

mITX-2748A (MRZV2MI)

Mini-ITX Motherboard

User's Manual 1st Ed

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Packing List

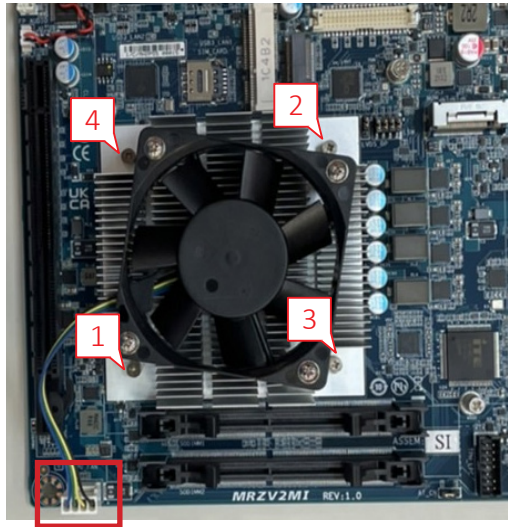
Before setting up your product, please make sure the following items have been shipped:

| Item | Quantity |
|---------------------|----------|
| mITX-2748A MB | 1 |
| SATA power cable | 1 |
| I/O Bracket | 1 |
| mITX-V2000 Fan Sink | 1 |

If any of these items are missing or damaged, please contact your distributor or sales representative immediately.

Assembly Sequence

Material fan-sink.



※The image is for reference only.
The actual product could be slightly different.

| | |
|------------------------|---|
| Torque | 2.5 kgf-cm |
| Assembly action | |
| 1> | Connect the fansink and the CPU Fan connector. Remove the release paper on the pad of the fansink. |
| 2> | Using your hand to fix the fansink to the correct corresponding hole position, and assemble the fansink as shown in the figure above. The correct torque is needed to be used to assemble the fansink. |
| 3> | If you want to disassemble the fansink, please reverse (starting from position 4) to remove. |

About this Document

This User's Manual contains all the essential information, such as detailed descriptions and explanations on the product's hardware and software features (if any), its specifications, dimensions, jumper/connector settings/definitions, and driver installation instructions (if any), to facilitate users in setting up their product.

Users may refer to the GIGAIPC.com for the latest version of this document.

Safety Precautions

Please read the following safety instructions carefully. It is advised that you keep this manual for future references

1. All cautions and warnings on the device should be noted.
2. Make sure the power source matches the power rating of the device.
3. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
4. Always completely disconnect the power before working on the system's hardware.
5. No connections should be made when the system is powered as a sudden rush of power may damage sensitive electronic components.
6. If the device is not to be used for a long time, disconnect it from the power supply to avoid damage by transient over-voltage.
7. Always disconnect this device from any AC supply before cleaning.
8. While cleaning, use a damp cloth instead of liquid or spray detergents.
9. Make sure the device is installed near a power outlet and is easily accessible.
10. Keep this device away from humidity.
11. Place the device on a solid surface during installation to prevent falls
12. Do not cover the openings on the device to ensure optimal heat dissipation.

13. Watch out for high temperatures when the system is running.
14. Do not touch the heat sink or heat spreader when the system is running
15. Never pour any liquid into the openings. This could cause fire or electric shock.
16. As most electronic components are sensitive to static electrical charge, be sure to ground yourself to prevent static charge when installing the internal components. Use a grounding wrist strap and contain all electronic components in any static-shielded containers.
17. If any of the following situations arises, please the contact our service personnel:
 - i. Damaged power cord or plug
 - ii. Liquid intrusion to the device
 - iii. Exposure to moisture
 - iv. Device is not working as expected or in a manner as described in this manual
 - v. The device is dropped or damaged
 - vi. Any obvious signs of damage displayed on the device
18. **DO NOT LEAVE THIS DEVICE IN AN UNCONTROLLED ENVIRONMENT WITH TEMPERATURES BEYOND THE DEVICE'S PERMITTED STORAGE TEMPERATURES (SEE CHAPTER 1) TO PREVENT DAMAGE.**

FCC Statement

Warning!



This device complies with Part 15 FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received including interference that may cause undesired operation.

Caution:

There is a danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions and your local government's recycling or disposal directives.

Attention:

Il y a un risque d'explosion si la batterie est remplacée de façon incorrecte. Ne la remplacer qu'avec le même modèle ou équivalent recommandé par le constructeur. Recycler les batteries usées en accord avec les instructions du fabricant et les directives gouvernementales de recyclage.

China RoHS Requirements (CN)

产品中有毒有害物质或元素名称及含量

GIGAIPC Main Board/ Daughter Board/ Backplane

| 部件名称 | 有毒有害物质或元素 | | | | | |
|---------------------|-----------|-----------|-----------|-----------------|---------------|-----------------|
| | 铅 (Pb) | 汞 (Hg) | 镉 (Cd) | 六价铬 (Cr(VI)) | 多溴联苯 (PBB) | 多溴二苯醚 (PBDE) |
| 印刷电路板 及其电 子组件 | ○ | ○ | ○ | ○ | ○ | ○ |
| 外部信号 连接器 及线材 | ○ | ○ | ○ | ○ | ○ | ○ |

○: 表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T 11363-2006 标准规定的限量要求以下。
 X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11363-2006 标准规定的限量要求。
 备注: 此产品所标示之环保使用期限, 系指在一般正常使用状况下。

China RoHS Requirement (EN)

Poisonous or Hazardous Substances or Elements in Products GIGAIPC Main Board/ Daughter Board/ Backplane

| Component | Poisonous or Hazardous Substances or Elements | | | | | |
|---|---|--------------|--------------|------------------------------|--------------------------------|---------------------------------------|
| | Lead (Pb) | Mercury (Hg) | Cadmium (Cd) | Hexavalent Chromium (Cr(VI)) | Polybrominated Biphenyls (PBB) | Polybrominated Diphenyl Ethers (PBDE) |
| PCB & Other Components | ○ | ○ | ○ | ○ | ○ | ○ |
| Wires & Connectors for External Connections | ○ | ○ | ○ | ○ | ○ | ○ |
| <p>○ : The quantity of poisonous or hazardous substances or elements found in each of the component's parts is below the SJ/T 11363-2006-stipulated requirement.</p> <p>X: The quantity of poisonous or hazardous substances or elements found in at least one of the component's parts is beyond the SJ/T 11363-2006-stipulated requirement.</p> <p>Note: The Environment Friendly Use Period as labeled on this product is applicable under normal usage only</p> | | | | | | |

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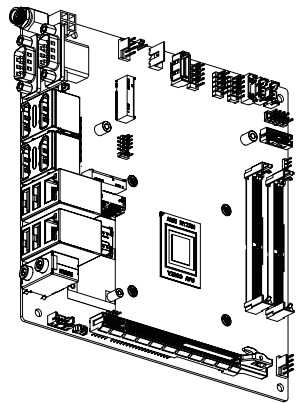
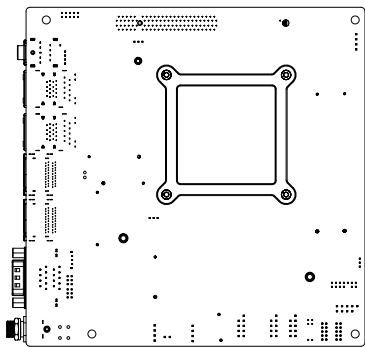
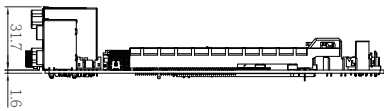
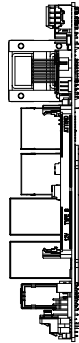
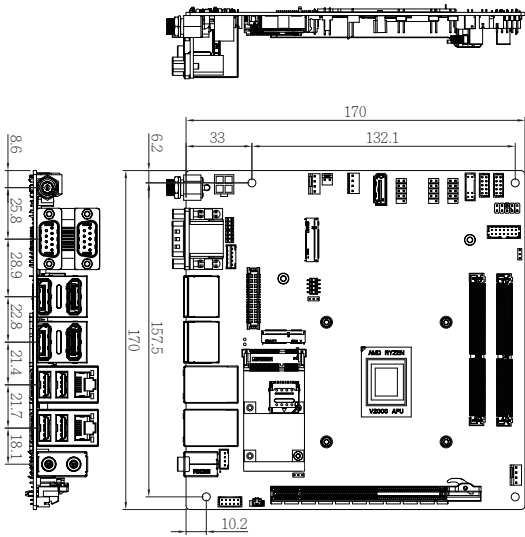
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Chapter 1

Chapter 1 – Product Specifications



1.1 Specifications

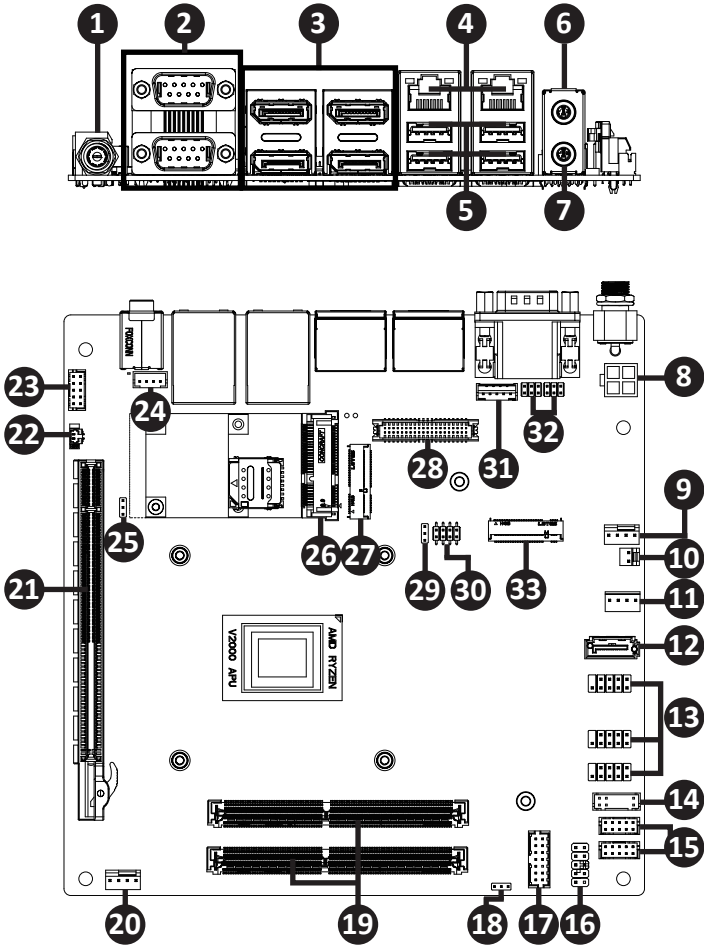
| Motherboard | mITX-2748A (MRZV2MI) |
|-----------------|---|
| Form Factor | Mini-ITX 170W x 170D (mm) |
| CPU | AMD Ryzen™ V2748 Embedded Processor 7nm, 8 cores, 16 threads, 2.9 GHz, up to 4.25GHz TDP 45W |
| Socket | 1 x FP6 BGA |
| Chipset | — |
| Memory | 2 x DDR4 SO-DIMM sockets, Max. Capacity 64 GB Support Dual channel DDR4 3200 MHz memory modules |
| Ethernet | 2 x GbE LAN Ports (Realtek® RTL8118-CG) |
| Video | Integrated Graphics Processor - AMD Radeon™ Graphics: 4 x DP ports, supporting a maximum resolution of 4096x2160 @60Hz 1 x LVDS port, supporting a maximum resolution of 1080P (switch from DP) (4 independent display outputs) |
| Audio | Realtek® Audio Codec |
| Storage | 1 x SATA 6Gb/s Port |
| Expansion Slots | 1 x PCIe x16 (Gen3 x8) 1 x 2280 M.2 M-Key (PCIe x4, SATA 6Gb/s) 1 x 2230 M.2 E-Key 1 x Full-size mini PCIe with SIM slot |

| Motherboard | mITX-2748A (MRZV2MI) |
|----------------------|---|
| Internal I/O | 1 x 4-pin ATX power connector 1 x SATA power connector 1 x CPU fan header 1 x System fan header 1 x Front panel header 1 x Front panel audio header 1 x 2W Speaker out header 6 x USB 2.0 headers 2 x COM headers (RS-232/422/485) 1 x GPIO (8 bits) & SMBus header 1 x Backlight Control header 1 x LVDS/ DP Jumper 1 x AT/ATX mode select jumper 1 x ATX Control header 1 x Clear CMOS jumper |
| Rear I/O | 2 x Audio Jacks (Line out, Mic in) 2 x COM Ports (RS-232/422/485 & RI/5V/12V) 4 x Display Ports 2 x RJ45 LAN Ports 4 x USB 3.2 Gen 1 1 x DC Jack (+12V~24VDC) |
| TPM | 1 x TPM header |
| OS Compatibility | Windows 10 (x64) |
| Operating Properties | Operating temperature: 0°C to 60°C Operating humidity: 0-90% (non-condensing) Non-operating temperature: -40°C to 85°C Non-operating humidity: 0%-95% (non-condensing) |
| Order Information | Fan version: 9MRZV2MIMR-SI (Box packing) |
| Optional Kit | TPM 2.0 module: 9CTM000NR-00 |

