FPC-21W42

21.5” Rugged Multi-touch Panel PC

Quick Reference Guide

1st Ed –06 March 2025

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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.

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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.
On the other hand, if the customer only returns the key parts to Avalue for repair, it is necessary that the serial number of the entire unit is given in the "Problem Description" field, so that warranty period can be ruled accordingly; or Avalue will handle the case as an Out-of- warranty case.

3.2 Return of faulty product for repair

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

3.3 Maintenance Charge

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

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

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

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

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

3.4 Maintenance service of phased-out products

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

3.5 Maintenance Report

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

4. Service Products

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

Defect Analysis Report (DAR)

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

Upgrade Service

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

Safety Instructions

Safety Precautions

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

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

avoid damage by transient overvoltage.

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

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

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

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

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

16. This equipment is not suitable for use in locations where children are likely to be present.

17. CAUTION: Risk of fire or explosion if the battery is replaced by an incorrect type.

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 incorretly 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 ther liquids. Dispose of the battery in accordance with local regulations and instructions from your service provider.

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

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

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

Content

1. Getting Started

1.1 Safety Precautions

Warning!

Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.

Caution!

Always ground yourself to remove any static charge before touching the CPU card. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components in a static-dissipative surface or static-shielded bag when they are not in the chassis.

1.2 Packing List

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

Item	Description	Q'ty
1	FPC-21W42	1
2	VESA Screws	4
3	HDD Screws	8
4	HDD Shockproof rubbers	8
5	PCIe Screws	2

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

Purposes and Applications

The FPC-21W42 is a ruggedized 21.5-inch industrial-grade panel PC designed for demanding environments and applications requiring high performance and reliability. It is equipped with powerful 13th Gen Intel® Core™ i3/i5/i7 processors, multiple display support, and a wide range of expansion options, making it suitable for various industrial, commercial, and outdoor applications.

At the core of the FPC-21W42 lies a powerful 13th Gen Intel® Core™ i3/i5/i7 processor that delivers exceptional computing performance for various industrial applications. FPC-21W42 offers rich I/O, PCIe expansion slot and supports up to 3 independent displays which can allowing for expanded visual information and enhanced productivity in multi-screen setups.

Unpacking

Note:

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

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

WARNING!

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

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

1.3 System Specifications

System Information	
SBC	MX610H
Processor	Onboard Raptor Lake S 13th Intel® Core™ SoC i7/i5/i3 • Intel® Core™ i7-13700TE (35W, 30M Cache, up to 1.10 GHz) • Intel® Core™ i5-13500E (65W, 24M Cache, up to 2.40 GHz) • Intel® Core™ i3-13100TE (35W, 12M Cache, up to 2.40 GHz)
CPU Cooler (Type)	1 x PWM FAN for CPU
System Memory	2 x 262-pin DDR5 4800 MHz SO-DIMM sockets support up to 64GB (non ECC only)
System Fan	1 x PWM FAN for System
I/O Chipset	Fintek® F81966AB-I
Watchdog Timer	H/W Reset, 5~255 Seconds/5~255 Minutes
H/W Status Monitor	• CPU Temperature Monitoring • Voltage Monitoring • CPU Fan Speed Control
TPM	TPM 2.0
Wireless LAN	M.2 keyA/E 802.11ax Dual-band, BT5.2,AX210.NGWGIE.NV, 99ARN4,Intel (optional)
Bluetooth	BT5.2 (optional)
Operating System	Win10, Win11, Linux
Expansion Card	• 1 x PCIe x16 Gen4 Slot • 1 x M.2 (2230) E-Key support WiFi module, with 1 x PCI-e x1 & USB 2.0 (CNVi Supported)
Storage	
Solid State Drive	1 x 2.5” Drive Bay design (optional)
Other Storage Device	1 x 2280 & 2242 M.2 Slot M Key with PCIe x4 & SATA 3.0 signal (optional)
Panel	
LCD Size	21.5", 16:9
Display Type	Full HD
Resolution	1920 x 1080
Pixel pitch	247.95um(H) x 247.95um(V)
Luminance	250 cd/m2
Contrast ratio	1000
Viewing angle	89 (U), 89 (D), 89 (L), 89 (R)
Response time	14 ms

Backlight	LED
Touch Type	Projective capacitive multi-touch up to 10 points
Touch Light Transmission	89 %
Touch Controller	USB touch (EETI)
Rear I/O	
Serial Port	• 2 x RS232(default)/422/485, • 2 x RS232(optional)
USB Port	• 4 x USB3.2 Gen1 • 2 x USB 2.0
DIO Port	1x8-bit GPIO (optional)
Video Port	3 x independent displays supported • 1 x LVDS 18/24-Bit Dual Channel - Resolution up to 1366x768 @60Hz (18-Bit) - Resolution up to 1920x1200 @60Hz (24-Bit) • 2 x DP - Resolution up to 4096×2304 @60Hz • 1 x HDMI - Resolution up to 3840x2160 @30Hz
Audio Port	Realtek® ALC897 • 1 x Line-out • 1 x Mic-in
LAN Port	1 x Intel® I219-LM GbE LAN PHY 1 x Intel® i225-V 2.5GbE LAN
Expansion Slots	1 x PCIe x16 Gen 4 Slot 1 x 2230 M.2 slot E Key with PCIe x1 & USB 2.0 signal (CNVi Supported) 1 x 2280 & 2242 M.2 Slot M Key with PCIe x4 Gen 3 & SATA3.0 signal
Onboard I/O	
COM	• COM1~COM2 : - 2 x RS232/422/485 selected by BIOS selection at I/O (COM1~COM2) - 2 x 2 x 3 pin, pitch 2.00mm connector for COM 1~2 support RS232 with Pin 9,+5V/+12V/RI by jumper (JCOMP1_2) • COM3~COM4 : - 2 x 2 x 5 pin, pitch 2.00mm connector for COM3~COM4 support RS232 connector (pin9 without Power) (JCOM3/4) - 2 x 2 x 3 pin, pitch 2.00mm connector for COM 1~2 support RS232 with Pin 9,+5V/+12V/RI by jumper(JCOMP3_4)
USB	2 x 2 x 5 pin, pitch 2.54mm connector for 4 x USB 2.0 (JUSB1/2)
USB 3.2 Gen 1	1 x 2 x 10 pin, pitch 2.00mm connector for 2 x USB 3.2 Gen 1x1 (JUSB3)

GPIO	1 x 2 x 5 pin, pitch 2.00mm connector for GPIO: 8 bits & +3.3VS (JGPIO1)
SATA	3 x Std. SATA 3.0 Connectors
CPU/System FAN	• 1 x 1 x 4 pin, pitch 2.54mm CPU fan connector with smart fan function supported (CPUFAN1) • 1 x 1 x 4 pin, pitch 2.54mm System fan connector with smart fan function supported (SYSTAN1)
AT/ATX Selector	• 1 x 1 x 3 pin, pitch 2.54mm connector for AT/ATX jumper (JATX1) • 1 x 2 x 12 pin ATX power connector (JPWR1) • 1 x 2 x 4 pin ATX 12V power connector (JPWR2)
Audio	1 x 2 x 5 pin, pitch 2.54mm connector for front Audio (JAUD1)
DC-Input	PSU Flex ATX 300W
Power Requirement	
Power Requirement	100-240V~, 5-2.5A, 50-60Hz
Power Mode	AT/ATX by jumper (Default Setting: ATX)
Power Button	1 x Power Switch on the side
Power Connector Type	AC Power input 3P (Male) Connector
Mechanical	
Dimension	538 x 341 x 122 mm
Weight	12.6 kg
Construction-Front	• Aluminum Die-casting • Front IP65
Construction-Rear	Metal black
Thermal Solution	CPU Cooler
Reliability	
Dust and Rain Test	Front IP65
Vibration Test	Random Vibration Operation 1. Test PSD : 0.00454G²/Hz , 1.5 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 7. Storage : SSD or M.2 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. 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
Mechanical Shock Test	1. Wave from : Half Sine wave 2. Acceleration Rate : 10g for operation mode 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 8. 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 : 81.3cm 3. Package weight : 12.6 Kg 4. Test drawing
Operating Temperature	0 ~ 45°C *Air flow=0.7 m/s
Operating Humidity	40°C @ 95% Relative Humidity, Non-condensing
Storage Temperature	-20°C ~ 60°C

Note: Specifications are subject to change without notice.

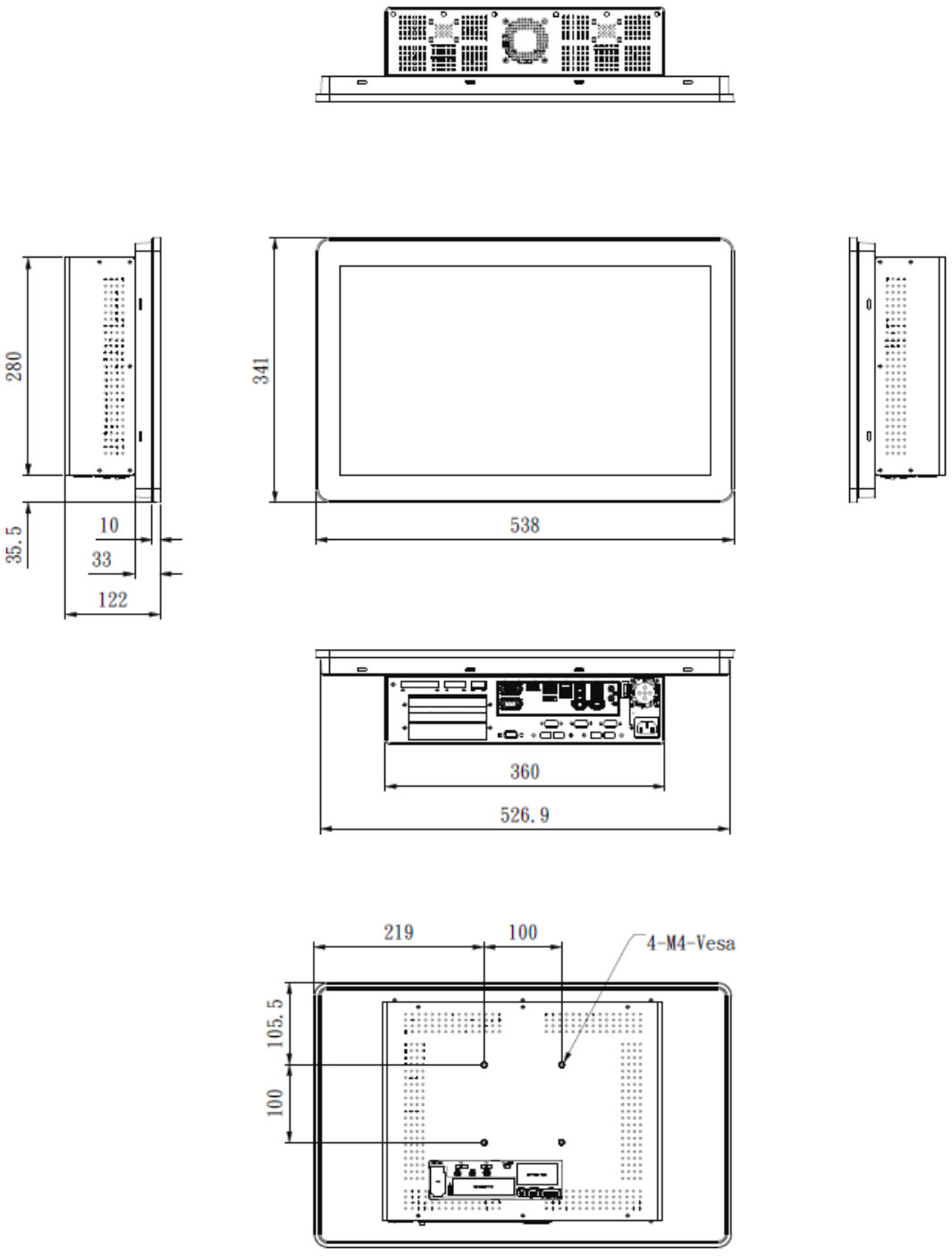
1.4 System Overview

1.4.1 I/O View

Connectors

Label	Function	Note
PSU AC100~240V	+100~240V AC power-in connector	
Mic-in	Mic-in audio jack	
Line-out	Line-out audio jack	
LAN	2 x RJ-45 Ethernet	
USB	4 x USB 3.2 connector 2 x USB 2.0 connector	
DP	2 x DP connector	
HDMI	HDMI connector	
COM	2 x Serial port connector	2 x RS232/422/485 (RS-232 default) DB9 connector
Extend Power Switch	Extend Power Switch (optional)	
PCIe x16	PCIe x16 Gen4 Slot	
GPIO	General purpose I/O connector (optional)	

1.5 System Dimensions



(Unit: mm)

2. Hardware Configuration

For advanced information, please refer to:

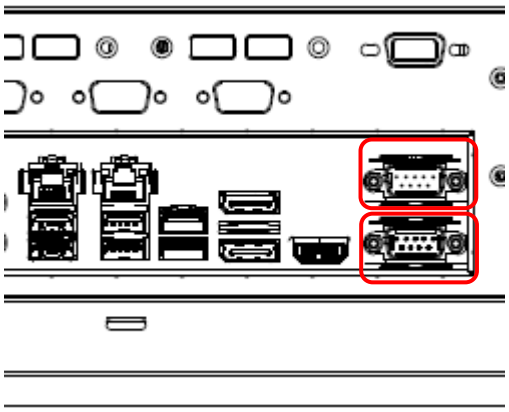
1- MX610H included in this manual.

