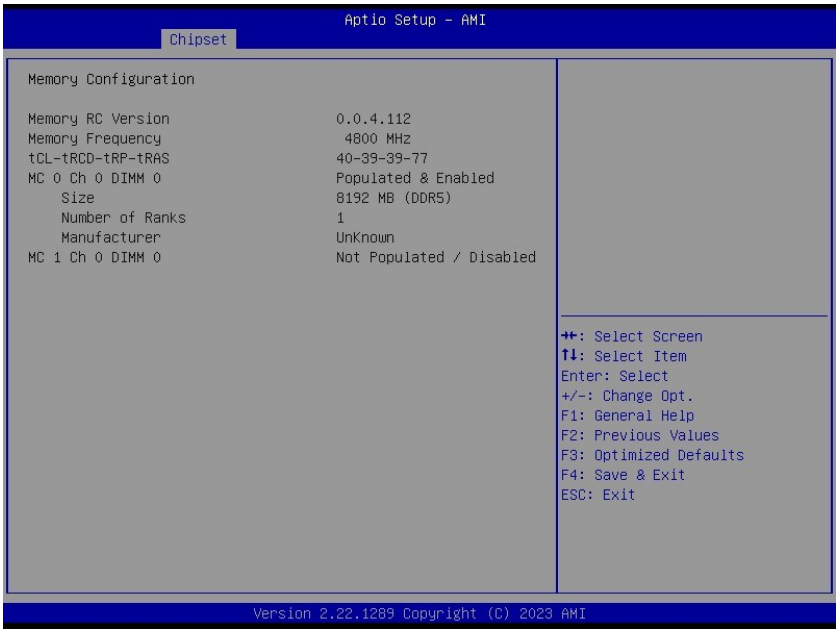


3.6.3 Chipset

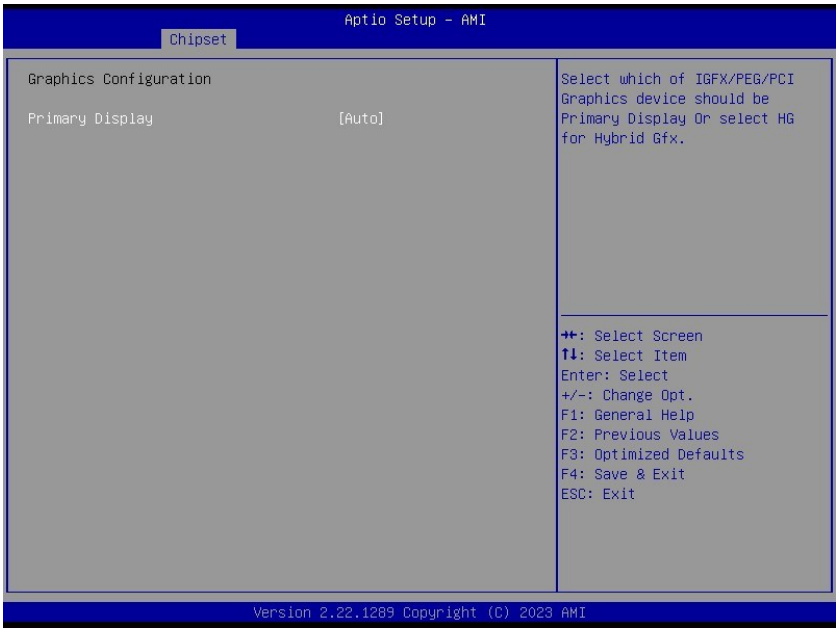
3.6.3.1 System Agent (SA) Configuration

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

3.6.3.1.1 Memory Configuration



3.6.3.1.2 Graphics Configuration

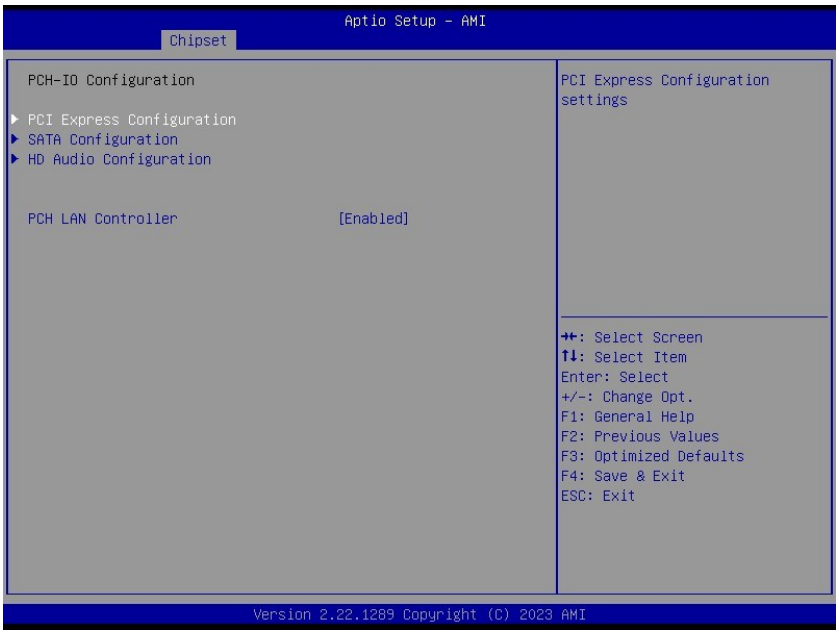


Item	Option	Description
Primary Display	Auto**[Default]** IGFX PEG Slot PCH PCI HG	Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select HG for Hybrid Gfx.

3.6.3.1.3 VMD Configuration

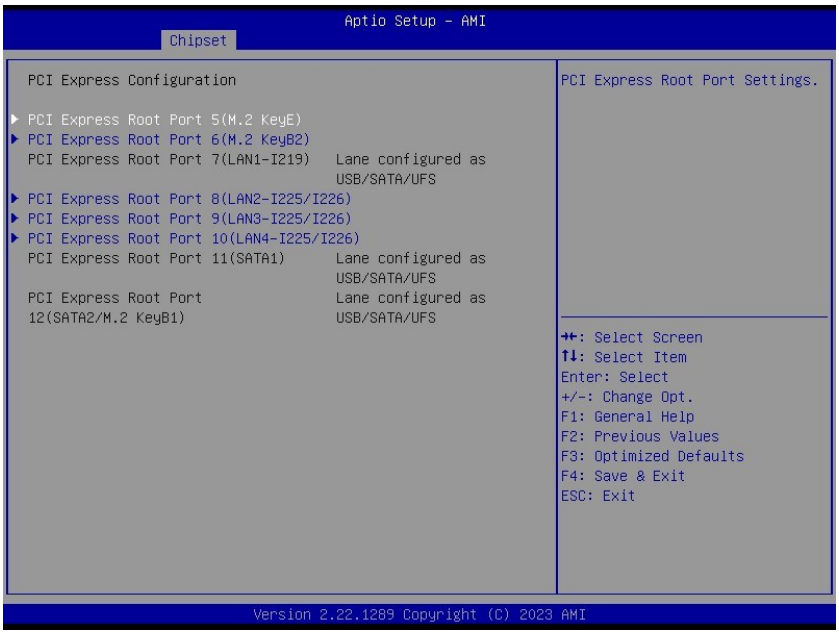
Item	Option	Description
Enable VMD controller	Disabled**[Default]** Enabled	Enable/Disable to VMD controller

