MAB-T660D

MAB-T660D AI PC Jack-Compact Size for Space-Constrained Medical Devices

Quick Reference Guide

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Revision	Date	By	Comment
1st	February 2026	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 "B" 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.

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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.
		**WARNING** • **INGESTION HAZARD**: This product contains a button cell or coin battery. • **DEATH** or serious injury can occur if ingested. • A swallowed button cell or coin battery can cause **Internal Chemical Burns** in as little as **2 hours**. • **KEEP** new and used batteries **OUT OF REACH of CHILDREN**. • **Seek immediate medical attention** if a battery is suspected to be swallowed or inserted inside any part of the body.

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.

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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-T660D Barebone system	1
2	24V/7.5A Power Adapter	1
3	CPU cooler	1
4	Screws (M3x4L) for HDD installation	4



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	12th Gen Alder Lake/ 13th Gen Raptor Lake/ 14th Gen Raptor Lake Refresh Intel® Core™ i3/i5/i7/i9 Processors. Max TDP 65W
Platform Controller Hub	Intel® H610E Chipset
System Memory	2 x SODIMM sockets support DDR5 5600MHz up to 64GB (Non-ECC) (CPU dependent)
System Fan	2 x FAN 4P/12V/8cm 70x75x16mm 5000rpm
I/O Chipset	Nuvoton NCT6126D (eSPI super IO)
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, Voltages monitoring, CPU fan speed control
TPM	dTPM2.0
iAMT	Yes
SBC	MX610HD
Expansion	
M.2 Key-X Size (Signals)	1 x M.2 M-Key 2242/2280 NVMe (PCIe x4 + SATA III) 1 x M.2 E-Key 2230 CNVi (PCIe x1 + USB 2.0)
PCIeX (Gen X)	1 x Gen 4 PCIe x16
Storage	
M.2 Key-X Size (Signals)	1xM.2 Key-M 2242/2280 NVMe (PCIex4, SATA3)
2.5” Drive Bay (Height)	1xInternal 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	2 x USB 2.0 (Type A) 2 x USB 3.2 (Type A)
HDMI	1 x HDMI
DP	1 x DP
Audio	Line-out, Mic-in
LAN Port	2 x RJ45
AC/DC Input	DC-In

Onboard I/O	
SATA Signal	2 x SATA III
SATA PWR	1 x 15-pin SATA Power Connector (2 Devices)
GPIO	1 x 8-bit GPIO Header
USB Port	1 x 2 x 5 pin, pitch 2.54mm connector for 2 x USB 2.0 (USB78) 1 x 2 x 10 pin, pitch 2.00mm connector for 2 x USB 3.2 Gen 1x1 (USB56)
COM Port	**COM1~COM2**: • 2 x RS232/422/485 ports, selectable via BIOS • Connector: 2 x 5-pin header (2.00mm pitch) • Pin 9: *No power output* • Power selection (Pin 9) available via jumper (JCOMPWR1~2): +5V / +12V / RI (Ring Indicator) **COM3**: • 1 x RS232 port • Connector: 2 x 5-pin header (2.00mm pitch) • Pin 9: *No power output* • Power configuration via jumper (JCOMPWR3): +5V / +12V / RI
AT/ATX Selector	1 x 1 x 3 pin, pitch 2.00mm connector for AT/ATX jumper (JPSON1)
RTC Battery	1 x 2 Pin, pitch 1.25mm horizontal type battery connector (SMD Type)
Audio	1 x 2 x 5 pin, pitch 2.54mm connector for front panel audio (FP_AUDIO1)
DC-Input	1 x 4 pin, pitch 2.50mm Mini-Fit Jr DC Jack at IO (DC_IN1)
Buzzer	Onboard
CPU/System FAN	CPU cooler 4P/12V/Fan 90*90*67 125W
AC/DC Input Conn.	1 x 2 x 2 pin, pitch 2.40mm for 12V ATX power (ATX12V1)
Display	
Graphic Chipset	Intel® Integrated UHD Graphic with Xe Architecture (CPU Dependent)
Resolution	1 x DP 1.4a 4096 x 2304@60Hz 1 x HDMI 1.4b 3840 x 2160 @30Hz
Audio	
Audio Codec	Realtek HD Audio Codec
Audio Amplifier	TI TPA3005 Stereo Class-D 3W4Ω
Ethernet	
LAN Chipset	1 x Intel® i225LM 2.5 Gigabit Controller 1 x Intel® I219-V Gigabit Ethernet PHY
Data Rate Per Port	2.5GbE (I225-LM) 1GbE (I219-V)
Power Requirement	

Voltage Input Spec.	19/24V DC-In
Voltage Input Conn.	DC Jack
ACPI	Single power ATX support S0, S3, S4, S5
Power Mode	AT / ATX mode (Default ATX)
Adapter	AC/DC adapter 24V/7.5A 180W, Screw Type
Mechanical & Environment	
Operating Temp.	0°C ~ 40°C (32°F ~ 104°F) with 0.5m/s air flow (turbo mode off) >>turbo off burn in/no PTAP USB dummy load
Storage Temp.	-20°C ~ 60°C(-4°F ~ 140°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 : 0.00050513G²/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 Sine Vibration test (Non-operation) 1 Test Acceleration : 2G 2 Test frequency : 5~500 Hz 3 Sweep：1 Oct/ per one minute. (logarithmic) 4 Test Axis : X,Y and Z axis 5 Test time :30 min. each axis 6 System condition : Non-Operating mode 7. Reference IEC 60068-2-6 Testing procedures Package Vibration Test: 1 Test PSD : 0.026G²/Hz , 2.16 Grms 2 Test frequency : 5~500 Hz 3 Test axis : X,Y and Z axis 4 Test time : 30 minutes per each axis 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 : Z axis 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 Reference ISTA 2A, Method : IEC-60068-2-32 Test: Ed Drop Test 1 One corner , three edges, six faces 2 ISTA 2A, IEC-60068-2-32 Test:Ed
Software Support	
OS Information	Win10, Win11, Linux

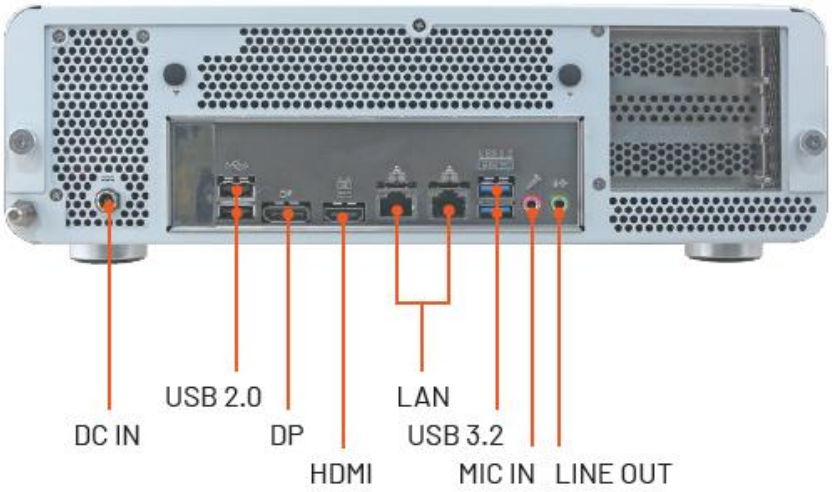


Note: Specifications are subject to change without notice.

1.3 System Overview

1.3.1 I/O View

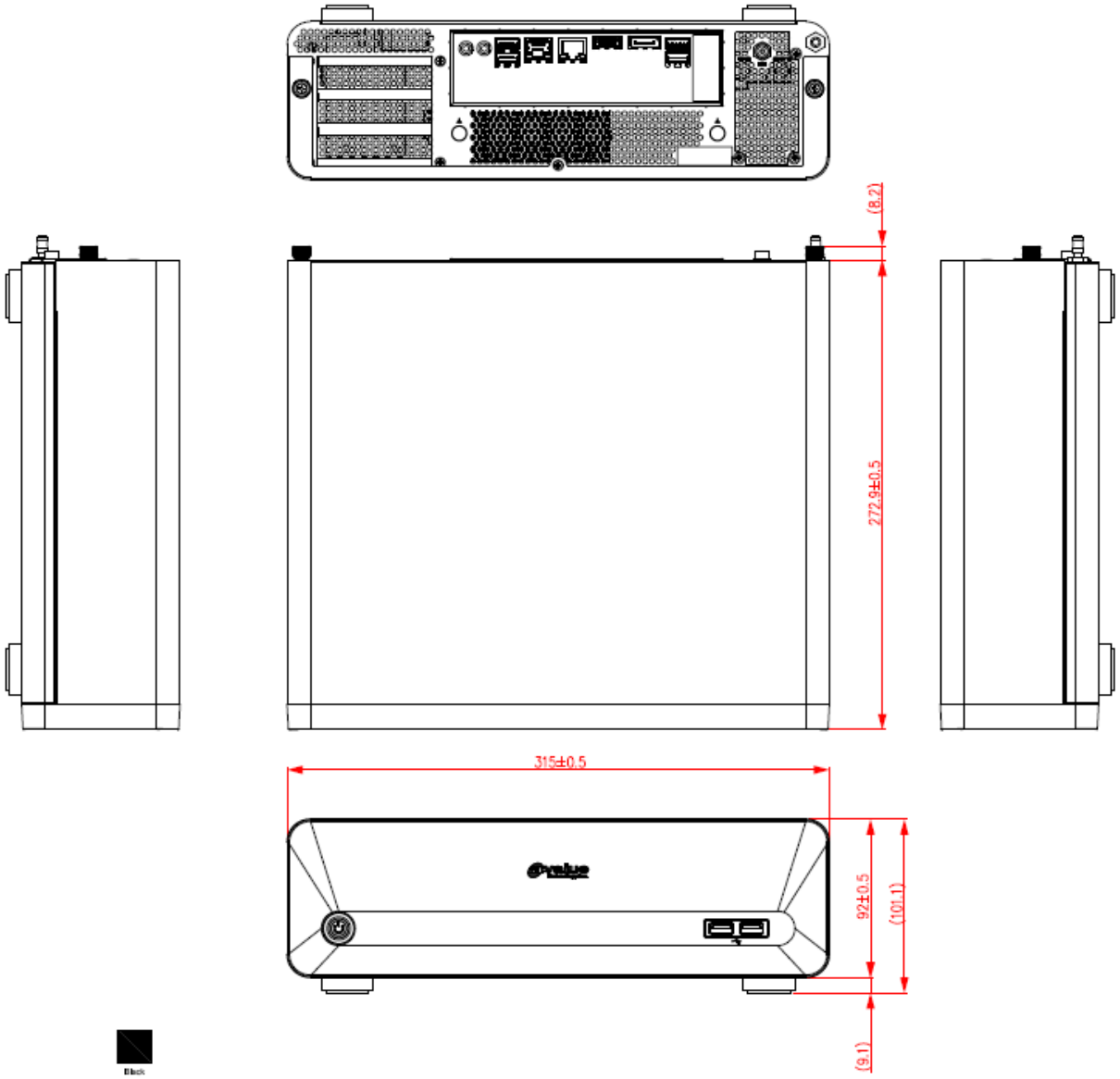




Connectors

Label	Function	Note
Power	Power on button	
USB 2.0	4 x USB2.0 connector	
USB 3.2	2 x USB3.2 connector	
LAN	2 x RJ-45 Ethernet	
DP	DP connector	
HDMI	HDMI connector	
LINE OUT	Line-out audio jack	
MIC IN	Mic-in audio jack	
DC IN	DC power-in connector	

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- MX610HD included in this manual.



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

www.avalue.com

2.1 Powering On the System

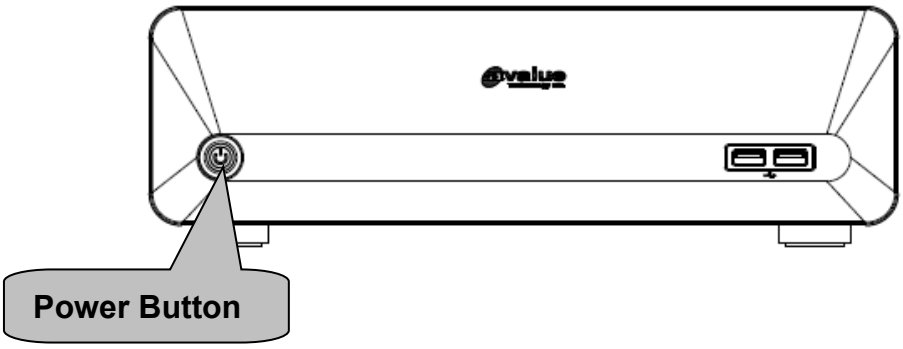
To power on the system, follow the steps below.

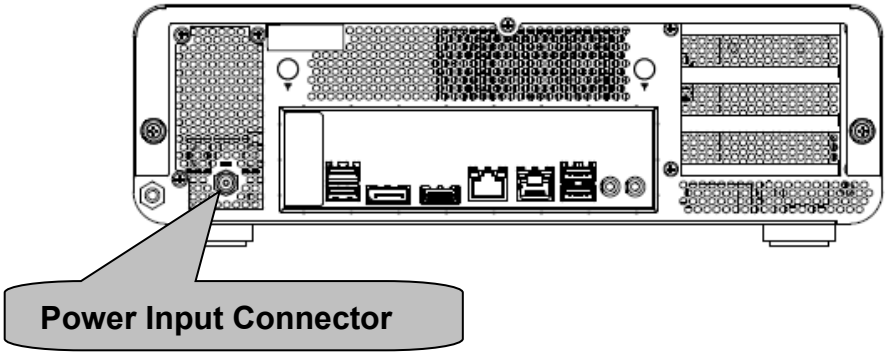
Step 1: Connect the power cord to the power adapter. Connect the other end of the power cord to a power source. Ensure to connect the power cord to a socket-outlet with earthing connection.

Step 2: Connect the power adapter to the power connector of the product.

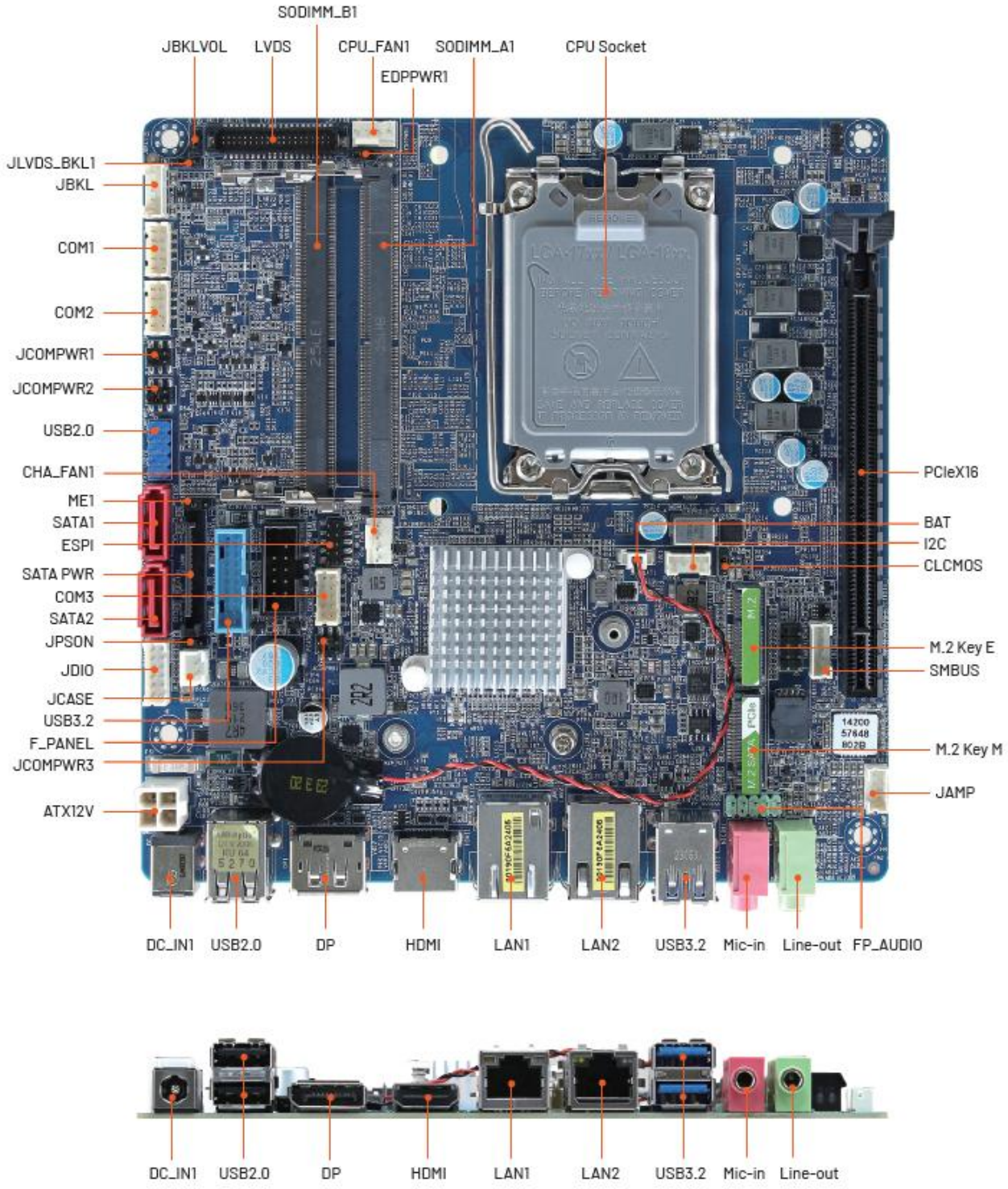
Step 3: Locate the power button on the product.

Step 4: Switch on the power button can turn on the system. Keep holding the power button on can force shutdown the PC.





2.2 MX610HD Overviews



2.3 MX610HD Jumpers & Connectors list

Jumpers

Label	Function	Note
CLCMOS1	Clear CMOS	3 x 1 header, pitch 2.00mm
JPSON1	AT/ATX Mode setting	3 x 1 header, pitch 2.00mm
JCOMPWR1~3	COM1~3 pin9 signal selector	3 x 2 header, pitch 2.00mm
JBKLVOL	LVDS backlight voltage selection	3 x 1 header, pitch 2.00mm
JLVDS_BKL1	LVDS brightness mode setting	3 x 1 header, pitch 2.00mm
ME1	Enable/disable the Intel ME F/W	3 x 1 header, pitch 2.00mm
EDPPWR1	eDP power setting	3 x 1 header, pitch 2.00mm

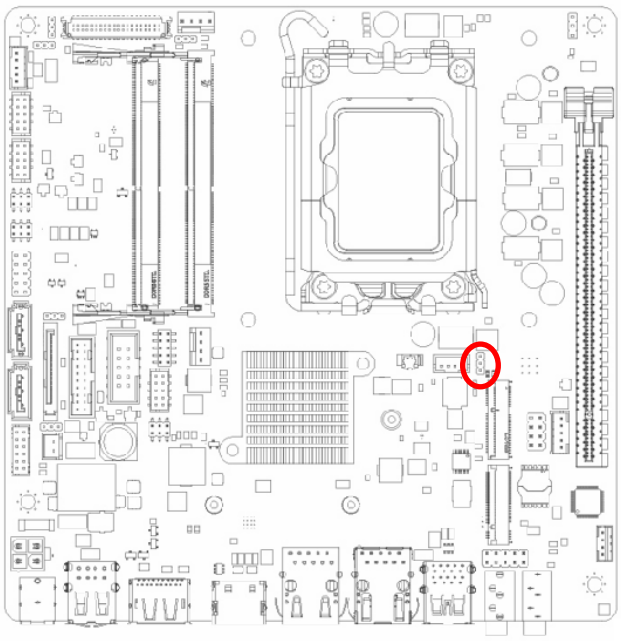
Connectors

Label	Function	Note
CPU_FAN1	CPU Fan connector	4 x 1 wafer, pitch 2.54mm
CHA_FAN1	Chassis Fan connector	4 x 1 wafer, pitch 2.54mm
F_PANEL1	Front Panel connector	5 x 2 wafer, pitch 2.54mm
ATX12V1	12V ATX power connectors	2 x 2 wafer, pitch 4.20mm
COM1~3	Serial Port 1~3 Connector	5 x 2 wafer, pitch 2.00mm
SATA1~2	SATA 1/2 Connector	Male connector (Red)
FP_ AUDIO1	Front Panel Audio Connector	5 x 2 header, pitch 2.54mm
JDIO1	General-purpose I/O Connector	6 x 2 wafer, pitch 2.00mm
I2C1	I2C connector	4 x 1 wafer, pitch 2.00mm
USB56	2 x USB 3.0 connector	10 x 2 wafer, pitch 2.00mm
USB78	2 x USB 2.0 connector	5 x 2 header, pitch 2.54mm
LVDS1	LVDS connector	20 x 2 wafer, pitch 1.25mm Note: Matching Connector: Hirose DF13-40DS-1.25C
JBKL1	LVDS backlight connector	5 x 1 wafer, pitch 2.00mm Note: Matching Connector: JST PHR-5
SMBUS1	SMBus connector	5 x 1 wafer, pitch 2.00mm
JAMP1	Amplifier Connector	4 x 1 wafer, pitch 2.00mm
JCASE1	Chassis Intrusion Header	2 x 1 wafer, pitch 2.50mm
CPU1	LGA1700 CPU socket	
SODIMMA1/B1	DDR5 SODIMM Slot	Dual channel. (1 DIMMs per channel)
PCIEX16_1	PCIe x16 Gen4	

