MAB-T660

MAB-T660 GPU card IT Grade AI Box PC with Intel 12/13th Gen Core I Processors

Quick Reference Guide

1st Ed –24 March 2025

Part No. E2017GAR2A0R

Document Amendment History

Revision	Date	By	Comment
1st	March 2025	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.

3.2 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.

3.3 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.

3.4 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 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.

13. CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.
14. Equipment intended only for use in a RESTRICTED ACCESS AREA.
15. Equipment designed for use below 5000 meters above sea level.

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 Packing List

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

Item	Description	Q'ty
1	MAB-T660 Barebone system	1
2	Screws (M3*8) for HDD installation	4
3	Shockproof rubber for HDD installation	4
4	Screws (M2*2mm-1pc, M3*4mm-1pc) and standoff (F/M M2*3.45/M2*2mm-1pc) for M.2 installation	3
5	DRAM rubber strap	2

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 box PC, follow the steps below.

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 box PC out of the boxes.

Step 6: Remove the peripheral parts box from the main box.

1.2 System Specifications

System	
Processor	12/13th Generation Intel® Core™ i3/i5/i7/i9 Processors
Platform Controller Hub	Intel® R680E Chipset
System Memory	2 x SODIMM Up to 64GB Dual Channel DDR5 4800MHz Non-ECC DRAM support
I/O Chipset	NuvoTon NCT6126D
BIOS Information	AMI uEFI BIOS, 256Mbit SPI Flash ROM
Watchdog Timer	H/W Reset, 5~255 seconds/5~255 minutes
H/W Status Monitor	CPU temperature monitoring Voltage monitoring CPU fan speed control
RAID	Support RAID 0, 1
iAMT	Yes
SBC	EMX-R680P
Expansion	
M.2 (Signal)	1 x M.2 (2230) E-Key, support Wi-Fi module with PCIe x 2 Gen 3 & USB 2.0 1 x M.2 (2242/2280) M-Key, support PCI-e x 4 Gen 4 SSD (top side)
PCIe (Gen X)	2 x PCI-e x 8 by switch (from CPU) or 1 x PCI-e x 16 Gen 5 with riser card E9697OAR1D0R-A & ACC-RISERCARD-18R
Storage	
M.2 (Signal)	1 x M.2 (2242/2280) M-Key, support PCI-e x 4 Gen 4 SSD (top side)
2.5” Drive Bay (Height)	1-Storage, 2.5” Drive Bay
Front I/O	
USB Port	2 x USB 2.0
Power Button	Yes
LED Indicator	Yes
Rear I/O	
USB Port	4 x USB 3.2 Gen 2 & 4 x USB 3.2 Gen 1
HDMI	1 x HDMI 2.1b
DP	2 x DP++
Audio	Line-out, Mic-in
LAN Port	4 x 2.5 Gigabit Ethernet
Antenna	2 x Antenna Mounting with Dust Protection Cover
System Fan	4cm fan*2
Onboard I/O	

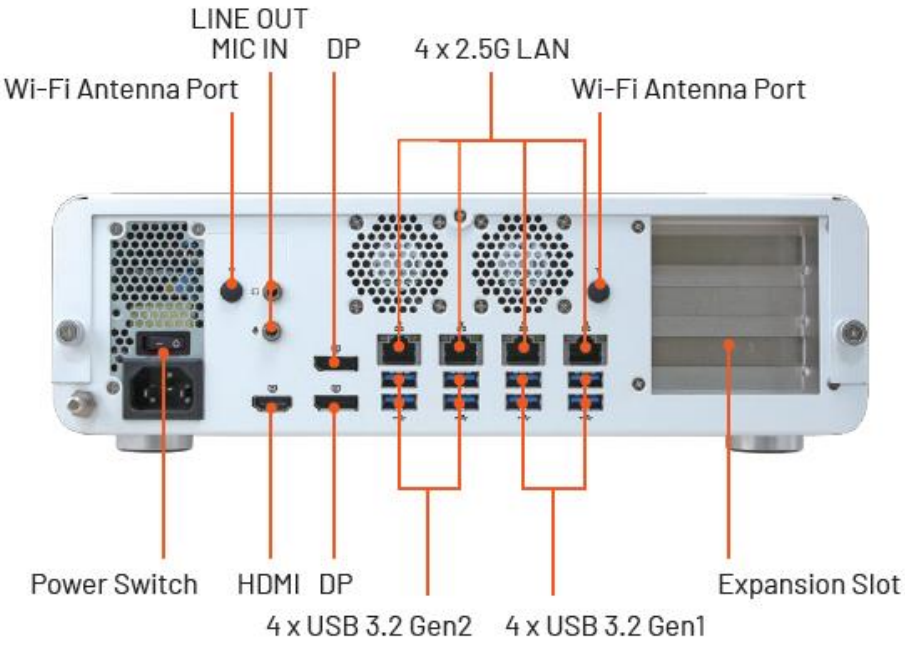
SATA Signal	2 x SATA III
GPIO	1 x 2 x 10 pin, pitch 1.27mm connector for GPIO: 16 bits & +5VS Level SMBus
USB Port	1 x 2 x 10 pin, pitch 2.0mm connector for 2 x USB 3.2 Gen 1
COM Port	COM 1-2: Support RS232/422/485 selected by BIOS selection - 2 x 2 x 5 pin, pitch 2.00mm connector for COM1~2 support RS232/RS422/RS485 connector selected by BIOS selection. COM 3-5: Support RS232 - 3 x 1 x 9 pin, pitch 1.0mm connector for COM 3~5 support RS-232 connector
AT/ATX Selector	1 x 1 x 3 pin pitch 2.00mm connector for AT/ATX jumper 1 x 2 x 10 pin ATX power connector 1 x 2 x 4 pin ATX 12V power connector
Buzzer	Onboard
CPU/System FAN	ACC-FAN-170-02R JYC1L115ATP LGA1700 65W
Display	
Graphic Chipset	Intel® UHD Graphics 770
Resolution	2 x DP++: 4096 x 2304@60Hz / 5120 x 3200@60Hz 1 x HDMI 2.1b (supported with LSPCON): 8K@60Hz
Audio	
Audio Codec	RealTek ALC888S Audio Codec
Audio Amplifier	RealTek ALC105 Stereo Class-D 2W4Ω
Ethernet	
LAN Chipset	4 x Intel® i226LM 2.5 Gigabit Controller
Data Rate Per Port	2.5GbE (I226-LM)
Power Requirement	
Voltage Input Spec.	AC 100-240 V in
ACPI	Single power ATX
Power Mode	AT/ATX (ATX is default setting)
Power Supply Unit	FSP400M-50PE
Mechanical & Environment	
Operating Temp.	0~35°C (32˚F ~ 95˚F) Operating Temp w/ 0.5m/s air flow
Storage Temp.	-30~70C° (-22°F ~ 158°F)
Operating Humidity	40°C @ 95% Relative Humidity, Non-condensing
Dimension (W*L*H)	315*273*92 mm
Weight	4.8KG
Vibration Test	Random Vibration Operation 1 Test PSD: 0.000505G²/Hz, 0.5 Grms

	2 System condition : operation mode 3 Test frequency : 5~500 Hz 4 Test axis : X,Y and Z axis 5 Test time : 30 minutes per each axis 6 IEC60068-2-64 Test Fh 6 Storage : SSD 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 5 IEC 60068-2-64 Test Fh
Shock Test	1 Wave from : Half Sine wave 2 Acceleration Rate : 10G 3 Duration Time : 11ms 4 No. of shock : 300 times 5 Test Axis : Z axis 6 operation mode 7 Reference IEC 60068-2-27 testing procedures Test Eb : 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 3 Package weight : 5Kg 4 Test drawing
Software Support	
OS Information	Win10, Win11, Linux

Note: Specifications are subject to change without notice.

1.3 System Overview

1.3.1 I/O View

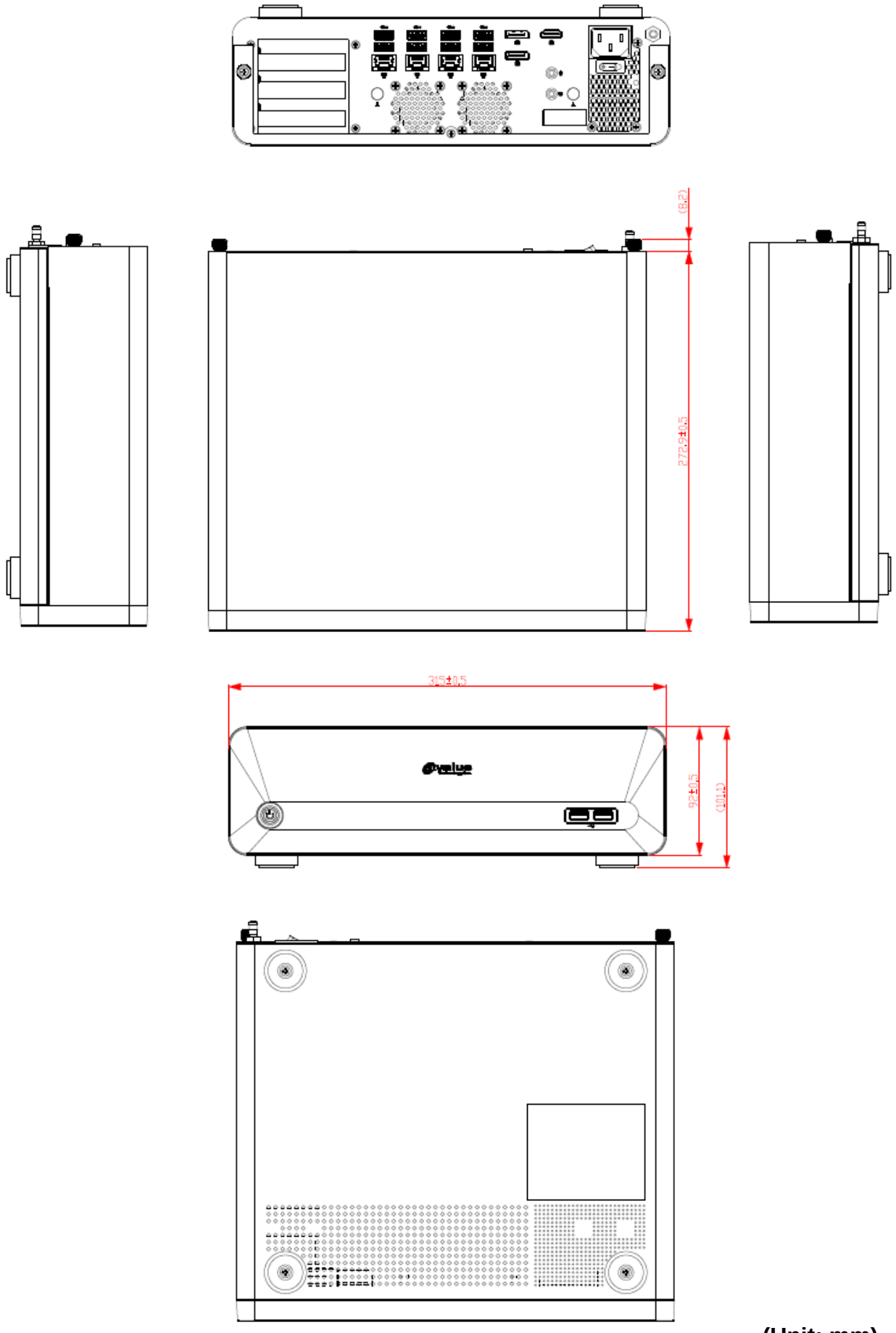


Connectors

Label	Function	Note
Power Button	Power on button	
USB 2.0	2 x USB2.0 connector	
USB 3.2 Gen1	4 x USB3.2 Gen1 connector	
USB 3.2 Gen2	4 x USB3.2 Gen1 connector	
2.5G LAN	4 x 2.5G RJ-45 Ethernet	
DP	2 x DP connector	
HDMI	HDMI connector	
LINE OUT	Line-out audio jack	
MIC IN	Mic-in audio jack	
Power Switch	Power switch	

Wi-Fi Antenna Port	2 x Wi-Fi Antenna port
Expansion Slot	Expansion slot

1.4 System Dimensions



(Unit: mm)

1.5 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-R680P included in this manual.

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

www.avalue.com

2.1 Powering On the System

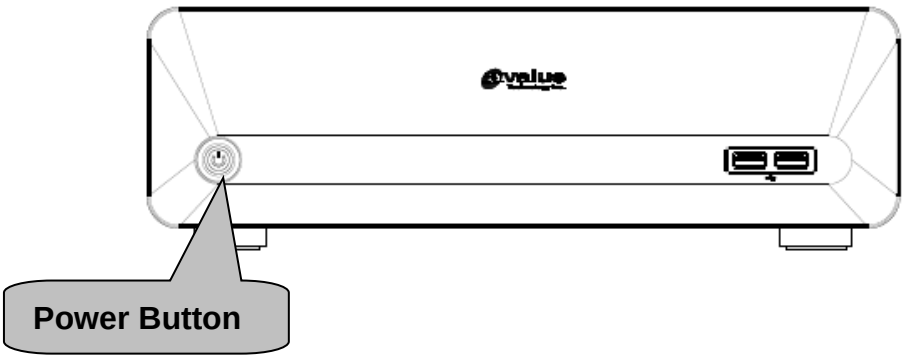
WARNING:

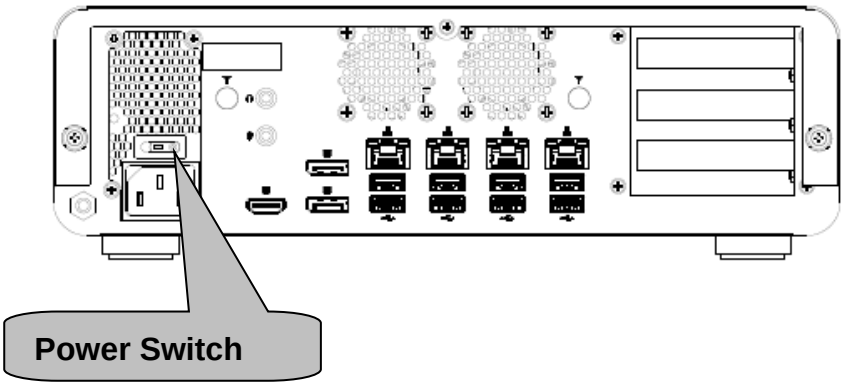
Make sure a power supply with the correct input voltage is being fed into the system. Incorrect voltages applied to the system may cause damage to the internal electronic components and may also cause injury to the user.

- Power on the system: press the power button for 3 seconds.
- Power off the system: press the power button for 6 seconds.

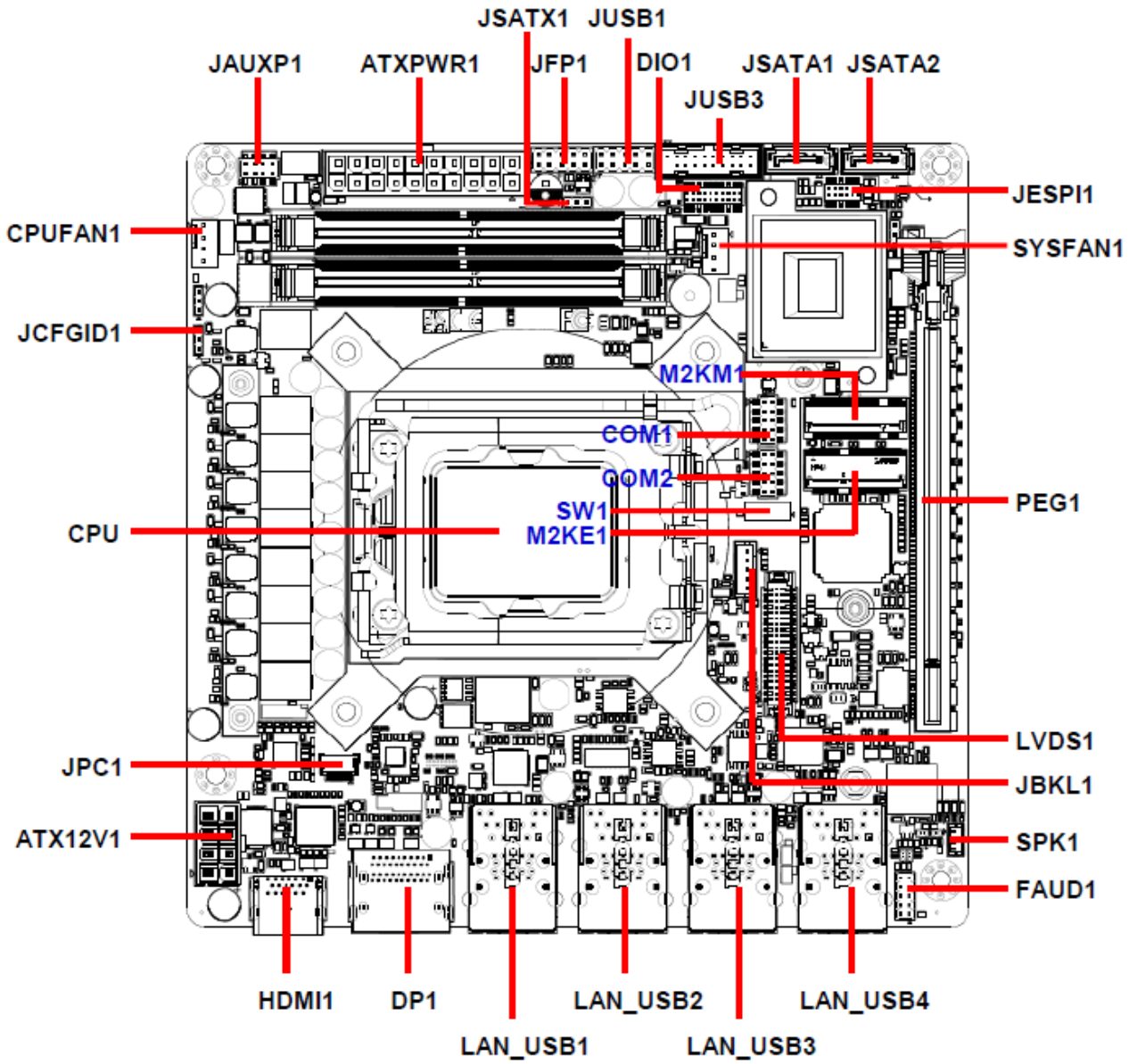
2.2 Connecting to Power Supply

Connect the power cord to the rear of the Box PC: First, insert the power cord into the power connector at the back of the device. Then, plug the power cord plug into the socket of the power source. Finally, turn on the power switch. The supported power input voltages is 100V-240V.





2.3 EMX-R680P Overviews



2.4 EMX-R680P Jumpers & Connectors list

Jumpers

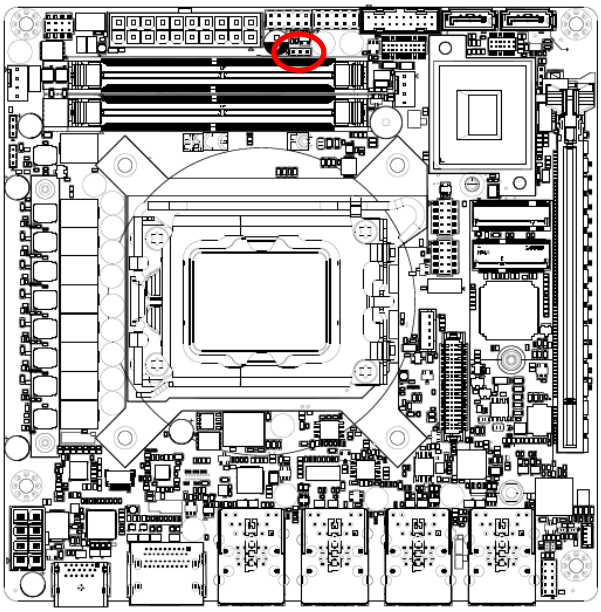
Label	Function	Note
JSATX1	AT/ATX Power Mode Select	3 x 1 header, pitch 2.00mm
JCFGID1	TDP Configuration	3 x 1 header, pitch 2.00mm
SW1	PCI Express BUS Selection	2 x 1 DIP Switch 2S 1.27mm

Connectors

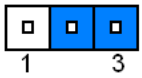
Label	Function	Note
CPUFAN1	CPU fan connector	4 x 1 wafer, pitch 2.54mm
SYSFAN1	System fan connector 1	4 x 1 wafer, pitch 2.54mm
JFP1	Front Panel connector	5 x 2 header, pitch 2.54mm
SODIMMA1/2	262-pin SO-DIMM Slot 1/2	
JAUXP1	Auxiliary Panel connector	4 x 2 header, pitch 2.00mm
COM1/2	Serial Port connector 1/2	5 x 2 box header, pitch 2.00mm
DIO1	General purpose I/O connector	10 x 2 header, pitch 1.27mm
LAN_USB1/2/3/4	RJ-45 Ethernet 1/2/3/4	
HDMI1	HDMI1 connector	
DP1	DP connector	
CPU	CPU connector	
M2KM1	M.2 Key M	
M2KE1	M.2 Key E	
JUSB1	USB connector	5 x 2 header, pitch 2.54mm
JUSB3	USB connector	10 x 2 header, pitch 2.00mm
PEG1	PCI-e x16 slots 1	
ATXPWR1	ATX Power connector	10 x 2 wafer, pitch 4.20mm
ATX12V1	Power connector	2 x 4 wafer, pitch 4.20mm
JPC1	JPC1 connector	6 x 1 wafer, pitch 1.00mm
SPK1	Speaker connector	4 x 1 wafer, pitch 1.25mm
FAUD1	FAUD1 connector	5 x 2 header, pitch 2.00mm
JESPI1	JESPI1 connector	6 x 2 header, pitch 1.27mm
JSATA1/2	Serial ATA connector 1/2	
JBKL1	LCD Inverter connector	5 x 1 wafer, pitch 2.00mm
LVDS1	LVDS connector	20 x 2 wafer, pitch 1.25mm

2.5 EMX-R680P Jumpers & Connectors settings

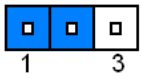
2.5.1 AT/ATX Power Mode Select (JSATX1)



ATX*

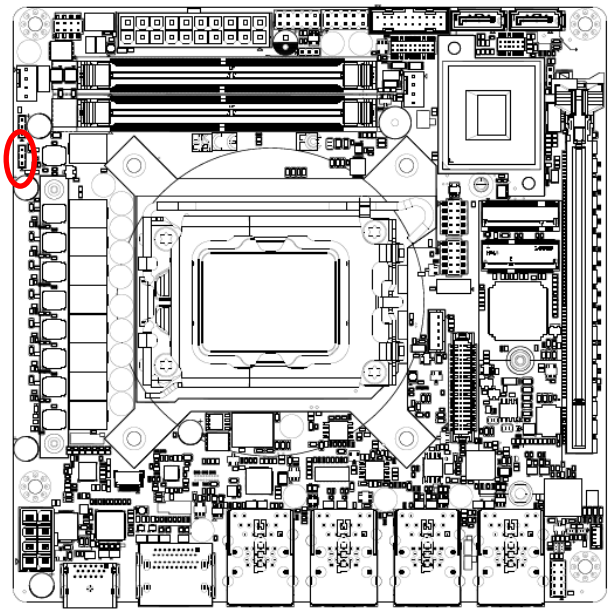


AT

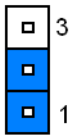


*** Default**

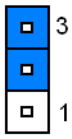
2.5.2 TDP Configuration (JCFGID1)



Config ID1



Config ID0*



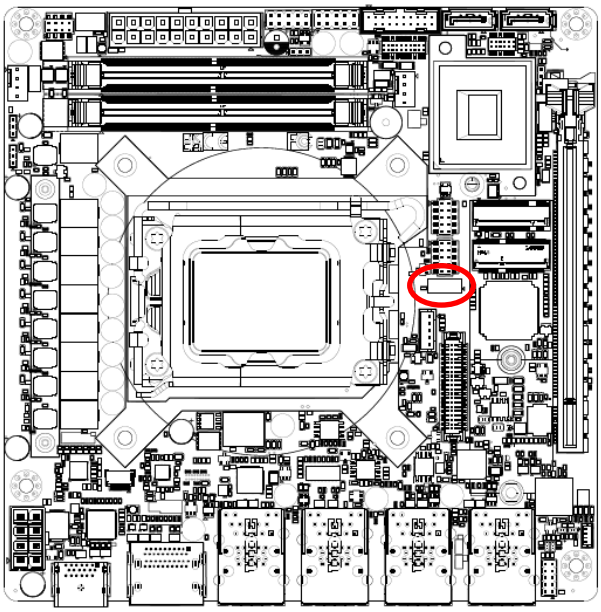
*** Default**

Note:

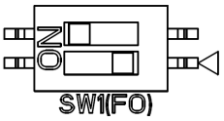
JCFGID1 (1-2) For debug only

JCFGID1 (2-3) For CPU Power FW setting (Default)

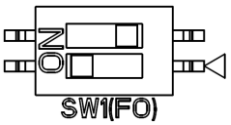
2.5.3 PCI Express BUS Selection (SW1)