3.6.3.2 PCH-IO Configuration

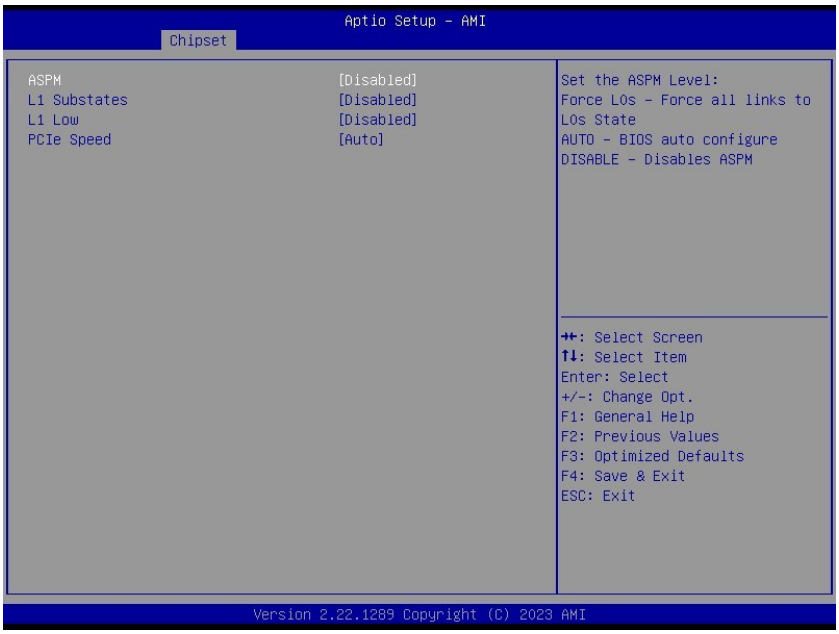


Item	Option	Description
PCH LAN Controller	Enabled**[Default]** Disabled	Enable/Disable onboard NIC.

3.6.3.2.1 PCI Express Configuration

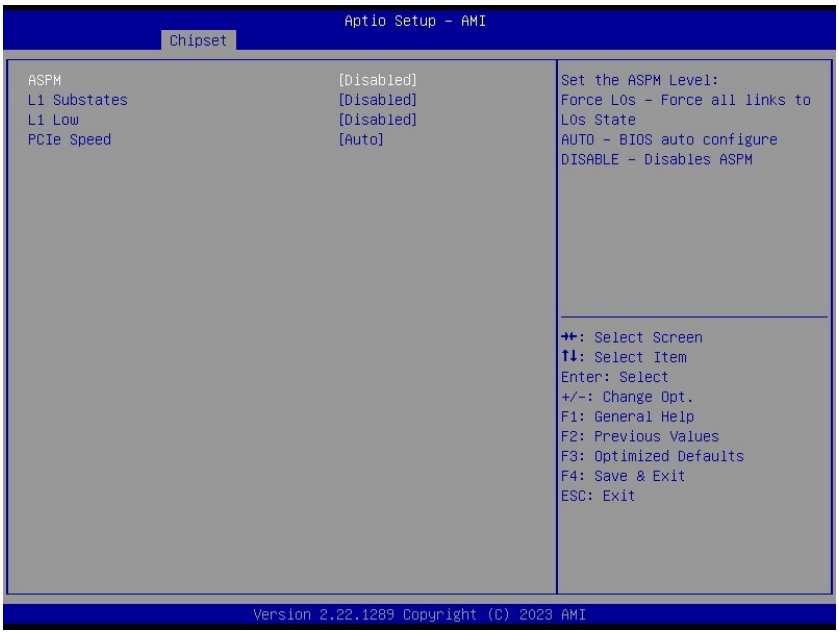


3.6.3.2.1.1 PCI Express Root Port 5(M.2 KeyE)



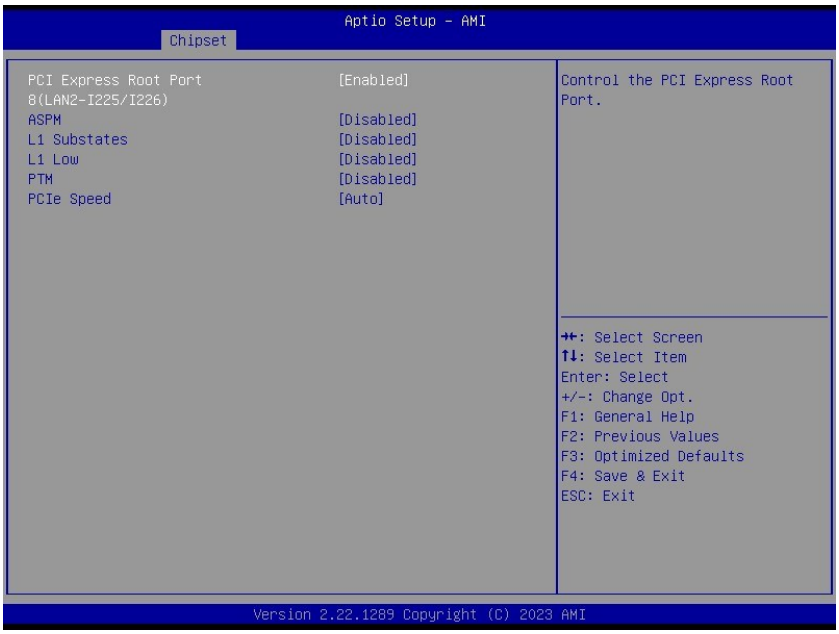
Item	Option	Description
ASPM	Disabled**[Default]** L1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM
L1 Substates	Disabled**[Default]**, L1.1 L1.1 & L1.2	PCI Express L1 Substates settings.
L1 Low	Disabled**[Default]** Enabled	PCI Express L1 Low Substate Enable/Disable.
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3	Configure PCIe speed.

3.6.3.2.1.2 PCI Express Root Port 6(M.2 KeyB2)



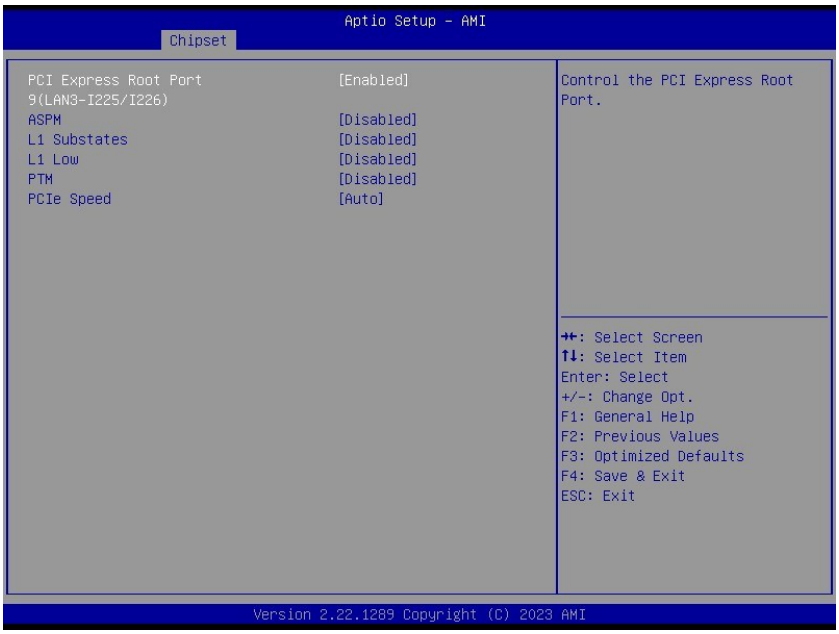
Item	Option	Description
ASPM	Disabled**[Default]** L1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM
L1 Substates	Disabled**[Default]**, L1.1 L1.1 & L1.2	PCI Express L1 Substates settings.
L1 Low	Disabled**[Default]** Enabled	PCI Express L1 Low Substate Enable/Disable.
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3	Configure PCIe speed.