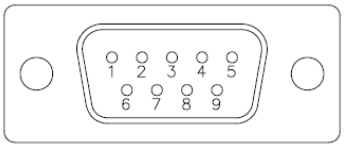
Note: If you need more information, please visit our website:

www.avalue.com

2.1 FPC-21W42 connector mapping

2.1.1 Serial port connector (COM)





RS-232*

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

*** Default**

RS-422

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

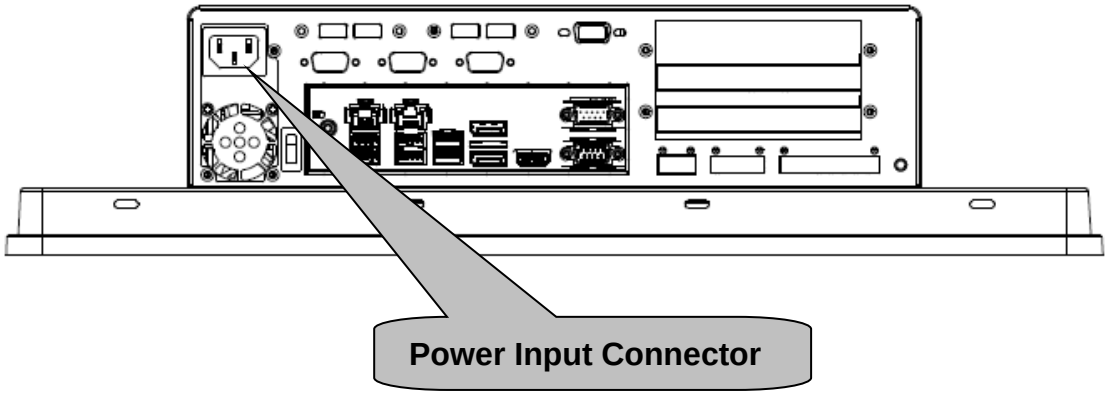
RS-485

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

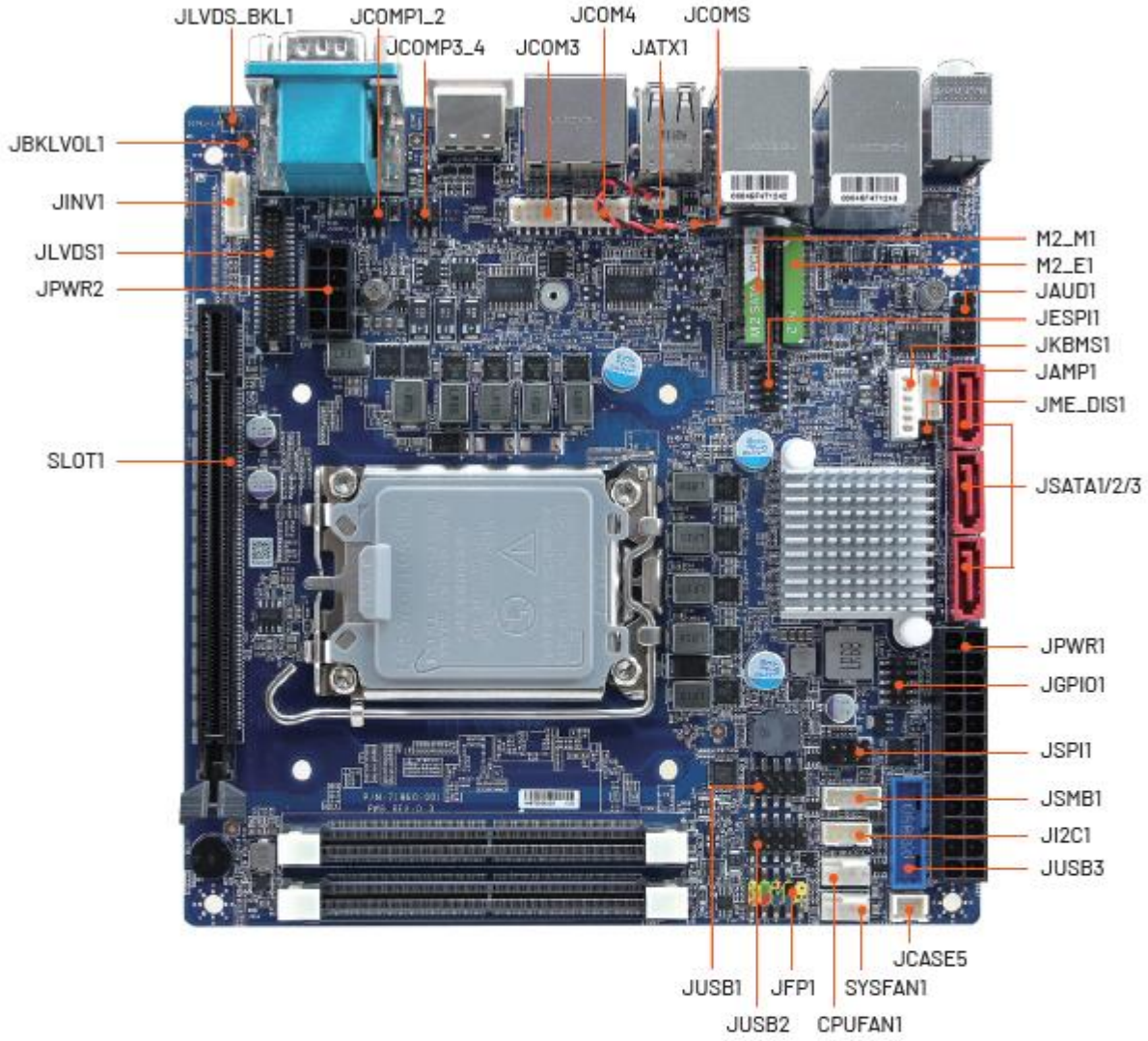
2.2 Powering On the System

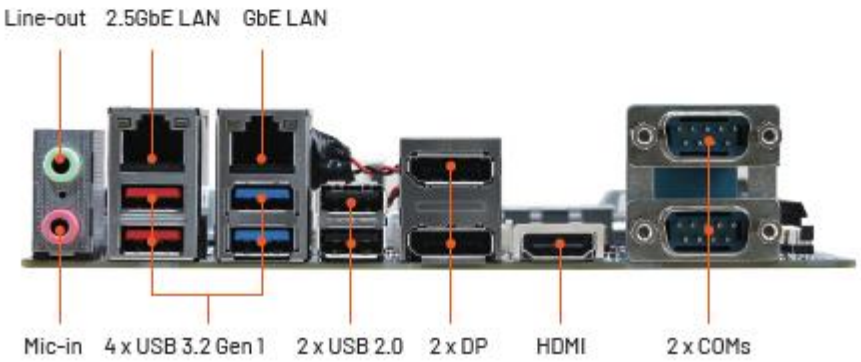
To power on the system, follow the steps below.

Step 1: Connect the power cord to the power supply unit. 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.



2.3 MX610H Overview

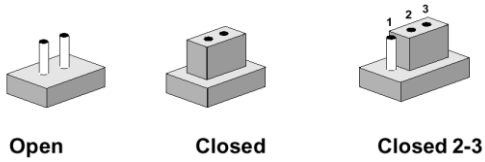




2.4 MX610H Jumper and Connector List

You can configure your board to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch.

It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” a jumper you connect the pins with the clip. To “open” a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2, and 3. In this case, you would connect either two pins.



The jumper settings are schematically depicted in this manual as follows:

A pair of needle-nose pliers may be helpful when working with jumpers.

Connectors on the board are linked to external devices such as hard disk drives, a keyboard, or floppy drives. In addition, the board has a number of jumpers that allow you to configure your system to suit your application.

If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes.

The following tables list the function of each of the board’s jumpers and connectors.

Jumpers

Label	Function	Note
JCMOS1	Clear CMOS	3 x 1 header, pitch 1.25mm
JME_DIS1	Enable/disable the Intel ME F/W	3 x 1 header, pitch 1.25mm
JATX1	AT/ATX Power Select	3 x 1 header, pitch 1.25mm
JLVDS_BKL1	LVDS Backlight Control Select	3 x 1 header, pitch 1.25mm
JBKLVOL1	LVDS Backlight Power 3V/5V Select	3 x 1 header, pitch 1.25mm
JCOMP1_2	COM1 & COM2 RI/+5V/+12V Select	3 x 2 header, pitch 2.00mm
JCOMP3_4	COM3 & COM4 RI/+5V/+12V Select	3 x 2 header, pitch 2.00mm

Connectors

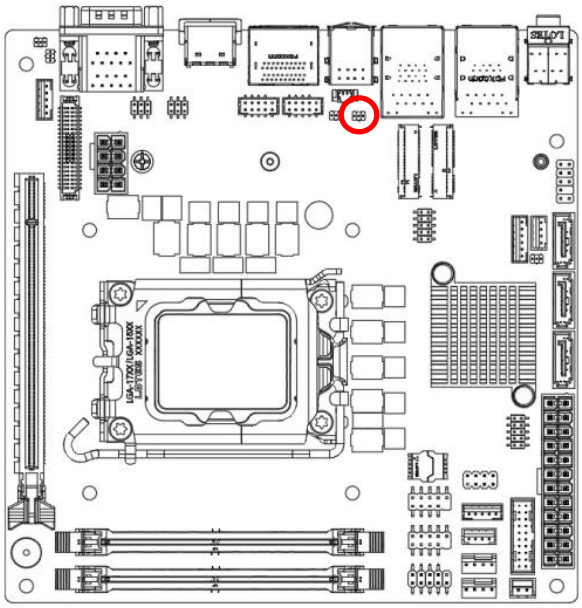
Label	Function	Note
JPWR1	ATX-Power Connector	12 x 2 header, pitch 4.20mm

JPWR2	12V ATX-Power Connector	4 x 2 header, pitch 4.20mm
JSATA1/2/3	Serial ATA Connectors	
CPUFAN1	CPU Fan Connector	4 x 1 wafer, pitch 2.54mm
SYSFAN1	System Fan Connector	4 x 1 wafer, pitch 2.54mm
JI2C1	I2C Connector	4 x 1 wafer, pitch 2.0mm
JSMB1	SMBus Connector	4 x 1 wafer, pitch 2.0mm
JFP1	System Panel Connector	5 x 2 header, pitch 2.54mm
JCOM3/4	Serial Port Connector 3/4	5 x 2 wafer, pitch 2.00mm
JGPIO1	Digital I/O header	5 x 2 header, pitch 2.54mm
JCASE5	Chassis Intrusion Connector	2 x 1 wafer, pitch 2.54mm
JKBMS1	PS/2 KB&MS Connector	6 x 1 wafer, pitch 2.00mm
JUSB1/2	USB 2.0 Connector	5 x 2 header, pitch 2.54mm
JAMP1	Amplifier Connector	4 x 1 wafer, pitch 2.00mm
JUSB3	USB 3.2 Gen 1 Connector	10 x 2 Box header, pitch 2.00mm
JAUD1	Front Panel Audio Connector	5 x 2 header, pitch 2.54mm
JINV1	LVDS Inverter Connector	5 x 1 wafer, pitch 2.00mm Matching connector：JST PHR-5
JLVDS1	LVDS Connector	20 x 2 header, pitch 1.25mm Matching connector : DF13-40DS-1.25C
DIMM1	262-pin DIMM slot 1	If there is only one memory module being installed in the system, install it on this slot first.
DIMM2	262-pin DIMM slot 2	
SLOT1	PCI express x16 slot	
M2_E1	2230 M.2 slot E Key	
M2_M1	2280 & 2242 M.2 Slot M Key	
AUDIO1	1 x Audio Dual Jack (Line-Out, Mic)	
Conn2	1 x 2.5GbE RJ45 + Dual USB 3.2 Gen1 Stacked Connector	
Conn1	1 x GbE RJ45 + Dual USB 3.2 Gen1 Stacked Connector	
DIMM1	262-pin DIMM slot 1	If there is only one memory module being installed in the system, install it on this slot first.
DIMM2	262-pin DIMM slot 2	
SLOT1	PCI express x16 slot	

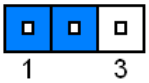
M2_E1	2230 M.2 slot E Key	
M2_M1	2280 & 2242 M.2 Slot M Key	
AUDIO1	1 x Audio Dual Jack (Line-Out, Mic)	
Conn2	1 x 2.5GbE RJ45 + Dual USB 3.2 Gen1 Stacked Connector	
Conn1	1 x GbE RJ45 + Dual USB 3.2 Gen1 Stacked Connector	
USB1	1 x Stack up USB 2.0 Connectors	
JSPI1	JSPI1 Connector	4 x 2 header, pitch 2.00mm
JESPI1	JESPI Connector	5 x 2 header, pitch 2.00mm
HDMI1	1 x HDMI Connector	
DP1	1 x Stack up dual DisplayPort Connector	
JCOM1	1 x Stack up dual COMs Connector	

