BMX-T528

Mini-ITX Desktop System with Intel® Tiger Lake Platform

Quick Reference Guide

1st Ed –29 July 2024

Part No. E2017GAO1A0R

Document Amendment History

Revision	Date	By	Comment
1st	July 2024	Avalue	Initial Release

Declaration of Conformity

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.

CE statement

The product(s) described in this manual complies with all application European Union (CE) directives if it has a CE marking. For computer systems to remain CE compliant, only CE-compliant parts may be used. Maintaining CE compliance also requires proper cable and cabling techniques.

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

Acknowledgements

Intel and Pentium are trademarks of Intel Corporation.

Microsoft Windows is registered trademark of Microsoft Corp.

All other product names or trademarks are properties of their respective owners.

Disclaimer

This manual is intended to be used as a practical and informative guide only and is subject

to change without notice. It does not represent a commitment on the part of Avalue. This product might include unintentional technical or typographical errors. Changes are periodically made to the information herein to correct such errors, and these changes are incorporated into new editions of the publication.

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 and Assistance

1. Visit the Avalue website at https://www.avalue.com/ where you can find the latest information about the product.
2. Contact your distributor or our technical support team or sales representative for technical support if you need additional assistance. Please have following information ready before you call:

- Product name and serial number
- Description of your peripheral attachments
- Description of your software (operating system, version, application software, etc.)
- A complete description of the problem
- The exact wording of any error messages

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

Product Warranty (Returns & Warranties policy)

1. Purpose

Avalue establishes the following maintenance specifications and operation procedures for providing the best quality of service and shortened repair time to our customers.

2. Warranty

2.1 Warranty Period

Avalue endeavors to offer customers the most comprehensive post-sales services and protection; besides offering a 2-year warranty for standard Avalue products, an extended warranty service can also be provided based on additional request from the customer. Within the warranty period, customers are entitled to receive comprehensive and prompt repair and warranty.

Standard products manufactured by Avalue are offered a 2-year warranty, from the date of delivery from Avalue. For ODM/OEM products manufactured by Avalue or PCBA with conformal coating, will follow up the define warranty of the agreement, otherwise will be offered 1-year warranty for ODM/OEM products but non-warranty for PCBA with conformal coating. For outsourcing parts kit by Avalue (ex: Motherboard, LCD touch panel, CPU, RAM, HDD) are offered a 6-month warranty, and Mobile/Tablet PC battery are offered a warranty of the half year, from the date of delivery by Avalue. Products before the mass production stage, i.e. engineering samples are not applied in this warranty or service policy. For extended warranty and cross-territory services, product defects resulting from design, production process or material are covered by the pre-set warranty period after the date of delivery from Avalue. For non-Avalue products, the product warranty and repair time shall be based on the service standards provided by the original manufacturer; in principle Avalue will provide these products a warranty service for no more than one year.

2.2 Maintenance services within the warranty period

In the case of Avalue product DOA (Defect-on-Arrival) when the customer finds any defect within 1 month after the delivery, Avalue will replace it with a new product in a soonest way. Except for custom products, once the customer is approved of a Cross-Shipment Agreement, which allows for delivery a new product to the customer before receiving the defective one, Avalue will immediately proceed with new product replacement for the said DOA case. On validation of the confirmed defect, Avalue is entitled to reserve the right whether to provide a new product for replacement. For the returned defective new product, it is necessary to verify that there shall be no bruise, alteration, scratch or marking to the appearance, and that none of the delivered accessories missing; otherwise, the customer will be requested to pay a processing fee. On the other hand, if the new product defect is resulting from incorrect configuration or erroneous use by the user instead of any problem of the hardware itself, the customer will also be requested to pay for relevant handling fees.

As for other conditions, Avalue will handle defects by way of repair. The customer will be requested to send the defective product to an Avalue authorized service center, and Avalue will return the repaired product back to the customer as soon as possible.

2.3 Ruling of an out-of-warranty defect

The following situations are not included in the warranty:

- The warranty period has expired.
- Product has been altered or its label of the serial number has been torn off.
- Product functionality issues resulting from improper use by the user, unauthorized dismantle or alteration, unfit operation environment, improper maintenance, accident or other causes. Avalue reserves the right for the ruling of the aforementioned situations.
- Product damage resulting from lightning, flood, earthquake or other calamities.
- The warranty rules of non-Avalue products and accessories shall be in accordance with standards set up by the original manufacturer. These products and accessories include RAM, HDD, FDD, CD-ROM, CPU, FAN, etc.
- Product upgrade request or test request submitted by the customer after expiration of the warranty.
- PCBA with conformal coating.
- Avalue semi-product and outsourced products without Avalue serial number.
- Products before the mass production stage, i.e. engineering samples.

3. Procedure for sending for repair

3.1 Attain a RMA number

A customer’s rejected product returned for repair shall have a RMA (Return Merchandise Authorization) number. Without a RMA number, Avalue will not provide any repair service for the rejected product, and the product will be returned to the customer at customer’s cost. Avalue will not issue any notice for the return of the product.

Each returned product for repair shall have a RMA number, which is simply the authorization of the return for repair; it is not a guarantee that the returned goods can be repaired or replaced. For applying for a RMA number, the customer may enter the eRMA webpage of Avalue https://www.avalue.com/en/member and log-in with an account number and a password authorized by Avalue. The system will then automatically issue a RMA number.

When applying for the RMA number, it is essential to fill in basic information of the customer and the product, together with detailed description of the problem encountered. If possible, avoid using ambiguous words such as “does not work” or “problematic”. Without a substantial description of the problem, it is hard to start the repair and will cause prolonged repair time. Lacking detailed statement of fault steps also makes the problem hard to be identified, sometimes resulting in second-time repairs.

In case the customer can't define the cause of problem, please contact Avalue application engineers. Sometimes when the problem can be resolved even before the customer sends back the product.
On the other hand, if the customer only returns the key parts to Avalue for repair, it is necessary that the serial number of the entire unit is given in the "Problem Description" field, so that warranty period can be ruled accordingly; or Avalue will handle the case as an Out-of- warranty case.

3.2 Return of faulty product for repair

It is recommended that the customer not to return the accessories (manual, connection cables, etc.) with the products for repair, devices such as CPU, DRAM, CF memory card, etc., shall also be removed from the faulty goods before return for repair. If these devices are relevant to described repair problems and necessary to be returned with the goods; please clearly indicate the items included in the eRMA application form. Avalue shall not be responsible for any item that is not itemized. Moreover, make sure the problem(s) are detailed in the "Problem Description" field.
In the list of delivery, the customer may fill-in a value which is lower than the actual value, to prevent customs levying a higher tax over the excessive value of the return goods. The customer shall be held responsible for extra fees caused by this. We strongly recommend that "Invoice for customs purpose only with no commercial value" be indicated on the delivery note. Also for the purpose of expedited handling, please printout the RMA number and put it in the carton, also indicate the number outside of the carton, with the recipient addressing to Avalue RMA Department.
When returning the defective product, please use an anti-static bag or ESD material to pack it properly. In case of improper packing resulting in damages in the transportation process, Avalue reserves the right to reject the un-repaired faulty good at the customer's costs. Furthermore, it is suggested that the faulty goods shall be sent via a door-to-door courier service. The customer shall be held responsible for any customs clearance fee or extra expenses if Air-Cargo is used for the delivery.
In case of a DOA situation of a new product, Avalue will be responsible for the product and the freight. If the faulty goods are within the warranty period, the sender will take responsibility for the freight. For an out-of-warranty case, the customer shall be responsible for the freight of both trips.

3.3 Maintenance Charge

Avalue will charge a moderate repair fee for the following conditions:

- The warranty period has expired.
- Product has been altered or its label of the serial number has been torn off.
- Product functionality issues resulting from improper use by the user, unauthorized dismantle or alteration, unfit operation environment, improper maintenance, accident

or other causes. Avalue reserves the right for the ruling of the aforementioned situations.

- Product damage resulting from lightning, flood, earthquake or other calamities.
- The warranty rules for non-Avalue products and accessories shall be in accordance with standards set up by the original supplier. These products and accessories include RAM, HDD, FDD, CD-ROM, CPU, FAN, etc.
- Product upgrade request or test request submitted by the customer after expiry of the warranty.
- PCBA with conformal coating.
- Avalue semi-product and outsourced products without Avalue serial number
- Products before the mass production stage, i.e. engineering samples.
- In case the products received are examined as NPF (No Problem Found) within the warranty period, the customer shall be responsible for the freight of both trips.
- Please contact your local distributor to examine in advance to prevent unnecessary freight cost.

For system failure of out-of-warranty products, Avalue will provide a quotation prior to repair service. When the customer applies for the cost, please refer to the Quotation number. In case the customer does not return the DOA product that has already been replaced by a new one, or the customer does not sign back the quotation of the out-of-warranty maintenance, Avalue reserves the right of whether or not to provide the repair service. In case the customer does not reply in 3 months, Avalue shall directly scrap or return the product back to customer at customer's cost without further notice to the customer.

3.4 Maintenance service of phased-out products

For servicing phased-out products, Avalue provides an extended period, starting the date of phase-out, as a guaranteed maintenance period of such products, for continuance of the maintenance service to meet customer's requirements. In case of unexpected factors causing Avalue to be unable to repair/replace a warranted but phased-out product, Avalue will, depending on the availability, upgrade the product (free of charge with continued warranty period as of the original product), or, give partial refund (based on the length of the remaining warranty period) to solve this kind of problem.

3.5 Maintenance Report

On completion of repair of a defective product, a Maintenance Report indicating the maintenance result and part(s) replaced (if any) will be sent to the customer together with the product. If the customer demands an additional maintenance analysis report, a service fee of various level will be charged depending on the warranty status. In case the analysis result shows that the defect attributes to Avalue's faulty design or process, the analysis fee will be exempted.

4. Service Products

Avalue provides service products to manage with different customer needs. Should you have any need, please consult to Avalue Sales Department.

Defect Analysis Report (DAR)

Avalue provides DAR (Defect Analysis Report) services aiming to elevating customer satisfaction. A DAR includes defect cause identification/verification/suggestion and improvement precautions, with instructions on correct usage for the avoidance of any reoccurrence.

Upgrade Service

Avalue is capable to provide system upgrade service for customization requirements. This upgrade service is applicable for main parts, such as CPU, memory, HDD, SSD, storage devices; also replacements motherboards of systems. Please contact Avalue sales for details to evaluate the possibility of system upgrade service and obtain information of lead time and price.

Safety Instructions

Safety Precautions

Before installing and using this device, please note the following precautions.

1. Read these safety instructions carefully.
2. Keep this User's Manual for future reference.
3. Disconnected this equipment from any AC outlet before cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
7. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
8. Use a power cord that has been approved for using with the product and that it matches the voltage and current marked on the product's electrical range label. The voltage and current rating of the cord must be greater than the voltage and current rating marked on the product.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to

avoid damage by transient overvoltage.

12. Never pour any liquid into an opening. This may cause fire or electrical shock.

13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel. If one of the following situations arises, get the equipment checked by service personnel:

- The power cord or plug is damaged.
- Liquid has penetrated into the equipment.
- The equipment has been exposed to moisture.
- The equipment does not work well, or you cannot get it work according to the user's manual.
- The equipment has been dropped and damaged.
- The equipment has obvious signs of breakage.

14. CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.

15. Equipment intended only for use in a RESTRICTED ACCESS AREA.

Explanation of Graphical Symbols

	Warning	A WARNING statement provides important information about a potentially hazardous situation which, if not avoided, could result in death or serious injury.
	Caution	A CAUTION statement provides important information about a potentially hazardous situation which, if not avoided, may result in minor or moderate injury to the user or patient or in damage to the equipment or other property.
	Note	A NOTE provides additional information intended to avoid inconveniences during operation.
		Direct current.
		Alternating current
		Stand-by, Power on
		FCC Certification
		CE Certification
		Follow the national requirements for disposal of equipment.
		Stacking layer limit
		This side up

		Fragile Packaging
		Beware of water damage, moisture-proof
		Carton recyclable
		Handle with care
		Follow operating instructions of consult instructions for use.

Disposing of your old product

WARNING:
There is danger of explosion if the battery is mishandled or incorrectly replaced. Replace only with the same type of battery. Do not disassemble it or attempt to recharge it outside the system. Do not crush, puncture, dispose of in fire, short the external contacts, or expose to water or other liquids. Dispose of the battery in accordance with local regulations and instructions from your service provider.

CAUTION:
- Lithium Battery Caution: Danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent type. Dispose batteries according to manufacturer's instructions.
- Disposal of a BATTERY into fire or a hot oven, or mechanically crushing or cutting of a BATTERY, that can result in an EXPLOSION
- Leaving a BATTERY in an extremely high temperature surrounding environment that can result in an EXPLOSION or the leakage of flammable liquid or gas.
- A BATTERY subjected to extremely low air pressure that may result in an EXPLOSION or the leakage of flammable liquid or gas.

Mise en garde!
AVERTISSEMENT : Il existe un risque d'explosion si la batterie est mal manipulée ou remplacée de manière incorrecte. Remplacez uniquement par le même type de batterie. Ne le démontez pas et ne tentez pas de le recharger en dehors du système. Ne pas écraser, percer, jeter au feu, court-circuiter les contacts externes ou exposer à l'eau ou à d'autres liquides. Jetez la batterie conformément aux réglementations locales et aux instructions de votre fournisseur de services.

MISE EN GARDE:
- Pile au lithium Attention : Danger d'explosion si la pile n'est pas remplacée correctement. Remplacer uniquement par un type identique ou équivalent. Jetez les piles conformément aux instructions du fabricant.
- L'élimination d'une BATTERIE dans le feu ou dans un four chaud, ou l'écrasement ou le découpage mécanique d'une BATTERIE, pouvant entraîner une EXPLOSION
- Laisser une BATTERIE dans un environnement à température extrêmement élevée pouvant entraîner une EXPLOSION ou une fuite de liquide ou de gaz inflammable.
- UNE BATTERIE soumise à une pression d'air extrêmement basse pouvant entraîner une EXPLOSION ou une fuite de liquide ou de gaz inflammable.

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 installation, please ensure all the items listed in the following table are included in the package.

Item	Description	Q'ty
1	BMX-T528	1
2	Adapter	1
3	AC Power cord	1
4	Mounting kit	1

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

Unpacking

Note:

If any of the components listed in the checklist below are missing, do not proceed with the installation. Contact the Avalue reseller or vendor the product was purchased from or contact an Avalue sales representative directly by sending an email to sales@avalue.com.

To unpack the flat bezel panel PC, follow the steps below.

WARNING!

The front side LCD screen has a protective plastic cover stuck to the screen. Only remove the plastic cover after the fiat bezel panel PC has been properly installed. This ensures the screen is protected during the installation process.

Step 1: Carefully cut the tape sealing the box. Only cut deep enough to break the tape.
Step 2: Open the outside box.
Step 3: Carefully cut the tape sealing the box. Only cut deep enough to break the tape.
Step 4: Open the inside box.
Step 5: Lift the panel PC out of the boxes.
Step 6: Remove the peripheral parts box from the main box.

1.3 System Specifications

System Information	
Processor	Intel® Core™ i7-1165G7 Processor (15W) Intel® Core™ i5-1135G7 Processor (15W) *According to the EMX-TGLC-B1 standard BOM
Platform Controller Hub	Soc
System Memory	Two 260-pin DDR4 3200 MHz SO-DIMM socket, supports up to 64GB Max (non ECC only)
I/O Chipset	NuvoTon_NCT6126D
BIOS Information	AMI uEFI BIOS, 256Mbit SPI Flash ROM
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	RAID0/1 (only Core i)
TPM	dTPM 2.0 (NuvoTon NPCT754AADYX) *According to the EMX-TGLC-B1 standard BOM
SBC	EMX-TGLC-B1
Expansion	
M.2 (Key-X, Size, Signal)	1-M.2 Type B 3042/3052/2242/2260/2280 Support PCI-e x1/ 1x SATA/1xUSB3.0/1xUSB2.0 with 1 x Nano SIM card slot with co-lay FPC connector, support WWAN+GNSS or NVMe (SATA) SSD *SATA 2 share with M.2 key B SATA *Only supports one SIM card *Does not support I2S and PCM functions *Only Support PCI-e x1 signal module 1-M.2 Key E 2230 support WiFi module and CNVi (1 x PCI-e x1 & USB 2.0 Signal) *Does not support PCM/I2S and UART/SDIO functions *Due to support Intel CNVI function, please do not use support UART or SDIO module to avoid misfunction.
Storage	
M.2 (Key-X, Size, Signal)	1-M.2 Type B 3042/3052/2242/2260/2280 NVMe SSD *SATA 2 share with M.2 key B SATA *Only Support PCI-e x1 signal module
2.5” Drive Bay (Height)	2-2.5” Drive Bay (9.5mm)

Front I/O	
USB Port	4 x USB2.0 optional
COM Port	4 x COM optional
SIM Slot	1 x Internal SIM slot
Antenna	4 x Antenna with dust cover
Rear I/O	
USB Port	4-USB 3.1 Gen2 (Edge)
COM Port	2 x RS/232/RS422/485, 4 x RS-232
Power Button	1 x Push Button for Power on/off
HDMI	2 x DP or 4 x DP
LVDS	1 x LVDS for DB26 Optional
RJ-45	2 x RJ45
LED	1 x Power LED (Green) 1 x Storage LED (Red)
DC Input Conn.	1-4P Mini Din Jack (Edge) 1-2P Terminal Black (cable)
Left I/O (View on front side)	
Antenna	2 x Antenna with dust cover
Right I/O (View on front side)	
Antenna	2 x Antenna with dust cover
Onboard I/O	
SATA Signal	2 x 7 pin SATAIII Interface connector
SATA PWR	2 x 4-Pin Wafer (2.0mm) for 5V/12V Power SATA Power,1A
USB Port	2 x 2 x 5 pin, pitch 2.54mm connector for 4 USB 2.0
COM Port	● COM 1 & COM2: - COM 1 & COM2 support RS232/422/485 connector, with / +5V & +12V Supported and RS422/485 by BIOS setting - 2 x 2 x 5 pin, pitch 2.00mm connector support RS-232/422/485 connector, Pin 9 with / +5V & +12V Supported - 2 x 2 x 3 pin, pitch 2.00mm connector, for RI/+5V/+12V Supported ● COM3 to 6: 1 x 2 x 20 pin, pitch 2.00mm connector for COM3~6: support RS-232 connector
AT/ATX Selector	1 x 1 x 3 pin pitch 2.54mm connector for AT/ATX jumper (JAT1)
RTC Battery	1 x 2 Pin Pitch 1.25mm SMT type battery connector (CR2032 Battery) JBAT1
Clear CMOS	1 x 3 pin, pitch 2.00mm connector for CMOS clear (JRTC1)
eSPI	1 x 2 x 6 pin, pitch 2.00mm connector for eSPI debug (JESPI1)
EC Debug	1 x 3 pin, pitch 2.00mm connector for EC SPI debug (JEC1)
Front Panel	1 x 2 x 5 pin, pitch 2.54mm connector for front panel_1 (JFP1)
BIOS EC	1 x 2 x 4 pin, pitch 2.00mm connector for BIOS SPI (JBIOS1)

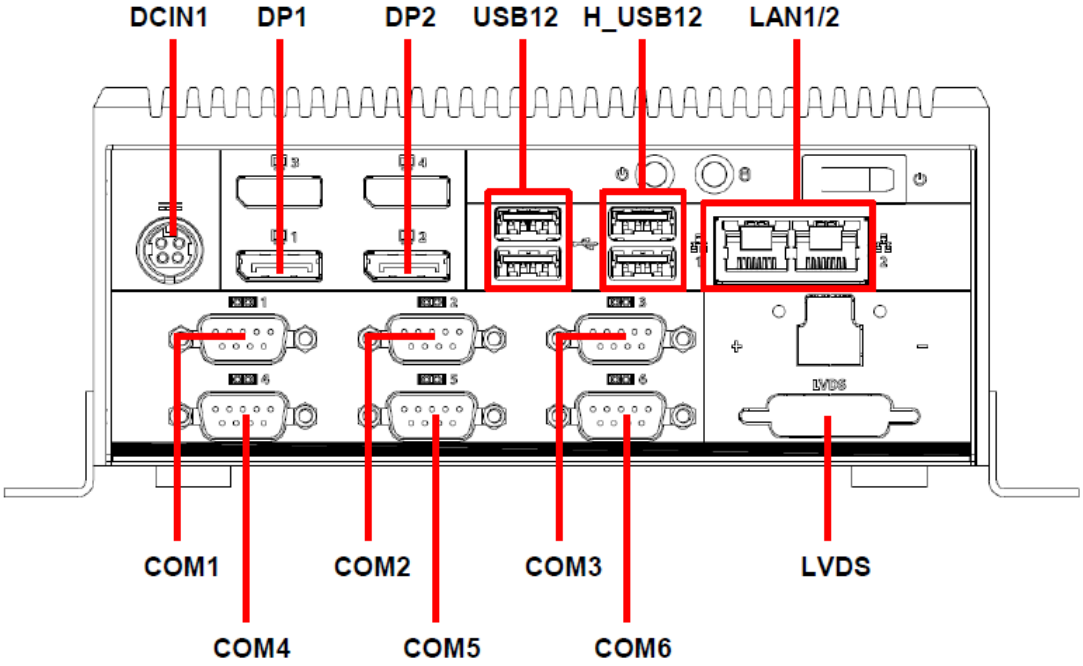
<table>
<tr><td>DC Input Conn.</td><td>1 x 4P Mini Din Jack
1 x 2 x 2 pin, pitch 4.20mm connector for power input connector (PWR1)</td></tr>
<tr><td colspan="2">Display</td></tr>
<tr><td>Graphic Chipset</td><td>Intel® Iris® Xe Graphics (i7-1165G7/ i5-1135G7)
Intel® UHD Graphics for 11th Gen Intel® Processors (i3-1115G4)</td></tr>
<tr><td>Multiple Display</td><td>Triple Display
Multiple Display: DP+DP+eDP or DP+DP+LVDS</td></tr>
<tr><td>Resolution</td><td>● DP (DP1.4): Max: 7680 x 4320@60 Hz
Note: This resolution is actual test result. Intel resolution as below:
● 2 x DP++: 1920 x 1080@60 Hz (with passive Displayport(DP) to HDMI Dongle/Adapter)
● LVDS: 1920 x 1080 Dual channel 18/24-bits LVDS (Chrontel CH7513 eDP to LVDS)
● eDP 4096 x 2304@60 Hz
*2 x DP++, LVDS</td></tr>
<tr><td colspan="2">Audio</td></tr>
<tr><td>Audio Codec</td><td>Realtek ALC897 co-lay ALC888S
*According to the EMX-TGLC-B1 standard BOM</td></tr>
<tr><td colspan="2">Ethernet</td></tr>
<tr><td>LAN Chipset</td><td>1 x Intel® I226LM 2.5 Gigabit Ethernet (LAN2)
1 x Intel® I219LM Gigabit Ethernet PHY (LAN1)
*according to the EMX-TGLC-B1 standard BOM</td></tr>
<tr><td>Data Rate Per Port</td><td>10/100/1000 Base-Tx GbE compatible & 2.5 Gigabit Ethernet</td></tr>
<tr><td>LED Indicator</td><td>
<table>
<tr><td colspan="4">Max. 2.5G LAN Port</td></tr>
<tr><td colspan="2">ACT/LINK</td><td>SPEED</td><td></td></tr>
<tr><td></td><td>Definition</td><td>LED</td><td>Definition</td></tr>
<tr><td>Light Off</td><td>No Link</td><td>Solid Orange</td><td>2.5G</td></tr>
<tr><td>Solid Yellow</td><td>Connection</td><td>Solid Green</td><td>1G/100M</td></tr>
<tr><td>Yellow Flashing</td><td>Activity</td><td>Light Off</td><td>10M</td></tr>
</table>
</td></tr>
<tr><td colspan="2">Power Requirement</td></tr>
<tr><td>Voltage Input Spec.</td><td>+24Vdc</td></tr>
<tr><td>Voltage Input Conn.</td><td>1-4P Mini Din Jack (Edge)
1-2P Terminal Black (cable)</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 (ATX is default setting)</td></tr>
</table>