M2E1	M.2 key E slot	PCIEx1+USB interface
M2M_1	M.2 key M slot	PCIEx4+SATA interface
SATAPW1	SATA Power connector	15 x 1 wafer, pitch 1.27mm
USB34	USB 2.0 Type A connector	Support 2 ports
DP1	Display port x1	
HDMI1	HDMI port x1	
LAN1	RJ-45 Ethernet Connector x 1	1 Gigabit Ethernet
LAN2	RJ-45 Ethernet Connector x 1	2.5 Gigabit Ethernet
USB12	USB 3.2 Type A connector	Support 2 ports
LINEOUT1	Line out port x1	Color: Lime
MICIN1	Mic-in port x1	Color: Pink

2.4 MX610HD Jumpers & Connectors settings

2.4.1 Clear CMOS (JCMOS1)



Protect*

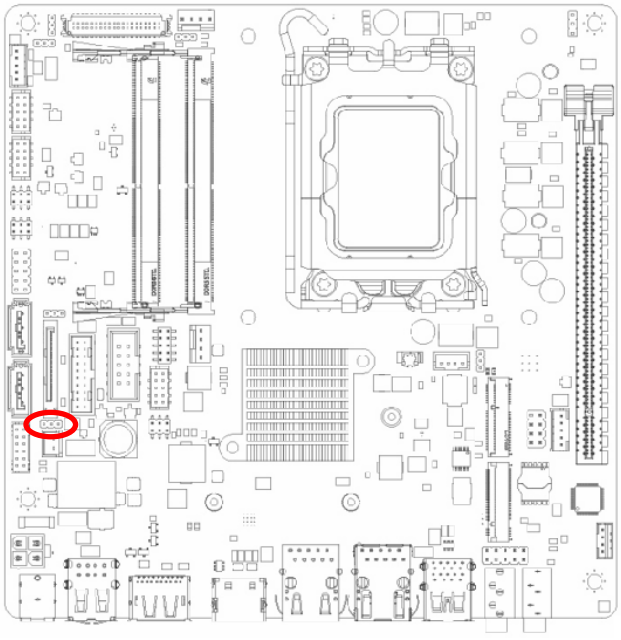


Clear CMOS



*** Default**

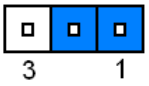
2.4.2 AT/ATX Power Mode Select (JPSON1)



ATX*

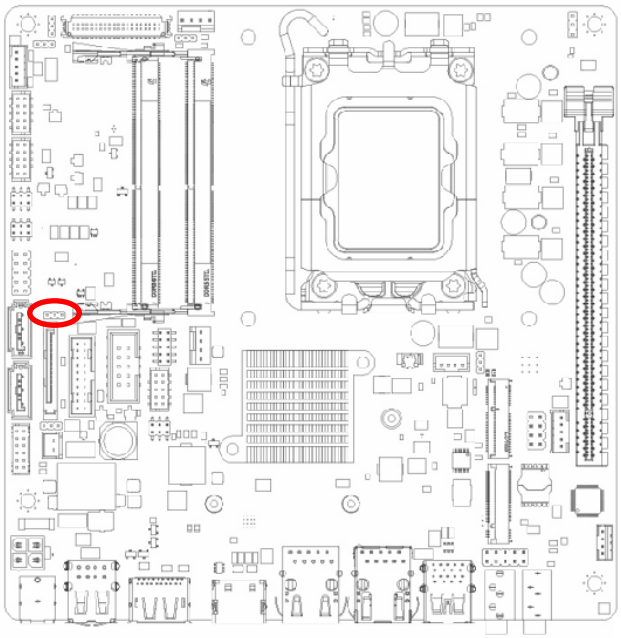


AT

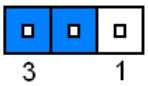


*** Default**

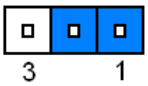
2.4.3 Enable/disable the Intel ME F/W (ME1)



Enable*

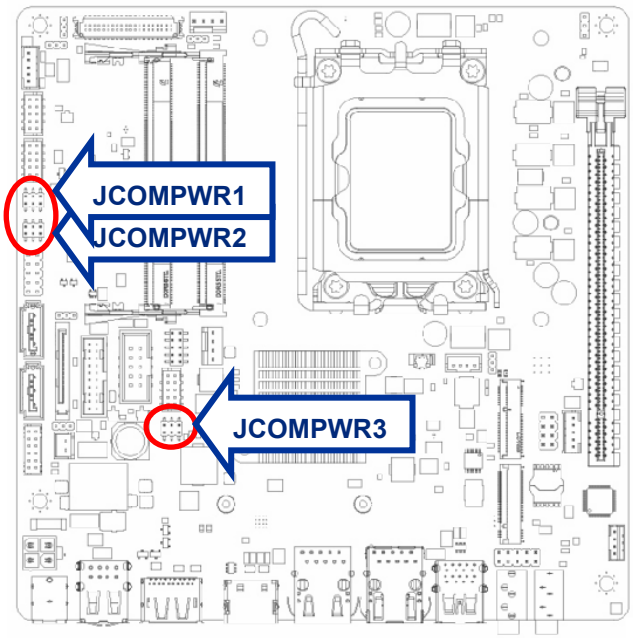


Disable

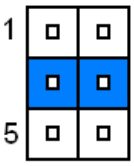


*** Default**

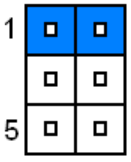
2.4.4 COM POWER SETTING (JCOMPWR1~3)



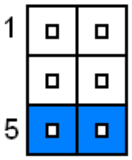
Ring*



+12V

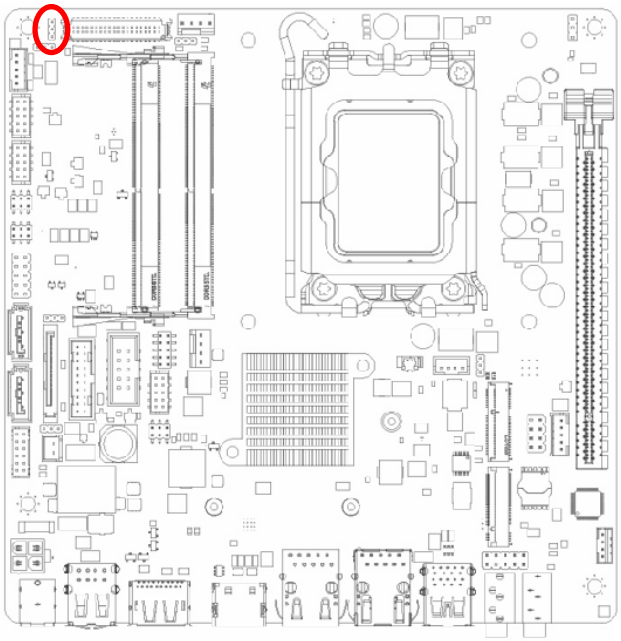


+5V

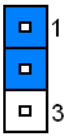


*** Default**

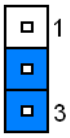
2.4.5 LVDS backlight voltage selection (JBKLVOL)



+5V

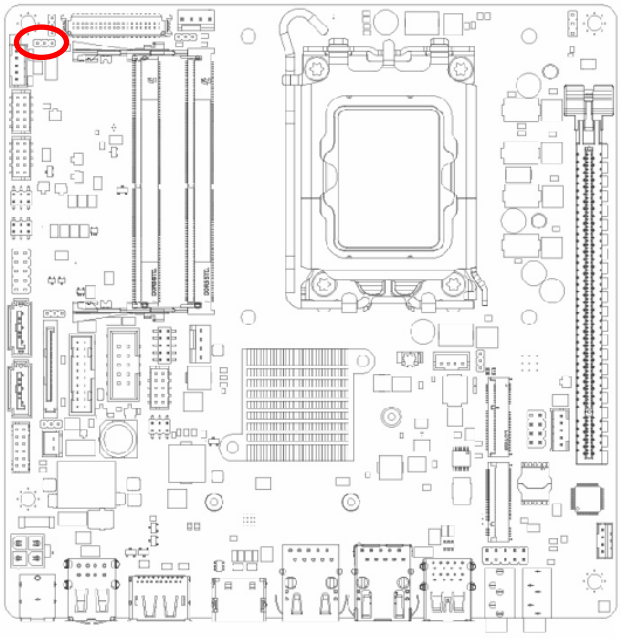


+3.3V*

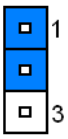


*** Default**

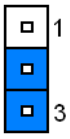
2.4.6 LVDS brightness control mode selection (JLVDS_BKL1)



PWM mode*

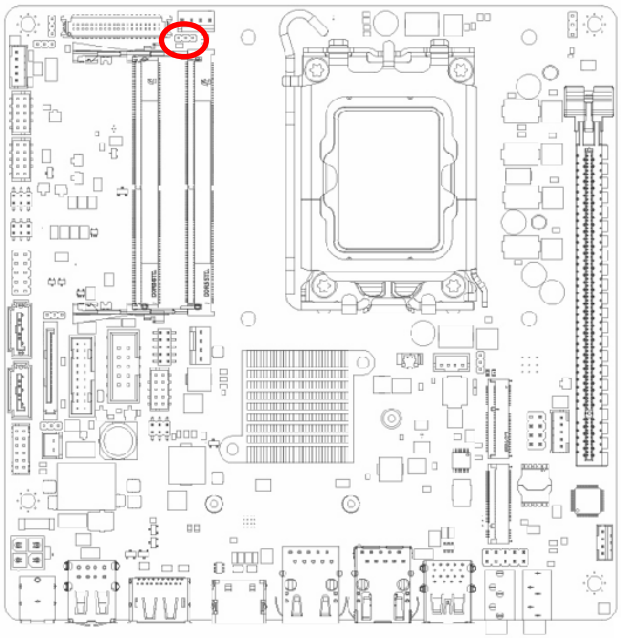


DC mode

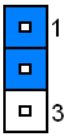


*** Default**

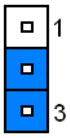
2.4.7 eDP voltage selection (EDPPWR1)



+5V

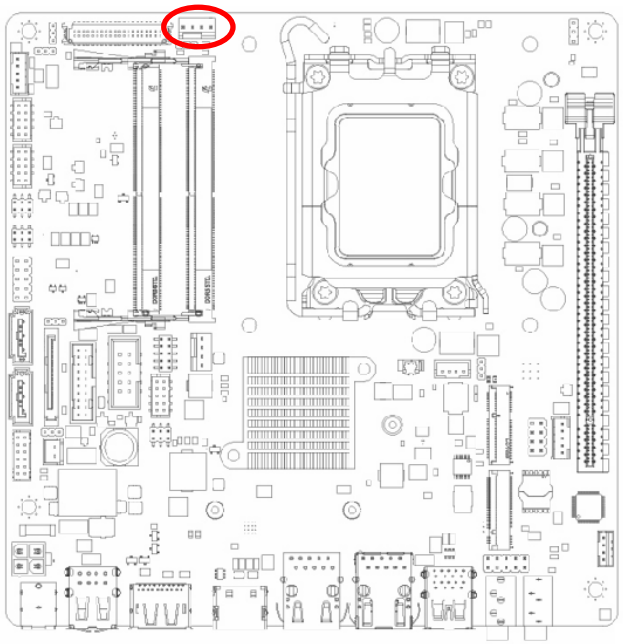


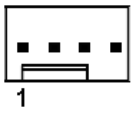
+3.3V*



*** Default**

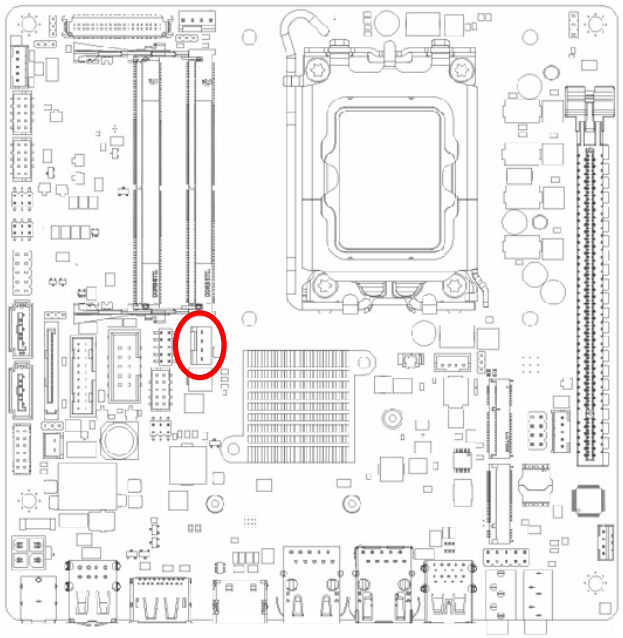
2.4.8 CPU fan connector (CPU_FAN1)

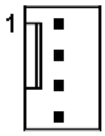




PIN	Signal
1	GND
2	+12V
3	TACH
4	PWM

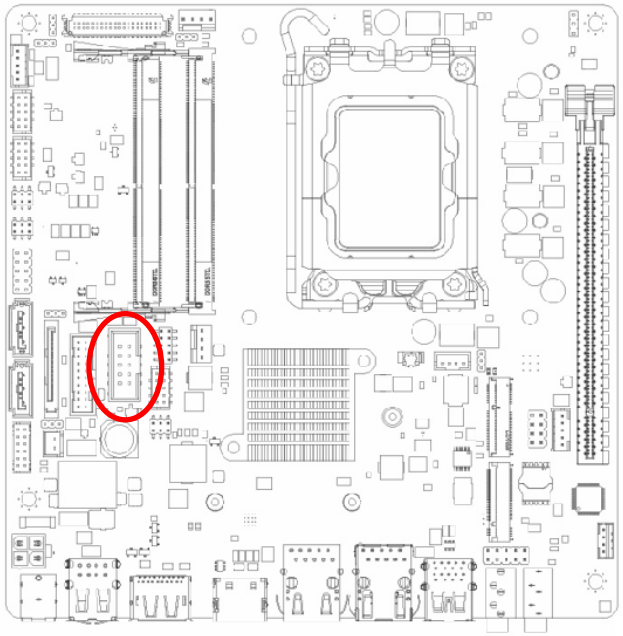
2.4.9 System fan connector (CHA_FAN1)

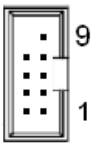




PIN	Signal
1	GND
2	+12V
3	TACH
4	PWM

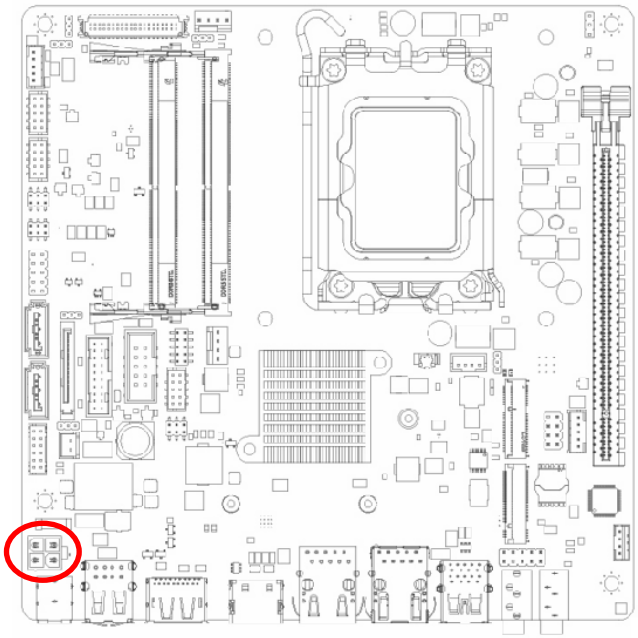
2.4.10 System Panel (F_PANEL)

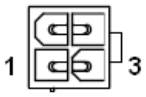




Function	Signal	PIN	PIN	Signal	Function
			9	NC	
Power button	GND	8	7	RST_BTN#	Reset button
	PANSWIN#	6	5	GND	
Power LED	Power LED#	4	3	HDD LED#	HDD LED
	Power LED+	2	1	HDD LED+	

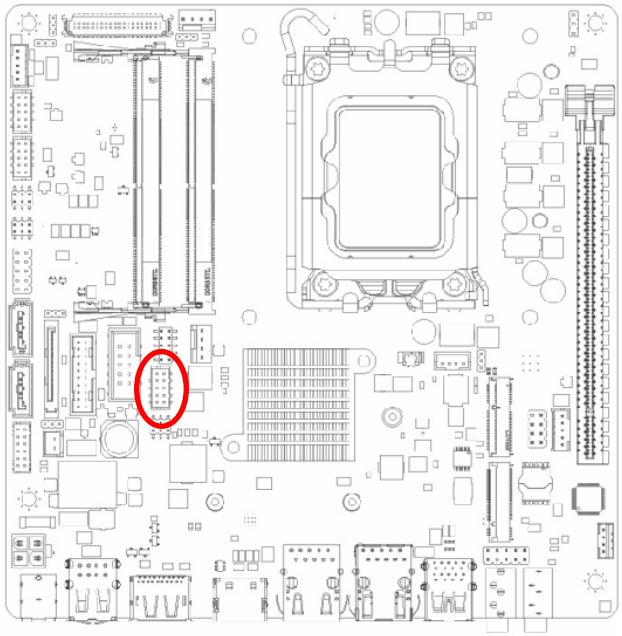
2.4.11 ATX power connectors (ATX12V1)

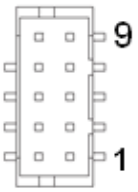




Signal	PIN	PIN	Signal
GND	2	4	+12V
GND	1	3	+12V

2.4.12 Serial Port connectors (COM3)

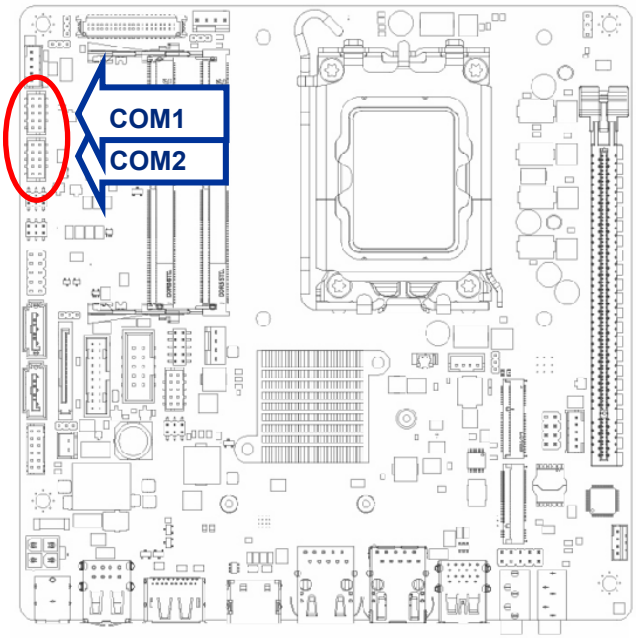


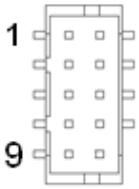


Signal	PIN	PIN	Signal
		9	COM_PIN9
CTS#	8	7	RTS#
DSR#	6	5	GND
DTR#	4	3	TXD
RXD	2	1	DCD#

Note: COM_PIN9 can be selected by jumper (JCOMPWR3) to RI / +5V / +12V

2.4.13 Serial Port connectors (COM1~2)





*** Default**

RS232*

Signal	PIN	PIN	Signal
DCD#	1	2	RXD
TXD	3	4	DTR#
GND	5	6	DSR#
RTS#	7	8	CRS#
COM_PIN9	9		

RS-422

Signal	PIN	PIN	Signal
TX-	1	2	TX+
RX+	3	4	RX-
GND	5	6	NC
NC	7	8	NC
COM_PIN9	9		

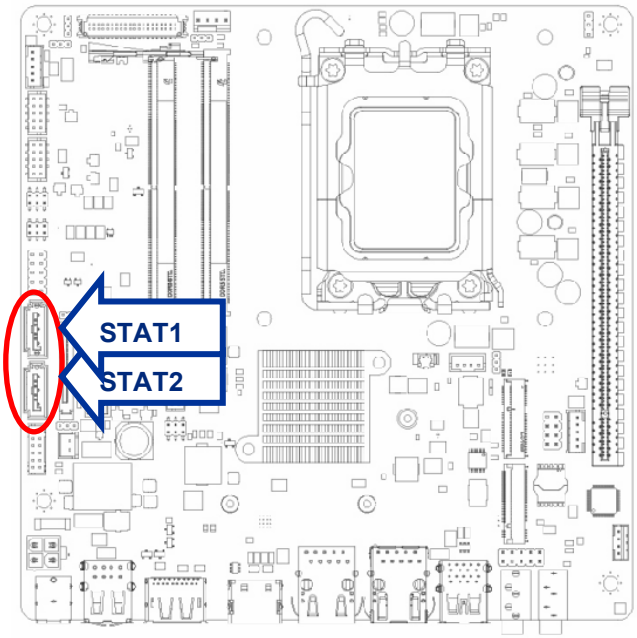
RS-485

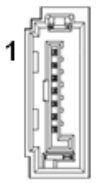
Signal	PIN	PIN	Signal
Data-	1	2	Data+
NC	3	4	NC
GND	5	6	NC
NC	7	8	NC
COM_PIN9	9		