Chapter 2

Chapter 2 – Hardware Information

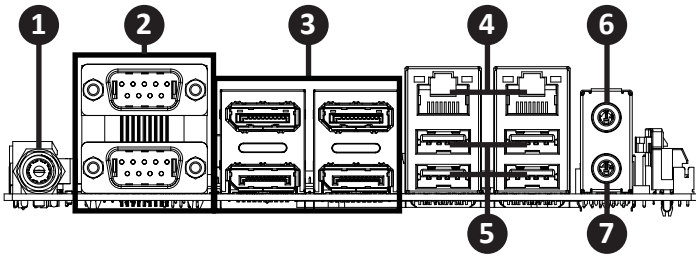
2.1 Jumpers and Connectors



| No | Code | Description |
|----|------------------------------------|---|
| 1 | DC_IN1 | DC IN Jack connector |
| 2 | COM1_2 | COM Port (RS-232/422/485 & RI/5V/12V) |
| 3 | DP1_2 DP3_4 | Display ports |
| 4 | USB3_LAN1 | LAN Connector x 2 |
| 5 | USB3_LAN2 | USB 3.2 Gen 1 Connector x 4 |
| 6 | AUDIO | Line Out port (Green) |
| 7 | | Mic In port (Pink) |
| 8 | DC_IN2 | ATX 2x2 pin power connector |
| 9 | SYS_FAN | System fan connector |
| 10 | ATX_CTL | ATX Control header, Support PS-ON Signal of Power Supply Unit |
| 11 | SATAPW | SATA power connector |
| 12 | SATA0 | SATA 6Gb/s connector |
| 13 | F_USB2_1, F_USB2_3, F_USB2_2 | USB 2.0 header |
| 14 | GPIO_CNT | General Purpose input/output header |
| 15 | COM3, COM4 | COM Port (RS-232/422/485) |
| 16 | SYS_PANEL | Front panel header |
| 17 | TPM_LPC | TPM header |
| 18 | AT_CN | AT/ATX mode select jumper |
| 19 | SODIMM1, SODIMM2 | 2 x DDR4 SO-DIMM slots |

| No | Code | Description |
|----|----------------|--|
| 20 | CPU_FAN | CPU FAN connector |
| 21 | PCIEX16 | PCIEX16 slot |
| 22 | BAT | Battery connector |
| 23 | FP_AUDIO | Front panel audio header |
| 24 | SPKR | Speaker out connector |
| 25 | CLR_CMOS | Clear CMOS jumper |
| 26 | MPCIE | MINI PCIE connector |
| 27 | M2E | M.2 Slot, E-Key NGFF 2230 |
| 28 | LVDS | LVDS connector |
| 29 | LVDS_DP | LVDS/DP Jumper |
| 30 | LSW | LVDS resolution jumper |
| 31 | BKL_CN | Backlight control connector |
| 32 | JCOM1 JCOM2 | RI pin RI/5V/12V select jumper for COM1 port & COM2 port |
| 33 | M2M | M.2 Slot, M-Key NGFF 2280 |

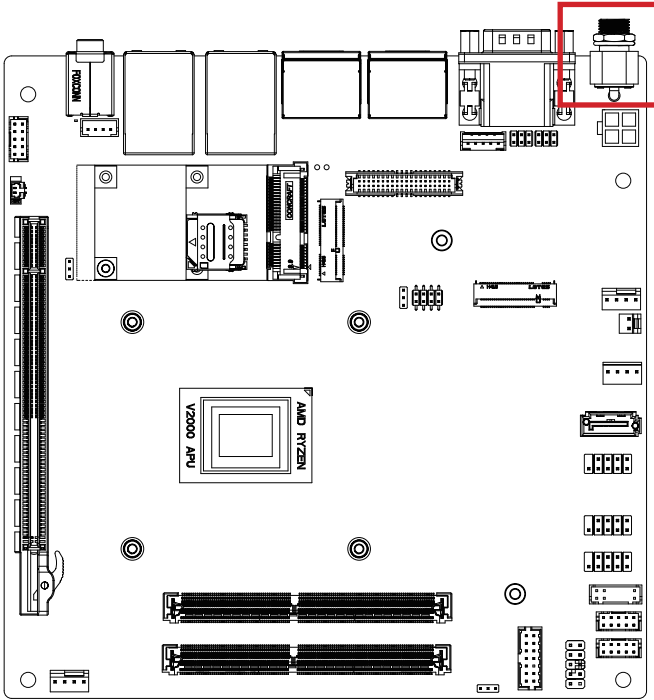
2.2.1 IO Connector Information



| | Code | Description |
|---|----------------|---------------------------------------|
| 1 | DC_IN1 | DC IN Jack connector |
| 2 | COM1_2 | COM Port (RS-232/422/485 & RI/5V/12V) |
| 3 | DP1_2 DP3_4 | Display ports |
| 4 | USB3_LAN1 | LAN Connector x 2 |
| 5 | USB3_LAN2 | USB 3.2 Gen 1 Connector x 4 |
| 6 | AUDIO | Line Out port (Green) |
| 7 | | Mic In port (Pink) |

2.2.2 DC_IN1 (DC IN Jack connector)

1



DC In Jack connector



Connector PN

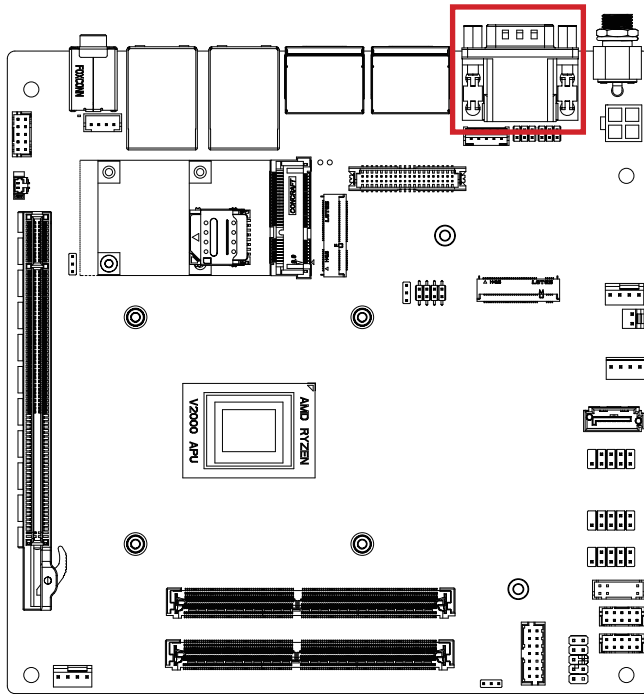
655-360-000

Vendor

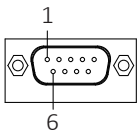
SHEN-MING

2.2.3 COM1_2 (COM Port (RS-232/422/485 & RI/5V/12V))

2



Serial Port connector



Connector PN

D20HB1102002P6JN

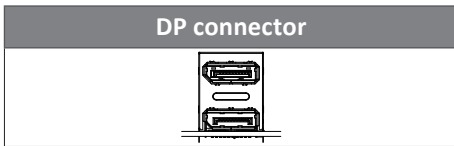
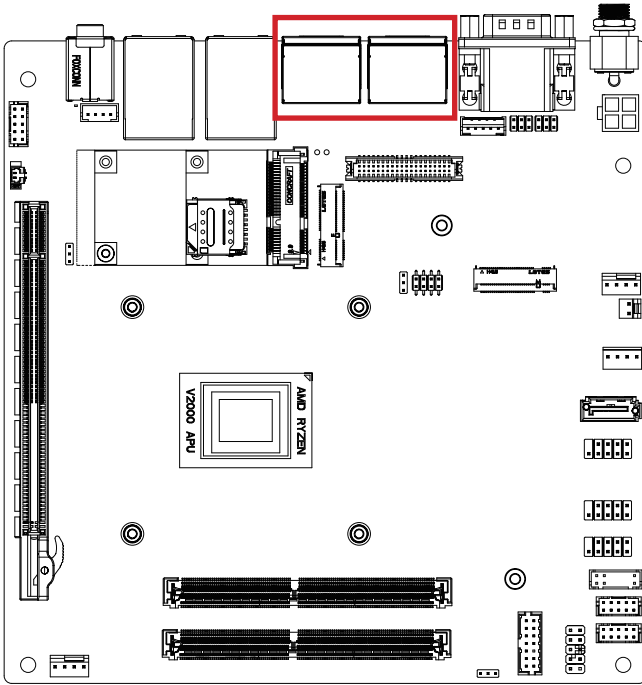
Vendor

FENYING

| Pin No. | RS-232 | RS-422 Full Duplex | RS-485 Half Duplex |
|---------|--------|--------------------|--------------------|
| 1 | DCD | TXD- | D- |
| 2 | RXD | TXD+ | D+ |
| 3 | TXD | RXD+ | - |
| 4 | DTR | RXD- | - |
| 5 | GND | | |
| 6 | DSR | - | - |
| 7 | RTS | - | - |
| 8 | CTS | - | - |
| 9 | RI | - | - |

2.2.4 DP1_2, DP3_4 (Display ports)

3

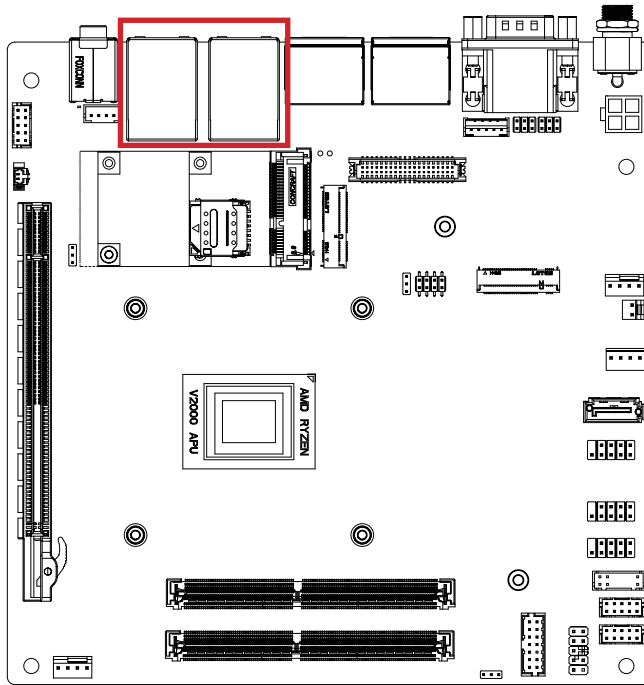


| Connector PN | Vendor |
|-----------------|--------|
| G3167C233S-006H | WIESON |

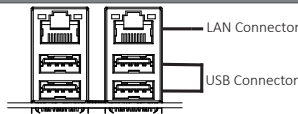
| Pin No. | Definition | Pin No. | Definition |
|---------|------------|---------|-----------------|
| 1 | TX0p | 11 | GND |
| 2 | GND | 12 | TX3n |
| 3 | TX0n | 13 | GND |
| 4 | TX1p | 14 | GND |
| 5 | GND | 15 | AUXp |
| 6 | TX1n | 16 | GND |
| 7 | TX2p | 17 | AUXn |
| 8 | GND | 18 | Hot Plug Detect |
| 9 | TX2n | 19 | GND |
| 10 | TX3p | 20 | 3.3V |

2.2.5 USB_LAN1, USB_LAN2 (USB+LAN connector x 2)

4 5



USB & LAN connector

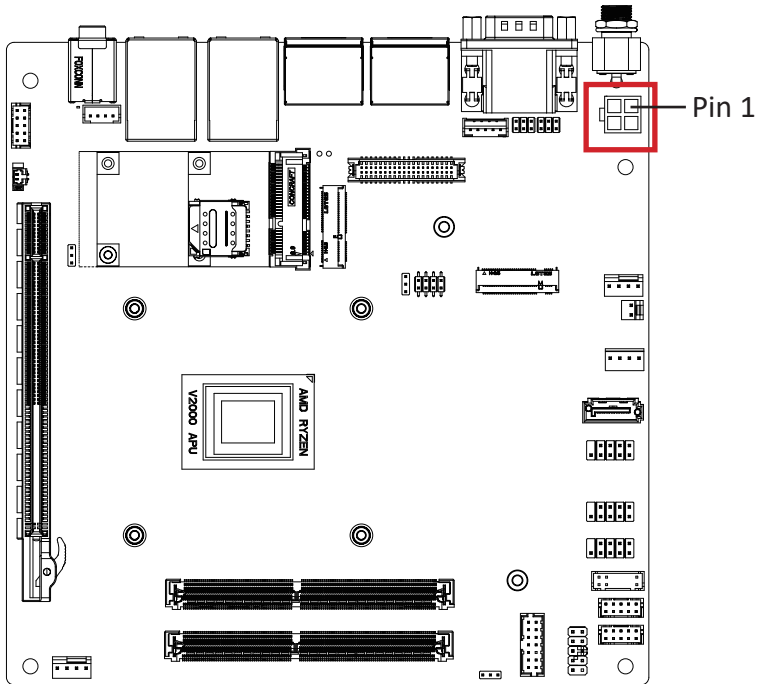


| USB Connector | | | |
|---------------|------------|---------|------------|
| Pin No. | Definition | Pin No. | Definition |
| 1 | 5V | 10 | 5V |
| 2 | D1n | 11 | D0n |
| 3 | D1p | 12 | D0p |
| 4 | GND | 13 | GND |
| 5 | USB3_RX1n | 14 | USB3_RX2n |
| 6 | USB3_RX1p | 15 | USB3_RX2p |
| 7 | GND | 16 | GND |
| 8 | USB3_TX1n | 17 | USB3_TX2n |
| 9 | USB3_TX1p | 18 | USB3_TX2p |

| LAN Connector | | | |
|---------------|------------|-------------------|------------|
| Pin No. | Definition | Pin No. | Definition |
| 1 | TX1+ | 4 | TX3+ |
| 2 | TX1- | 5 | TX3- |
| 3 | TX2+ | 7 | TX4+ |
| 6 | TX2- | 8 | TX4- |
| State | | Description | |
| Orange On | | 1Gbps data rate | |
| Green On | | 100Mbps data rate | |
| Off | | 10Mbps data rate | |

2.2.6 DC_IN2 (ATX 2x2 pin power connector)

8



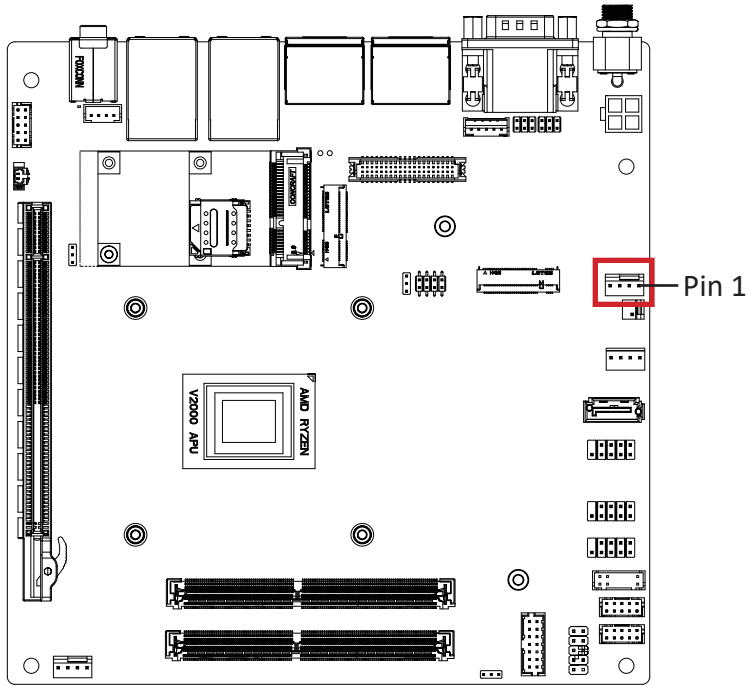
| Power connector | |
|-----------------|--|
| | |


| Connector PN | Vendor |
|---------------|--------|
| 740-81-04TW56 | PINREX |

| Pin No. | Definition |
|---------|-------------|
| 1 | GND |
| 2 | GND |
| 3 | +12V ~ +24V |
| 4 | +12V ~ +24V |

