MPT-7100V

In-Vehicle Computer System with WWAN Redundancy

User Manual

Version 1.0
June 2025

iBASE

Compliance

CE

This product has passed CE tests for environmental specifications and limits. This product is in accordance with the directives of the Union European (EU). If users modify and/or install other devices in this equipment, the CE conformity declaration may no longer apply.

FC

This product has been tested and found to comply with the limits for a Class B device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications.

WEEE

This product must not be disposed of as normal household waste, in accordance with the EU directive of for waste electrical and electronic equipment (WEEE - 2012/19/EU). Instead, it should be disposed of by returning it to a municipal recycling collection point. Check local regulations for disposal of electronic products.

Green IBASE

This product is compliant with the current RoHS 2 restrictions and prohibits use of the following substances in concentrations exceeding 0.1% by weight (1000 ppm) except for cadmium, limited to 0.01% by weight (100 ppm).

- Hexavalent chromium: 1,000 ppm
- Polybrominated biphenyls (PBBs): 1,000 ppm
- Polybrominated diphenyl ethers (PBDEs): 1,000 ppm
- Cadmium: 100 ppm
- Mercury: 1,000 ppm
- Lead: 1,000 ppm
- Bis(2-ethylhexyl) phthalate (DEHP): 1,000 ppm
- Butyl benzyl phthalate (BBP): 1,000 ppm
- Dibutyl phthalate (DBP): 1,000 ppm
- Diisobutyl phthalate (DIBP): 1,000 ppm

Important Safety Information

Carefully read the precautions before using the device.

Environmental conditions:

- Lay the device horizontally on a stable and solid surface in case the device may fall, causing serious damage.
- Leave plenty of space around the device and do not block the openings for ventilation. NEVER DROP OR INSERT ANY OBJECTS OF ANY KIND INTO THE VENTILATION OPENINGS.
- Slots and openings on the chassis are for ventilation. Do not block or cover these openings. Make sure you leave plenty of space around the device for ventilation. NEVER INSERT OBJECTS OF ANY KIND INTO THE VENTILATION OPENINGS.

Care for your IBASE products:

- Before cleaning the device, turn it off and unplug all cables such as power in case a small amount of electrical current may still flow.
- Use neutral cleaning agents or diluted alcohol to clean the device chassis with a cloth. Then wipe the chassis with a dry cloth.
- Vacuum the dust with a computer vacuum cleaner to prevent the air vent or slots from being clogged.

WARNING

Attention during use:

- Do not use this product near water.
- Do not spill water or any other liquids on your device.
- Do not place heavy objects on the top of the device.
- Operate this device from the type of power indicated on the marking label. If you are not sure of the type of power available, consult your distributor or local power company.
- Do not walk on the power cord or allow anything to rest on it.
- If you use an extension cord, make sure that the total ampere rating of the product plugged into the extension cord does not exceed its limits.

Avoid Disassembly

You are not suggested to disassemble, repair or make any modification to the device. Disassembly, modification, or any attempt at repair could generate hazards and cause damage to the device, even bodily injury or property damage, and will void any warranty.

CAUTION

Danger of explosion if internal lithium-ion battery is replaced by an incorrect type. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Warranty Policy

- **IBASE standard products:**

  24-month (2-year) warranty from the date of shipment. If the date of shipment cannot be ascertained, the product serial numbers can be used to determine the approximate shipping date.

- **3rd-party parts:**

  12-month (1-year) warranty from delivery for the 3rd-party parts that are not manufactured by IBASE, such as CPU, memory, SSD/HDD, power adapter, panel and touchscreen.

✳ *Products that fails due to misuse, accident, improper installation or unauthorized repair shall be treated as out of warranty and customers shall be billed for repair and shipping charges.*

Technical Support & Services

1. Visit the IBASE website at www.ibase.com.tw to find the latest information about the product.
2. If you need any further assistance from your distributor or sales representative, prepare the following information of your product and elaborate upon the problem.
   - Product model name
   - Product serial number
   - Detailed description of the problem
   - The error messages in text or in screenshots if there is any
   - The arrangement of the peripherals
   - Software in use (such as OS and application software, including the version numbers)
3. If repair service is required, you can download the RMA form at the website of IBASE. Fill out the form and contact your distributor or sales representative.