Note:

- COM1、2 can be selected RS232(default)/422/485 by BIOS selection
- When COM1、2 is RS232 COM_PIN9 can be selected by jumper(JCOMPWR1、2) to RI/+5V/+12V
- When COM1、2 is RS422/485 COM_PIN9 can be selected by jumper(JCOMPWR1、2) to +5V/+12V

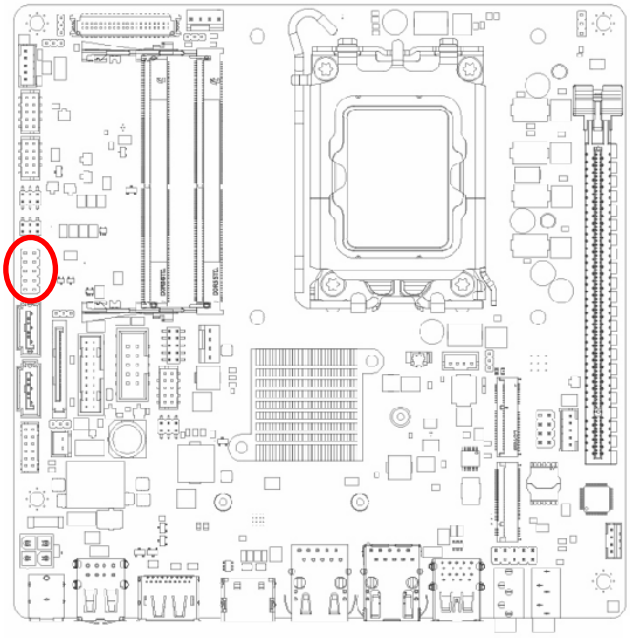
2.4.14 Serial ATA Connector (SATA1~2)

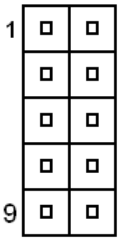




PIN	Signal
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

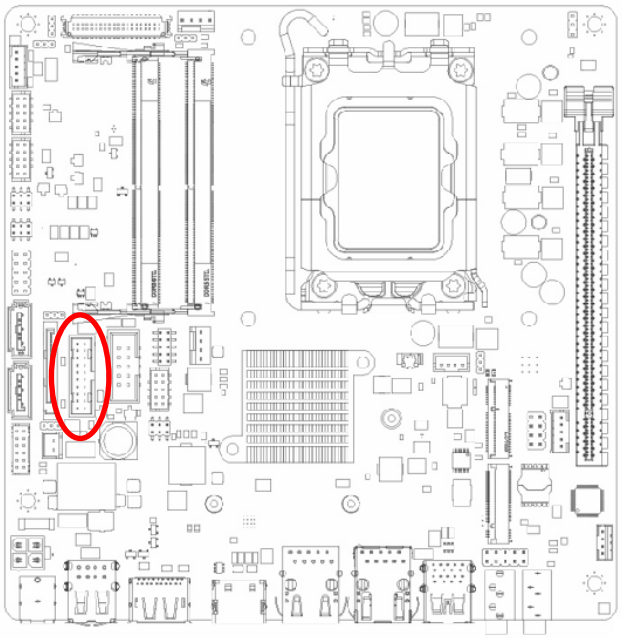
2.4.15 USB2.0 connectors (USB78)

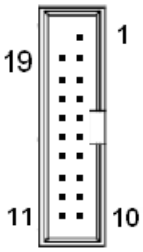




Signal	PIN	PIN	Signal
+5V	1	2	+5V
DATA-	3	4	DATA-
DATA+	5	6	DATA+
GND	7	8	GND
		10	NC

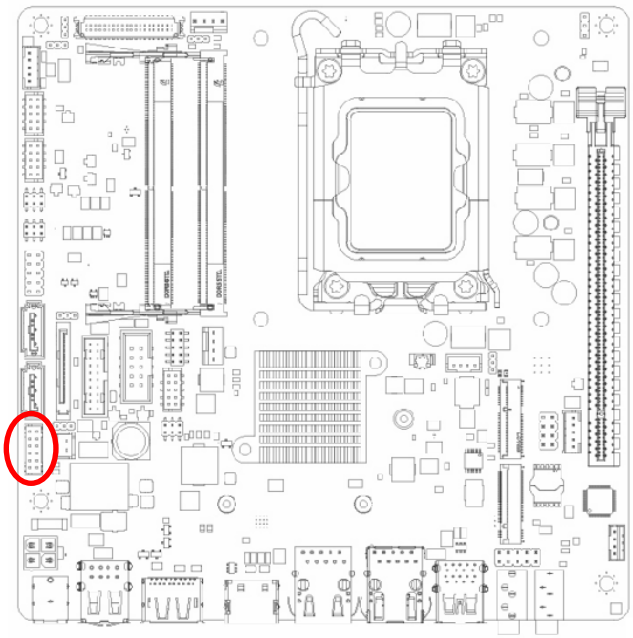
2.4.16 USB3.0 connectors (USB56)

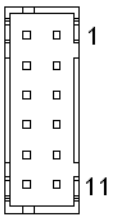




Signal	PIN	PIN	Signal
		1	+5V
+5V	19	2	StdA_SSRX-
StdA_SSRX-	18	3	StdA_SSRX+
StdA_SSRX+	17	4	GND
GND	16	5	StdA_SSTX-
StdA_SSTX-	15	6	StdA_SSTX+
StdA_SSTX+	14	7	GND
GND	13	8	DATA-
DATA-	12	9	DATA+
DATA+	11	10	NC

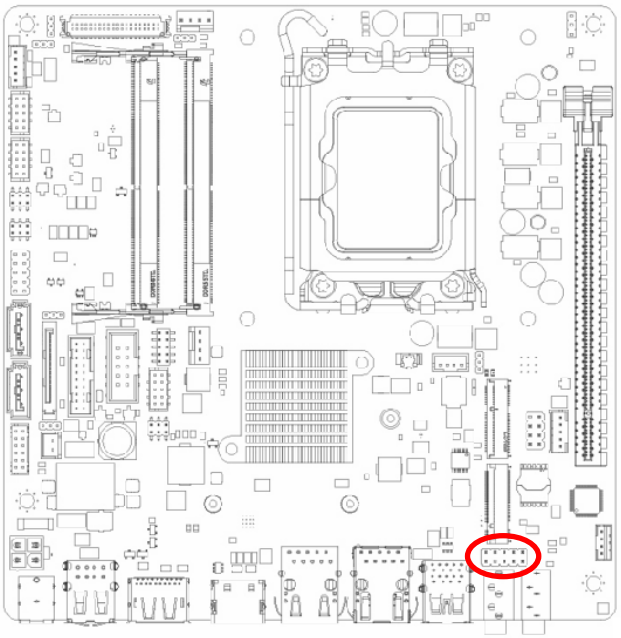
2.4.17 8 bit GPIO header (JDIO1)

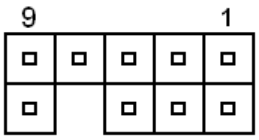




Signal	PIN	PIN	Signal
GPIO4	2	1	GPIO0
GPIO5	4	3	GPIO1
GPIO6	6	5	GPIO2
GPIO7	8	7	GPIO3
SMB_DATA	10	9	SMB_CLK
+3.3V	12	11	GND

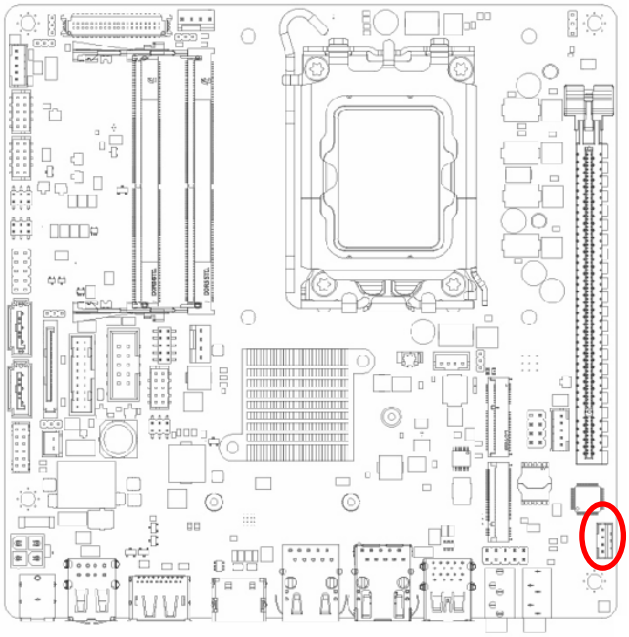
2.4.18 Front Audio connector (FP_AUDIO1)





Signal	PIN	PIN	Signal
MIC2L	1	2	GND
MIC2R	3	4	+3.3V
LINE2R	5	6	MIC2_JD
SENSEB	7		
LINE2L	9	10	LINE2_JD

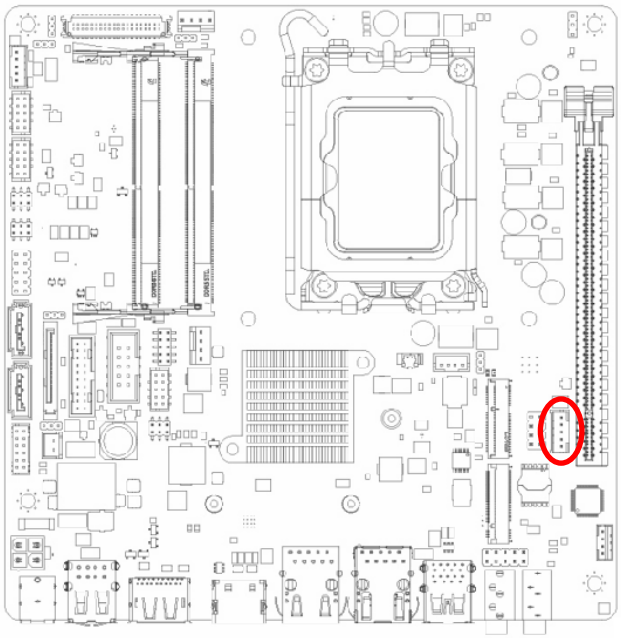
2.4.19 Amplifier connector (JAMP1)





PIN	Signal
4	AMP_R+
3	AMP_R-
2	AMP_L+
1	AMP_L-

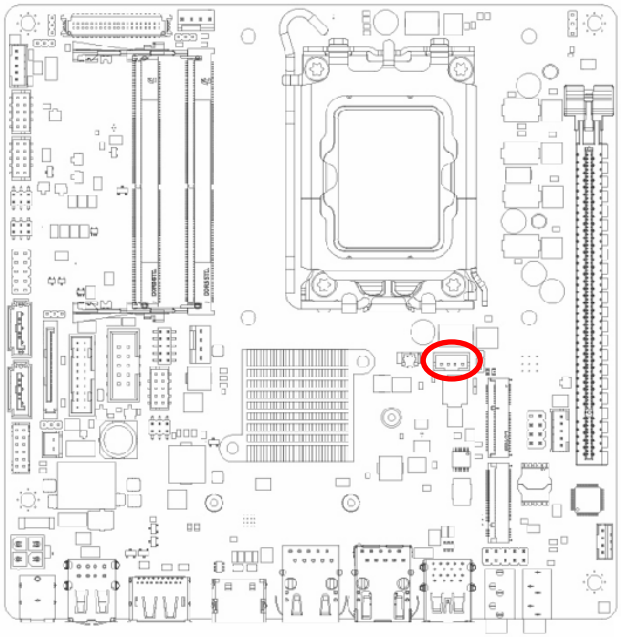
2.4.20 SM bus connector (SMBUS1)

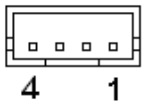




Signal	PIN
+3.3V	5
GND	4
SMB_ALT	3
SMB_DATA	2
SMB_CLK	1

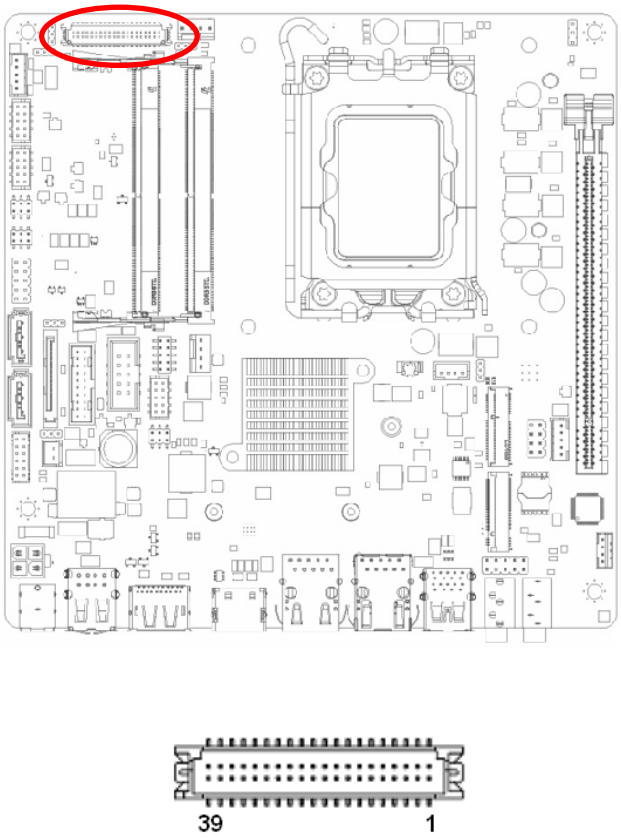
2.4.21 I2C connector (I2C1)





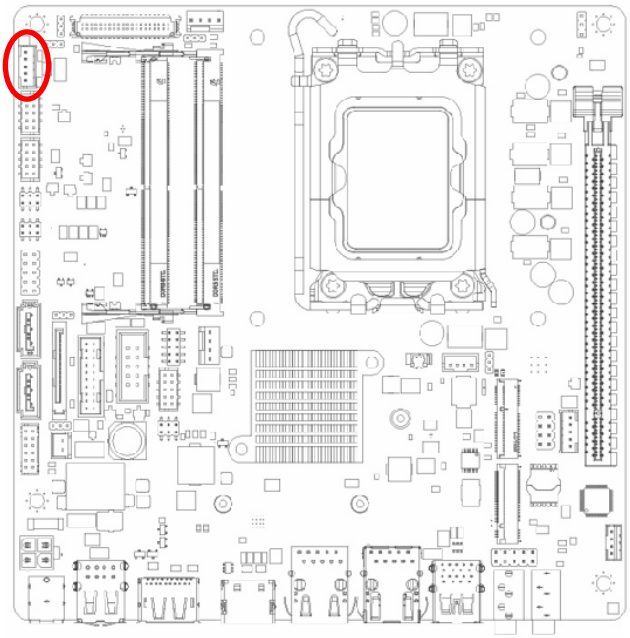
PIN	Signal
1	+3.3V
2	I2C_SCL
3	I2C_SDA
4	GND

2.4.22 LVDS connector (LVDS1)



Signal	PIN	PIN	Signal
+5V	2	1	+3.3V
+5V	4	3	+3.3V
LVDS_EDID_DAT	6	5	LVDS_EDID_CLK
GND	8	7	GND
LVDSA_P0	10	9	LVDSA_P1
LVDSA_N0	12	11	LVDSA_N1
GND	14	13	GND
LVDSA_P2	16	15	LVDSA_P3
LVDSA_N2	18	17	LVDSA_N3
GND	20	19	GND
LVDSB_P0	22	21	LVDSB_P1
LVDSB_N0	24	23	LVDSB_N1
GND	26	25	GND
LVDSB_P2	28	27	LVDSB_P3
LVDSB_N2	30	29	LVDSB_N3
GND	32	31	GND
LVDSA_CLK_P	34	33	LVDSB_CLK_P
LVDSA_CLK_N	36	35	LVDSB_CLK_N
GND	38	37	GND
+12V	40	39	+12V

2.4.23 LVDS backlight connector (JBKL1)



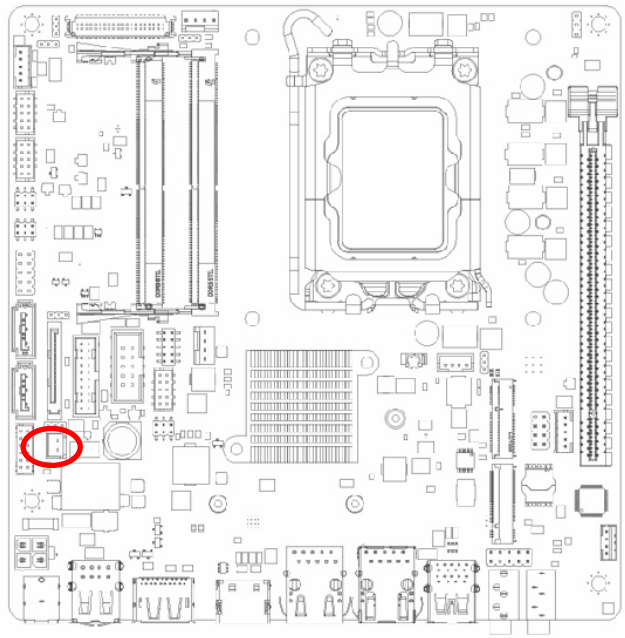


PIN	Signal
5	+5V
4	BRIGHT1
3	BL_EN
2	GND
1	+12V

Some notes on VBIOS:

- LVDS Default: Disabled.
- Defaults resolution: 1024x768 18/1.
- Under BIOS: Manually brightness adjustment. Only with BIOS Mode can be adjusted. Defaults brightness value is 128, for range 1~255.
- Defaults is LVDS Interface. eDP Interface need H/W Operation. (eDP Connector by BOM option)

2.4.24 Chassis intrusion connector (JCASE1)





PIN	Signal
1	SIO_CASEOPEN#
2	GND

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:

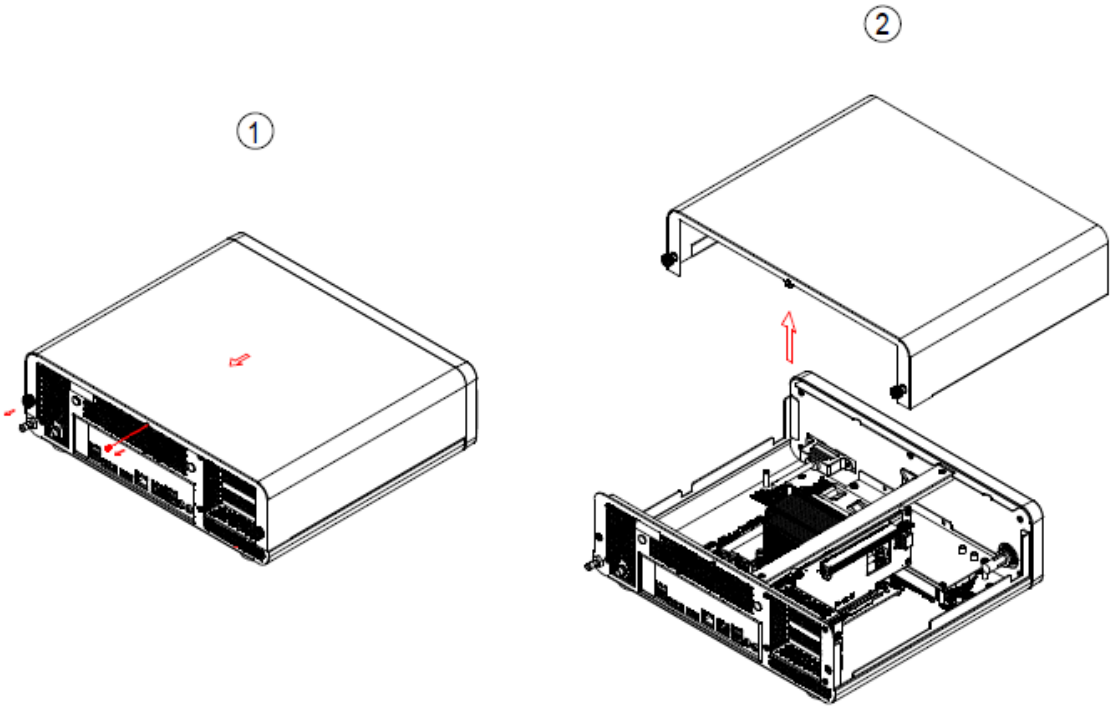
- Wear an anti-static wristband: Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- Self-grounding: Before handling the board, touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected 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

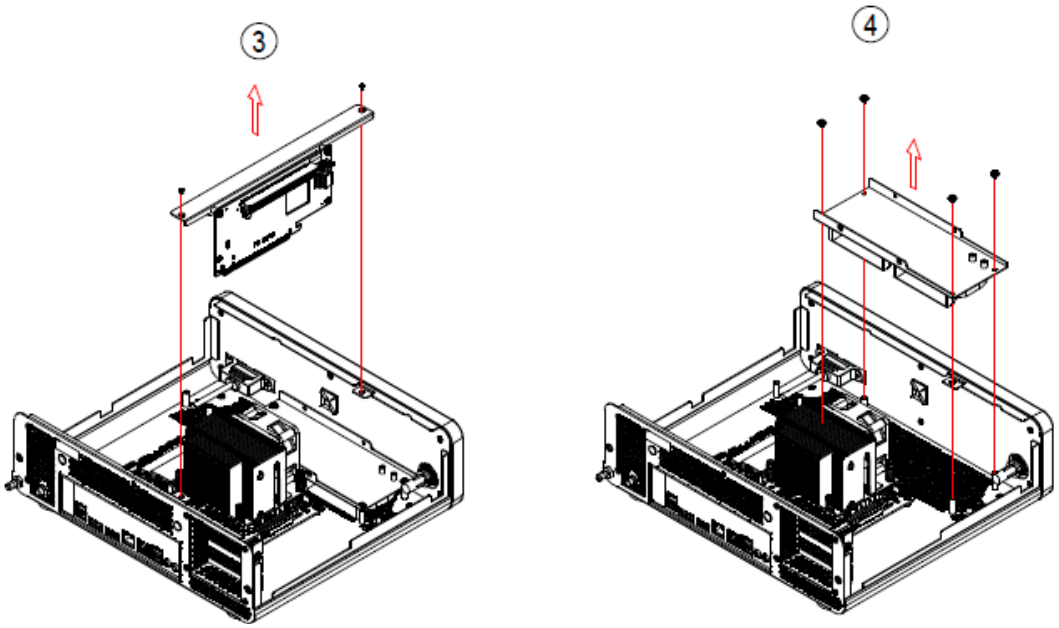
When installing the box PC, please follow the precautions listed below:

- 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.