2.5 EMX-TGLC-B1 Jumpers & Connectors settings

2.5.1 Clear CMOS (JCMOS1)



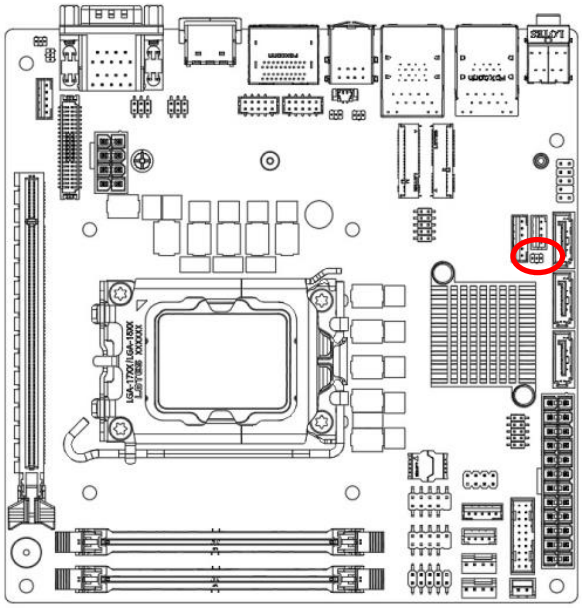
Normal *



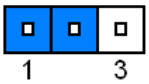
Clear CMOS

*** Default**

2.5.2 Enable/disable the Intel ME F/W (JME_DIS1)



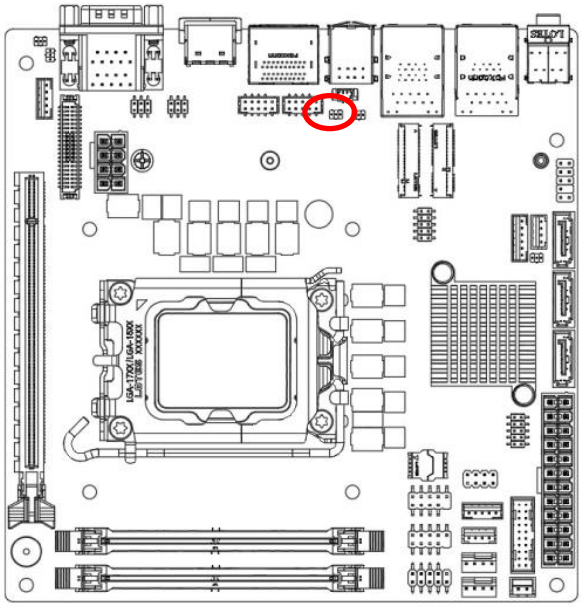
Enable*



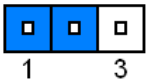
Disable

*** Default**

2.5.3 AT/ATX Power Select (JATX1)



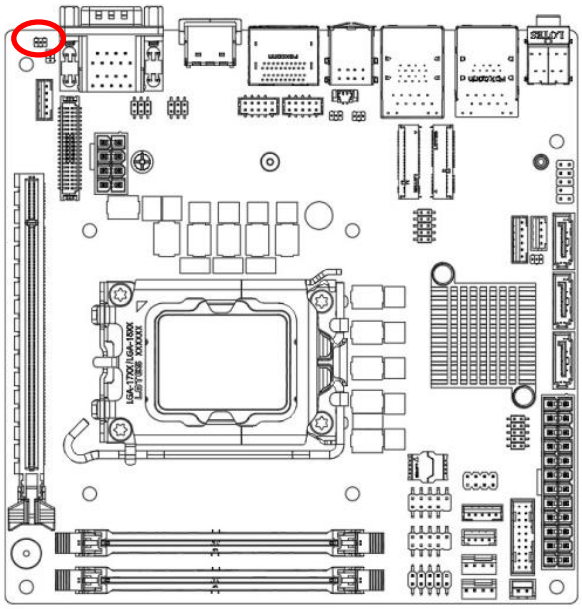
ATX*



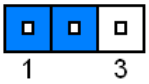
AT

*** Default**

2.5.4 LVDS Backlight Control Select (JLVDS_BKL1)



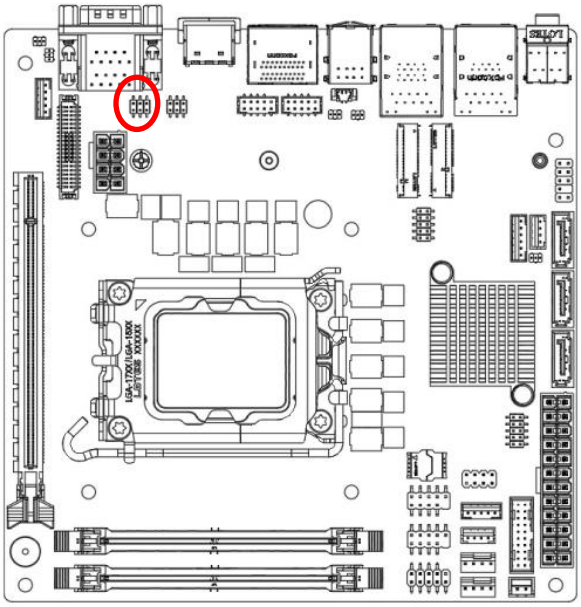
From PCH*



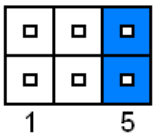
From ADI_AD5258BRMZ10 IC

*** Default**

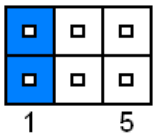
2.5.5 COM1/2 RI/+5V/+12V Select (JCOMP1_2)



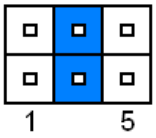
RI*



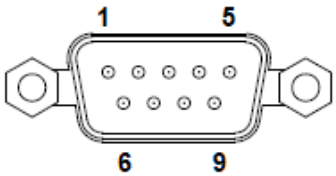
+5V



+12V

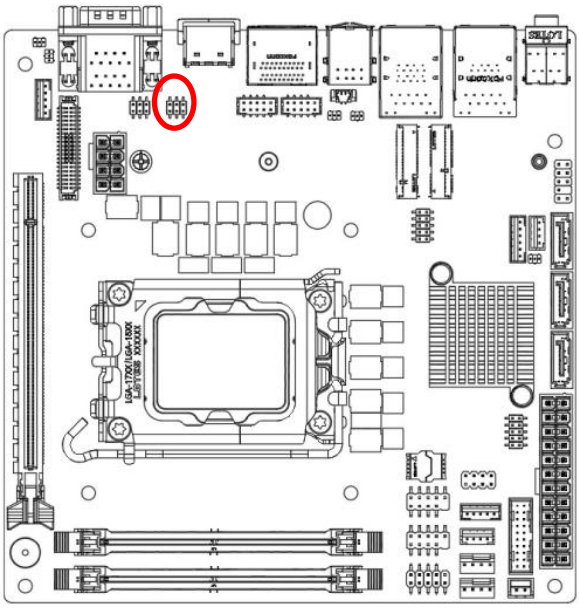


*** Default**

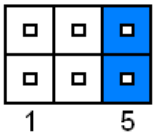


PIN	RS232	RS422	RS485
1	DCD	TXD -	DATA-
2	RXD	RXD +	
3	TXD	TXD +	DATA+
4	DTR	RXD -	
5	GND	GND	GND
6	DSR		
7	RTS		
8	CTS		
9	Ring in or 5V/12V out	5V/12V out	5V/12V out

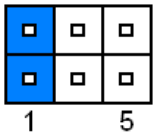
2.5.6 COM3/4 RI/+5V/+12V Select (JCOMP3_4)



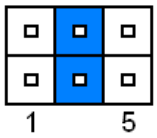
RI*



+5V

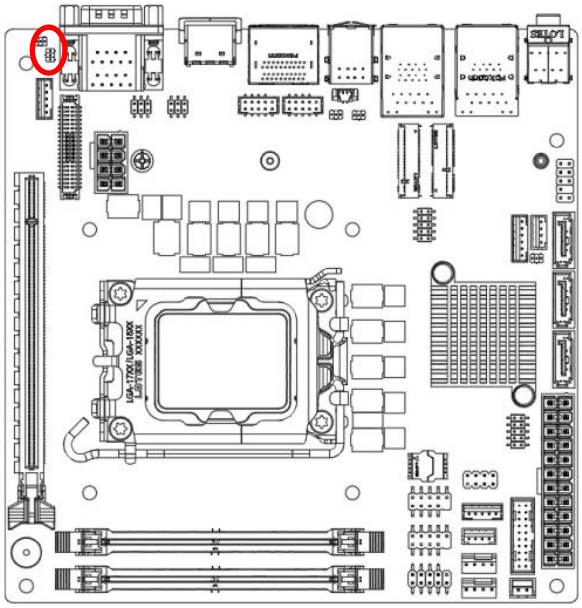


+12V

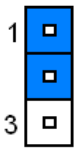


*** Default**

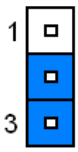
2.5.7 LVDS Backlight Power 3V/5V Select (JBKLVOL1)



+5V

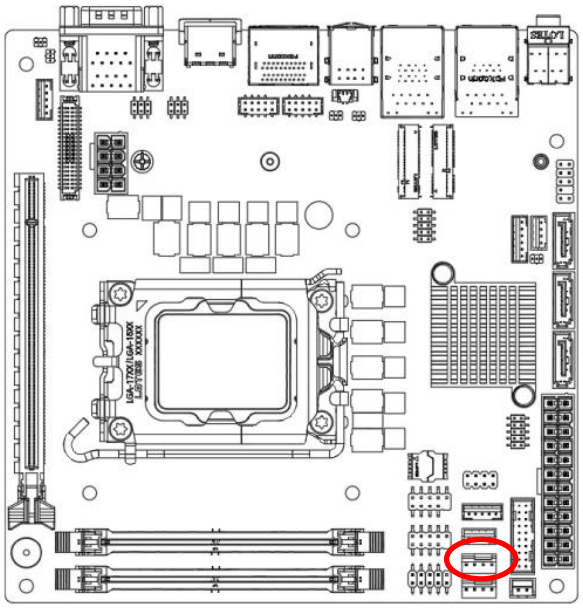


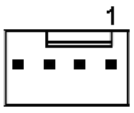
+3V*



*** Default**

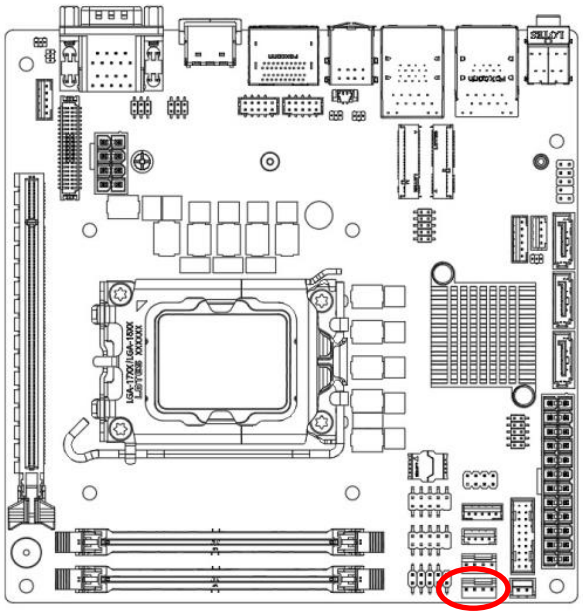
2.5.8 CPU fan connector (CPUFAN1)

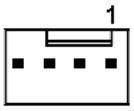




PIN	Signal
1	GND
2	+12V
3	FAN_SENSE
4	FAN_PWN

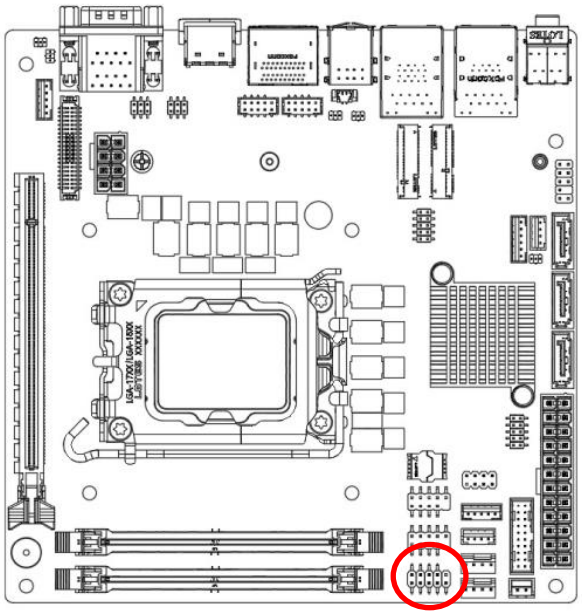
2.5.9 System fan connector (SYSFAN1)

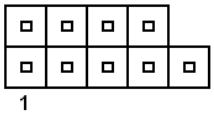




PIN	Signal
1	GND
2	+12V
3	FAN_SENSE
4	FAN_PWN

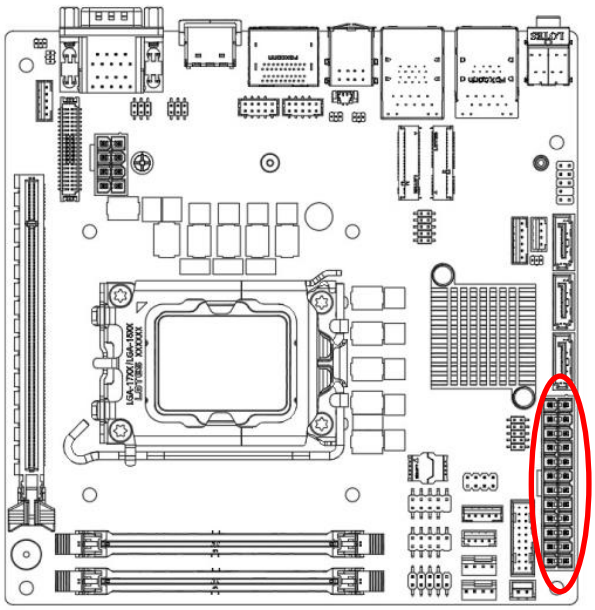
2.5.10 System Panel Connector (JFP1)

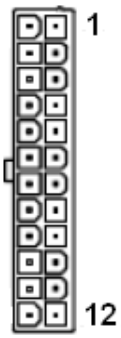




Signal	PIN	PIN	Signal
		9	Reserved
GND	8	7	Reset Switch+
Power Button+	6	5	GND
Suspend LED+	4	3	HDD LED-
Power LED+	2	1	HHD LED+

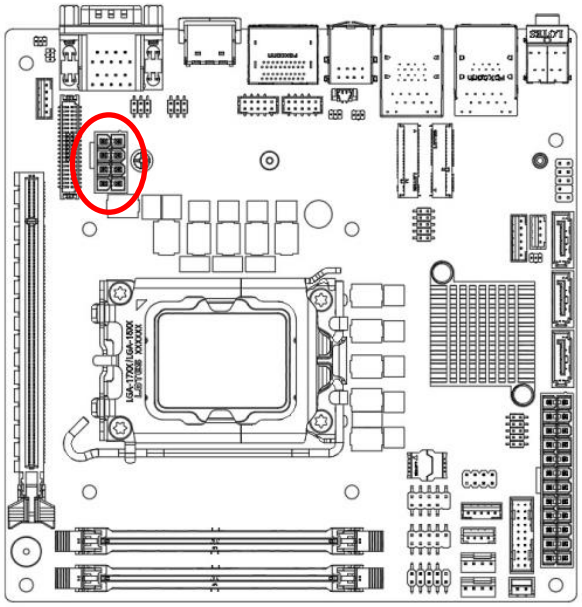
2.5.11 ATX-Power Connector (JPWR1)

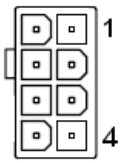




Signal	PIN	PIN	Signal
+3.3V	13	1	+3.3V
-12V	14	2	+3.3V
GND	15	3	GND
PS-ON#	16	4	+5V
GND	17	5	GND
GND	18	6	+5V
GND	19	7	GND
NC	20	8	PWR OK
+5V	21	9	5VSB
+5V	22	10	+12V
+5V	23	11	+12V
GND	24	12	+3.3V