Mechanical & Environment	
Operating Temp.	0°C ~ 50°C (w/SSD) ambient w/ 0.5 air flow
Storage Temp.	-30~70C° (-22°F ~ 158°F)
Operating Humidity	40°C @ 95% Relative Humidity, Non-condensing
Dimension (W*L*H)	1800mm x 182mm x 82.2 mm (Standard)
Weight	Net weight:2.2KG Gross weight: 3.4KG
Vibration Test	Random Vibration Operation 1. PSD: 0.0505G²/Hz , 5 Grms 2. System condition : operation mode 3. Test frequency : 10~500 Hz 4. Test axis : X,Y and Z axis 5. Test time : 30 minutes per each axis 6. IEC60068-2-64 Test Fh 7. Storage : SSD Sine Vibration test (Non-operation) 1. Test Acceleration : 2G 2. Test frequency : 5~500 Hz 3. Sweep：1 Oct/ per one minute. (logarithmic) 4. Test Axis : X,Y and Z axis 5. Test time :30 min. each axis 6. System condition : Non-Operating mode 7. Reference IEC 60068-2-6 Testing procedures Package Vibration Test: 1. Test PSD : 0.026G²/Hz , 2.16 Grms 2. Test frequency : 5~500 Hz 3. Test axis : X,Y and Z axis 4. Test time : 30 minutes per each axis IEC 60068-2-64 Test Fh
Shock Test	Wave from : Half Sine wave Acceleration Rate : 55G Duration Time : 11ms No. of shock : 18 times Test Axis : +/- X, +/-Y, +/-Z axis operation mode Reference IEC 60068-2-27 testing procedures Test Eb : SSD Shock Test

Drop Test	Package drop test Reference ISTA 2A, Method : IEC-60068-2-32 Test:Ed Test Ea : Drop Test 1. Test phase : One corner, three edges, six faces 2. Test high : 96.5cm Package weight : 5Kg (3.4KG)
Mounting Kit	Wall mount kit (optional) DIN RAIL (optional)
Software Support	
OS Information	Win10, Win11, Linux

Note: Specifications are subject to change without notice.

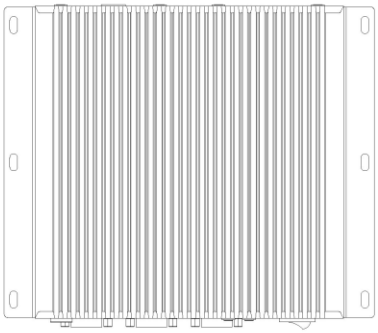
1.4 System Overview

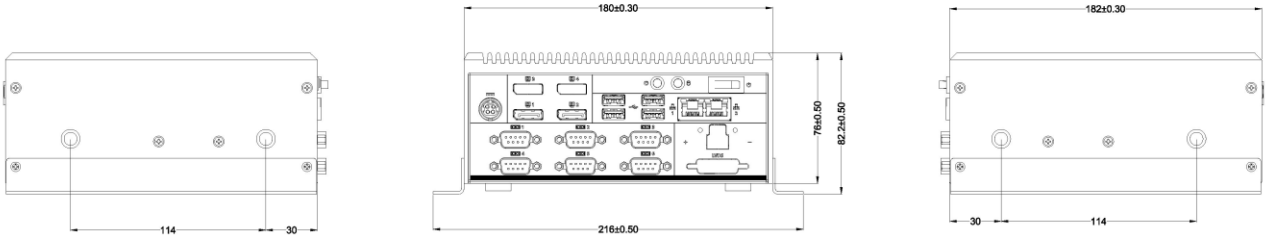


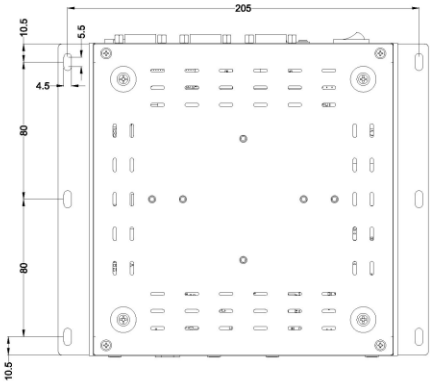
Connectors

Label	Function	Note
Power	Power on button	
DCIN1	DC in connector	
H_USB12	USB 3.2 connector x 2	
USB12	USB 2.0 connector x 2	
COM	Serial Port connector x 6	
LAN1/2	RJ45 Ethernet x 2	
DP1/2	DP connector	
LVDS	LVDS Connector	

1.5 System Dimensions







(Unit: mm)

1.6 Operating Principle

(a) Installation:

- Take the device and accessories from package and put in the suitable place.
- Check the packing list (accessories).
- Connect the power cord to the device.
- Put the plug of power cord into receptacle of power source.
- Press power button “Power Icon” on the device to start the device.

(b) Installation for monitor:

- Plug in the monitor cable (HDMI or DP).

(c) Installation keyboard and mouse.

- Plug in mouse and keyboard.

(d) Operation for Turn ON the system

- Turn ON the system.
- Press the power ON/OFF icon firmly to turn power ON/OFF.
- The power ON/OFF LED will turn blue to indicate power is on.
- Check with the Icon behavior for power status.

2. Hardware Configuration

For advanced information, please refer to:

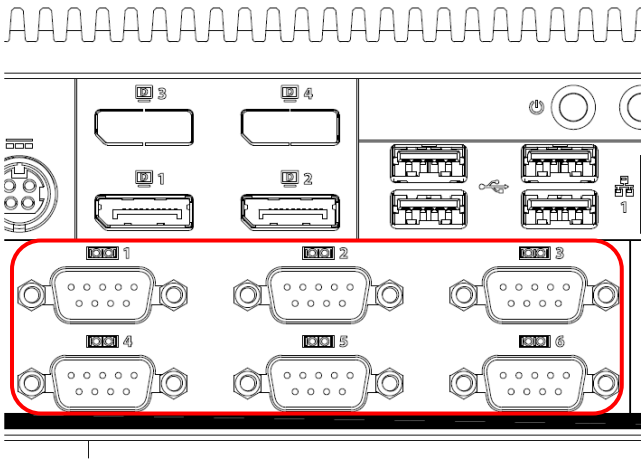
1- EMX-TGLC-B1 included in this manual.

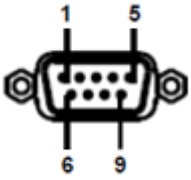
Note: If you need more information, please visit our website:

www.avalue.com

2.1 BMX-T528 connector mapping

2.1.1 Serial Port connector (COMs)





In RS-232 Mode

Signal	PIN	PIN	Signal
NDCD#	1	6	NDSR#
NRXD	2	7	NRTS#
NTXD	3	8	NCTS#
NDTR#	4	9	NRI#
GND	5		

In RS-422 Mode

Signal	PIN	PIN	Signal
TxD1-	1	6	NC
TxD1+	2	7	NC
RxD1+	3	8	NC
RxD1-	4	9	NC
GND	5		

In RS-485 Mode

Signal	PIN	PIN	Signal
DATA1-	1	6	NC
DATA1+	2	7	NC
NC	3	8	NC
NC	4	9	NC
GND	5		

2.2 Powering On the System

WARNING:

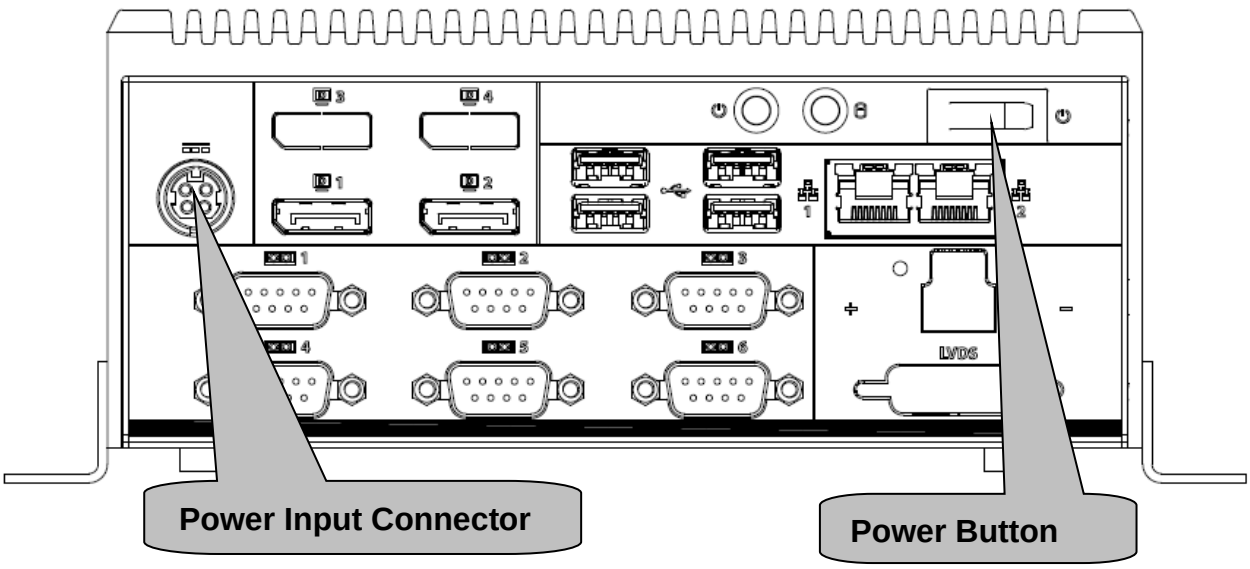
Make sure a power supply with the correct input voltage is being fed into the system. Incorrect voltages applied to the system may cause damage to the internal electronic components and may also cause injury to the user.

- Power on the system: press the power button for 3 seconds.
- Power off the system: press the power button for 6 seconds.
- The power of this system can be less than 250w 20A.

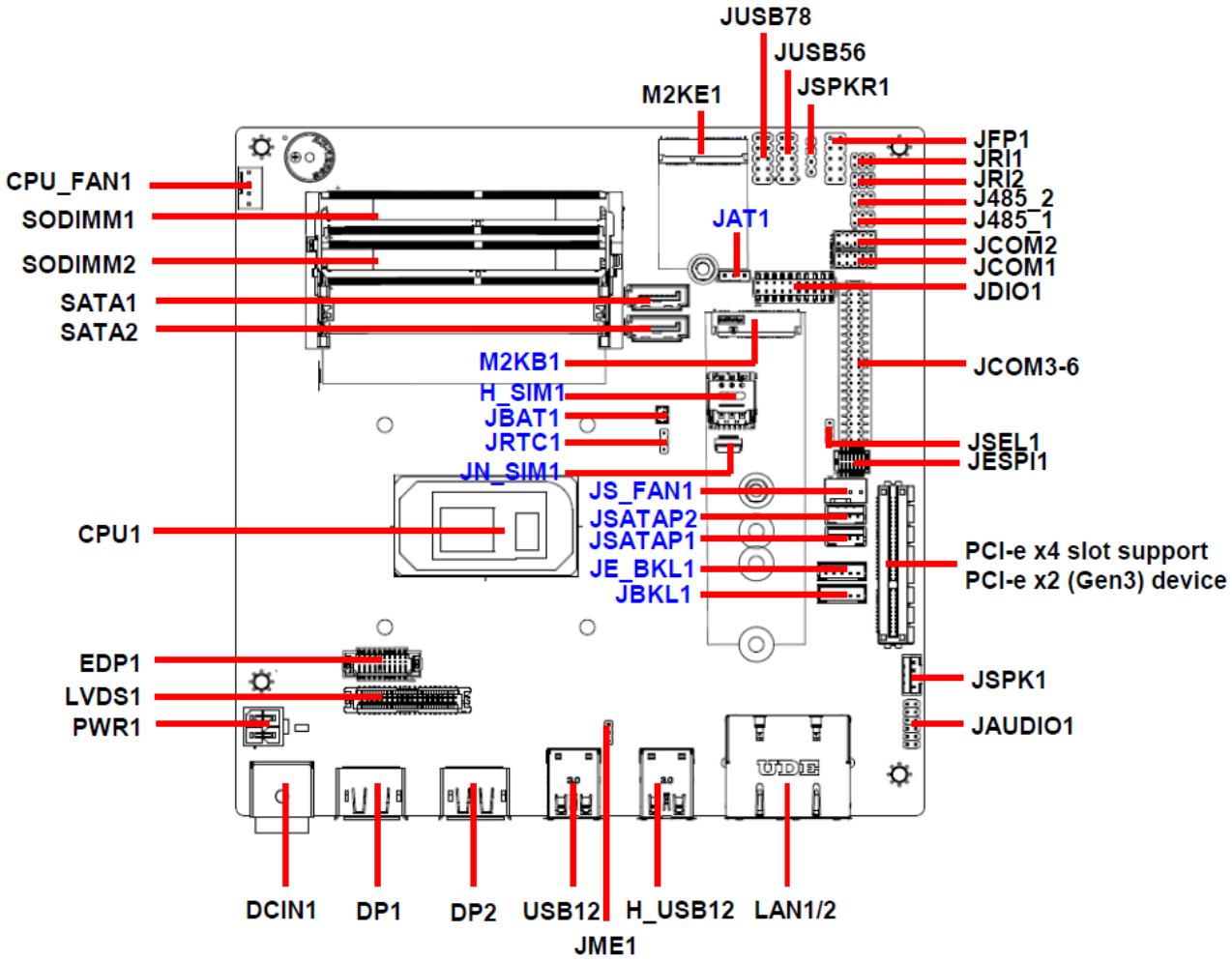
2.3 Connecting to Power Supply

There are two power connectors on the rear panel. Power 1 connector is a DIN connector block that supports ACC On signal. Power 2 connector is a 4-pin terminal that can directly connect to a power adapter. The supported power input voltages are:

- Power 1 (DIN connector): 12 V ~ 28 V
- Power 2 (terminal block): 12 V ~ 28 V



2.4 EMX-TGLC-B1 Overviews



2.5 EMX-TGLC-B1 Jumper & Connector list

Jumpers

Label	Function	Note
JRI1/2	Serial port 1/2 pin9 signal select	3 x 2 header, pitch 2.00mm
JAT1	AT/ATX Power Mode Select	3 x 1 header, pitch 2.54mm
JSEL1	M2KB1 Voltage setting	3 x 1 header, pitch 2.00mm
JRTC1	Clear CMOS	2 x 1 wafer, pitch 2.00mm
JME1	Flash BIOS ME connector	3 x 1 header, pitch 2.00mm

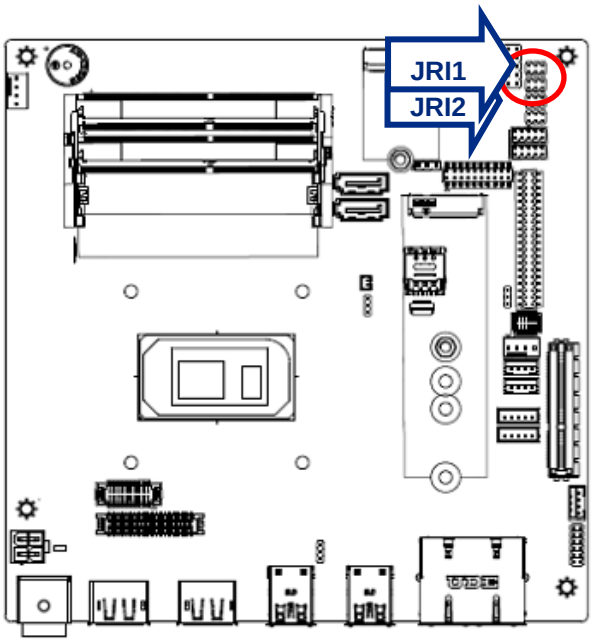
Connectors

Label	Function	Note
JFP1	Miscellaneous setting connector	5 x 2 header, pitch 2.54mm
SODIMM1/2	206-pin DDR4 SO-DIMM socket	
JAUDIO1	Front Audio connector	6 x 2 header, pitch 2.00mm
JESPI1	SPI connector	6 x 2 wafer, pitch 1.00mm
JCOM1	Serial Port 1 connector	5 x 2 header, pitch 2.00mm
JCOM2	Serial Port 2 connector	5 x 2 header, pitch 2.00mm
JCOM3-6	Serial Port 3-6 connector	20 x 2 header, pitch 2.00mm
JDIO1	General purpose I/O connector	10 x 2 header, pitch 2.00mm
JSPK1	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
USB1/2	USB connector 1/2	
JUSB56/78	USB connector 56/78	5 x 2 header, pitch 2.54mm
LAN1/2	RJ-45 Ethernet 1/2	
JBAT1	Battery connector	2 x 1 wafer, pitch 1.25mm
M2KE1	M.2 2230 Type E Slot	
M2KB1	M.2 3042/2242/2260/2280 Type B Slot	
DP1/2	DP connector 1/2	
J485_1/2	Serial Port 1/2 RS485/422 Mode connector	3 x 2 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	

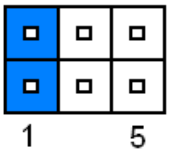
USIM1	USIM card slot	
JN_SIM1	USIM connector	10 x 1 header, pitch 0.50mm
CPU_FAN1	CPU fan connector	4 x 1 wafer, pitch 2.54mm
JS_FAN1	SYS fan connector	4 x 1 wafer, pitch 2.54mm
JSATAP 1/2	JSATAP connector 1/2	4 x 1 wafer, pitch 2.00mm
PCIEX4_1	PCIe x4 connector	

2.6 Setting Jumpers & Connectors

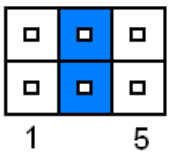
2.6.1 Serial port 1/2 pin9 signal select (JRI1/JRI2)



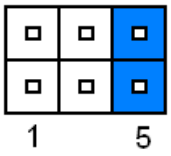
Ring*



+5V

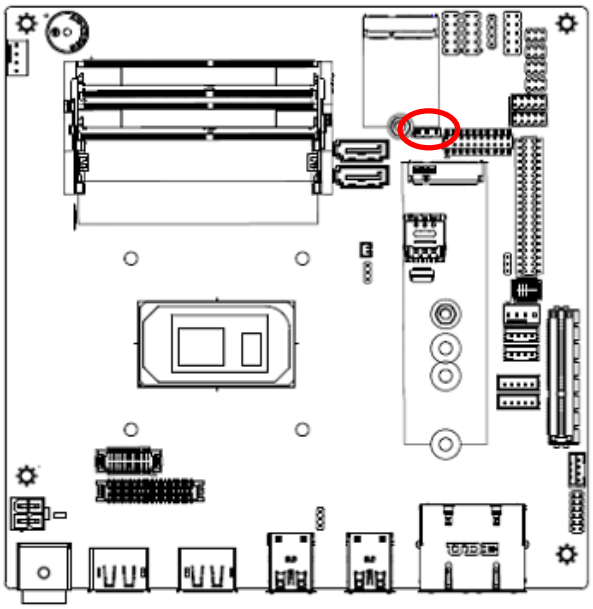


+12V

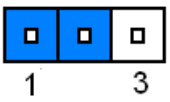


*** Default**

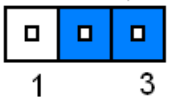
2.6.2 AT/ATX Power Mode Select (JAT1)



ATX*

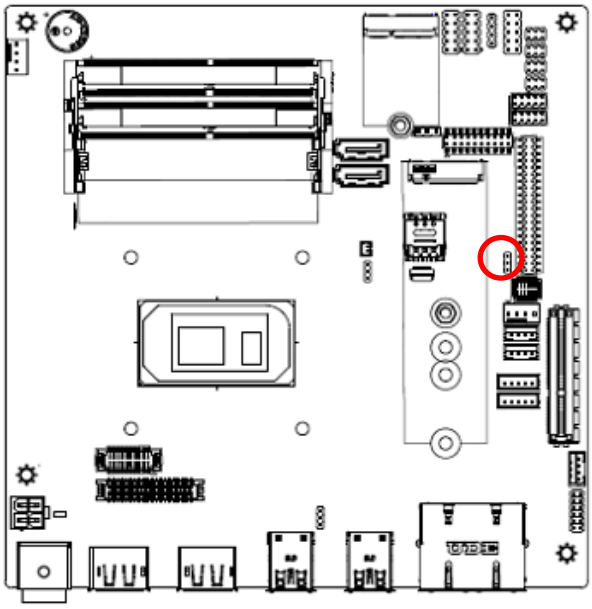


AT

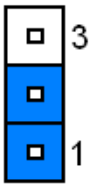


*** Default**

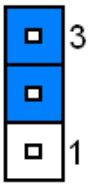
2.6.3 M2KB1 Voltage setting (JSEL1)