3.6.3.2.1.3 PCI Express Root Port 8(LAN2-I225/I226)



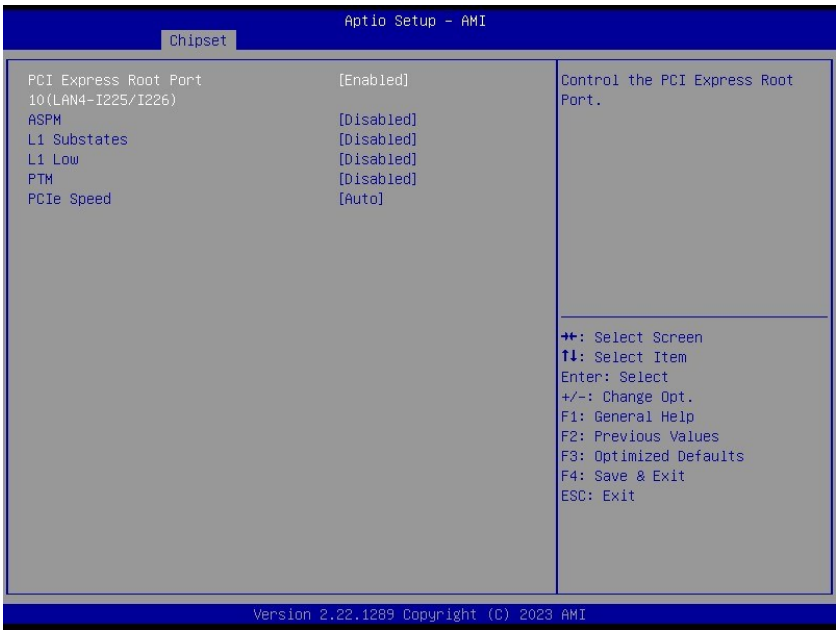
Item	Option	Description
PCI Express Root Port 8 (LAN2-I225/I226)	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM	Disabled**[Default]** L1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled**[Default]**, L1.1 L1.1 & L1.2	PCI Express L1 Substates settings.
L1 Low	Disabled**[Default]** Enabled	PCI Express L1 Low Substate Enable/Disable.
PTM	Disabled**[Default]** Enabled	Enable/Disable Precision Time Measurement
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3	Configure PCIe speed.

3.6.3.2.1.4 PCI Express Root Port 9(LAN3-I225/I226)



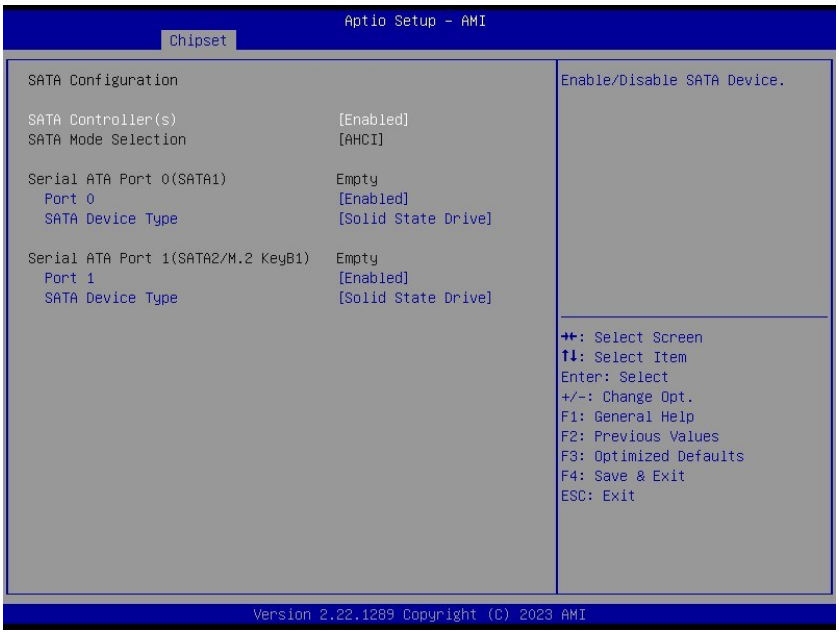
Item	Option	Description
PCI Express Root Port 9 (LAN3-I225/I226)	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM	Disabled**[Default]** L1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled**[Default]**, L1.1 L1.1 & L1.2	PCI Express L1 Substates settings.
L1 Low	Disabled**[Default]** Enabled	PCI Express L1 Low Substate Enable/Disable.
PTM	Disabled**[Default]** Enabled	Enable/Disable Precision Time Measurement
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3	Configure PCIe speed.

3.6.3.2.1.5 PCI Express Root Port 10(LAN4-I225/I226)



Item	Option	Description
PCI Express Root Port 10 (LAN4-I225/I226)	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM	Disabled**[Default]** L1 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.
L1 Low	Disabled**[Default]** Enabled	PCI Express L1 Low Substate Enable/Disable.
PTM	Disabled**[Default]** Enabled	Enable/Disable Precision Time Measurement
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3	Configure PCIe speed.

3.6.3.2.2 SATA Configuration

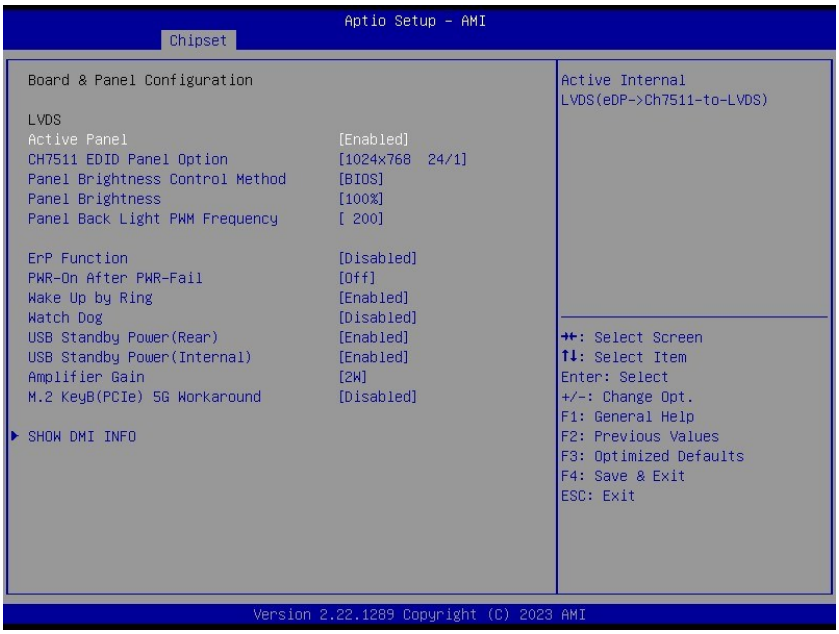


Item	Option	Description
SATA Controller(s)	Disabled Enabled**[Default]**,	Enable/Disable SATA Device.
Port 0	Disabled Enabled**[Default]**,	Enable or Disable SATA Port
SATA Device Type	Hard Disk Drive Solid State Drive**[Default]**,	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive
Port 1	Disabled Enabled**[Default]**,	Enable or Disable SATA Port
SATA Device Type	Hard Disk Drive Solid State Drive**[Default]**,	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive

3.6.3.2.3 HD Audio Configuration

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

3.6.3.3 Board & Panel Configuration

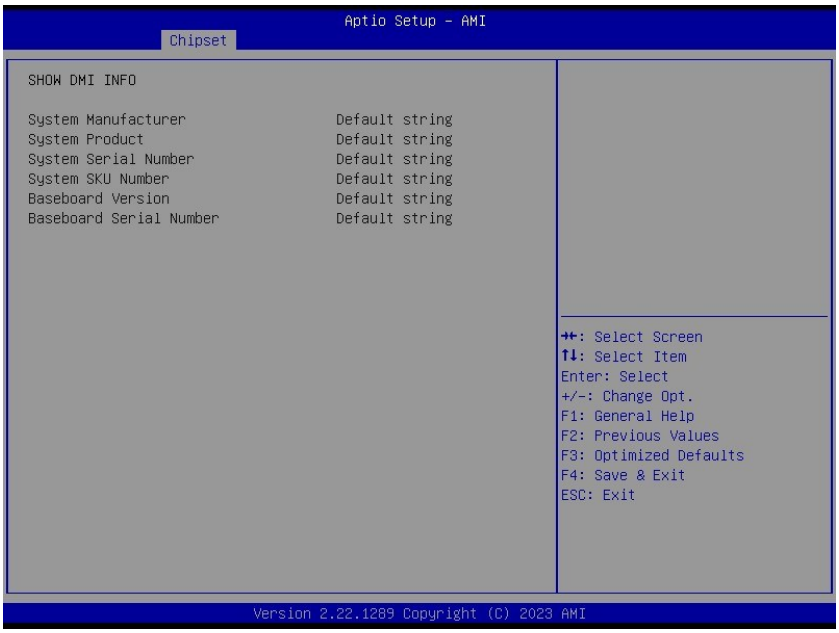


Item	Option	Description
Active Panel	Disabled Enabled**[Default]**	Active Internal LVDS(eDP->Ch7511-to-LVDS)

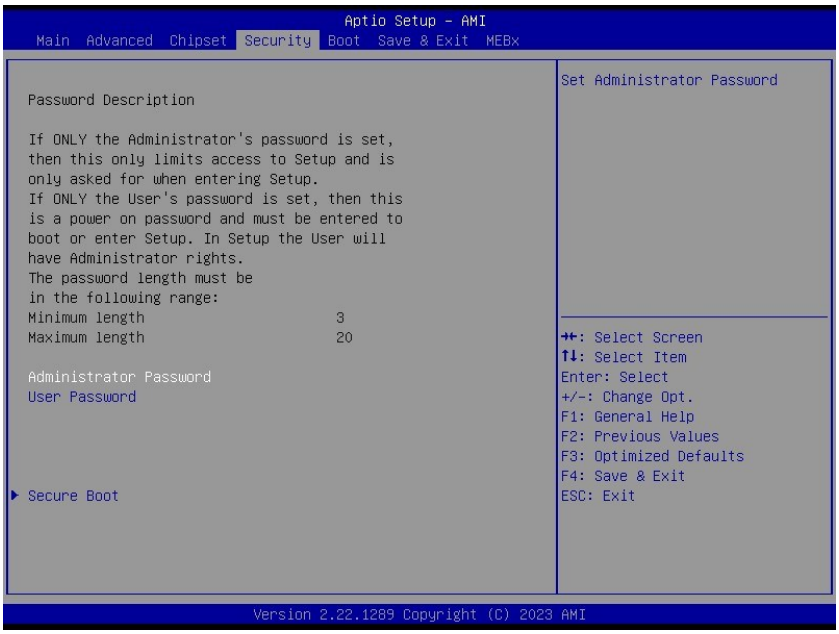
CH7511 EDID Panel Option	1024 x 768 24/1**[Default]** 800 x 600 18/1 1024 x 768 18/1 1366 x 768 18/1 1024 x 600 18/1 1280 x 800 18/1 1920 x 1200 24/2 1920 x 1080 18/2 1280 x 1024 24/2 1440 x 900 18/2 1600 x1200 24/2 1366 x768 24/1 1920 x1080 24/2 1680 x1050 24/2	Port1-EDP to LVDS(Chrotel 7511)Panel EDID Option
Panel Brightness Control Method	BIOS**[Default]** BR Button VR OS Driver	Panel Brightness Control Method. 1.BIOS 2. Brightness Button 3. VR 4.OS Driver
Panel Brightness	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	Select WatchDog.

	30 min	
USB Standby Power(Rear)	Disabled Enabled**[Default]**,	Enabled/Disabled USB1/2 Standby Power during S3/S4/S5
USB Standby Power(Internal)	Disabled Enabled**[Default]**,	Enabled/Disabled JUSB3/4 Standby Power during S3/S4/S5
Amplifier Gain	2W**[Default]**, 6W	Amplifier Gain
M.2 KeyB(PCIe) 5G Workaround	Disabled**[Default]**, Enabled	Enabled/Disabled M.2 KeyB PCIe 5G Card Workaround