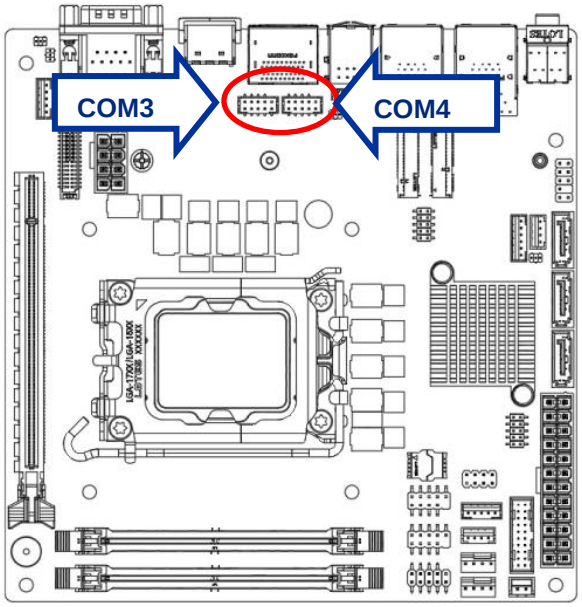
2.5.12 12V ATX-Power Connector (JPWR2)

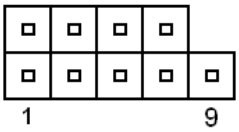




Signal	PIN	PIN	Signal
+12V	5	1	GND
+12V	6	2	GND
+12V	7	3	GND
+12V	8	4	GND

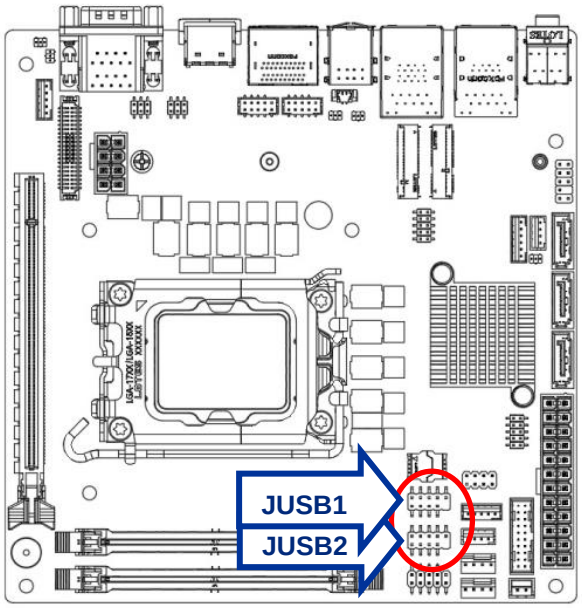
2.5.13 Serial Port connectors (JCOM3/4)

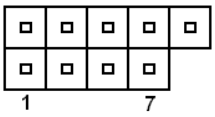




Signal	PIN	PIN	Signal
DCD	1	2	SIN
SOUT	3	4	DTR
GND	5	6	DSR
RTS	7	8	CTS
RI/+5V/+12V	9		

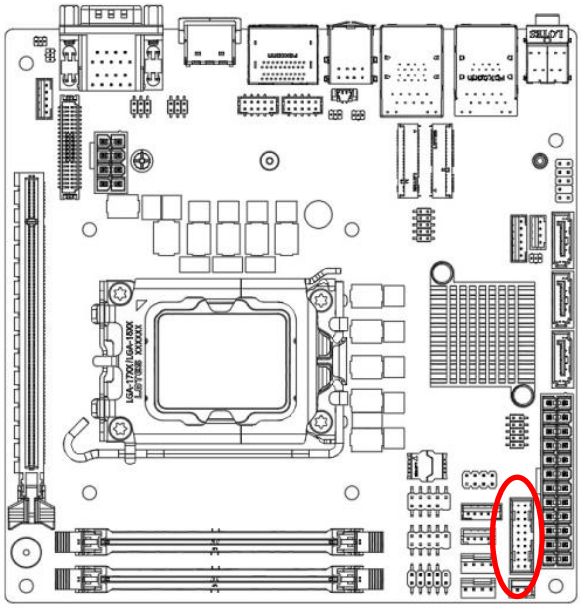
2.5.14 USB 2.0 Connector (JUSB1/2)

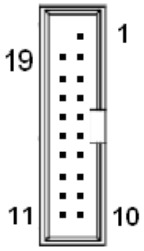




Signal	PIN	PIN	Signal
+5V	1	2	+5V
USB0-	3	4	USB1-
USB0+	5	6	USB1+
GND	7	8	GND
		10	NC

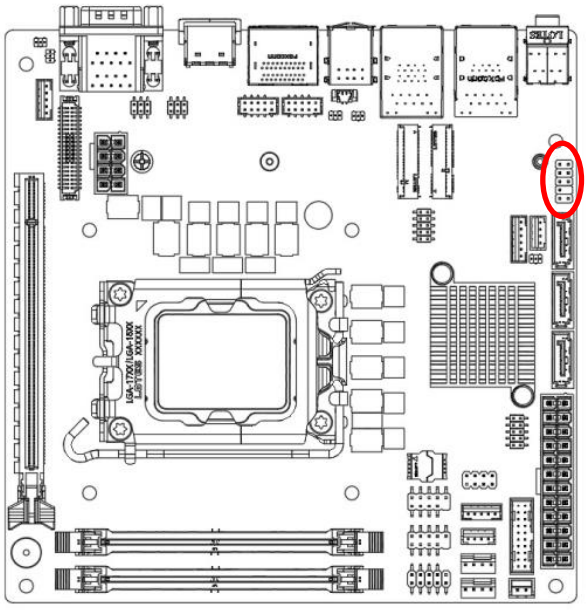
2.5.15 USB 3.2 Gen 1 Connector (USB3)

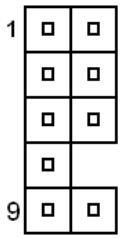




Signal	PIN	PIN	Signal
		1	+5V
+5V	19	2	USB3.0_RX-
USB3.0_RX-	18	3	USB3.0_RX+
USB3.0_RX+	17	4	GND
GND	16	5	USB3.0_TX-
USB3.0_TX-	15	6	USB3.0_TX+
USB3.0_TX+	14	7	GND
GND	13	8	USB_D-
USB_D-	12	9	USB_D+
USB_D+	11	10	NC

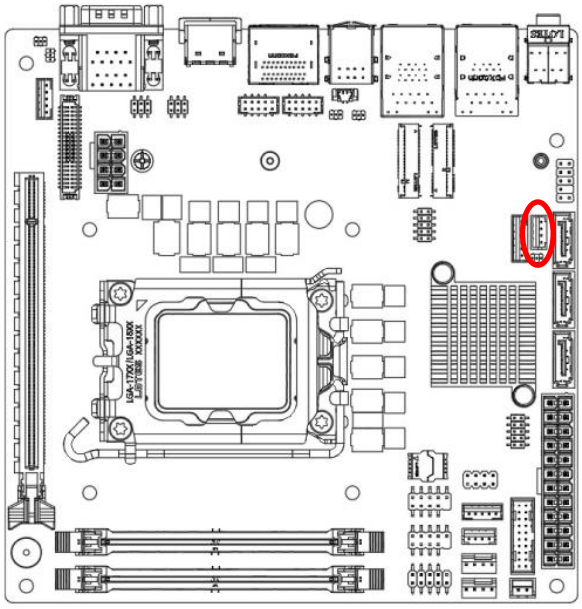
2.5.16 Front Panel Audio Connector (JAUD1)





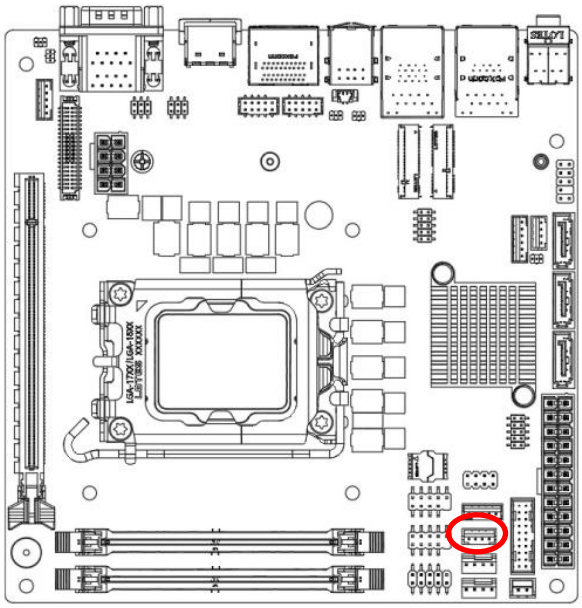
Signal	PIN	PIN	Signal
MIC_L	1	2	GND
MIC_R	3	4	Front Panel Audio Detection
Head Phone_R	5	6	MIC Detection
Sense_Send	7		
Head Phone_L	9	10	Head Phone Detection

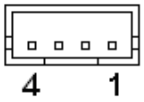
2.5.17 Amplifier connector (JAMP1)



Signal	PIN
AMP_ R-	1
AMP_ R+	2
AMP_ L-	3
AMP_ L+	4

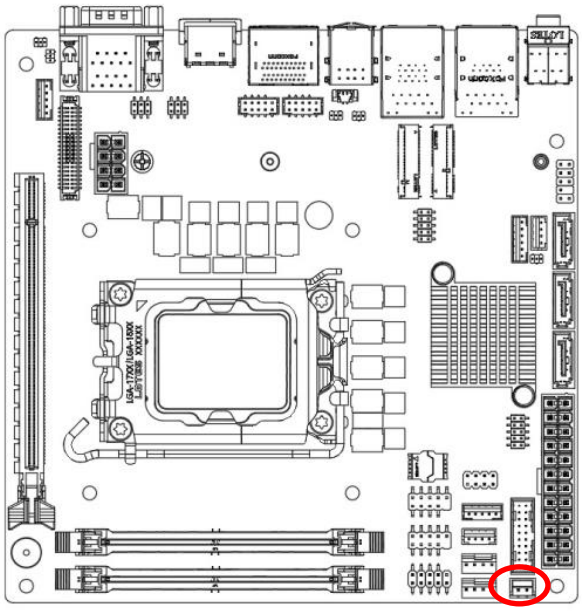
2.5.18 I2C connector (JI2C1)





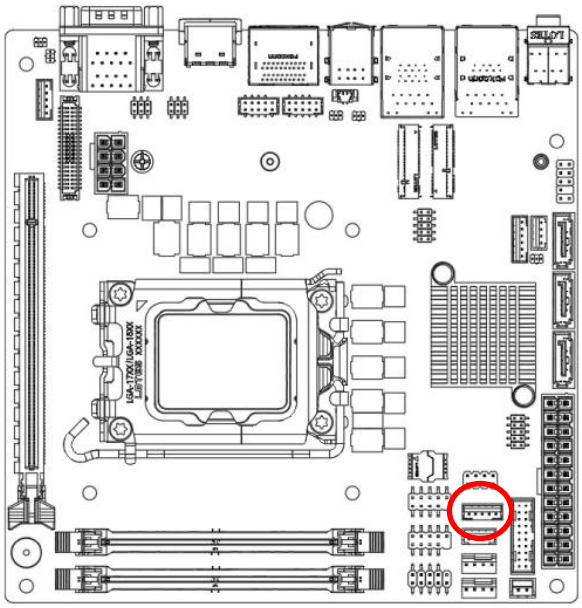
PIN	Signal
1	3.3V
2	CLK
3	DATA
4	GND

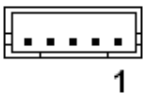
2.5.19 Chassis Intrusion Connector (JCASE5)



PIN	Signal
2	GND
1	SIO_CASEOPEN#

2.5.20 SMBus connector (JSMB1)

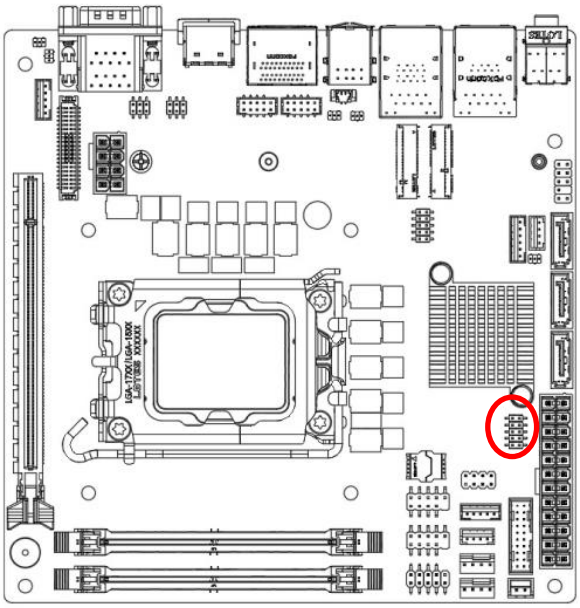


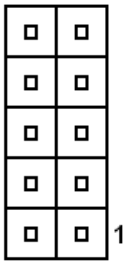


Signal	PIN
3.3V	5
GND	4
SMBALERT#	3
SMBDATA	2
SMBCLK	1

Note: The connector is for the RD to update the Power IC firmware only

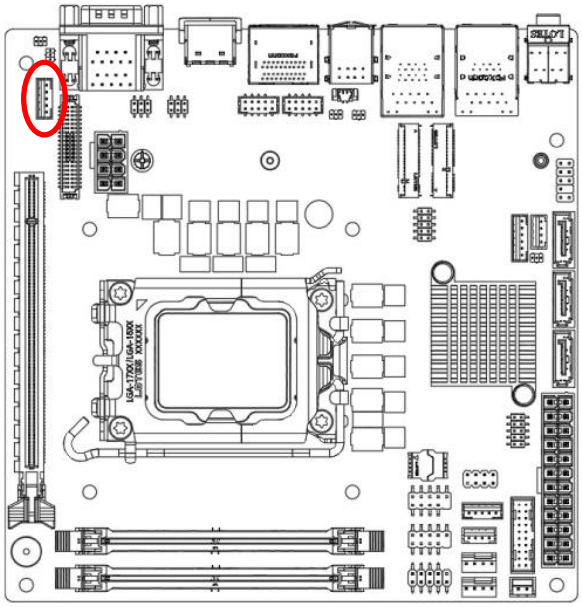
2.5.21 Digital I/O header connector (JGPIO1)