+3.3V

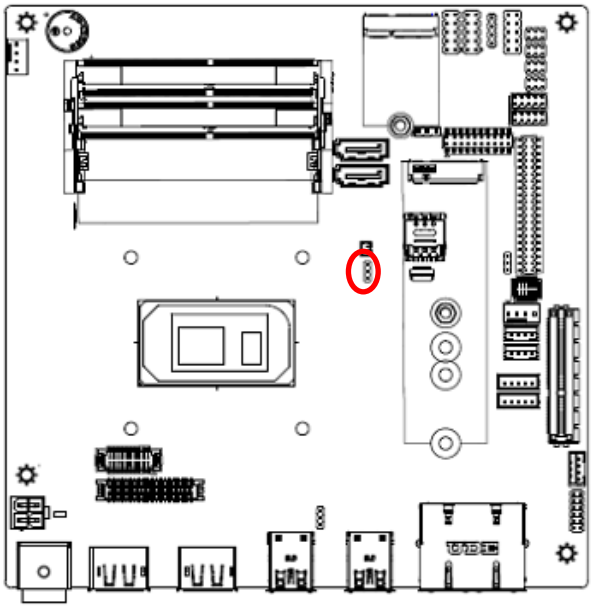


+3.8V*

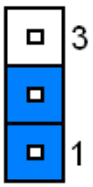


*** Default**

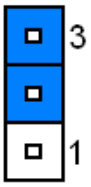
2.6.4 Clear CMOS (JRTC1)



Protect*

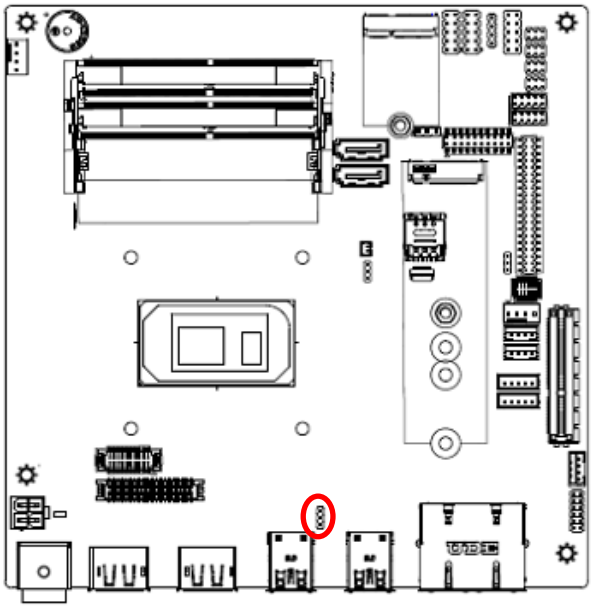


Clear CMOS

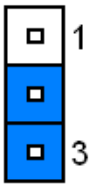


*** Default**

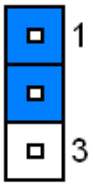
2.6.5 Flash BIOS ME connector (JME1)



Protect*

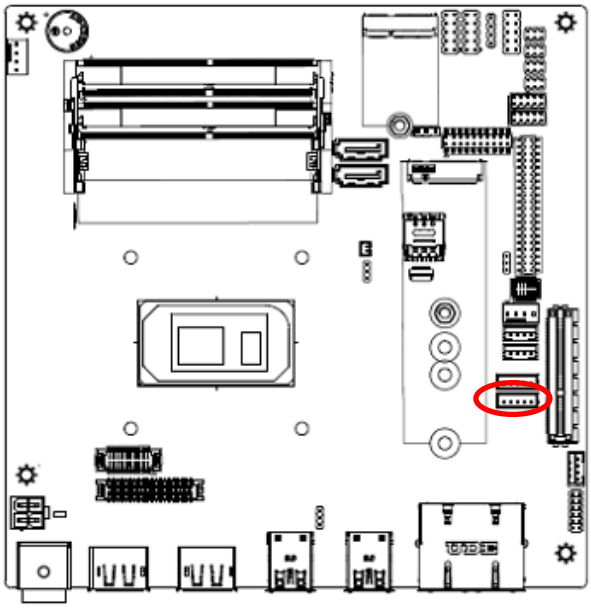


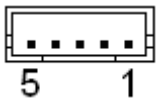
Flash BIOS ME



*** Default**

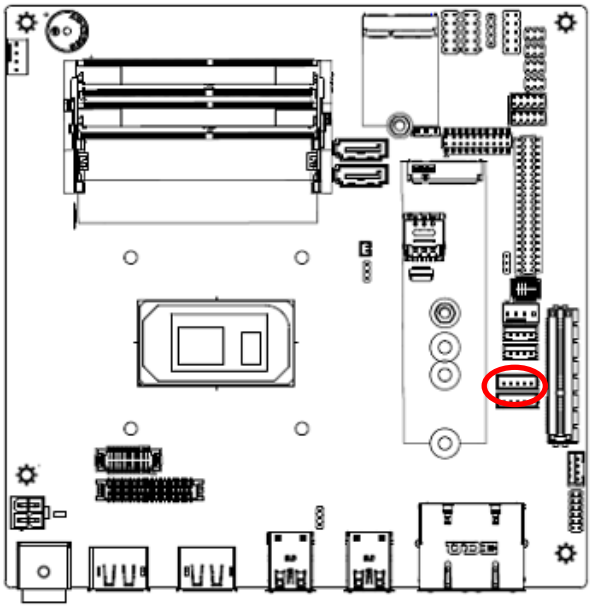
2.6.6 LCD Inverter connector (JBKL1)

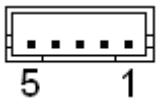




PIN	Signal
1	+12V_INV
2	GND
3	BKLEN
4	VBRIGHT
5	+5V

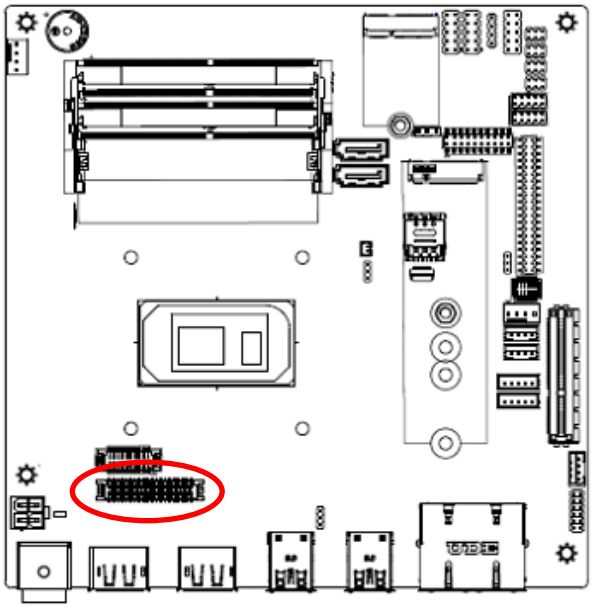
2.6.7 LCD Inverter connector (JE_BKL1)

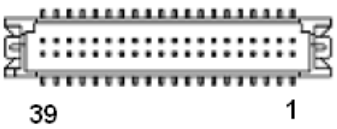




PIN	Signal
1	+12V_INV
2	GND
3	EDP2_BKLTEN
4	EDP2_BKLT_CTL
5	+5V

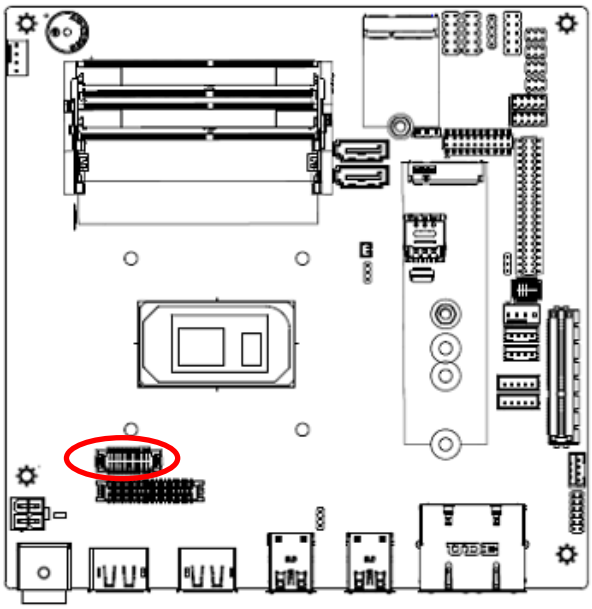
2.6.8 LVDS connector (LVDS1)

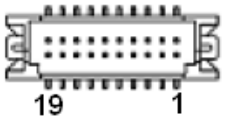




Signal	PIN	PIN	Signal
+V5S_LVDS	2	1	+ V3.3S_LVDS
+V5S_LVDS	4	3	+ V3.3S_LVDS
+V5S_LVDS	6	5	+ V3.3S_LVDS
GND	8	7	GND
LVDS_A_DATA_P_0	10	9	LVDS_A_DATA_P_1
LVDS_A_DATA_N_0	12	11	LVDS_A_DATA_N_1
GND	14	13	GND
LVDS_A_DATA_P_2	16	15	LVDS_A_DATA_P_3
LVDS_A_DATA_N_2	18	17	LVDS_A_DATA_N_3
GND	20	19	GND
LVDS_B_DATA_P_0	22	21	LVDS_B_DATA_P_1
LVDS_B_DATA_N_0	24	23	LVDS_B_DATA_N_1
GND	26	25	GND
LVDS_B_DATA_P_2	28	27	LVDS_B_DATA_P_3
LVDS_B_DATA_N_2	30	29	LVDS_B_DATA_N_3
GND	32	31	GND
LVDS_A_CLK_P	34	33	LVDS_B_CLK_P
LVDS_A_ CLK_N	36	35	LVDS_B_ CLK_N
GND	38	37	GND
+V12S_LVDS	40	39	+V12S_LVDS

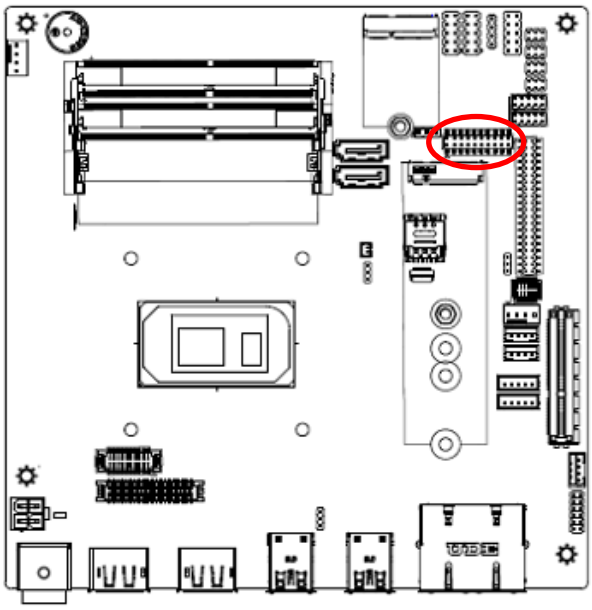
2.6.9 eDP_Panel connector (EDP1)

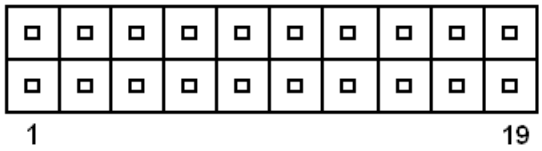




Signal	PIN	PIN	Signal
GND	2	1	GND
DDIB_C_TXN3	4	3	DDIB_C_TXN0
DDIB_C_TXP3	6	5	DDIB_C_TXP0
NC	8	7	GND
GND	10	9	DDIB_C_TXN1
DDIB_C_AUXN	12	11	DDIB_C_TXP1
DDIB_C_AUXP	14	13	GND
GND	16	15	DDIB_C_TXN2
DDIB_EDP_HPD	18	17	DDIB_C_TXP2
+V5_3.3S_EDP	20	19	+V5_3.3S_EDP

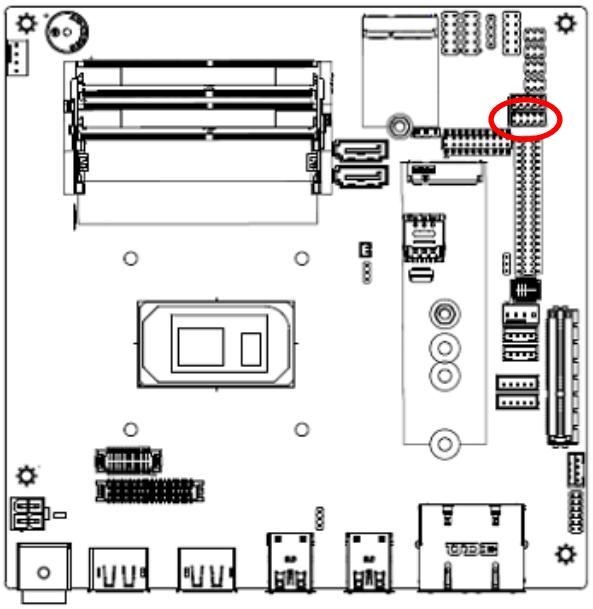
2.6.10 General purpose I/O connector (JDIO1)

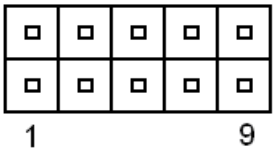




Signal	PIN	PIN	Signal
DIO_GP20	1	2	DIO_GP10
DIO_GP21	3	4	DIO_GP11
DIO_GP22	5	6	DIO_GP12
DIO_GP23	7	8	DIO_GP13
DIO_GP24	9	10	DIO_GP14
DIO_GP25	11	12	DIO_GP15
DIO_GP26	13	14	DIO_GP16
DIO_GP27	15	16	DIO_GP17
SMB_SCL_UDIO_R	17	18	SMB_SDA_UDIO_R
GND	19	20	+V3_5S_DIO (Max current = 0.5A)

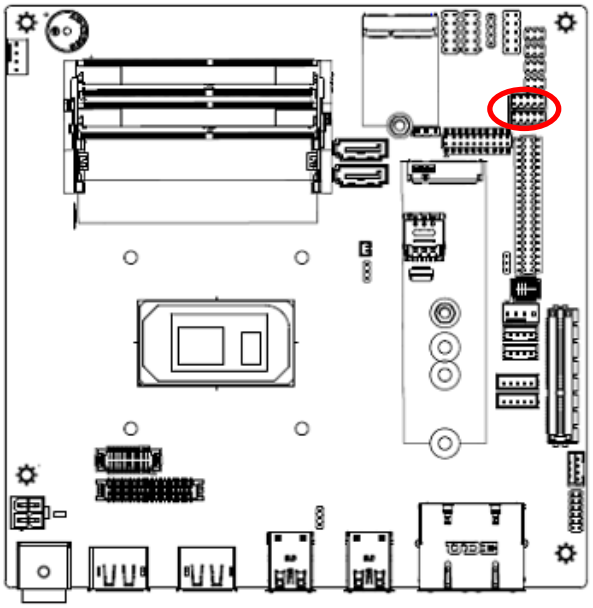
2.6.11 Serial port1 connector (JCOM1)

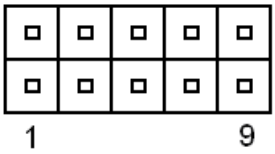




Signal	PIN	PIN	Signal
COM_DCD#_1	1	2	COM_RXD_1
COM_TXD_1	3	4	COM_DTR#_1
GND	5	6	COM_DSR#_1
COM_RTS#_1	7	8	COM_CTS#_1
+V12S_COM_RI#_1	9	10	NC

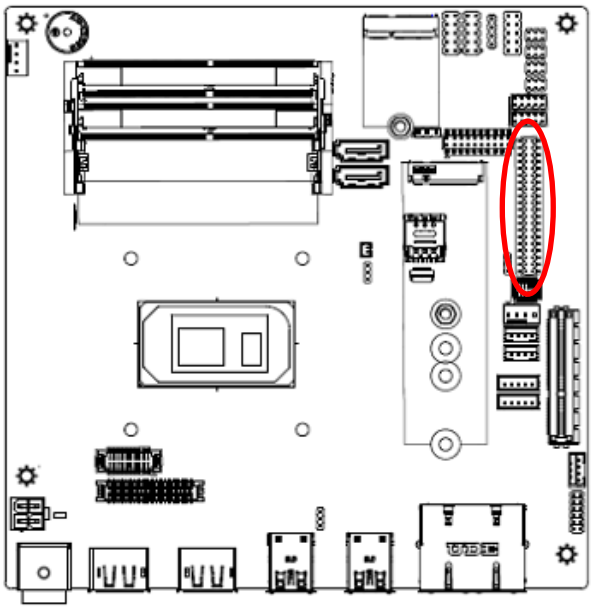
2.6.12 Serial port2 connector (JCOM2)

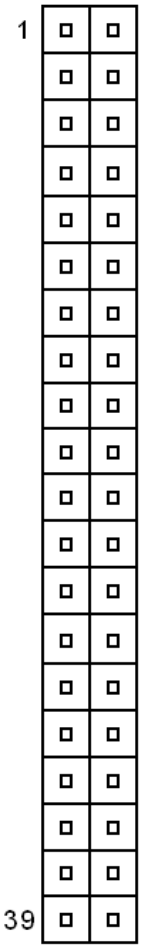




Signal	PIN	PIN	Signal
COM_DCD#_2	1	2	COM_RXD_2
COM_TXD_2	3	4	COM_DTR#_2
GND	5	6	COM_DSR#_2
COM_RTS#_2	7	8	COM_CTS#_2
+V12S_COM_RI#_2	9	10	NC

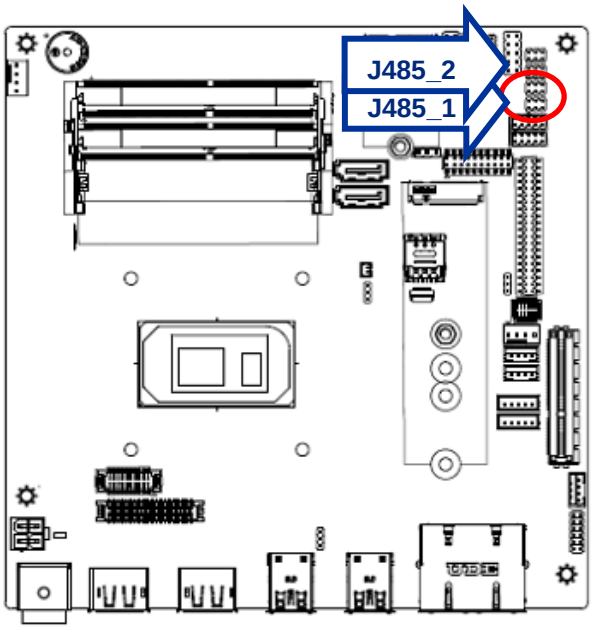
2.6.13 Serial port 3/4/5/6 connector (JCOM3_6)

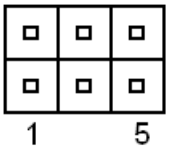




Signal	PIN	PIN	Signal
COM_DCD#_3	1	2	COM_RXD_3
COM_TXD_3	3	4	COM_DTR#_3
GND	5	6	COM_DSR#_3
COM_RTS#_3	7	8	COM_CTS#_3
COM_RI#_3	9	10	NC
COM_DCD#_4	11	12	COM_RXD_4
COM_TXD_4	13	14	COM_DTR#_4
GND	15	16	COM_DSR#_4
COM_RTS#_4	17	18	COM_CTS#_4
COM_RI#_4	19	20	NC
COM_DCD#_5	21	22	COM_RXD_5
COM_TXD_5	23	24	COM_DTR#_5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

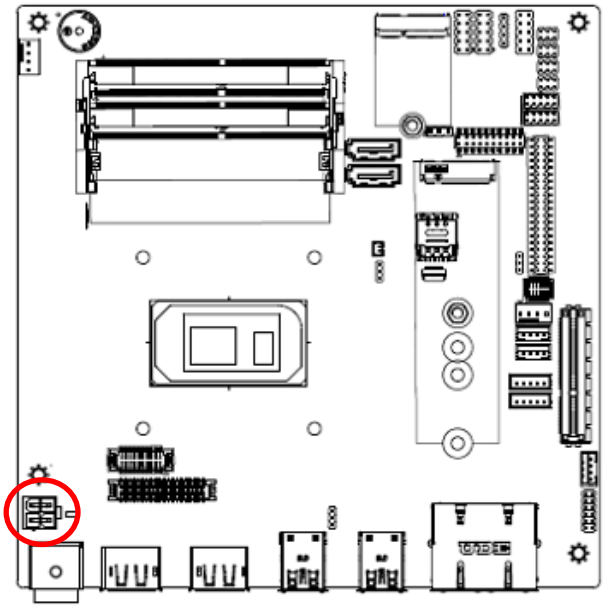
2.6.14 Serial Port 1/2 RS485/422 Mode connector (J485_1/2)

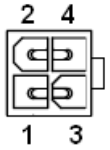




Signal	PIN	PIN	Signal
485-422_TXDN1	1	2	485-422_TXDP_1
422_RXDP_1	3	4	422_RXDP_1
+ V5S_422485	5	6	GND