3.6.3.3.1 SHOW DMI INFO



3.6.4 Security



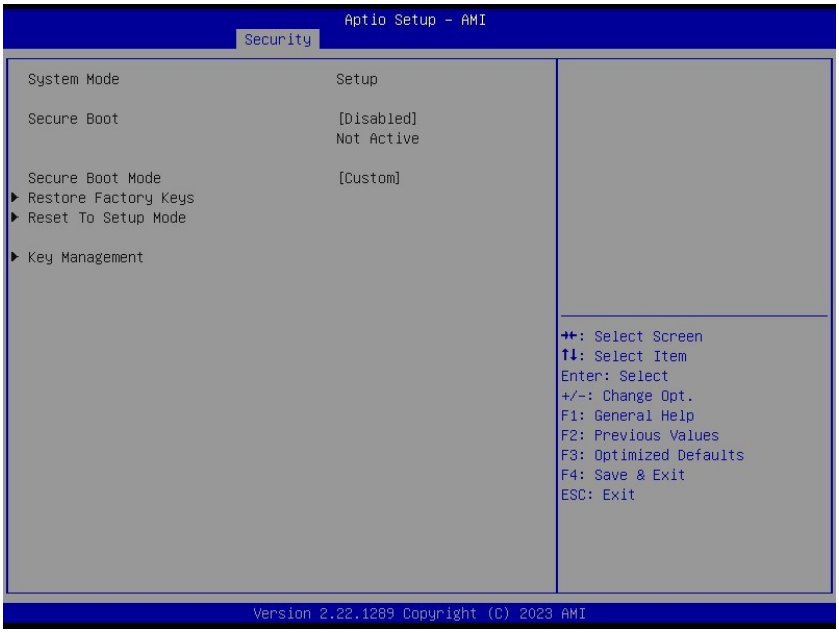
- **Administrator Password**

Set setup Administrator Password

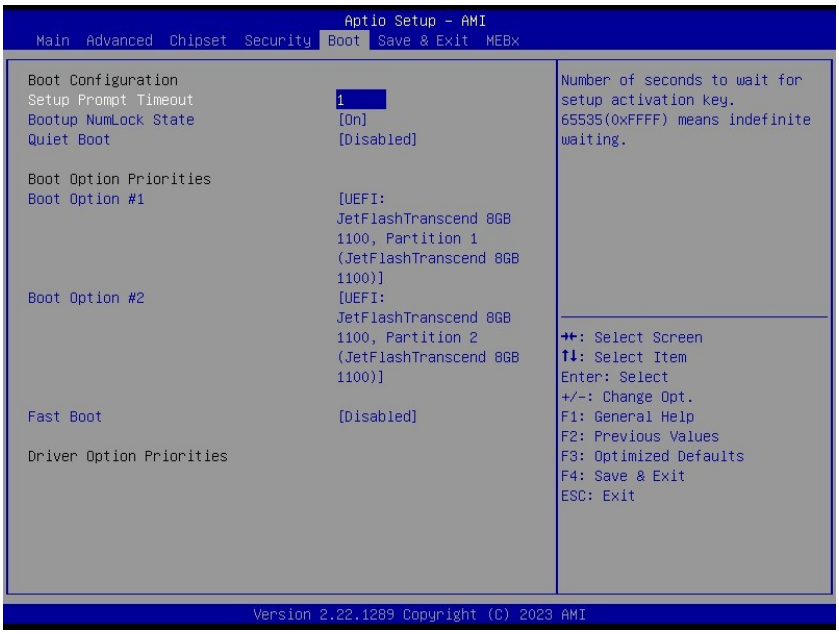
- **User Password**

Set User Password

3.6.4.1 Secure Boot menu

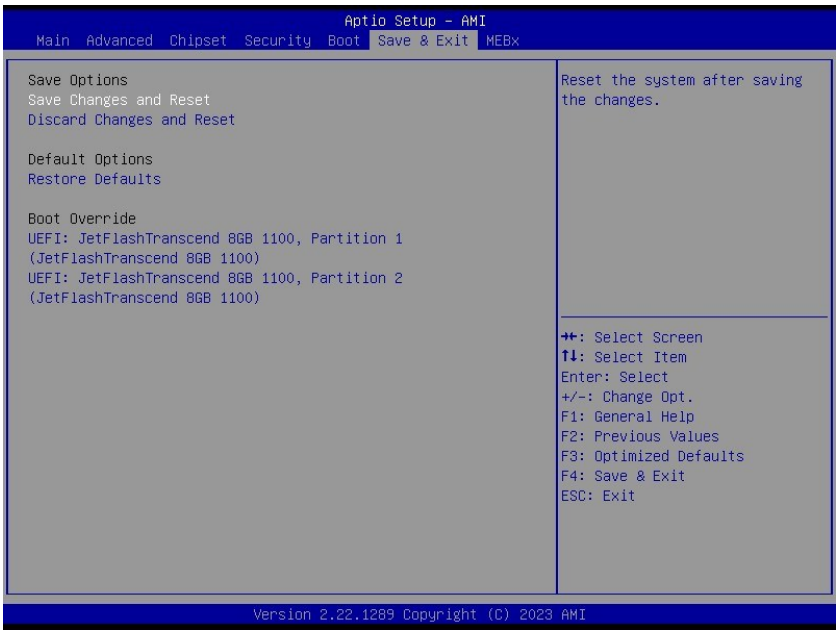


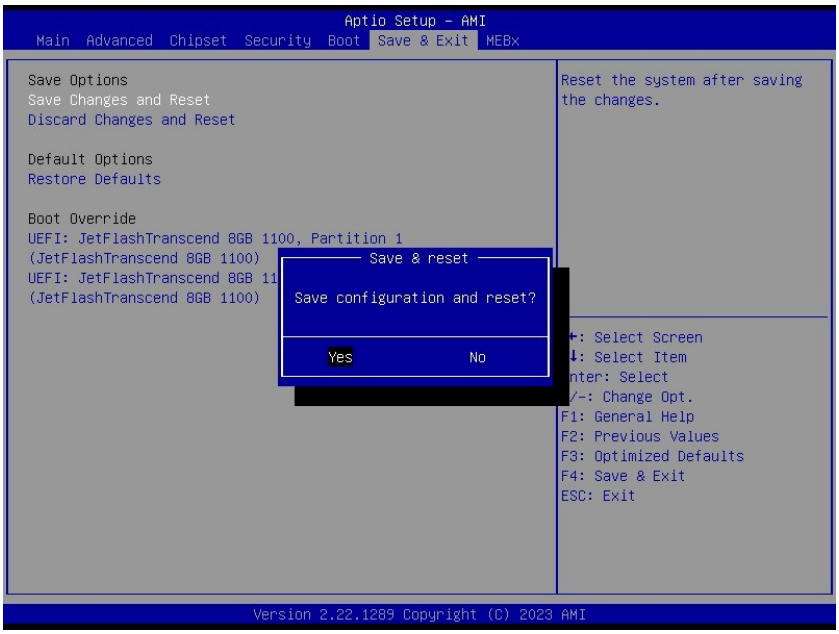
3.6.5 Boot



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

3.6.7 MEBx

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.

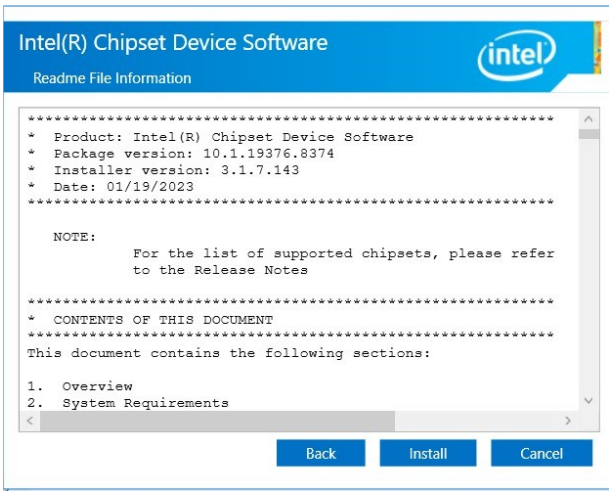
4.1 Install Chipset Driver

All drivers can be found on the Avalue Official Website:

www.avalue.com

Note: The installation procedures and screen shots in this section are based on Windows 11 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. Complete setup

4.2 Install VGA Driver

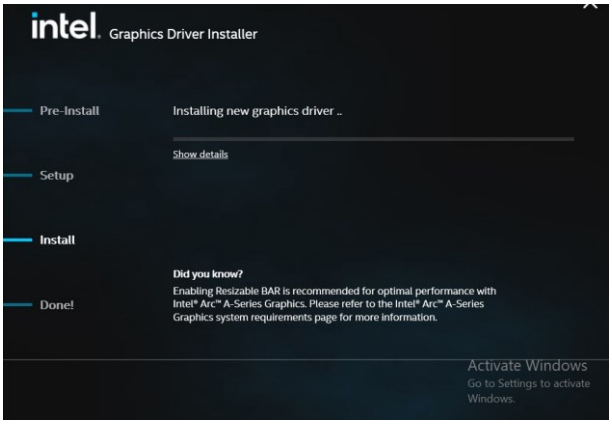
All drivers can be found on the Avalue Official Website:

www.avalue.com

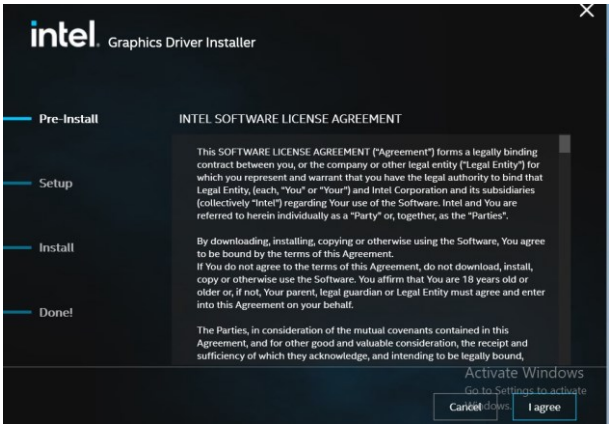
Note: The installation procedures and screen shots in this section are based on Windows 11 operation system. If the warning message appears while the installation process, click Continue to go on.

Step 3. Click **Start.**

Step 1. Click **Begin installation**.