SW1 [2 on, 1 off]*(Default)
Hi- 1x16 PCI Express*

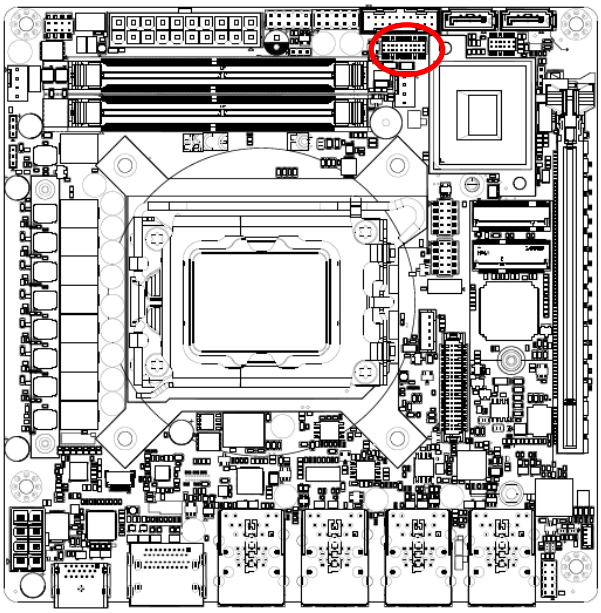


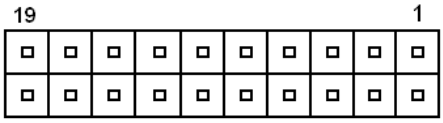
SW1 [1 on, 2 off]
Lo- 2x8 PCI Express



*** Default**

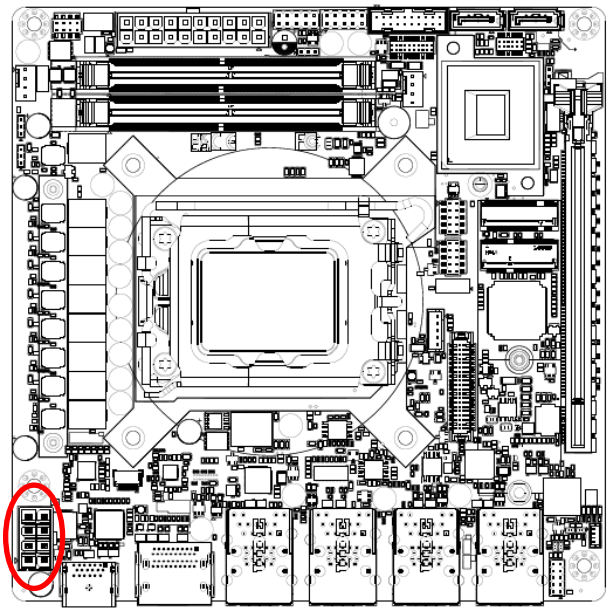
2.5.4 General purpose I/O connector (DIO1)

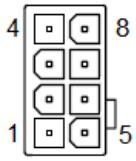




Signal	PIN	PIN	Signal
DI0	1	2	DO0
DI1	3	4	DO1
DI2	5	6	DO2
DI3	7	8	DO3
DI4	9	10	DO4
DI5	11	12	DO5
DI6	13	14	DO6
DI7	15	16	DO7
5V_SMB_CLK	17	18	5V_SMB_DATA
GND	19	20	+5V

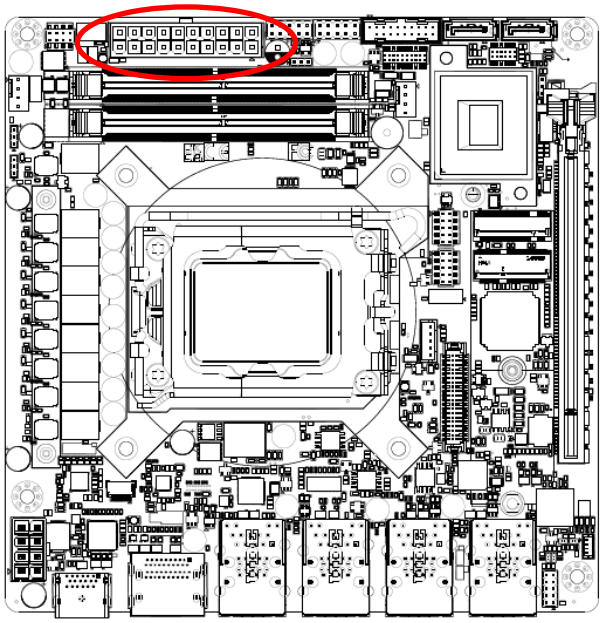
2.5.5 Power connector (ATX12V1)

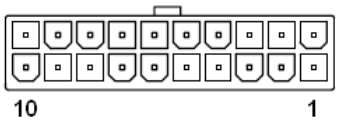




Signal	PIN	PIN	Signal
GND (ATX_2X4DET)	4	8	+V12S_CPU
GND	3	7	+V12S_CPU
GND	2	6	+V12S_CPU
GND	1	5	+V12S_CPU

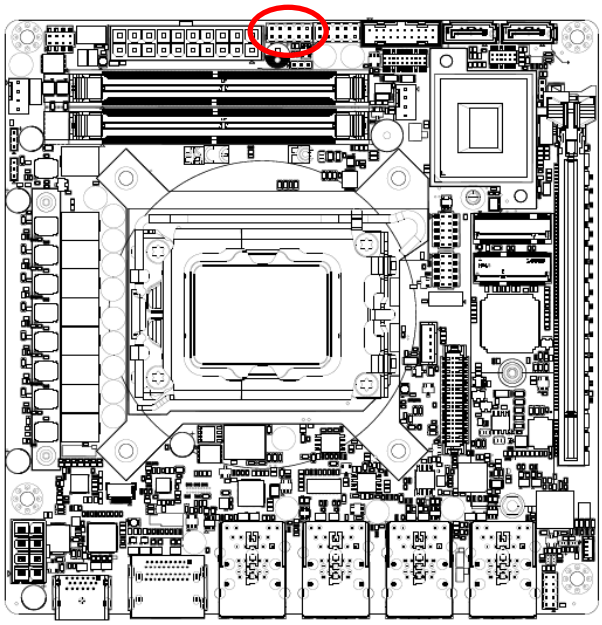
2.5.6 ATX Power connector (ATXPWR1)

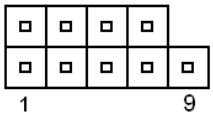




Signal	PIN	PIN	Signal
+V3P3S	11	1	+V3P3S
NC	12	2	+V3P3S
GND	13	3	GND
+V5A_SB	14	4	+5V
GND	15	5	GND
GND	16	6	+5V
GND	17	7	GND
NC	18	8	ATX20_PWROK
+5V	19	9	+V5A_SB
GND	20	10	+12V

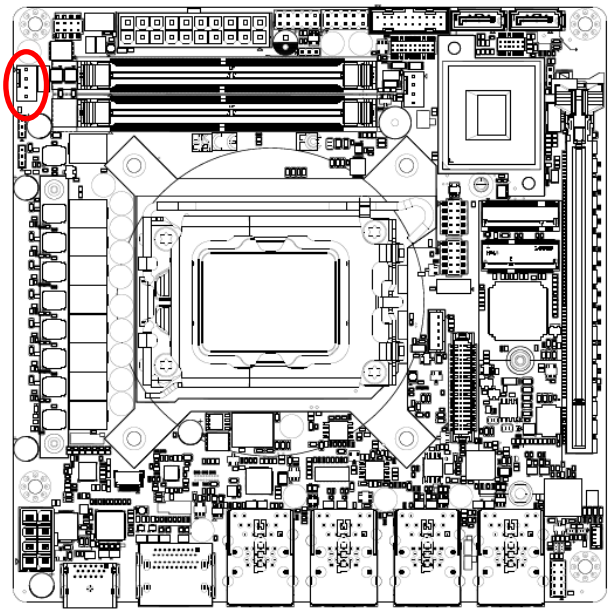
2.5.7 Front Panel connector (JFP1)





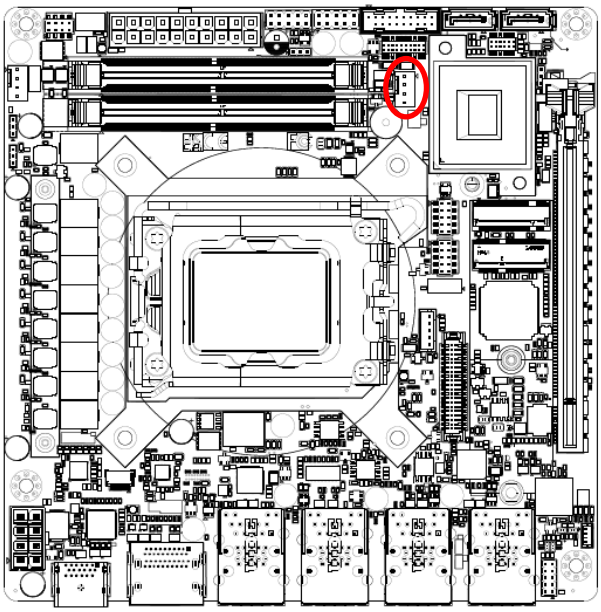
Signal	PIN	PIN	Signal
HDD_LED+	1	2	PWR_LED+
HDD_LED-	3	4	PWR_LED-
SYS_RST#	5	6	PWRBTN#
GND	7	8	GND
NC	9		

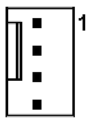
2.5.8 CPU fan connector (CPUFAN1)



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

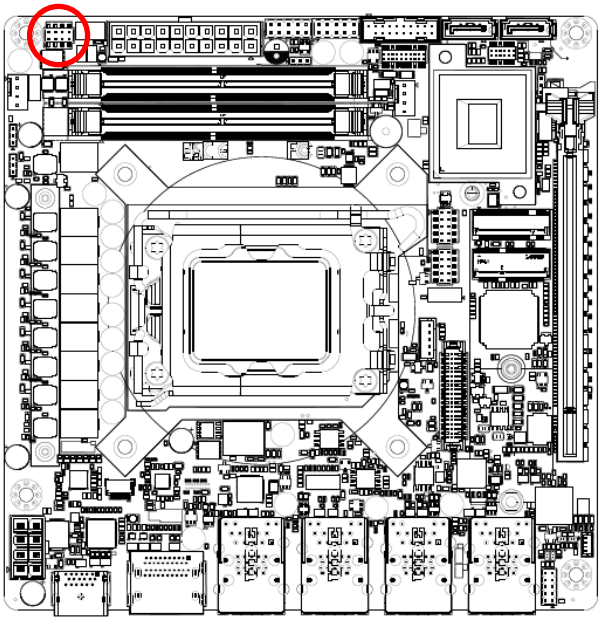
2.5.9 System fan connector 1 (SYSFAN1)

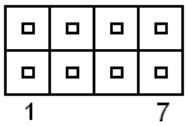




Signal	PIN
GND	1
+12V	2
SYS_ FANIN	3
SYS_FANOUT	4

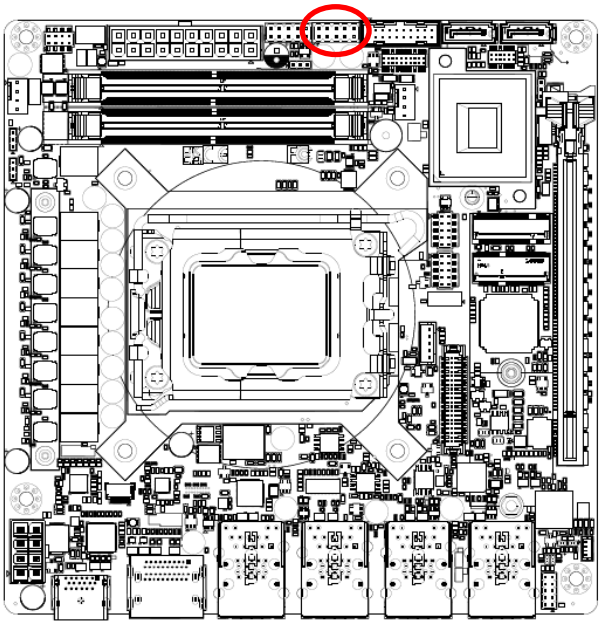
2.5.10 Auxiliary Panel connector (JAUXP1)

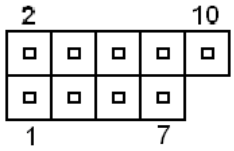




Signal	PIN	PIN	Signal
FRONT_LAN1_ACT	1	2	GND
FRONT_LAN2_ACT	3	4	GND
FRONT_LAN3_ACT	5	6	GND
FRONT_LAN4_ACT	7	8	GND

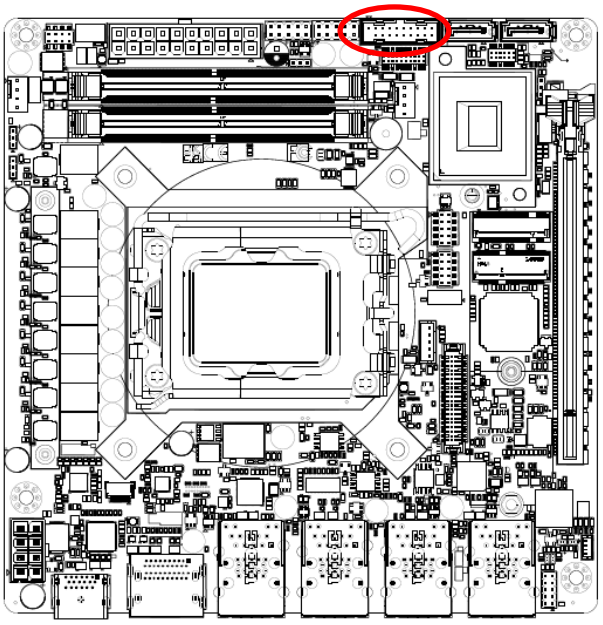
2.5.11 USB connector (JUSB1)

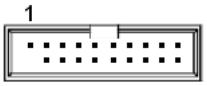




Signal	PIN	PIN	Signal
+V5A_USBB-C	1	2	+V5A_USBB-C
USB_11N	3	4	USB_12N
USB_11P	5	6	USB_12P
GND	7	8	GND
		10	NC

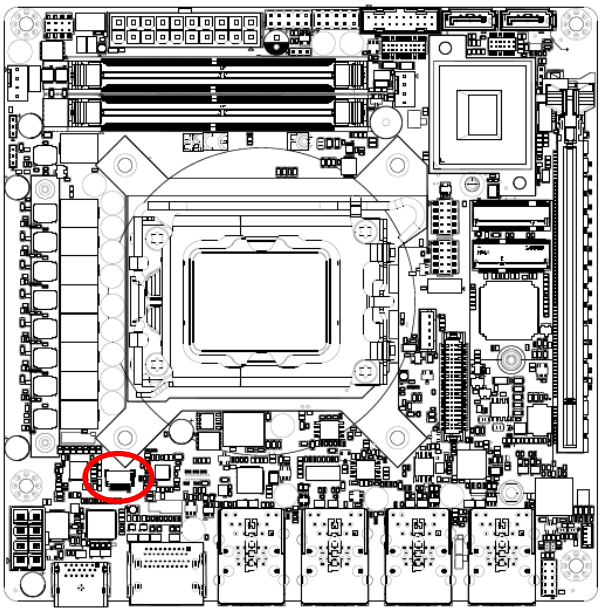
2.5.12 USB connector (JUSB3)

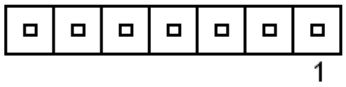




Signal	PIN	PIN	Signal
		1	+V5A_USB5-6
+V5A_USB5-6	19	2	USB32_RXN10
USB32_RXN9	18	3	USB32_RXP10
USB32_RXP9	17	4	GND
GND	16	5	USB32_TXN10
USB32_TXN9	15	6	USB32_TXP10
USB32_TXP9	14	7	GND
GND	13	8	USB_N10
USB_N9	12	9	USB_P10
USB_P9	11	10	GND

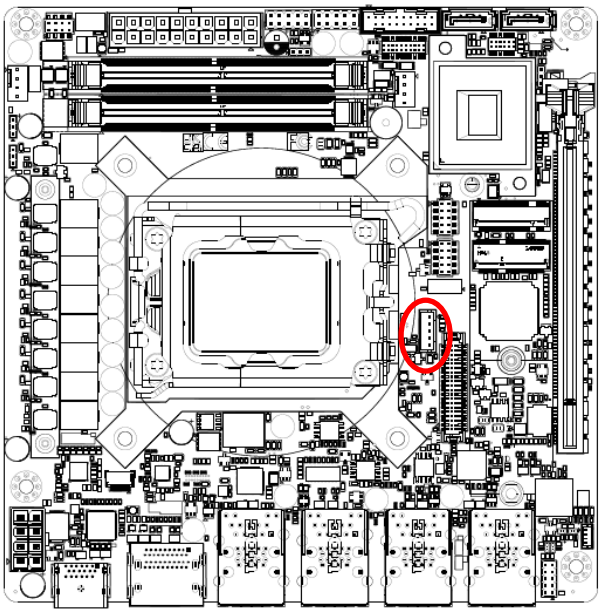
2.5.13 JPC1 connector (JPC1)





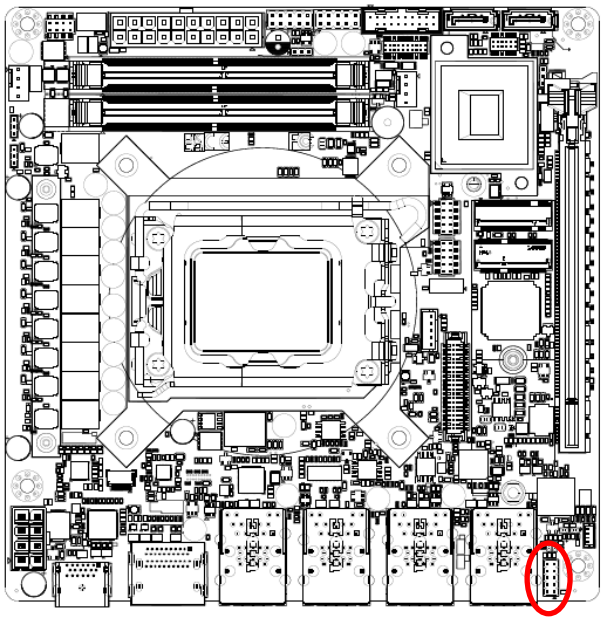
Signal	PIN
VCCCORE_nPMALERT	1
VCCCORE_PMSDA	2
GND	3
VCCCORE_PMSCL	4
NC	5
+V3P3_EXT	6
GND	7

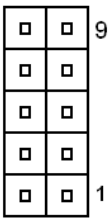
2.5.14 LCD Inverter connector (JBKL1)



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

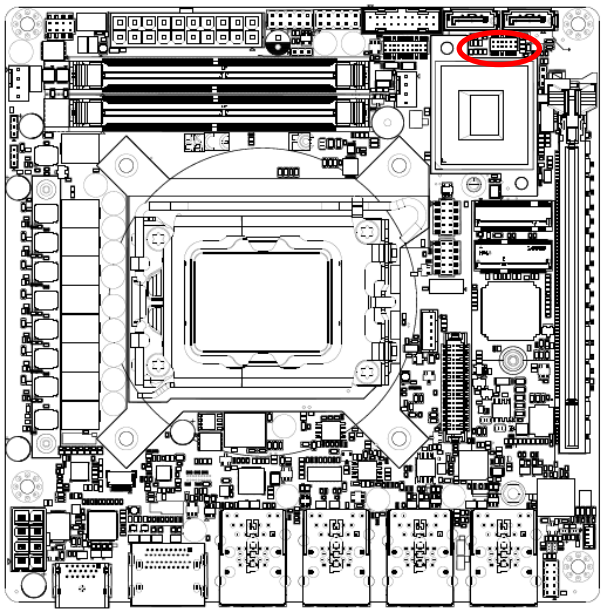
2.5.15 FAUD1 connector (FAUD1)

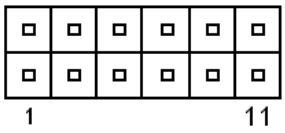




Signal	PIN	PIN	Signal
LINE2_JD	10	9	LINE2_LIN
NC	8	7	SENSE
MIC2_JD	6	5	LINE2_RIN
ACZ_DET#	4	3	MIC2_RIN
GND	2	1	MIC2_LIN

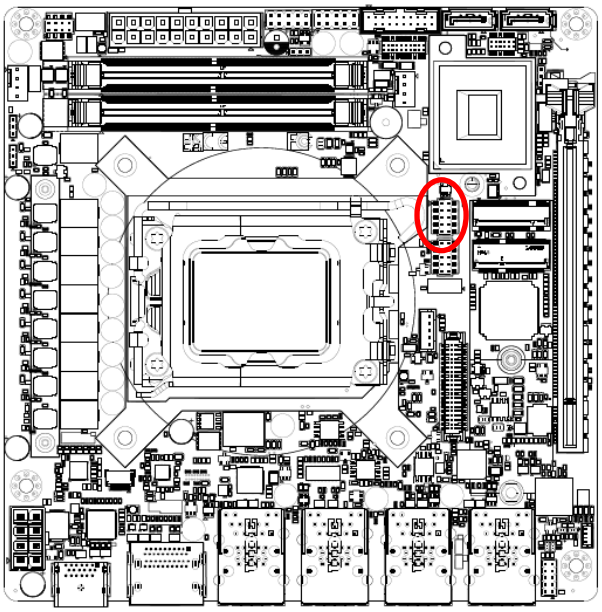
2.5.16 JESPI1 connector (JESPI1)

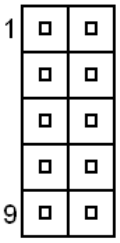




Signal	PIN	PIN	Signal
ESPI_DEG_IO0	1	2	+V3P3A
ESPI_DEG_IO1	3	4	PLT_RST#_BUF
ESPI_DEG_IO2	5	6	ESPI_CS#
ESPI_DEG_IO3	7	8	ESPI_DEG_CLK
ESPI_CS1#	9	10	GND
ESPI_RST#	11	12	ESPI_ALERT#

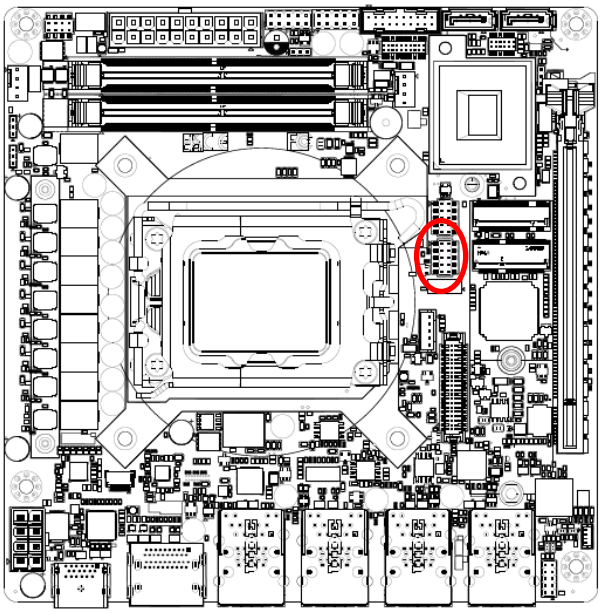
2.5.17 Serial port connector (COM1)

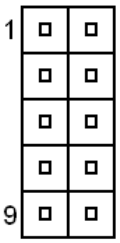




Signal	PIN	PIN	Signal
NDCDA#_TXN_1	1	2	NDCDA#_TXP_1
NTXDA_RXP_1	3	4	NTXDA_RXN_1
GND	5	6	NDSRA#
NRTSA#	7	8	NCTSA#
NRIA#	9	10	NC

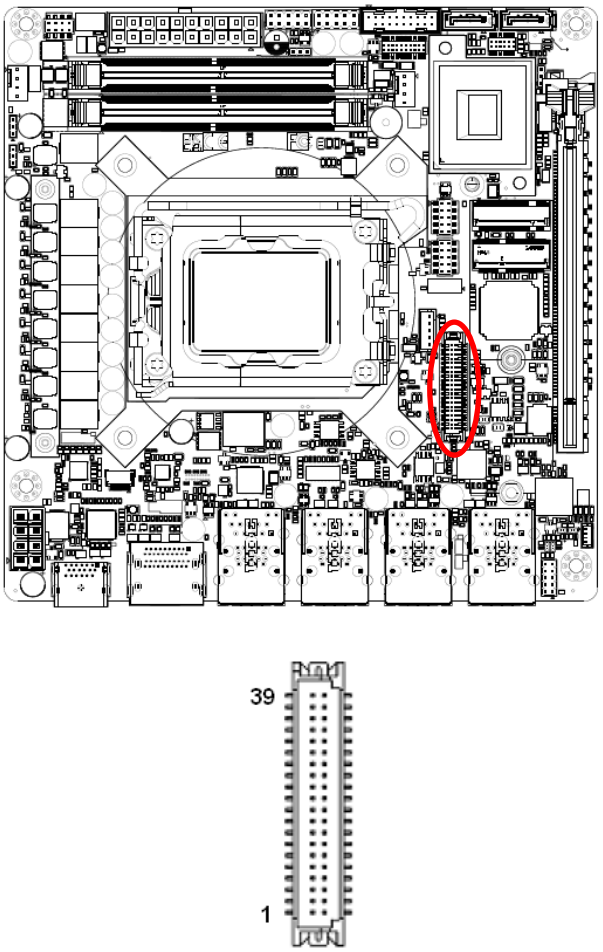
2.5.18 Serial port connector (COM2)





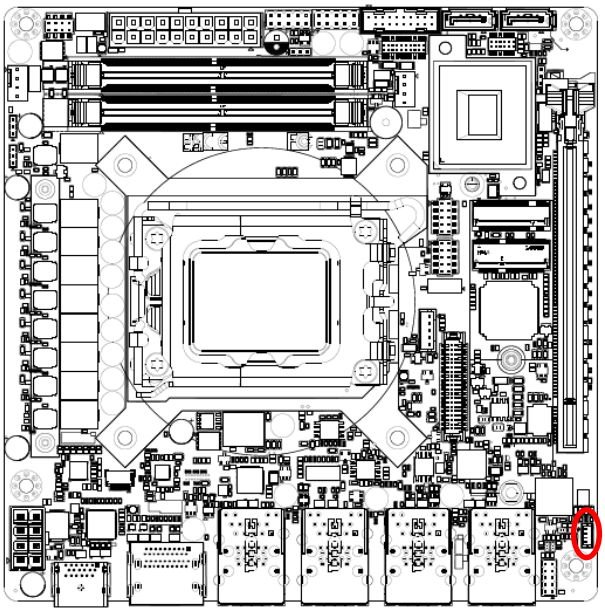
Signal	PIN	PIN	Signal
NDCDA#_TXN_2	1	2	NDCDA#_TXP_2
NTXDA_RXP_2	3	4	NTXDA_RXN_2
GND	5	6	NDSRA#
NRTSA#	7	8	NCTSA#
NRIA#	9	10	NC

2.5.19 LVDS connector (LVDS1)



Signal	PIN	PIN	Signal
LVDS_VDD12V	39	40	LVDS_VDD12V
GND	37	38	GND
LVDS_CLK2N	35	36	LVDS_CLK1N
LVDS_CLK2P	33	34	LVDS_CLK1P
GND	31	32	GND
LVDS_DATAN7	29	30	LVDS_DATAN6
LVDS_DATAP7	27	28	LVDS_DATAP6
GND	25	26	GND
LVDS_DATAN5	23	24	LVDS_DATAN4
LVDS_DATAP5	21	22	LVDS_DATAP4
GND	19	20	GND
LVDS_DATAN3	17	18	LVDS_DATAN2
LVDS_DATAP3	15	16	LVDS_DATAP2
GND	13	14	GND
LVDS_DATAN1	11	12	LVDS_DATAN0
LVDS_DATAP1	9	10	LVDS_DATAP0
GND	7	8	GND
NC	5	6	NC
LVDS_VDD33V	3	4	LVDS_VDD5V
LVDS_VDD33V	1	2	LVDS_VDD5V

2.5.20 Speaker connector (SPK1)



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

3. Installation

Removing the Top Cover Warning

To prevent electric shock or system damage, before removing the chassis cover, must turn off power and disconnect the unit from power source.