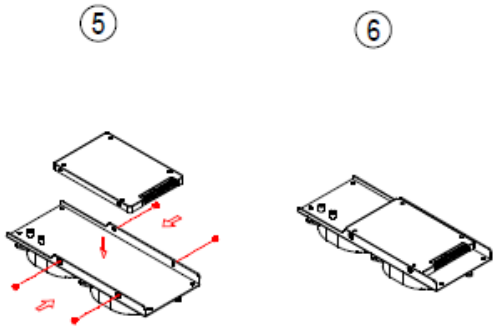
3.1 Installing Solid State Disk (MAB-T660D)



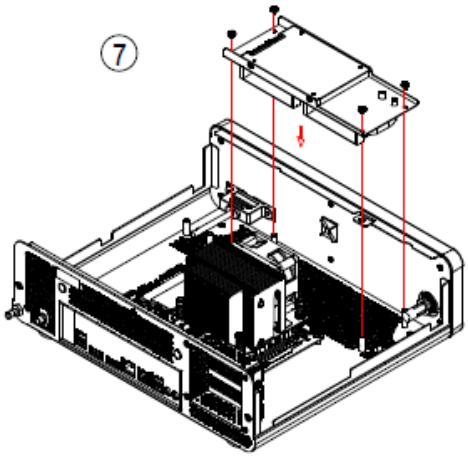
Step1. Loosen the screws on both sides and remove the screw in the middle to take off the top cover.



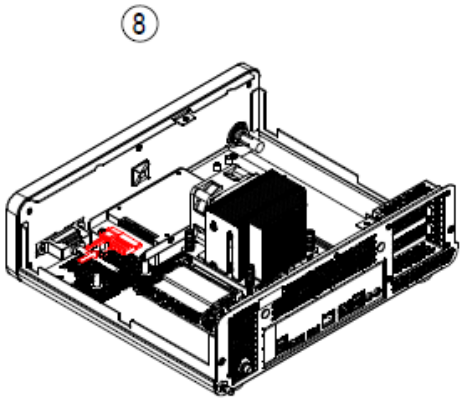
Step2. Remove the screws securing the internal mounting bracket.
Step3. Lift the bracket upward and remove it from the chassis.



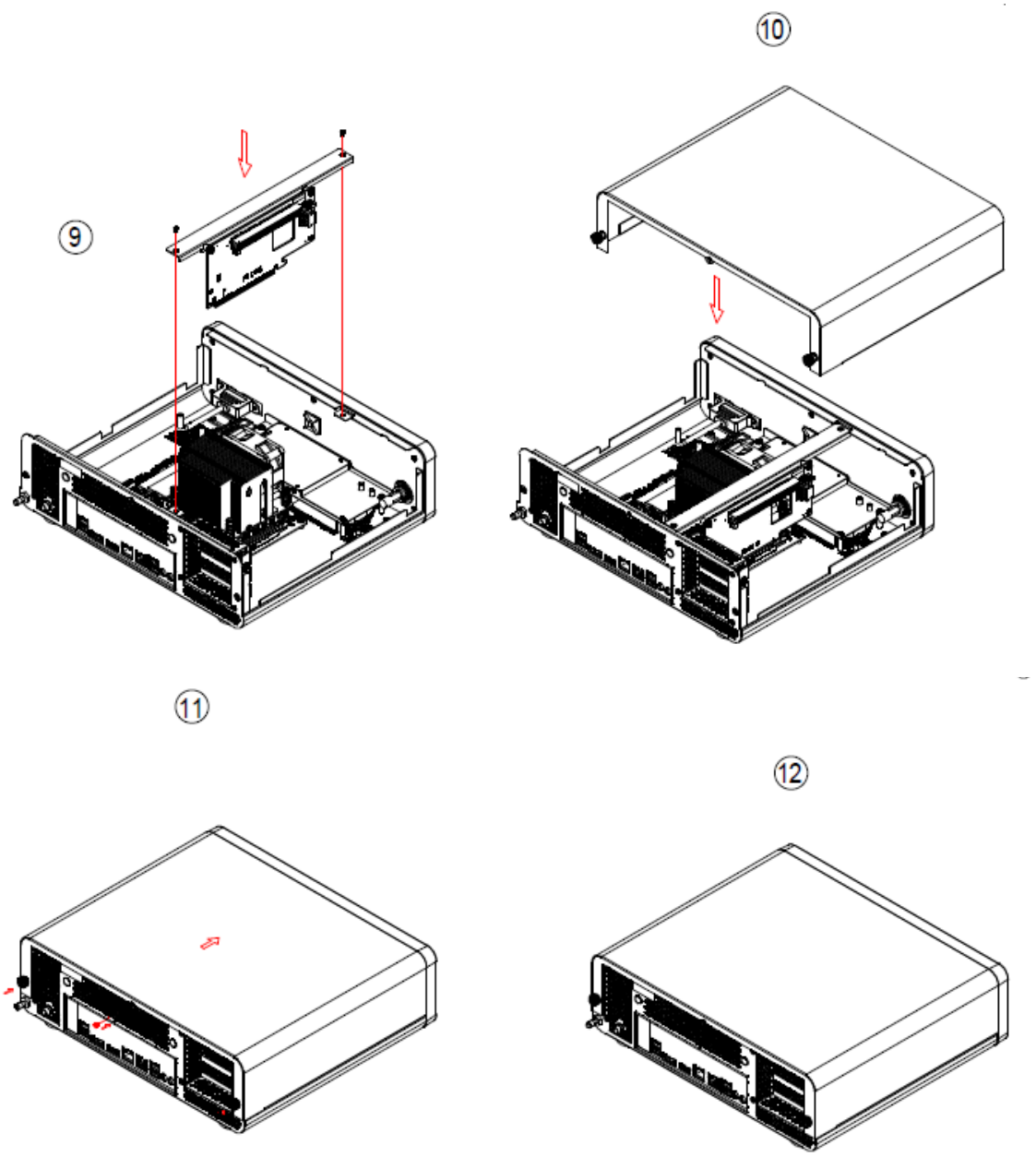
Step4. Secure HDD by means of 4 screws and 4 shockproof rubbers.



Step5. Insert SSD bracket into designated locations and fasten with 6 screws to complete SSD installation.

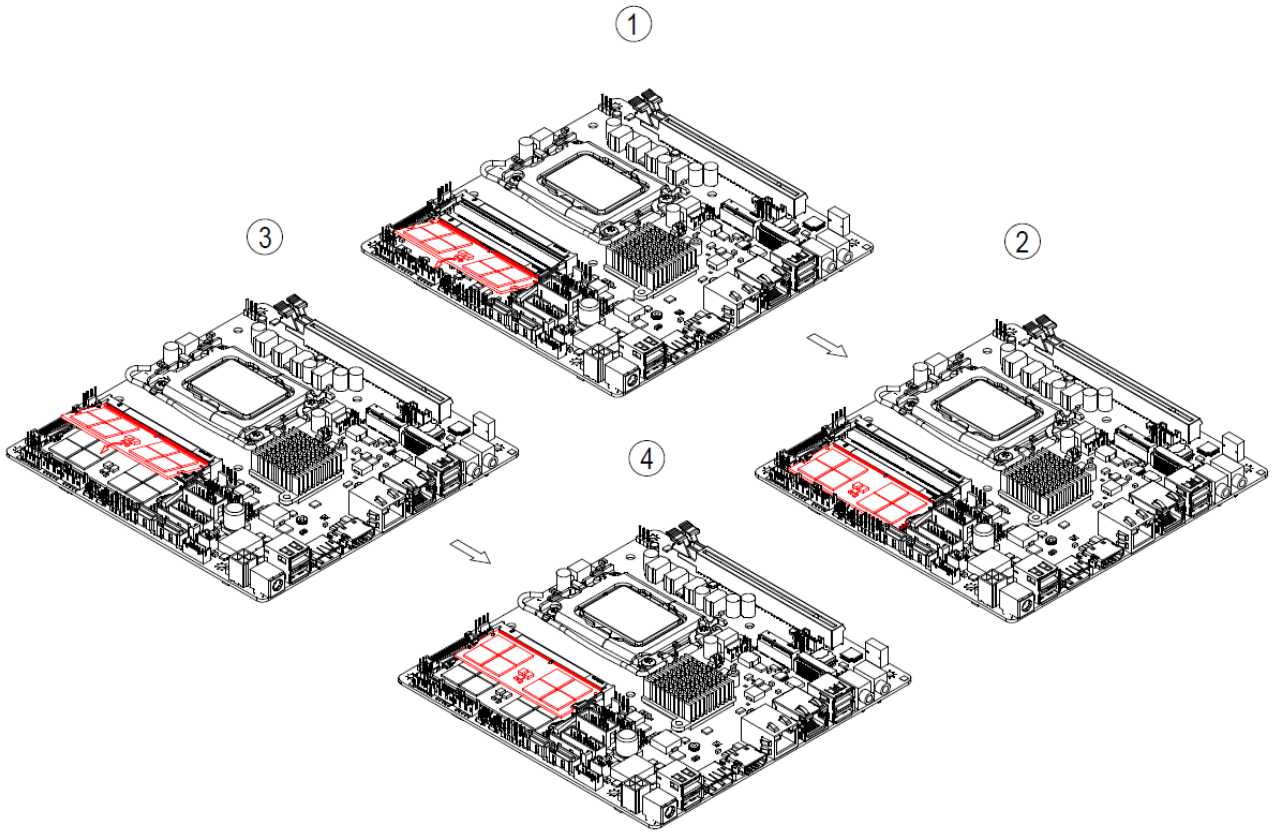


Step6. Slide the DDR5 SODIMMs into the memory sockets and press it down until properly seated.



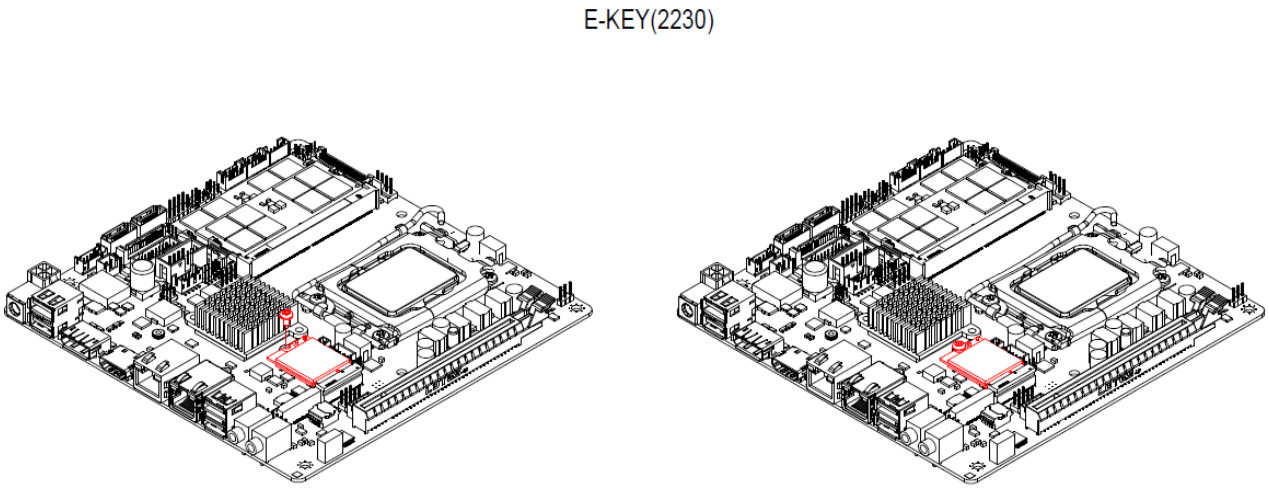
Step7. Reinstall the SSD bracket back into the chassis and secure it with screws.
Step8. Put the top cover back and fix screws. Ensure all screws are properly tightened and the system is fully reassembled.

3.2 Installing Memory (MAB-T660D)



Step1. Properly install the memory module and press until properly seated.

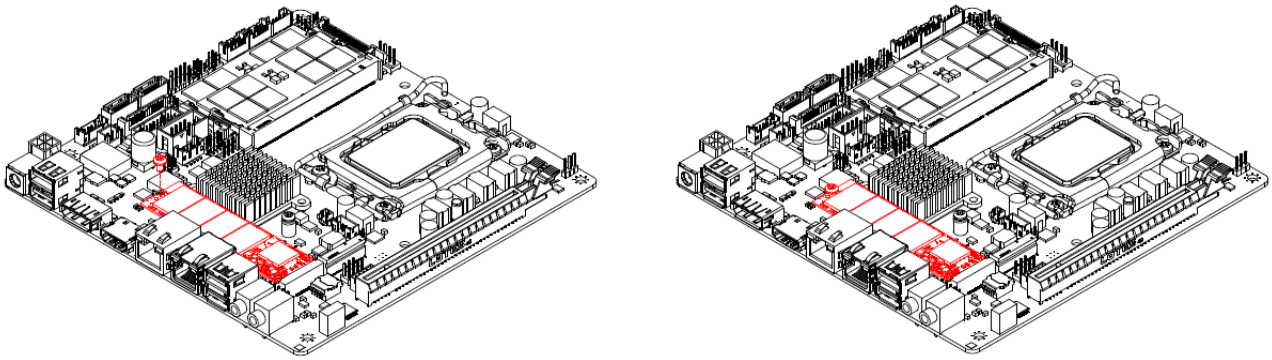
3.3 Installing M.2 E-Key (2230) card (MAB-T660D)



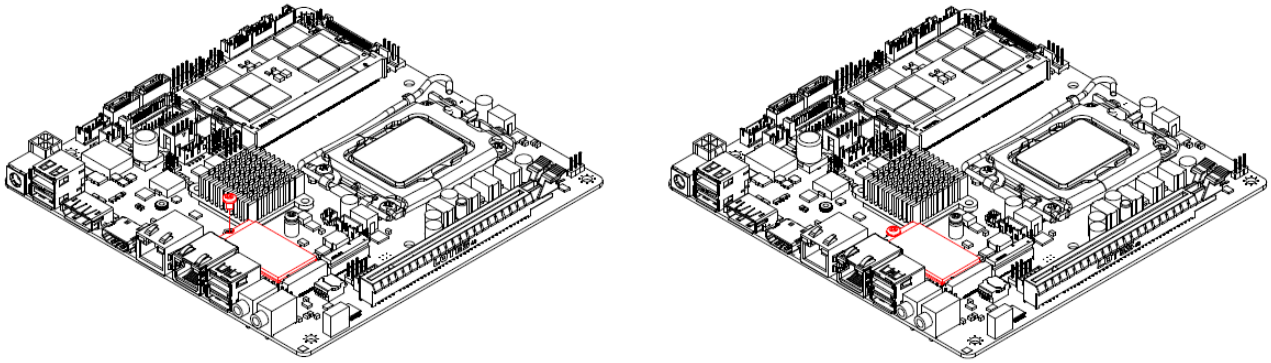
Step1. Insert M.2 E-Key (2230) card into designated location and fasten with screw to complete installation.

3.4 Installing M.2 M-Key (2280/2242) cards (MAB-T660D)

M-KEY(2280)



M-KEY(2242)



Step1. Insert M.2 M-Key (2280/2242) cards into designated locations and fasten with screws to complete installation.

3.5 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.BIOS Setup

4.1 Introduction

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

4.2 Starting Setup

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

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

Press <Del> or <F2> to enter SETUP

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

Press F1 to Continue, DEL to enter SETUP

4.3 Using Setup

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

Button	Description
↑	Move to previous item
↓	Move to next item
←	Move to the item in the left hand
→	Move to the item in the right hand
Esc key	Main Menu -- Quit and not save changes into NVRAM Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
+ key	Increase the numeric value or make changes
- key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2 key	Previous Values.
F3 key	Optimized defaults
F4 key	Save & Exit Setup

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



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

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

4.4 Getting Help

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

4.5 In Case of Problems

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

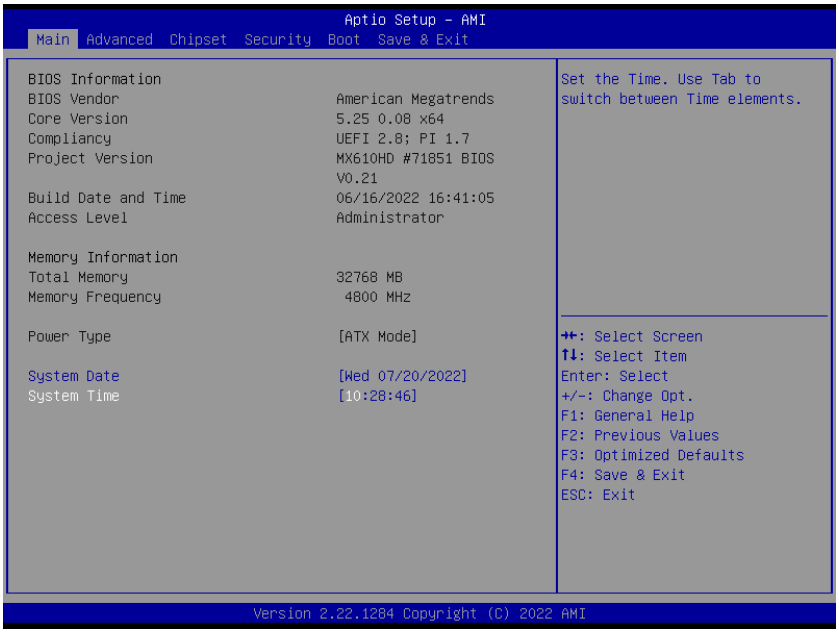
The best advice is to only alter settings which you thoroughly understand. To this end, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both BIOS Vendor and your systems manufacturer to provide the absolute maximum performance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

4.6 BIOS setup

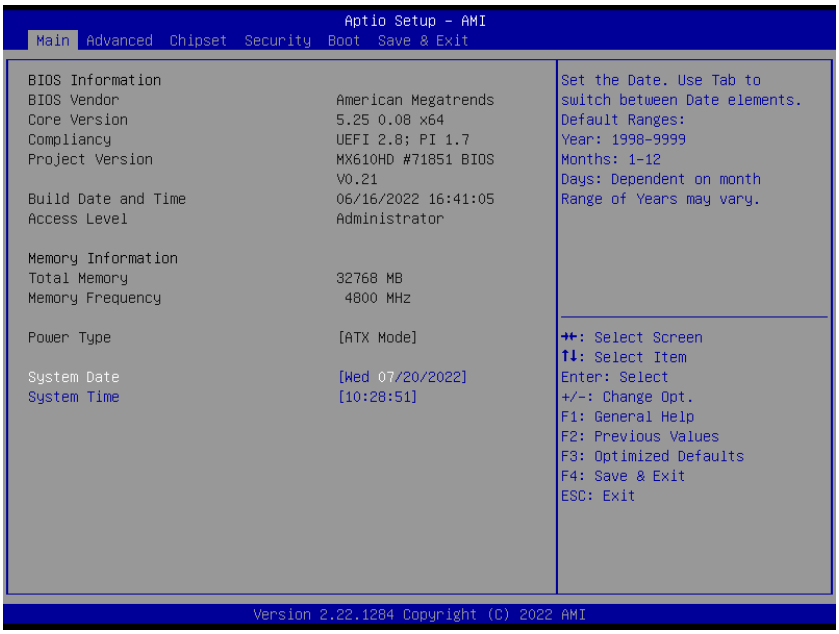
Once you enter the Aptio Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from several setup functions and exit choices. Use the arrow keys to select among the items and press <Enter> to accept and enter the sub-menu.