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Chapter 1
General Information

The information provided in this chapter includes:

- Features
- Packing List
- Specifications
- Product View
- Dimensions

1.1 Introduction

1.2 Features

- Robust M12 & FAKRA connectors with rich I/O interface
- Dual SIM sockets support WWAN redundancy
- Onboard isolated CAN 2.0A / 2.0B / CAN-FD
- Full car battery Ignition power control
- Two removable 2.5” device bay for SSD storage
- Rich I/O for wireless, SSD, GPS, WWAN and add-on card expansion
- Wide-range voltage GPIO interface
- 1x USB Type-C Alternate mode with PD 60W
- Fanless and ruggedized design

1.3 Packing List

Your MPT-7100V package should include the items listed below.

Item	Q'ty	IBASE P/N
MPT-7100V	1	- -
Manual @ Driver download instruction		D2MANUAL--0000100P
Wall Mounting Bracket	2	H06MTMPT7100V000AP
GPIO Matching Connector (Dinkle terminal block, 10 pins)	1	C1216ECH311003100P
CAN BUS Matching Connector (Dinkle terminal block, 6 pins)	1	C1216ECH306103100P
Wall Mounting Bracket Screw	4	H02306110122001N0P

1.4 Optional Accessories

Item	IBASE P/N
LAN cable: M12 X-Code to RJ45 CAT-6 (up to 2.5GbE)	C501LAN8208A32000P
LAN cable: M12 X-Code to RJ45 CAT-5 (up to 1.0GbE)	C501LAN6300A32000P
Fuse	C2309001151058100P

1.5 Specifications

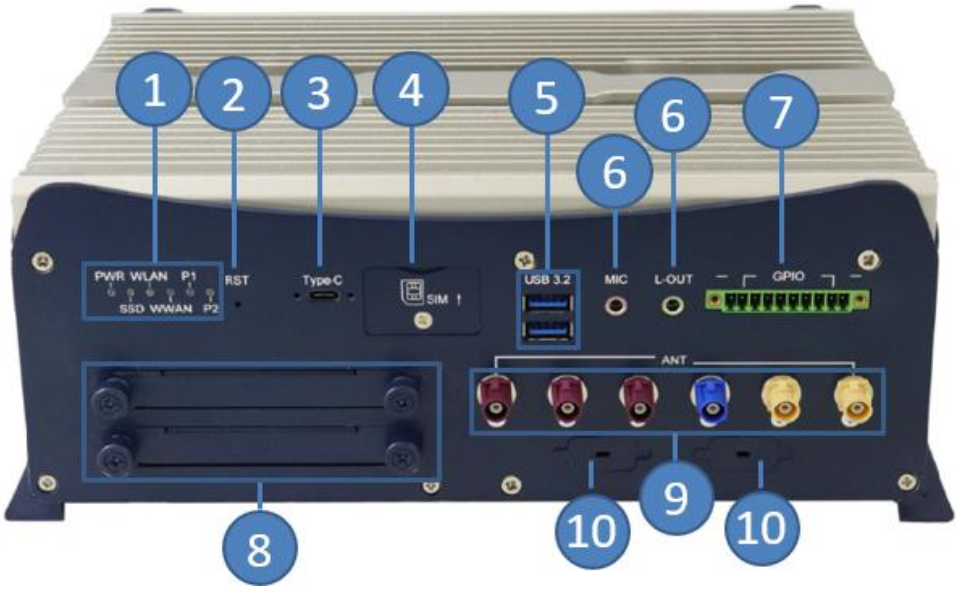
Product Name	MPT-7100V
System	
Motherboard	MBT-7101V
CPU	13th Gen Intel® Core U-Series Processor
Speed	Up to 3.0GHz
Memory	2x 8GB DDR5-5200 SO-DIMM (Dual Channel)
Front Panel External I/O	• 2x USB3.2 Gen2 stack Type-A connector • 2x External accessible SIM socket • 1x USB Type-C connector with screw-lock • 2x Removable 2.5“ SSD device bay • 1x 3.5mm green color audio for Line-out • 1x 3.5mm pink color audio for MIC-in • 1x Reset button • 1x 10-pin terminal block for isolated digital I/O • 6x FAKRA antenna holes (optional SMA type) • 6x Light-pipe for status LED indicators (2x programmable)
Rear Panel External I/O	• 2x M12 X-code 8P female for 2.5 GbE LAN1/LAN2 • 2x USB 2.0 Type-A connector • 1x 3-pin terminal block for DC-input • 1x DisplayPort output 1x DVI-D connector, 1 x VGA connector • 1x 6-pin terminal block for 2x isolated CAN bus • 2x DB9M for COM#1 (RS232/422/485) / COM#2 (RS232 only) • 1x Removable blade fuse holder • 4x Light-pipe for LAN status LED indicators • 1x PCI-E (x4) slot • 1x M3 with washer screw hole for grounding connection
Storage	• 1x M.2 2280 M-Key socket for NVMe SSD (PCI-E x4 [Gen.4]) • 2x 2.5“ removable device bay for SSD