Electrostatic discharge (ESD) can cause serious damage to electronic components. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the product is accessed internally, or any other electrical component is handled, the following anti-static precautions are strictly adhered to:

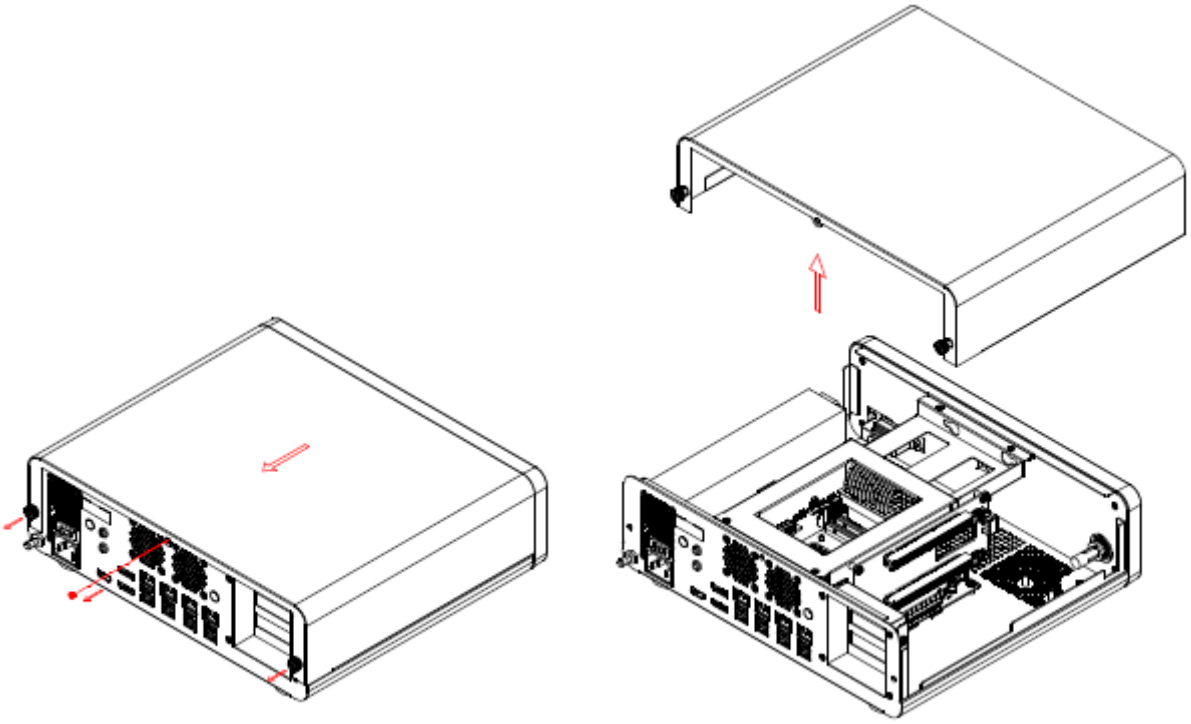
- Wear an anti-static wristband: Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- Self-grounding: Before handling the board, touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- Use an anti-static pad: When configuring the product, place it on an anti-static pad. This reduces the possibility of ESD damaging the product.
- Only handle the edges of the PCB: When handling the PCB, hold the PCB by the edges.

Installation Precautions

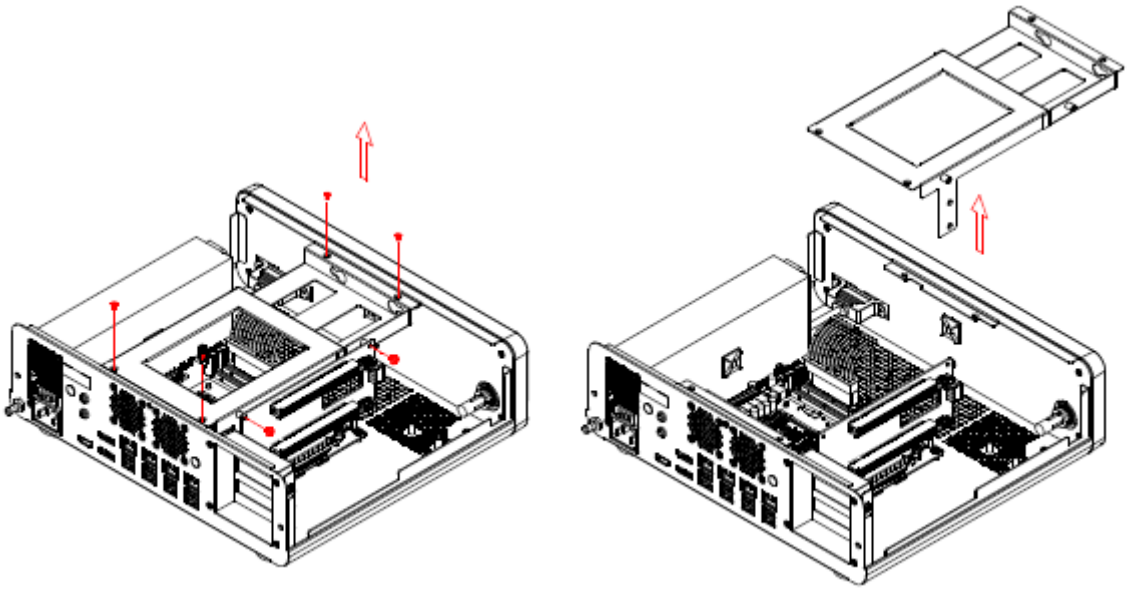
When installing the box PC, please follow the precautions listed below:

- Power turned off: When installing the box PC, make sure the power is off. Failing to turn off the power may cause severe injury to the body and/or damage to the system.
- Certified Engineers: Never open the equipment. For safety reasons, the equipment should be opened only by qualified skilled person.
- Anti-static Discharge: If a user open the rear of the box PC, to configure the jumpers or plug in added peripheral devices, ground themselves first and wear an anti-static wristband.

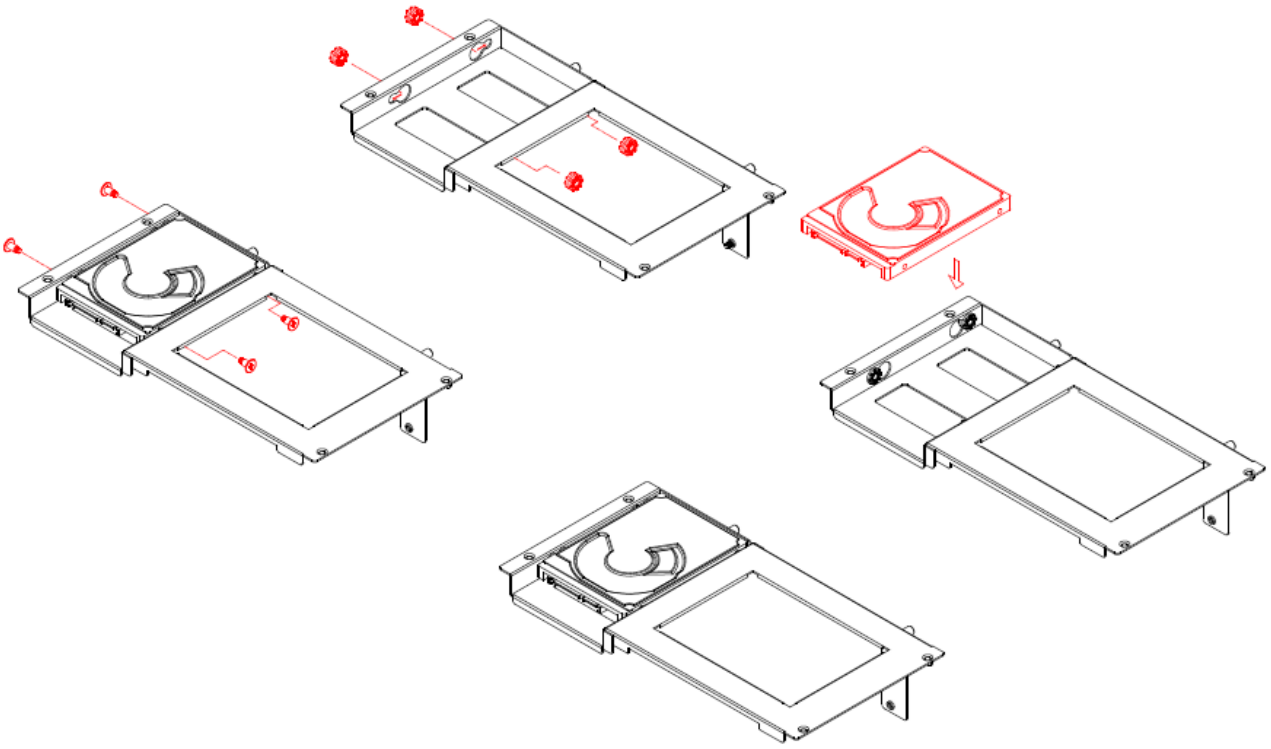
3.1 Installing Solid State Disk & Memory (MAB-T660)



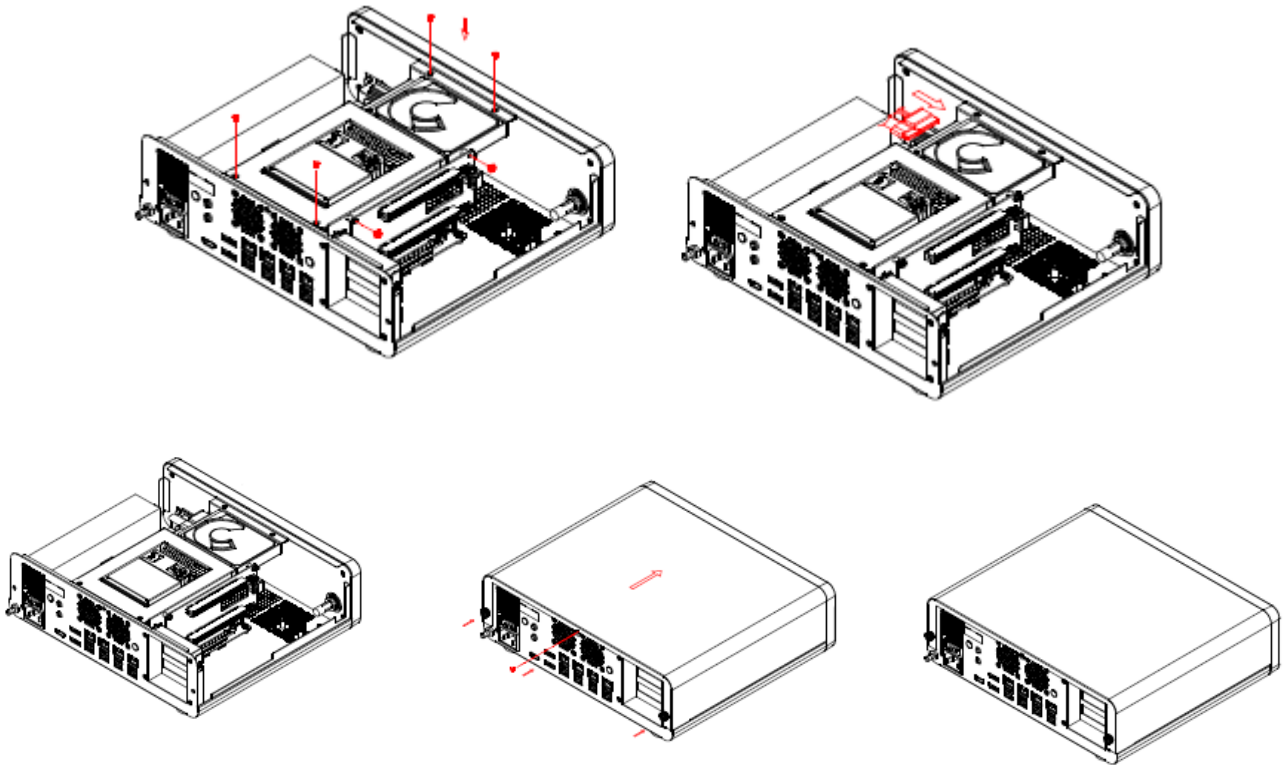
Step1. Loosen the screws on both sides and remove the screw in the middle to take off the top cover.



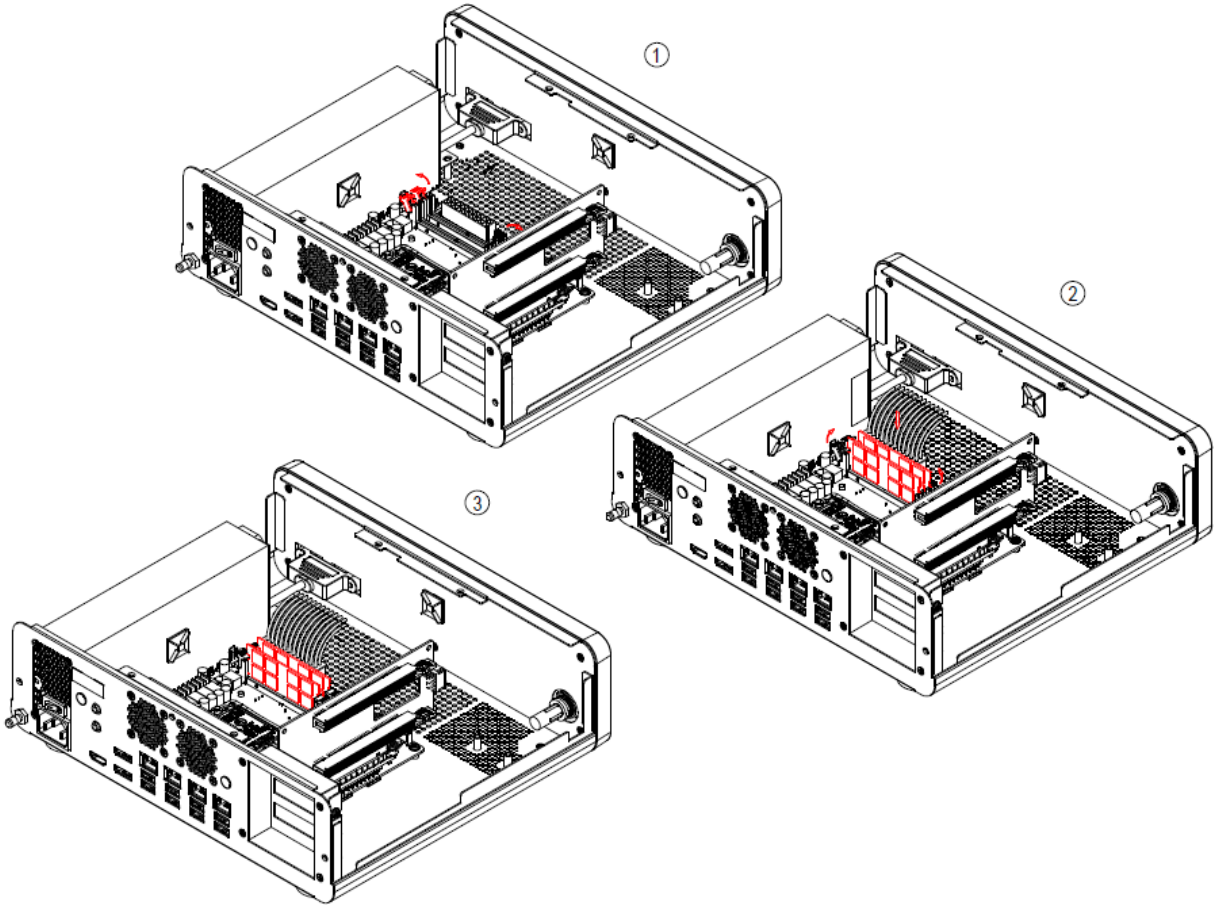
Step2. Remove 6 screws to release the SSD bracket.



Step3. Secure HDD by means of 4 screws (M3*8) and 4 shockproof rubbers.

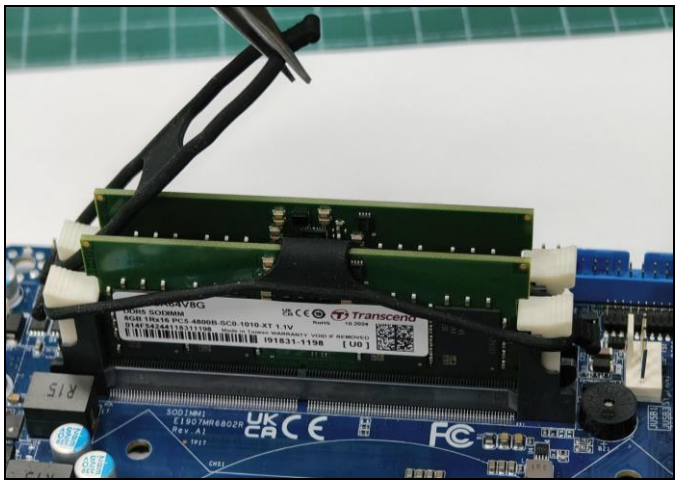


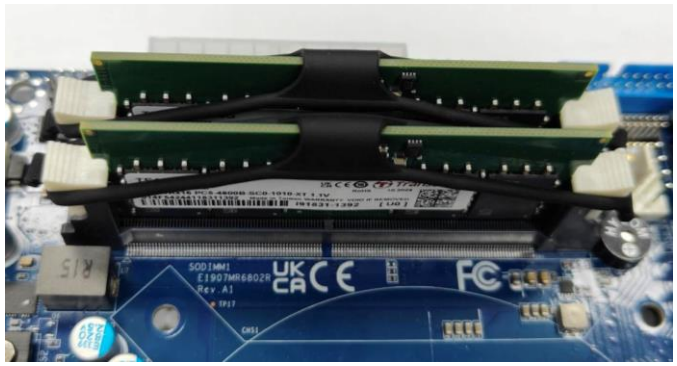
Step4. Insert SSD bracket into designated locations and fasten with 6 screws to complete SSD installation.



Step5. Slide the DDR5 SODIMMs into the memory sockets and press it down until properly seated.

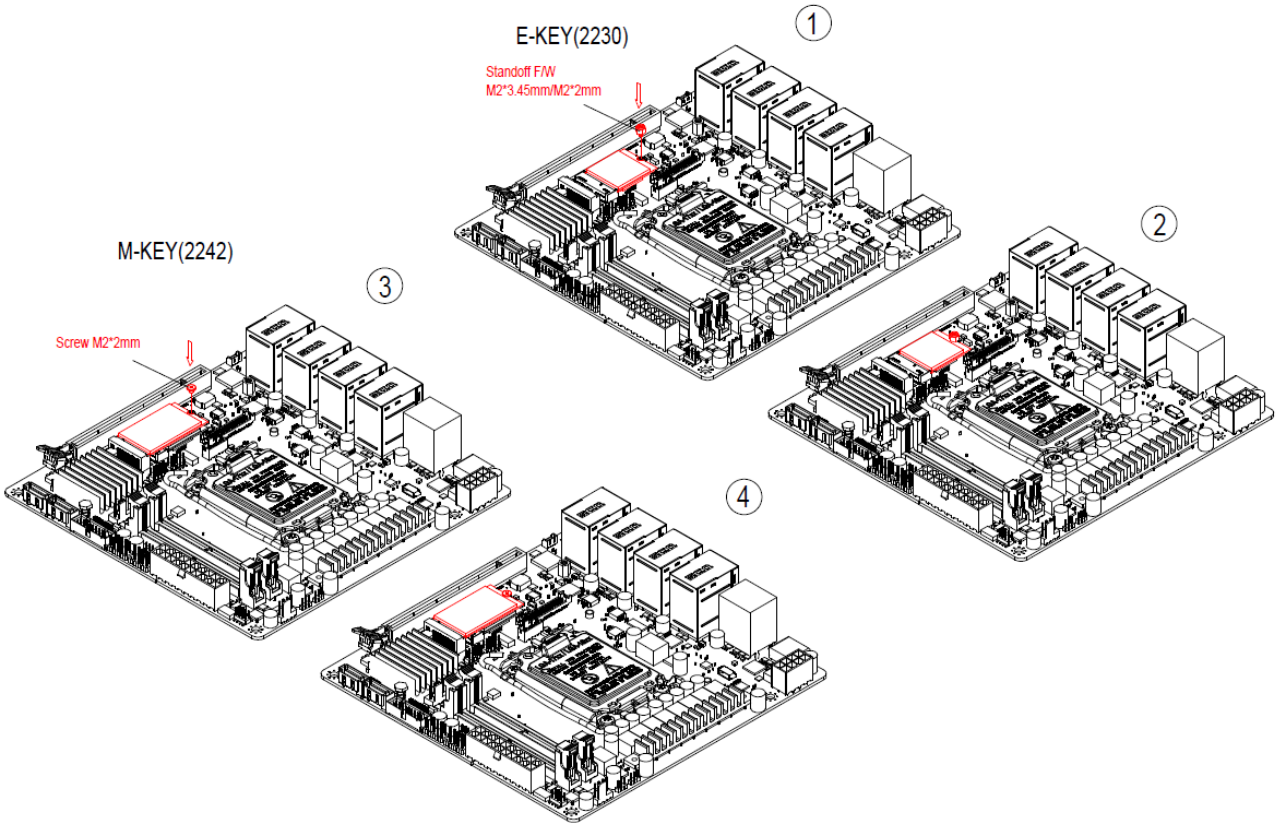
3.2 DDR5 DRAM Retention Strap Installation (MAB-T660)





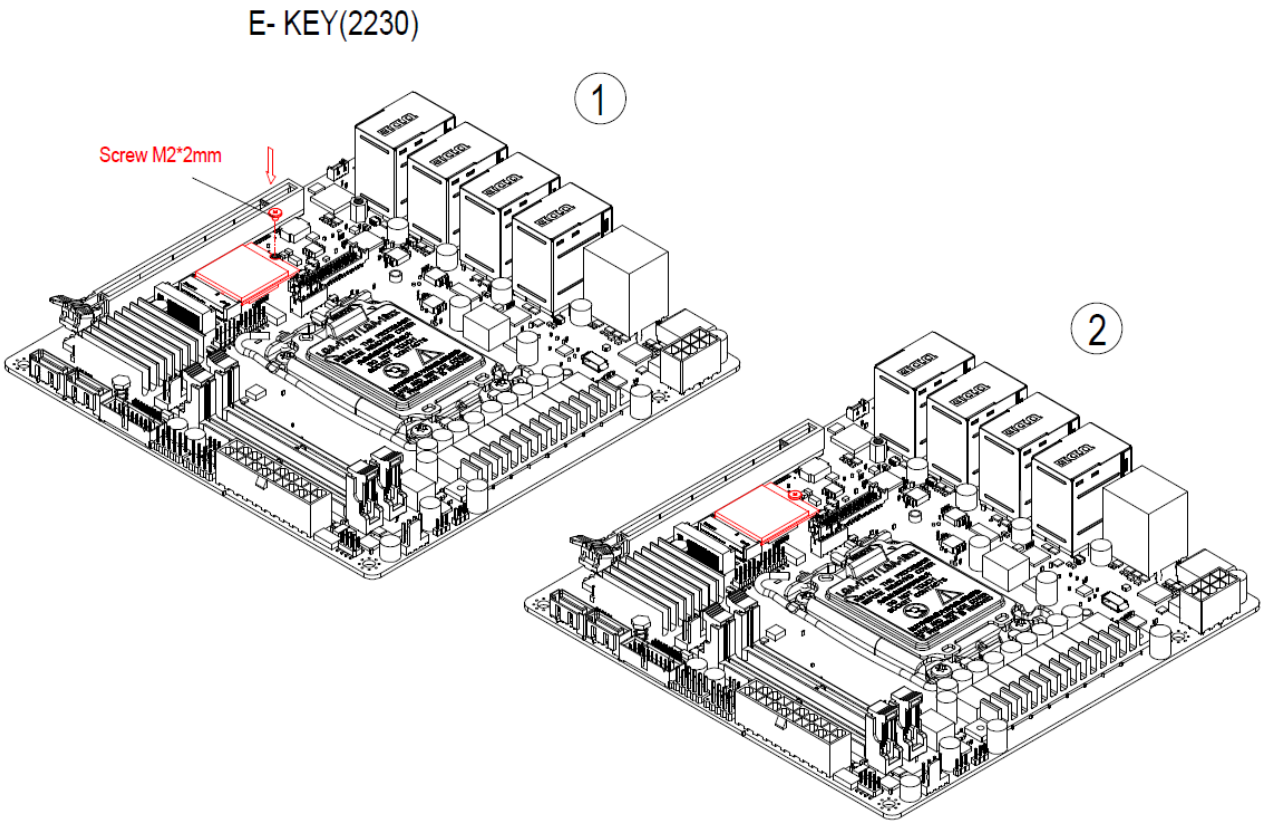
Step1. Use a tool to gently lift the straps over the RAM modules.