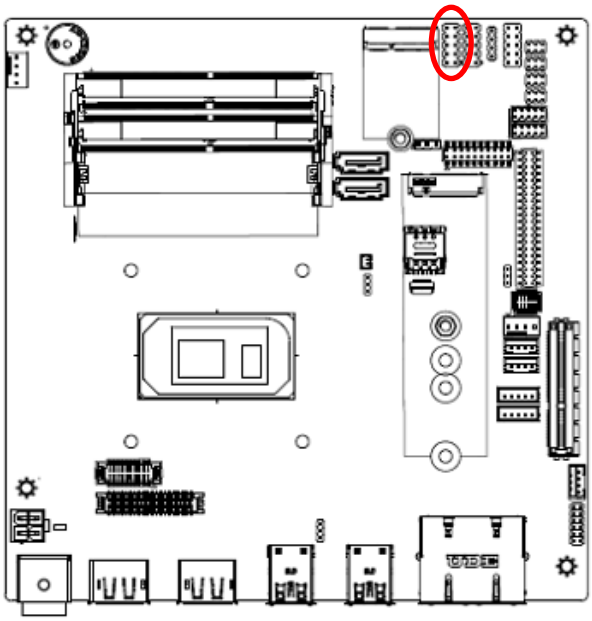
2.6.15 Power connector (PWR1)

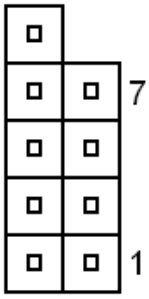




Signal	PIN	PIN	Signal
GND	2	4	+V24A_VIN_ADP
GND	1	3	+V24A_VIN_ADP

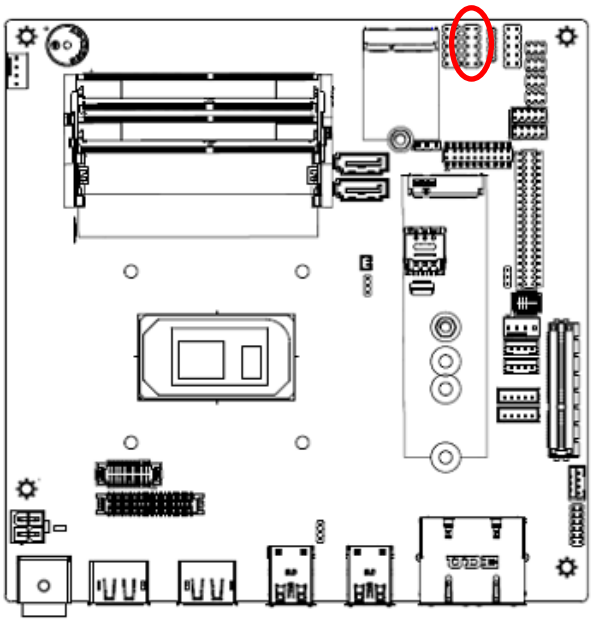
2.6.16 USB connector (JUSB78)

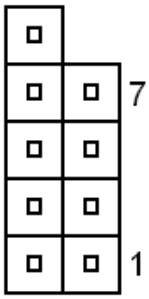




Signal	PIN	PIN	Signal
GND	10		
GND	8	7	USB_R_DP7
USB_R_DP8	6	5	USB_R_DN7
USB_R_DN8	4	3	+V5A_USB78
+V5A_USB78	2	1	+V5A_USB78

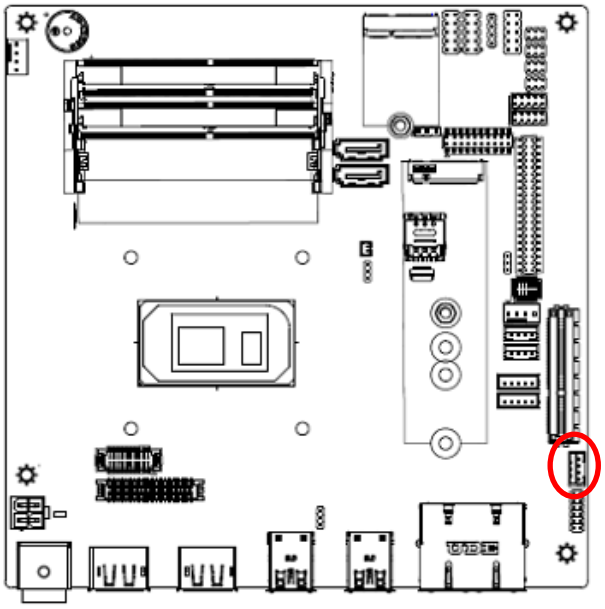
2.6.17 USB connector (JUSB56)





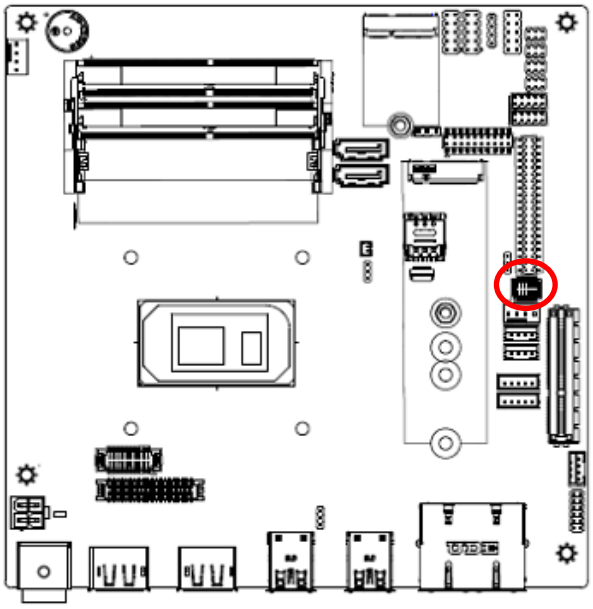
Signal	PIN	PIN	Signal
GND	10		
GND	8	7	USB_R_DP5
USB_R_DP6	6	5	USB_R_DN5
USB_R_DN6	4	3	+V5A_USB56
+V5A_USB56	2	1	+V5A_USB56

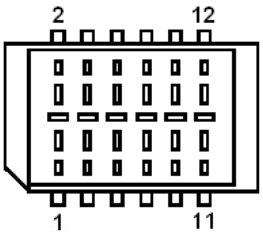
2.6.18 Speaker connector (JSPK1)



Signal	PIN
AMP_ LOUT+	1
AMP_ LOUT-	2
AMP_ ROUT+	3
AMP_ ROUT-	4

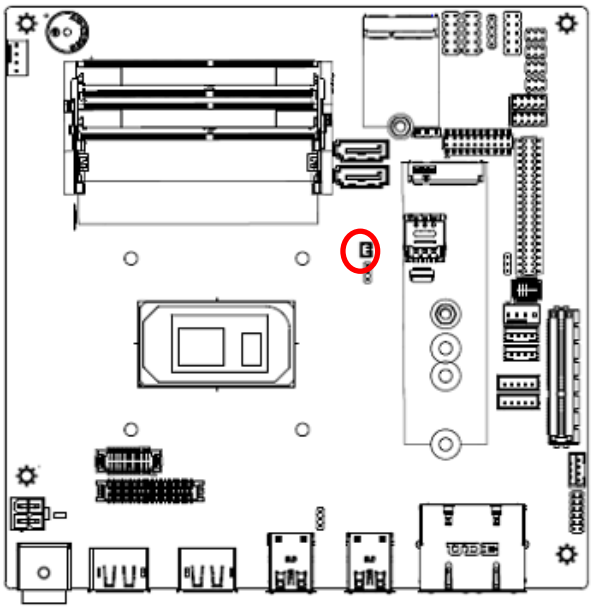
2.6.19 SPI connector (JESPI1)





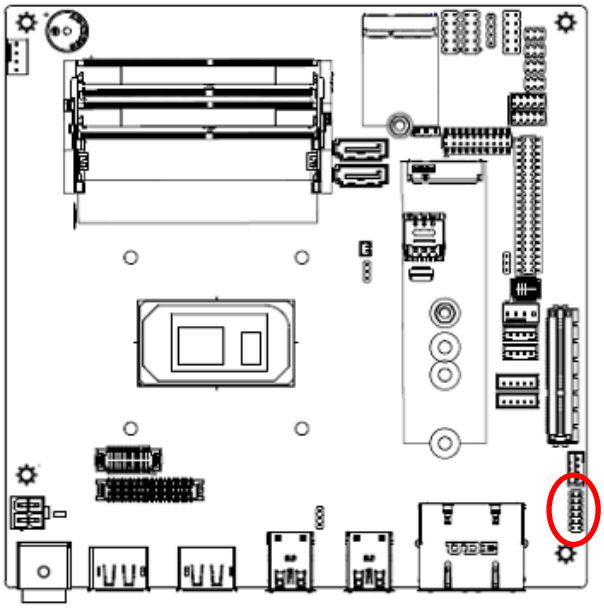
Signal	PIN	PIN	Signal
eSPI_CON_IO0	1	2	+3.3V_ESPI
eSPI_CON_IO1	3	4	PCH_PLT_RST#
eSPI_CON_IO2	5	6	eSPI_CON_CS#
eSPI_CON_IO3	7	8	eSPI_CON_CLK
NC	9	10	GND
eSPI_CON_RST#	11	12	NC

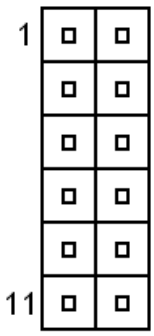
2.6.20 Battery connector (JBAT1)



PIN	Signal
2	GND
1	+RTCBAT

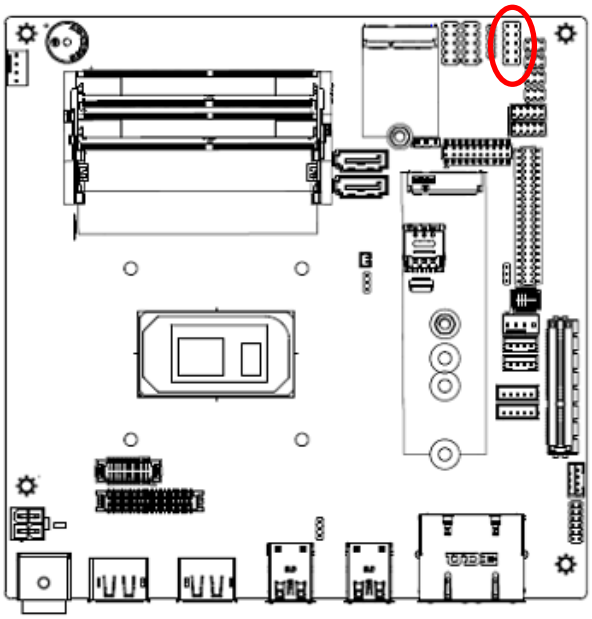
2.6.21 Front Audio connector (JAUDIO1)

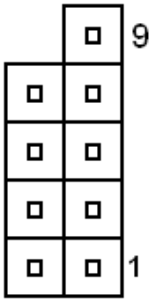




Signal	PIN	PIN	Signal
FRONT-R-OUT	1	2	FRONT-L-OUT
HD_AGND	3	4	HD_AGND
LINE1_R_IN	5	6	LINE1_L_IN
MIC1_R_IN	7	8	MIC1_L_IN
FRONT-JD	9	10	LINE1-JD
MIC1_JD	11	12	HD_AGND

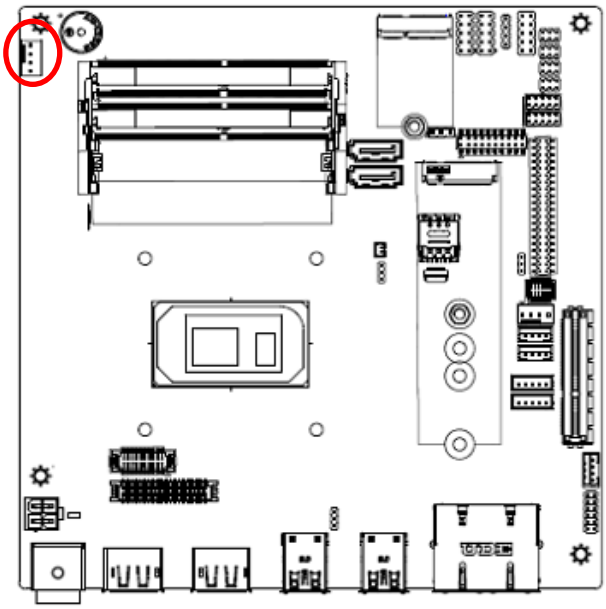
2.6.22 Miscellaneous setting connector (JFP1)

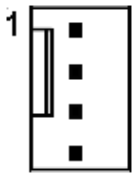




Signal	PIN	PIN	Signal
		9	NC
-PWR_BNT	8	7	-Reset
+PWR_BNT	6	5	+Reset
-PWR_LED	4	3	-HD_LED
+PWR_LED	2	1	+HD_LED

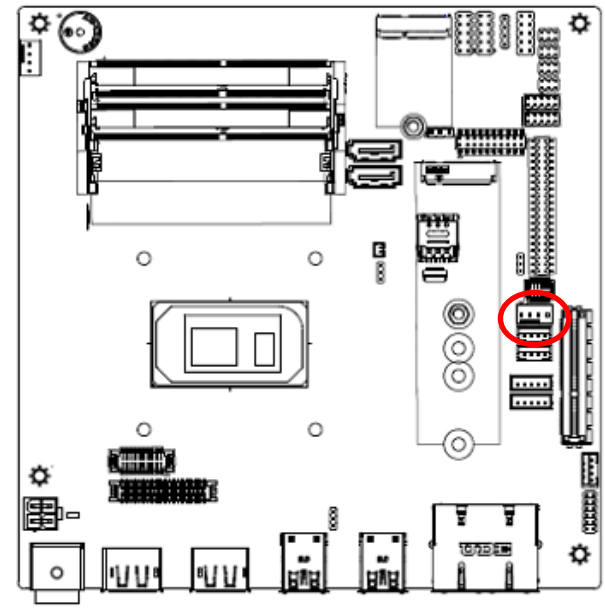
2.6.23 CPU fan connector (CPU_FAN1)

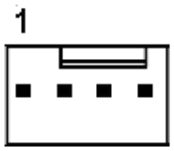




Signal	PIN
GND	1
+12V	2
CPUFAN_IN	3
CPUFAN_OUT	4

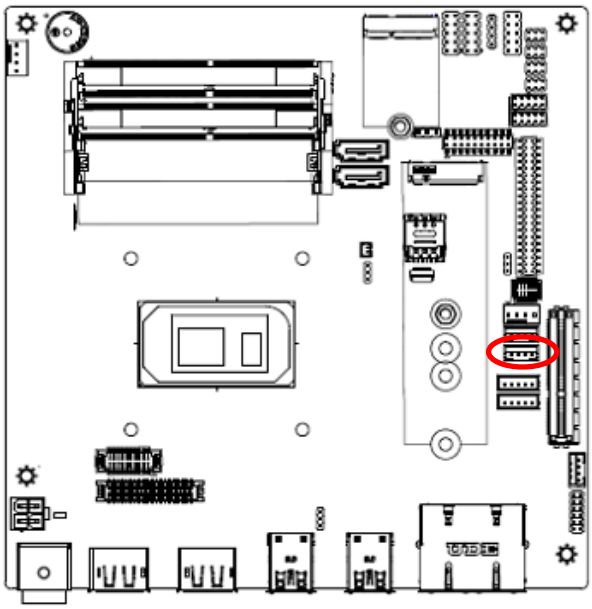
2.6.24 SYS fan connector (JS_FAN1)

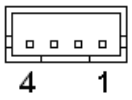




Signal	PIN
GND	1
+12V	2
SYSFAN_IN	3
SYSFAN_OUT	4

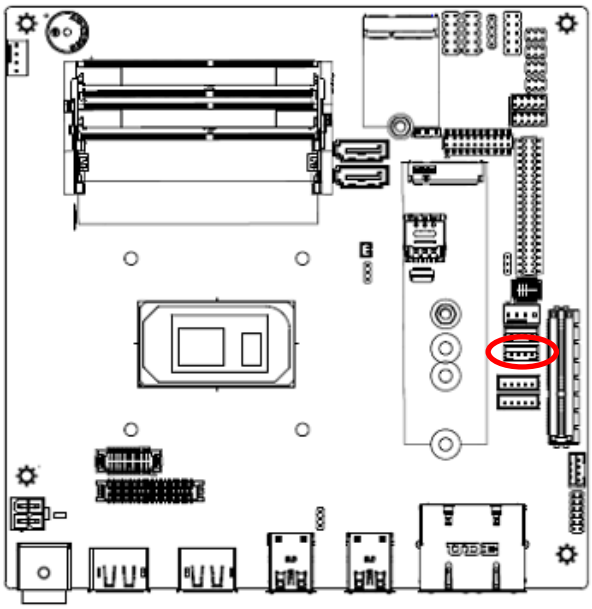
2.6.25 JSATAP connector (JSATAP1)

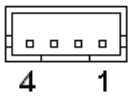




Signal	PIN
+5V	1
GND	2
GND	3
+12V	4

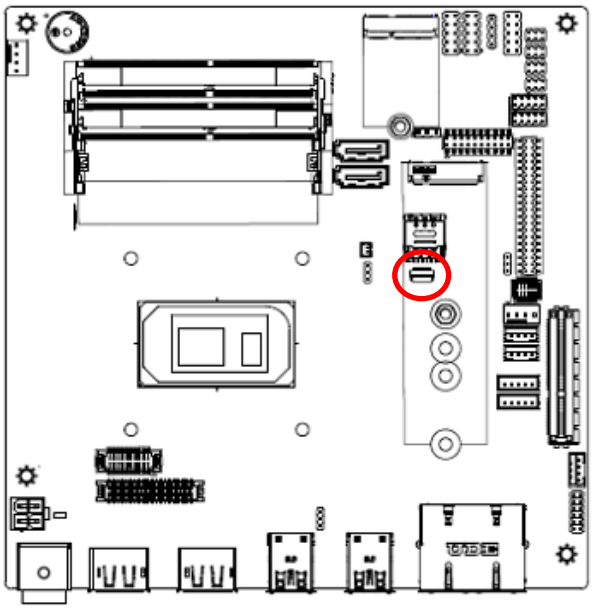
2.6.26 JSATAP connector (JSATAP2)

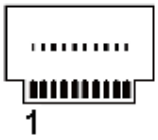




Signal	PIN
+5V	1
GND	2
GND	3
+12V	4

2.6.27 USIM connector (JN_SIM1)



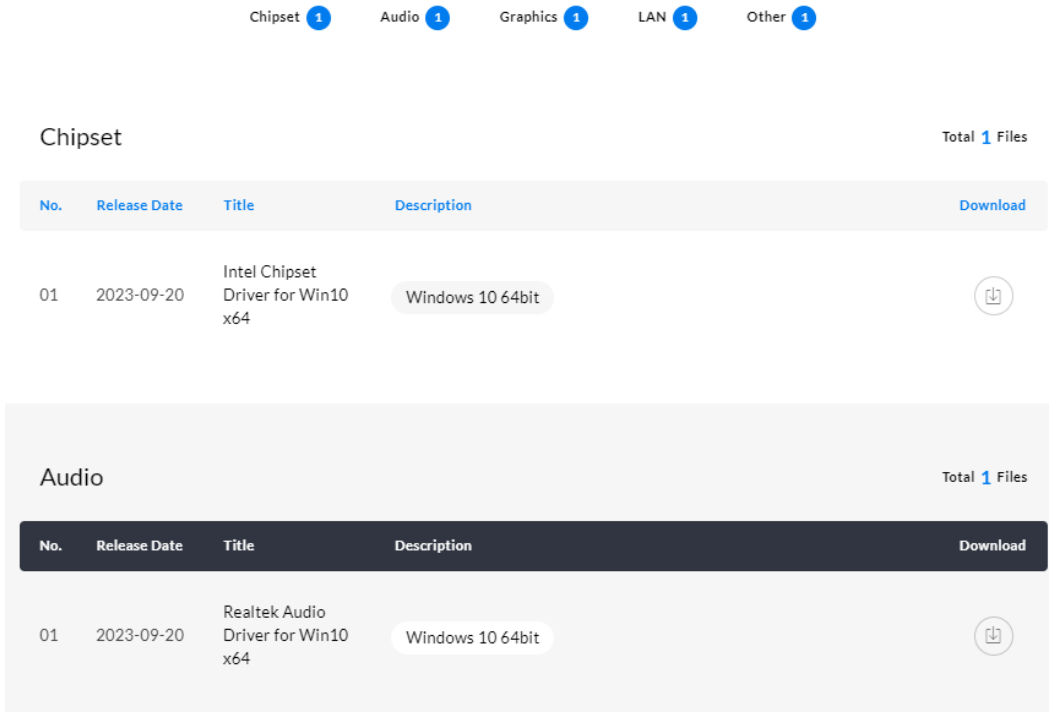


Signal	PIN
+VCC_SIM	1
GND	2
UIM_RESET#	3
+VPP_SIM_1	4
GND	5
UIM_CLK_R	6
UIM_DATA_R	7
GND	8
N_SIM_CD_R	9
NC	10

3. Drivers Installation

All the drivers are available on Avalue Downloads Area (**https://www.avaluetech.com/en/support/download**). Type the model name and press Enter to find all the relevant software, utilities, and documentation.

Note:
The panel PC with projected capacitive type touchscreen and Windows 7 (or later) OS does not require touch driver installation. This is because there is a HID touch digitizer built-in driver in Windows 7 or later.



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.

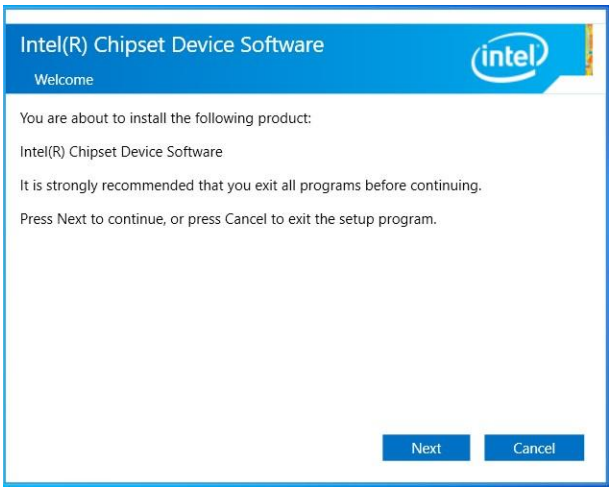
3.1 Install Chipset Driver

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

Step 3. Click **Install**.