Expansion slots	• 1x M.2 2230 E-Key socket for WLAN & BT connection (PCI-E + USB2.0 + SMBus). • 1x M.2 3042/52 B-Key socket for WWAN (4G/5G) connection (PCI-E + USB3.2 + SMBus). • 1x M.2 2280 M-Key socket for NVMe SSD / Hailo AI module (PCI-E x4 [Gen.4]) • 1x Mini PCI-E full-sized socket for MVB/CAN FD module (PCI-E + USB2.0 + SMBus) • 1x Mini PCI-E half-sized socket (USB 2.0)
Power Supply	9V~36V DC input
Construction	Aluminum
Chassis Color	Silver & Blue
Mounting	Wall mounting
Dimensions	256.0 (W) x 182.0 (D) x 97.3 (H) mm 10.08” (W) x 7.17” (D) x 3.83” (H)
Operating System	• Windows 10 (64-bit) • Windows Embedded Standard 7 (64-bit) • Linux Kernal 3.8.0 or above (64-bit)
Environmental	
Operating Temperature	-40°C ~70°C (-40°F~158°F) (w/o fan & SSD) -20°C ~55°C (-4°F~131°F) (w/ PCI-E card)
Storage Temperature	-40°C ~ 85°C (-40°F~185°F)
Relative Humidity	10 ~ 95% RH @45°C (non-condensing)
Vibration	Operating/Non-operating (SSD): 2,26 Grms (5~500 Hz) / MIL-STD-810H, composite wheeled condition (Z-axis only)
Shock	Operating: Sawtooth: 20G, 11msec (Z-axis) /MIL-STD 810H, Non-operating: Sawtooth: 40G, 11 msec (Z-axis) / MIL-STD-810H

All specifications are subject to change without prior notice.

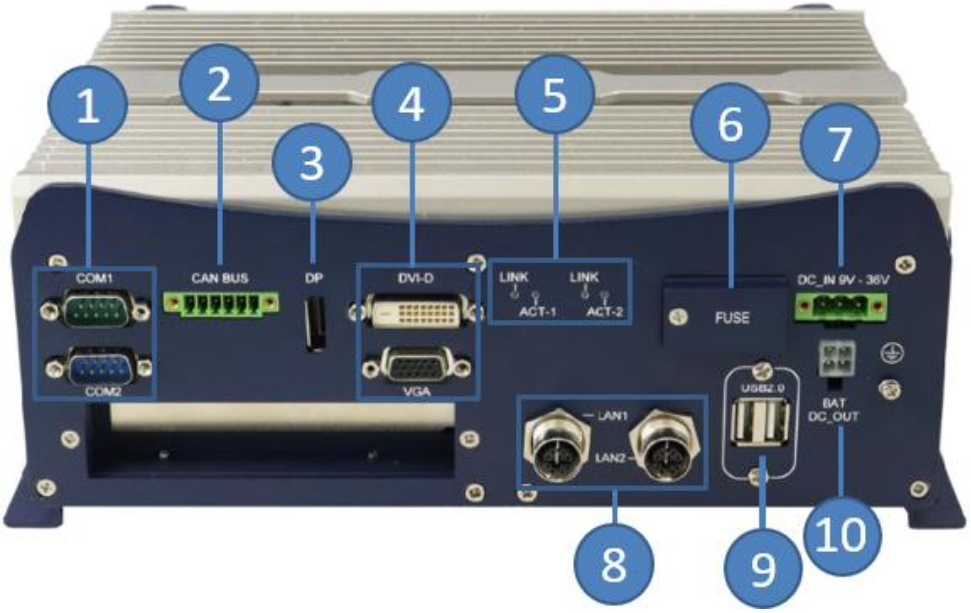
1.6 System View

Front View



No.	Name	No.	Name
1	LED for PWR, SSD, WLAN,WWAN, P1 & P2	6	Microphone and Line-Out
2	Reset Button	7	GPIO Connector
3	USB Type-C Connector	8	Removable SSD Drive Bays
4	Dual SIM Card Socket	9	Antenna Holes
5	USB 3.2 Connectors	10	Reserved Space for DB9