3.3 Installing M.2 E-Key (2230) card and M.2 M-Key (2242) card (MAB-T660)



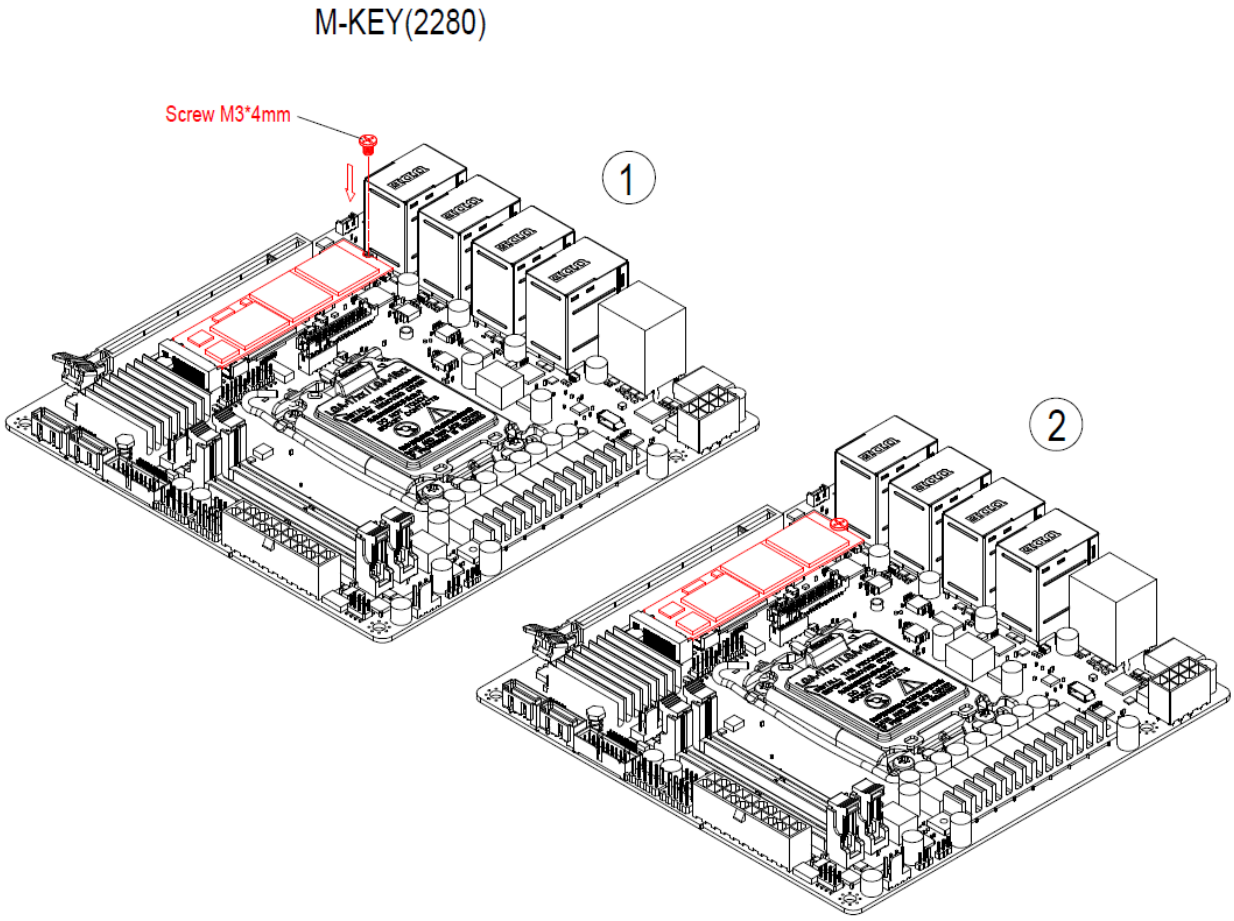
Step1. Insert M.2 E-Key (2230) card and M.2 M-Key (2242) card into designated locations and fasten with screws to complete installation.

3.4 Installing M.2 E-Key (2230) card (MAB-T660)



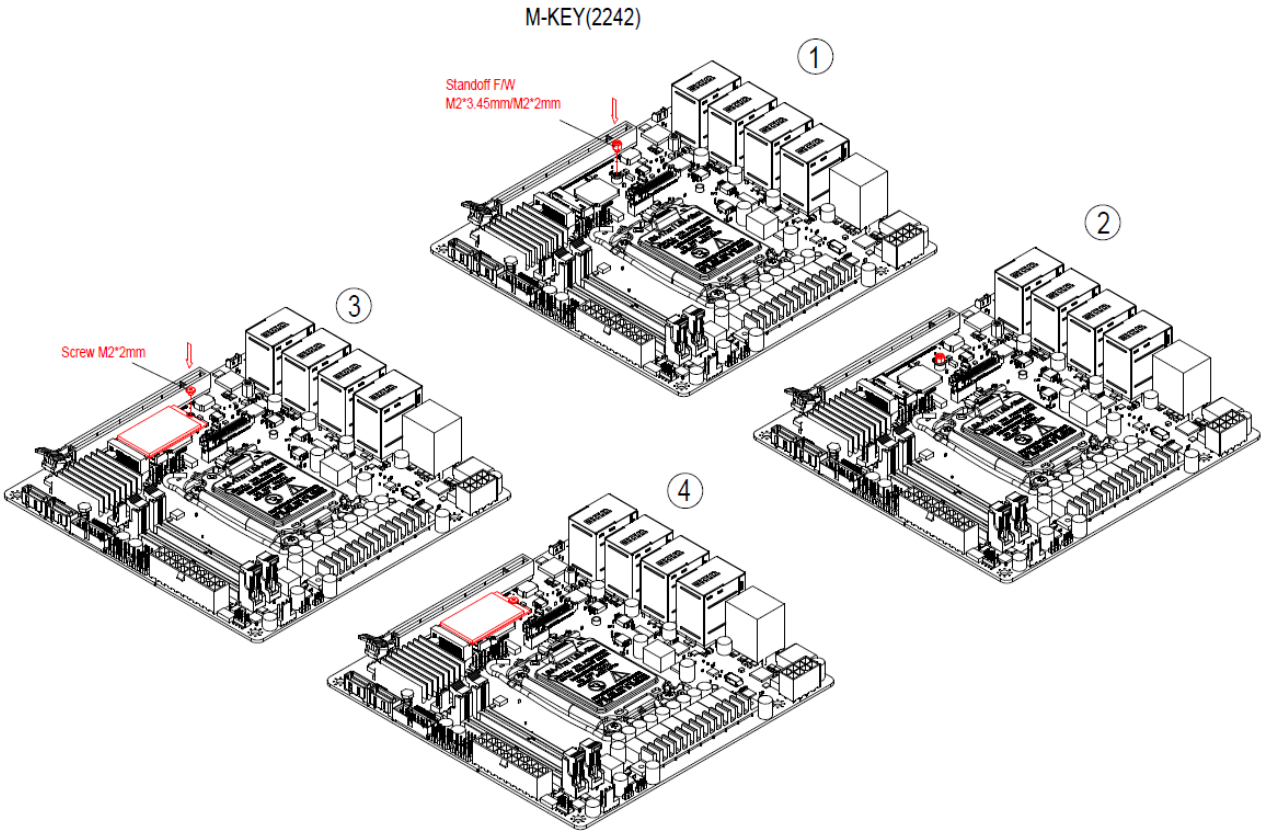
Step1. Insert M.2 E-Key (2230) card into designated locations and fasten with screw to complete installation.

3.5 Installing M.2 M-Key (2280) card (MAB-T660)



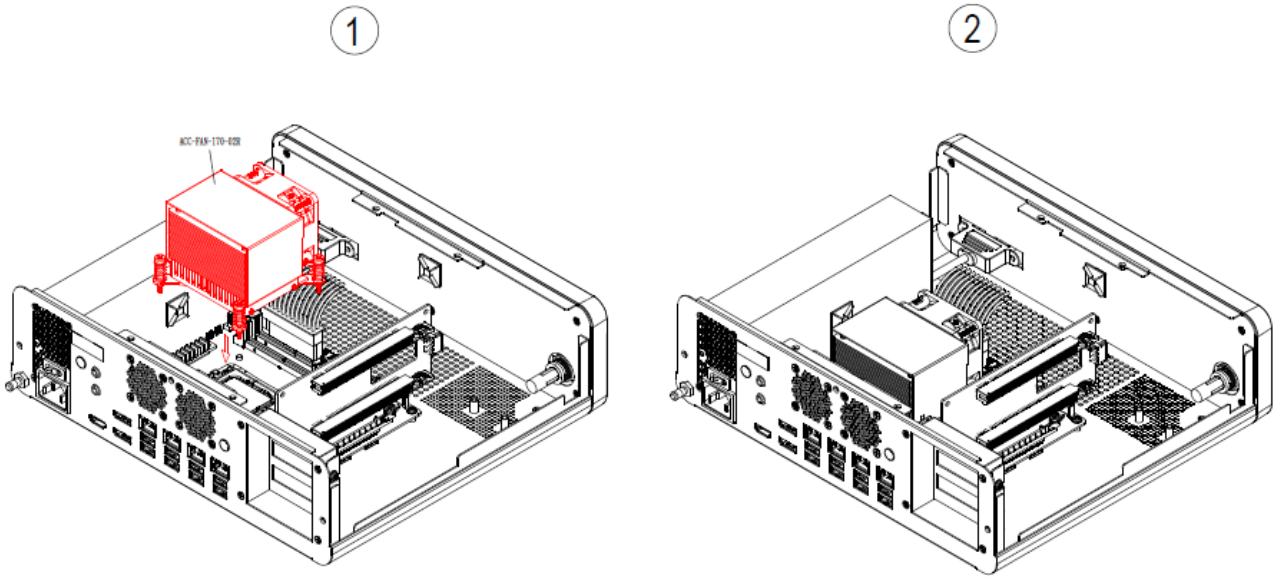
Step1. Insert M.2 M-Key (2280) card into designated locations and fasten with screw to complete installation.

3.6 Installing M.2 M-Key (2242) card (MAB-T660)



Step1. Insert M.2 M-Key (2242) card into designated locations and fasten with screw to complete installation.

3.7 Installing CPU Cooler (MAB-T660)



Step1. Using 3 screws to lock CPU Cooler through screw holes from the system.

3.8 System Mounting

Warning! *More than one person should participate in mounting the* box *PC to prevent accidental damage to the personal injury.*

Safety Precautions

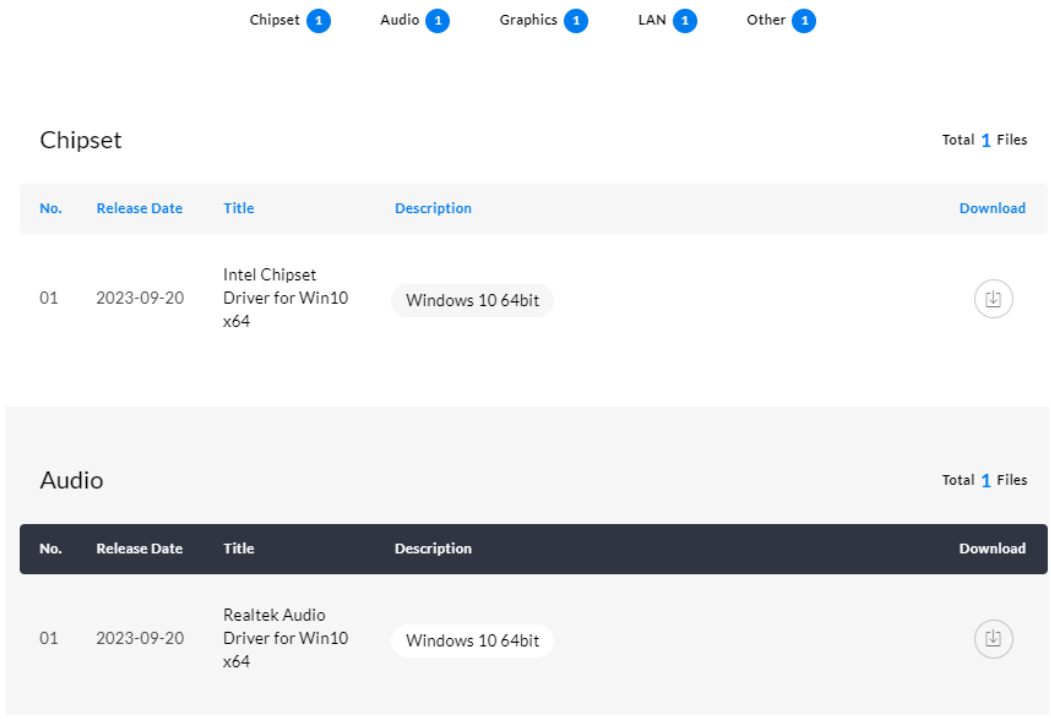
Observe the following common safety precautions before installing any electronic device:

- Use separate, non-intersecting paths to route power and networking wires. If power wiring and device wiring paths must be crossed make sure the wires are perpendicular at the intersection point.
- Keep the wires separated according to the interface. Wires that share similar electrical characteristics must be bundled together.
- Do not bundle input wiring with output wiring. Keep them separate.
- When necessary, it is strongly advised that you label wiring to all devices in the system.

4. Drivers Installation

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

Note:
The box 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.



(For reference only)

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

4.1 Install Chipset Driver

All drivers can be found on the Avalue Official Website:

http://www.avalue.com

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

Step1. Click **Next**.

Step 3. Click **Install**.

Step 2. Click **Accept**.

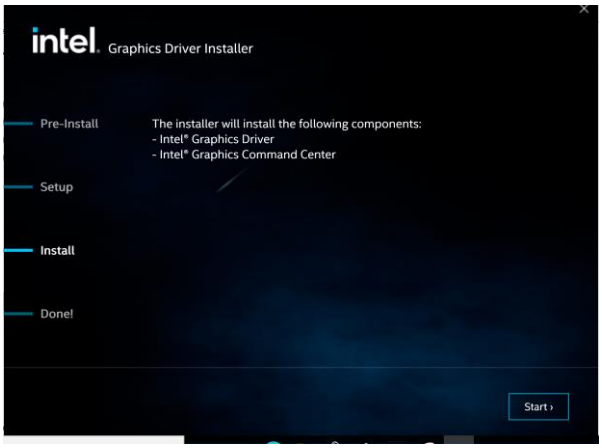
Step 4. Setup completed.

4.2 Install VGA Driver

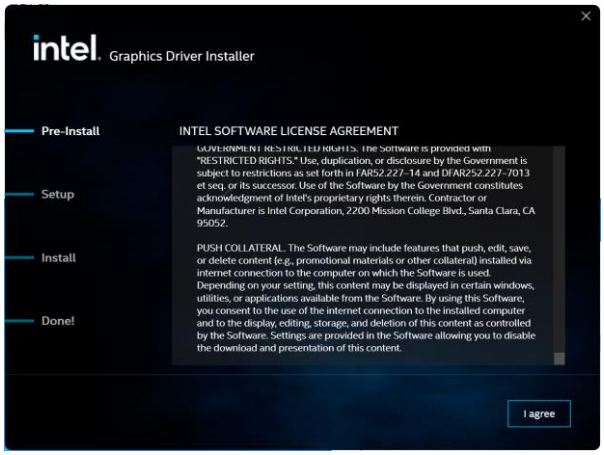
All drivers can be found on the Avalue Official Website:
http://www.avalue.com

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

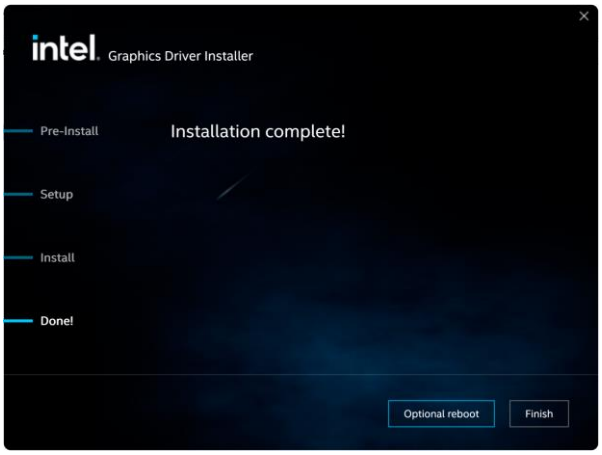
Step 1. Click **Begin installation**.



Step 3. Click **Start**.



Step 2. Click **Next**.



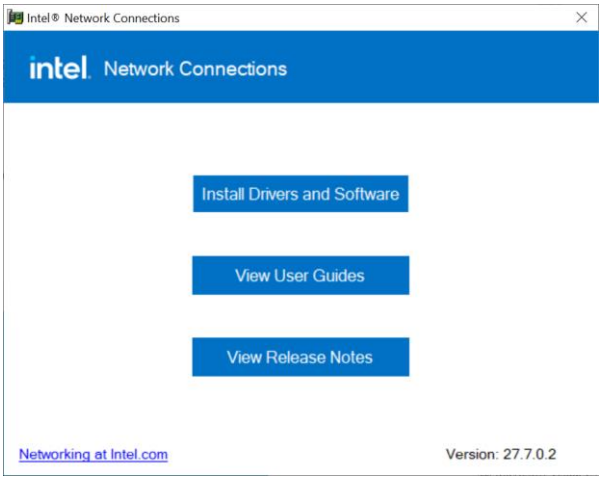
Step 4. Click **Finish** to complete setup.

4.3 Install Ethernet Driver

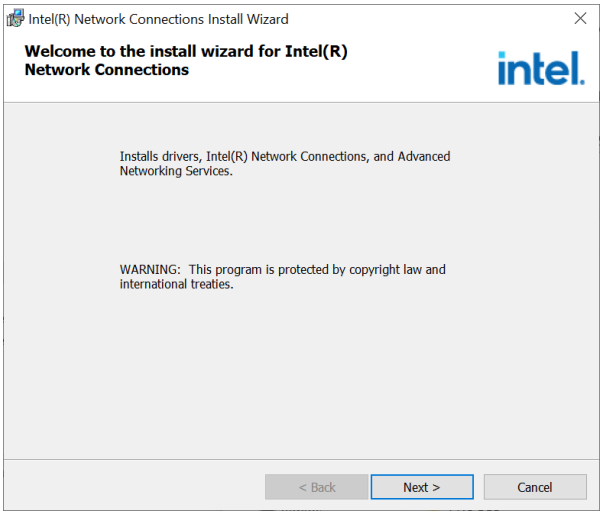
All drivers can be found on the Avalue Official Website:

http://www.avalue.com

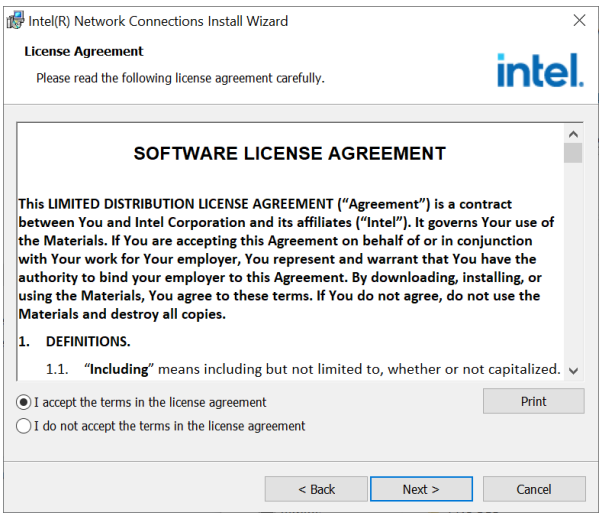
Note: The installation procedures and screen shots in this section are based on Windows 11 operation system.



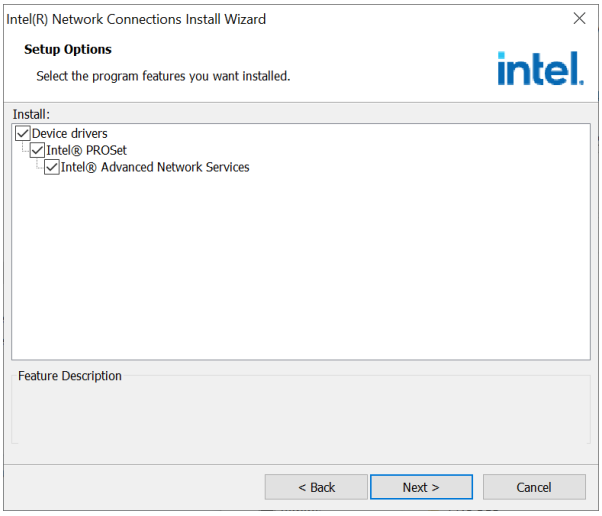
Step 1. Click **Install Drivers and Software** to continue installation.



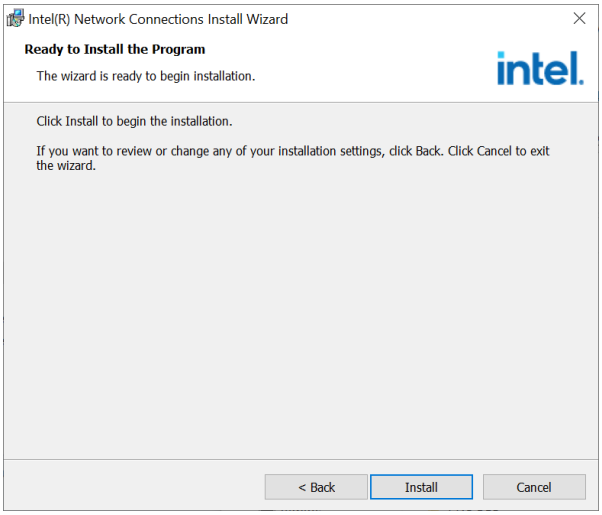
Step 2. Click **Next**.



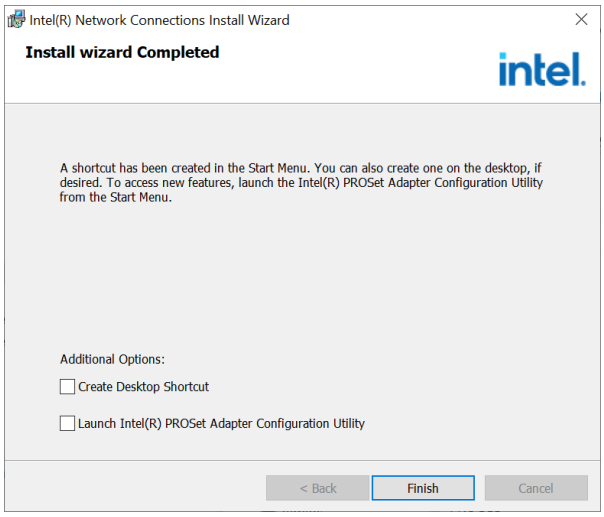
Step 3. Click **Next.**



Step 4. Click **Next.**



Step 5. Click **Install**.



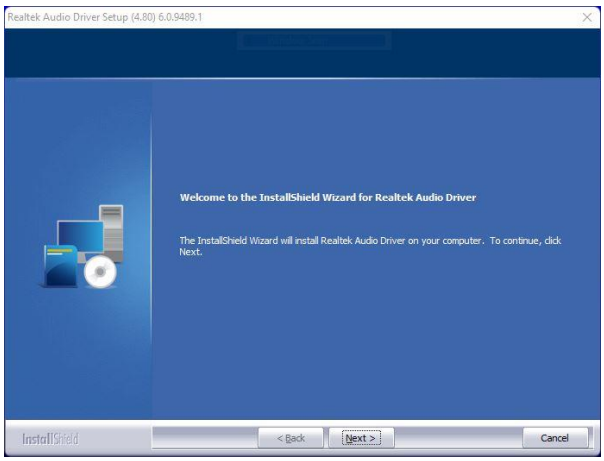
Step 6. Click **Finish** to complete setup.

4.4 Install Audio Driver (For Realtek ALC888S HD Audio)

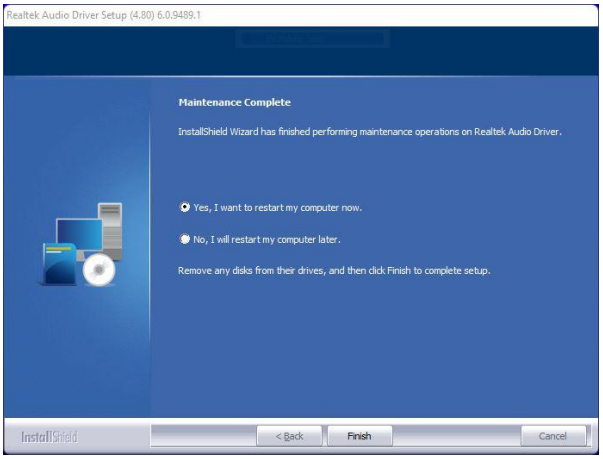
All drivers can be found on the Avalue Official Website:

http://www.avalue.com

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



Step 1. Click **Next** to Install.

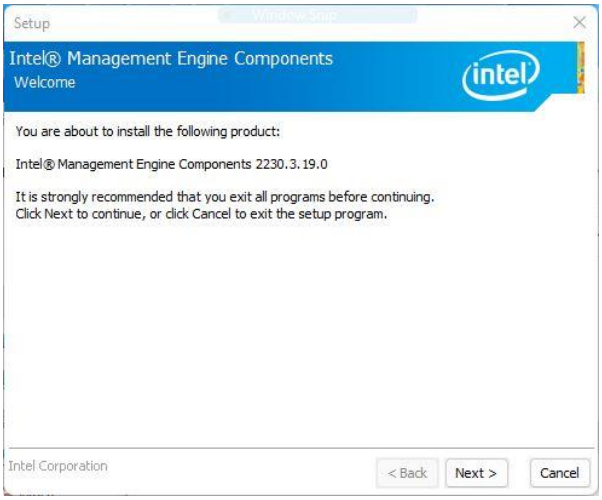


Step 2. Select **Finish** to complete Installation.