Step1. Click **Next**.

Step 4. Complete setup.

Step 2. Click **Accept**.

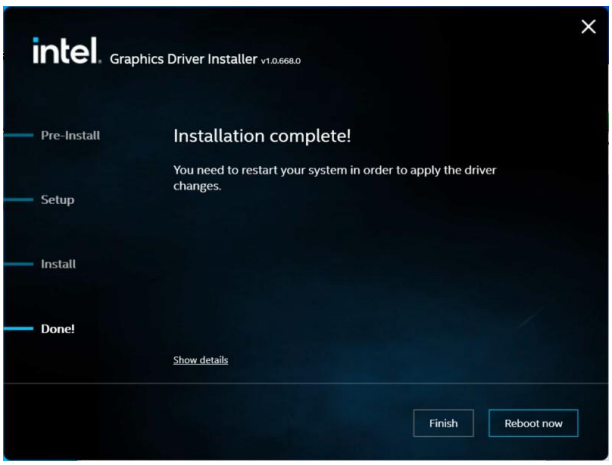
3.2 Install VGA Driver

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

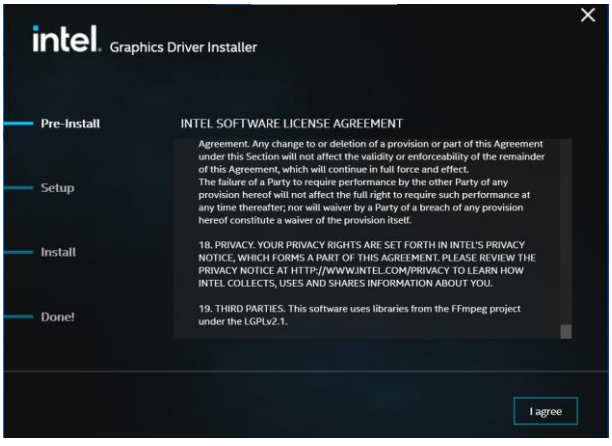
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system. If the warning message appears while the installation process, click Continue to go on.

Step 3. Click **Start.**

Step 1. Click **Begin installation**.



Step 4. Click **Reboot now.**



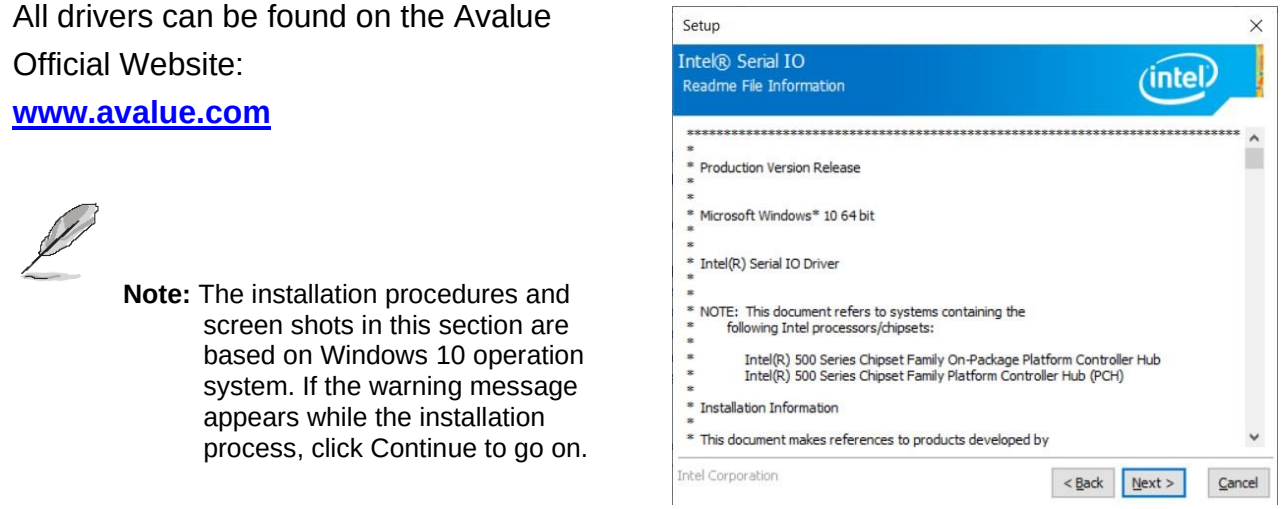
Step 2.
Click **Next** to accept license agreement.

3.3 Install Serial IO Driver

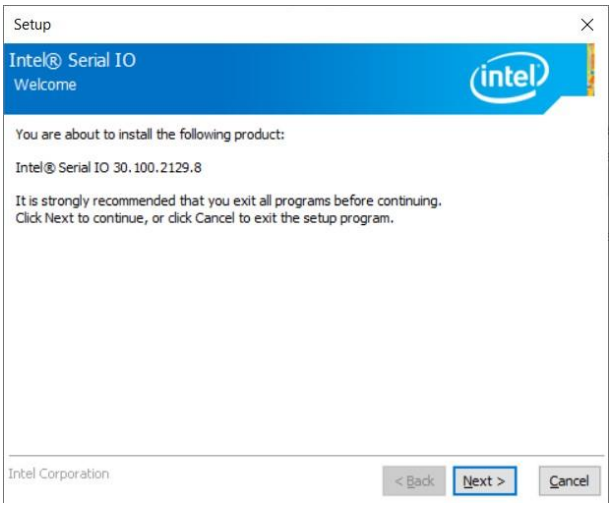
All drivers can be found on the Avalue Official Website:

www.avalue.com

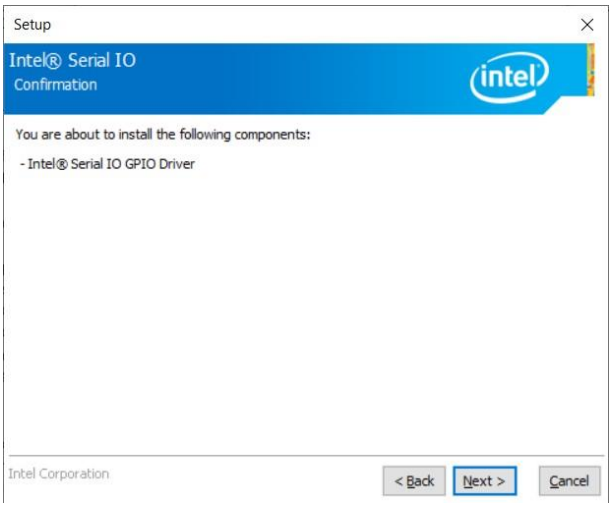
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system. If the warning message appears while the installation process, click Continue to go on.



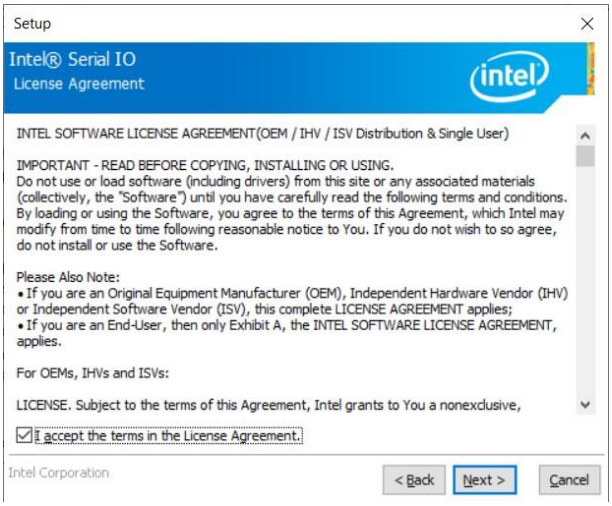
Step 3. Click **Next**.



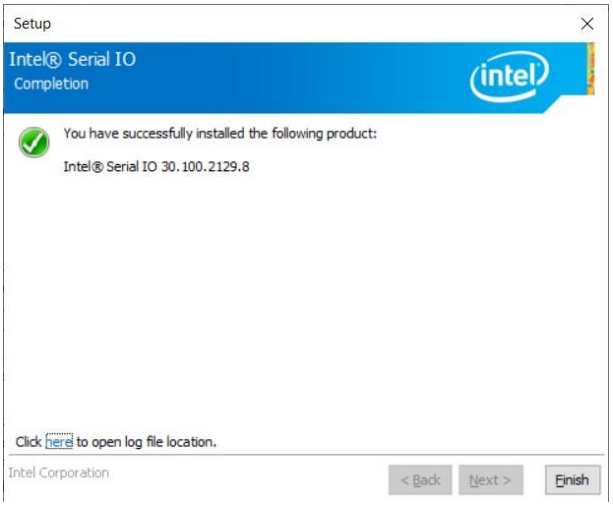
Step 1. Click **Next** to continue setup.



Step 4. Click **Next**.



Step 2. Click **Next**.



Step 5.

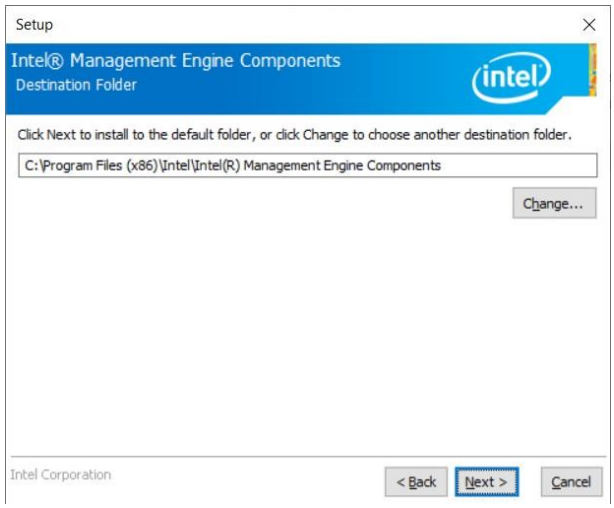
Click **Finish** to complete the setup.

3.4 Install ME Driver

All drivers can be found on the Avalue Official Website:

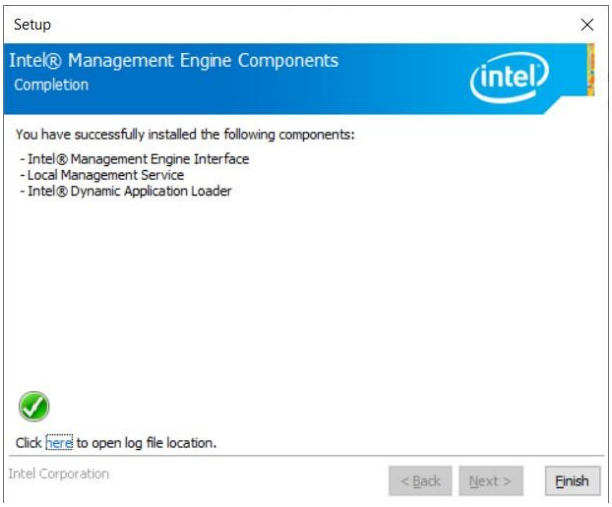
www.avalue.com

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

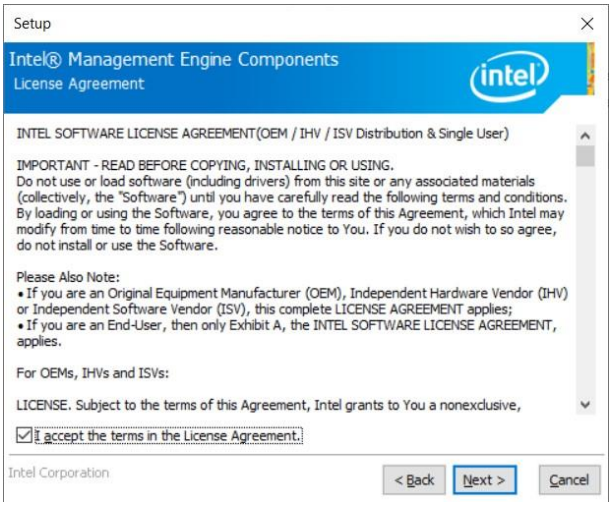


Step 3. Click **Next**.

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



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

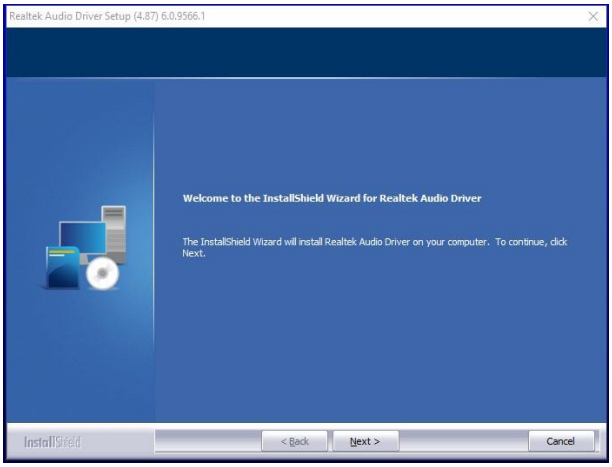


Step 2. Click **Next**.

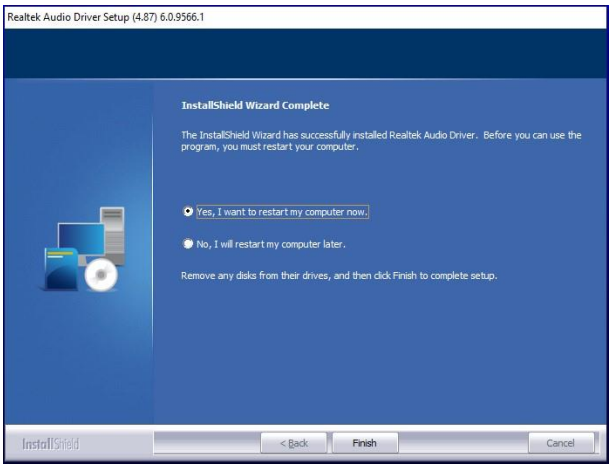
3.5 Install Audio Driver (For Realtek ALC897 and ALC888S HD Audio)

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



Step1. Click **Next** to Install.

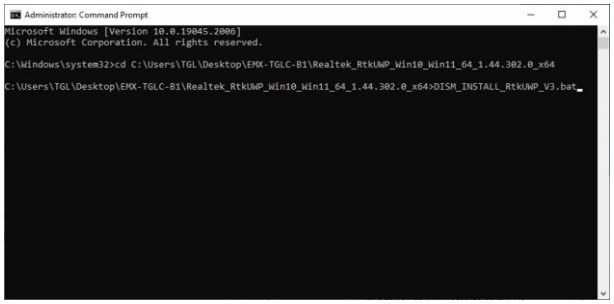


Step 2. Click **Finish** to complete setup.

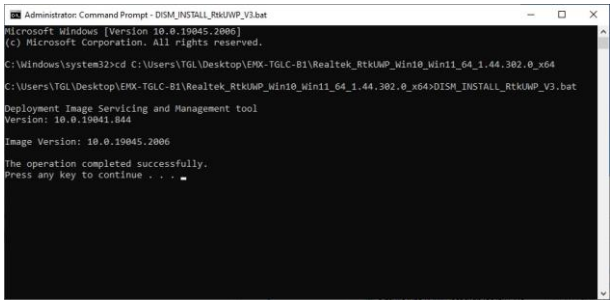
3.6 Realtek Audio Console

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.



Step1.



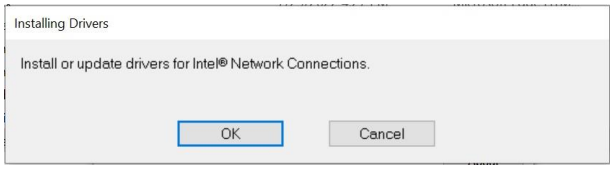
Step 2.

3.7 Install LAN Driver

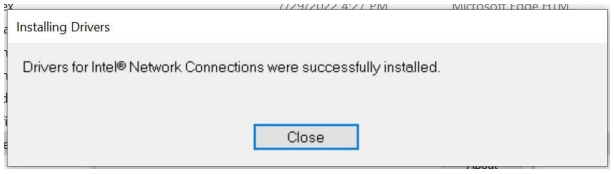
All drivers can be found on the Avalue Official Website:

www.avalue.com

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



Step1. Click **OK.**



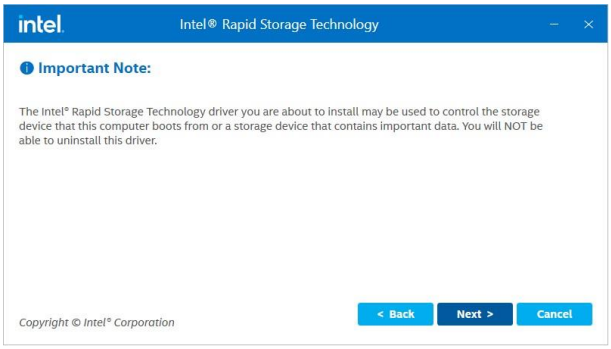
Step 2. Click **Close**.

3.8 Install RST for RAID Driver

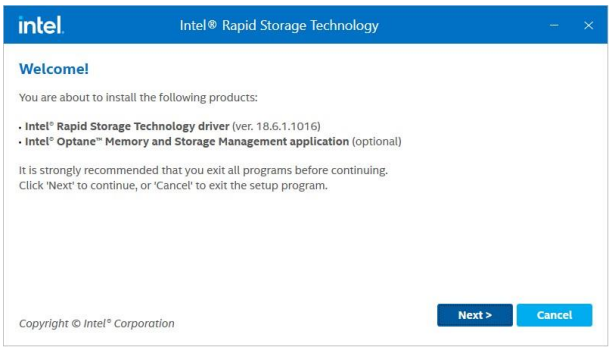
All drivers can be found on the Avalue Official Website:

www.avalue.com

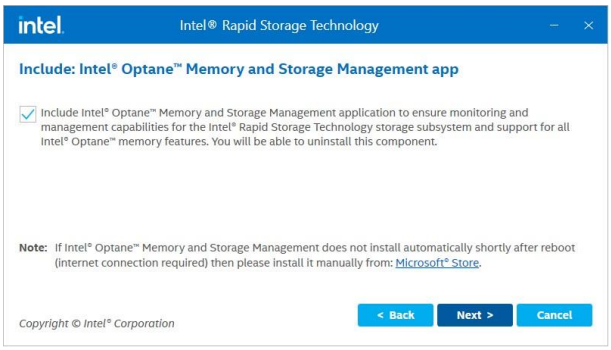
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system. If the warning message appears while the installation process, click Continue to go on.



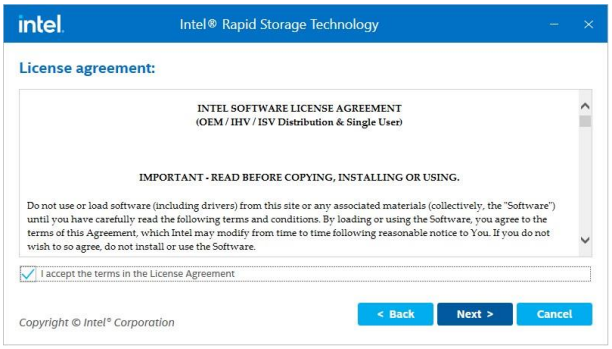
Step 3. Click **Next**.



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



Step 4. Click **Next**.



Step 2. Click **Next**.

Step 5. Complete setup.

4.BIOS Setup

4.1 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.

4.2 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

4.3 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.

4.4 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.

4.5 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.

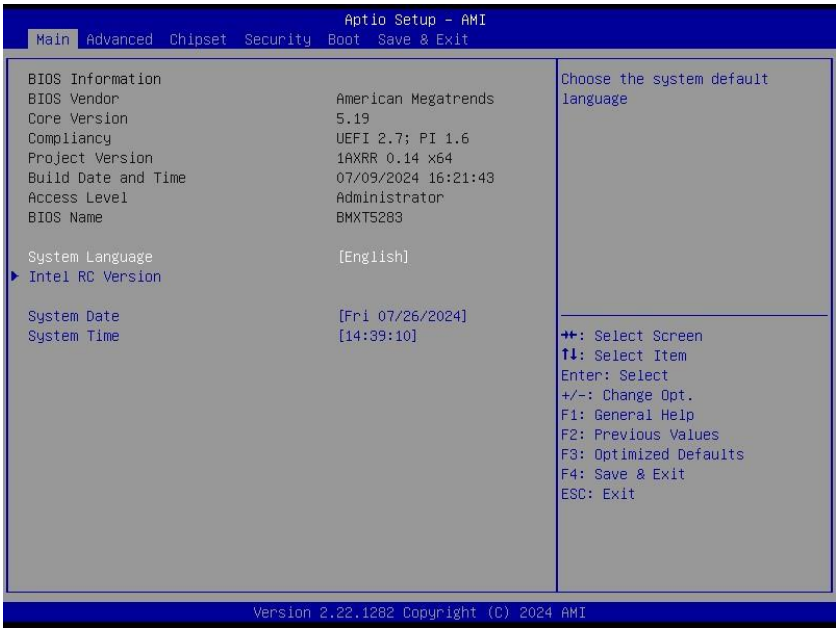
The best advice is to only alter settings which you thoroughly understand. To this end, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both BIOS Vendor and your systems manufacturer to provide the absolute maximum performance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

4.6 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.

4.6.1 Main Menu

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



4.6.1.1 System Language

This option allows choosing the system default language.