2.2.7 SYS_FAN (System Fan connector)

9



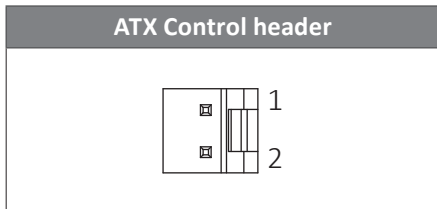
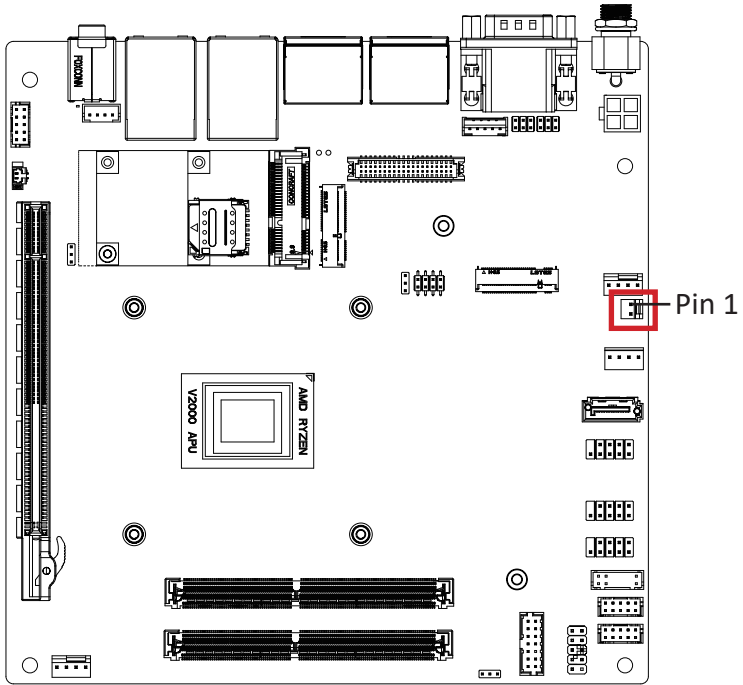
| System FAN connector | | |
|----------------------|---|---|
| 4 |  | 1 |

| Connector PN | Vendor |
|---------------|-----------|
| 744-81-045R11 | PINREX |
| WF04R22RJQ105 | HORNGTONG |

| Pin No. | Definition |
|---------|---------------|
| 1 | GND |
| 2 | 12V |
| 3 | Detect |
| 4 | Speed Control |

2.2.8 ATX_CTL (ATX Control header, Support PS-ON Signal of Power Supply Unit)

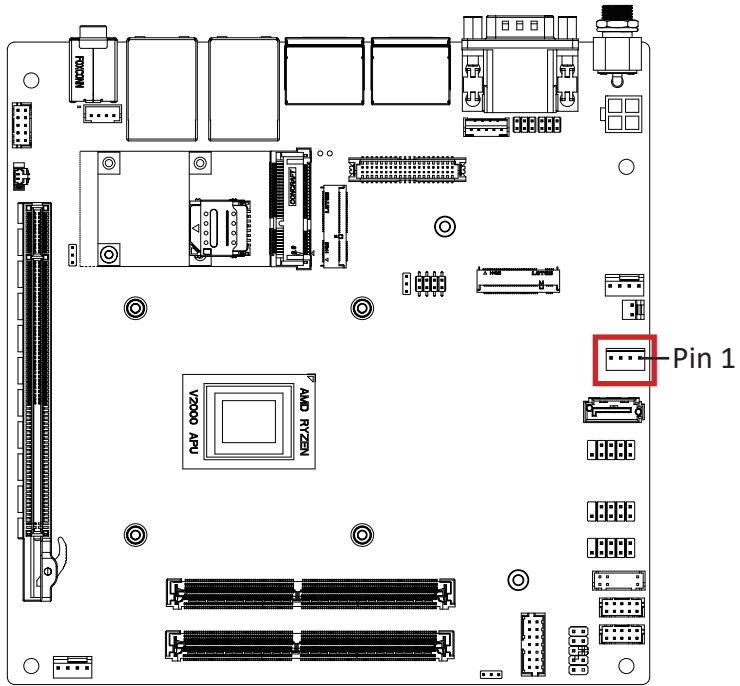
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| Pin No. | Definition |
|---------|------------|
| 1 | PSON# |
| 2 | 5V |

2.2.9 SATAPW (SATA power connector)

11



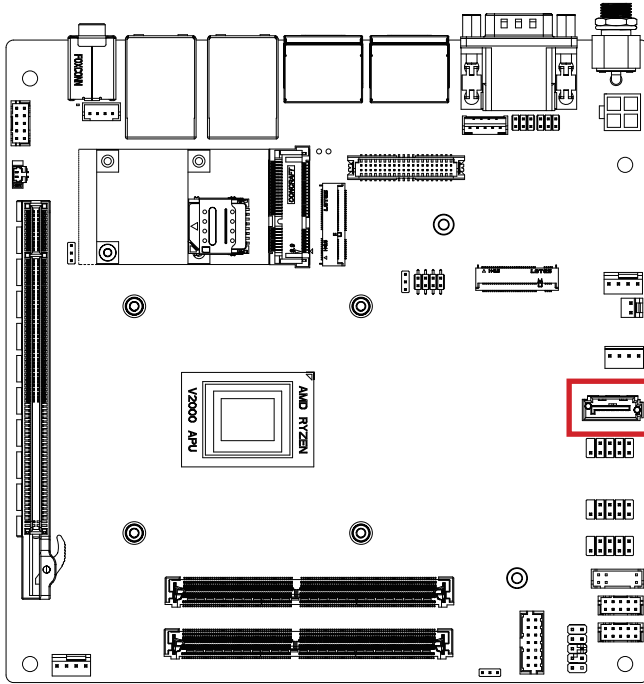
| Hard Disk Power connector | |
|---------------------------|--|
| 4 | |

| Connector PN | Vendor |
|----------------|-----------|
| 743-81-04TW00 | PINREX |
| WF04Q2-3BJQ000 | HORNGTONG |

| Pin No. | Definition |
|---------|------------|
| 1 | 12V |
| 2 | GND |
| 3 | GND |
| 4 | 5V |

2.2.10 SATA0 (SATA 6Gb/s Connector)

12



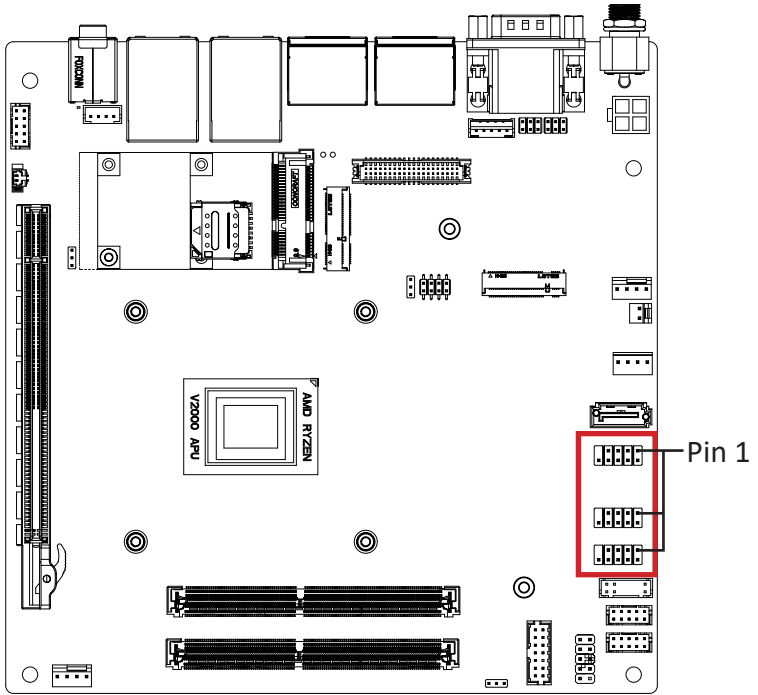
| SATA 6Gb/s connector | |
|----------------------|--|
| | |

| Pin No. | Definition |
|---------|------------|
| 1 | GND |
| 2 | TXp |
| 3 | TXn |
| 4 | GND |
| 5 | RXn |
| 6 | RXp |
| 7 | GND |

| Connector PN | Vendor |
|-----------------|--------|
| WATF-07DBLBA1UW | WINWIN |

2.2.11 F_USB2_1, F_USB2_3, F_USB2_2 (USB 2.0 header)

13



USB 2.0 header



Connector PN

210-92-05GB04
PH10R53BAZ009

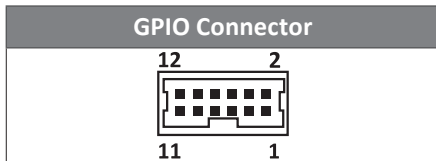
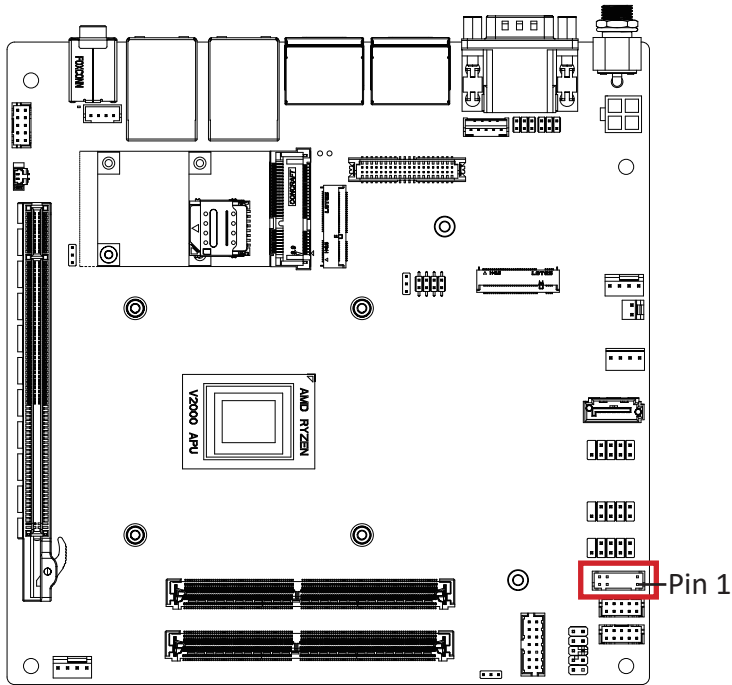
Vendor

PINREX
HORNGTONG

| Pin No. | Definition |
|---------|------------|
| 1 | 5V |
| 2 | 5V |
| 3 | D2n |
| 4 | D1n |
| 5 | D2p |
| 6 | D1p |
| 7 | GND |
| 8 | GND |
| 9 | No Pin |
| 10 | No Connect |

2.2.12 GPIO_CNT (General purpose input/output connector)

14



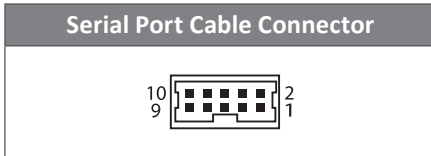
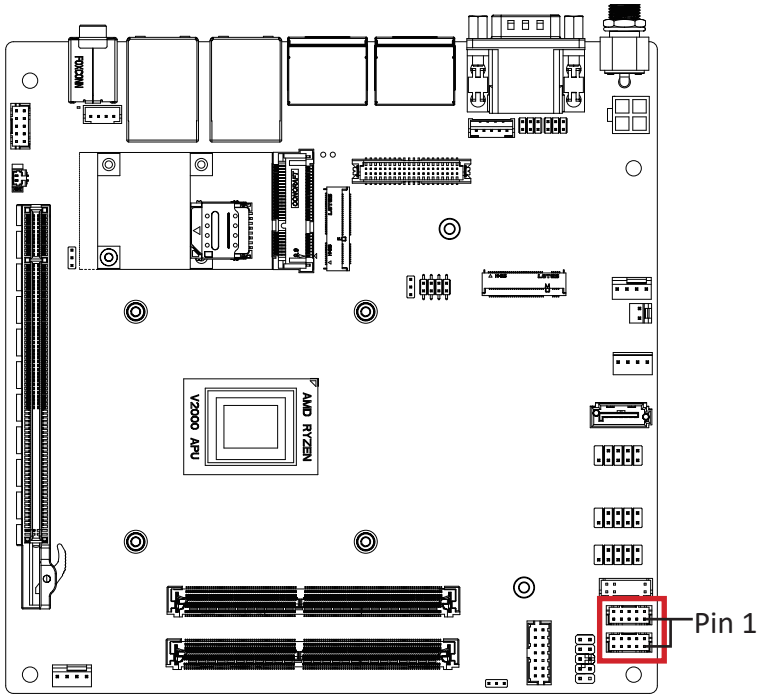
| Pin No. | Definition |
|---------|---------------|
| 1 | GPIO-output_1 |
| 2 | GPIO-input_1 |
| 3 | GPIO-output_2 |
| 4 | GPIO-input_2 |
| 5 | GPIO-output_3 |
| 6 | GPIO-input_3 |
| 7 | GPIO-output_4 |
| 8 | GPIO-input_4 |
| 9 | SMBus Clock |

| Pin No. | Definition |
|---------|------------|
| 10 | SMBus DATA |
| 11 | 5V |
| 12 | GND |

| Connector PN | Vendor |
|-----------------|------------|
| 725-81-12TW00 | PINREX |
| A2004WV-2X06P46 | JOINT-TECH |