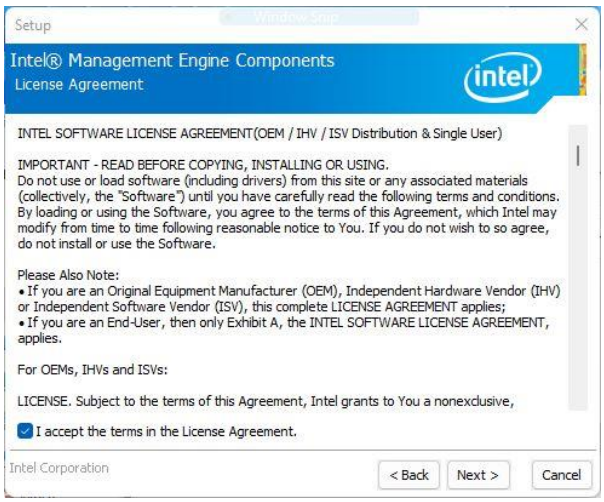
4.5 Install ME Driver

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

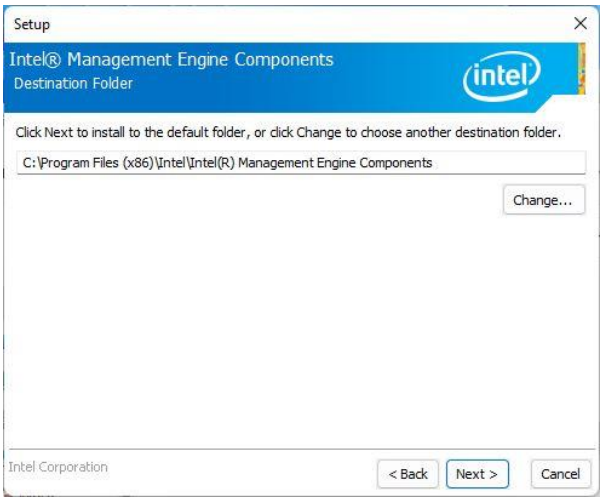
Note: The installation procedures and screen shots in this section are based on Windows 11 operation system. If the warning message appears while the installation process, click Continue to go on.



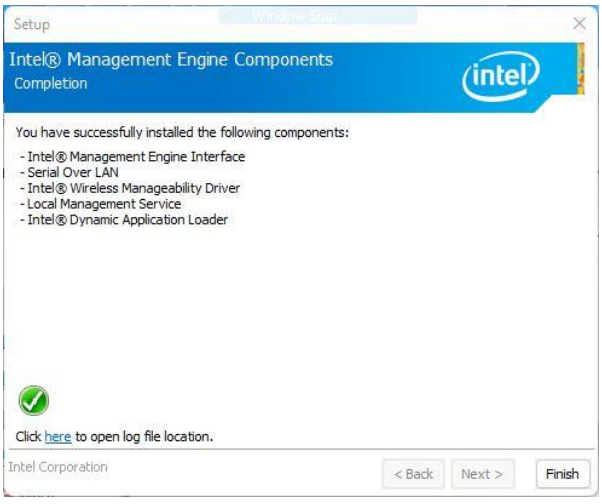
Step1. Click **Next** to start installation.



Step 2. Click **Next**.



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



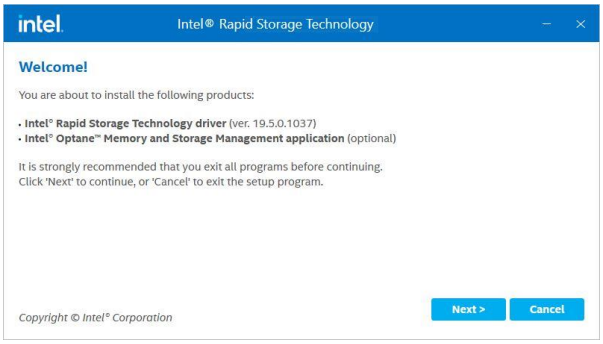
Step 4. Click **Finish** to complete setup.

4.6 Install RST Driver for RAID Mode

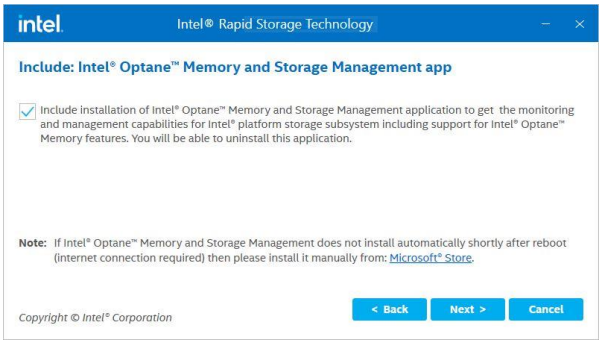
All drivers can be found on the Avalue Official Website:

http://www.avalue.com

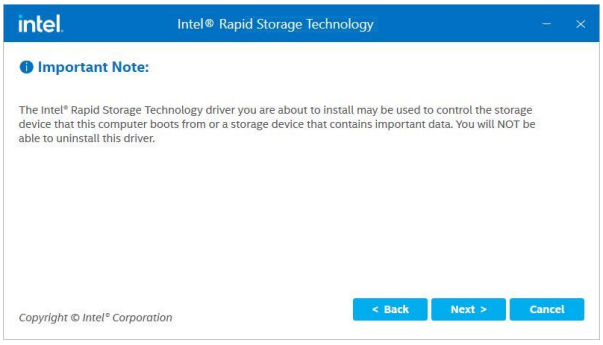
Note: The installation procedures and screen shots in this section are based on Windows 11 operation system.



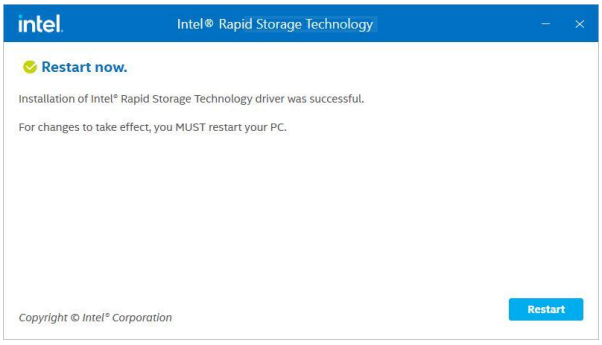
Step 1. Click **Next** to continue installation.



Step 3. Click **Next**.



Step 2. Click **Next**.



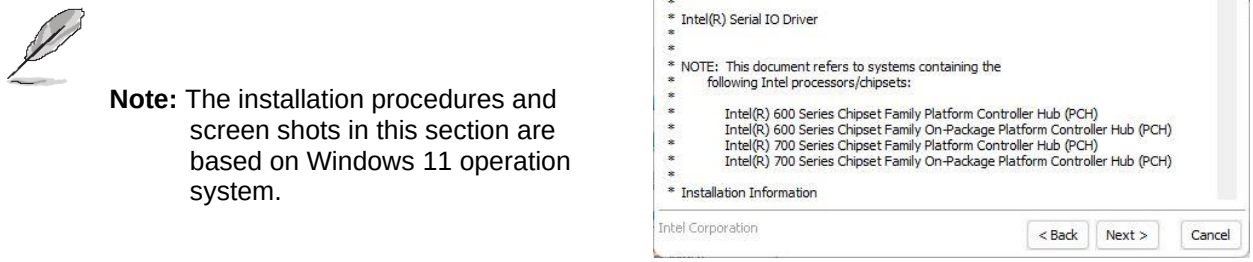
Step 4. Click **Finish** to complete setup.

4.7 Install Serial IO Driver

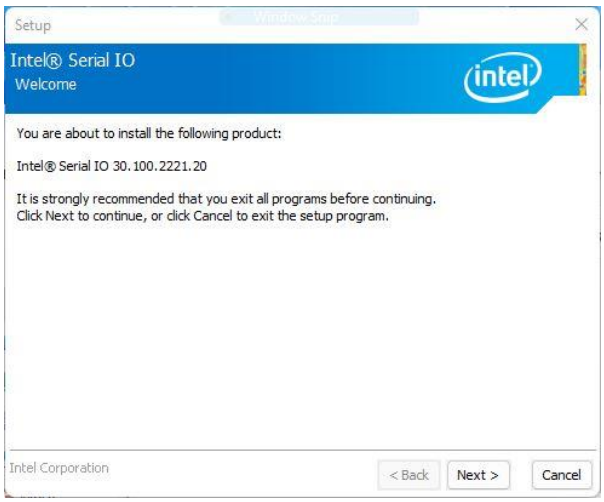
All drivers can be found on the Avalue Official Website:

http://www.avalue.com

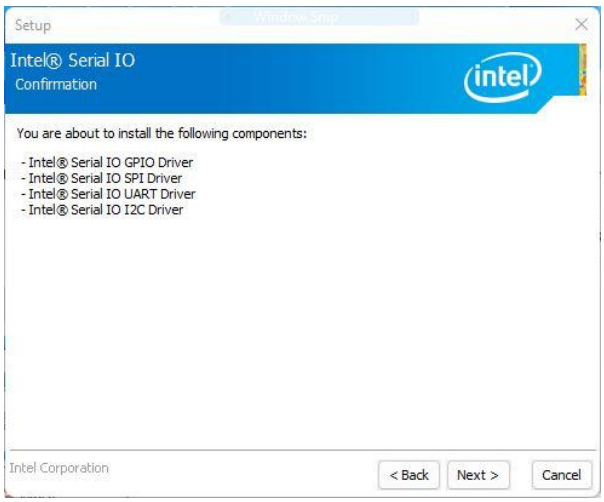
Note: The installation procedures and screen shots in this section are based on Windows 11 operation system.



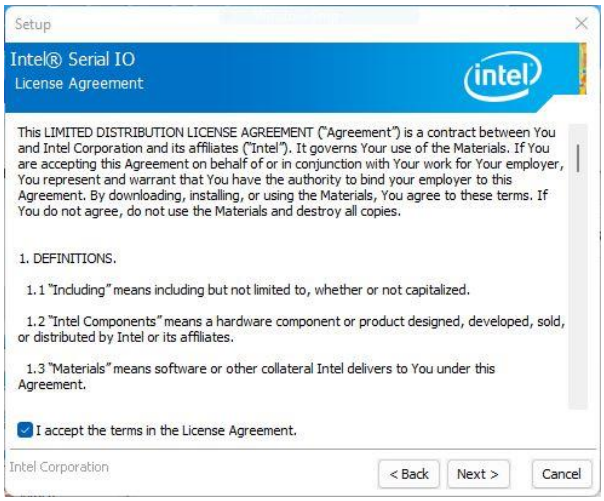
Step 3. Click **Next.**



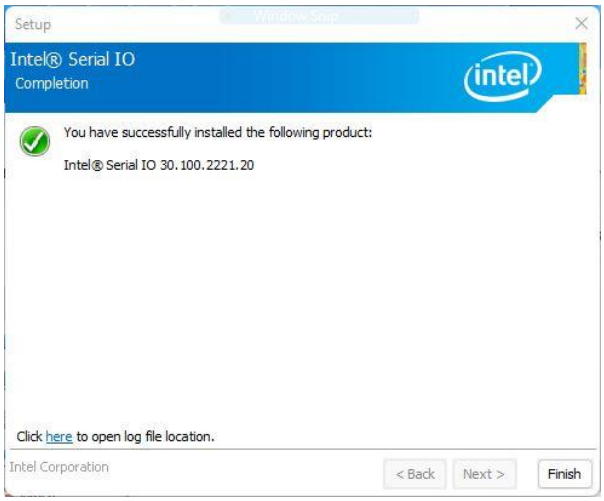
Step 1. Click **Next** to continue installation.



Step 4. Click **Next**.



Step 2. Click **Next**.



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

5.BIOS Setup

5.1 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.

5.2 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

5.3 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.

5.4 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.

5.5 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.

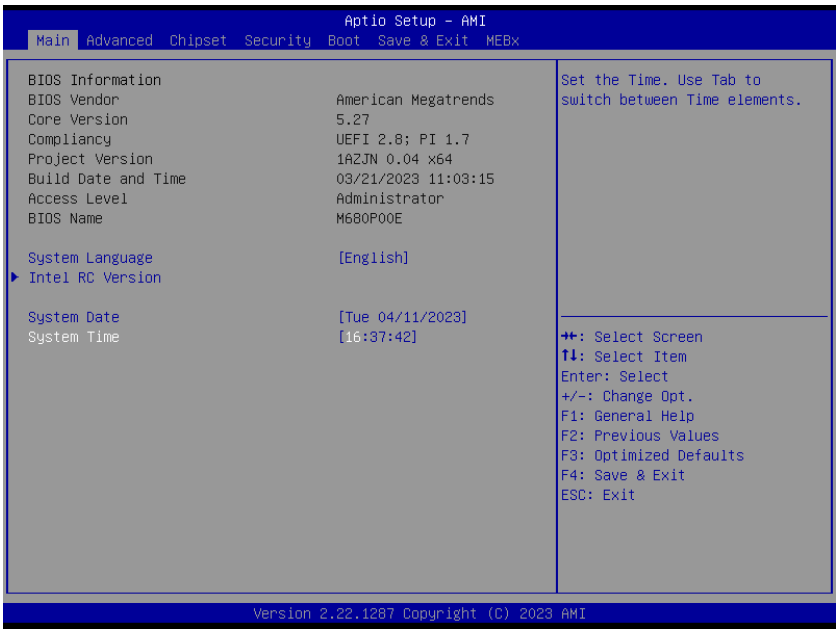
The best advice is to only alter settings which you thoroughly understand. To this end, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both BIOS Vendor and your systems manufacturer to provide the absolute maximum performance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

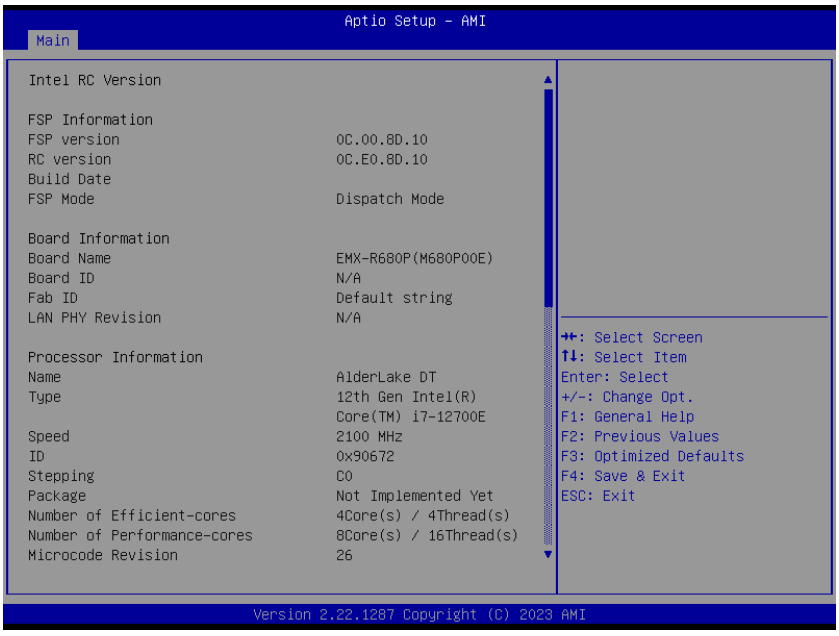
5.6 BIOS setup

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.

5.6.1 Main Menu

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





5.6.1.1 System Language

This option allows choosing the system default language.

5.6.1.2 System Date

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

5.6.1.3 System Time

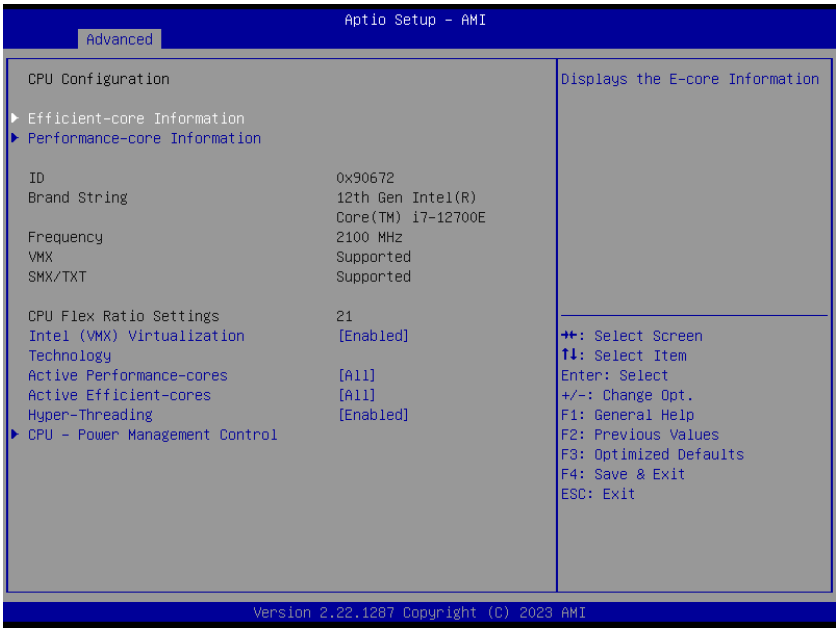
Use the system time option to set the system time. Manually enter the hours, minutes and seconds.

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.

5.6.2 Advanced Menu

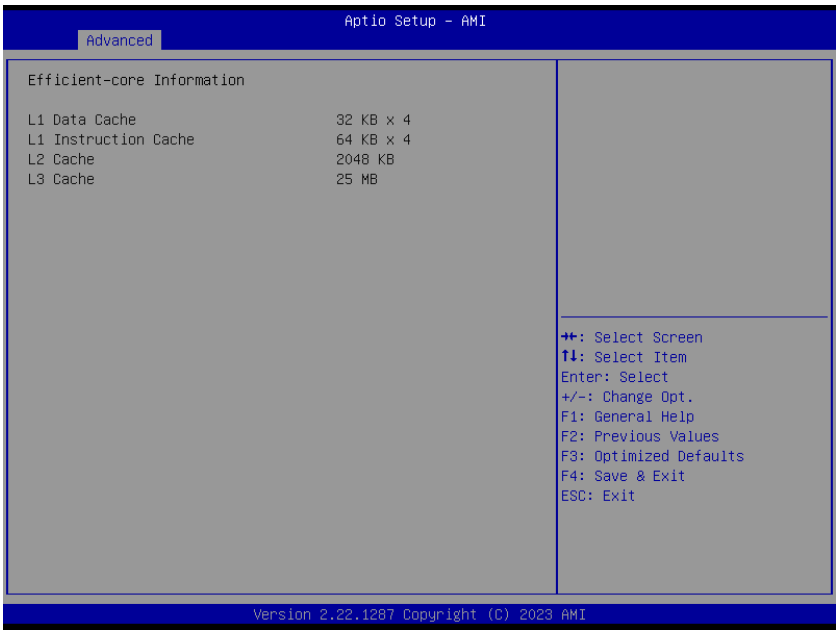
This section allows you to configure your CPU and other system devices for basic operation through the following sub-menus.

5.6.2.1 CPU Configuration

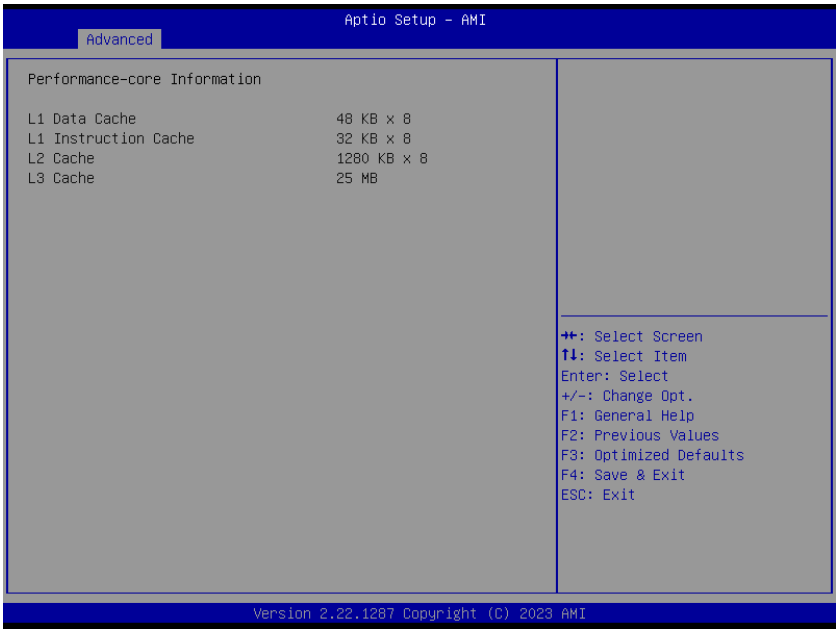


Item	Options	Description
Intel (VMX) Virtualization Technology	Disabled Enabled**[Default]**,	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.
Active Processor Cores	All**[Default]**, 7/6/5/4/3/2/1	Number of P-cores to enable in each processor package.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

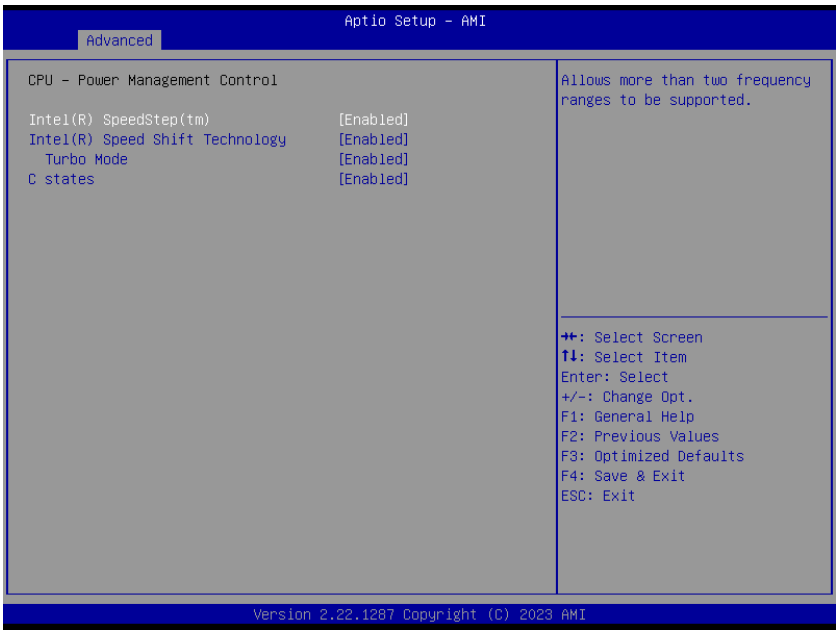
5.6.2.1.1 Efficient-core Information



5.6.2.1.2 Performance-core Information

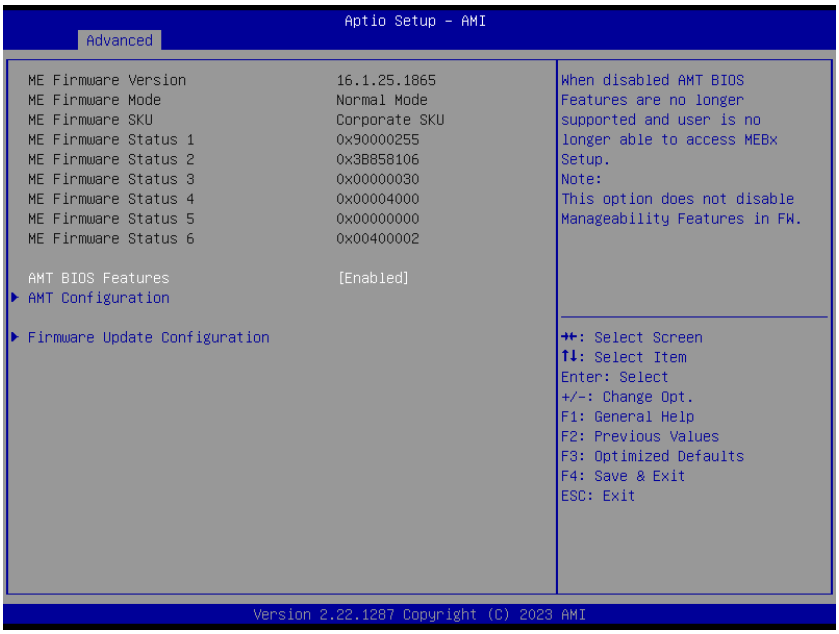


5.6.2.1.3 CPU - Power Management Control



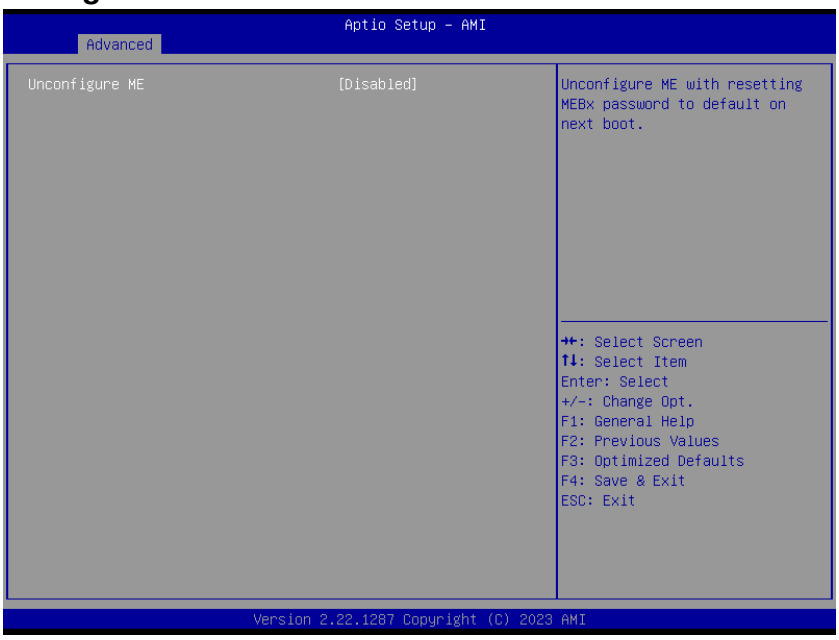
Item	Options	Description
Intel(R) SpeedStep(tm)	Disabled Enabled**[Default]**,	Allows more than two frequency ranges to be supported.
Intel(R) Speed Shift Technology	Disabled**[Default]**, Enabled	Enable/Disable Intel(R) Speed Shift Technology support. Enabling will expose the CPPC v2 interface to allow for hardware controlled P-states.
Turbo Mode	Disabled Enabled**[Default]**,	Enable/Disable processor Turbo Mode (requires EMTTM enabled too). AUTO means enabled.
C-states	Disabled**[Default]**, Enabled	Enable/Disable CPU Power Management. Allows CPU to go to C states when it's not 100% utilized.