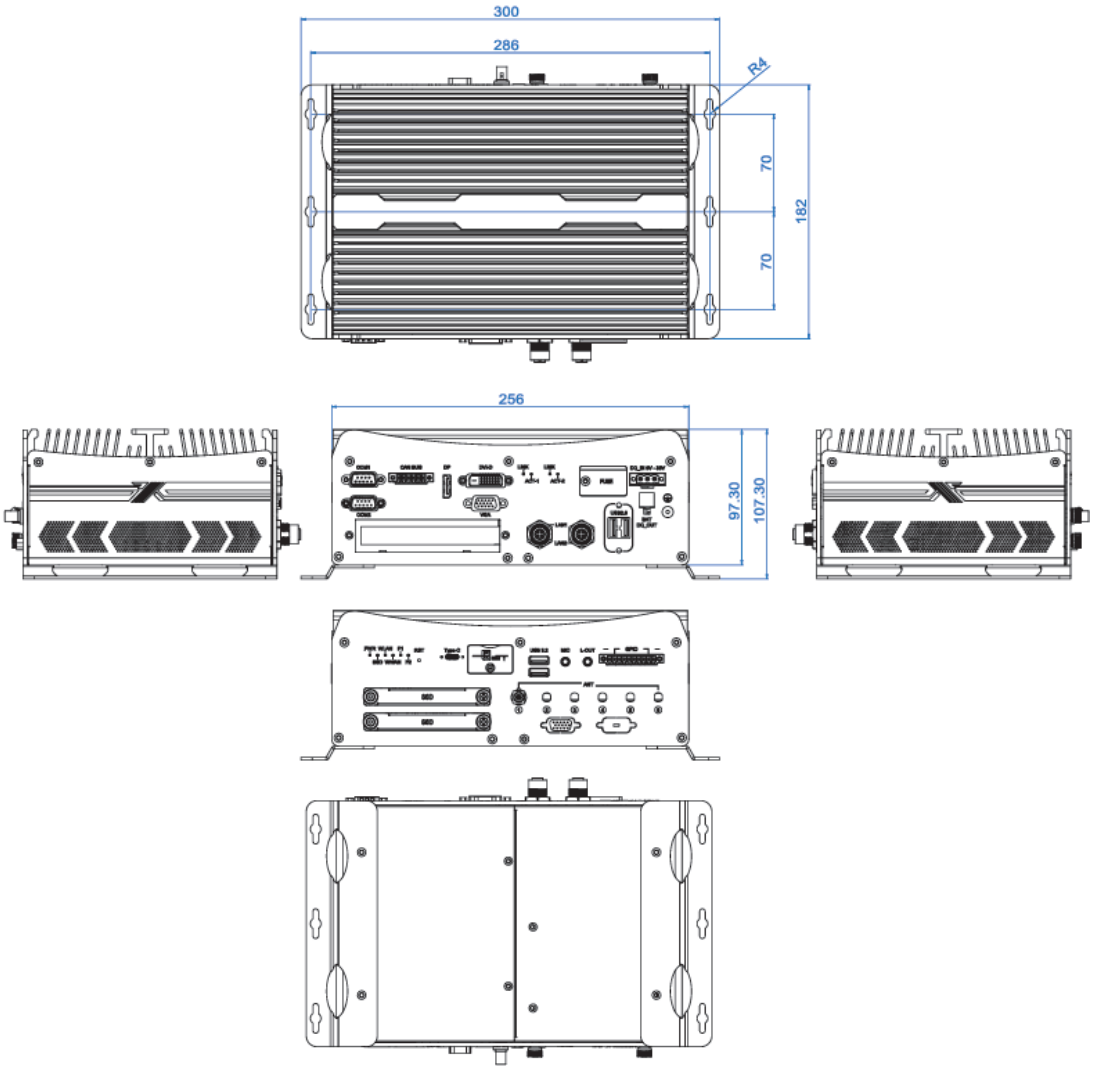
Rear View



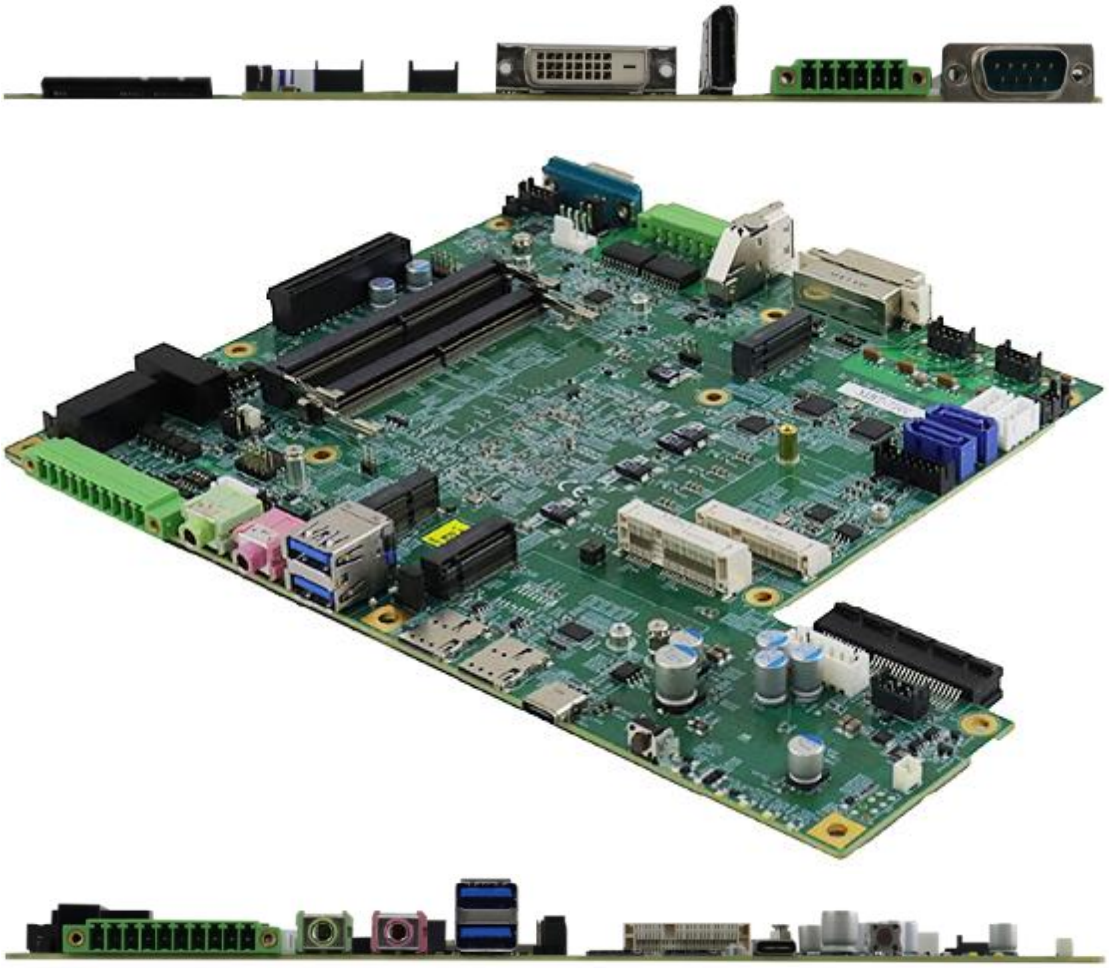
No.	Name	No.	Name
1	COM1 & COM2 Connector	6	Fuse holder
2	CAN Bus	7	DC_IN 9V~36V
3	DisplayPort	8	LAN1 and LAN2 in (M12)
4	DVI-D and VGA Connector	9	USB 2.0 Ports
5	LINK and ACT LEDs for LAN Ports	10	UPS Battery / DC 12V Output