4.6.1.2 System Date

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

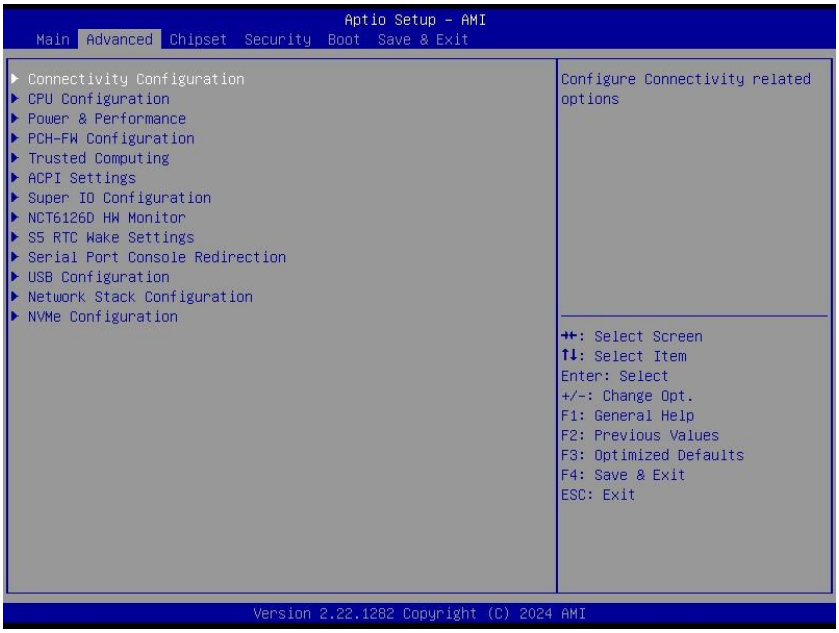
4.6.1.3 System Time

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) to download the latest product and BIOS information.

4.6.2 Advanced Menu

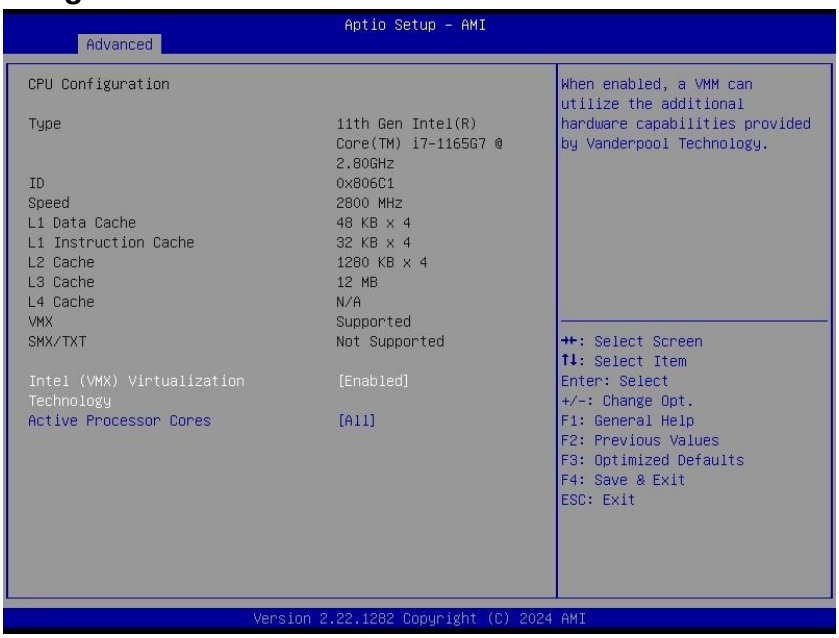
This section allows you to configure your CPU and other system devices for basic operation through the following sub-menus.



4.6.2.1 Connectivity Configuration

Item	Options	Description
CNVi Mode	Disable Integrated**[Default]** Auto Detection	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

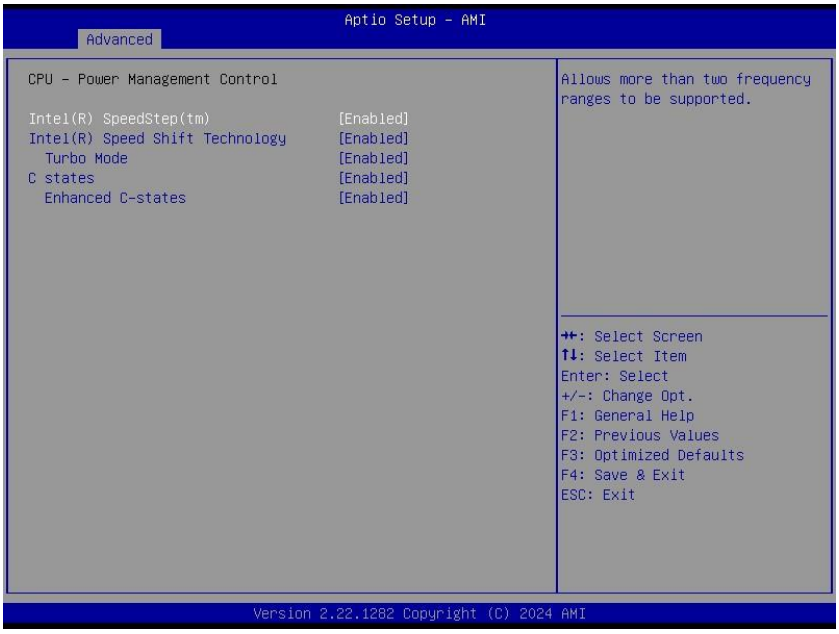
4.6.2.2 CPU Configuration



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]**, 1/2/3	Number of cores to enable in each processor package.

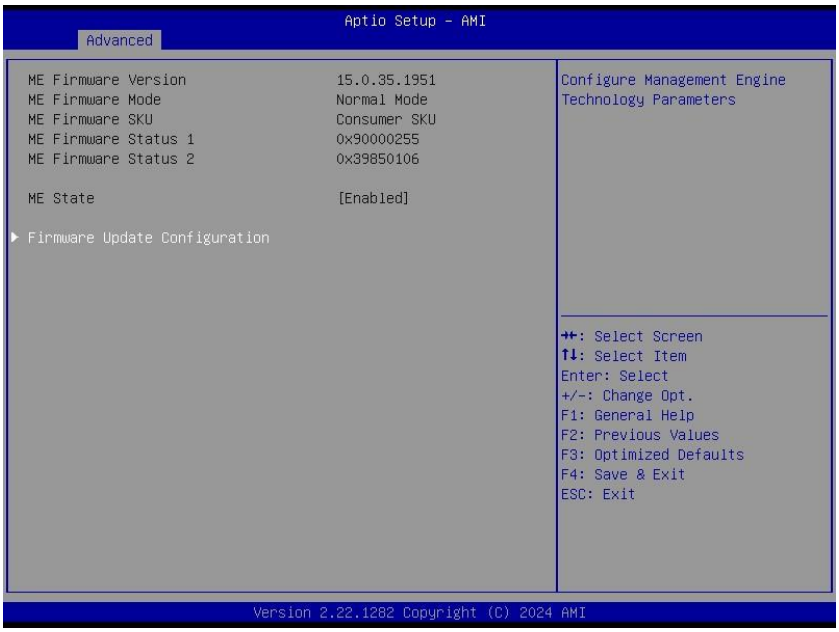
4.6.2.3 Power & Performance

4.6.2.3.1 CPU - Power Management Control

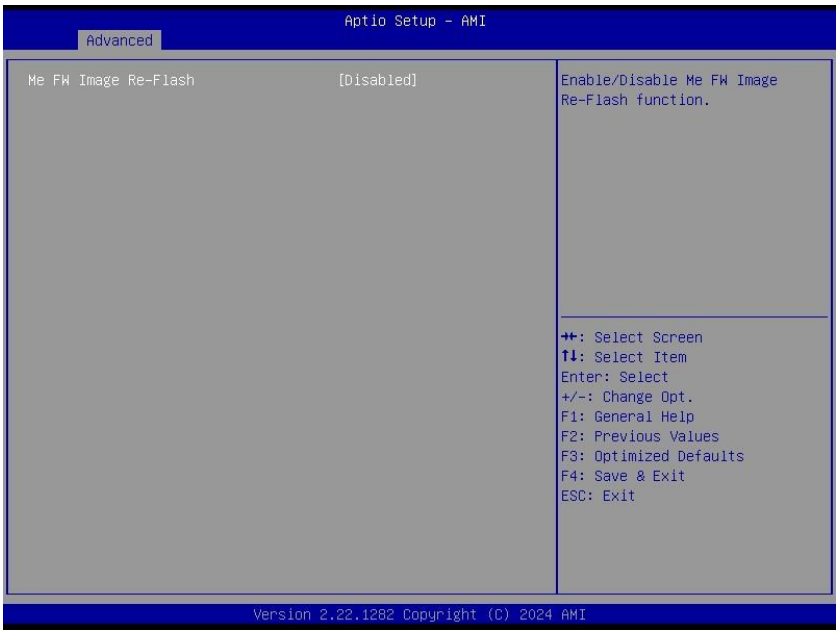


Item	Options	Description
Intel(R) SpeedStep(tm)	Disabled Enabled**[Default]**,	Allows more than two frequency ranges to be supported.
Intel(R) Speed Shift Technology	Disabled Enabled**[Default]**,	Enable/Disable Intel(R) Speed Shift Technology support. Enabling will expose the CPPC v2 interface to allow 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.

4.6.2.4 PCH-FW Configuration

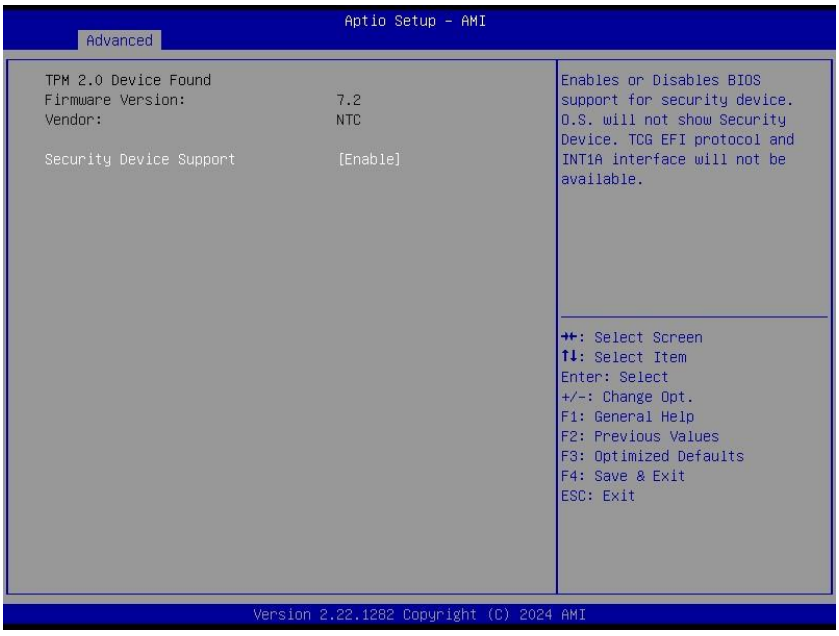


4.6.2.4.1 Firmware Update Configuration



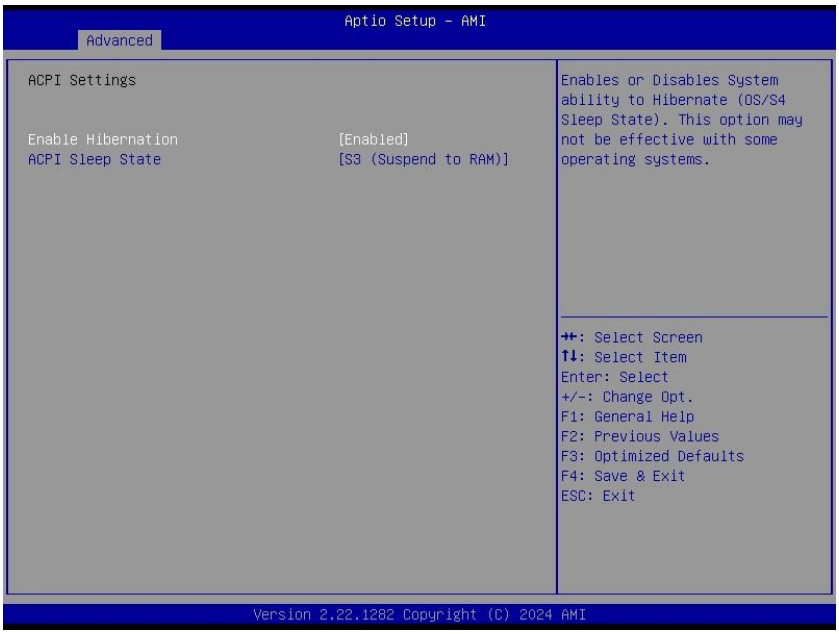
Item	Options	Description
Me FW Image Re-Flash	Disabled**[Default]**, Enabled	Enable/Disable Me FW Image Re-Flash function.

4.6.2.5 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.

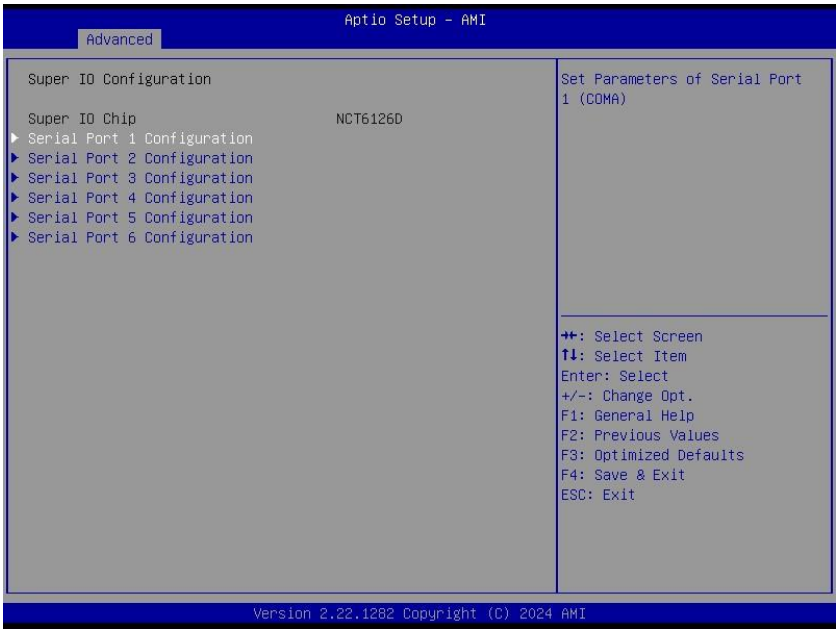
4.6.2.6 ACPI Settings



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.

4.6.2.7 Super IO Configuration

You can use this item to set up or change the IT8528 Super IO configuration for serial ports. Please refer to 4.6.2.7.1~ 4.6.2.7.6 for more information.

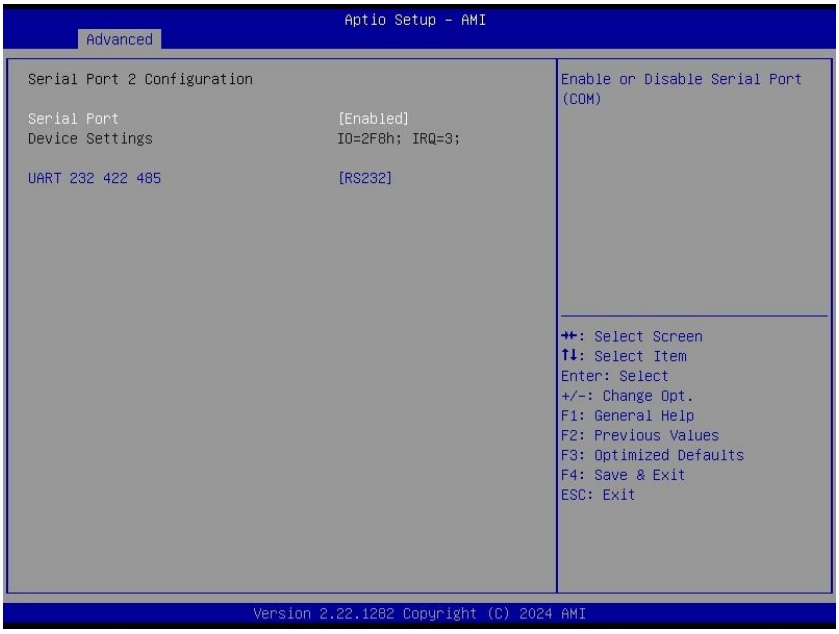


Item	Description
Serial Port 1 Configuration	Set Parameters of Serial Port 1 (COMA).
Serial Port 2 Configuration	Set Parameters of Serial Port 2 (COMB).
Serial Port 3 Configuration	Set Parameters of Serial Port 3 (COMC).
Serial Port 4 Configuration	Set Parameters of Serial Port 4 (COMD).
Serial Port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

4.6.2.7.1 Serial Port 1 Configuration

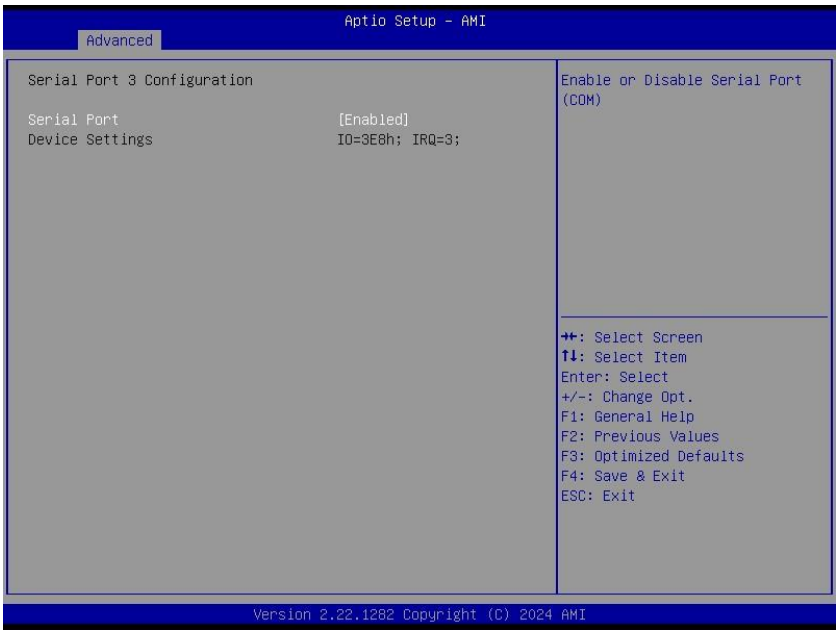
Item	Option	Description
Serial Port	Disabled Enabled**[Default]**,	Enable or Disable Serial Port (COM).
UART 232 422 485	UART 232**[Default]**, UART 422, UART 485	Change the Serial Port as RS232/422/485.

4.6.2.7.2 Serial Port 2 Configuration



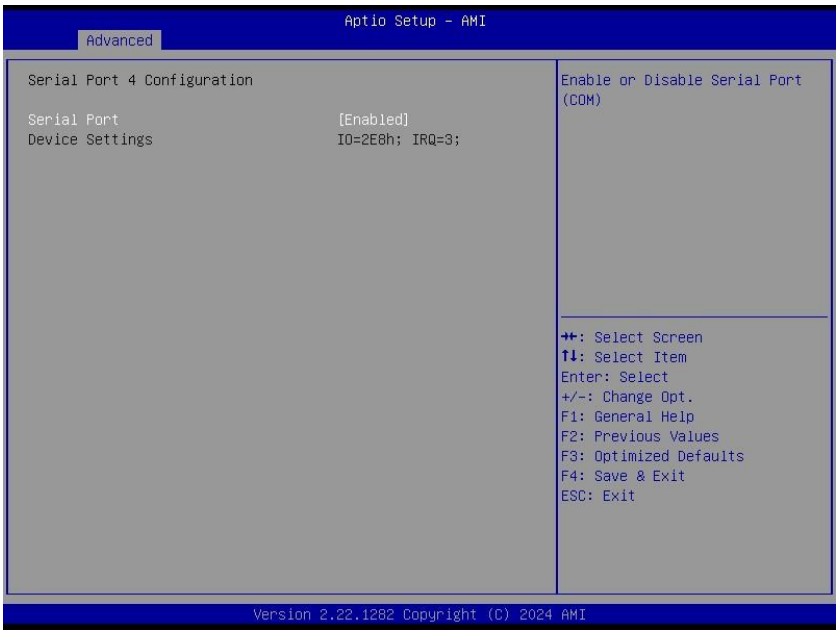
Item	Option	Description
Serial Port	Disabled Enabled**[Default]**,	Enable or Disable Serial Port (COM).
UART 232 422 485	UART 232**[Default]**, UART 422, UART 485	Change the Serial Port as RS232/422/485.

4.6.2.7.3 Serial Port 3 Configuration



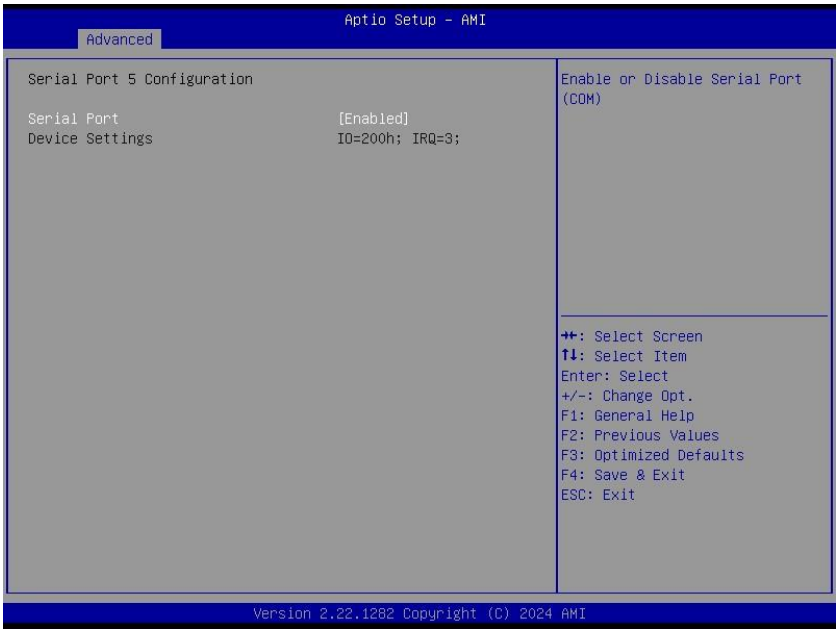
Item	Option	Description
Serial Port	Disabled Enabled**[Default]**,	Enable or Disable Serial Port (COM).