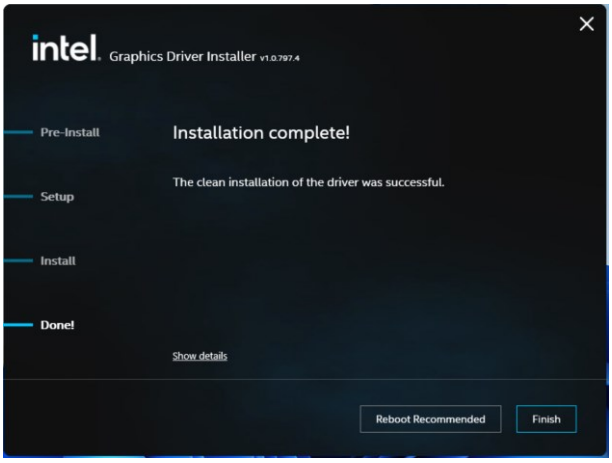


Step 4.



Step 2.

Click **Next** to accept license agreement.



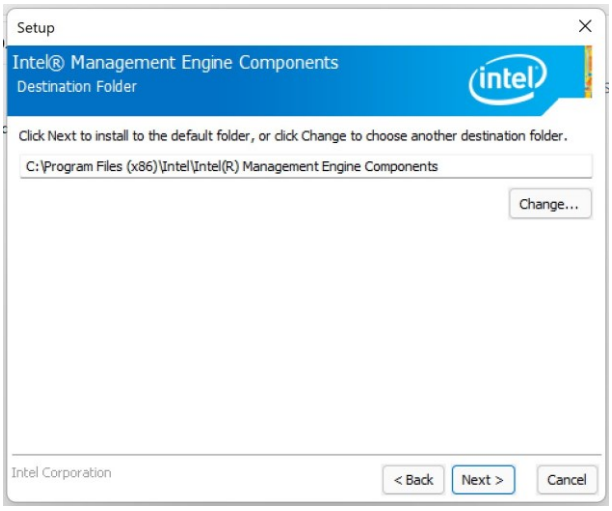
Step 5. Click **Finish.**

4.3 Install ME Driver

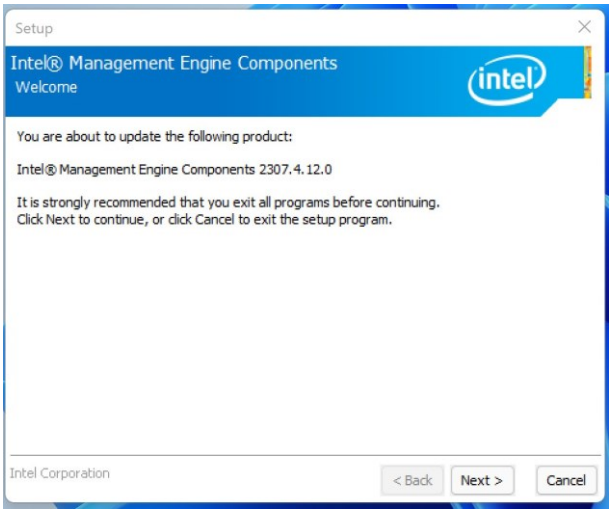
All drivers can be found on the Avalue Official Website:

www.avalue.com

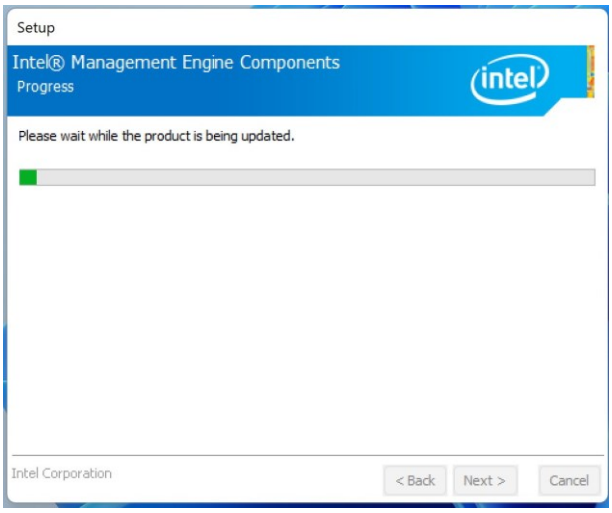
Note: The installation procedures and screen shots in this section are based on Windows 11 operation system. If the warning message appears while the installation process, click Continue to go on.



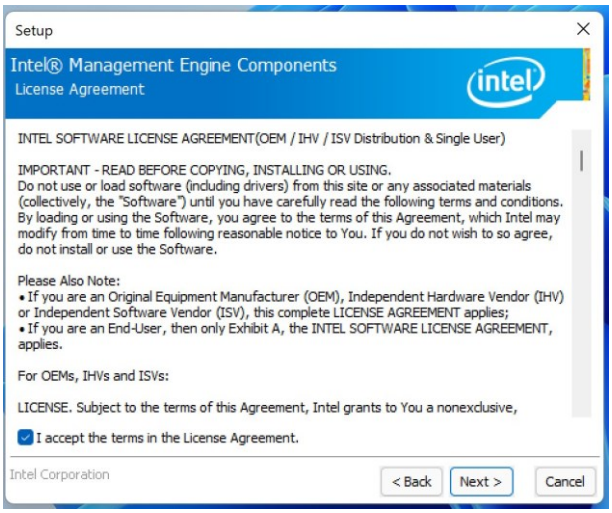
Step 3. Click **Next**.



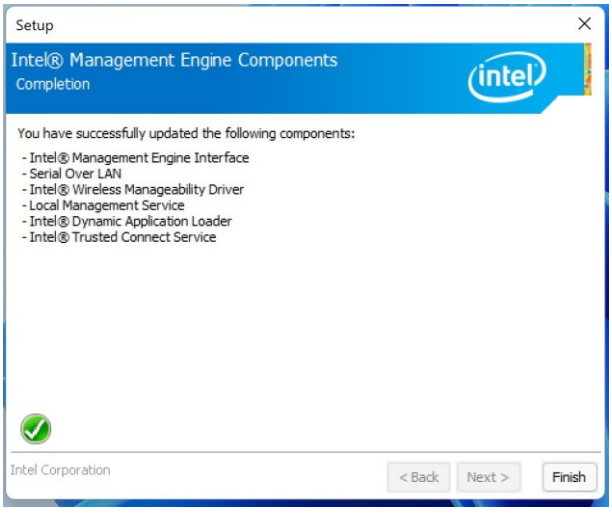
Step 1. Click **Next** to continue setup.



Step 4.



Step 2. Click **Next**.



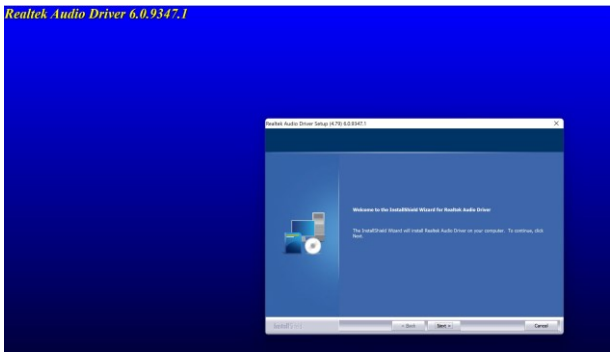
Step 5. Click **Finish** to complete setup.