5.6.2.2 PCH-FW Configuration



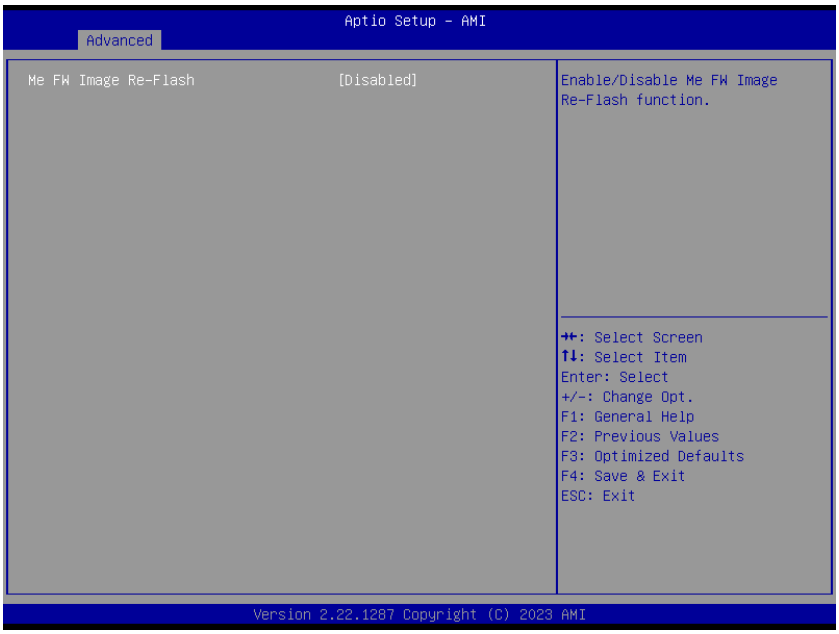
Item	Options	Description
AMT BIOS Features	Disabled Enabled**[Default]**,	When disabled AMT BIOS Features are no longer supported and user is no longer able to access MEBx Setup. Note: This option does not disable Manageability Features in FW.

5.6.2.2.1 AMT Configuration



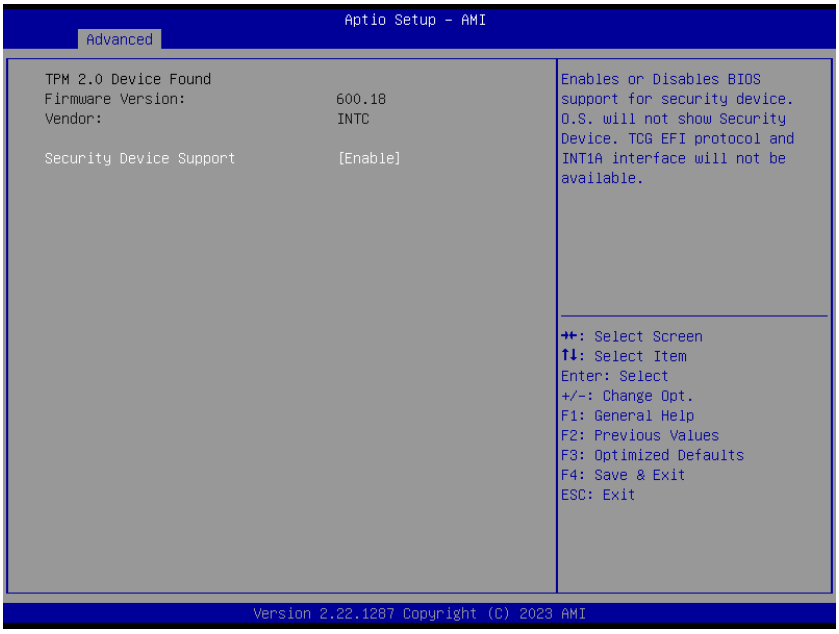
Item	Description
Unconfigure ME	Unconfigure ME with resetting MEBx password to default on next boot.

5.6.2.2.2 Firmware Update Configuration



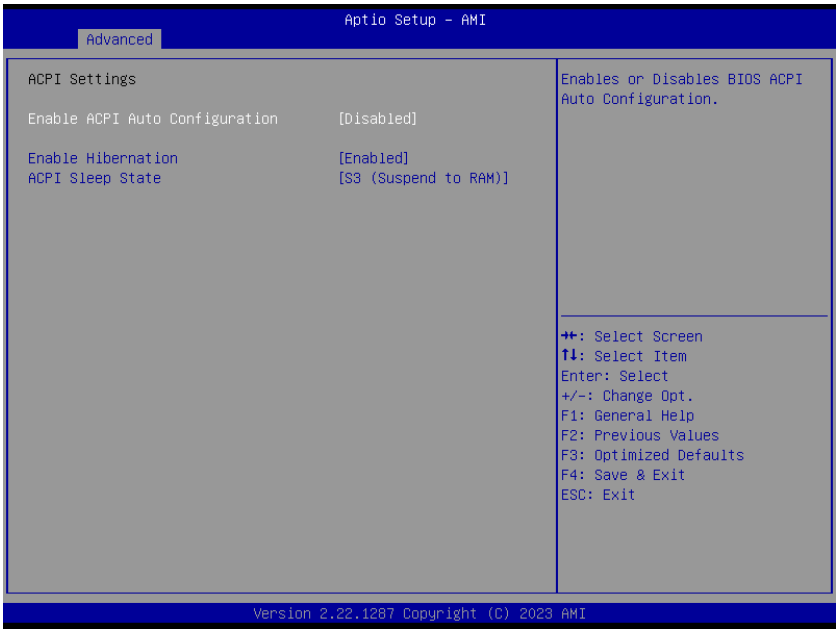
Item	Options	Description
Me FW Image Re-Flash	Disabled**[Default]**, Enabled	Enable/Disable Me FW Image Re-Flash function.

5.6.2.3 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.

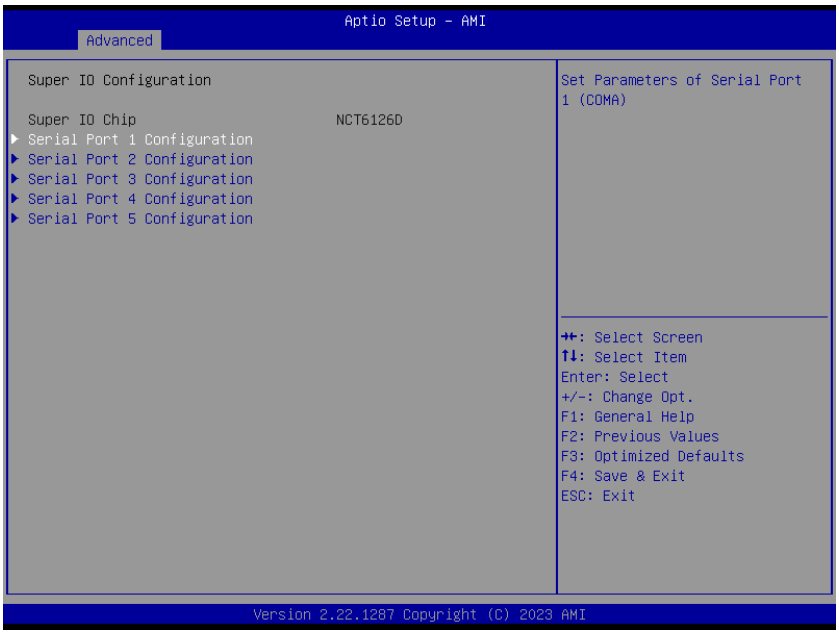
5.6.2.4 ACPI Settings



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

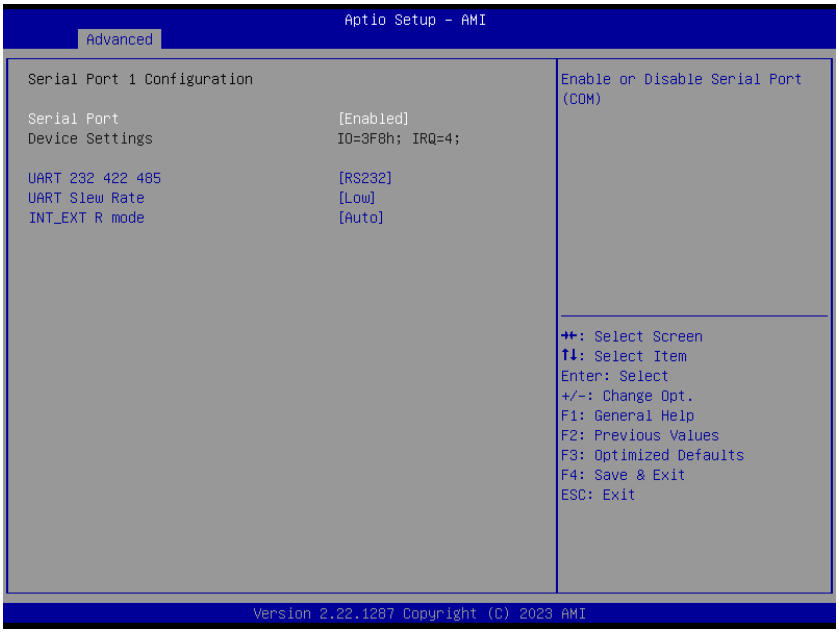
5.6.2.5 Super IO Configuration

You can use this item to set up or change the Super IO configuration for serial ports. Please refer to 5.6.2.5.1~ 5.6.2.5.5 for more information.



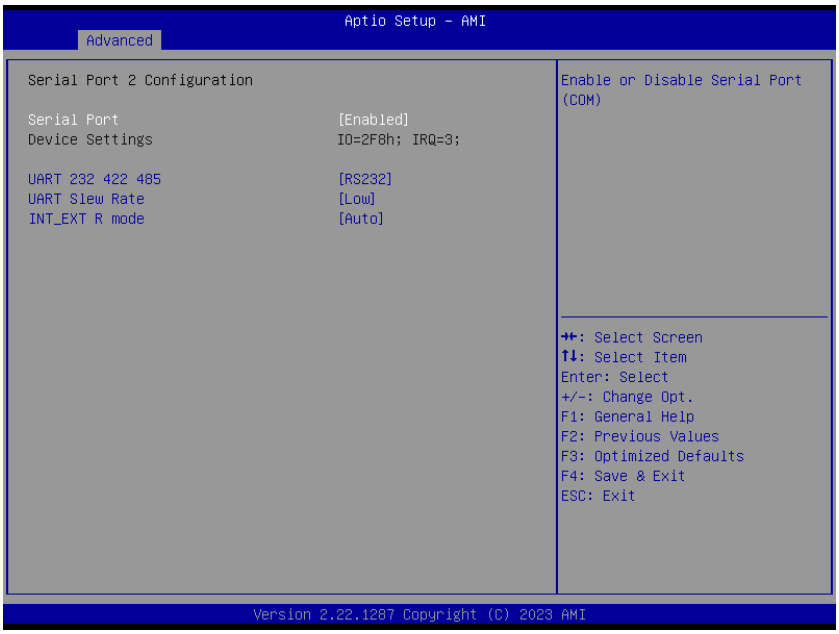
Item	Description
Serial Port 1 Configuration	Set Parameters of Serial Port 1 (COMA).
Serial Port 2 Configuration	Set Parameters of Serial Port 2 (COMB).
Serial Port 3 Configuration	Set Parameters of Serial Port 3 (COMC).
Serial Port 4 Configuration	Set Parameters of Serial Port 4 (COMD).
Serial Port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

5.6.2.5.1 Serial Port 1 Configuration



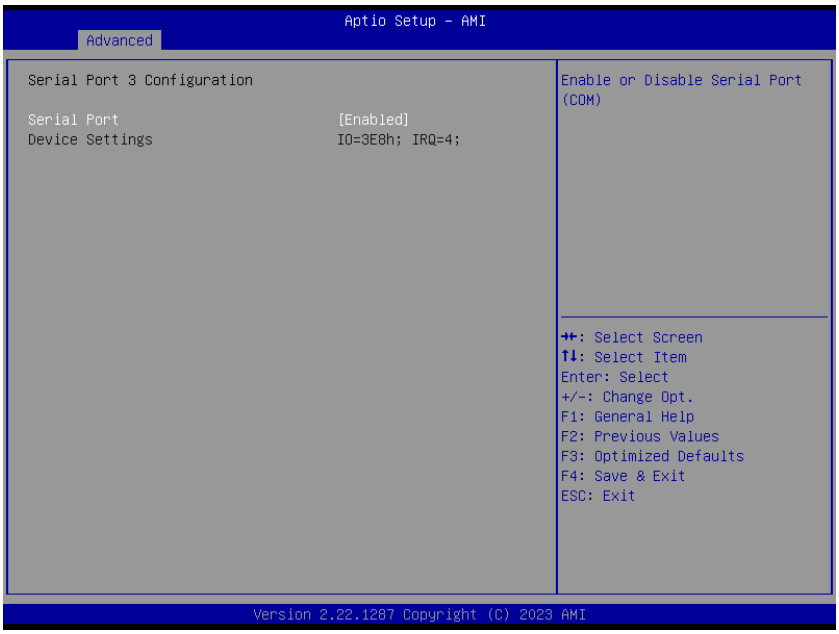
Item	Option	Description
Serial Port	Disabled Enabled**[Default]**,	Enable or Disable Serial Port (COM)
UART 232 422 485	UART 232**[Default]**, UART 422, UART 485	Set COM Port as RS232, 422 or 485 mode.
UART Slew Rate	Low**[Default]**, High	Low: RS232/422/485 =250Kbps High: RS232 = 3Mbps, RS422/485 = 20Mbps
INT_EXT R mode	Auto**[Default]**, Non INT + EXT R INT R EXT R INT + EXT R	Adjust the Serial Port with internal or external termination resistors

5.6.2.5.2 Serial Port 2 Configuration



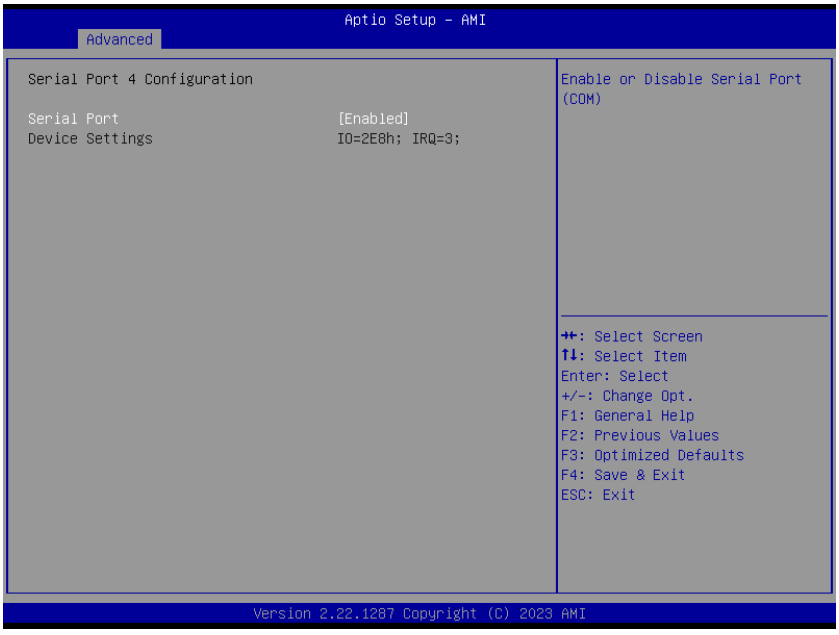
Item	Option	Description
Serial Port	Disabled Enabled**[Default]**,	Enable or Disable Serial Port (COM)
UART 232 422 485	UART 232**[Default]**, UART 422, UART 485	Set COM Port as RS232, 422 or 485 mode.
UART Slew Rate	Low**[Default]**, High	Low: RS232/422/485 =250Kbps High: RS232 = 3Mbps, RS422/485 = 20Mbps
INT_EXT R mode	Auto**[Default]**, Non INT + EXT R INT R EXT R INT + EXT R	Adjust the Serial Port with internal or external termination resistors

5.6.2.5.3 Serial Port 3 Configuration



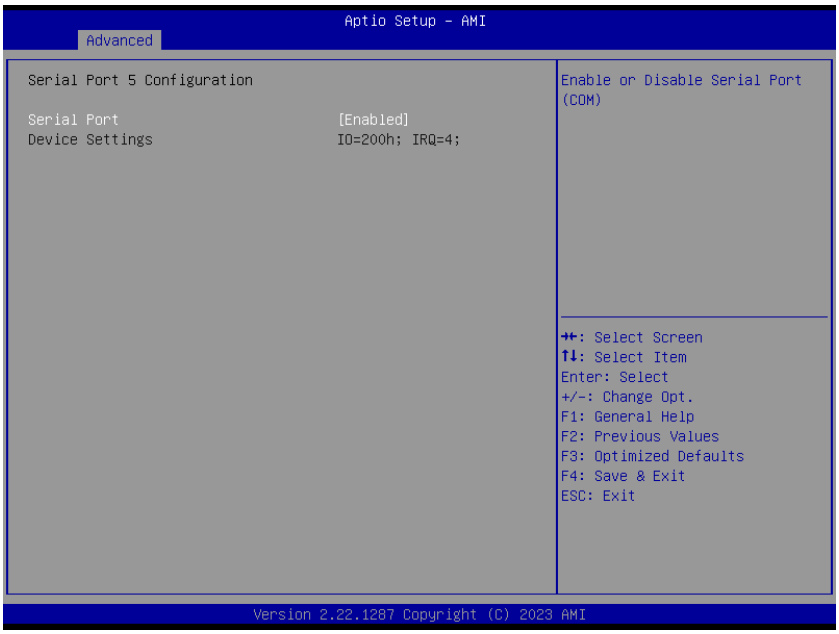
Item	Option	Description
Serial Port	Disabled Enabled**[Default]**,	Enable or Disable Serial Port (COM)

5.6.2.5.4 Serial Port 4 Configuration



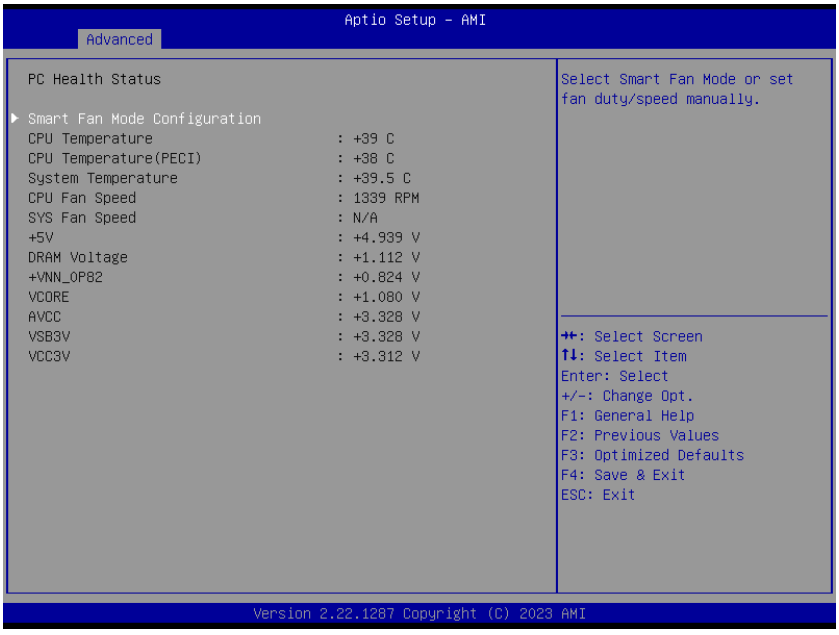
Item	Option	Description
Serial Port	Disabled Enabled**[Default]**,	Enable or Disable Serial Port (COM)

5.6.2.5.5 Serial Port 5 Configuration

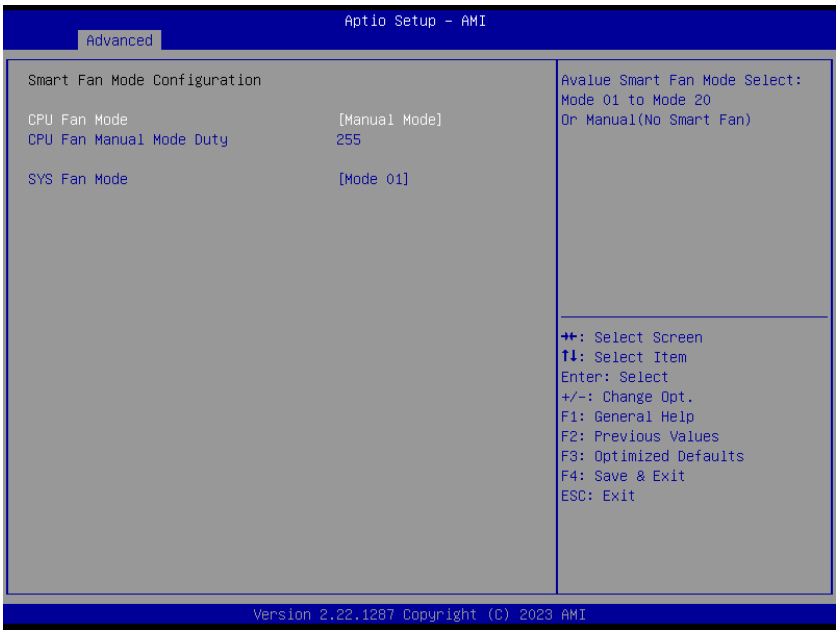


Item	Option	Description
Serial Port	Disabled Enabled**[Default]**,	Enable or Disable Serial Port (COM)

5.6.2.6 NCT6126D HW Monitor

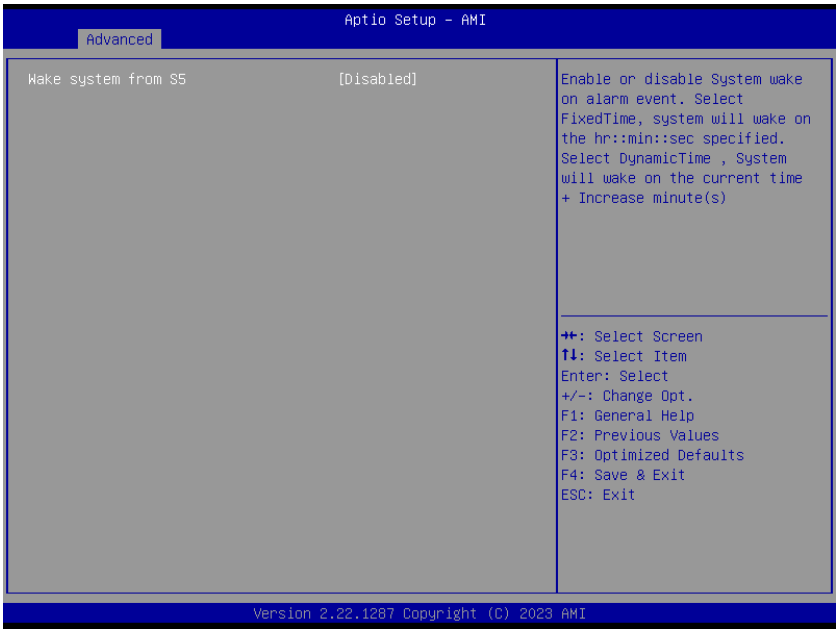


5.6.2.6.1 Smart Fan Mode Configuration



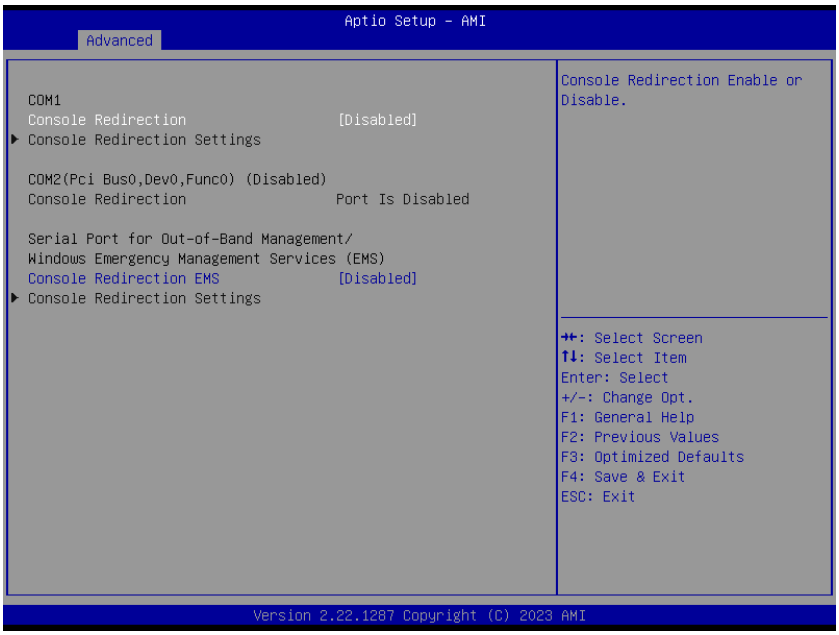
Item	Option	Description
CPU Fan Mode	Manual Mode**[Default]**, /Mode 01/Mode 02 /Mode 03/Mode 04 /Mode 05/Mode 06 /Mode 07/Mode 08 /Mode 09/Mode 10 /Mode 11/Mode 12 /Mode 13/Mode 14 /Mode 15/Mode 16 /Mode 17/Mode 18 /Mode 19/Mode 20	Avalue Smart Fan Mode Select: Mode 01 to Mode 20 Or Manual(No Smart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