1.7 System Dimensions

Unit: mm

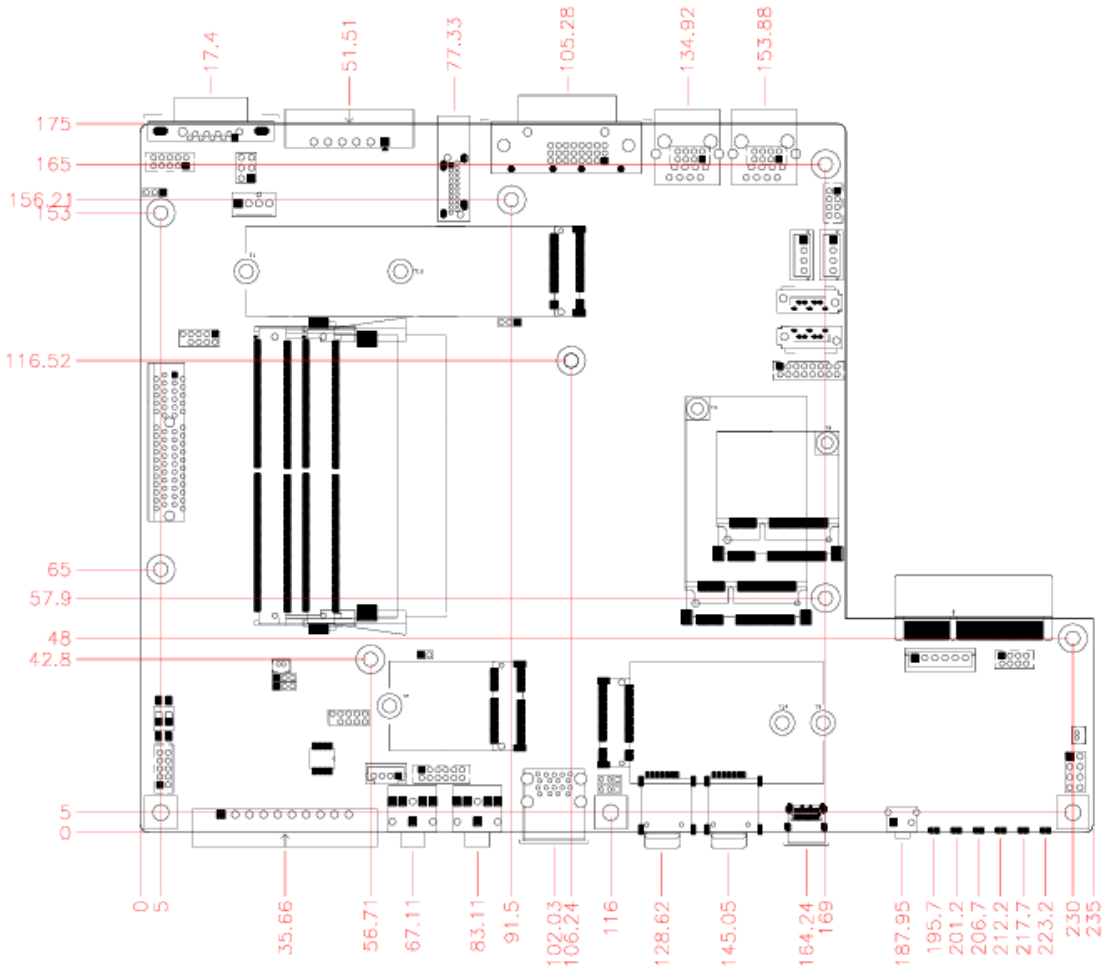


1.8 Board View



1.9 MBT-7101 Board Dimensions

Unit: mm



Chapter 2
Hardware Configuration

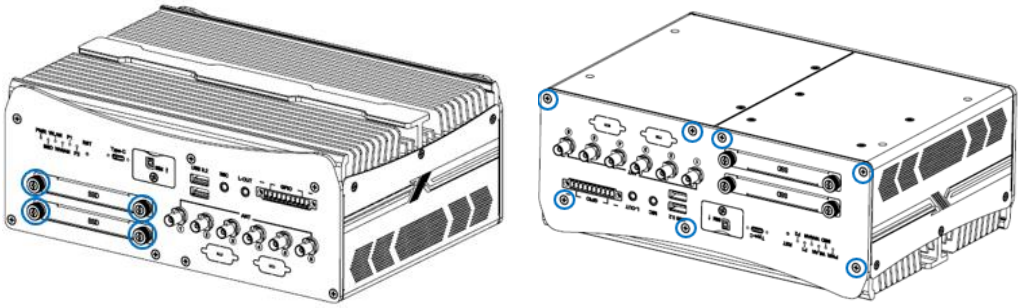
The information provided in this chapter includes:

- Essential installations
- Information and locations of connectors

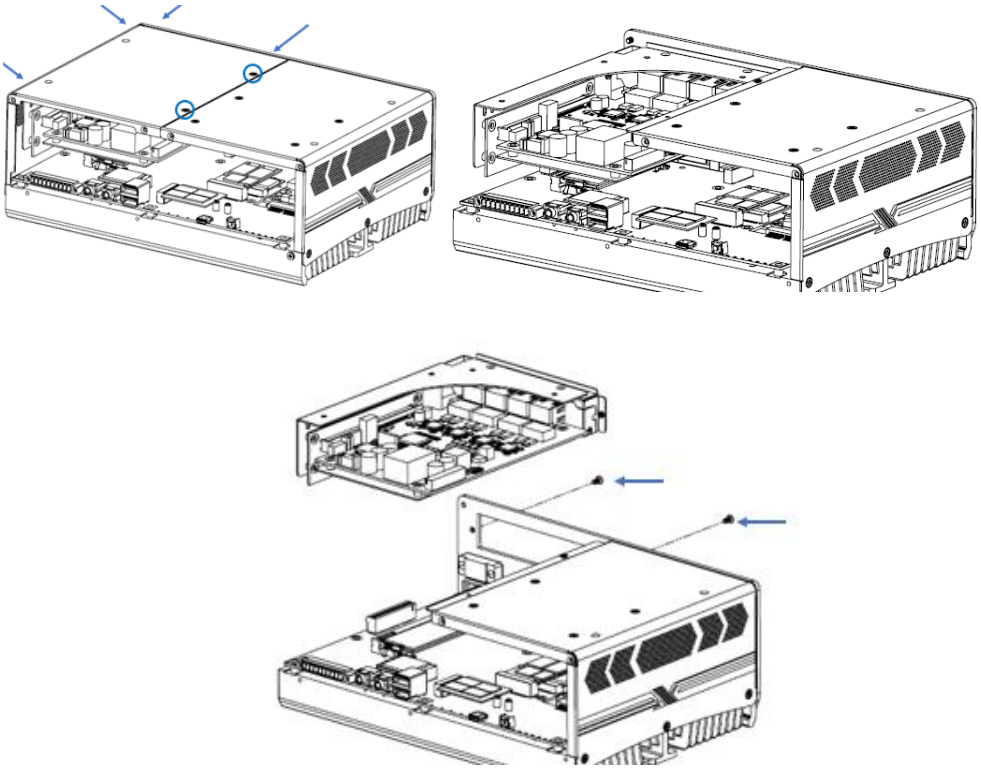
2.1 Essential Installations

When installing memory modules, M.2 cards or other components in the system, first **remove the relevant screws** to access the designated area. Carefully **detach the existing component** if applicable, and **replace it with the new one**, ensuring proper alignment. Once the installation is complete, **secure the component by fastening the screws back in reverse order** of removal.

1. Loosen the 4 screws locking the SSD trays and pull the trays out, then turn the MPT-7100V upside down and remove the screws as shown in the image to remove the front I/O cover.

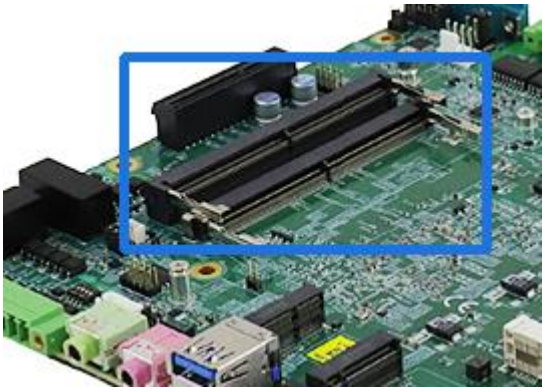


2. Release the following 6 screws to half open the bottom cover, then remove the two screws at the back to expose the components to be replaced..