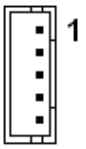




Signal	PIN	PIN	Signal
N_GPO3	10	9	N_GPI3
N_GPO2	8	7	N_GPI2
N_GPO1	6	5	N_GPI1
N_GPO0	4	3	N_GPI0
3.3V	2	1	GND

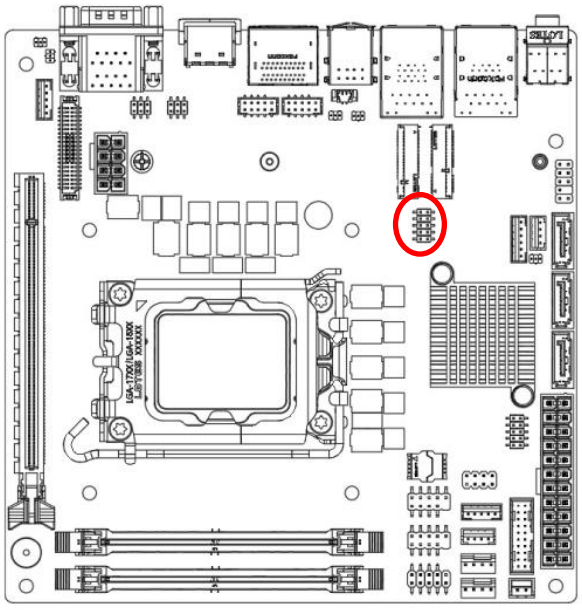
2.5.22 LVDS Inverter Connector (JINV1)

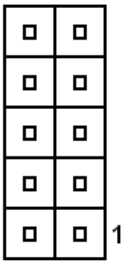




Signal	PIN
+12V	1
GND	2
Enable	3
Brightness control	4
+5V	5

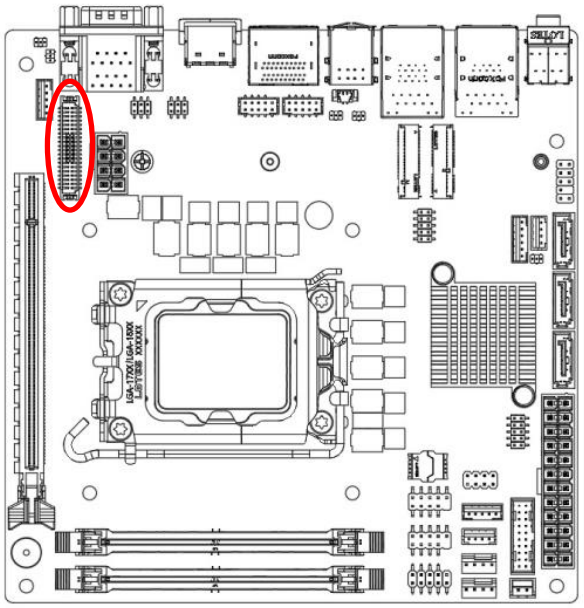
2.5.23 JESPI connector (JESPI1)





Signal	PIN	PIN	Signal
GND	10	9	ESPI_HDR_ALERT0
ESPI_CLK_HDR_C	8	7	ESPI_IO3_HDR_C
ESPI_CS0_N	6	5	ESPI_IO2_HDR_C
ESPI_HDR_RESET#	4	3	ESPI_IO1_HDR_C
VCC3	2	1	ESPI_IO0_HDR_C

2.5.24 LVDS connector (JLVDS1)

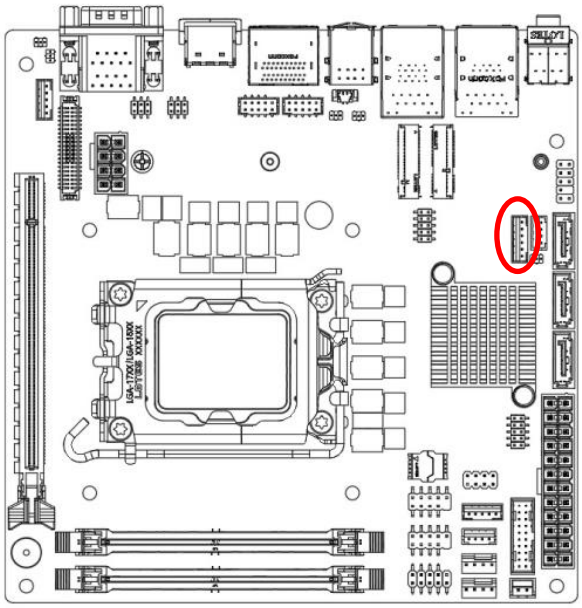


Signal	PIN	PIN	Signal
+12V	39	40	+12V
GND	37	38	GND
LVDSB_CLK#	35	36	LVDSA_CLK#
LVDSB_CLK	33	34	LVDSA_CLK
GND	31	32	GND
LVDSB_DATA#3	29	30	LVDSB_DATA#2
LVDSB_DATA3	27	28	LVDSB_DATA2
GND	25	26	GND
LVDSB_DATA#1	23	24	LVDSB_DATA#0
LVDSB_DATA1	21	22	LVDSB_DATA0
GND	19	20	GND
LVDSA_DATA#3	17	18	LVDSA_DATA#2
LVDSA_DATA3	15	16	LVDSA_DATA2
GND	13	14	GND
LVDSA_DATA#1	11	12	LVDSA_DATA#0
LVDSA_DATA1	9	10	LVDSA_DATA0
GND	7	8	GND
DDC_CLK	5	6	DDC_DATA
+3.3V_LVDS	3	4	+5V_LVDS
+3.3V_LVDS	1	2	+5V_LVDS

Some notes on LVDS:

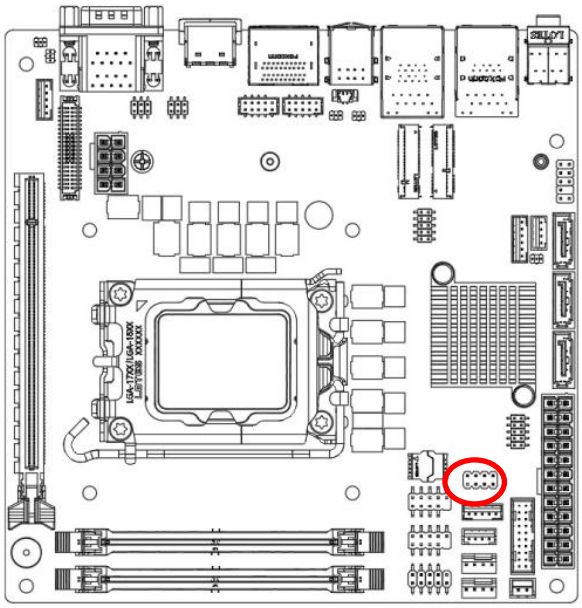
- LVDS was disabled by default
- Default resolution: 1024x768 18/1
- Default PWM Voltage: 3V (5V By jumper selection)
- JLVDS_BK1:
  *short 1-2 Brightness bar is workable under Win10 OS
  *short 2-3 Backlight is controlled by ADI_AD5258BRMZ10 IC via API

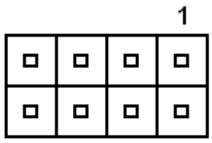
2.5.25 PS/2 KB&MS Connector (JKBMS1)



Signal	PIN
KB_CLK	1
KB_DAT	2
MS_CLK	3
GND	4
+5V	5
MS_DAT	6

2.5.26 JSPI header connector (JSPI1)





Signal	PIN	PIN	Signal
+VCCSPI	1	2	GND
SPI_CS0_HDR	3	4	SPI_CLK_HDR
SPI_MISO_HDR	5	6	SPI_MOSI_HDR
SPI_HOLD#_HDR	7		

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 flat bezel panel PC, please follow the precautions listed below:

- Power turned off: When installing the flat bezel panel 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 panel of the flat bezel panel PC, to configure the jumpers or plug in added peripheral devices, ground themselves first and wear an anti-static wristband.

3.1 System Mounting

Warning! *More than one person should participate in mounting the panel PC to prevent accidental damage to the panel or 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.

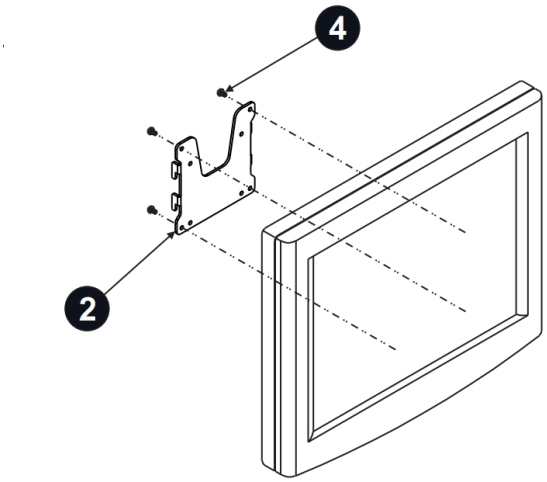
The panel PC supports various mounting options, as listed below.

- Wall mounting (ACC-RITYVESA-B075R, Demonstration only)
- Arm/ Stand mounting (ACC-ARM-D41R, Demonstration only)
- Panel mounting (Mounting kit in the package)
- VESA mounting (Screws in the package)

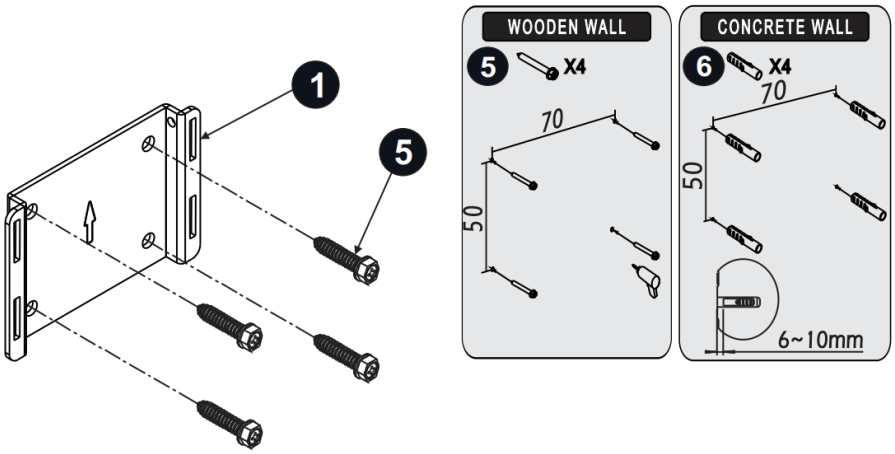
3.1.1 Wall Mounting

To mount the panel PC onto wall, follow the instruction below (see Figure for addition reference).

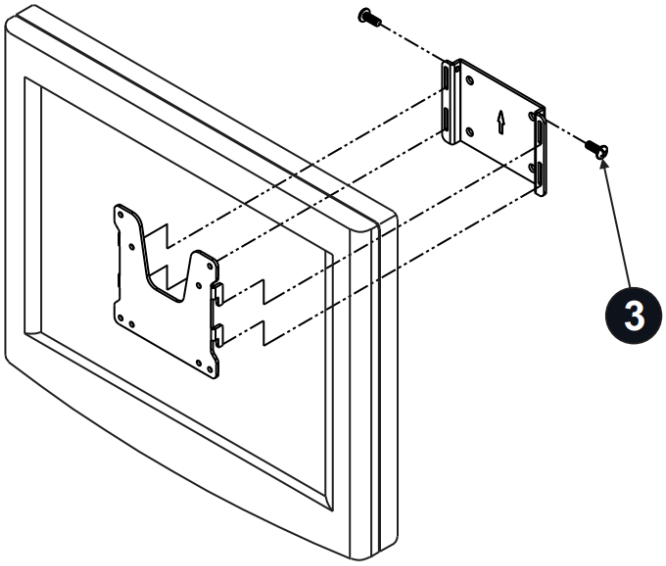
1. Insert four M4 screws into the VESA holes on the panel PC and tighten them to secure the bracket to the rear panel, ensure that the thread depth of the screws on the rear panel does not exceed 4mm.



2. Select the location on the wall for the wall mount plate, secure the mount plate to the wall by inserting four M5 screws into pilot holes and tightening them.



3. To mount the panel PC on the wall, align the wall mount bracket attached to the panel PC with the wall mount plate on the wall and slide the panel PC downwards to hang the bracket on the mount plate. Secure the panel PC in place by tightening screws in the wall mount bracket.



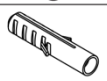
MAIN PARTS

ITEM	❶	❷	❸
PARTS			 M5X15
QTY	1	1	2

PARTS FOR TV BRACKETS

ITEM	❹
PARTS	
QTY	4

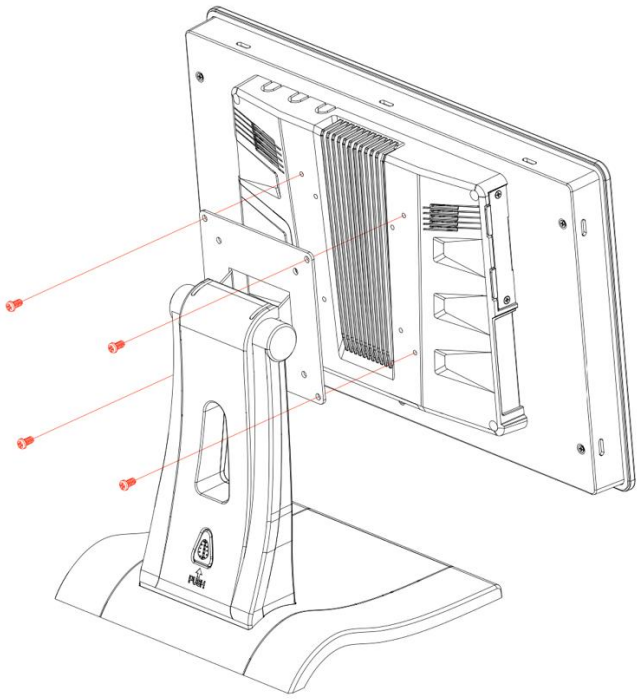
PARTS FOR WALL BRACKETS

ITEM	❺	❻
PARTS		
QTY	4	4

3.1.2 Arm/ Stand Mounting

This Panel PC can be mounted on a VESA-compliant arm mount with a 100mm interface pad. To affix the panel PC to an arm mount, follow the steps below.