4.6.1 Main Menu

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







4.6.1.1 System Date

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

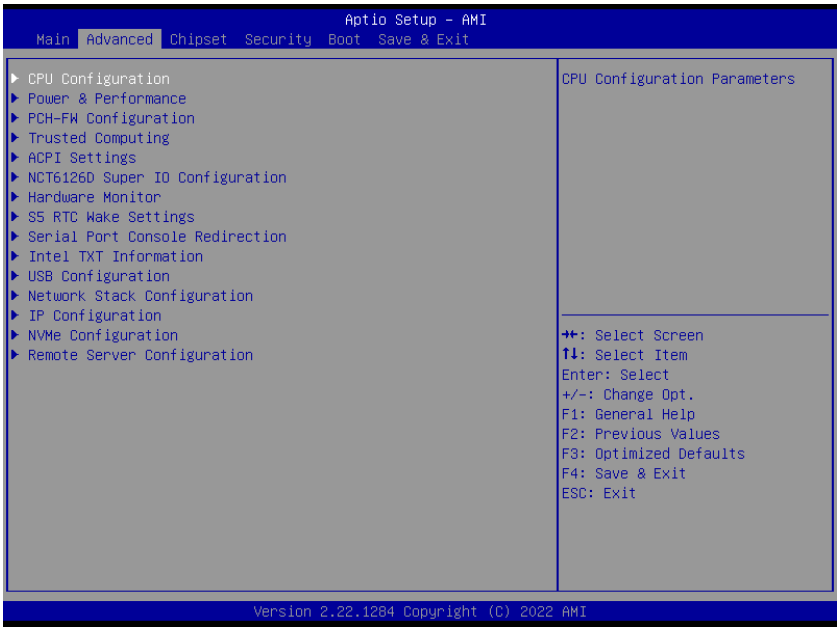
4.6.1.2 System Time

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

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

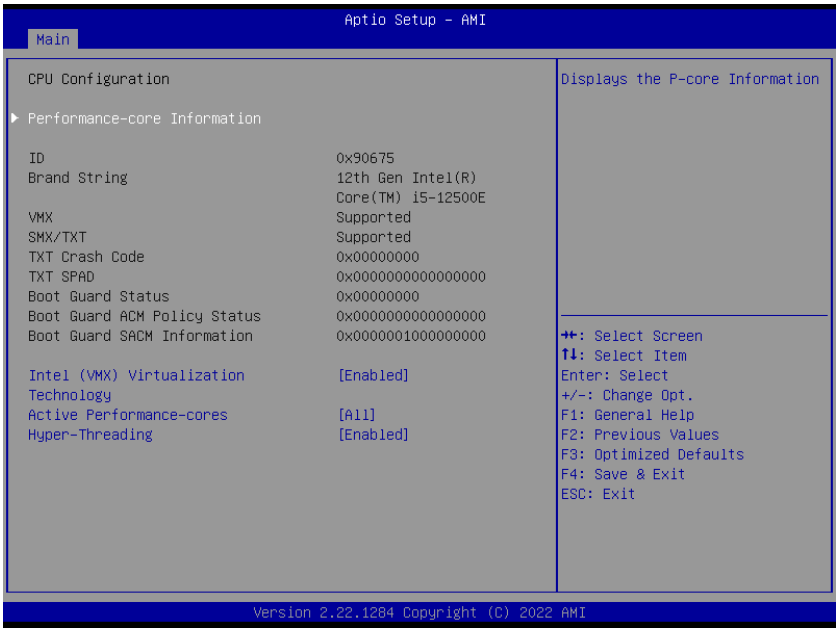
4.6.2 Advanced BIOS Setup

Select the Advanced tab from the setup screen to enter the Advanced BIOS Setup screen. You can select any of the items in the left frame of the screen, such as Chipset configuration, to go to the sub menu for that item. You can display an Advanced BIOS Setup option by highlighting it using the <Arrow> keys. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup screen is shown below. The sub menus are described on the following pages.



4.6.2.1 CPU Configuration

Display CPU information and related setting



- **Intel(VMX)Virtualization[Enabled]**
  When enabled, a VMX can utilize the additional hardware compatibilities provided by Vandorpool Technology
  Configuration options: [Enable] [Disable]

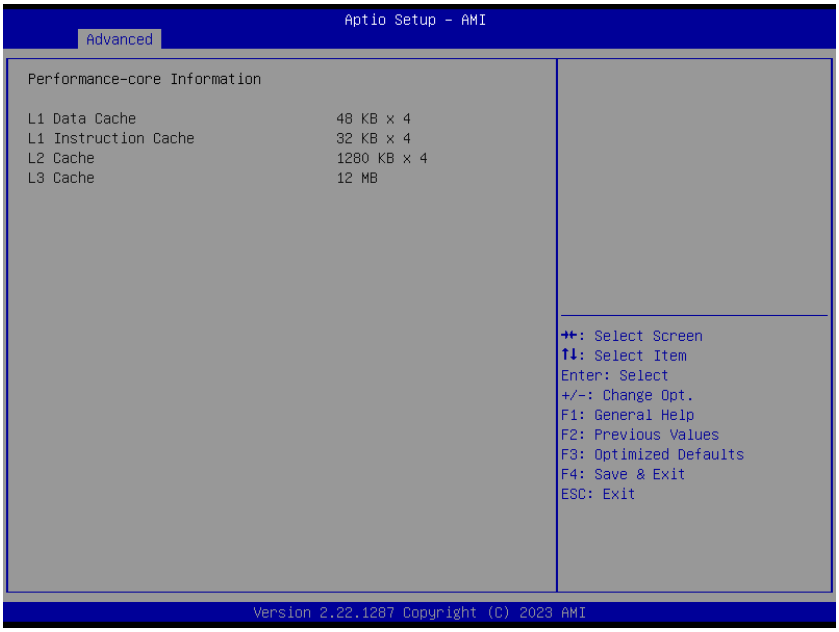
- **Active Performance –Cores**
  Number of P-core to enable in each processor package

- **Hyper-Threading**

Enable or disable Hyper-Threading technology
Configuration options: [Enable] [Disable]

4.6.2.1.1 Power & Performance

Power management control for CPU



- **Intel® Speedstep™ [Enabled]**
  Allow more than two frequency range to be supported
  Configuration options: [Enable] [Disable]

- **Turbo Mode**
  Default <Disable>

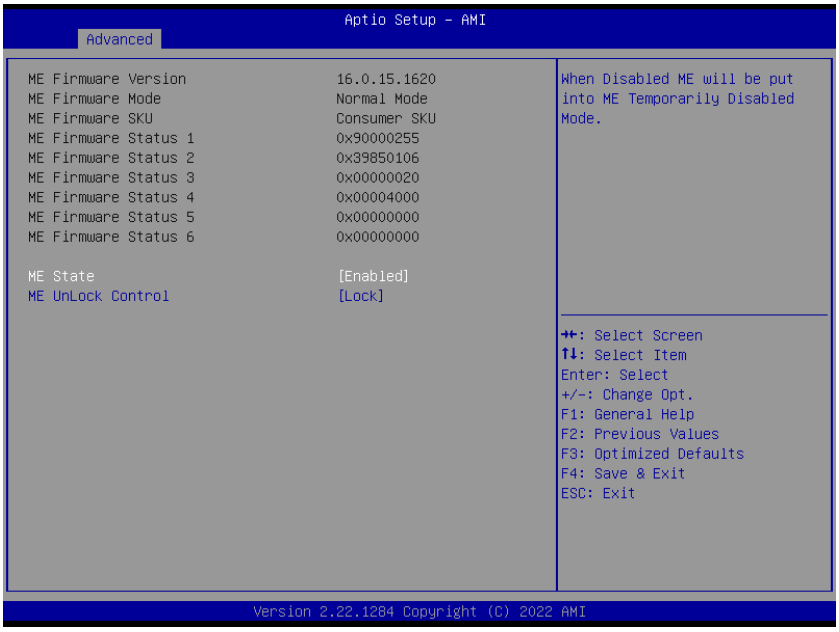
- **C states**
  Enable/Disable CPU power management. Allows CPU to go to C states when it's not 100% utilized
  Configuration options: [Enable] [Disable]

- **Enhance C states**
  When enabled, CPU will switch to minimum speed when all cores enter C state
  Configuration options: [Enable] [Disable]

- **Package C state limit**
  Maximum package C state limit setting. CPU default : Leaves to factory default value
  Configuration options: [C0/C1] [C2] [C3]

4.6.2.2 PCH-FW Configuration

Configure Management Engine Technology Parameters

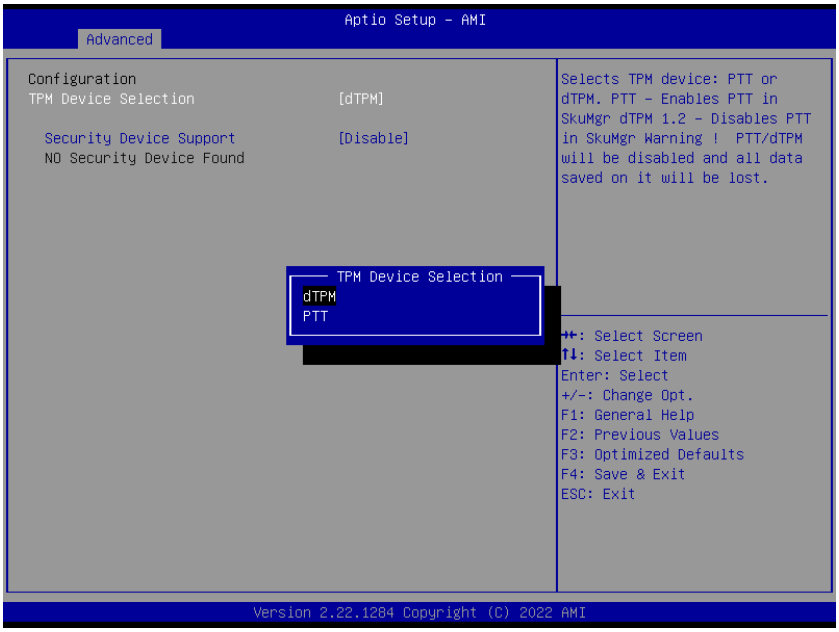


- **ME State [Enabled]**
  When disabled ME will be put into ME temporarily disabled mode
  Configuration options: [Enable] [Disable]

- **ME unlock control [Lock]**
  When Set unlock, system will shut down for active function
  Configuration options: [Lock] [Unlock]

4.6.2.3 Trusted Computing

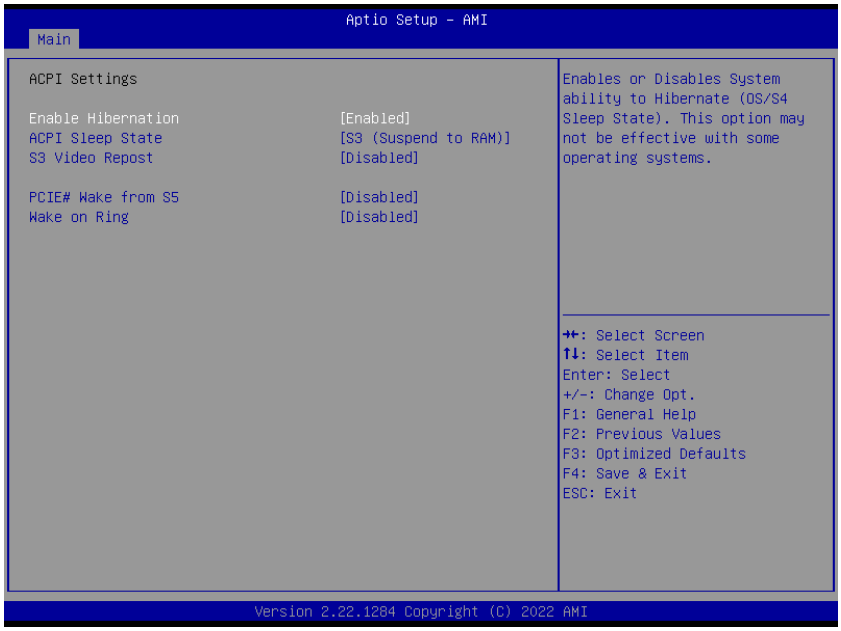
Security device settings



- **TPM Device Selection [dTPM]**
  Select TPM device
  Configuration options: [dTPM] [PTT]

- **Security Device support [Disabled]**
  Enable or Disable BIOS support security device
  Configuration options: [Enable] [Disable]

4.6.2.4 ACPI Settings



- **Enable Hibernation [Enable]**
  Enable or Disable system ability to Hibernation.
  Configuration options: [Enable] [Disable]

- **ACPI Sleep State [S3 only (Suspend to RAM)]**
  Select the highest ACPI sleep state the system will enter the SUSPEND button is press. Configuration options: [Suspend Disable] [S3 (suspend to RAM)]

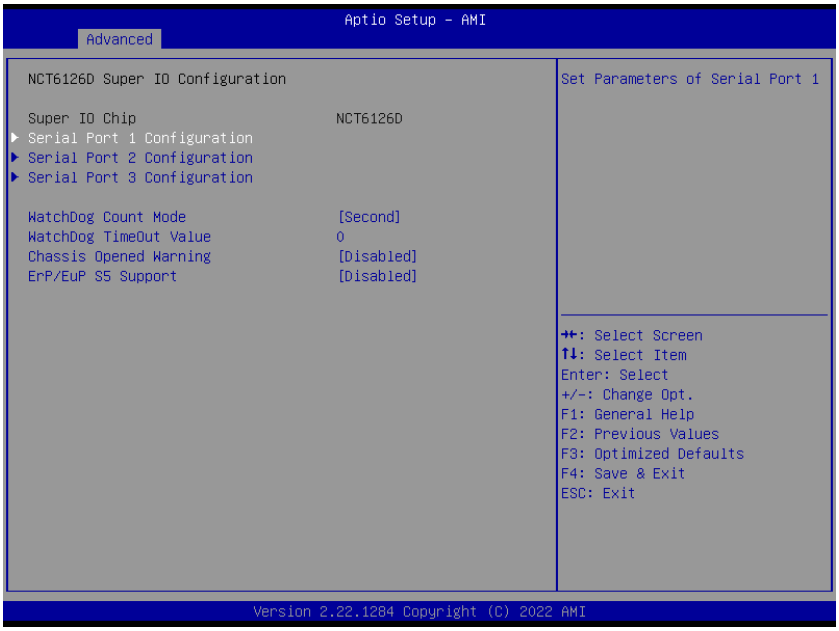
- **S3 Video Repost [Disabled]**
  Enable or disable S3 video repost
  Configuration options: [Disabled] [Enabled]

- **PCIE# wake from S5 [Disabled]**
  Enable or disable PCIE wake the system from S5.
  Configuration options: [Disabled] [Enabled]

- **Wake on Ring [Disabled]**
  Enable or disable wake on ring function under ACPI S3/S4/S5.
  Configuration options: [Disabled] [Enabled]

4.6.2.5 NCT6126D Super IO configuration

Provide NCT6126D super IO configuration settings



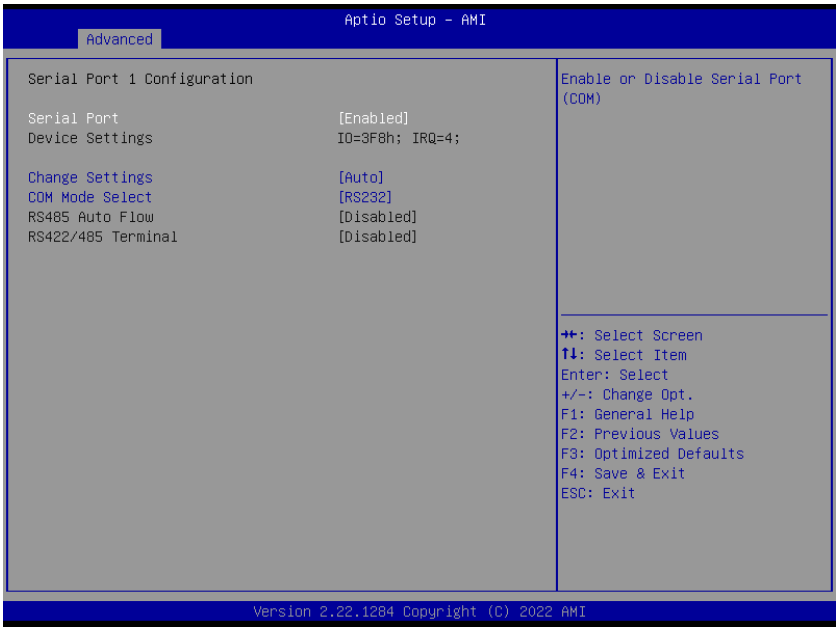
- **WatchDog count mode [Second]**
  WatchDog count mode Selection
  Configuration options: [Second] [Minute]

- **WatchDog Timeout value**
  Fill watchdog timeout value, 0 means disables

- **Chassis opened warning [Disabled]**
  Select chassis intrusion enabled to Disabled
  Configuration options: [Disabled] [Enabled]

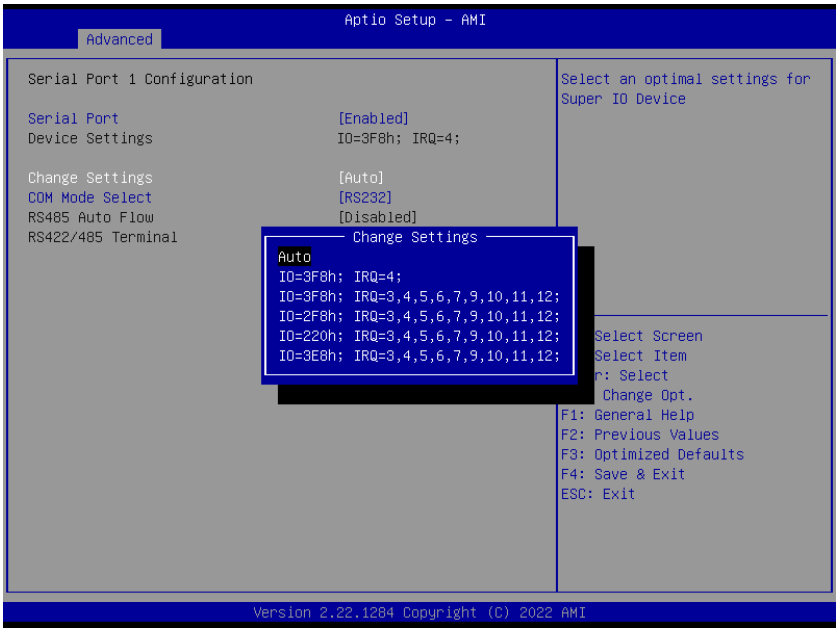
- **ErP/EuP S5 Support [Disabled]**
  Configuration options: [Disabled] [Enabled]

4.6.2.5.1 Serial Port 1 Configuration



- **Serial Port [Enabled]**
  Enable or Disable serial Port (COM)
  Configuration options: [Disabled] [Enabled]

- **Change Setting [Auto]**
  Select an optimal settings for super IO device
  Configuration options: as below



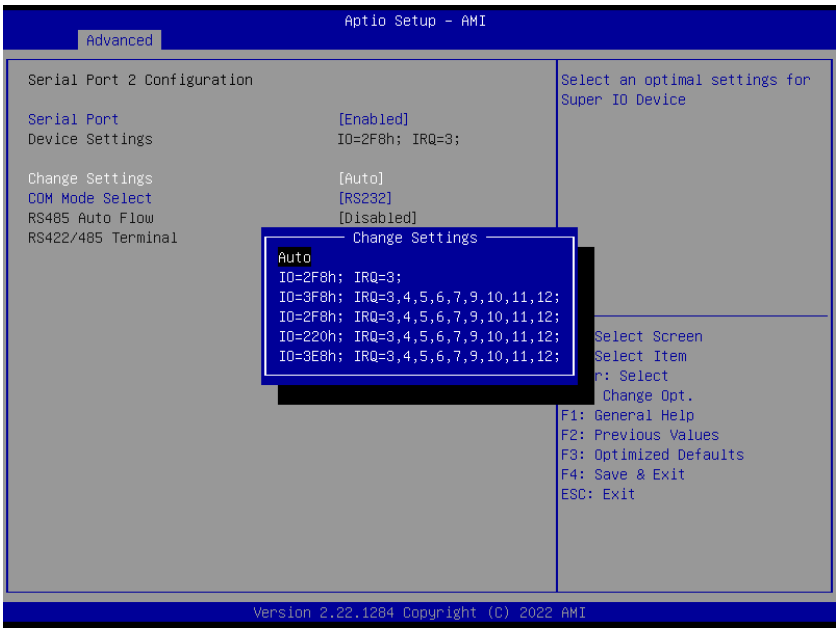
- **COM mode Select [RS232]**
  Configure the COM port Mode

Configuration options: [RS232] [RS485 Half Duplex][RS422 Ful Duplex]

4.6.2.5.2 Serial Port 2 Configuration

- **Serial Port [Enabled]**
  Enable or Disable serial Port (COM)
  Configuration options: [Disabled] [Enabled]

- **Change Settings [Auto]**
  Select an optimal settings for super IO device
  Configuration options: as below