2.2.13 COM3, COM4 (COM header (RS-232/422/485))

15

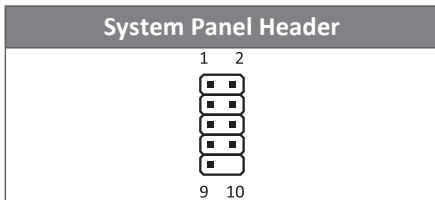
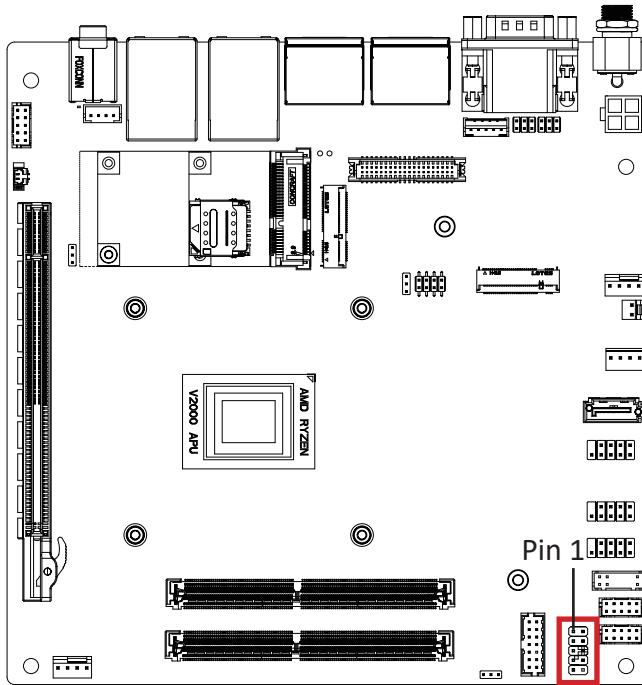


| Connector PN | Vendor |
|-----------------|------------|
| 725-81-10TW00 | PINREX |
| A2004WV-2X05P46 | JOINT-TECH |

| Pin No. | Definition | Pin No. | Definition |
|---------|------------|---------|------------|
| 1 | RXD | 6 | GND |
| 2 | DCD | 7 | CTS |
| 3 | DTR | 8 | RTS |
| 4 | TXD | 9 | No Connect |
| 5 | DSR | 10 | RI |

2.2.14 SYS_PANEL (Front Panel Header)

16

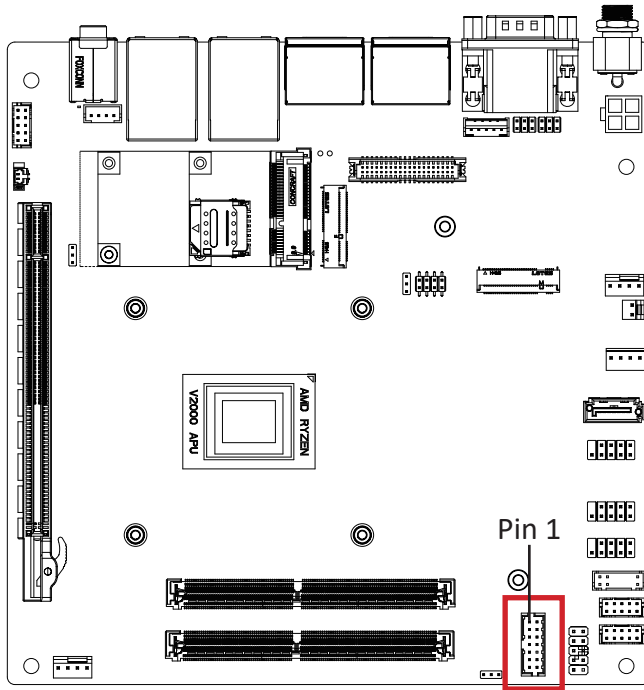


| Connector PN | Vendor |
|---------------|--------|
| 210-92-05GW5W | PINREX |

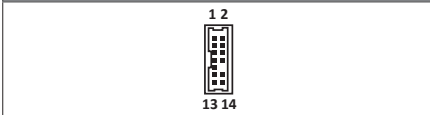
| Pin No. | Definition |
|---------|---------------|
| 1 | HDD LED+ |
| 2 | Power LED+ |
| 3 | HDD LED- |
| 4 | Power LED- |
| 5 | GND |
| 6 | Power Button+ |
| 7 | Reset Button |
| 8 | Power Button- |
| 9 | No Connect |
| 10 | No Pin |

2.2.15 TPM_LPC (TPM header)

17



TPM Module Connector



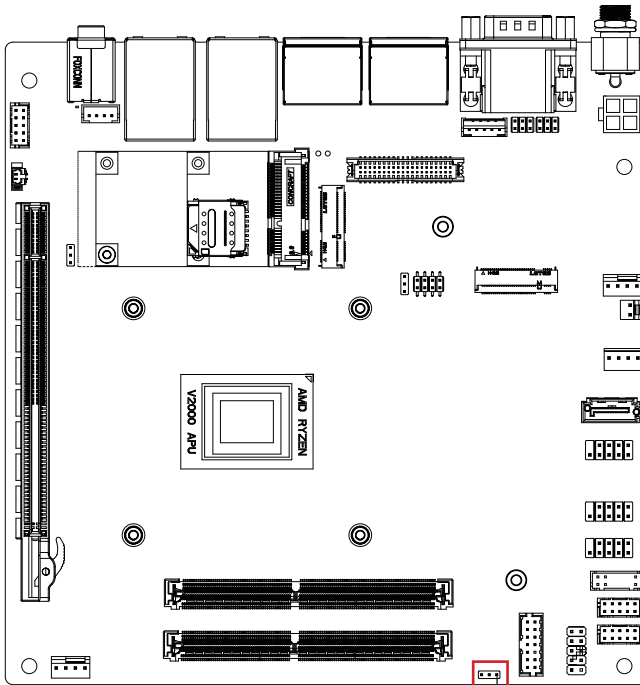
| Pin No. | Definition |
|---------|------------|
| 1 | LPCCLK |
| 2 | 3.3V |
| 3 | TPM RST |
| 4 | 3.3V |
| 5 | LAD0 |
| 6 | IRQ_SERIAL |
| 7 | LAD1 |
| 8 | TPM_DET |
| 9 | LAD2 |
| 10 | NC |

| Pin No. | Definition |
|---------|------------|
| 11 | LAD3 |
| 12 | GND |
| 13 | LFRAME |
| 14 | GND |

| Connector PN | Vendor |
|----------------|-----------|
| 52S-90-14GB10 | PINREX |
| BH14NQ-7BAI010 | HORNGTONG |

2.2.16 AT_CN (AT/ATX mode select jumper)

18



Pin 1

AT/ATX mode select jumper



Connector PN

220-96-03GB01

PH03N2-7BAN000

Vendor

PINREX

HORNGTONG

Pin No.

Definition

1

AT MODE

2

Detect

3

ATX MODE

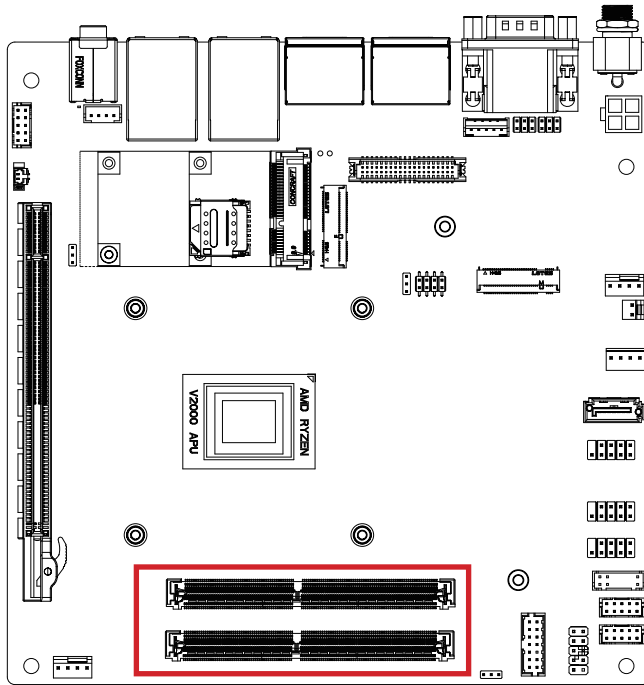
Jumper setting

1-2 Close : AT mode.

2-3 Close : ATX mode. (Default setting)

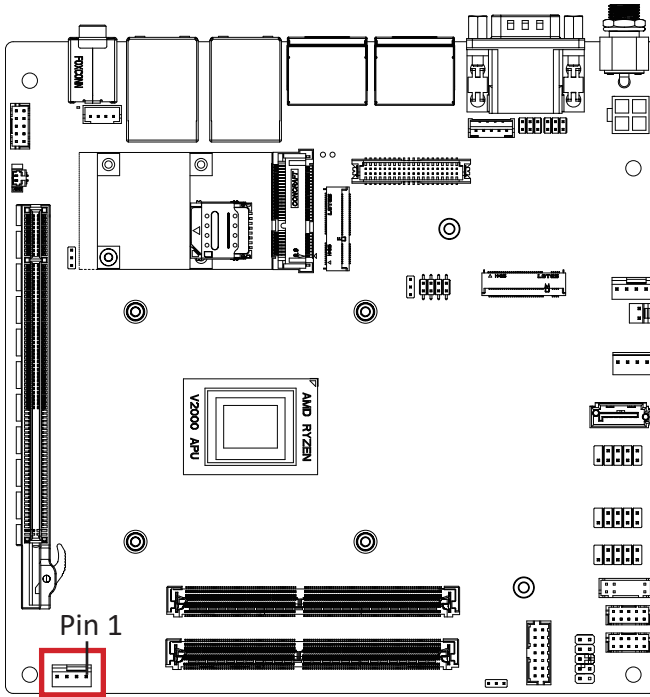
2.2.17 SODIMM1, SODIMM2 (2 x DDR4 SO-DIMM slots)


19



2.2.18 CPU_FAN (CPU Fan connector)

20



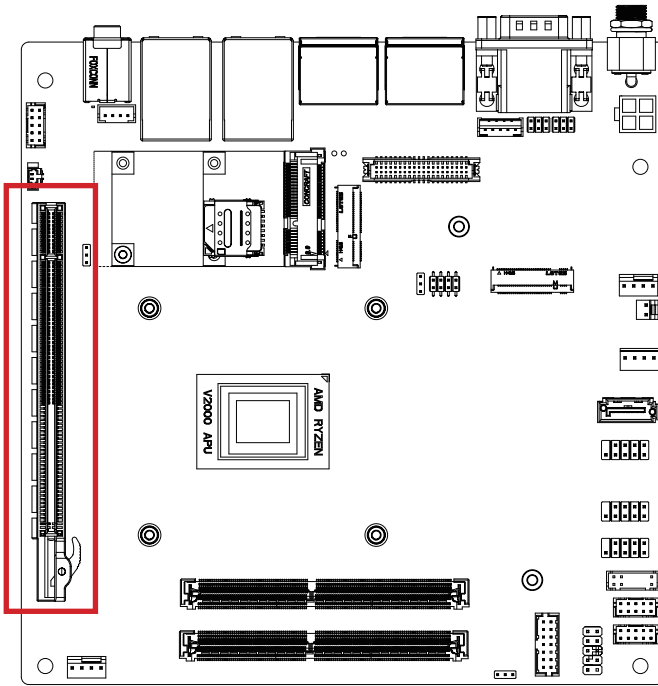
| CPU FAN connector | |
|-------------------|---|
| 4 |  1 |

| Connector PN | Vendor |
|---------------|--------|
| 744-81-045W1Z | PINREX |

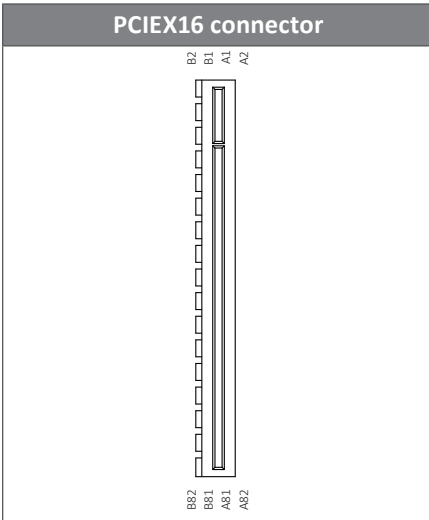
| Pin No. | Definition |
|---------|---------------|
| 1 | GND |
| 2 | 12V |
| 3 | Detect |
| 4 | Speed Control |

2.2.19 PCIEX16 (PCIe x16 slot)

21

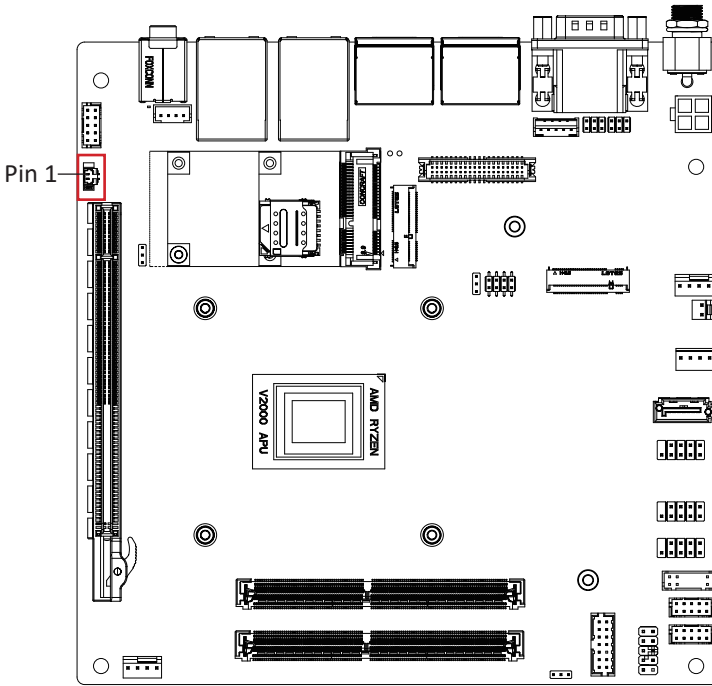


PCIEX16 connector



2.2.20 BAT (Battery connector)

22



Battery Cable Connector



Connector PN

85205-0270L

Vendor

ACES

A1250WV-S-02PC

JOINT-TECH

Pin No.