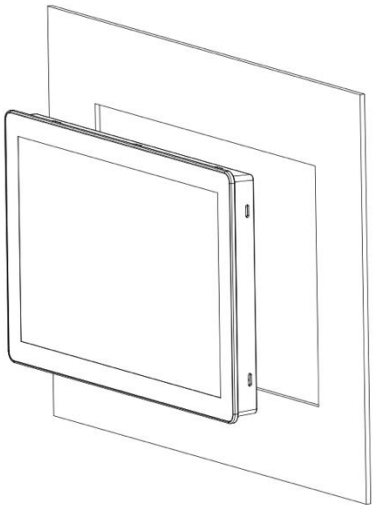
1. Refer to the installation instruction of mounting arm/ stand to correctly assembly the arm/ stand onto the surface as a base.
2. Align the retention screw holes on the mounting arm interface with VESA holes in the panel PC and secure the panel PC with four M4 retention screws. Ensure that the thread depth of the screws on the rear panel does not exceed 4mm.



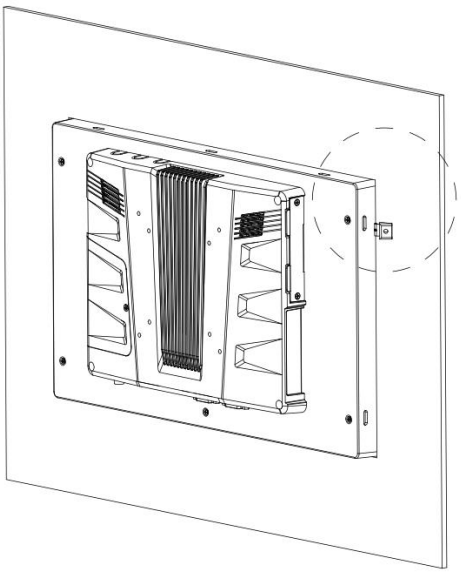
3.1.3 Panel Mounting

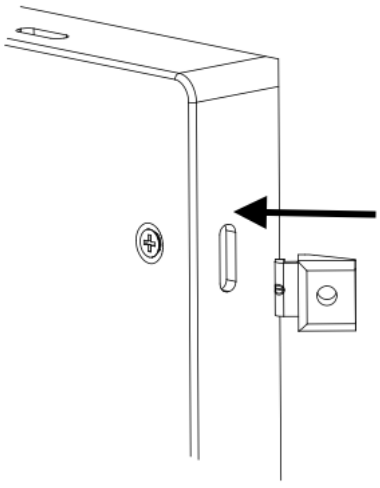
To mount the flat bezel panel PC into a panel, follow the steps below.

1. Prepare a panel cutout according to the panel PC dimensions. For the panel cutout dimension, please refer to “System Dimensions” section in this manual.

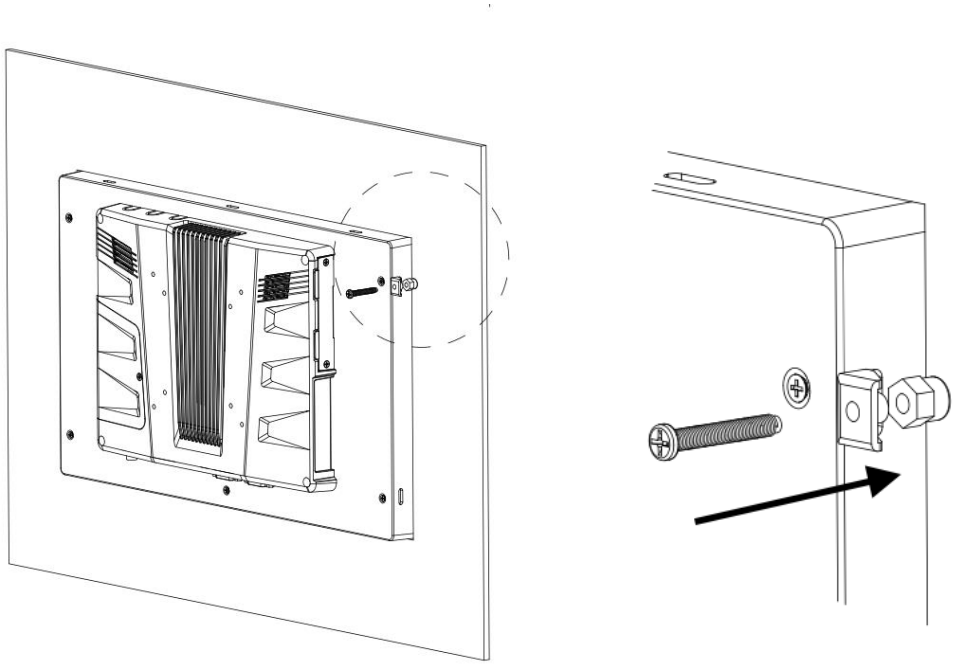


2. Install the panel PC in the cabinet and retrieve hook brackets from the accessory box.

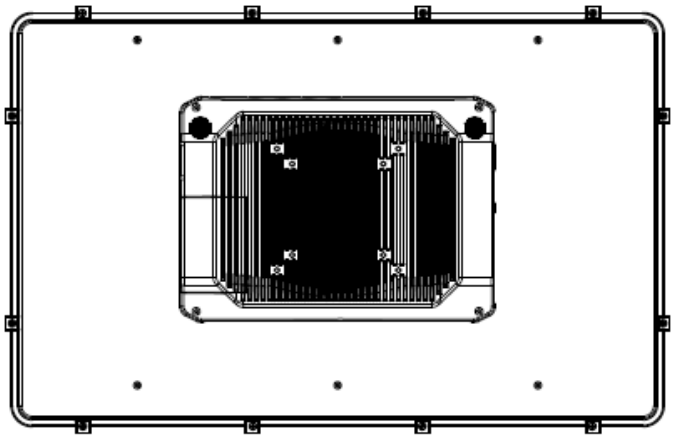




3. Insert the hook brackets into the holes following the direction of the arrows shown in below figure and hang the panel PC.

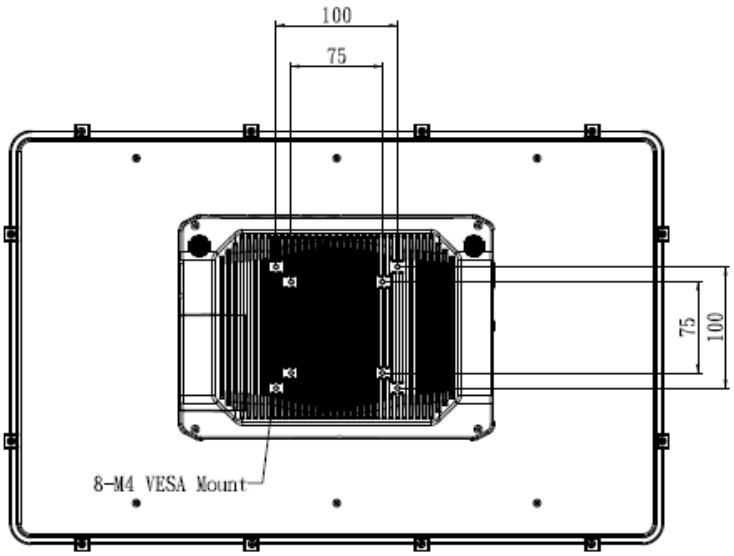


4. Tighten the screws to affix the panel PC in place, fasten all the hook bracket to ensure panel PC well fix at cabinet.



3.1.4 VESA Mounting

The following picture indicates VESA mounting hole pattern (75x75 / 100x100 mm) on this Panel PC. VESA mount is a widely used mounting solution suitable for all kinds of industrial applications.



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.

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 the F1 key again.

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.

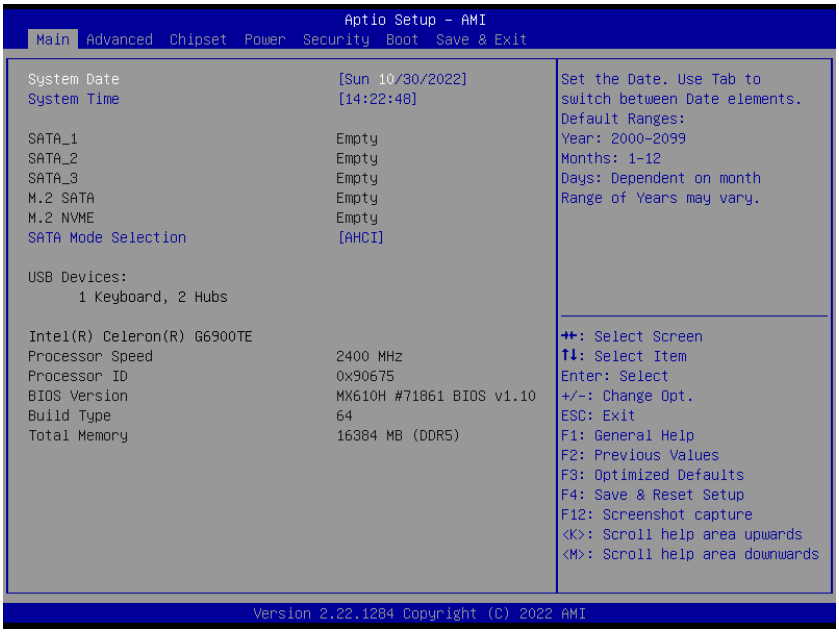
The best advice is to only alter settings which you thoroughly understand. To this end, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both BIOS Vendor and your systems manufacturer to provide the absolute maximum performance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

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

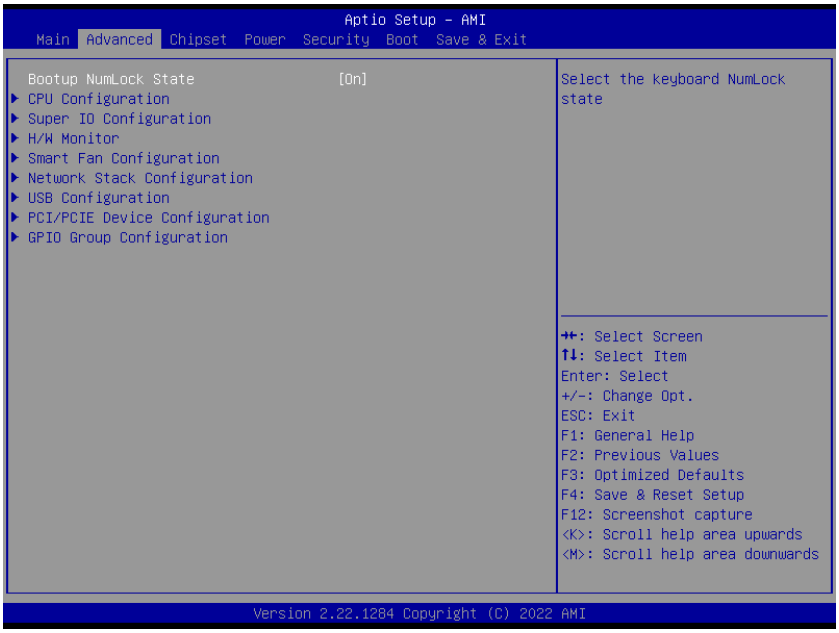
5.6.1.2 System Time

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.

5.6.2 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.



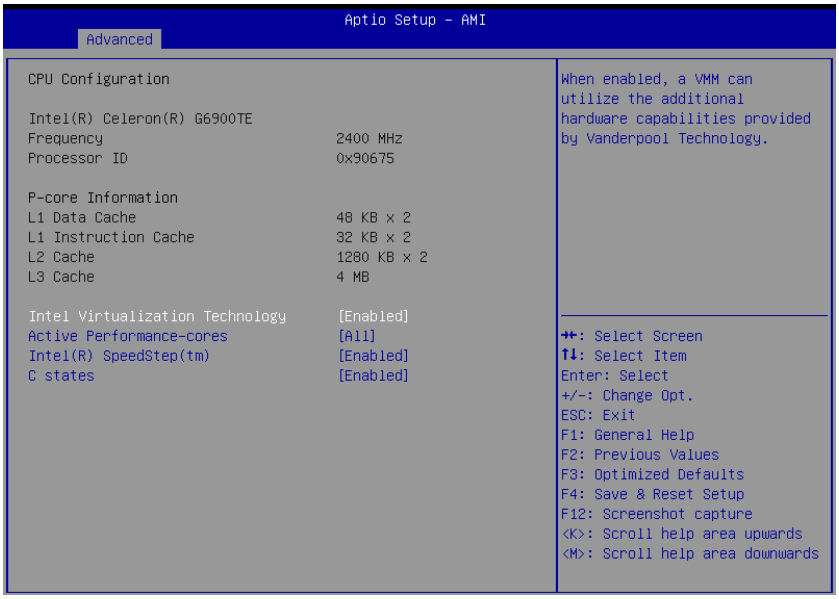
- **Bootup NumLock State**

  This setting is to set the Num Lock status when the system is powered on.

  [On] Turn on the Num Lock key when the system is powered on.

  [Off] Allow users to use the arrow keys on the numeric keypad.