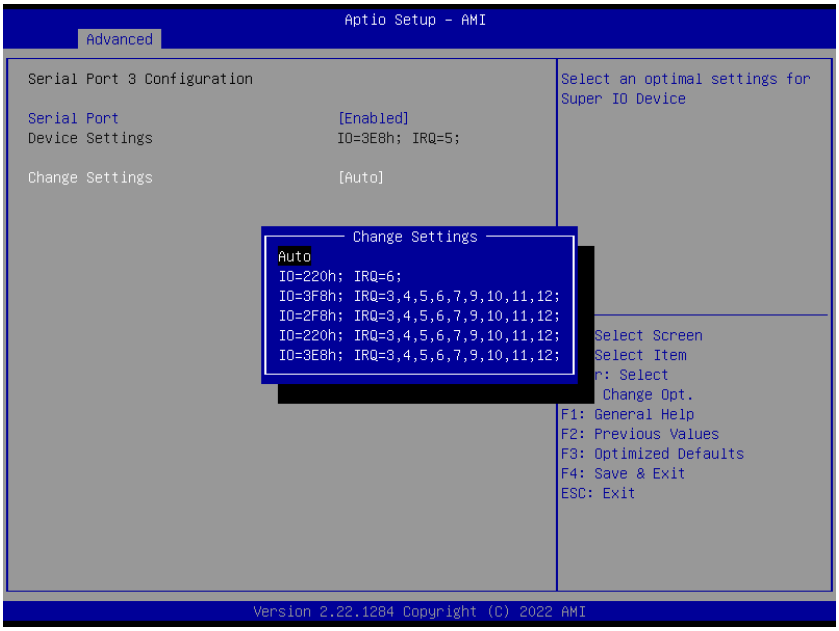


- **COM mode Select [RS232]**
  Configure the COM port Mode
  Configuration options: [RS232] [RS485 Half Duplex][RS422 Ful Duplex]

4.6.2.5.3 Serial Port 3 Configuration

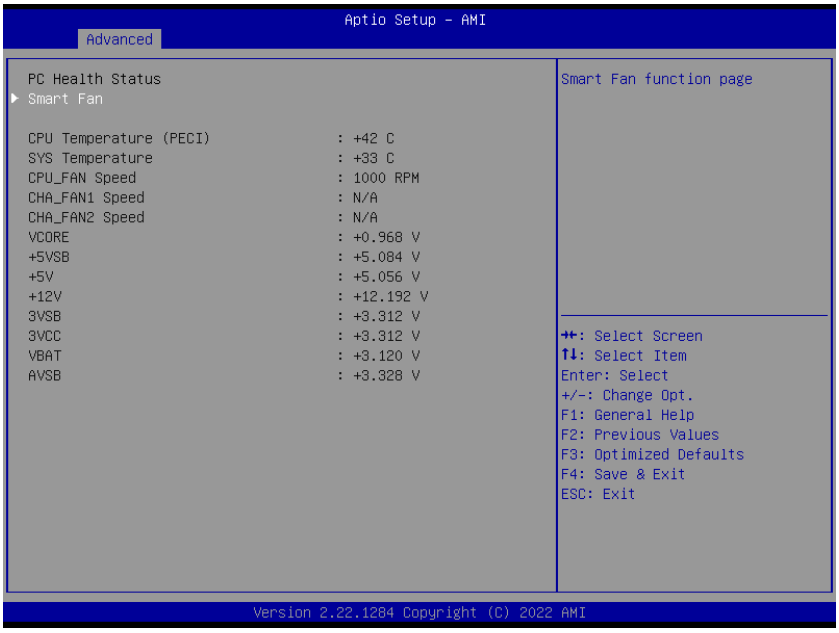
- **Serial Port [Enabled]**
  Enable or Disable serial Port (COM)
  Configuration options: [Disabled] [Enabled]

- **Change Settings [Auto]**
  Select an optimal settings for super IO device
  Configuration options: as below

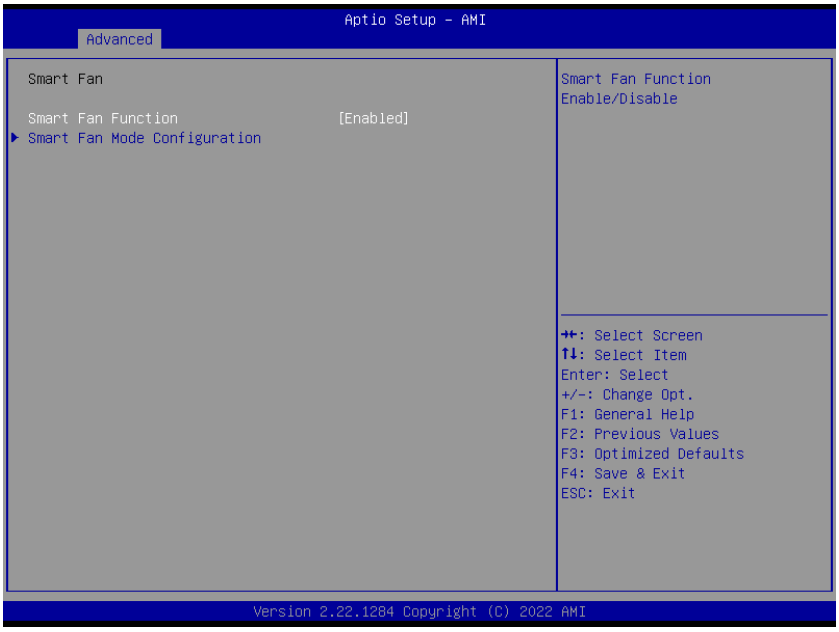


4.6.2.6 Hardware monitor

Display Hardware monitor information



4.6.2.6.1 Smart FAN



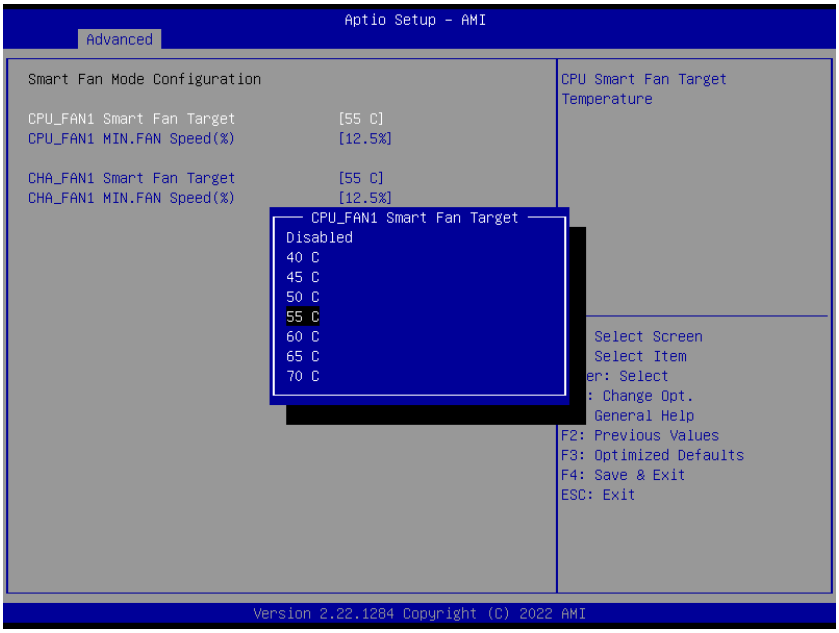
- **Smart FAN Function [Enabled]**
  Smart fan function Enable/Disabled
  Configuration options: [Enabled] [Disabled][Manual]

4.6.2.6.1.1 Smart FAN mode Configuration

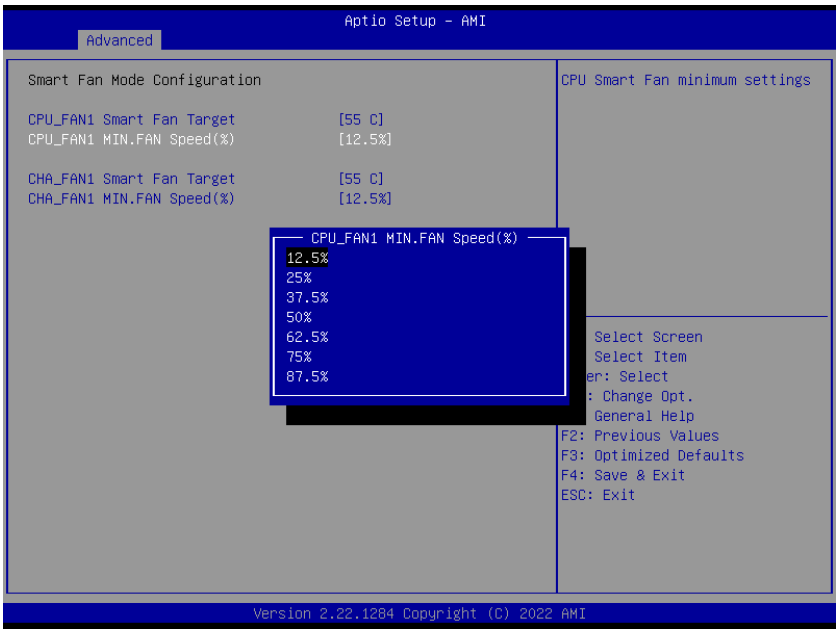
Setting different FAN on this motherboard



- **CPU_FAN1/CHA_FAN1 FAN Target**
  Smart FAN target temperature
  Configuration options: Please see below picture



- **CPU_FAN1/CHA_FAN1 MIN.FAN Speed (%)**
  CPU or Chassis Smart FAN minimum settings
  Configuration options: Please see below picture

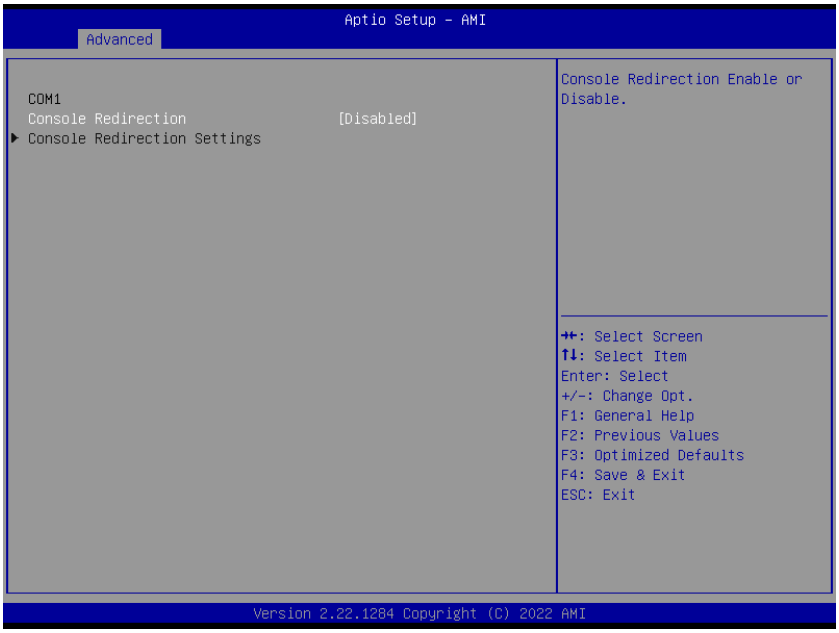


4.6.2.7 S5 RTC Wake Settings



- **Wake system from S5 [Disabled]**
  Enabled or Disabled system wake on alarm event
  Configuration options: [Enabled] [Disabled]

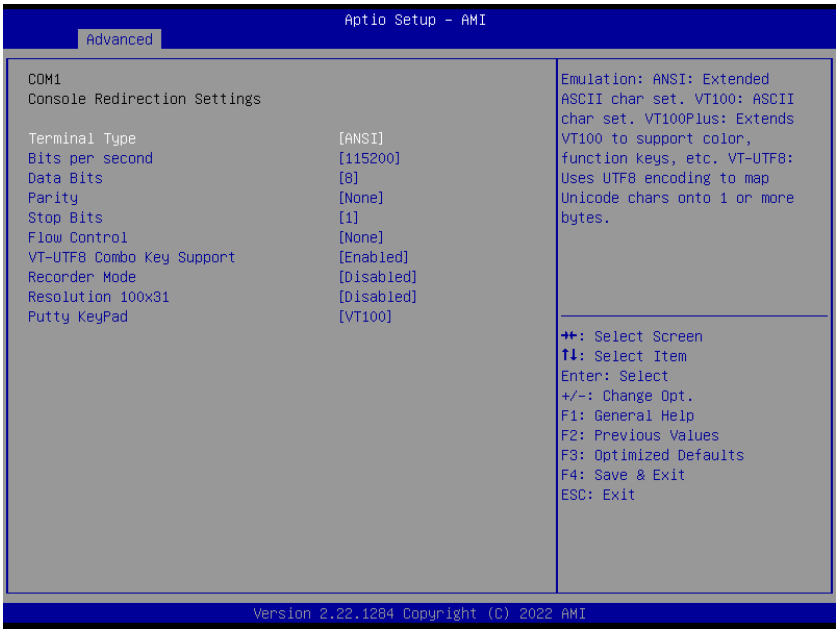
4.6.2.8 Serial Port Console Redirection



- **Console Redirection [Disabled]**

Enabled or Disabled COM1 Console redirection
Configuration options: [Disabled][Enabled]

4.6.2.8.1 Console Redirection settings



- **Terminal Type[ANSI]**
  Select terminal type
  Configuration options: [VT100][VT100Plus][VT-UTF8][ANSI]

- **Bits per second[115200]**
  Select serial port transmission speed
  Configuration options: [9600][19200][38400][57600][115200]

- **Bits per second[115200]**
  Select data bits
  Configuration options: [7][8]

- **Parity[None]**
  A parity bit can be sent with the data bits to detect some transmission errors
  Configuration options: [None][Even][Odd][Mark][Space]

- **Stop Bits[1]**
  Stop bits indicate the end of a serial data package
  Configuration options: [1][2]

- **Flow Control[None]**
  Flow control can prevent data loss from buffer overflow.
  Configuration options: [None][Hardware RTS/CTS]

- **VT-UTF8 Combo key Support [Enabled]**
  Enable VT-UTF8 combination key support for ANSI/VT100 terminals
  Configuration options: [Enabled] [Disabled]

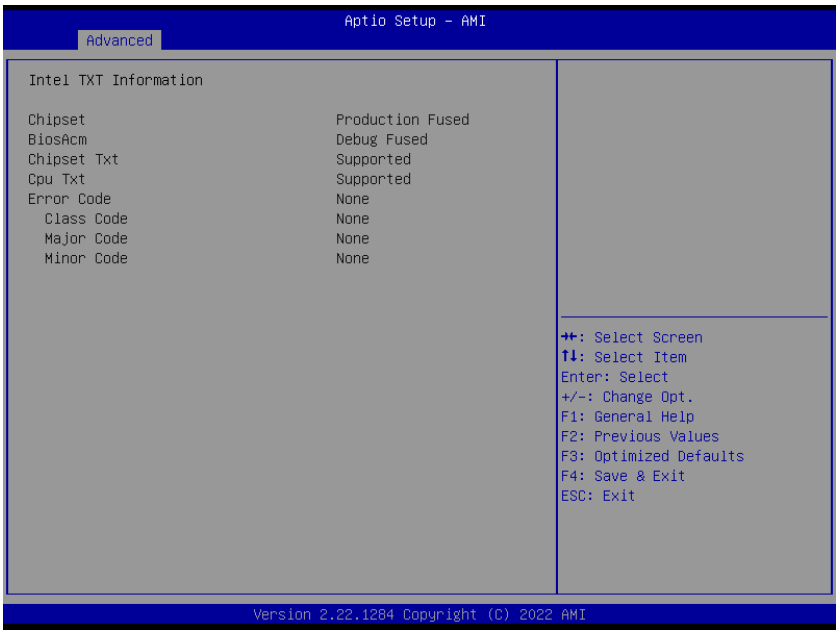
- **Recorder Mode [Disabled]**
  With this mode enabled only text will be sent.
  Configuration options: [Enabled] [Disabled]

- **Resolution 100x31 [Disabled]**
  Enables or disables extended terminal resolution
  Configuration options: [Enabled] [Disabled]

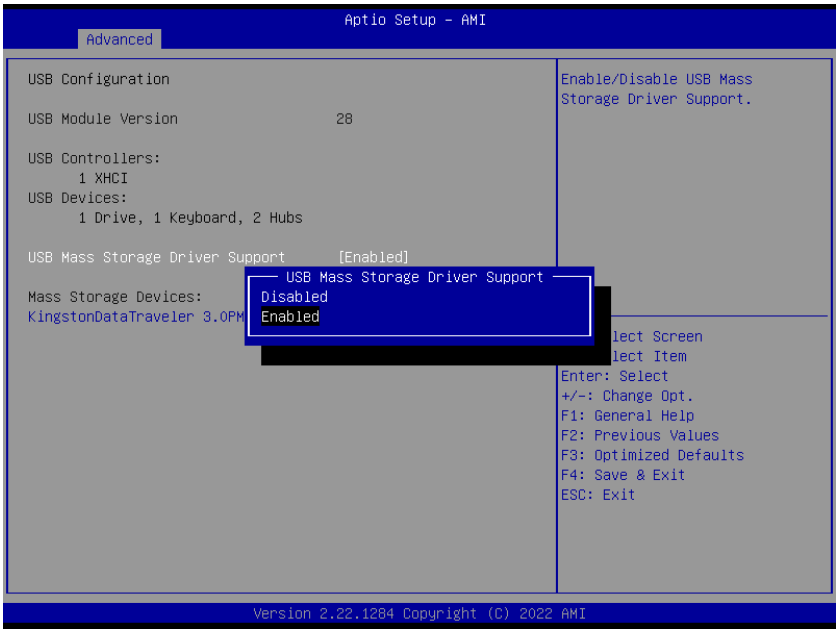
- **Putty Keypad [VT100]**
  Selects function key and keypad on putty
  Configuration options: [VT1000] [LINUX][XTERMR6][SCO][ESCN][VT400]

4.6.2.9 intel TXT information

Display Intel TXT information. This depends on CPU sku.

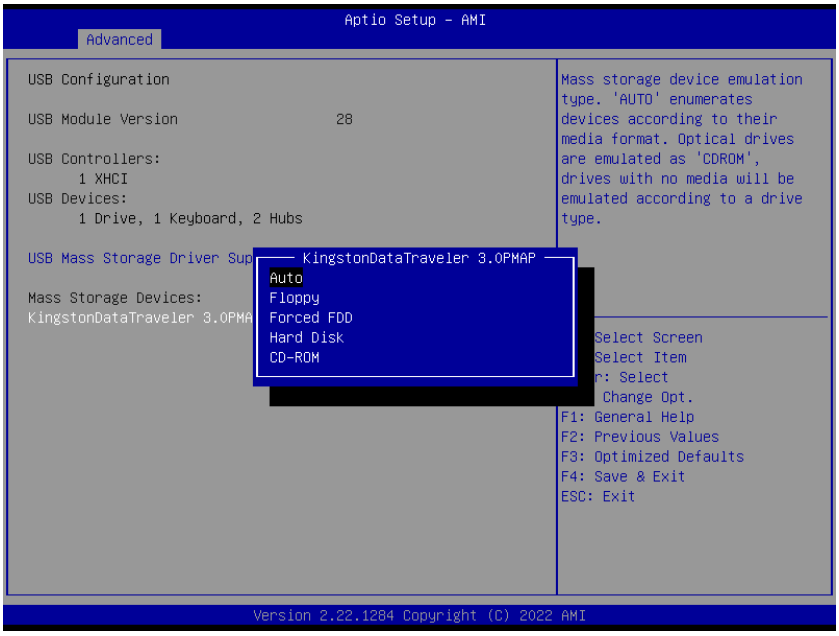


4.6.2.10 USB Configuration



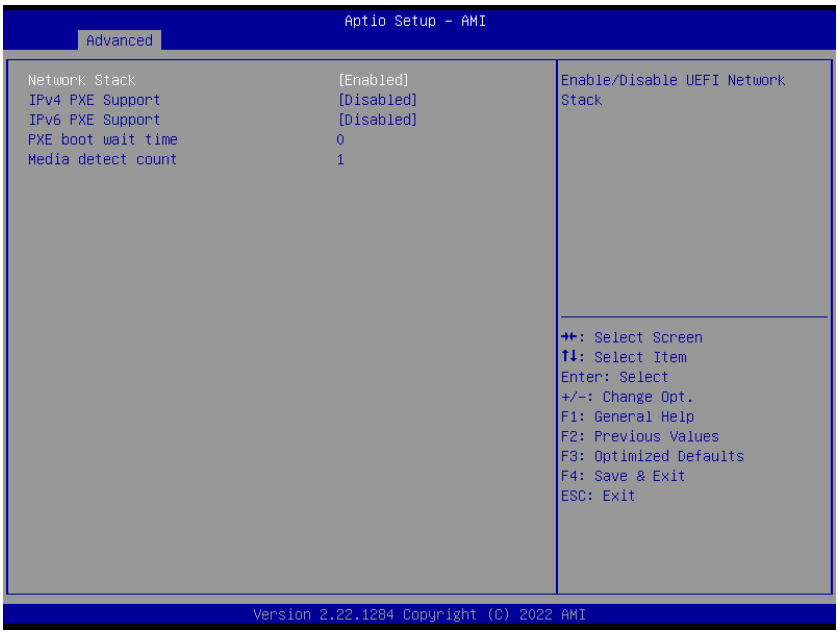
- **USB Mass Storage Driver Support [Enabled]**
  Enable or Disable USB Mass Storage Driver Support
  Configuration options: [Enabled][Disabled]

- **Mass Storage Devices [Auto]**
  Mass Storage device emulation Type. “Auto” enumerates device according to its media format.