Definition

1

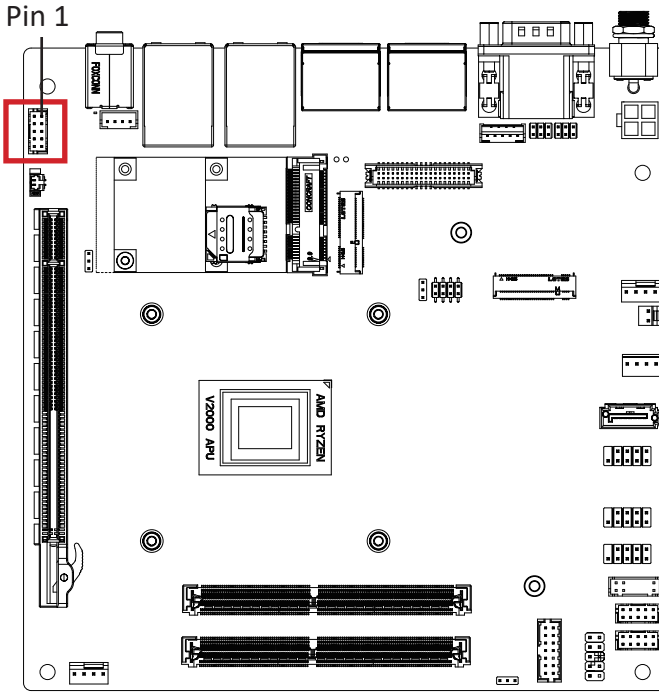
3V

2

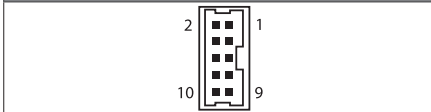
GND

2.2.21 FP_AUDIO (Front panel audio header)

23



Front panel audio header

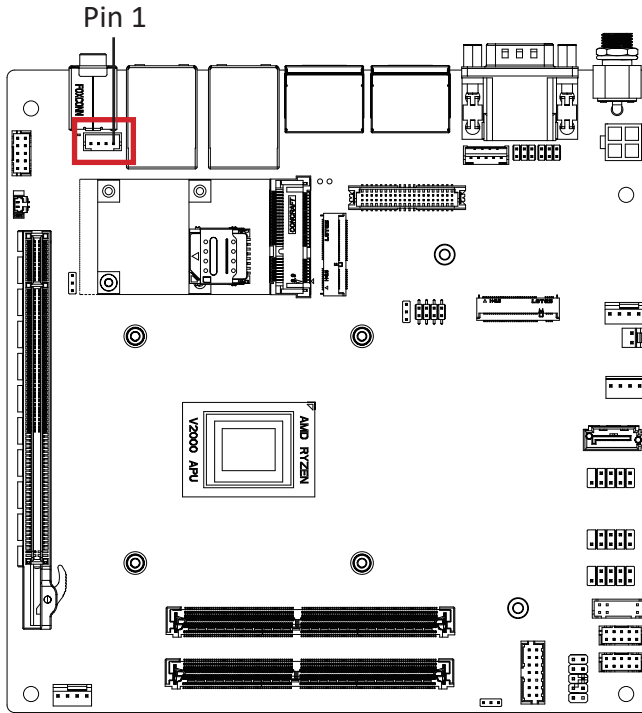


| Connector PN | Vendor |
|-----------------|------------|
| 725-81-10TW00 | PINREX |
| A2004WV-2X05P46 | JOINT-TECH |

| Pin No. | Definition | Pin No. | Definition |
|---------|------------|---------|------------|
| 1 | MIC_Left | 6 | No connect |
| 2 | GND | 7 | FAUDIO_JD |
| 3 | MIC_Right | 8 | No Connect |
| 4 | Detect | 9 | HPOUT_L |
| 5 | HPOUT_R | 10 | Detect |

2.2.22 SPKR (Speaker out connector)

24



Audio Amplifier Connector



Connector PN

Vendor

721-81-045W00

PINREX

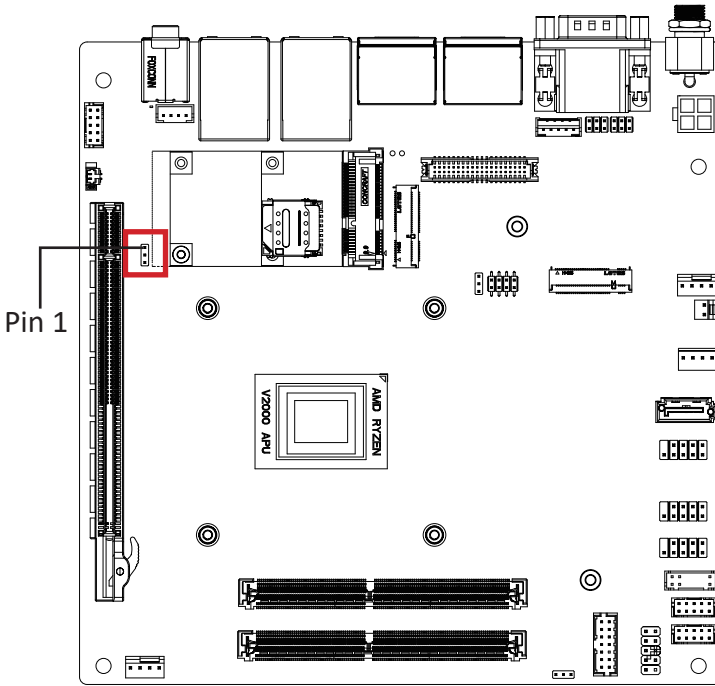
A2001WV-04P146

JOINT-TECH

| Pin No. | Definition |
|---------|----------------|
| 1 | Speaker Out L+ |
| 2 | Speaker Out L- |
| 3 | Speaker Out R- |
| 4 | Speaker Out R+ |

2.2.23 CLR_CMOS (Clear CMOS jumper)

25



Clear COMS Jumper



Connector PN

220-96-03GB01
PH03N2-7BAN000

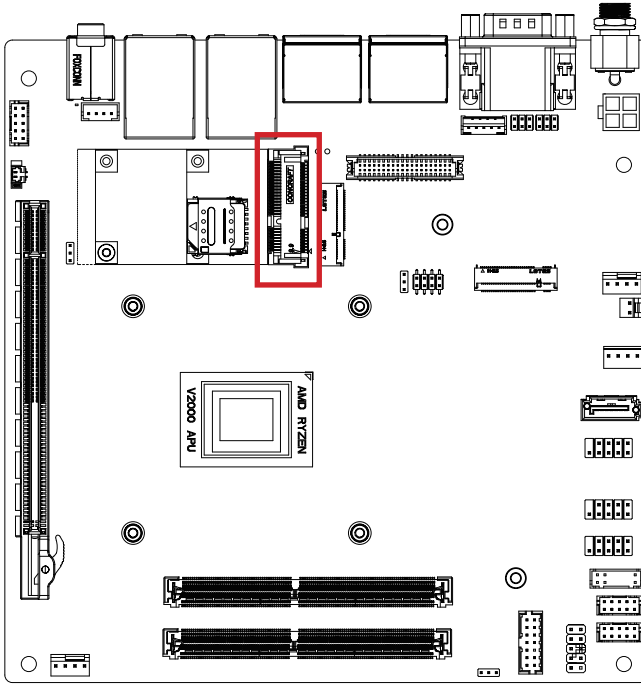
Vendor

PINREX
HORNGTONG

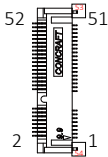
| Pin No. | Definition |
|---|------------|
| 1 | GND |
| 2 | RTCVDD_C |
| 3 | No Connect |
| 1-2 Close: Clear COMS data. 2-3 Close: Normal Operator (Default setting) | |

2.2.24 MPCIE (Mini PCIE connector)

26



Mini PCIe Connector



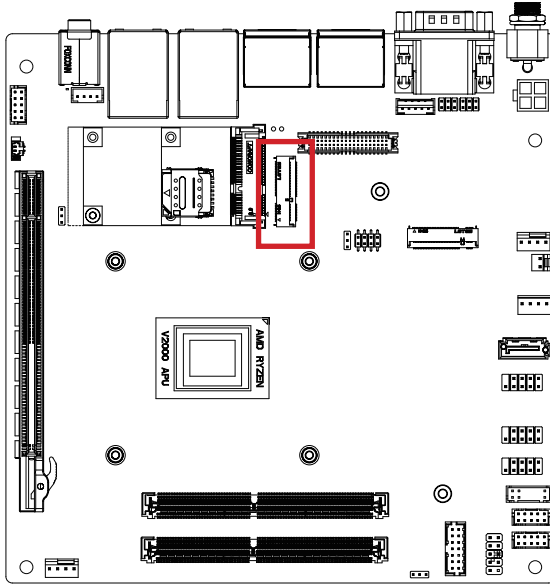
| Pin No. | Definition | Pin No. | Definition |
|---------|--------------------|---------|--------------|
| 1 | PCIE WAKE | 2 | 3.3V |
| 3 | NC | 4 | GND |
| 5 | NC | 6 | NC |
| 7 | PCIE Clock Request | 8 | SIM PWR |
| 9 | GND | 10 | SIM DATA |
| 11 | PCIE Clock n | 12 | SIM Clock |
| 13 | PCIE Clock p | 14 | SIM Reset |
| 15 | GND | 16 | UIM VPP3 |
| 17 | NC | 18 | GND |
| 19 | NC | 20 | WLAN_DISABLE |
| 21 | GND | 22 | Reset |

| Pin No. | Definition | Pin No. | Definition |
|---------|------------|---------|------------|
| 23 | PCIE RXn | 24 | 3.3V |
| 25 | PCIE RXp | 26 | GND |
| 27 | GND | 28 | NC |
| 29 | GND | 30 | SMB Clock |
| 31 | PCIE TXn | 32 | SMB DATA |
| 33 | PCIE TXp | 34 | GND |
| 35 | GND | 36 | USB Dn |
| 37 | GND | 38 | USB Dp |
| 39 | 3.3V | 40 | GND |
| 41 | 3.3V | 42 | NC |
| 43 | GND | 44 | NC |
| 45 | NC | 46 | NC |
| 47 | NC | 48 | NC |
| 49 | NC | 50 | GND |
| 51 | NC | 52 | 3.3V |

| Connector PN | Vendor |
|-----------------|---------|
| AS0B221-S99Q-7H | FOXCONN |

2.2.25 M2E (M.2 E-key NGFF 2230)

27



M.2 E Key Connector



| Pin No. | Definition | Pin No. | Definition |
|---------|------------|---------|------------|
| 1 | GND | 2 | 3.3V |
| 3 | D1p | 4 | 3.3V |
| 5 | D1n | 6 | NC |
| 7 | GND | 8 | NC |
| 9 | NC | 10 | NC |
| 11 | NC | 12 | NC |
| 13 | NC | 14 | NC |
| 15 | NC | 16 | NC |
| 17 | NC | 18 | GND |
| 19 | NC | 20 | NC |
| 21 | NC | 22 | NC |
| 23 | NC | | |

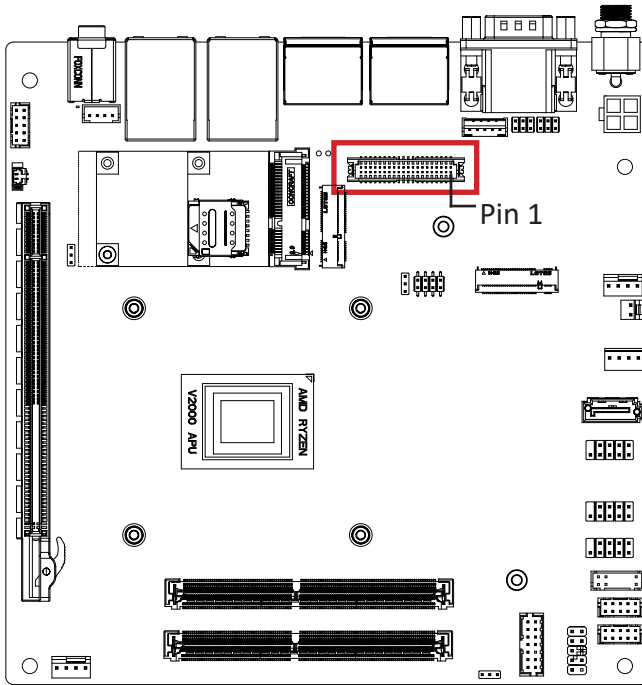
| Pin No. | Definition | Pin No. | Definition |
|---------|------------|---------|------------|
| 33 | GND | 32 | NC |
| 35 | PCIE_TXp | 34 | NC |
| 37 | PCIE_TXn | 36 | NC |
| 39 | GND | 38 | NC |

| | | | |
|----|--------------------|----|--------------|
| 41 | PCIE_RXp | 40 | CL_DATA |
| 43 | PCIE_RXn | 42 | NC |
| 45 | GND | 44 | NC |
| 47 | PCIE CLOCKp | 46 | NC |
| 49 | PCIE CLOCKn | 48 | NC |
| 51 | GND | 50 | SUSCLK |
| 53 | PCIE Clock Request | 52 | PCIRST |
| 55 | PCIE wake up | 54 | BT_Disable |
| 57 | GND | 56 | WLAN_DISABLE |
| 59 | NC | 58 | NC |
| 61 | NC | 60 | NC |
| 63 | GND | 62 | NC |
| 65 | NC | 64 | NC |
| 67 | NC | 66 | NC |
| 69 | GND | 68 | NC |
| 71 | NC | 70 | NC |
| 73 | NC | 72 | 3.3V |
| 75 | GND | 74 | 3.3V |

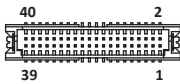
| Connector PN | Vendor |
|----------------|------------|
| 80152-8521 | BELLWETHER |
| APCI0095-P002A | LOTES |

2.2.26 LVDS (LVDS connector)

28



LVDS Connector



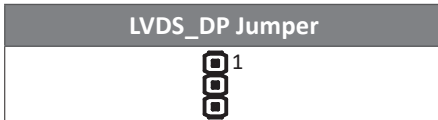
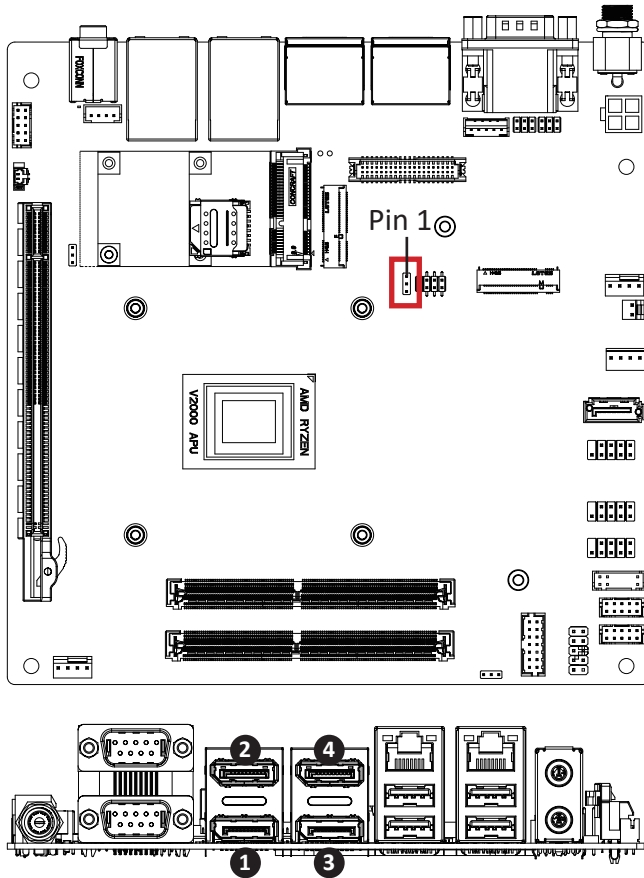
| Pin No. | Definition | Pin No. | Definition |
|---------|------------|---------|------------|
| 1 | 3.3V | 21 | A5+ |
| 2 | 5V | 22 | A4+ |
| 3 | 3.3V | 23 | A5- |
| 4 | 5V | 24 | A4- |
| 5 | SPECO | 25 | GND |
| 6 | SPEDO | 26 | GND |
| 7 | GND | 27 | A7+ |
| 8 | GND | 28 | A6+ |
| 9 | A1+ | 29 | A7- |
| 10 | A0+ | 30 | A6- |
| 11 | A1- | 31 | GND |
| 12 | A0- | 32 | GND |
| 13 | GND | 33 | CLK2+ |
| 14 | GND | 34 | CLK1+ |
| 15 | A3+ | 35 | CLK2- |

| Pin No. | Definition | Pin No. | Definition |
|---------|------------|---------|------------|
| 16 | A2+ | 36 | CLK1- |
| 17 | A3- | 37 | GND |
| 18 | A2- | 38 | GND |
| 19 | GND | 39 | 12V |
| 20 | GND | 40 | 12V |

| Connector PN | Vendor |
|---------------------|------------|
| 712-76-40GWEO | PINREX |
| A1252WV-SF-2X20PD01 | JOINT-TECH |