5.6.2.1 CPU Configuration



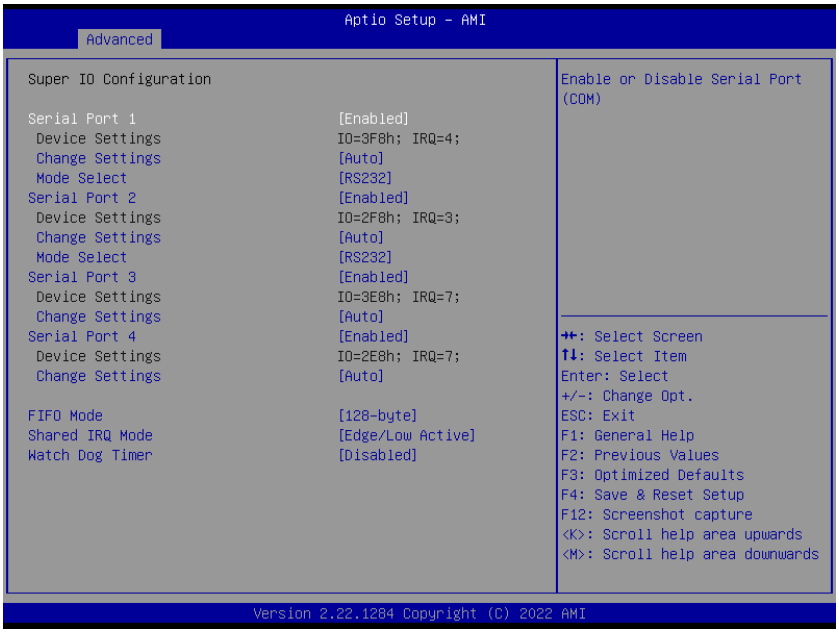
- **Intel(VMX)Virtualization[Enabled]**
  Virtualization enhanced by Intel Virtualization Technology will allow a platform to run multiple operating systems and applications in independent partitions. With Virtualization, one computer system can function as multiple “virtual” systems.

- **Active Processor Cores**
  This setting specifies the number of active processor cores.

- **Intel(R) SpeedStep(TM)**
  EIST (Enhanced Intel SpeedStep Technology) allows the system to dynamically adjust processor voltage and core frequency, which can result in decreased average power consumption and decreased average heat production.

- **C States**
  This setting controls the C-States (CPU Power states).
  [Enabled] Detects the idle state of system and reduce CPU power consumption accordingly.
  [Disabled] Disables this function.

5.6.2.2 Supoer IO Configuration



- **Serial Port 1/ 2/ 3/ 4**
  This setting enables/disables the specified serial port.

- **Change Settings**
  This setting is used to change the address & IRQ settings of the specified serial port.

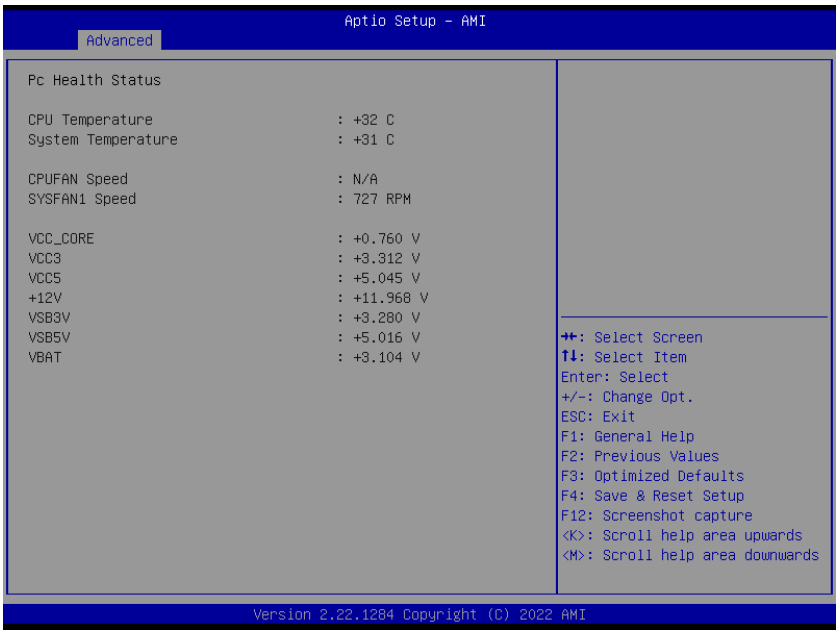
- **FIFO Mode**
  This setting controls the FIFO (First In First Out) data transfer mode.

- **Shared IRQ Mode**
  This setting provides the system with the ability to share interrupts among its serial ports.

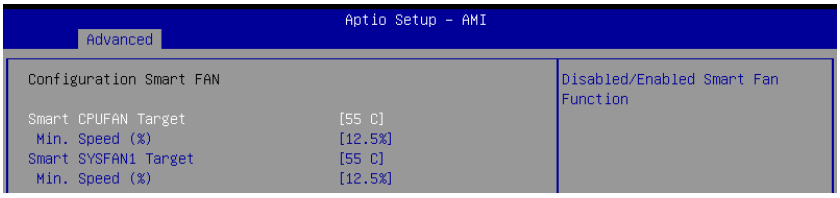
- **Watch Dog Timer**
  You can enable the system watchdog timer, a hardware timer that generates a reset when the software that it monitors does not respond as expected each time the watchdog polls it.

5.6.2.3 H/W Monitor (PC Health Status)

These items display the current status of all monitored hardware devices/components such as voltages, temperatures and all fans' speeds.



5.6.2.4 Smart Fan Configuration

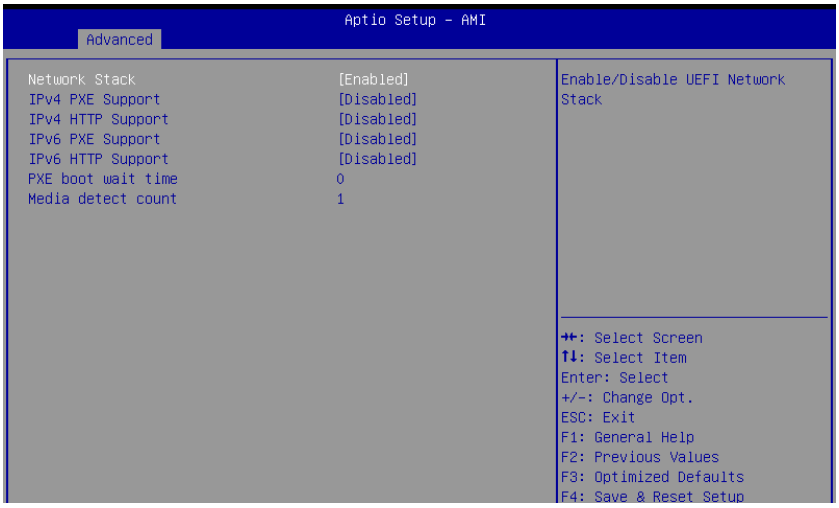


- **Smart CPUFAN/ SYSFAN Target**

  This setting enables/ disables the Smart Fan function. Smart Fan is an excellent feature which will adjust the system fan speed automatically depending on the current system temperature, avoiding the situation of the system overheating.

5.6.2.5 Network Stack Configuration

This menu provides Network Stack settings for users to enable network boot (PXE) from BIOS.



- **Network Stack**
  This menu provides Network Stack settings for users to enable network boot (PXE) from BIOS. The following items will display when **Network Stack** is enabled.

- **IPv4 PXE Support**
  Enables or disables IPv4 HTTP support.

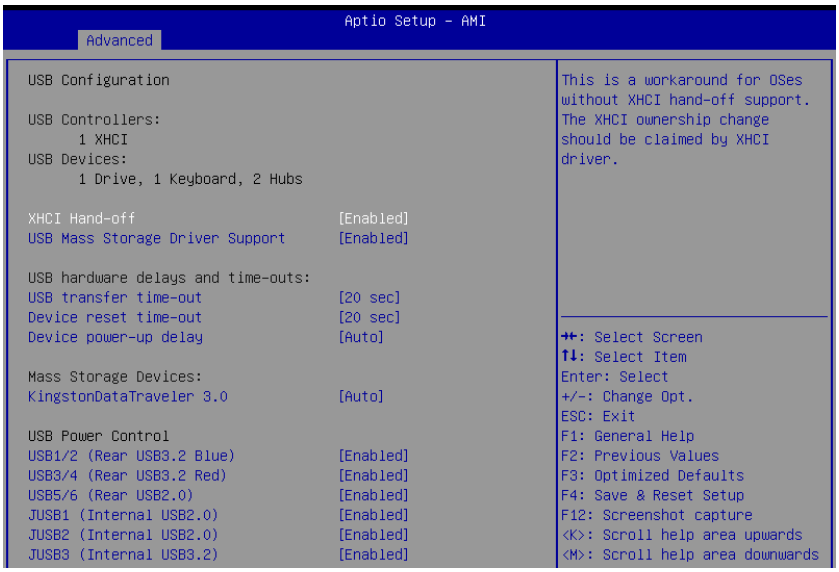
- **IPv6 PXE Support**
  Enables or disables IPv6 PXE boot support

- **IPv6 HTTP Support**
  Enables or disables IPv6 HTTP support

- **PXE boot wait time**
  This option specifies the wait time to press the ESC key for aborting the PXE boot. Press “+” or “-” on your keyboard to change the value. The default setting is 0.

- **Media detect count**
  This option specifies the number of times media will be checked. Press “+” or “-” on your keyboard to change the value. The default setting is 1.

5.6.2.6 USB Configuration



- **XHCI Hand-off**
  This setting controls the XHCI (eXtensible Host Controller Interface) Hand-off.
  [Enabled] On-board USB 3.2 ports functions like a regular 3.2 port.
  [Disabled] On-board USB 3.2 ports functions like a 2.0 port.

- **USB Mass Storage Driver Support**
  A USB mass storage driver setting enables/disables the ability to communicate with external drives and other removable devices connected through the USB port, such as external HDDs/SSDs and flash drives.

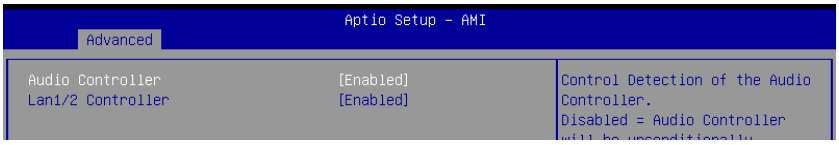
- **USB transfer time-out**
  Set the USB core's wait time for Control, Bulk, and Interrupt transfers.

- **Device reset time-out**
  Set the amount of time that the POST (Power On Self Test) will wait for the USB mass storage device to be detected.

- **Device power-up delay**
  Set the maximum time that a USB device will wait before reporting itself to the host controller.

- **USB Power Control**
  This setting enables/disables USB Ports.

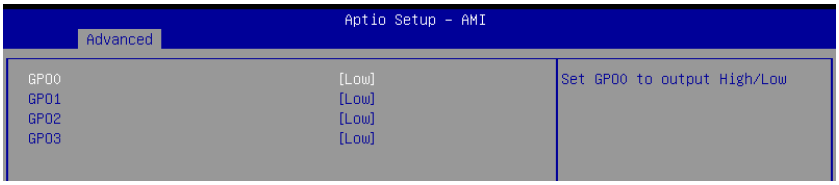
5.6.2.7 PCI/ PCIE Device Configuration



- **Audio Controller**
  This setting enables/disables the onboard audio controller

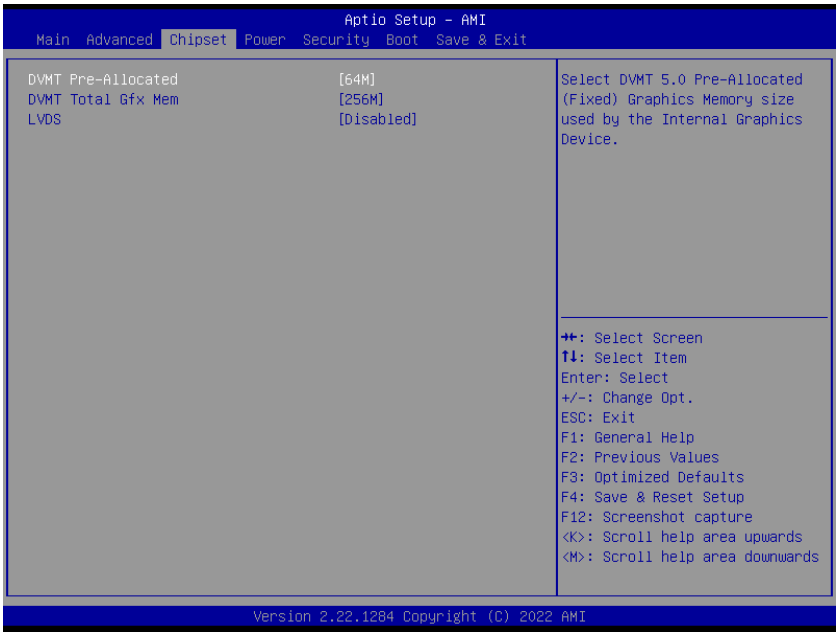
- **Lan1/ 2 Controller**
  This setting enables/disables the onboard LAN 1/2 controllers.

5.6.2.8 GPIO Group Configuration



- **GPO0 ~ GPO3**
  These settings control the operation mode of the specified GPIO.

5.6.3 Chipset



- **DVMT Pre-Allocated**
  This setting specifies the pre-allocated graphics memory size for DVMT (Dynamic

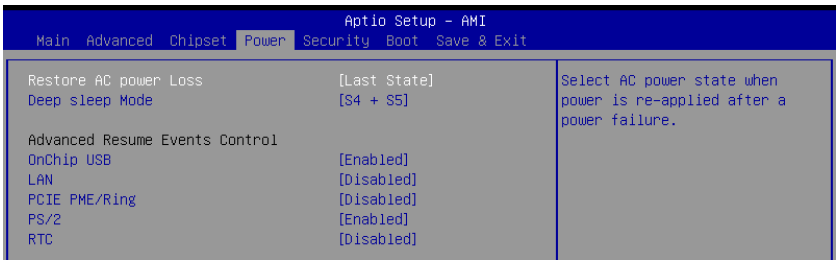
Video Memory Technology).

- **DVMT Total Gfx Mem**
  This setting specifies the total graphics memory size for DVMT.

- **LVDS**
  This setting enables/disables LVDS.

- **LCD Panel Type**
  This setting specifies the LCD Panel's resolution and distribution formats. The item will display when **LVDS is enabled**.

5.6.4 Power



- **Restore AC Power Loss**
  This setting specifies whether your system will reboot after a power failure or interrupt occurs. Available settings are:
  [Power Off] Leaves the computer in the power off state.
  [Power On] Leaves the computer in the power on state.
  [Last State] Restores the system to the previous status before power failure or interrupt occurred.

- **Deep Sleep Mode**
  The setting enables/disables the Deep S5 power saving mode. S5 is almost the same as G3 Mechanical Off, except that the PSU still supplies minimum power to the power button to allow returning to S0. A full reboot is required. No previous memory content is retained. Other components may remain powered so the computer can "wake" on input from the keyboard, clock, modem, LAN, or USB device.