5.6.2.7 S5 RTC Wake Settings



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

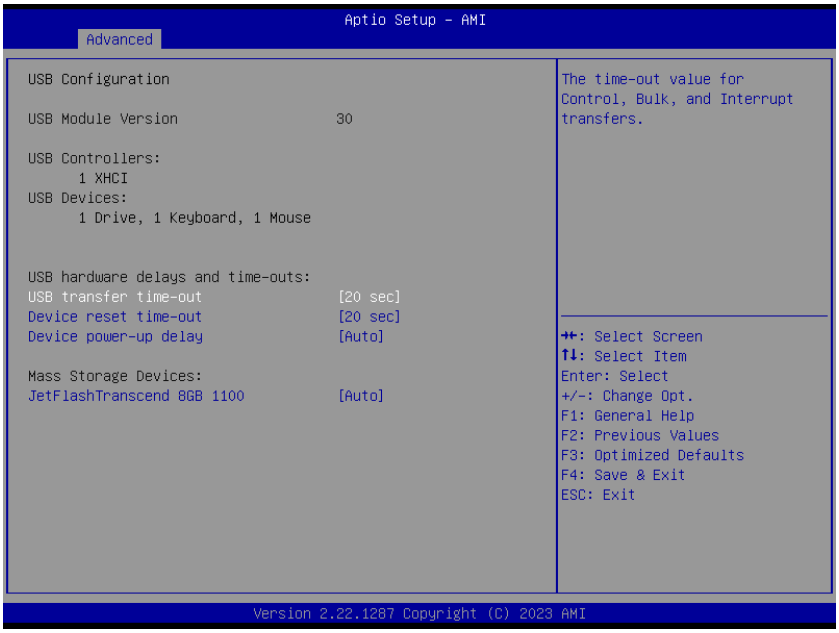
5.6.2.8 Serial Port Console Redirection



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

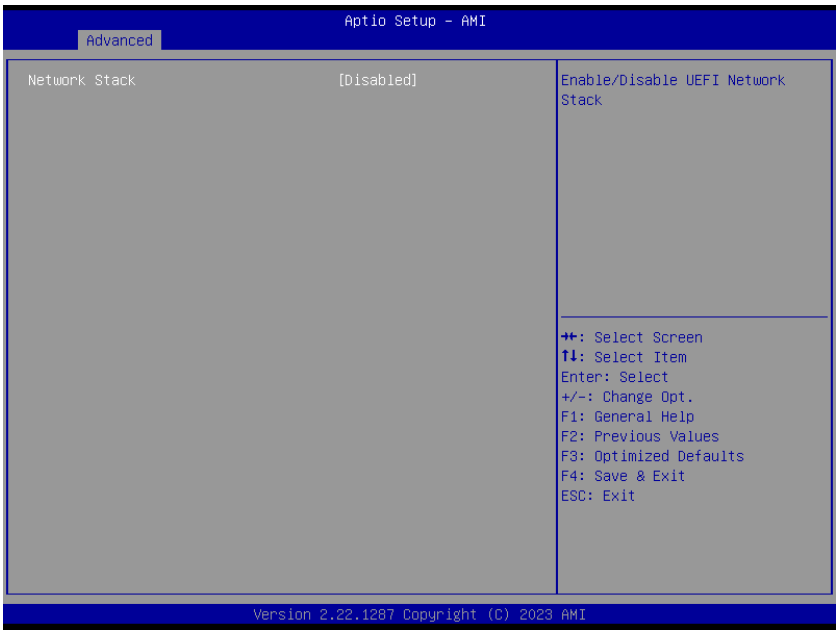
5.6.2.9 USB Configuration

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



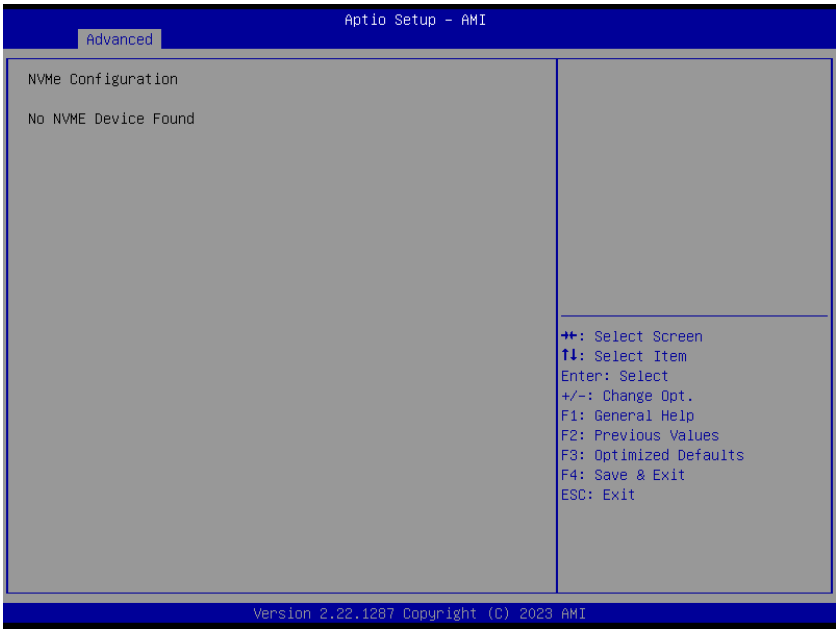
Item	Option	Description
USB transfer time-out	1 sec 5 sec 10 sec 20 sec**[Default]**	The time-out value for Control, Bulk, and Interrupt transfers.
Device reset time-out	10 sec 20 sec**[Default]** 30 sec 40 sec	USB mass storage device Start Unit command time-out.
Device power-up delay	Auto**[Default]** 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 100 ms, 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.

5.6.2.10 Network Stack Configuration

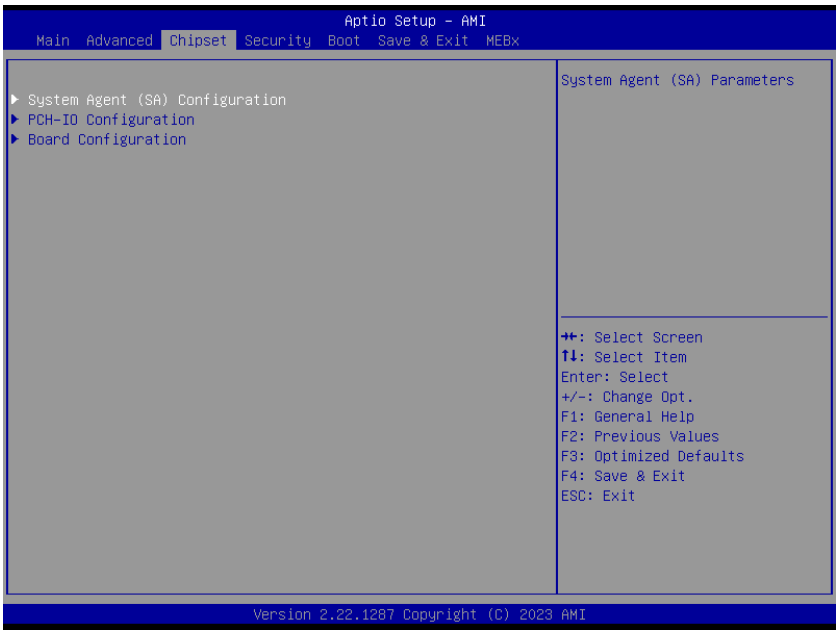


Item	Option	Description
Network Stack	Disabled**[Default]** Enabled	Enable/Disable UEFI Network Stack.

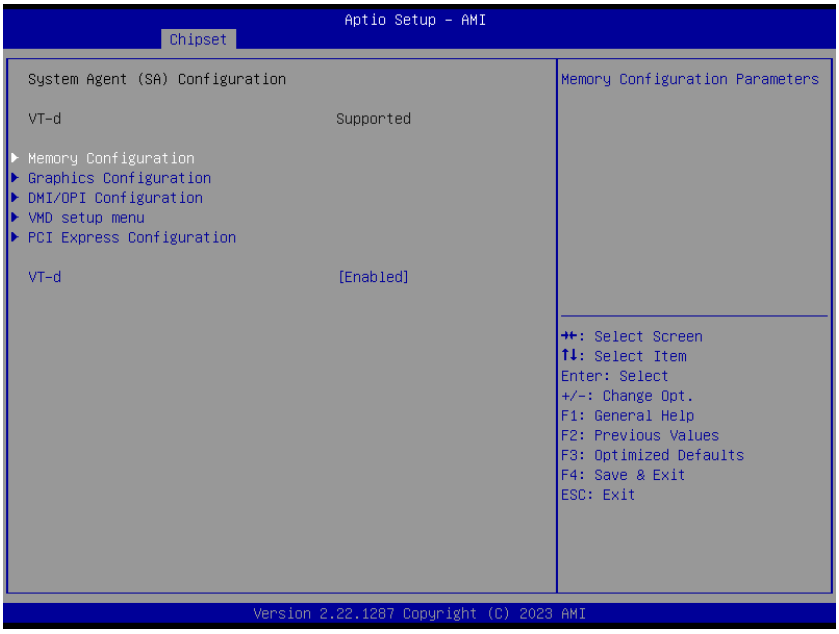
3.6.2.11 NVMe Configuration



5.6.3 Chipset

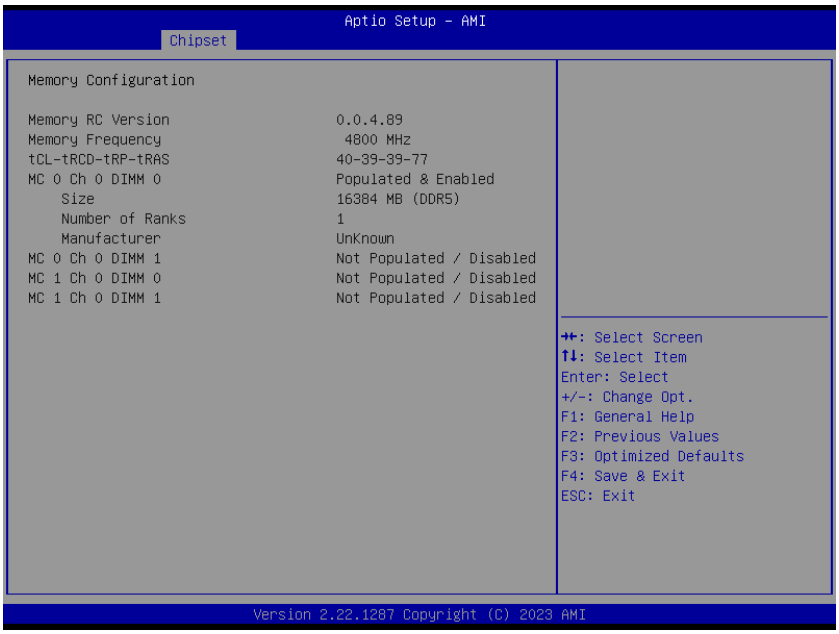


5.6.3.1 System Agent (SA) Configuration



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

5.6.3.1.1 Memory Configuration

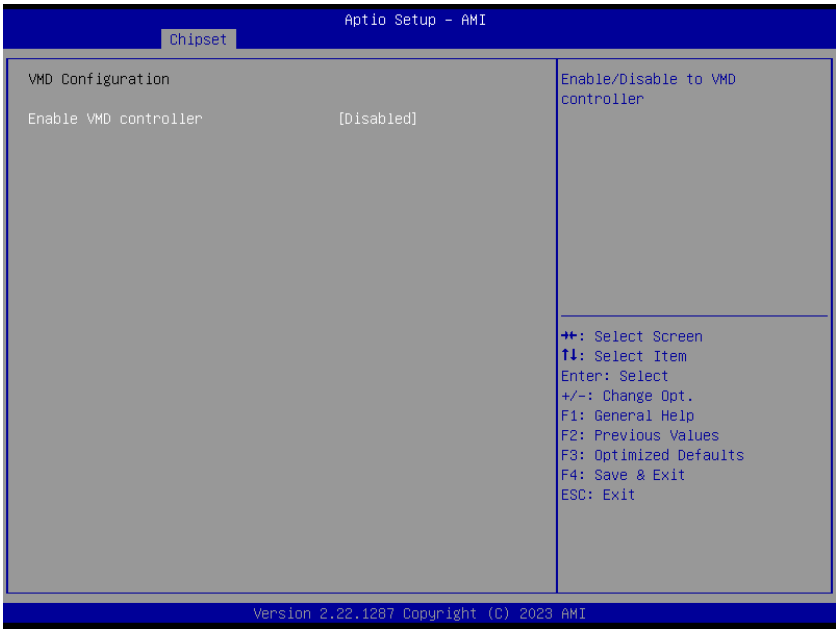


5.6.3.1.2 Graphics Configuration

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

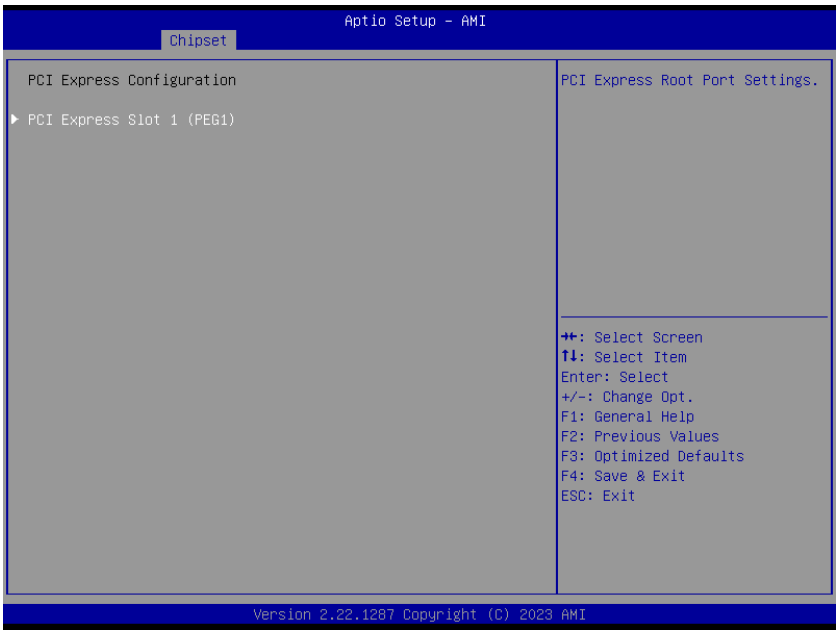
5.6.3.1.3 DMI/OPI Configuration

5.6.3.1.4 VMD setup menu



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

5.6.3.1.5 PCI Express Configuration

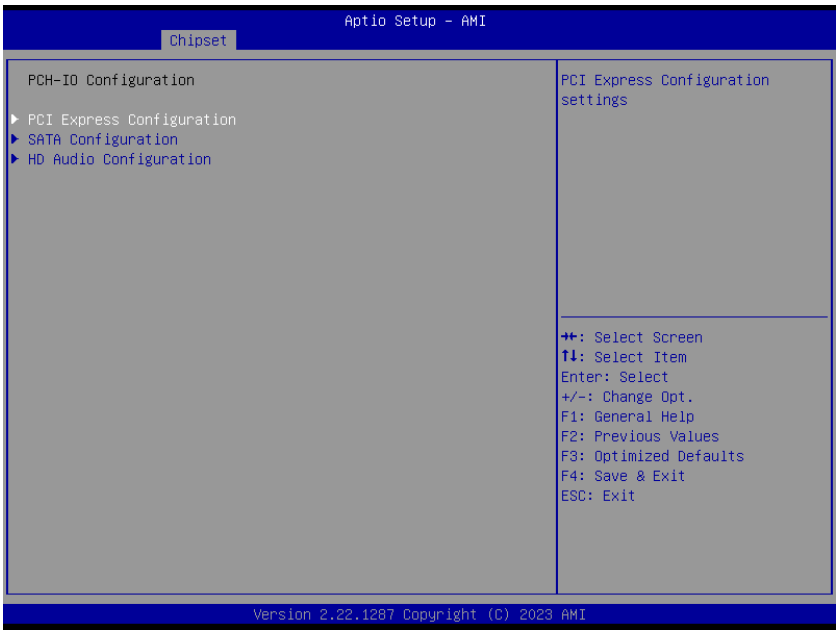


5.6.3.1.5.1 PCI Express Slot 1 (PEG1)

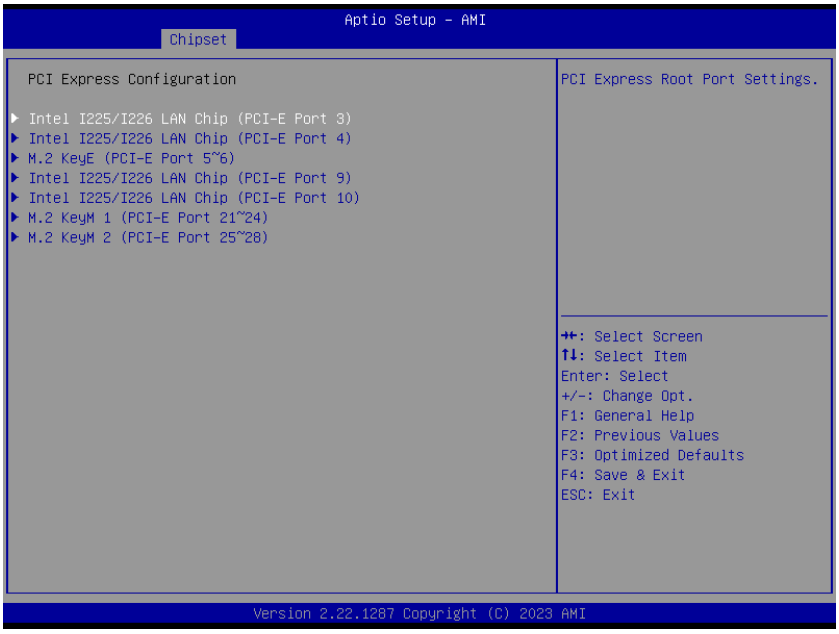
Item	Option	Description
PCI Express Slot 1 (PEG1)	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM	Disabled**[Default]** L0s L1 L0sL1	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
PCIe Speed	Auto**[Default]** /Gen1/Gen2 /Gen3/Gen4 /Gen5	Configure PCIe speed.

Detect Timeout	0	The number of milliseconds reference code will wat for link to exit Detect state for enabled ports before assuming there is no device and potentially disabling the port.

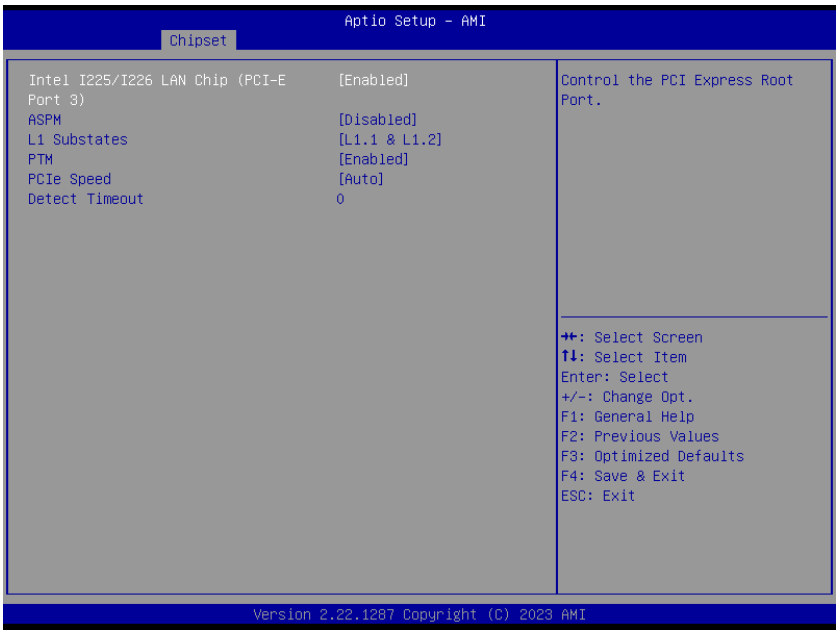
5.6.3.2 PCH-IO Configuration



5.6.3.2.1 PCI Express Configuration

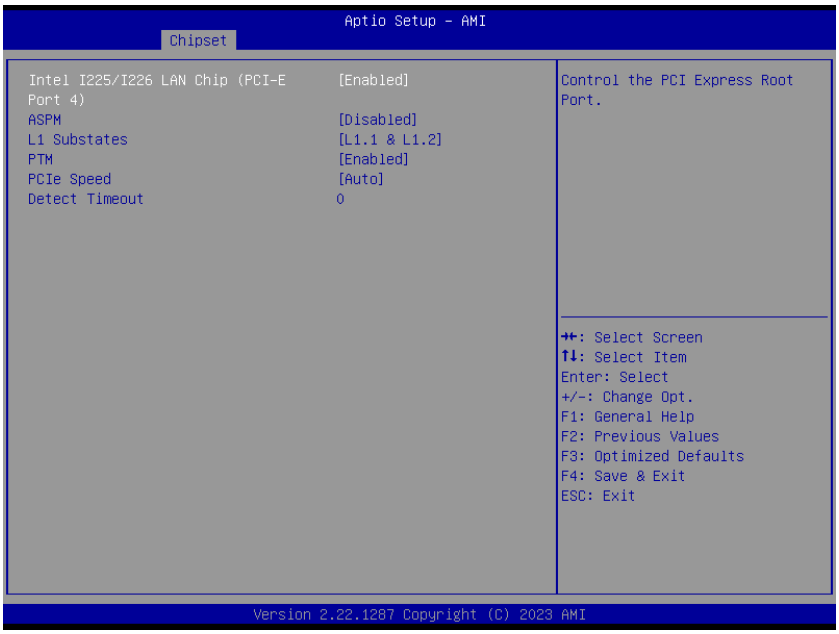


5.6.3.2.1.1 Intel I225/I226 LAN Chip (PCI-E Port 3)



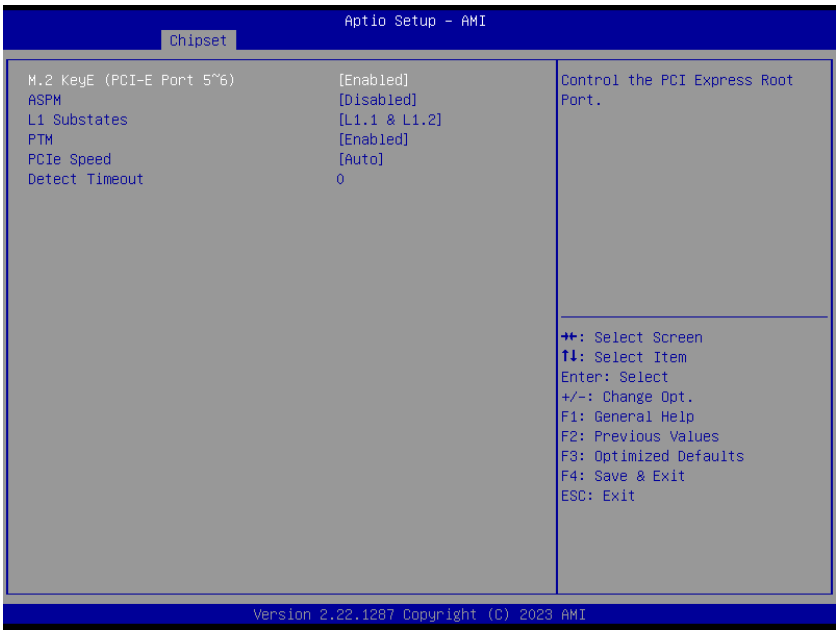
Item	Option	Description
Intel I225/I226 LAN Chip (PCI-E Port 3)	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM	Disabled**[Default]** L1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled L1.1 L1.1 & L1.2**[Default]**,	PCI Express L1 Substates settings.
PTM	Disabled**[Default]**, Enabled	Enable/Disable Precision Time Measurement.
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3 Gen4	Configure PCIe speed.
Detect Timeout	0	The number of milliseconds reference code will wat for link to exit Detect state for enabled ports before assuming there is no device and potentially disabling the port.

5.6.3.2.1.2 Intel I225/I226 LAN Chip (PCI-E Port 4)



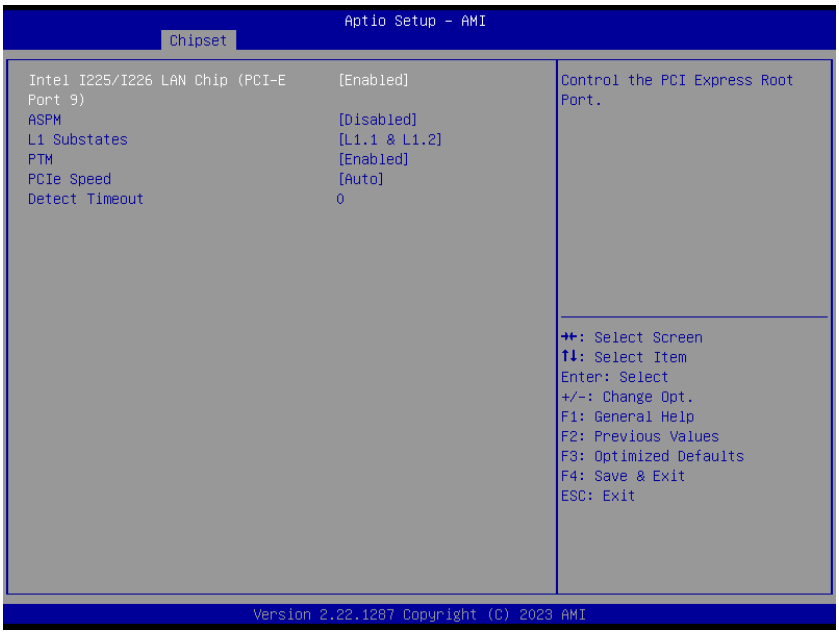
Item	Option	Description
Intel I225/I226 LAN Chip (PCI-E Port 4)	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM	Disabled**[Default]** L1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled L1.1 L1.1 & L1.2**[Default]**,	PCI Express L1 Substates settings.
PTM	Disabled**[Default]**, Enabled	Enable/Disable Precision Time Measurement.
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3 Gen4	Configure PCIe speed.
Detect Timeout	0	The number of milliseconds reference code will wat for link to exit Detect state for enabled ports before assuming there is no device and potentially disabling the port.