2.2.27 LVDS_DP (LVDS/DP jumper)

29

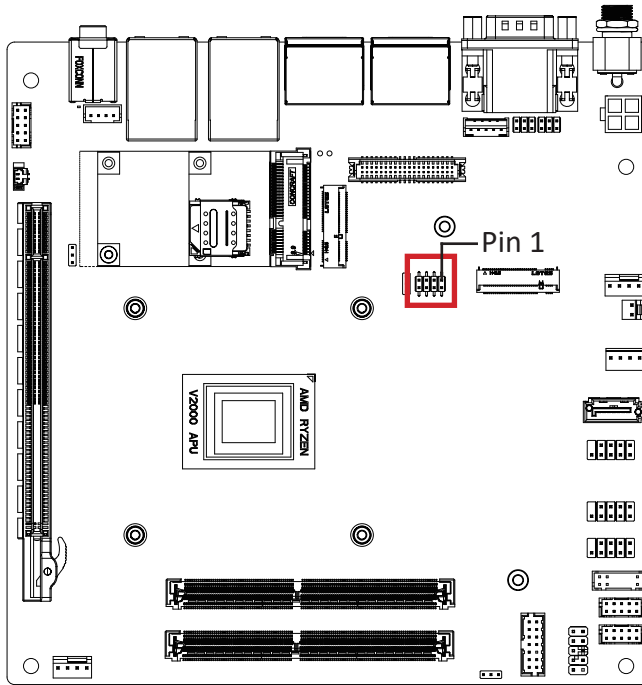


| Pin No. | Definition |
|----------------------------------|------------|
| 1 | No Connect |
| 2 | GPU_SEL |
| 3 | GND |
| 1-2 Close: DP4 DP Mode (Default) | |
| 2-3 Close: DP4 LVDS Mode | |

| Connector PN | Vendor |
|----------------|-----------|
| 220-96-03GB01 | PINREX |
| PH03N2-7BAN000 | HORNGTONG |

2.2.28 LSW (LVDS resolution jumper)

30

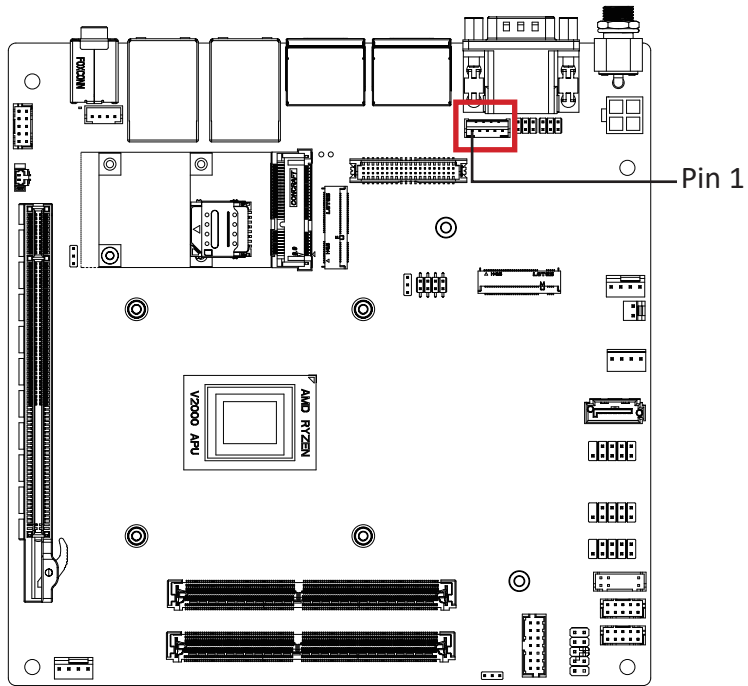


| LVDS Resolution Jumper | | | |
|------------------------|----------------------|----------------|----------------------|
| Jumper Setting | Resolution | Jumper Setting | Resolution |
| | 800 x 600 18bit | | 1366 x 768 24bit |
| | 1024 x 768 18bit | | 1440 x 900 24bit |
| | 1024 x 768 24bit | | 1400 x 1050 24bit |
| | 1024 x 600 18bit | | 1600 x 900 24bit |
| | 1280 x 800 18bit | | 1680 x 1050 24bit |
| | 1280 x 960 18bit | | 1600 x 1200 24bit |
| | 1280 x 1024 24bit | | 1920 x 1080 24bit |
| | 1366 x 768 18bit | | 1920 x 1200 24bit |

| Connector PN | Vendor |
|---------------|--------|
| 222-97-04GBE1 | PINREX |

2.2.29 BKL_CN (Backlight control connector)

31



Backlight control connector



Connector PN

721-81-05TW00

Vendor

PINREX

A2001WV-05P146

JOINT-TECH

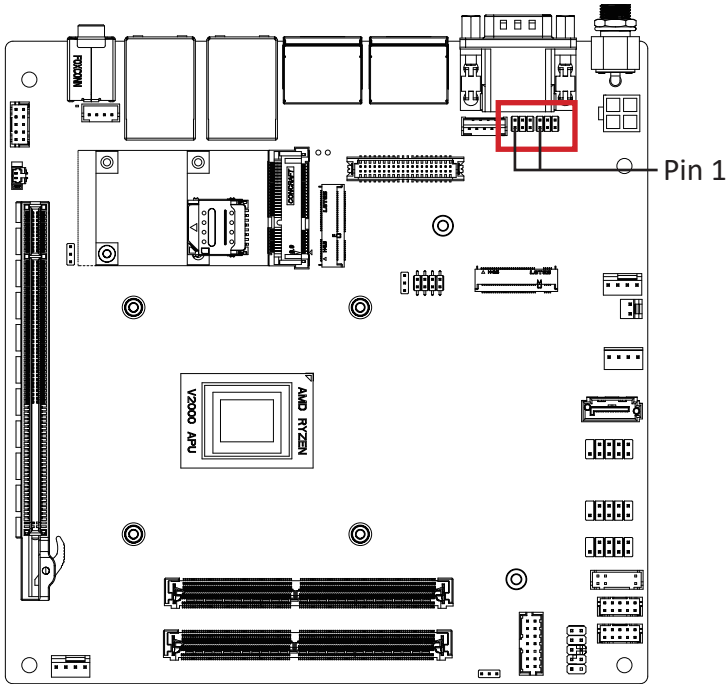
Pin No.

Definition

| | |
|---|-------------------|
| 1 | 5V |
| 2 | PWM |
| 3 | Back Light Enable |
| 4 | GND |
| 5 | 12V |

2.2.30 JCOM1, JCOM2 (RI# pin RI#/5V/12V Select jumper for COM1 & COM2 port)

32

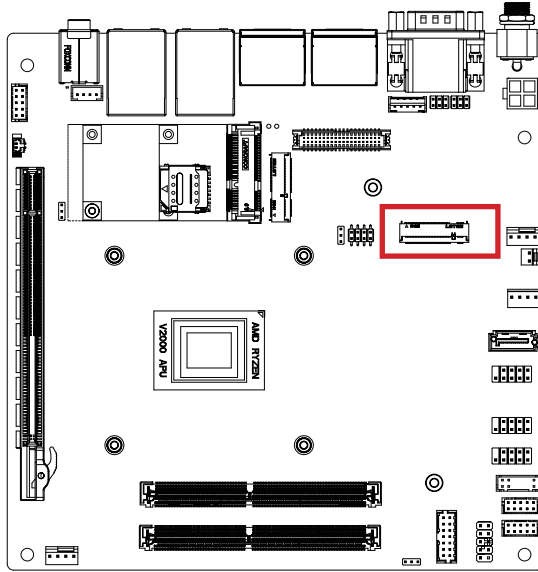


| JCOM1, JCOM2 Jumper | |
|---------------------|---------------------------------------|
| | 1-2 Close: 5V (Power COM) |
| | 3-4 Close: RI (Stand COM)(Default) |
| | 5-6 Close: 12V (Power COM) |

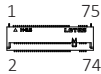
| Connector PN | Vendor |
|---------------|-----------|
| 220-97-03GB01 | PINREX |
| PH06N53BAZ000 | HORNGTONG |

2.2.31 M2M (M.2 M-key NGFF 2280)

33



M.2 M Key Connector



| Pin No. | Definition | Pin No. | Definition |
|---------|------------|---------|------------|
| 1 | GND | 2 | 3.3V |
| 3 | GND | 4 | 3.3V |
| 5 | NC | 6 | NC |
| 7 | NC | 8 | NC |
| 9 | GND | 10 | SSD LED |
| 11 | NC | 12 | 3.3V |
| 13 | NC | 14 | 3.3V |
| 15 | GND | 16 | 3.3V |
| 17 | NC | 18 | 3.3V |
| 19 | NC | 20 | NC |
| 21 | GND | 22 | NC |
| 23 | NC | 24 | NC |
| 25 | NC | 26 | NC |
| 27 | GND | 28 | NC |
| 29 | PCIe1 RXn | 30 | NC |
| 31 | PCIe1 RXp | 32 | NC |
| 33 | GND | 34 | NC |
| 35 | PCIe2 TXn | 36 | NC |

| Pin No. | Definition | Pin No. | Definition |
|---------|-------------------|---------|--------------------|
| 37 | PCIe2 TXp | 38 | DEVS LP |
| 39 | GND | 40 | SMB Clock |
| 41 | PCIe0 RXn/SATA Bp | 42 | SMB Data |
| 43 | PCIe0 RXp/SATA Bn | 44 | SMB Alert |
| 45 | GND | 46 | NC |
| 47 | PCIe0 TXn/SATA An | 48 | NC |
| 49 | PCIe0 TXp/SATA Ap | 50 | PCI Reset |
| 51 | GND | 52 | PCIe Clock Request |
| 53 | PCIe Clock n | 54 | PCIe Wake# |
| 55 | PCIe Clock p | 56 | NC |
| 57 | GND | 58 | NC |

| Pin No. | Definition | Pin No. | Definition |
|---------|------------|---------|------------|
| 67 | NC | 68 | SUSCLK |
| 69 | Detect | 70 | 3.3V |
| 71 | GND | 72 | 3.3V |
| 73 | GND | 74 | 3.3V |
| 75 | GND | | |

| Connector PN | Vendor |
|------------------|---------|
| 2E0BC41-C85CM-LH | FOXCONN |

Chapter 3

Chapter 3 – BIOS

3.1 Introduction

BIOS (Basic input/output system) provides hardware detailed information and boot-up options, which include firmware to control, set-up and test all hardware settings. Therefore, BIOS is the communication bridge between OS/application software and hardware.

3.1.1 How to Entering into BIOS menu

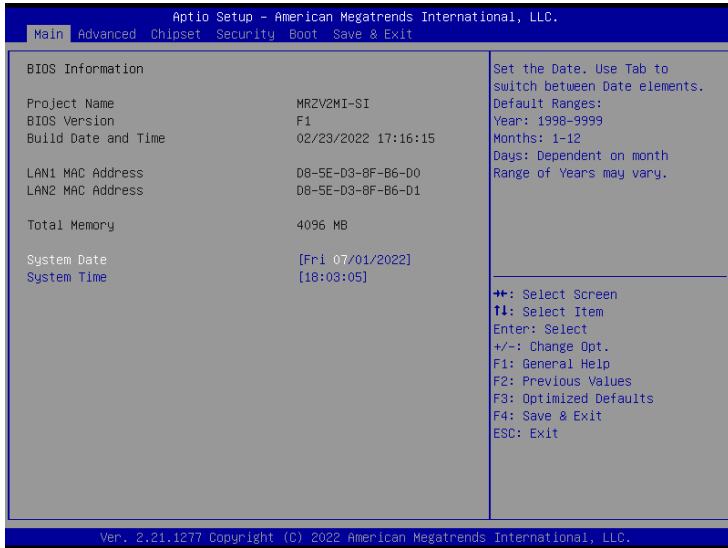
Once the system is power on, press the key as soon as possible to access into BIOS Setup program.