4.6.2.11 Network Stack Configuration

Network Stack setting



- **Network Stack [Disabled]**
  Enabled/Disabled UEFI Network Stack
  Configuration options: [Enabled][Disabled]

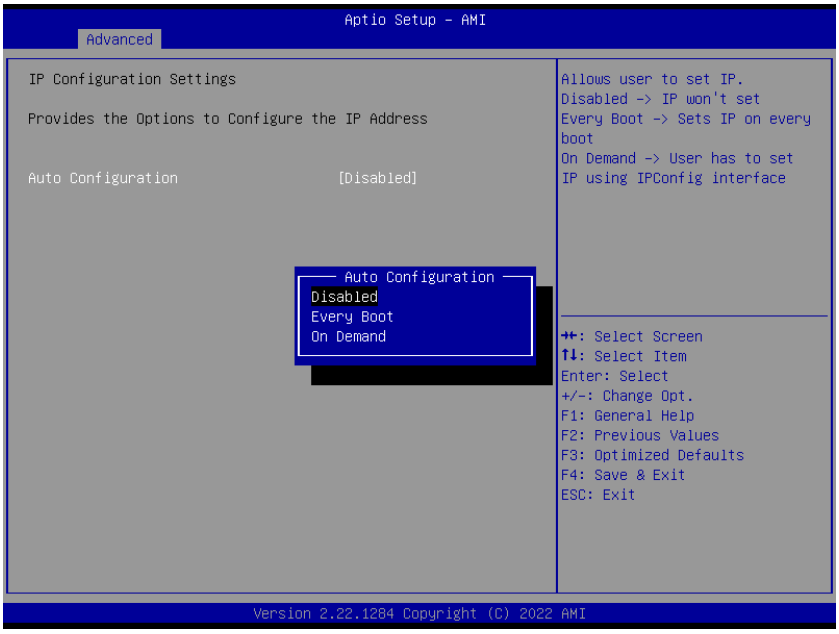
- **IPv4 PXE Support [Disabled]**
  Enabled or disabled IPv4 PXE boot Support
  Configuration options: [Enabled][Disabled]

- **IPv6 PXE Support [Disabled]**
  Enabled or disabled IPv6 PXE boot Support
  Configuration options: [Enabled][Disabled]

- **PXE boot wait time**
  Wait time in seconds to press ESC key to abort the PXE boot.

- **Media detect count**
  Number of time the presence of media will be checked

4.6.2.12 IP configuration



- **Auto Configuration[Disabled]**

Allow user to set IP.

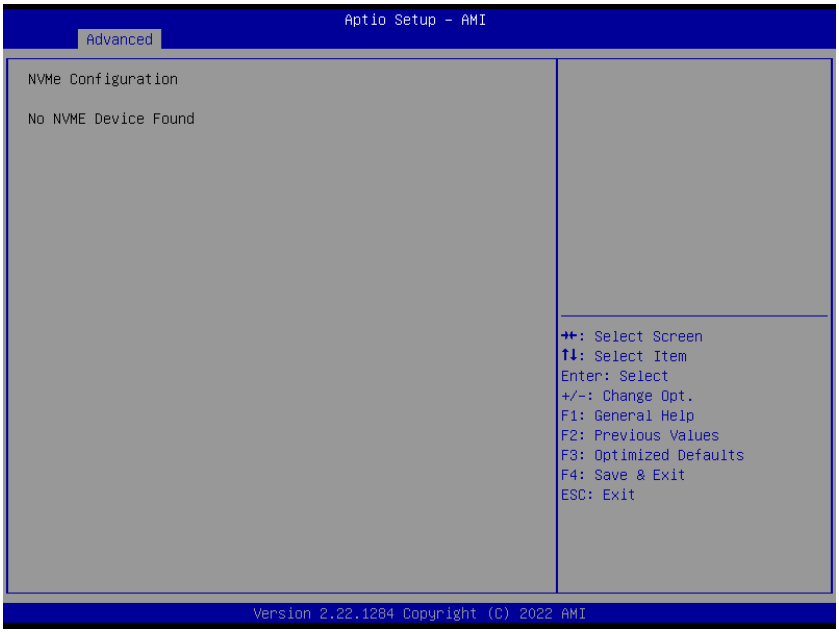
Disabled→IP won't set

Every Boot→Sets IP on every boot

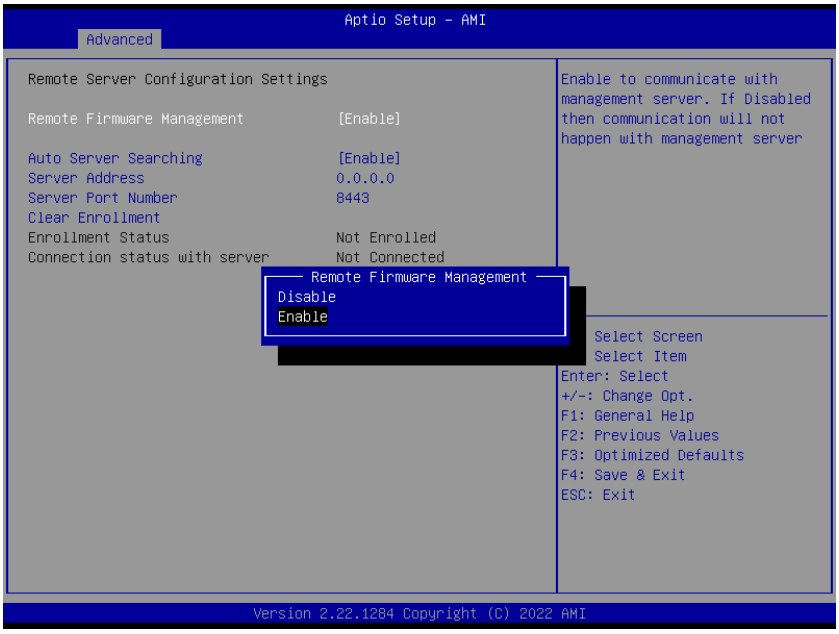
On demand→User has to set IP using IPConfig interface.

4.6.2.13 NVMe Configuration

Display NVMe controller or Drive information



4.6.2.14 Remote Server Configuration



- **Remote Firmware Management [Enabled]**
  Enable to communicate with management server.
  Configuration options: [Disabled][Enabled]

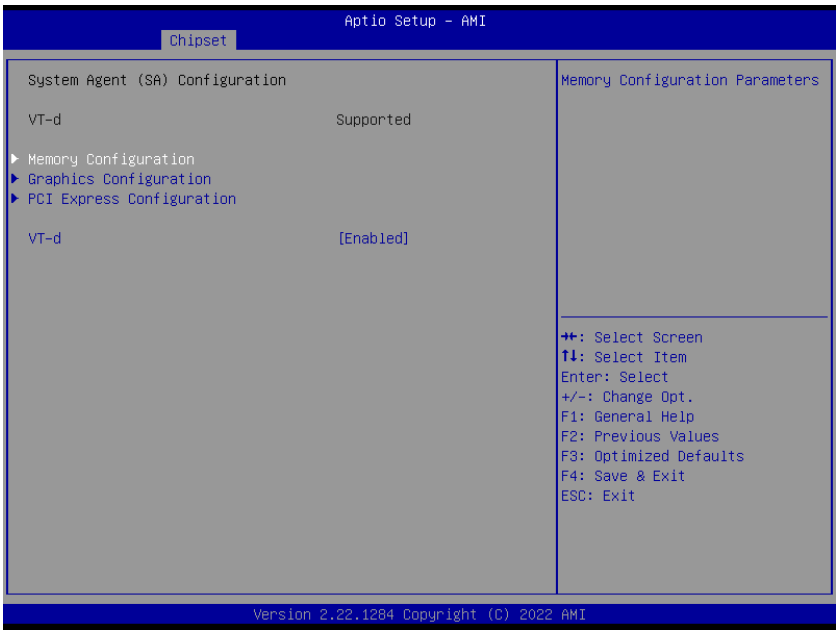
- **Auto Server searching [Enabled]**
  Enabled to obtain DHCP server IP automatically. Disabled to provide Server IP manually. Need to do clear Enrollment, if server is changed to DHCP.
  Configuration options: [Enabled][Disabled]

- **Server Address [Enabled]**
  Management server address to be used if Auto server searching is either disabled or failed. If changed, need to do clear Enrollment if already enrolled with previous IP.

4.6.3 Chipset



4.6.3.1 System Agent (SA) Configuration



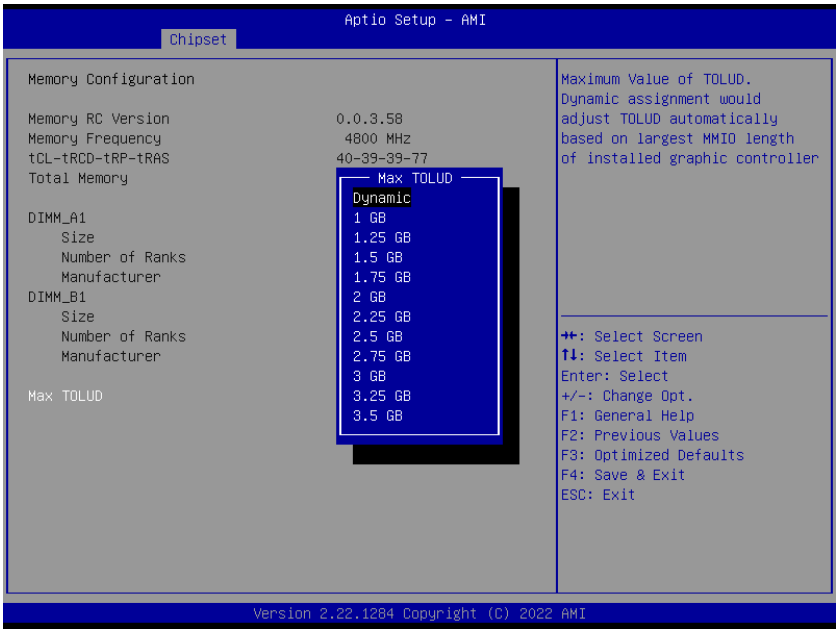
- **VT-d [Enabled]**

VT-d capability

Configuration options: [Disabled] [Enabled]

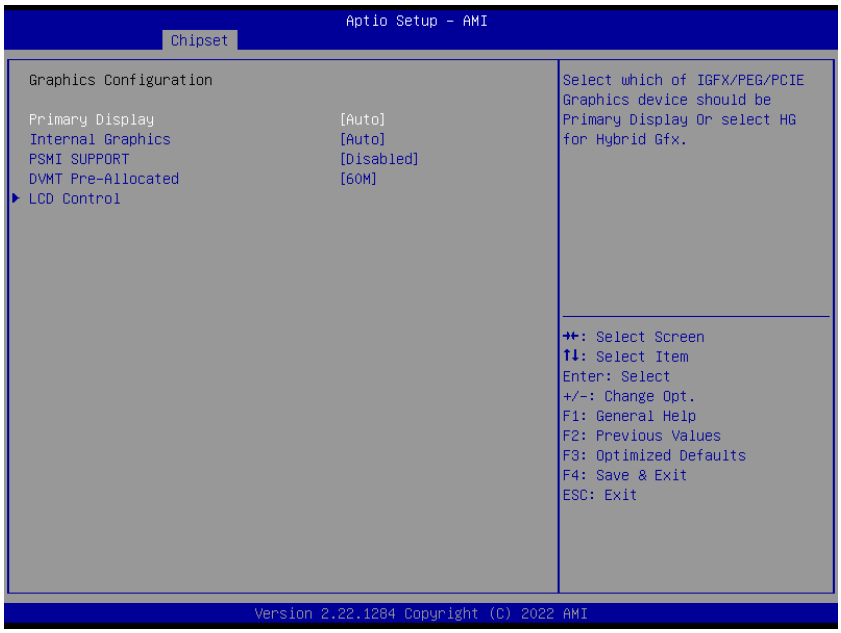
4.6.3.1.1 Memory Configuration

Maximum Value of TOLUD. Dynamic assignment would adjust TOLUD automatically based on largest MMIO length of installed graphic controller.



4.6.3.1.2 Graphics Configuration

Graphic configuration settings



- **Primary Display[Auto]**

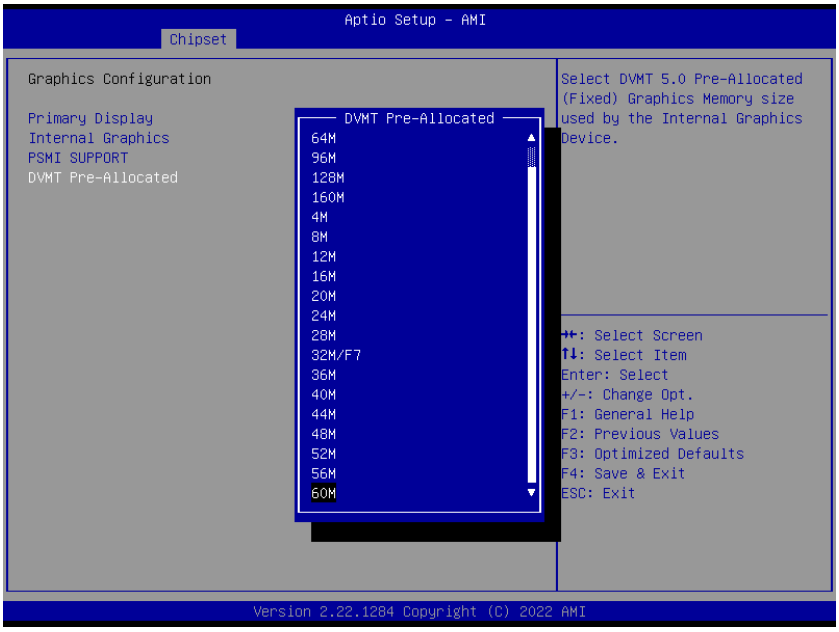
  Select which of IGFX/PEG/PCIE graphic device should be primary display or select HG for Hybrid Gfx.

  Configuration options: [Auto] [IGFX][PEG slot][PCIE]

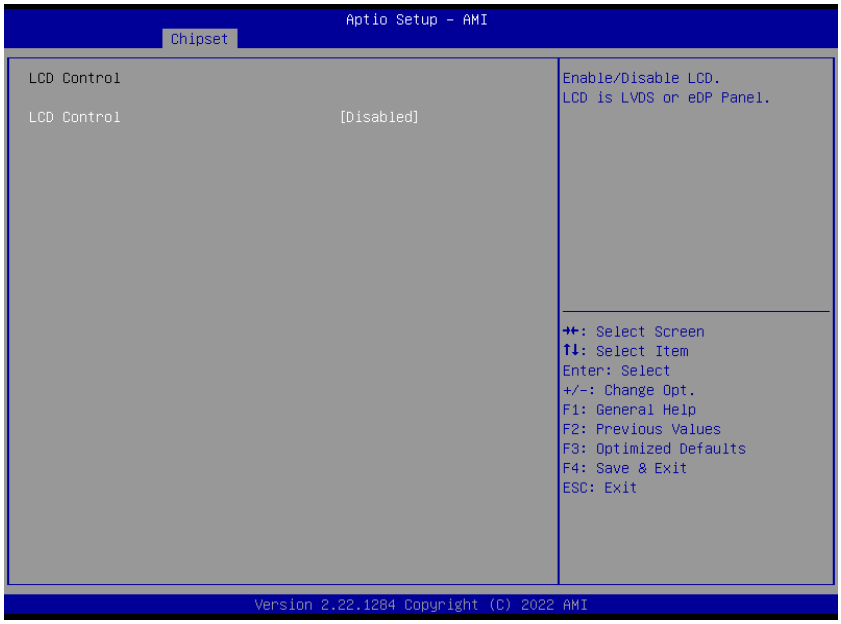
- **Internal Graphics [Auto]**
  Keep IGFX enabled based on the setup options
  Configuration options: [Auto] [disabled][enabled]

- **PSMI Support [Disabled]**
  PSMI enabled/Disabled
  Configuration options: [Disabled][Enabled]

- **DVMT Pre-allocated [60M]**
  Select DVMT 5.0 Pre-allocated (Fixed) Graphics memory size used by the internal graphics device.
  Configuration options: As below picture



4.6.3.1.2.1 LCD Control



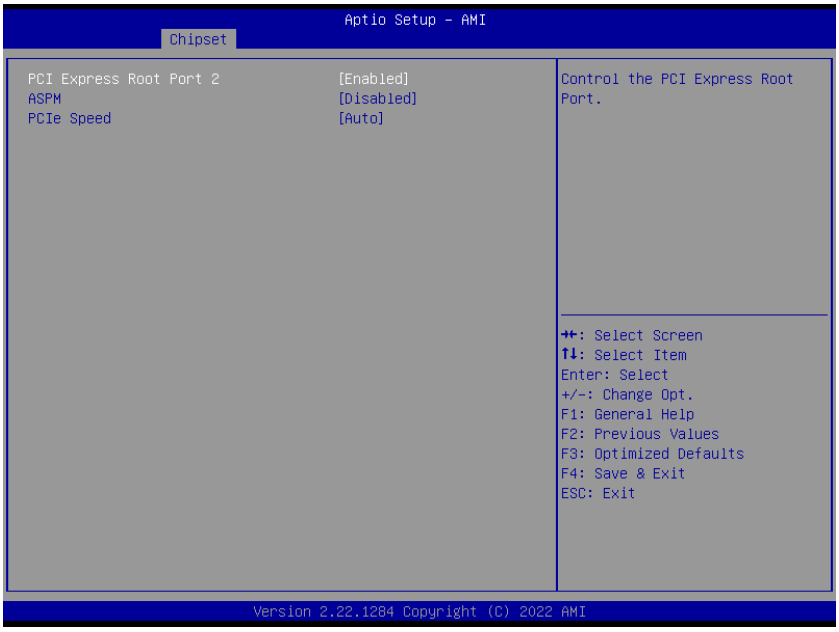
- **LCD Control [Disabled]**
  Enable/Disable LCD. LCD is LVDS or eDP panel
  Configuration options: [Disabled][Enabled]

4.6.3.1.3 PCI Express Configuration



- **Detect Non-compliance Device [Disabled]**
  Detect Non-compliance Device in PEG
  Configuration options: [Disabled][Enabled]

4.6.3.1.3.1 PCI Express Root Port 2 (x16 PEG slot)

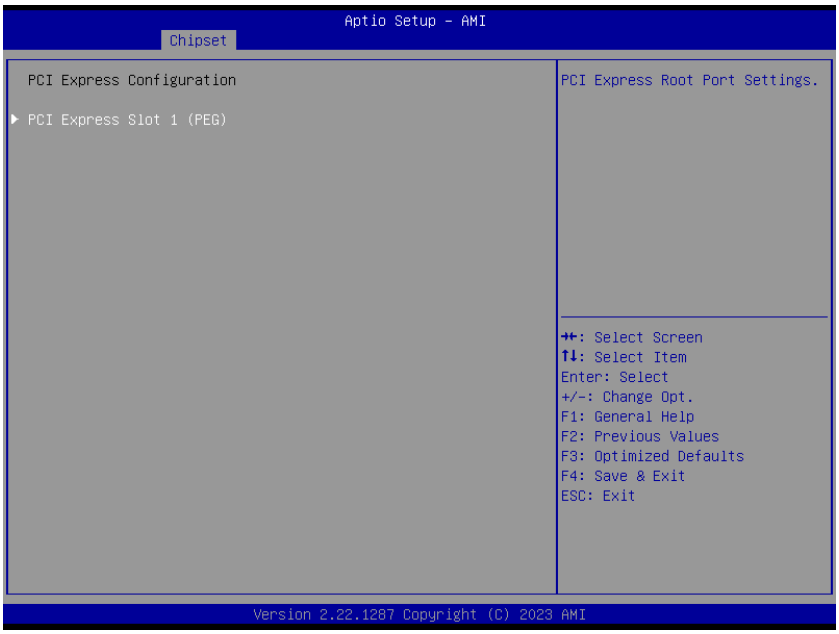


- **PCI Express Root Port 2[Enabled]**
  Control the PCI express Root Port
  Configuration options: [Enabled] [Disabled]

- **ASPM [Disabled]**
  Set the ASPM level
  Configuration options: [Disaled] [L0s][L1][L0sL1]

- **PCIe Speed [Auto]**
  Configure PCIe Speed
  Configuration options: [Auto][Gen1][Gen2][Gen3][Gen4][Gen5]

4.6.3.1.4 PEG Port Configuration



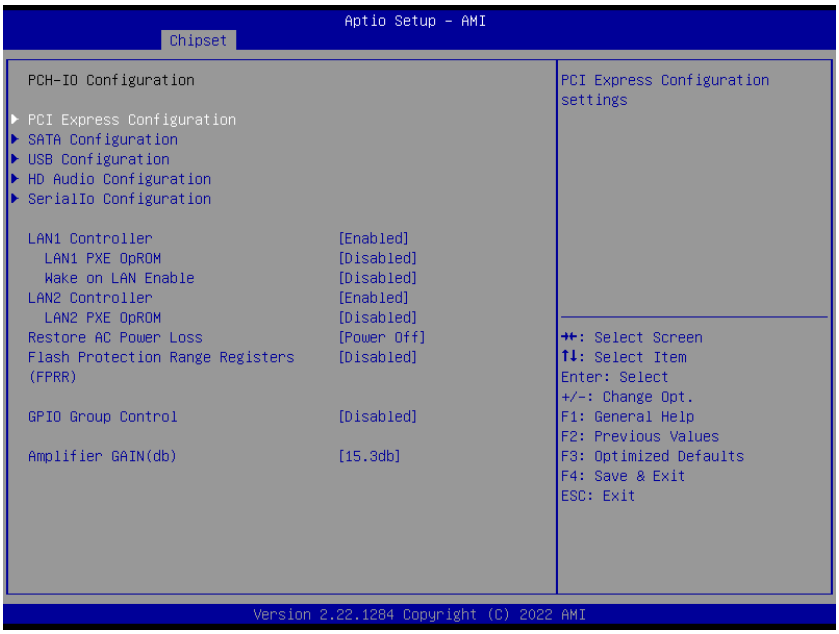
4.6.3.1.4.1 PEG Port Feature Configuration



Item	Option	Description
PCI Express Slot 1 (PEG)	Disabled**[Default]** Enabled	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 wait for link to exit Detect state for enabled ports before assuming there is no device and potentially disabling the port.