4.6.2.7.4 Serial Port 4 Configuration



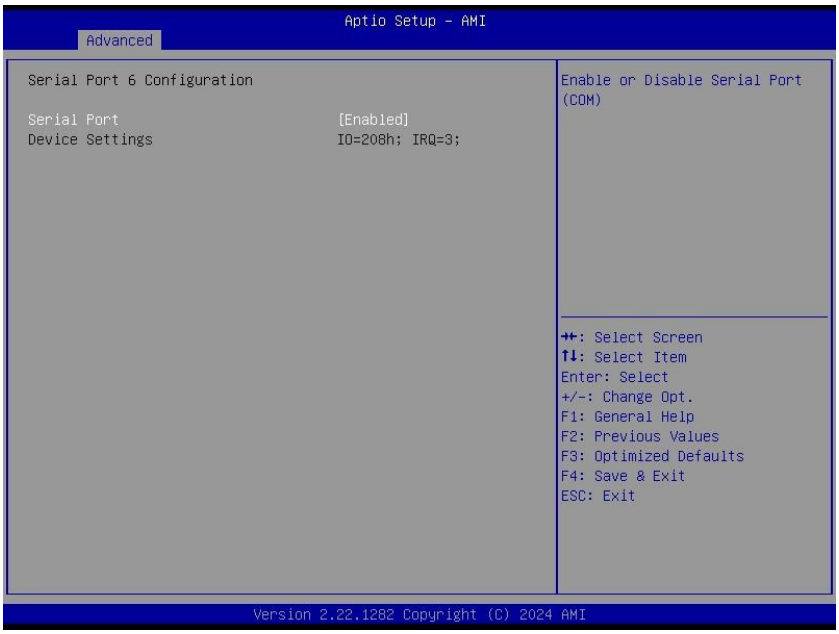
Item	Option	Description
Serial Port	Disabled Enabled**[Default]**,	Enable or Disable Serial Port (COM).

4.6.2.7.5 Serial Port 5 Configuration



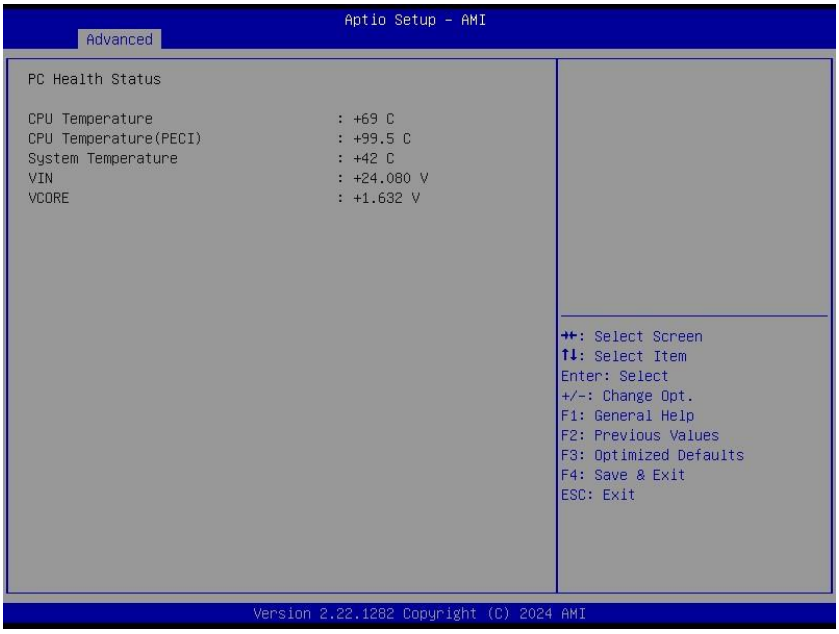
Item	Option	Description
Serial Port	Disabled Enabled**[Default]**,	Enable or Disable Serial Port (COM).

4.6.2.7.6 Serial Port 6 Configuration



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

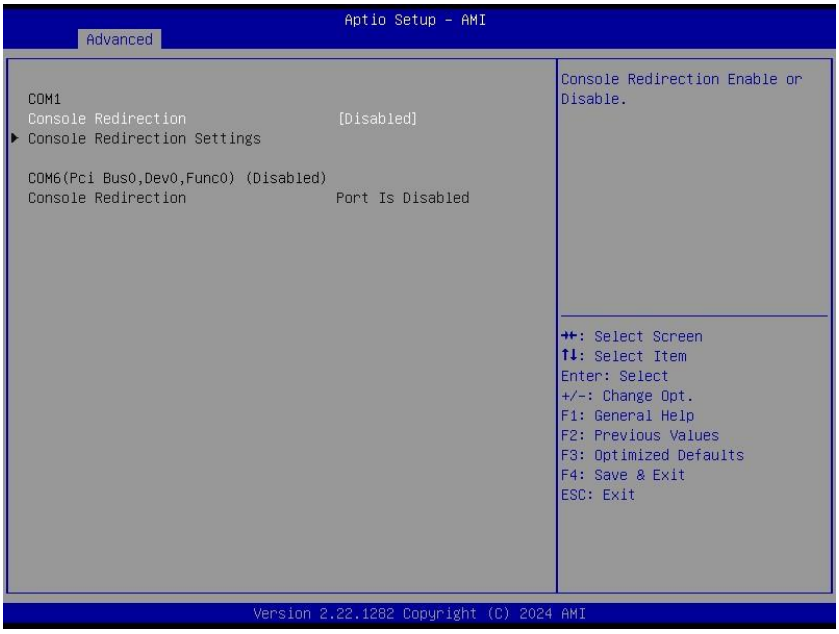
4.6.2.8 NCT6126D HW Monitor



4.6.2.9 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).

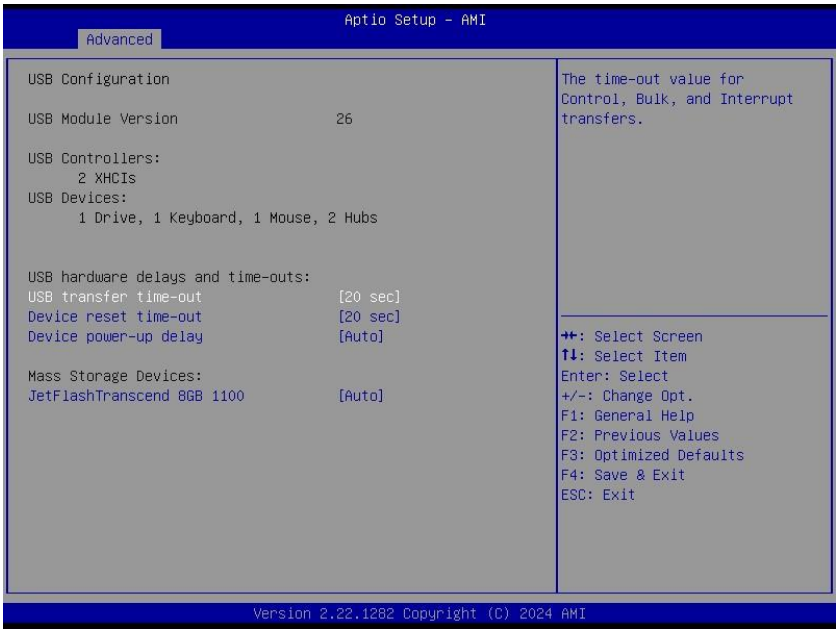
4.6.2.10 Serial Port Console Redirection



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

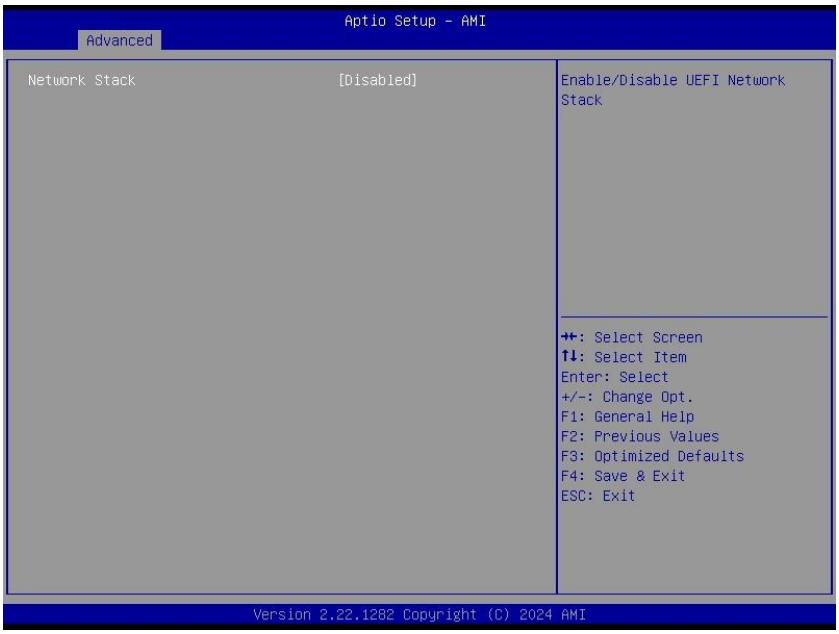
4.6.2.11 USB Configuration

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



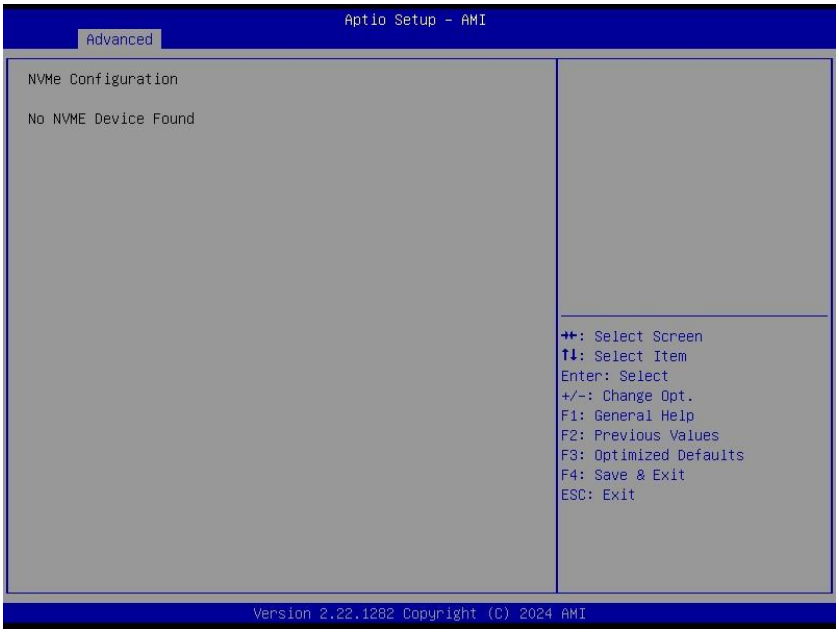
Item	Option	Description
USB transfer time-out	1 sec 5 sec 10 sec 20 sec**[Default]**	The time-out value for Control, Bulk, and Interrupt transfers.
Device reset time-out	10 sec 20 sec**[Default]** 30 sec 40 sec	USB mass storage device Start Unit command time-out.
Device power-up delay	Auto**[Default]**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

4.6.2.12 Network Stack Configuration

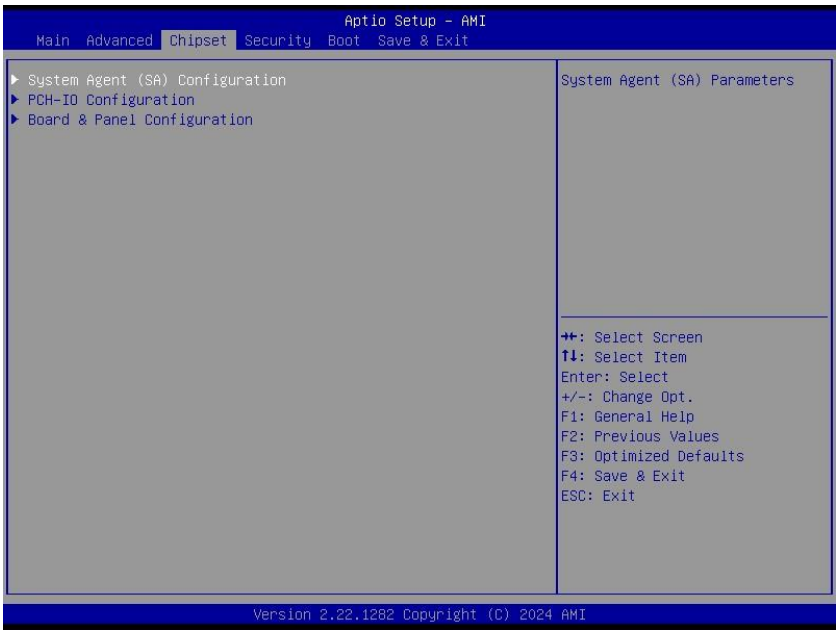


Item	Option	Description
Network Stack	Enabled Disabled**[Default]**	Enable/Disable UEFI Network Stack.

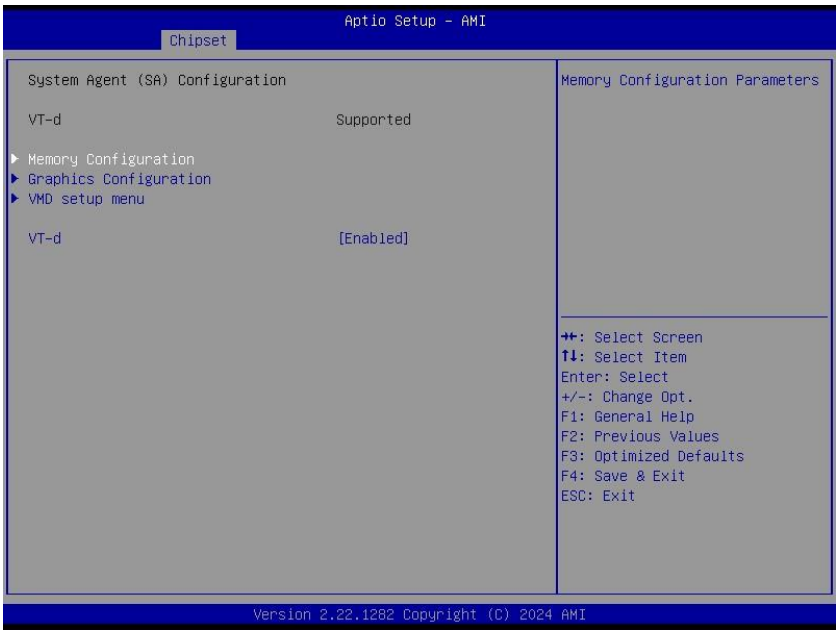
4.6.2.13 NVMe Configuration



4.6.3 Chipset

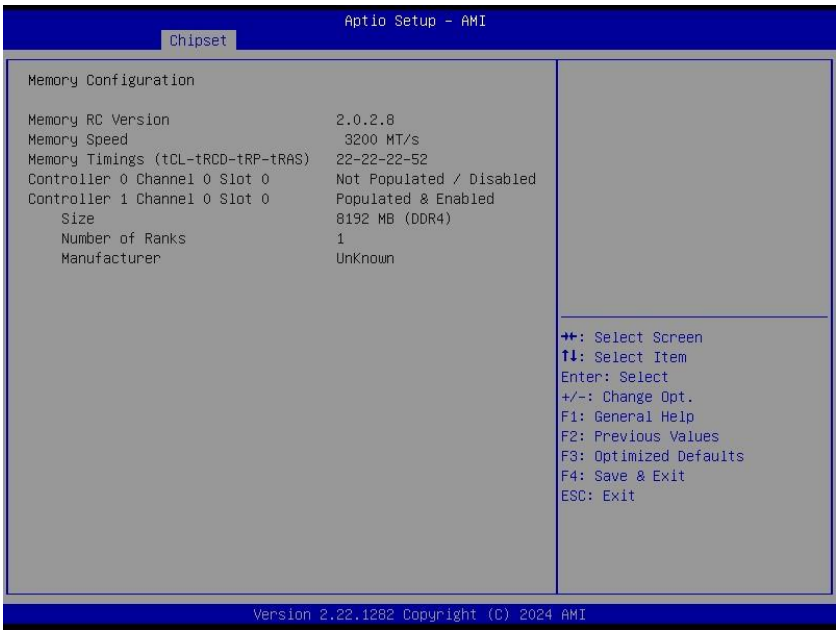


4.6.3.1 System Agent (SA) Configuration

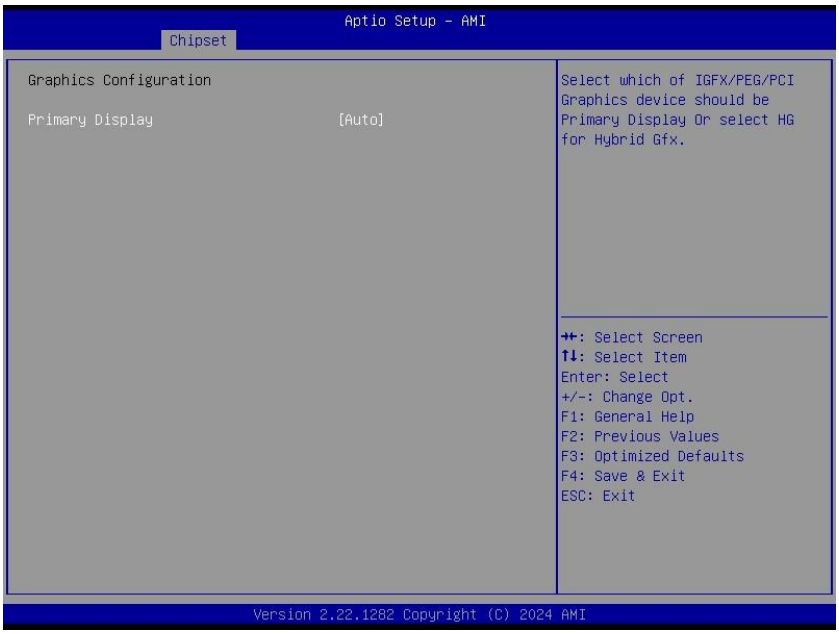


Item	Option	Description
VT-d	Disabled Enabled**[Default]**	VT-d capability.

4.6.3.1.1 Memory Configuration



4.6.3.1.2 Graphics Configuration



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

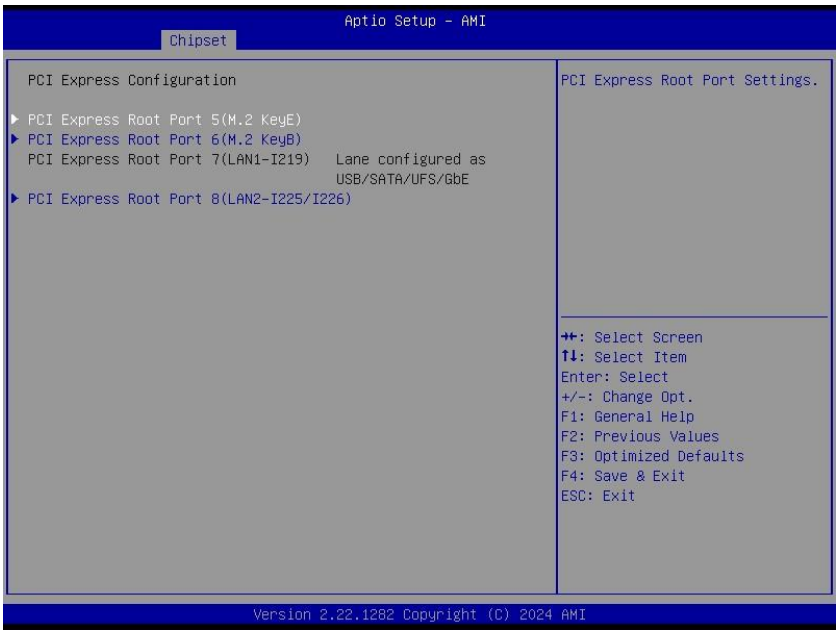
4.6.3.1.3 VMD Configuration

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

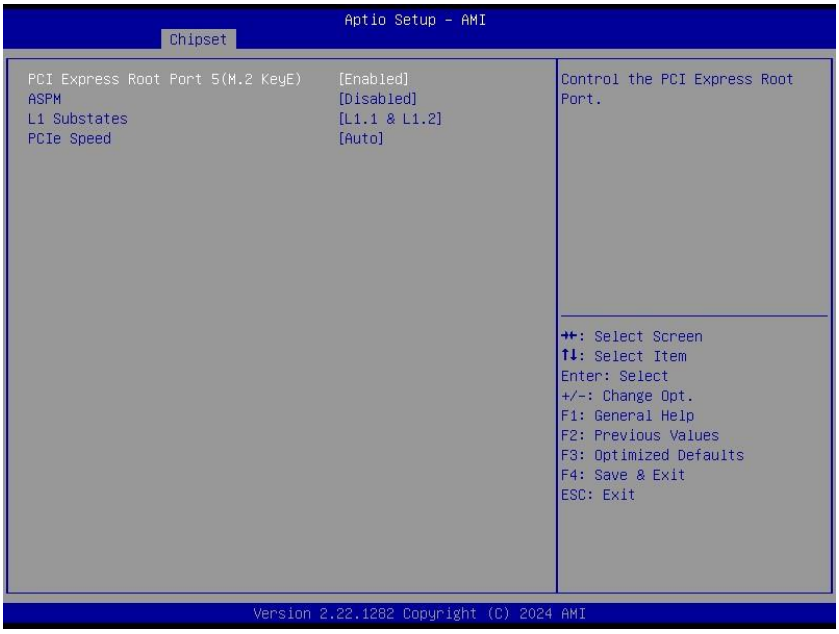
4.6.3.2 PCH-IO Configuration

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

4.6.3.2.1 PCI Express Configuration



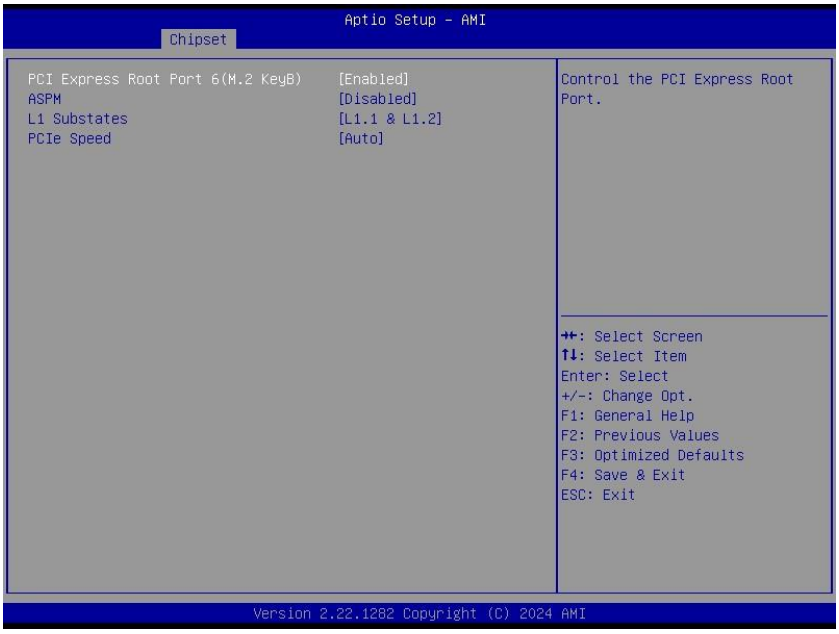
4.6.3.2.1.1 PCI Express Root Port 5(M.2 KeyE)



Item	Option	Description
PCI Express Root Port 5 (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.