- **OnChip USB**
  The item allows the activity of the OnChip USB device to wake up the system from S4/ S5 sleep state.

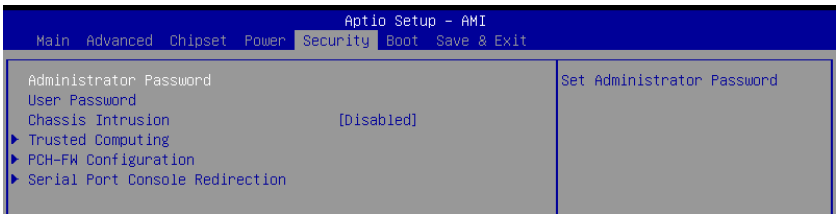
- **LAN**
  Enables or disables the system to be awakened from the power saving modes when activity or input signal of Intel LAN device is detected.

- **PCIE PME/Ring**
  Enables or disables the system to be awakened from power saving modes when activity or input signal of onboard PCIE PME/Ring is detected.

- **PS/2**
  Enables or disables the system wake up by PS/2 devices, such as keyboard or mouse.

- **RTC**
  When [Enabled], you can set the date and time at which the RTC (real-time clock) alarm awakens the system from suspend mode.

5.6.5 Security

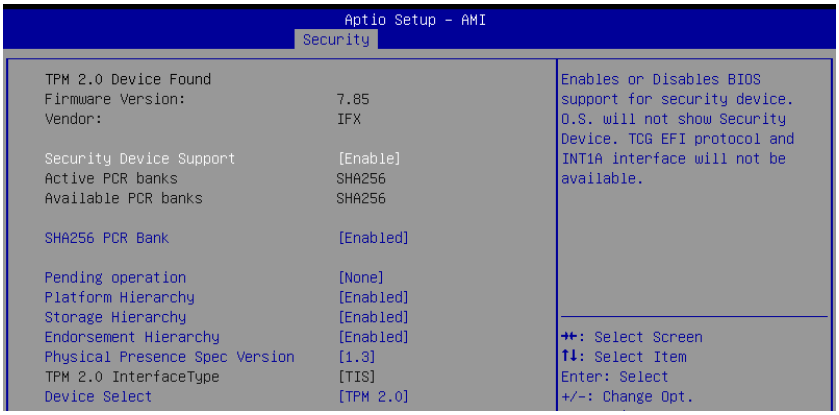


- **Administrator Password**
  Administrator Password controls access to the BIOS Setup utility.

- **User Password**
  User Password controls access to the system at boot and to the BIOS Setup utility.

- **Chassis Intrusion**
  Detects whether the chassis has been opened when used with the Chassis Intrusion header.

5.6.5.1 Trusted Computing



- **Security Device Support**
  This setting enables/disables BIOS support for security device. When set to [Disable], the OS will not show security device. TCG EFI protocol and INT1A interface will not be available.

- **SHA256 PCR Bank**
  These settings enable/disable the SHA-1 PCR Bank and SHA256 PCR Bank.

- **Pending Operation**
  When **Security Device Support** is set to [Enable], **Pending Operation** will appear. Set this item to [TPM Clear] to clear all data secured by TPM or [None] to discard the selection. It is advised that users should routinely back up their TPM secured data.

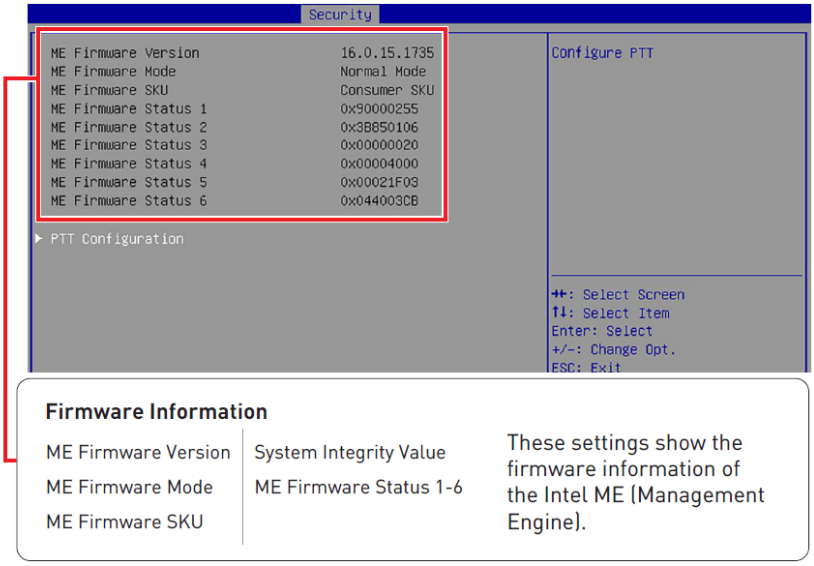
- **Platform Hierarchy, Storage Hierarchy, Endorsement Hierarchy**
  These settings enable/disable the Platform Hierarchy, Storage Hierarchy and Endorsement Hierarchy.

- **Physical Presence Spec Version**
  This settings show the Physical Presence Spec Version.

- **TPM 2.0 Interface Type**
  This setting shows the TPM 2.0 Interface Type.

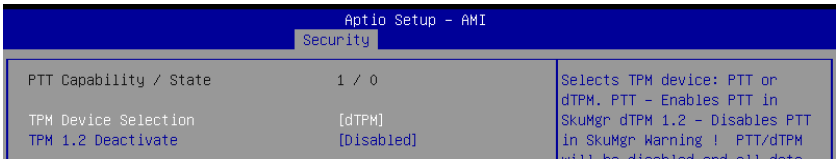
- **Device Select**
  Select your TPM device through this setting.

5.6.5.2 PCH-FW Configuration



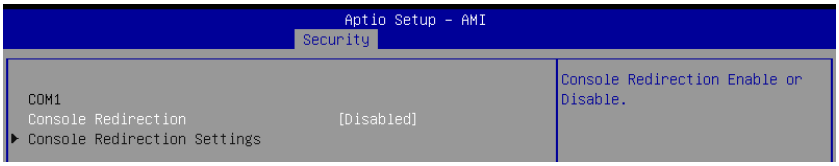
5.6.5.2.1 PTT Configuration

Intel Platform Trust Technology (PTT) is a platform functionality for credential storage and key management used by Microsoft Windows.



- **TPM Device Selection**
  Select TPM (Trusted Platform Module) devices from PTT or dTPM (Discrete TPM).
  [PTT] Enables PTT in SkuMgr.
  [dTPM] Disables PTT in SkuMgr. **Warning! PTT/ dTPM will be disabled and all data saved on it will be lost.**

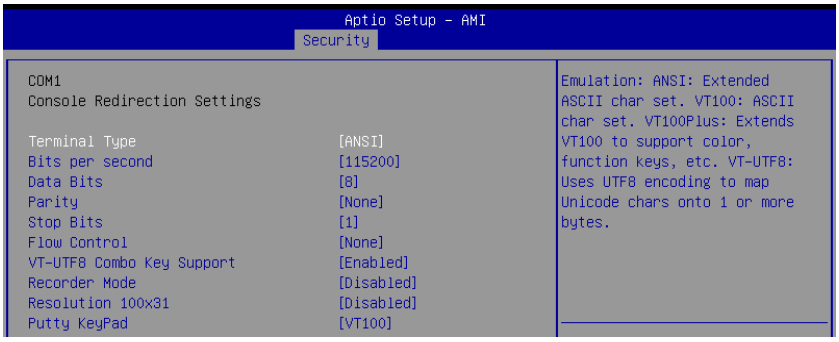
5.6.5.3 Serial Port Console Redirection



- **Console Redirection**
  Console Redirection operates in host systems that do not have a monitor and keyboard attached. This setting enables/disables the operation of console redirection. When set to [Enabled], BIOS redirects and sends all contents that should be displayed

on the screen to the serial COM port for display on the terminal screen. All data received from the serial port is interpreted as keystrokes from a local keyboard.

5.6.5.3.1 Console Redirection Settings (COM1)



- **Terminal Type**
  To operate the system's console redirection, you need a terminal supporting ANSI terminal protocol and a RS-232 null modem cable connected between the host system and terminal. You can select emulation for the terminal from this setting.
  [ANSI] Extended ASCII character set.
  [VT100] ASCII character set.
  [VT100Plus] Extends VT100 to support color, function keys, etc.
  [VT-UTF8] Uses UTF8 encoding to map Unicode characters onto one or more bytes.

- **Bits per second, Data Bits, Parity, Stop Bits**
  These setting specifies the transfer rate (bits per second, data bits, parity, stop bits) of Console Redirection.

- **Flow Control**
  Flow control is the process of managing the rate of data transmission between two nodes. It's the process of adjusting the flow of data from one device to another to ensure that the receiving device can handle all of the incoming data. This is particularly important where the sending device is capable of sending data much faster than the receiving device can receive it.

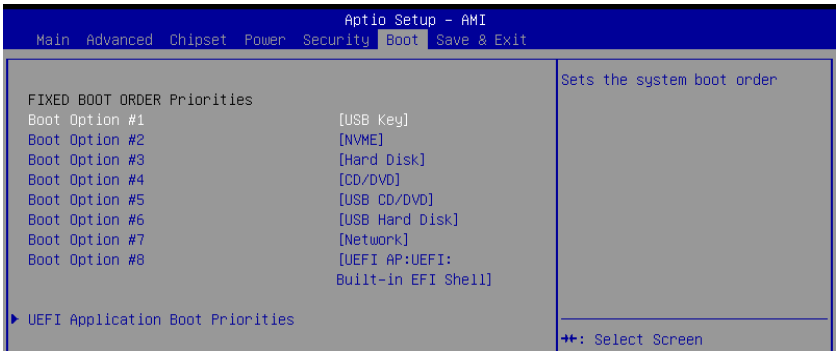
- **VT-UTF8 Combo Key Support**
  This setting enables/disables the VT-UTF8 combination key support for ANSI/VT100 terminals.

- **Recorder Mode, Resolution 100x31**
  These settings enable/disable the recorder mode and the resolution 100x31.

- **Putty KeyPad**

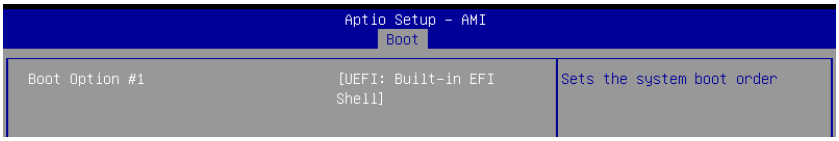
PuTTY is a terminal emulator for Windows. This controls the numeric keypad for use in PuTTY.

5.6.6 Boot



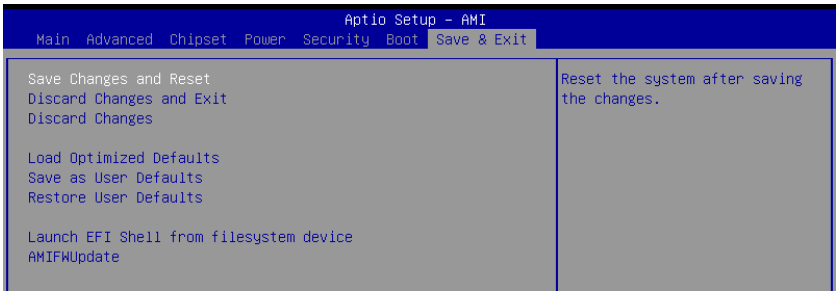
- **Boot Option #1-8**
  This setting allows users to set the boot device sequence.

5.6.6.1 UEFI Application Boot Priorities



- **Boot Option #1**
  This setting allows users to set the system boot order.

5.6.7 Save & Exit



- **Save Changes and Reset**
  Save changes to CMOS and reset the system.

- **Discard Changes and Exit**
  Abandon all changes and exit the BIOS menu.

- **Discard Changes**
  Abandon all changes from current session.

- **Load Optimized Defaults**
  Use this menu to load the default values set by the motherboard manufacturer specifically for optimal performance of the motherboard.

- **Save as User Defaults**
  Save changes as the user's default profile.

- **Restore User Defaults**
  Restore the user's default profile.

- **Launch EFI Shell from filesystem device**
  This setting helps to launch the EFI Shell application from one of the available file system devices.

- **AMIFWUpdate**
  Launch AMIFWUpdate for updating the BIOS.

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.
- Strike or exert excessive force onto the LCD panel.
- Touch any of the LCD panels with a sharp object.
- 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.

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

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 panel PC before cleaning.
- If you dropped any material or liquid such as water onto the panel 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.

- Except for the LCD panel, never spray or squirt liquids directly onto any other components. To clean the LCD panel, 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 panel 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 panel 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.

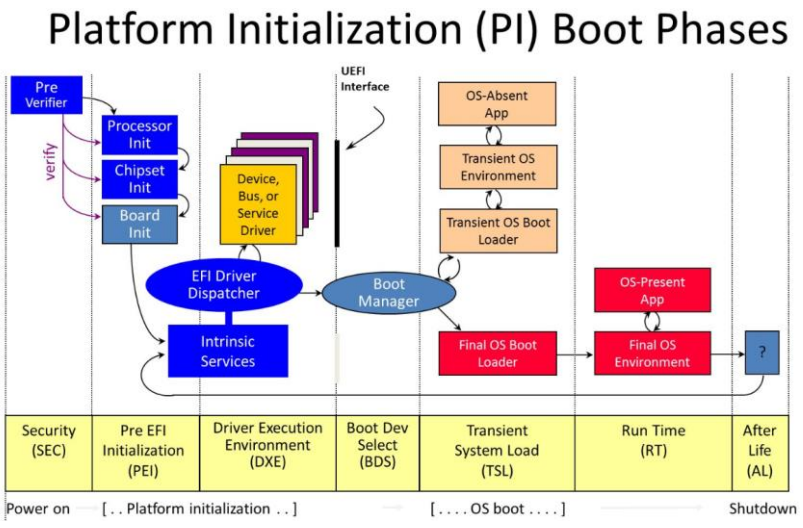
Basic Troubleshooting

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



https://uefi.org/specs/PI/1.8/V2_Overview.html

7. Product Application

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

8. Operating the Device

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