3.1.2 Function Keys to setup in BIOS Setup program

| Function keys | Description |
|---------------|--|
| →← | Select Screen |
| ↑↓ | Select Item |
| Enter | Execute command or enter the submenu |
| + | Increase the numeric value or make changes |
| — | Decrease the numeric value or make changes |
| F1 | General Help |
| F2 | Previous Values |
| F3 | Load Optimized Defaults Settings |
| F4 | Save changes & Exit the BIOS Setup program |
| ESC | Exit the BIOS Setup program |

3.2 The Main Menu

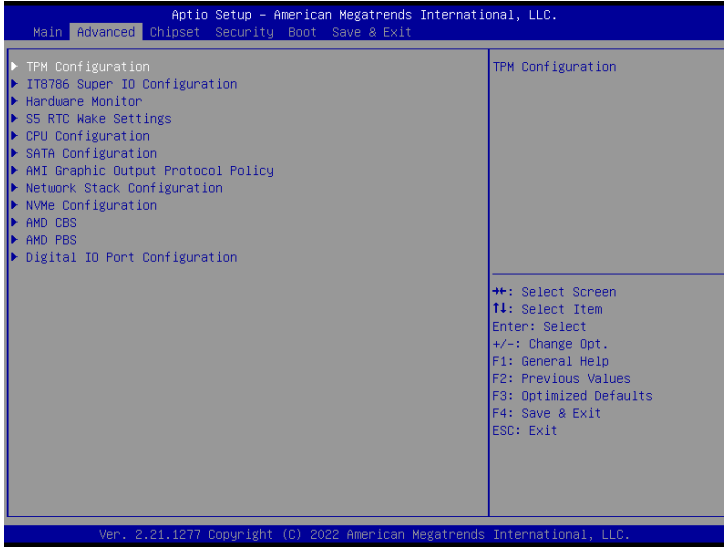
The main menu shows the basic system information. Use arrow keys to move among the items.



| Items | Description |
|----------------------------|---|
| Project Name | Shows Project name information |
| BIOS Version | Shows the BIOS version of the system |
| Build Date and Time | Shows the Build Date and Time when the BIOS was created. |
| LAN1 MAC Address | Shows LAN1 MAC Address information |
| LAN2 MAC Address | Shows LAN2 MAC Address information |
| Total Memory | Shows the total memory size of the installed memory |
| System Date | Set the Date for the system (Format : Week - Month - Day - Year) |
| System Time | Set the time for the system (Format : Hour - Minute - Second) |

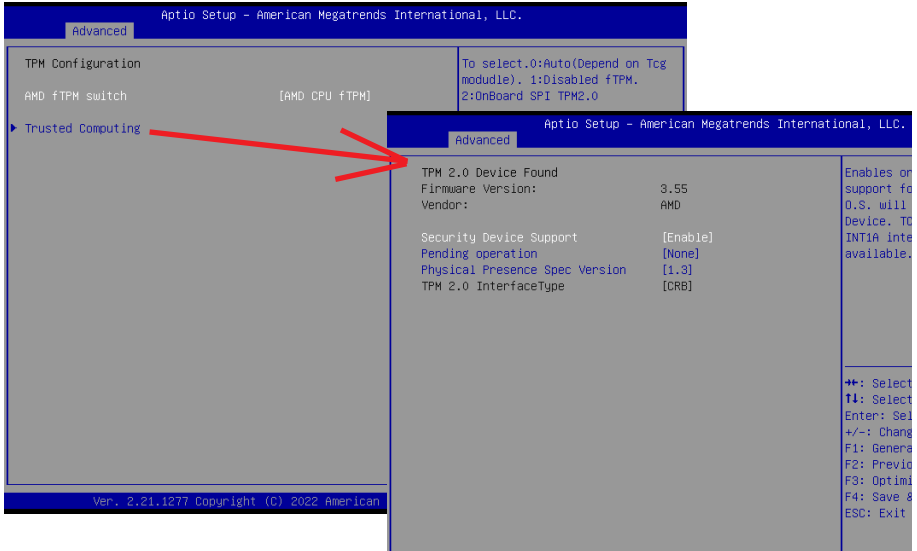
3.3 Advanced

The Advanced menu is to configure the functions of hardware settings through submenu. Use arrow keys to move among the items, and press <Enter> to access into the related submenu.



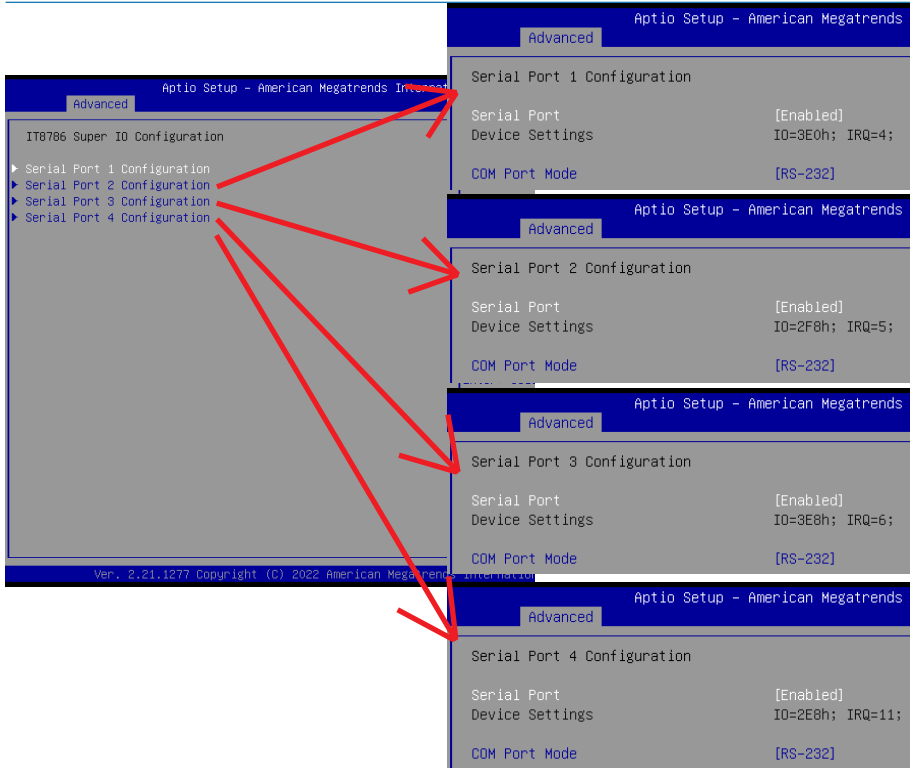
3.3.1 TPM Configuration

Use TPM Configuration submenu to choose TPM interface.



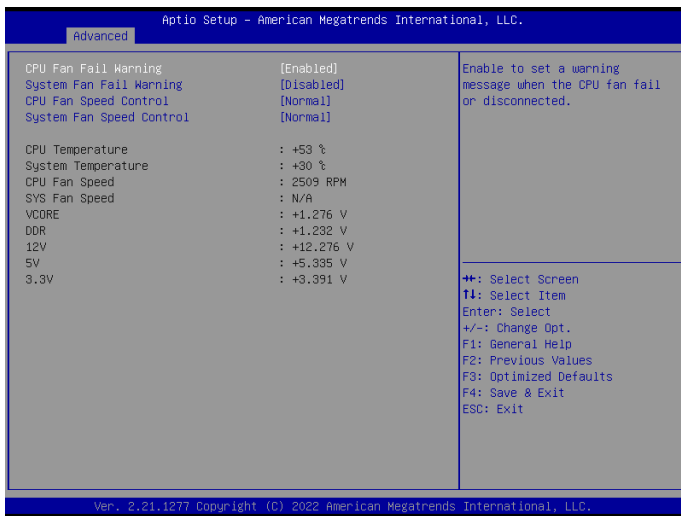
| Item | Description |
|--------------------------|--|
| AMD fTPM switch | AMD CPU fTPM : Enables AMD CPU firmwarm TPM (Default setting) Route to LPC TPM : Enables to route to LPC TPM |
| Trusted Computing | Security Device Support : Enabled : Enables TPM feature (Default setting) Disabled : Disables TPM feature Pending operation : None : No execution will be conducted (Default setting) TPM clear : Set to clear data on TPM Physical Presence Spec Version : Choose PPI spec version Option items : 1.2 or 1.3 (Default setting) |

3.3.2 IT8786 Super IO Configuration



| Item | Description |
|------------------------------------|--|
| Serial Port 1 Configuration | Press [Enter] to configure advanced items : |
| Serial Port 2 Configuration | Serial Port : Enabled : Enables allows you to configure the serial port settings Disabled : if Disabled, displays no configuration for the serial port |
| Serial Port 3 Configuration | Device settings : Display the specified Serial Port base I/O address and IRQ |
| Serial Port 4 Configuration | Mode : Choose RS-232, RS-422, or RS-485 feature |

3.3.3 Hardware Monitor



| Item | Description |
|---------------------------------|--|
| CPU Fan Fail Warning | Enabled : Enables CPU FAN Fail warning alert function (Default setting) Disabled : Disables CPU FAN Fail warning alert function |
| System Fan Fail Warning | Enabled : Enables CPU FAN Fail warning alert function Disabled : Disables CPU FAN Fail warning alert function (Default setting) |
| CPU Fan Speed Control | Normal : Fan speed set by BIOS default (Default setting) Full Speed : Set Fan operates at full speed |
| System Fan Speed Control | Normal : Fan speed set by BIOS default (Default setting) Full Speed : Set Fan operates at full speed |
| CPU temperature | Shows current CPU temperature |
| System temperature | Shows current system temperature |
| CPU Fan Speed | Shows current CPU Fan speed |
| SYS Fan Speed | Shows current system fan speed |

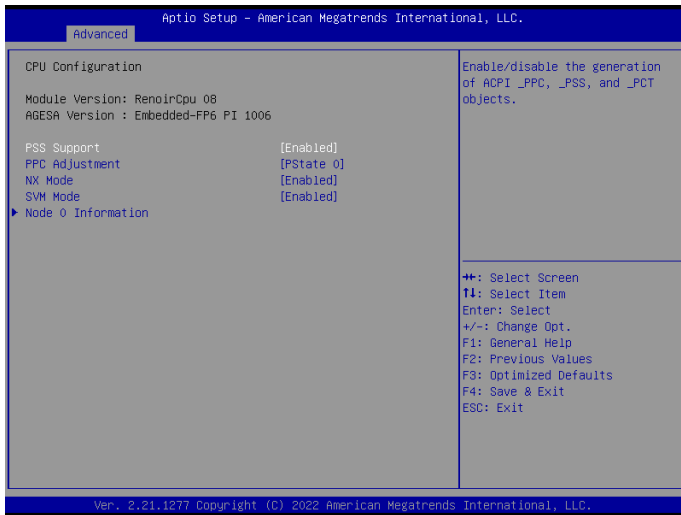
3.3.4 S5 RTC Wake Settings



| Item | Description |
|-----------------------------------|--|
| <p>Wake system from S5</p> | <p>Enable or Disable System to wake on a specific time. Disabled : Disables system to wake on a specific time (Default setting) Fixed Time : Enables system to wake on a specific time (Format : hr : min : sec)</p> |

3.3.5 CPU Configuration

This submenu shows detailed CPU informations.

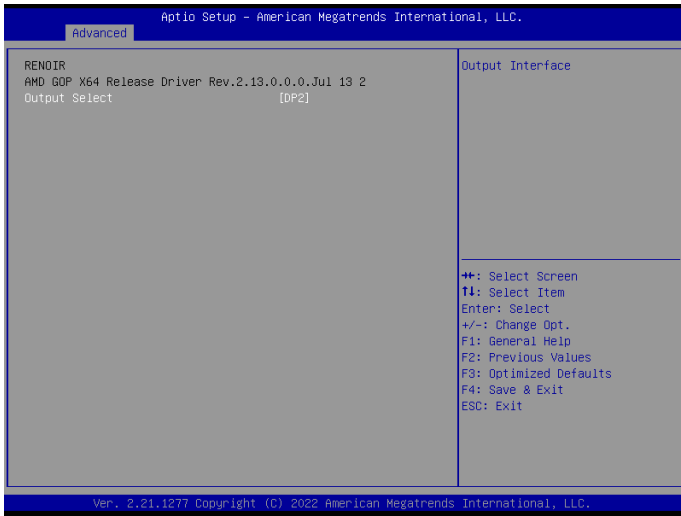


| Item | Description |
|---------------------------|--|
| PSS Support | Allows you to get PState information Enabled : Enables to get PState information (Default setting) Disabled : Disables to get PState information |
| PPC Adjustment | To adjust the PState of the CPU Option items : PState 0 (Default setting), PState 1, PState 2 |
| NX Mode | Enables or Disables the No-execute page-protection function. Enabled : Enables Turbo Mode (Default setting) Disabled : Disables Turbo Mode |
| SVM Mode | Enables or Disables the CPU virtualization funtion. Enabled : Enables SVM Mode (Default setting) Disabled : Disables SVM Mode |
| Node 0 Information | Shows AMD CPU information |

3.3.6 SATA Configuration

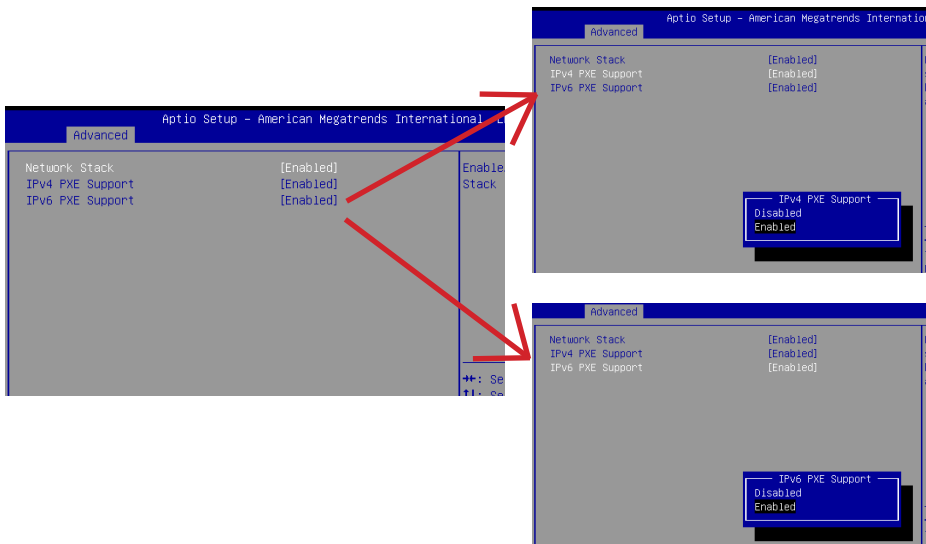


3.3.7 AMI Graphic Output Protocol Policy



| Item | Description |
|----------------------|--|
| Output Select | Choose default monitor output when there are more than one monitor plugged on the motherboard. |

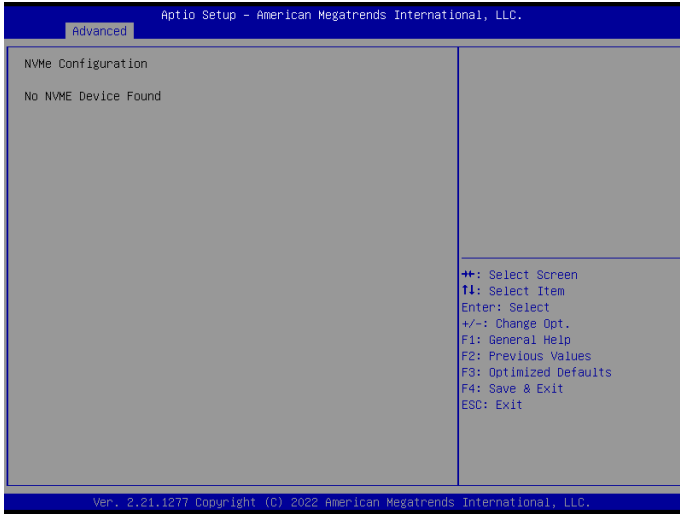
3.3.8 Network Stack Configuration



| Item | Description |
|-------------------------|---|
| Network Stack | When system is power on, install LAN driver under UEFI mode Disabled : Disables UEFI Network Stack (Default setting) Enabled : Enables UEFI Network Stack |
| Ipv4 PXE Support | When Network stack is enabled : Disabled : Disables Ipv4 PXE Support Enabled : Enables Ipv4 PXE Support |
| Ipv6 PXE Support | When Network stack is enabled : Disabled : Disables Ipv6 PXE Support Enabled : Enables Ipv6 PXE Support |