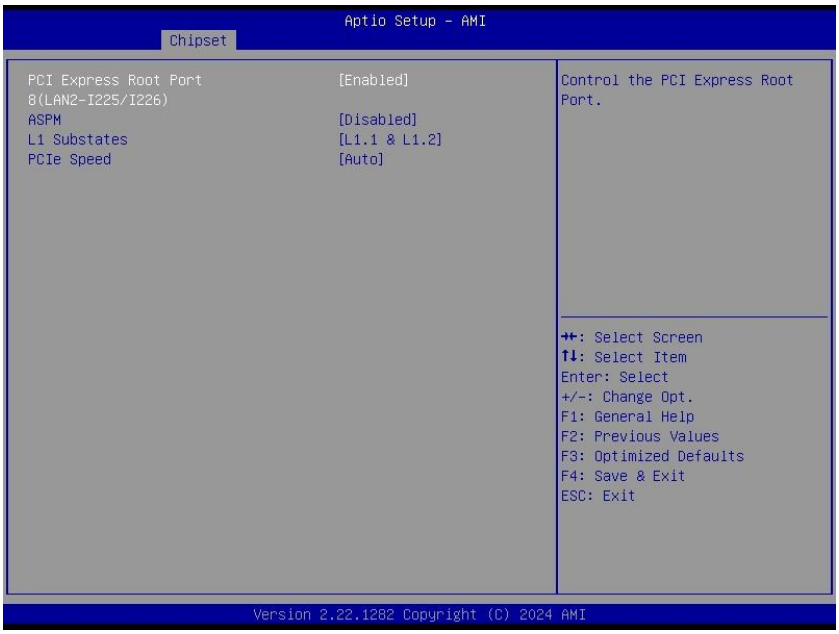
L1 Substates	Disabled L1.1 L1.1 & L1.2**[Default]**,	PCI Express L1 Substates settings.
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3	Select PCIe speed.

4.6.3.2.1.2 PCI Express Root Port 6(M.2 KeyB)



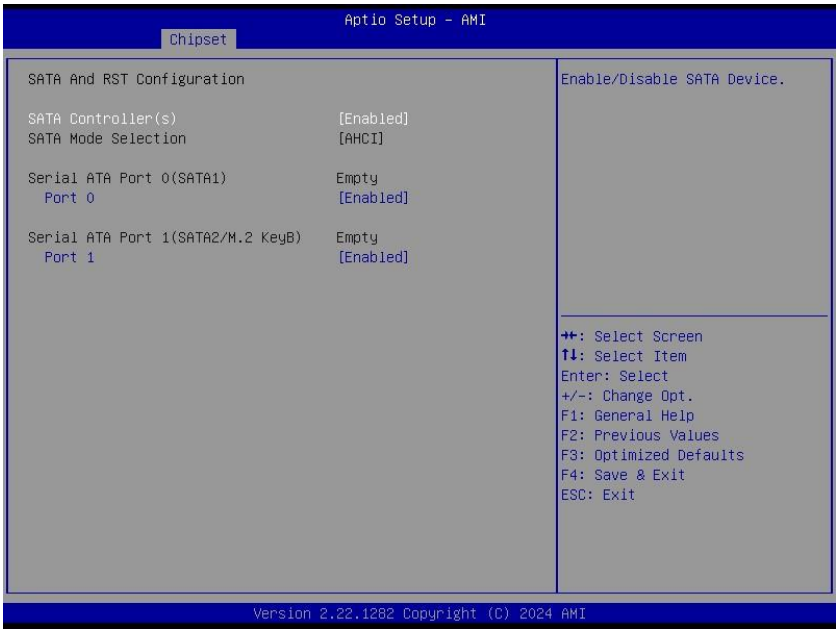
Item	Option	Description
PCI Express Root Port 6 (M.2 KeyB)	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM	Disabled**[Default]** L0s L1 L0sL1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled L1.1 L1.1 & L1.2**[Default]**,	PCI Express L1 Substates settings.
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3	Select PCIe speed.

4.6.3.2.1.3 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]** L0s L1 L0sL1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled L1.1 L1.1 & L1.2**[Default]**,	PCI Express L1 Substates settings.
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3	Select PCIe speed.

4.6.3.2.2 SATA And RST Configuration

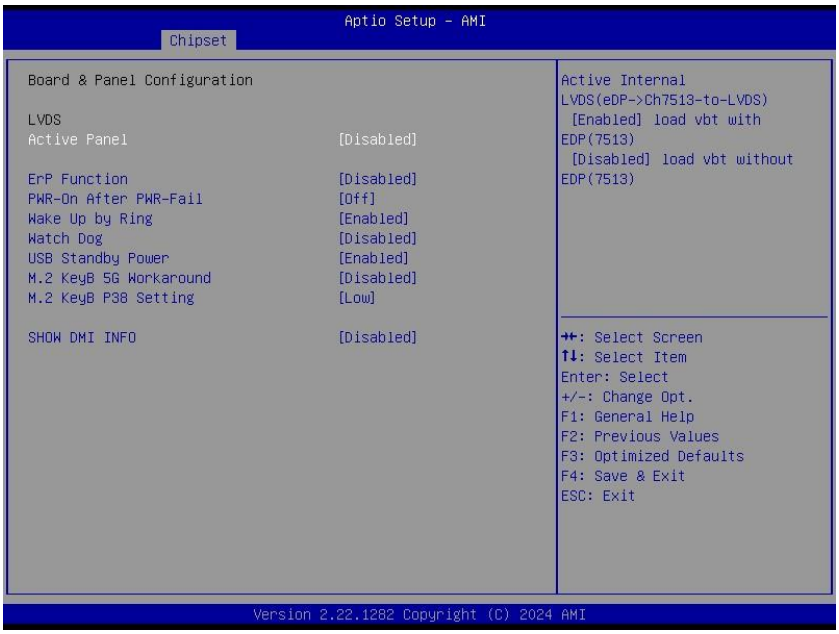


Item	Option	Description
SATA Controller(s)	Disabled Enabled**[Default]**,	Enable/Disable SATA Device.
Port 0/1	Disabled Enabled**[Default]**,	Enable or Disable SATA Port

4.6.3.2.3 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.

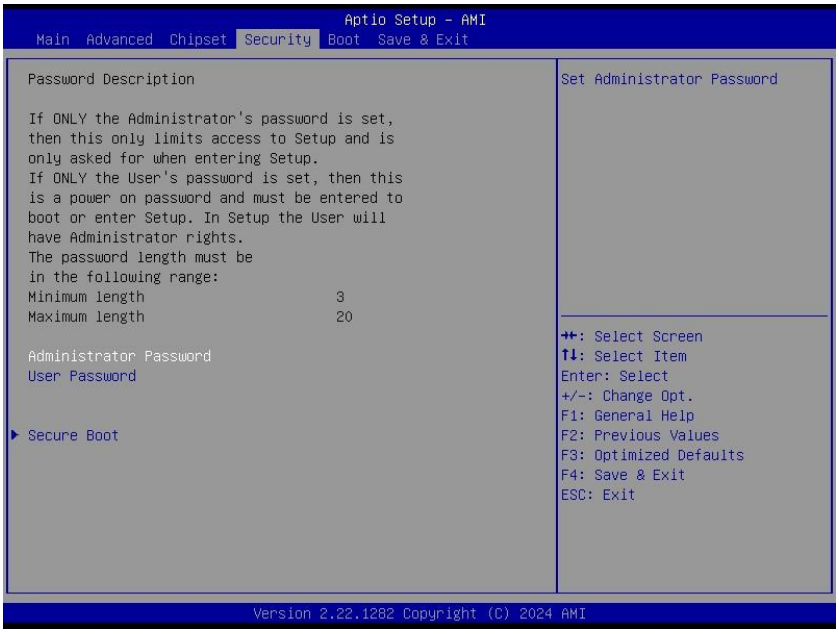
4.6.3.2.4 Board & Panel Configuration



Item	Option	Description
Active Panel	Disabled**[Default]** Enabled	Active Internal LVDS(eDP->Ch7513-to-LVDS) [Enabled] load vbt with EDP(7513) [Disabled] load vbt without EDP(7513)
CH7513 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 7513-eDP	Port1-EDP to LVDS(Chrotel 7513)Panel EDID Option
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	Disabled Enabled**[Default]**,	Enabled/Disabled USB Standby Power during S3/S4/S5
M.2 KeyB 5G Workaround	Disabled**[Default]**, Enabled	Enabled/Disabled M.2 KeyB 5G Workaround
M.2 KeyB P38 Setting	Low**[Default]**, High	Set M.2 KeyB Pin38(DEVSLP) as Low/High
SHOW DMI INFO	Disabled**[Default]**, Enabled	SHOW DMI INFO

4.6.4 Security



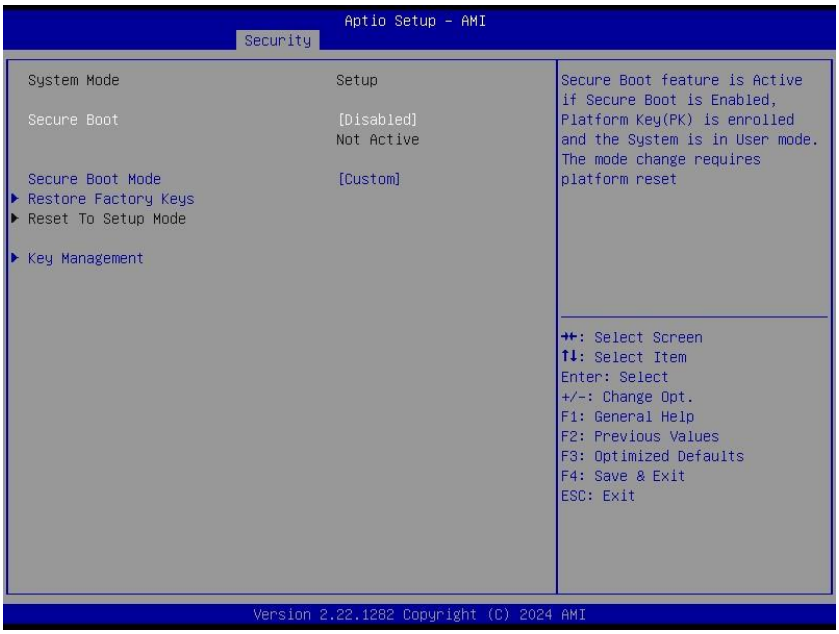
- **Administrator Password**

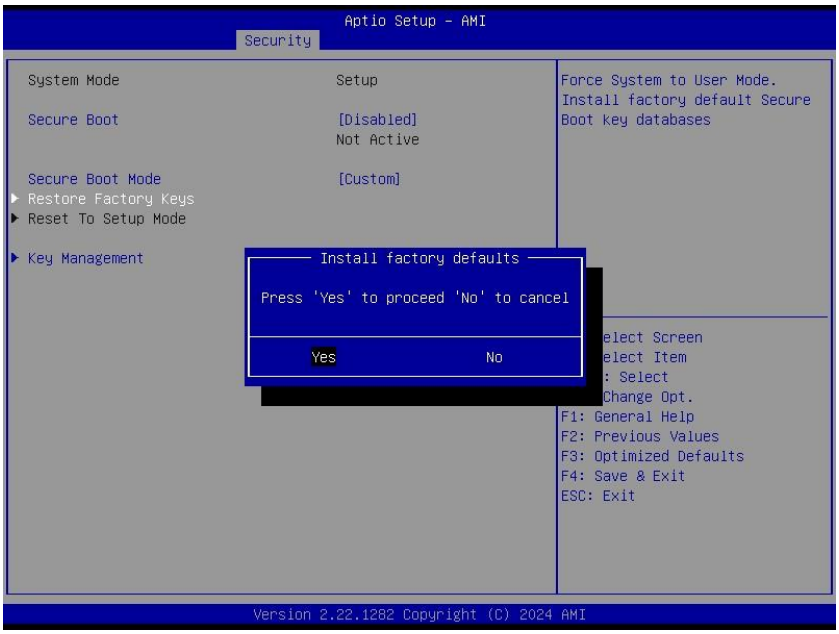
Set setup Administrator Password

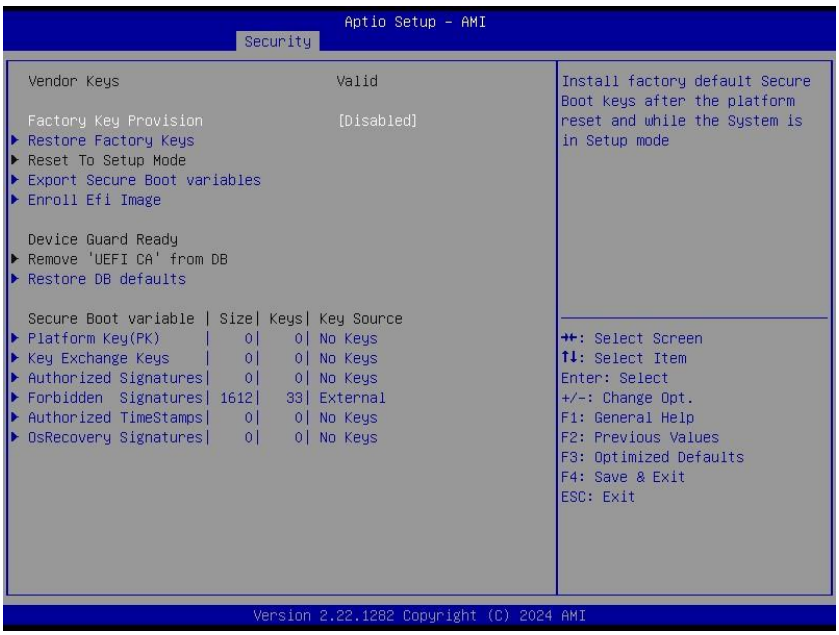
- **User Password**

Set User Password

4.6.4.1 Secure Boot menu

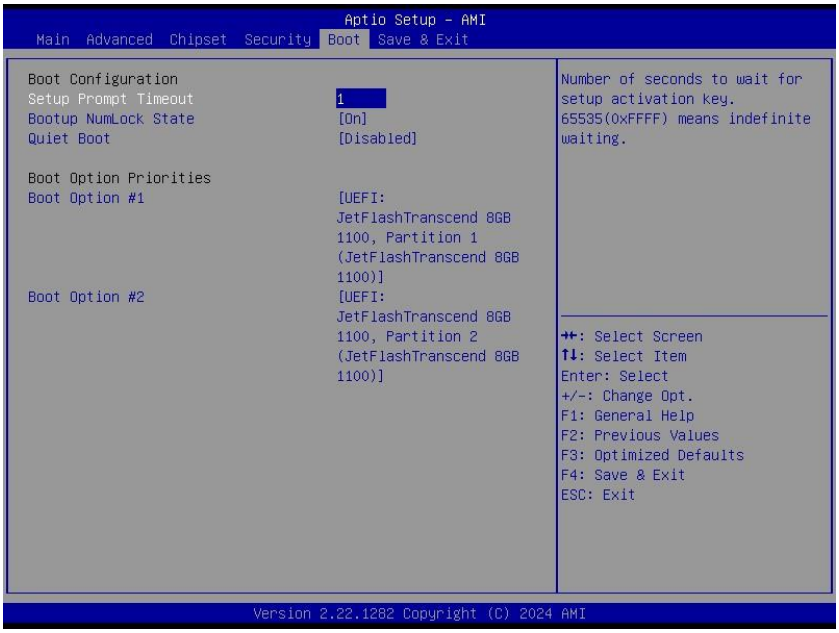






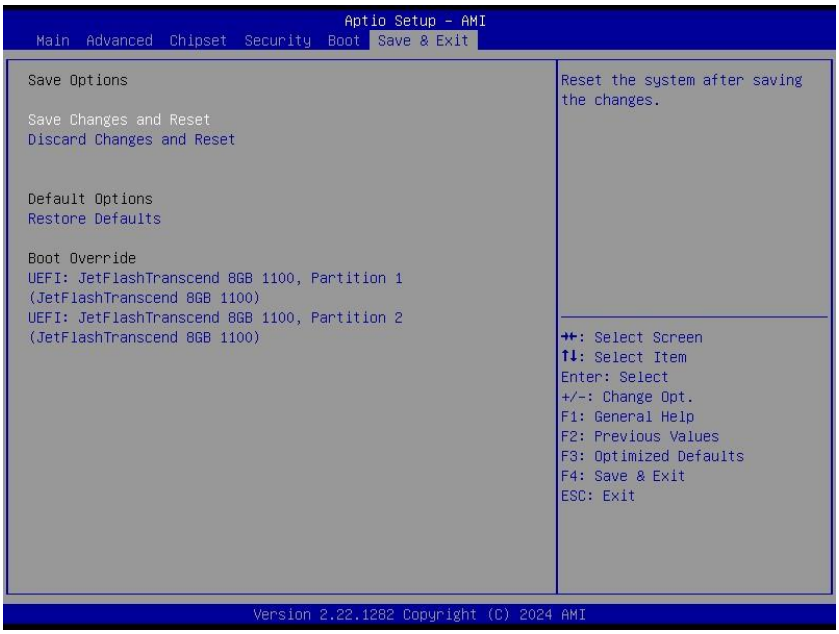
Item	Option	Description
Secure Boot	Disabled Enabled**[Default]**	Secure Boot feature is Active if Secure Boot is Enabled, Platform Key(PK) is enrolled and the System is in User mode. The mode change requires platform reset
Secure Boot Mode	Standard**[Default]** Custom	Secure Boot mode options: Standard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

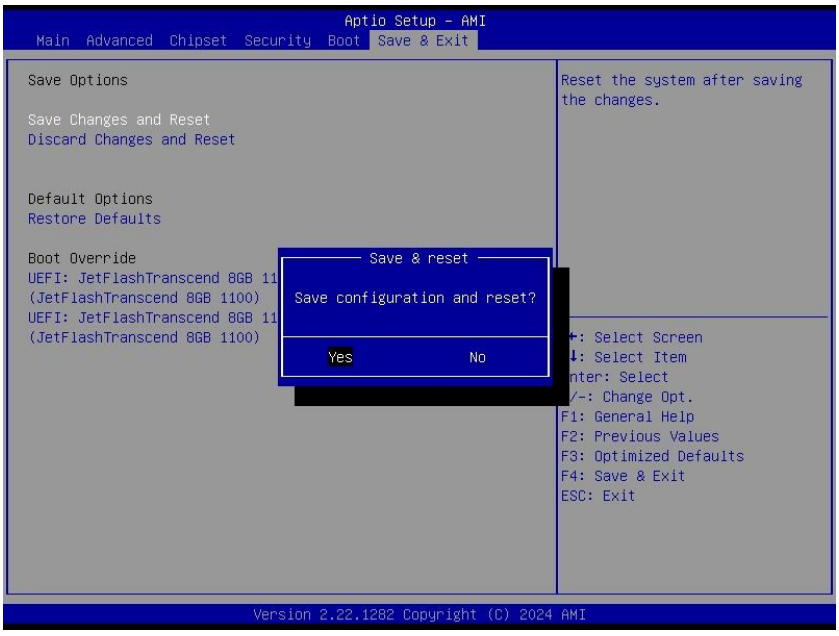
4.6.5 Security



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.	

4.6.6 Save and exit





4.6.6.1 Save Changes and Reset

Reset the system after saving the changes.

4.6.6.2 Discard Changes and Reset

Reset system setup without saving any changes.

4.6.6.3 Restore Defaults

Restore/Load Default values for all the setup options.

4.6.6.4 Launch EFI Shell from filesystem device

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

5. Product Application

For detailed instructions on the operation of the Watchdog Timer and Digital I/O (DIO) features of this Panel PC, please refer to the comprehensive guide available in the "AvalueIOAPI" manual. Please reaching out to your respective distributors, Avalue technical support team, or Avalue customer service representatives for further information. Feel free to inquire about this supplementary resource to enhance your understanding of the Watchdog Timer and Digital I/O (DIO) Application for optimal utilization of your Panel PC.

6. Operating the Device

The Multi-Touch mode was pre-installed on the Panel PC and need tools for any customizations. Should you have specific requirements or encounter scenarios where a customized touch mode is necessary, we recommend reaching out to your local distributors, Avalue technical support team, or Avalue customer service representatives. These professionals can provide tailored guidance and assistance to address any unique needs related to Multi-Touch mode adjustments.