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

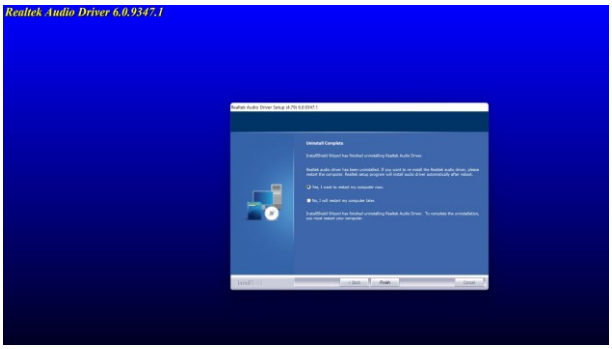
All drivers can be found on the Avalue Official Website:

www.avalue.com

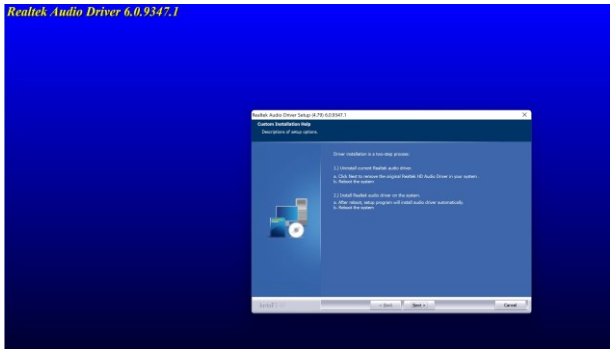
Note: The installation procedures and screen shots in this section are based on Windows 11 operation system. If the warning message appears while the installation process, click Continue to go on.



Step1. Click **Next** to Install.



Step 3. Click **Finish** to complete setup.



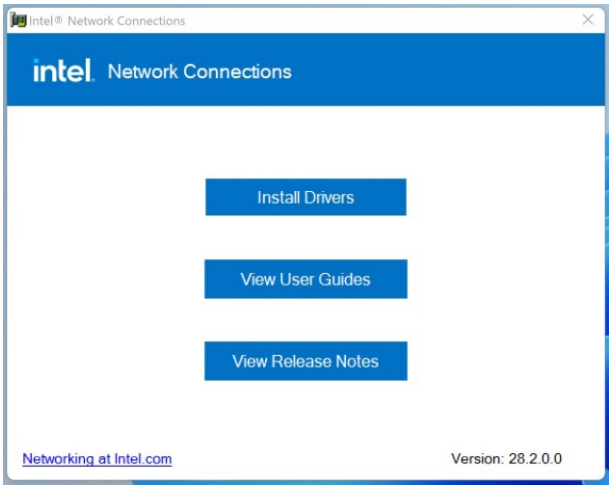
Step 2. Click **Next**.

4.5 Install LAN Driver

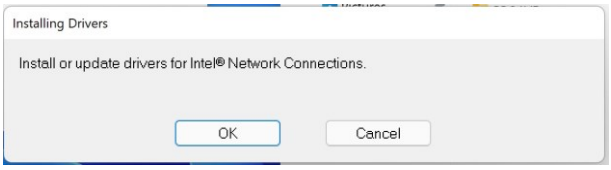
All drivers can be found on the Avalue Official Website:

www.avalue.com

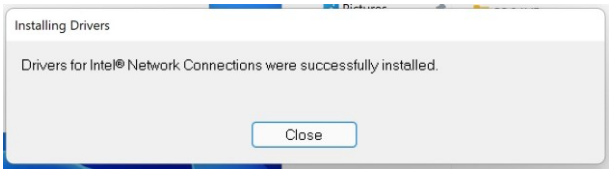
Note: The installation procedures and screen shots in this section are based on Windows 11 operation system. If the warning message appears while the installation process, click Continue to go on.



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



Step 2. Click **OK**.



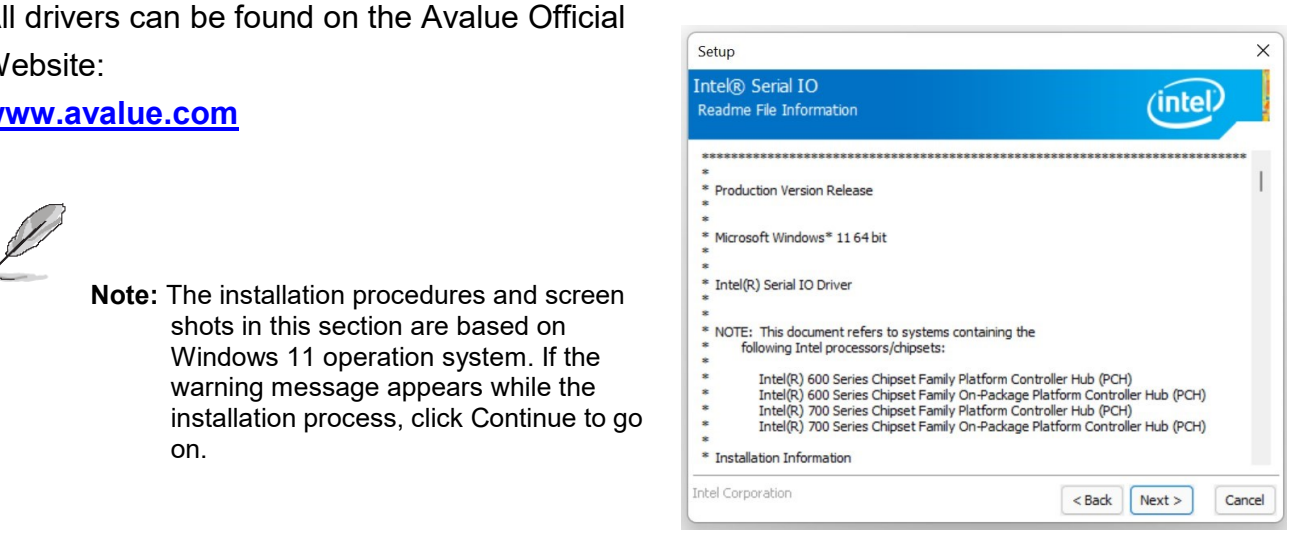
Step 3. Click **Close**.

4.6 Install Serial IO Driver

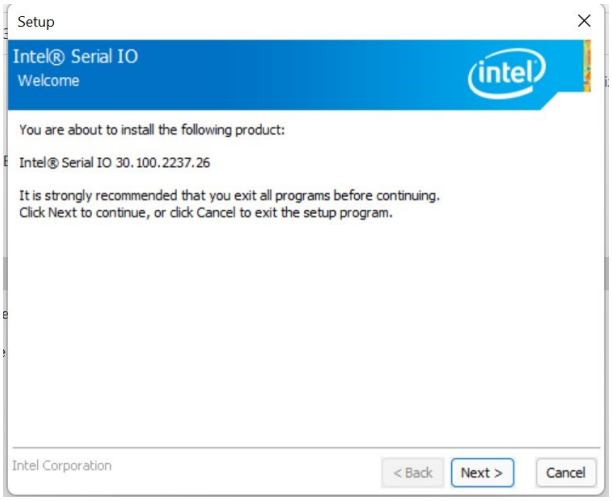
All drivers can be found on the Avalue Official Website:

www.avalue.com

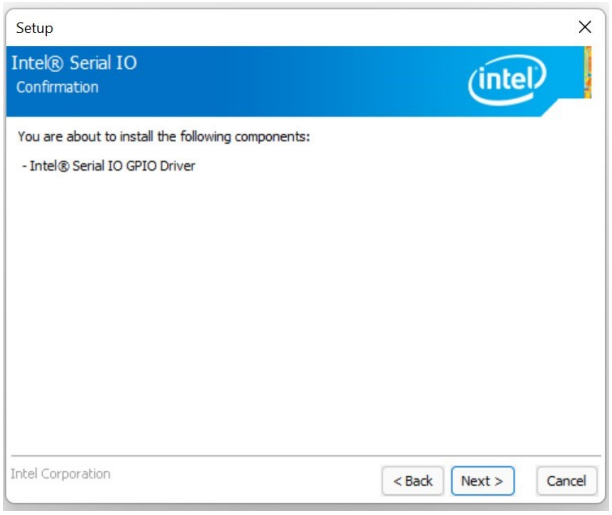
Note: The installation procedures and screen shots in this section are based on Windows 11 operation system. If the warning message appears while the installation process, click Continue to go on.