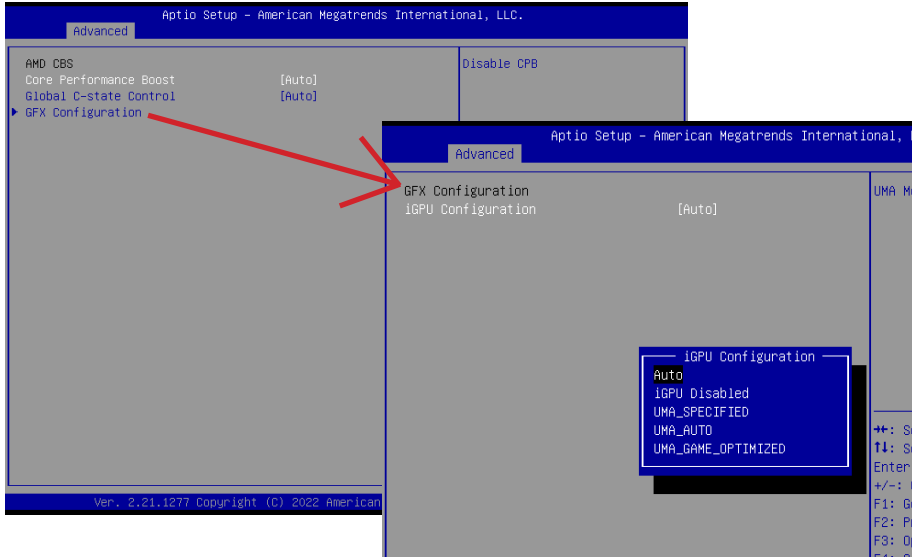
3.3.9 NVMe Configuration

NVMe Configuration shows information when your M.2 NVMe PCIe SSD is installed.



3.3.10 AMD CBS

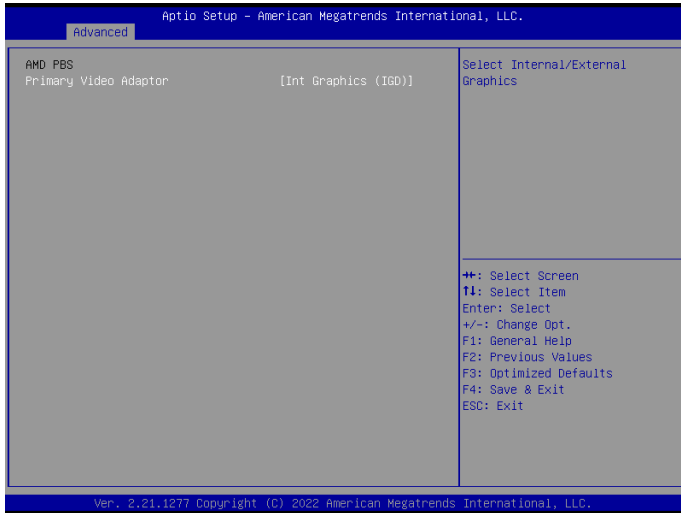
For AMD CPU function settings.



| Item | Description |
|-------------------------------|---|
| Core Performance Boost | To let CPU transits to a higher frequency. Disabled : Disables Core Performance Boost Auto : System will automatically allocate its' frequency (Default setting) |
| Global C-state Control | Command CPU to enter into low power consumption mode when CPU is under idle mode. Disabled : Disables Global C-state Control function Enabled : Enables Global C-state Control function Auto : System will automatically enter into power saving mode (Default setting) |
| GFX Configuration | For AMD CPU internal graphic setting Option items : Auto (Default setting), iGPU Disabled, UMA_SPECIFIED, UMA_AUTO, UMA_GAME_OPTIMIZED |

3.3.11 AMD PBS

To choose using internal graphic or external graphic let BIOS Menu display on the monitor.



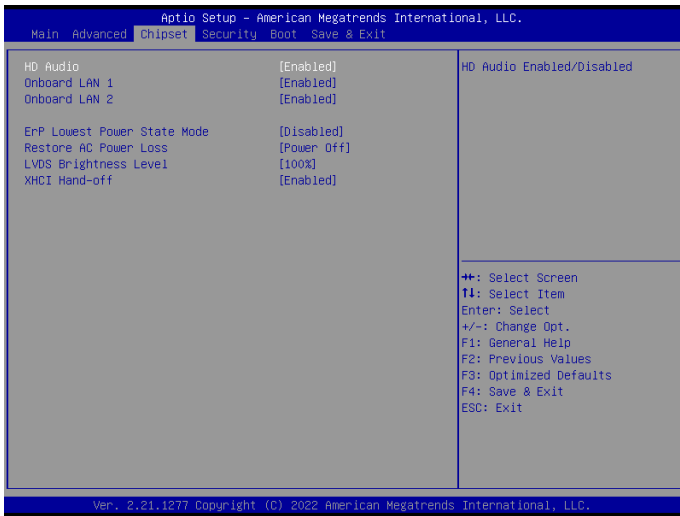
| Item | Description |
|-----------------------|--|
| Primary Video Adaptor | Select to use internal or external graphic. Int Graphics (IGD) : Internal Graphic (Default setting) Ext Graphics (PEG) : External Graphics |

3.3.12 Digital IO Port Configuration



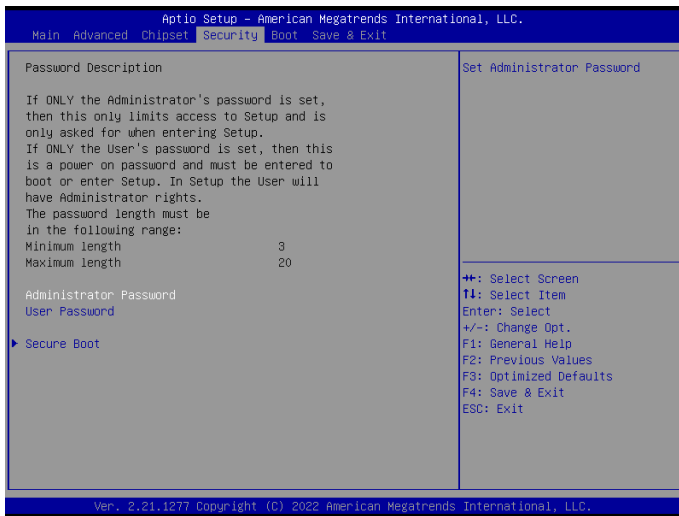
| Item | Description |
|---|--|
| OS control Digital IO | <p>Disabled : If Digital IO Output value/level is modified in OS, they will not be memorized and kept. (Default setting)</p> <p>Enabled : If Digital IO Output value/level is modified in OS, they will be memorized and kept.</p> |
| <p>SOGPO_1 (Pin 1)</p> <p>SOGPI_1 (Pin 2)</p> <p>SOGPO_2 (Pin 3)</p> <p>SOGPI_2 (Pin 4)</p> <p>SOGPO_3 (Pin 5)</p> <p>SOGPI_3 (Pin 6)</p> <p>SOGPO_4 (Pin 7)</p> <p>SOGPI_4 (Pin 8)</p> | Configure Digital IO Input or Output values for each pin. |

3.4 Chipset



| Item | Description |
|--|--|
| HD Audio | Enable/Disable onboard audio controller Enabled : Enables onboard audio controller (Default setting) Disabled : Disables onboard audio controller |
| Onboard LAN1 Onboard LAN2 | Enable/Disable onboard LAN controller Enabled : Enables onboard LAN controller (Default setting) Disabled : Disables onboard LAN controller |
| ErP Lowest Power State Mode | Enable/Disable power saving funtion Enabled : Enables ERP Lowest Power State Mode Disabled : Disabled ERP Lowest Power State Mode (Default setting) |
| Restore AC Power Loss | To set which option the system should returns if a sudden power loss occurred Power on : System power on when the power is back Power off : Do not power on when the power is back (Default setting) Last state : Restore the system to the state before power loss occurs |
| LVDS Brightness level | To modified the backlight brightness of the LVDS panel Option items : 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%, 100% (Default Setting) |
| XHCI Hand-off | Enable/Disable XHCI Hand-off function Enabled : Enables XHCI Hand-off function (Default setting) Disabled : Disables XHCI Hand-off function |

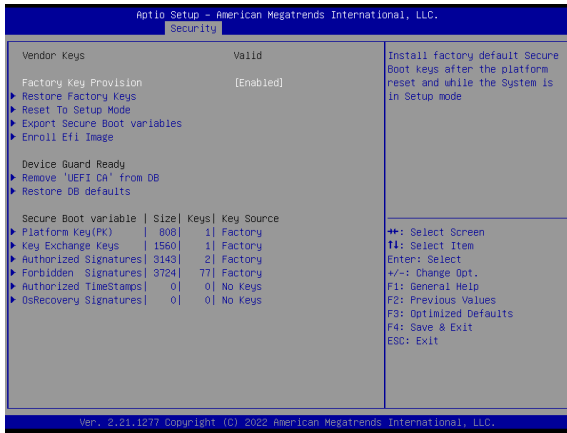
3.5 Security



| Item | Description |
|-------------------------------|---|
| Administrator Password | To set up Administrator's password Minimum length : 3 Maximum length : 20 |
| User Password | To set up User's password Minimum length : 3 Maximum length : 20 |
| Secure Boot | Press <Enter> to configure the advanced items |



| Item | Description |
|-----------------------------|--|
| Secure Boot | Secure Boot requires all the applications that are running during the booting process to be pre-signed with valid digital certificates Enabled : Enables Secure Boot function Disabled : Disables Secure Boot function (Default setting) |
| Secure Boot Mode | Standard : Standard mode Custom : Custom mode (Default setting) |
| Restore Factory Keys | To restore factory settings Yes : Agree to restore factory settings No : Cancel to restore factory settings |
| Reset To Setup Mode | Yes : Agree to setup mode No : Cancel to setup mode |
| Key Management | Enables expert users to modify Secure boot policy variables without full authentication Press <Enter> to configure the advanced items |

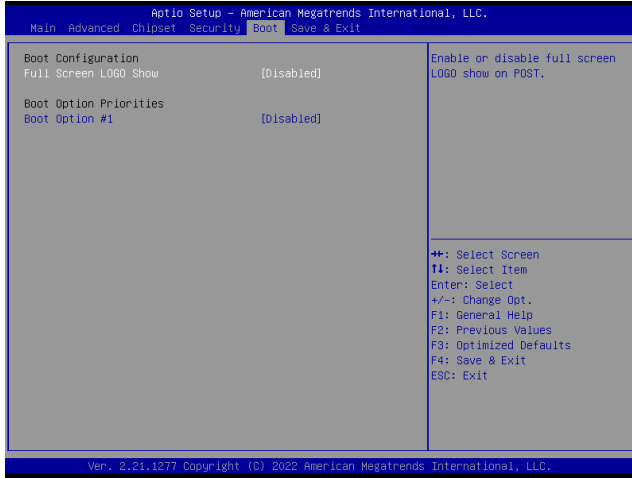


| Item | Description |
|-------------------------------------|---|
| Factory Key Provision | Install factory default Secure Boot keys after the platform reset and while the system is in Setup mode Enabled : Enables Factory Key Provision (Default setting) Disabled : Disables Factory Key Provision |
| Restore Factory Keys | To restore factory settings Yes : Agree to restore factory settings No : Cancel to restore factory settings |
| Reset To Setup Mode | Yes : Agree to setup mode No : Cancel to setup mode |
| Export Secure Boot variables | Copy NVRAM content of Secure Boot variables to files in a root folder on a file system device |
| Enroll Efi Image | Allow the image to run in Secure Boot mode |
| Remove 'UEFI CA' from DB | To remove 'UEFI CA' from database Yes : Agree to remove 'UEFI CA' from database No : Cancel to remove 'UEFI CA' from database |
| Restore DB defaults | Restore DB variables to factory defaults Yes : Agree to restore DB defaults No : Cancel to restore DB defaults |

| Item | Description |
|------------------------------|---|
| Platform Key (PK) | These items allows you to enroll factory defaults or load Certificates from a file. |
| Key Exchange Keys | |
| Authorized Signatures | |
| Forbidden Signatures | |
| Authorized TimeStamps | |
| OsRecovery Signatures | |

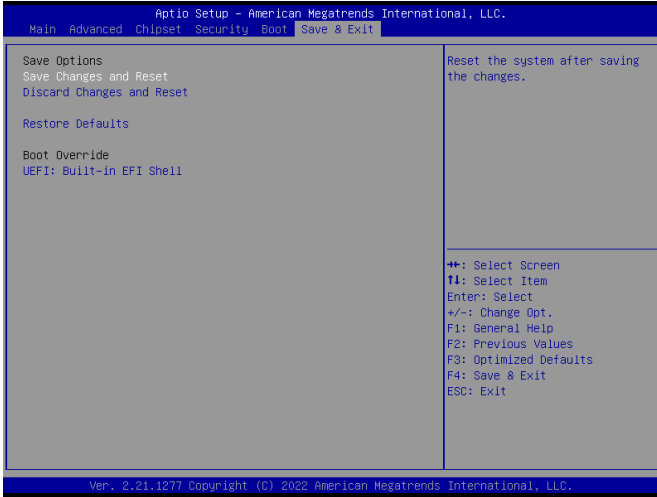
3.6 Boot

This Boot menu allows you to set/change system boot options



| Item | Description |
|-----------------------|---|
| Full Screen LOGO Show | Enable/Disable full screen LOGO show on POST screen Enabled : Enables Full screen LOGO Show on POST screen Disabled : Disables Full screen LOGO Show on POST screen (Default setting) |
| Boot Option #1 | Shows the information of the storage that be installed in the system Choose/set the boot priority |

3.7 Save & Exit



| Item | Description |
|----------------------------------|---|
| Save Changes and Reset | After configuring all the options that you wish to change, choose this option to save all the changes and reboot the system Yes : Agree to save and reset No : Cancel to save and reset |
| Discard Changes and Reset | Choose this option to reboot the system without saving any changes Yes : Agree to discard changes and reset No : Cancel to discard changes and reset |
| Restore Defaults | Restore/Load default values for all the setup options Yes : Agree to load optimized defaults No : Cancel to load optimized defaults |
| Boot Override | Boot override |