5.6.3.2.1.3 M.2 KeyE (PCI-E Port 5~6)



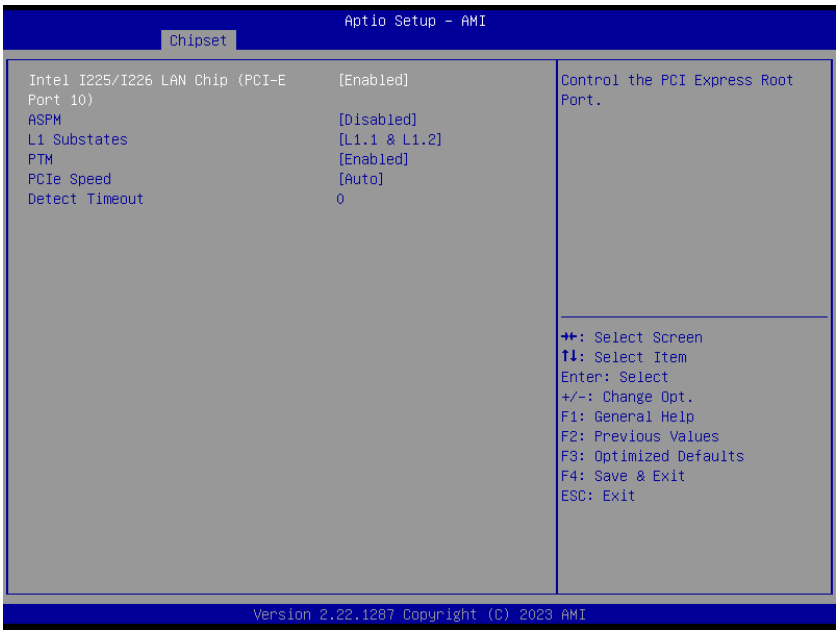
Item	Option	Description
M.2 KeyE (PCI-E Port 5~6)	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM	Disabled**[Default]** L1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled L1.1 L1.1 & L1.2**[Default]**,	PCI Express L1 Substates settings.
PTM	Disabled**[Default]**, Enabled	Enable/Disable Precision Time Measurement.
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3 Gen4	Configure PCIe speed.
Detect Timeout	0	The number of milliseconds reference code will wat for link to exit Detect state for enabled ports before assuming there is no device and potentially disabling the port.

5.6.3.2.1.4 Intel I225/I226 LAN Chip (PCI-E Port 9)



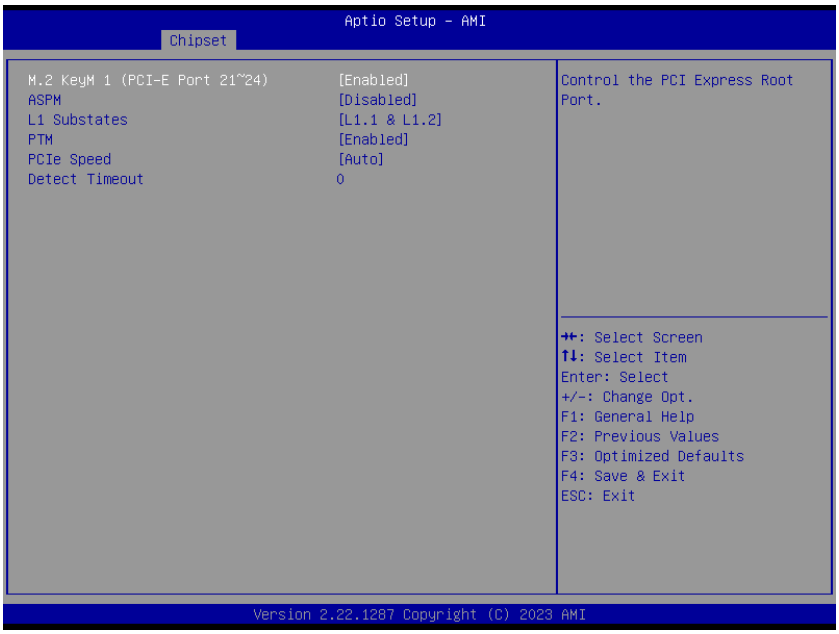
Item	Option	Description
Intel I225/I226 LAN Chip (PCI-E Port 9)	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM	Disabled**[Default]** L1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled L1.1 L1.1 & L1.2**[Default]**,	PCI Express L1 Substates settings.
PTM	Disabled**[Default]**, Enabled	Enable/Disable Precision Time Measurement.
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3 Gen4	Configure PCIe speed.
Detect Timeout	0	The number of milliseconds reference code will wat for link to exit Detect state for enabled ports before assuming there is no device and potentially disabling the port.

5.6.3.2.1.5 Intel I225/I226 LAN Chip (PCI-E Port 10)



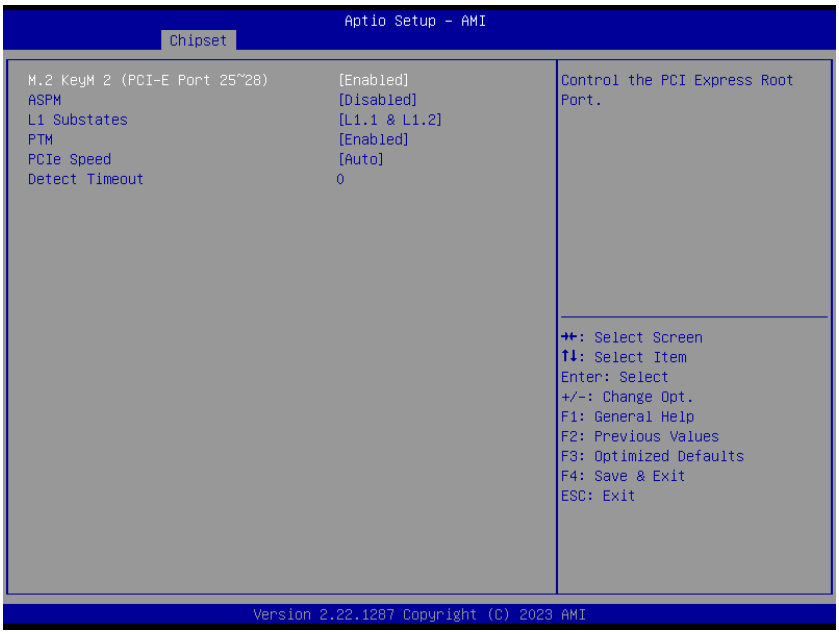
Item	Option	Description
Intel I225/I226 LAN Chip (PCI-E Port 10)	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM	Disabled**[Default]** L1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled L1.1 L1.1 & L1.2**[Default]**,	PCI Express L1 Substates settings.
PTM	Disabled**[Default]**, Enabled	Enable/Disable Precision Time Measurement.
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3 Gen4	Configure PCIe speed.
Detect Timeout	0	The number of milliseconds reference code will wat for link to exit Detect state for enabled ports before assuming there is no device and potentially disabling the port.

5.6.3.2.1.6 M.2 KeyM 1 (PCI-E Port 21~24)



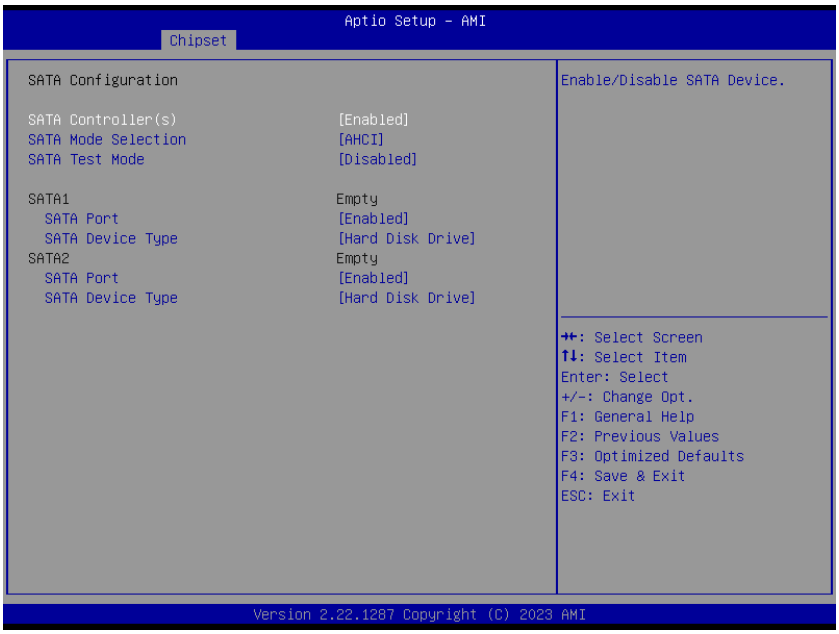
Item	Option	Description
3.6.3.2.1.6 M.2 KeyM 1 (PCI-E Port 21~24)	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM	Disabled**[Default]** L1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled L1.1 L1.1 & L1.2**[Default]**,	PCI Express L1 Substates settings.
PTM	Disabled**[Default]**, Enabled	Enable/Disable Precision Time Measurement.
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3 Gen4	Configure PCIe speed.
Detect Timeout	0	The number of milliseconds reference code will wat for link to exit Detect state for enabled ports before assuming there is no device and potentially disabling the port.

5.6.3.2.1.7 M.2 KeyM 2 (PCI-E Port 25~28)



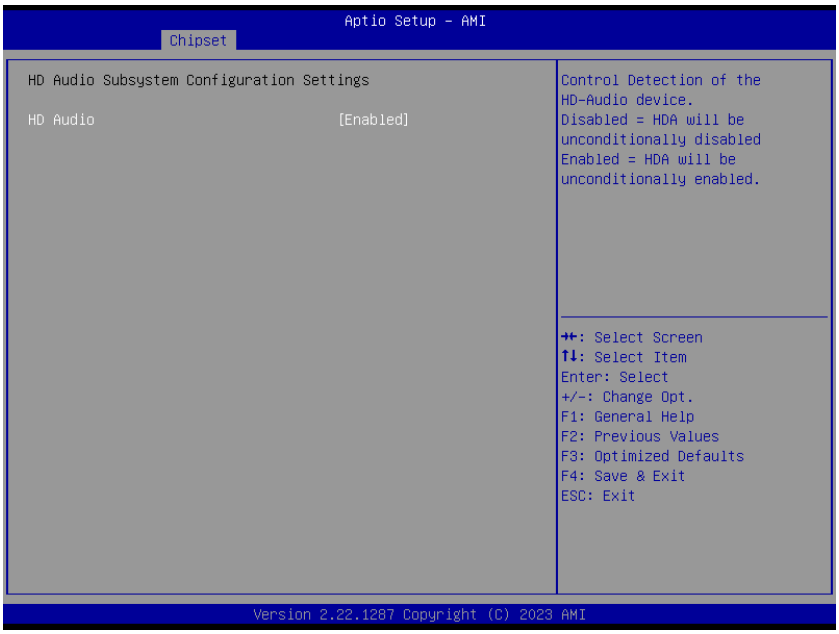
Item	Option	Description
M.2 KeyM 2 (PCI-E Port 25~28)	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM	Disabled**[Default]** L1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled L1.1 L1.1 & L1.2**[Default]**,	PCI Express L1 Substates settings.
PTM	Disabled**[Default]**, Enabled	Enable/Disable Precision Time Measurement.
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3 Gen4	Configure PCIe speed.
Detect Timeout	0	The number of milliseconds reference code will wat for link to exit Detect state for enabled ports before assuming there is no device and potentially disabling the port.

5.6.3.2.2 SATA Configuration



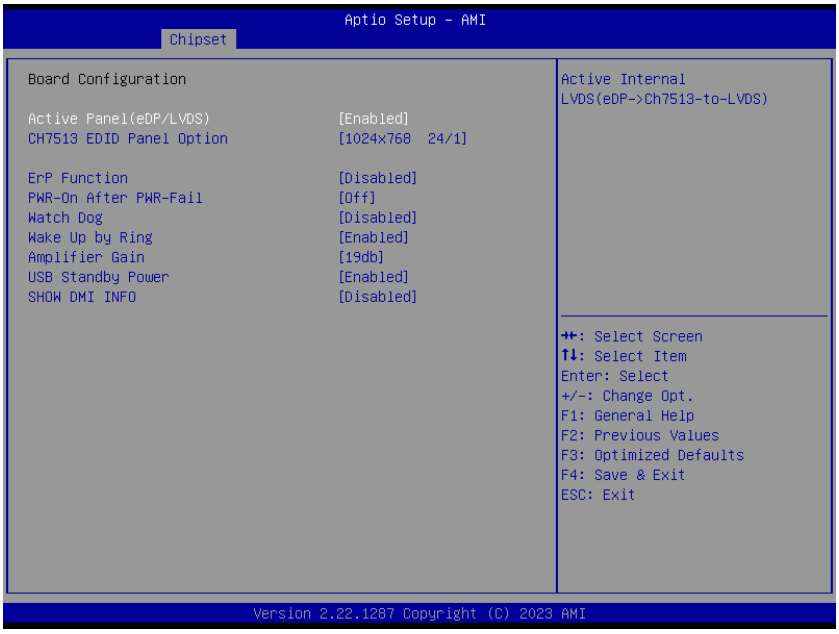
Item	Option	Description
SATA Controller(s)	Enabled**[Default]**, Disabled	Enable/Disable SATA Device.
SATA Mode Selection	AHCI	Determines how SATA controller(s) operate.
SATA Test Mode	Enabled**[Default]**, Disabled	Test Mode Enable/Disable (Loop Back).
SATA Port	Disabled**[Default]**, Enabled	Enable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

5.6.3.2.3 HD Audio Configuration



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

5.6.3.2.4 Board & Panel Configuration



Item	Option	Description
Active Panel(eDP/LVDS)	Disabled Enabled**[Default]**	Active Internal LVDS(eDP->Ch7513-to-LVDS)

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 Ioss resume.
Watch Dog	Disabled**[Default]**,/ 30 sec/40 sec/50 sec/ 1 min/2 min/10 min/30 min	Select WatchDog.
Wake Up by Ring	Disabled Enabled**[Default]**,	Wake Up by Ring from S3/S4/S5
Amplifier Gain	11db 14db 19db**[Default]**, 25db	Amplifier Gain
USB Standby Power	Disabled Enabled**[Default]**,	Enable/Disable USB Standby Power during S3/S4/S5
SHOW DMI INFO	Disabled**[Default]**, Enabled	SHOW DMI INFO

5.6.4 Security

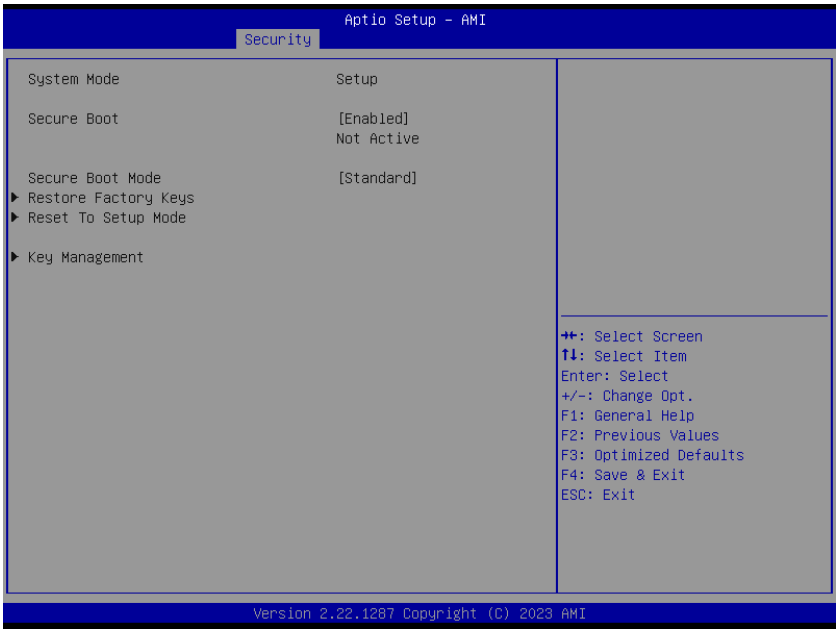
- **Administrator Password**

Set setup Administrator Password

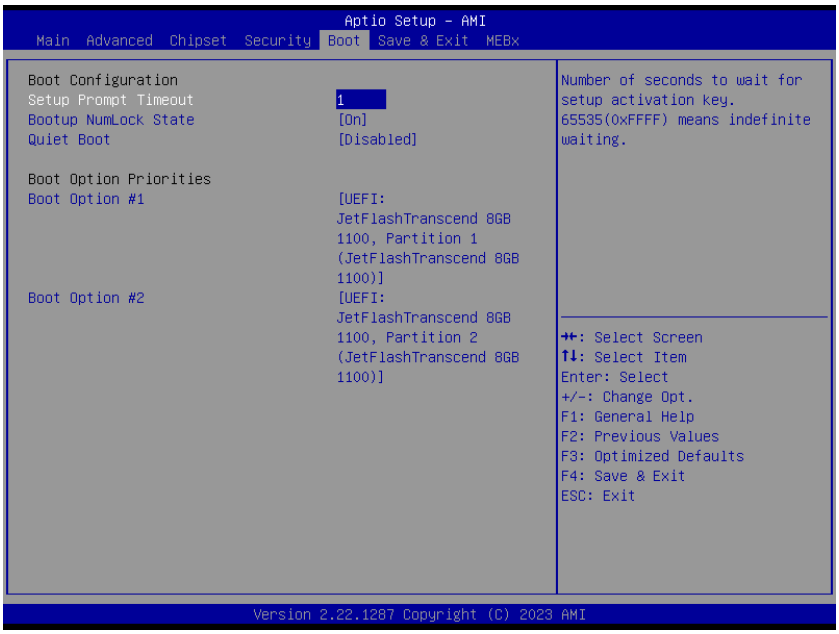
- **User Password**

Set User Password

5.6.4.1 Secure Boot menu

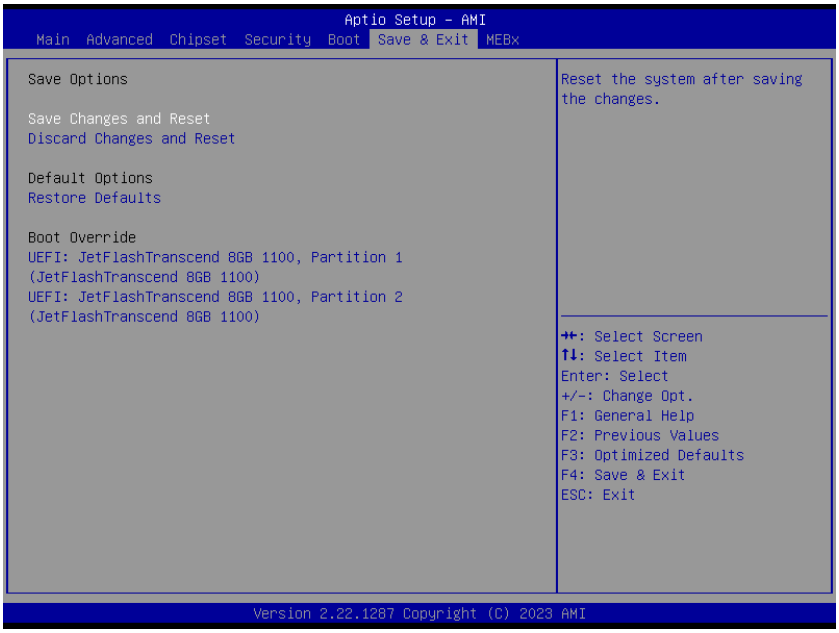


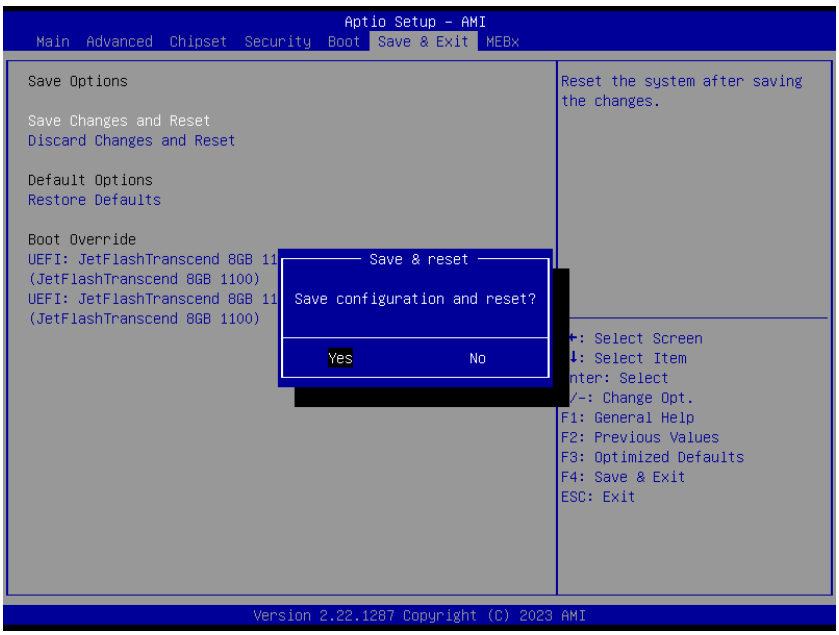
5.6.5 Boot



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
Boot Option #1	Set the system boot order.	
Boot Option #2	Set the system boot order.	

5.6.6 Save and exit





5.6.6.1 Save Changes and Reset

Reset the system after saving the changes.

5.6.6.2 Discard Changes and Reset

Reset system setup without saving any changes.

5.6.6.3 Restore Defaults

Restore/Load Default values for all the setup options.

5.6.6.4 Launch EFI Shell from filesystem device

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

5.6.7 MEBx


Aptio Setup – AMI
Main Advanced Chipset Security Boot Save & Exit MEBx
Intel(R) ME Password
MEBx Login
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.22.1287 Copyright (C) 2023 AMI

6. Maintenance & Troubleshooting

System Maintenance Introduction

If the components of the product fail they must be replaced.

Please contact the system reseller or vendor to purchase the replacement parts. Please follow the safety precautions outlined in the sections that follow

General Safety Precautions

Please ensure the following safety precautions are adhered to at all times.

1. Follow the electrostatic precautions outlined below whenever the device is opened.
2. Make sure the power is turned off and the power cord is disconnected whenever the product is being installed, moved or modified.
3. To prevent the risk of electric shock, make sure power cord is unplugged from wall socket. To fully disengage the power to the unit, please disconnect the power cord from the AC outlet. Refer servicing to qualified service personnel. The AC outlet shall be readily available and accessible.
4. Do not apply voltage levels that exceed the specified voltage range. Doing so may cause fire and/or an electrical shock. Use a power cord that matches the voltage of the power outlet, which has been approved and complies with the safety standard of your particular country.
5. Electric shocks can occur if the product chassis is opened when it is running. To avoid risk of electric shock, this device must only be connected to a supply mains with protective earth.
6. Do not drop or insert any objects into the ventilation openings of the product.
7. If considerable amounts of dust, water, or fluids enter the device, turn off the power supply immediately, unplug the power cord, and contact your dealer or the nearest service center.
8. This equipment is not suitable for use in locations where children are likely to be present.
9. DO NOT:

- Drop the device against a hard surface.
- In a site where the ambient temperature exceeds the rated temperature.

Anti-Static Precautions

WARNING:
Failure to take ESD precautions during the installation of the product may result in permanent damage to the product and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the product. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the product is opened and any of the electrical components are handled, the following anti-static precautions are strictly adhered to.

- Wear an anti-static wristband: Wearing a simple anti-static wristband can help to prevent ESD from damaging any electrical component.
- Self-grounding: Before handling any electrical component, touch any grounded conducting material. During the time the electrical component is handled, frequently touch any conducting materials that are connected to the ground.
- Use an anti-static pad: When configuring or working with an electrical component, place it on an anti-static pad. This reduces the possibility of ESD damage.
- Only handle the edges of the electrical component. When handling the electrical component, hold the electrical component by its edges. Please ensure the following safety precautions are adhered to at all times.

Maintenance and Cleaning

When maintaining or cleaning the product, please follow the guidelines below.

WARNING:

- For safety reasons, turn-off the power and unplug the box PC before cleaning.
- If you dropped any material or liquid such as water onto the box PC when cleaning, unplug the power cable immediately and contact your dealer or the nearest service center. Always make sure your hands are dry when unplugging the power cable.

Maintenance and Cleaning

Prior to cleaning any part or component of the product, please read the details below.

- Never spray or squirt liquids directly onto any other components. To clean the box PC, gently wipe it with a piece of soft dry cloth or a slightly moistened cloth.
- The interior of the device does not require cleaning. Keep fluids away from the device interior.
- Be cautious of all small removable components when vacuuming the device.
- Never drop any objects or liquids through the openings of the device.
- Be cautious of any possible allergic reactions to solvents or chemicals used when cleaning the device.
- Avoid eating, drinking and smoking within vicinity of the device.

Cleaning Tools

Some components in the box PC may only be cleaned using a product specifically designed for the purpose. In such case, the product will be explicitly mentioned in the cleaning tips. Below is a list of items to use when cleaning the box PC.

- Cloth: Although paper towels or tissues can be used, a soft, clean piece of cloth is recommended when cleaning the device.
- Water or rubbing alcohol: A cloth moistened with water or rubbing alcohol can be used to clean the device.
- Using solvents: The use of solvents is not recommended when cleaning the device as they may damage the plastic parts.
- Vacuum cleaner: Using a vacuum specifically designed for computers is one of the best methods of cleaning the device. Dust and dirt can restrict the airflow in the device and cause its circuitry to corrode.
- Cotton swabs: Cotton swaps moistened with rubbing alcohol or water are excellent tools for wiping hard to reach areas.
- Foam swabs: Whenever possible, it is best to use lint free swabs such as foam swabs for cleaning.

Basic Troubleshooting

PEI Beep Codes

# of Beeps	Description
1	Memory not Installed
2	Recovery started
3	Typically for development use. The beep code is generated when DXEIPL PPI or DXE Core is not found.
4	Recovery failed
4	S3 Resume failed
7	Typically for development use. The beep code is generated when platform cannot be reset because reset PPI is not available.

DXE Beep Codes

# of Beeps	Description
1	Invalid password
4	Typically for development use. The beep code is generated when some of the Architectural Protocols are not available.
5	No Console Input or Output Devices are found
5	No Console Input Devices are found
6	Flash update is failed
7	Typically for development use. The beep code is generated when platform cannot be reset because reset protocol is not available.
8	Platform PCI resource requirements cannot be met

7. Product Application

For detailed instructions on the operation of the Watchdog Timer and Digital I/O (DIO) features of this box 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 box PC.