4.6.3.2 PCH-IO Configuration



- **Lan1 Controller [Enabled]**
  Enable or Disable onboard LAN1
  Configuration options: [Disabled][Enabled]

- **Lan1 PXE OpROM [Disabled]**
  Enabled or Disabled boot option for LAN1 controller
  Configuration options: [Disabled][Enabled]

- **Wake on LAN Enabled[Disabled]**
  Enable or Disable integrated LAN to wake the system
  Configuration options: [Disabled][Enabled]

- **Lan2 Controller [Enabled]**
  Enable or Disable onboard LAN2
  Configuration options: [Disabled][Enabled]

- **Lan2 PXE OpROM [Disabled]**
  Enabled or Disabled boot option for LAN2 controller
  Configuration options: [Disabled][Enabled]

- **Restore AC Power Loss[Power off]**
  Specify what state to go to when power is re-applied after a power failure
  Configuration options: [Power on][Power off][Last State]

- **Flash Protection Range Registers(FPRR) [Disabled]**
  Enabled Flash Protection Range Registers
  Configuration options: [Disabled][Enabled]

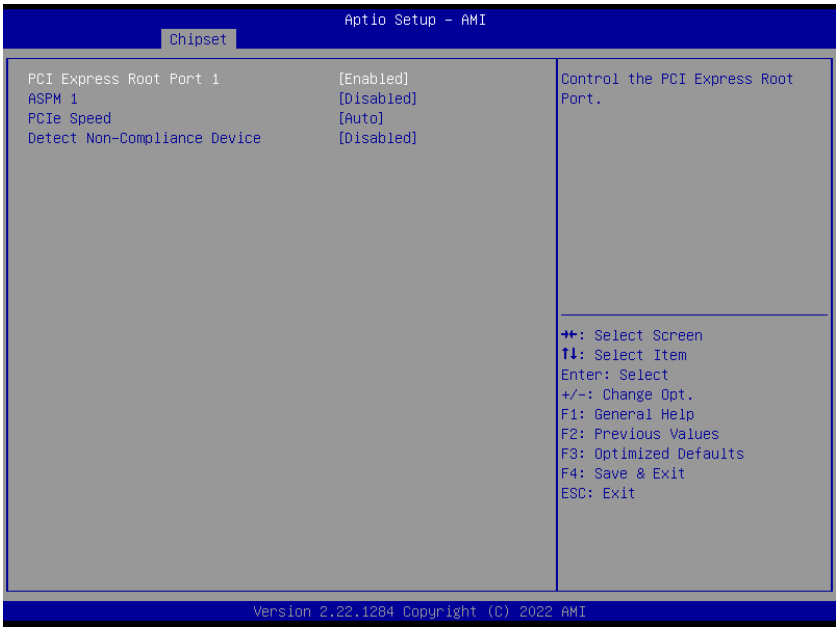
- **GPIO Group Control [Disabled]**
  Configure the digital GPIO pins
  Configuration options: [Disabled][Enabled]

- **Amplifier GAIN(db) [15.3db]**
  Select Amplifier GAIN value
  Configuration options: [15.3db][21.2db][27.2db][31.8db]

4.6.3.2.1 PCI Express Configuration



4.6.3.2.1.1 PCI Express Root Port 1(x1 KeyE)



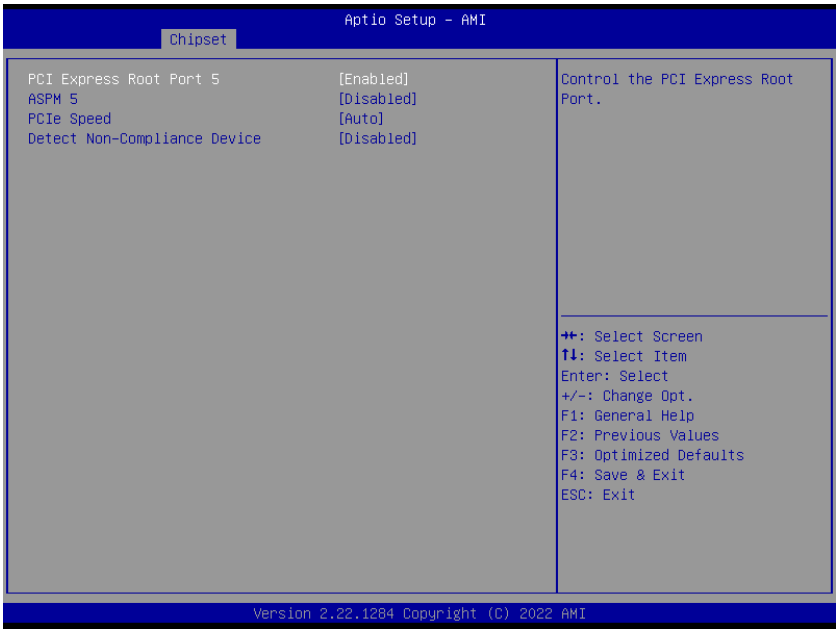
- **PCI Express Root Port 1 [Enabled]**
  Control the PCI Express Port
  Configuration options: [Disabled][Enabled]

- **ASPM Support [Disabled]**
  Set the ASPM level: Force L0s- Force all links to L0s State; Auto- BIOS auto configure; Disabled- Disables ASPM
  Configuration options: [Disabled][L1][Auto]

- **PCIe Speed [Auto]**
  Select PCI Express Port speed
  Configuration options: [Auto][Gen1][Gen2][Gen3] [Gen4]

- **Detect Non-compliance device [Disabled]**
  Detect non-compliance PCI express Device, If enabled, it will take more time at Post time.
  Configuration options: [Disabled][Enabled]

4.6.3.2.1.2 PCI Express Root Port 5(x4 Key M)



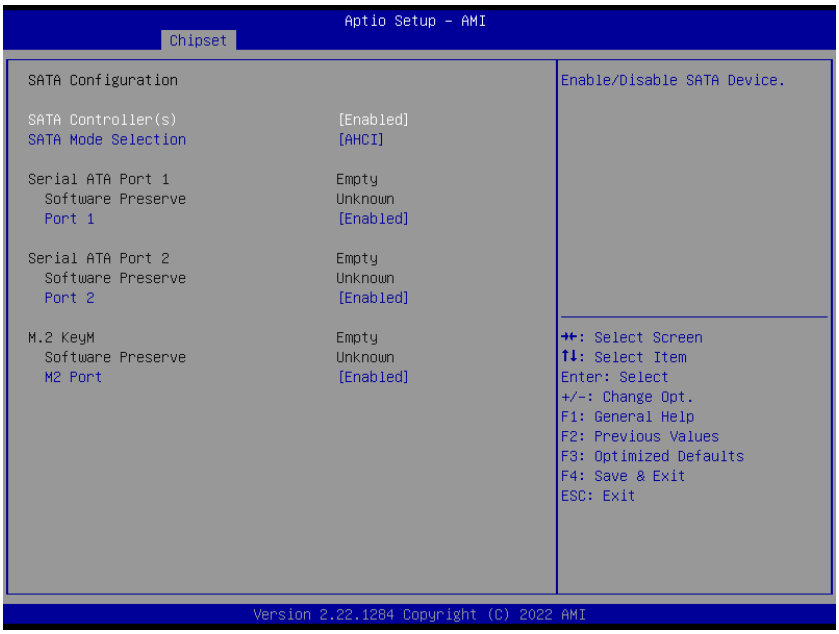
- **PCI Express Root Port 5 [Enabled]**
  Control the PCI Express Port
  Configuration options: [Disabled][Enabled]

- **ASPM 5 [Disabled]**
  Set the ASPM level: Force L0s- Force all links to L0s State; Auto- BIOS auto configure; Disabled- Disables ASPM
  Configuration options: [Disabled][L1][Auto]

- **PCIe Speed [Auto]**
  Select PCI Express Port speed
  Configuration options: [Auto][Gen1][Gen2][Gen3] [Gen4]

- **Detect Non-compliance device [Disabled]**
  Detect non-compliance PCI express Device, If enabled, it will take more time at Post time.
  Configuration options: [Disabled][Enabled]

4.6.3.2.2 SATA Configuration



- **SATA Controller(s) [Enabled]**
  Enable or Disable SATA device
  Configuration options: [Enabled][Disabled]

- **SATA Mode Selection [AHCI]**
  Determines how SATA controller operate
  Configuration options: [AHCI]

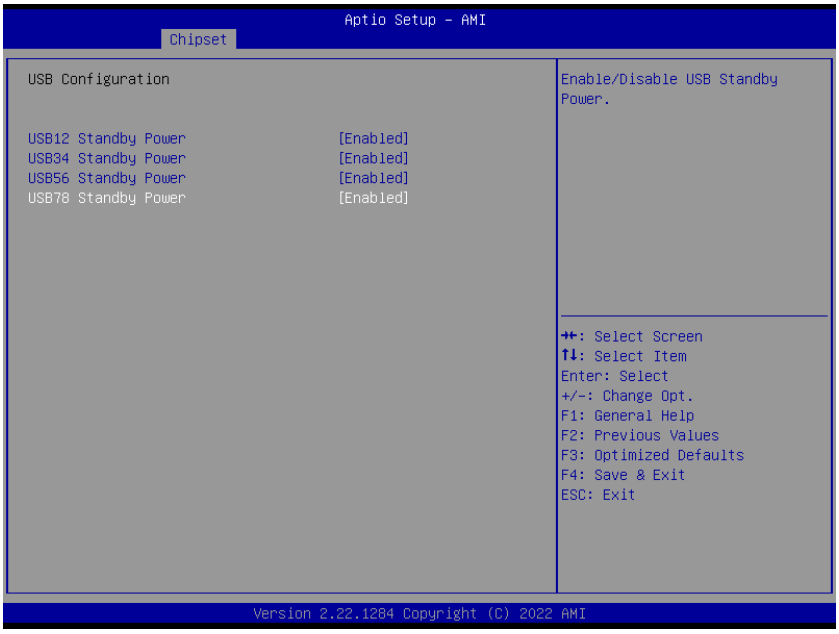
- **Port 1(M2 Port) [Enabled]**
  Enable or Disable SATA port 1
  Configuration options: [Enabled][Disabled]

- **Port 2 [Enabled]**
  Enable or Disable SATA port 2
  Configuration options: [Enable][Disabled]

- **Port 3 [Enabled]**
  Enable or Disable SATA port 3
  Configuration options: [Enabled][Disabled]

- **M2 port [Enabled]**
  Enable or Disable SATA on M.2 Key M slot
  Configuration options: [Enabled][Disabled]

4.6.3.2.3 USB Configuration



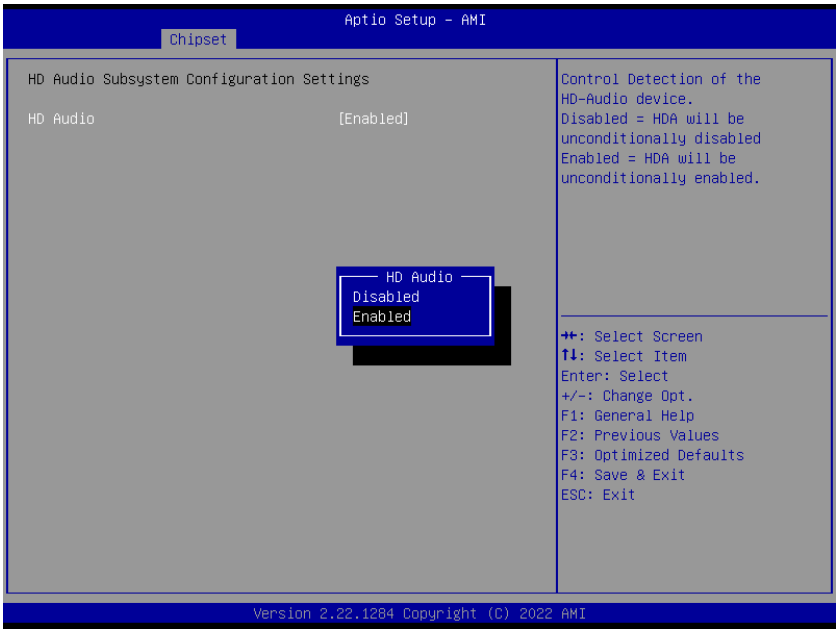
- **USB12 Standby Power[Enabled]**
  Enable or Disable USB standby power
  Configuration options: [Disabled] [Enabled]

- **USB34 Standby Power[Enabled]**
  Enable or Disable USB standby power
  Configuration options: [Disabled] [Enabled]

- **USB56 Standby Power[Enabled]**
  Enable or Disable USB standby power
  Configuration options: [Disabled] [Enabled]

- **USB78 Standby Power[Enabled]**
  Enable or Disable USB standby power
  Configuration options: [Disabled] [Enabled]

4.6.3.2.4 HD audio Configuration



- **HD audio[Enabled]**
  Control Detection of the HD-Audio device.
  Configuration options: [Disabled] [Enabled]

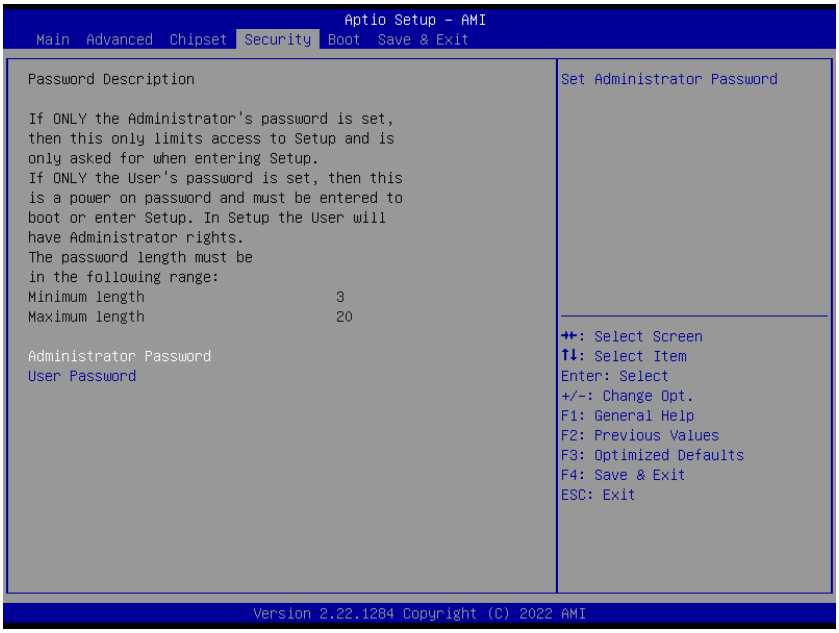
4.6.3.2.5 Serial IO Configuration



- **I2C0 Controller[Enabled]**
  Enabled/Disabled Serial IO Controller
  Configuration options: [Disabled] [Enabled]

- **I2C2 Controller[Enabled]**
  Enabled/Disabled Serial IO Controller
  Configuration options: [Disabled] [Enabled]

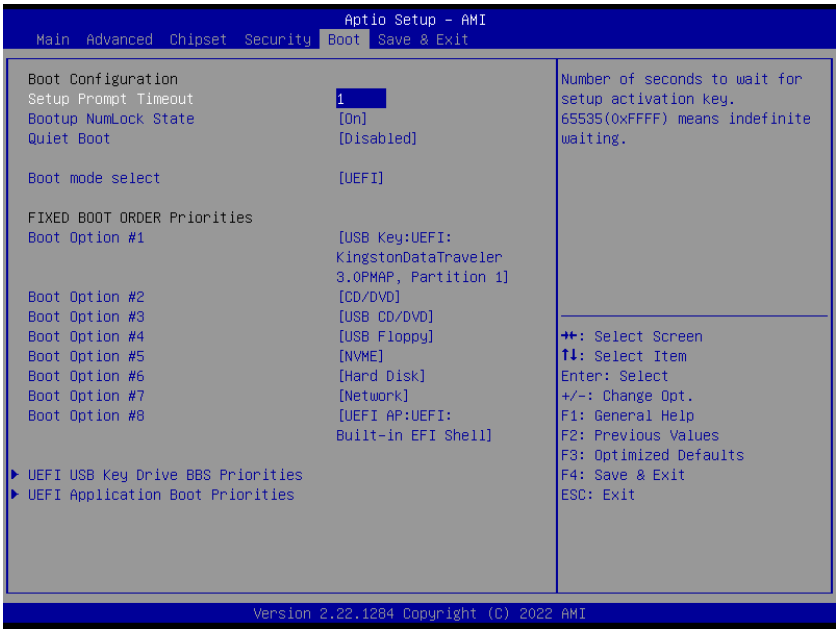
4.6.4 Security



- **Administrator Password**
  Set Administrator Password

- **User Password**
  Set User Password

4.6.5 Boot



- **Setup Prompt Timeout [1]**
  Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.

- **Bootup NumLock State [On]**
  Select the keyboard NumLock state
  Configuration options: [On] [Off]

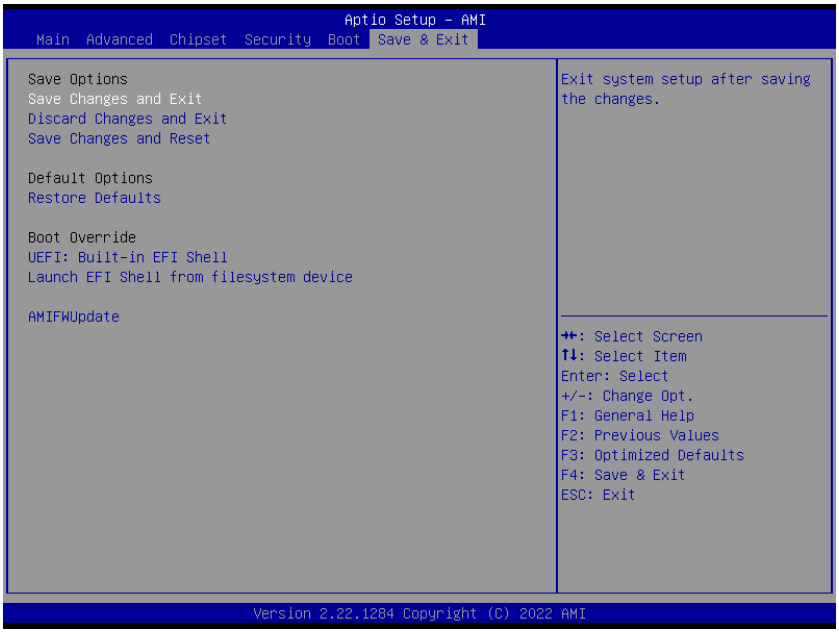
- **Quick Boot [Disable]**
  Enable or disable Quick Boot option
  Configuration options: [Disabled] [Enabled]

- **Boot mode select [UEFI]**
  Select boot mode LEGACY/UEFI
  Configuration options: [LEGACY] [UEFI]

- **UEFI USB Key Drive BBS Priorities**
  Specifies the boot device priority sequence from available UEFI USB key Drives.

- **UEFI Application Boot Priorities**
  Specifies the boot device priority sequence from available UEFI Application.

4.6.6 Save & Exit



- **Save changes and Exit**
  Exit system setup after saving the changes.

- **Discard changes and Exit**
  Exit system setup without saving the changes.

- **Save changes and Reset**
  Reset the system after saving the changes.

- **Restore Defaults**
  Restore/Load default values for all the setup option.

- **Launch EFI Shell from filesystem device**
  Attempts to launch EFI shell application from one of the available filesystem devices.

- **AMIFWUpdate**
  Launches AMIFWUpdate

5. 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

6. 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.