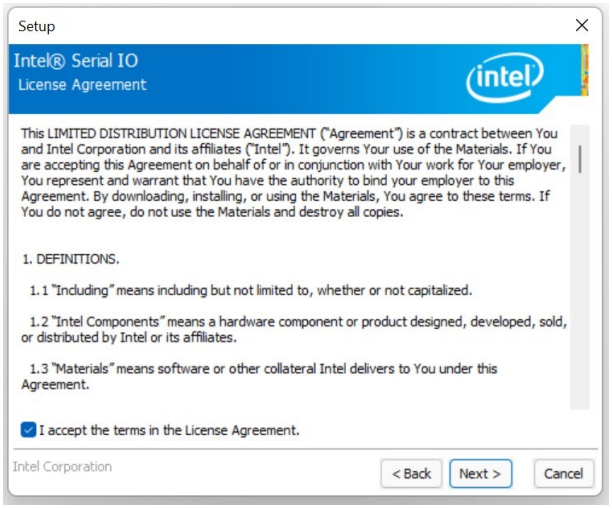
Step 3. Click **Next**.



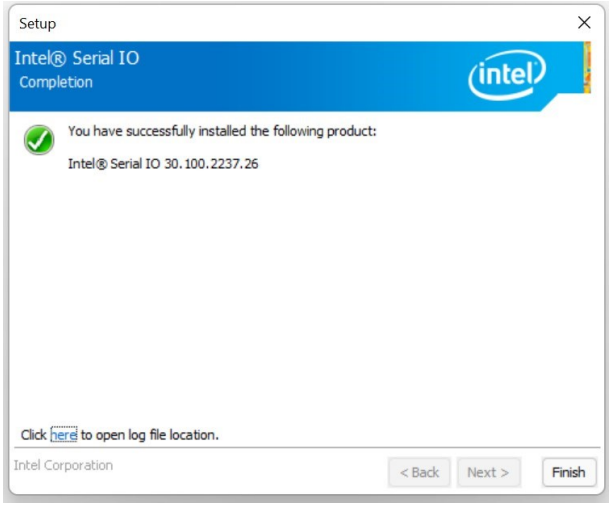
Step 1. Click **Next** to continue setup.



Step 4. Click **Next**.

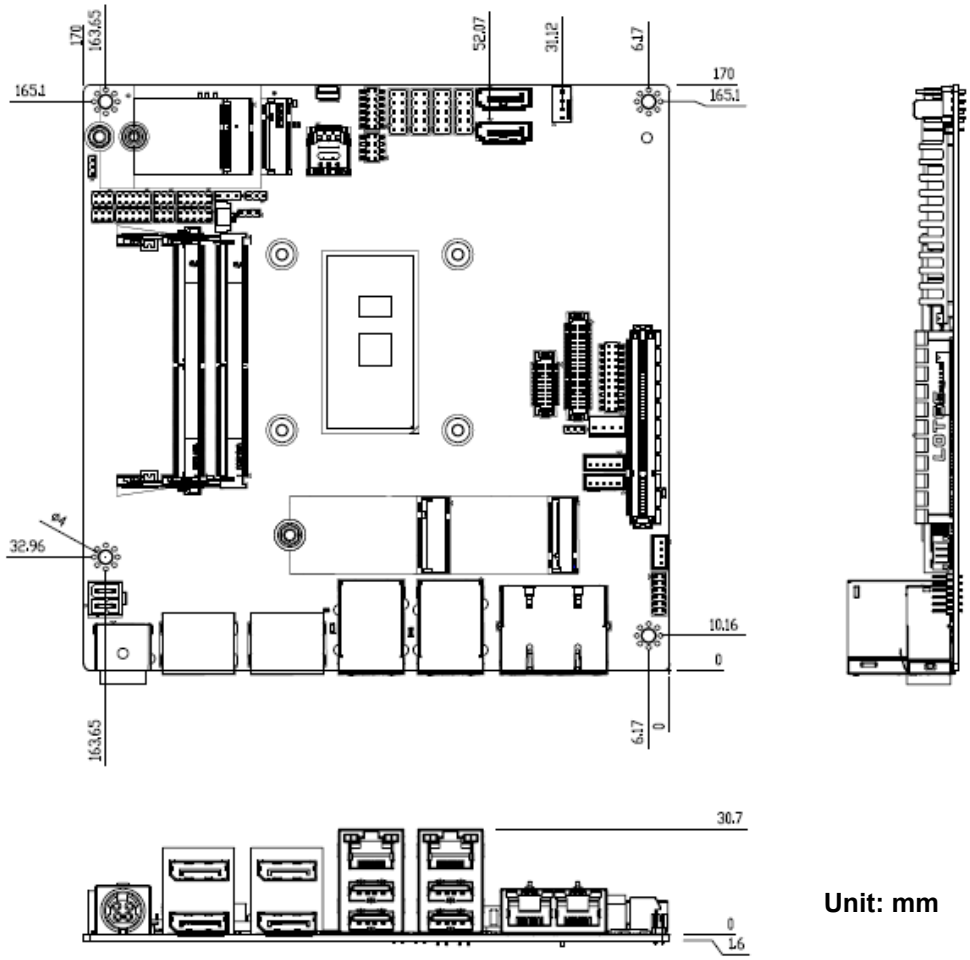


Step 2. Click **Next**.

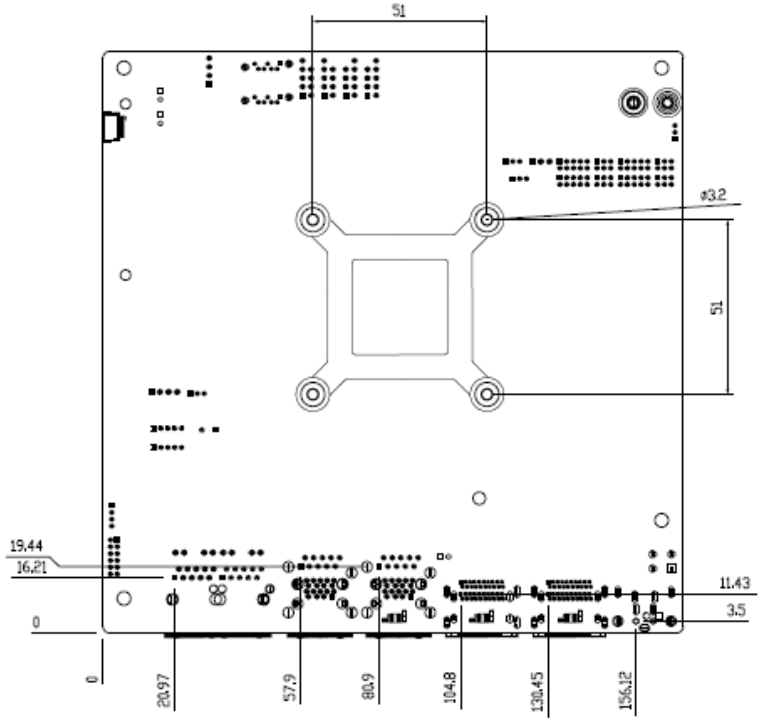


Step 5. Click **Finish** to complete setup.

5. Mechanical Drawing



Unit: mm



Unit: mm