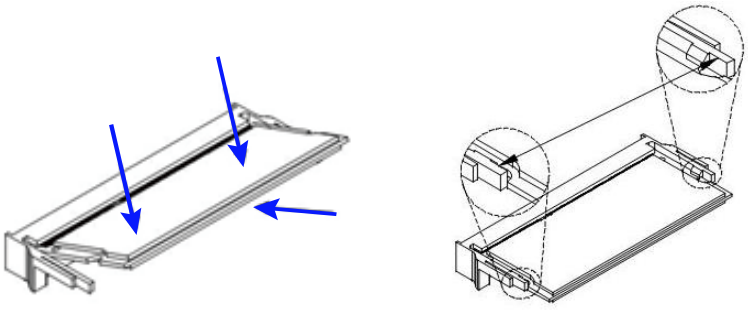
2.1.1 Memory Installation

1. Locate the memory slot and align the keys of the memory module with that on the memory slot.



2. Insert the module at an angle and press it down until the side clips click into place. When fully seated, the module will be held firmly at the bottom of the slot.

To remove the module, press the clips outwards with both hands.



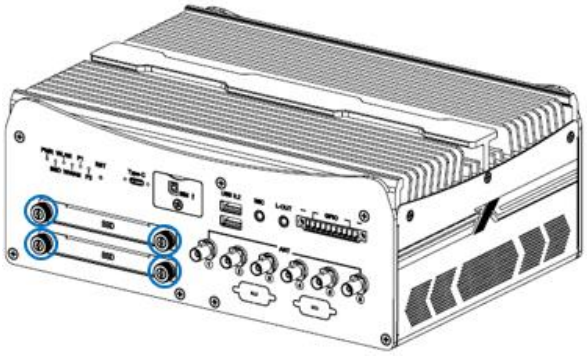
After installation, tighten the 8 screws mentioned in Step 2 to secure the device.

2.1.2 Storage Installation

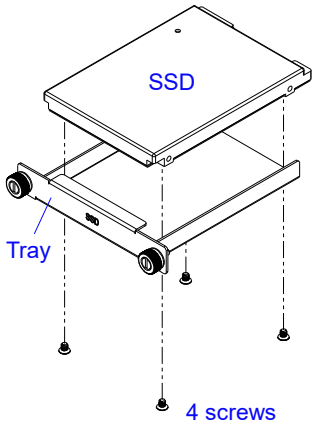
You can use either SSD or M.2 SATA card, or use both for storage.
For SSD or M.2 SATA card replacement or installation, follow the instructions below.

Installation for 2.5” SSD

1. Release 2 screws to pull out an SSD tray (4 screws for 2 trays).



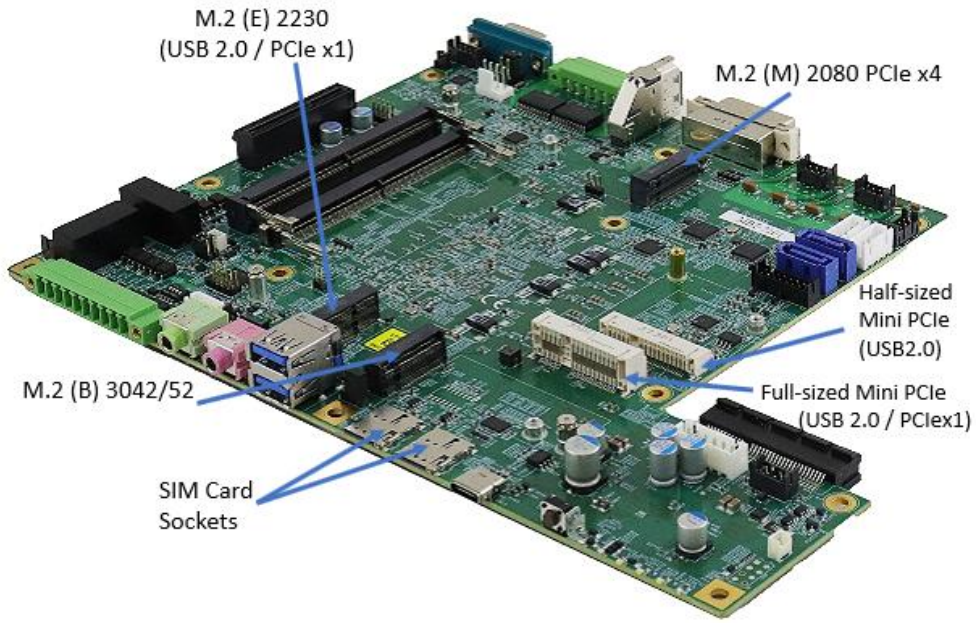
2. Put your 2.5” SSD onto the tray(s), and secure the SSD with the supplied 4 screws for each tray.



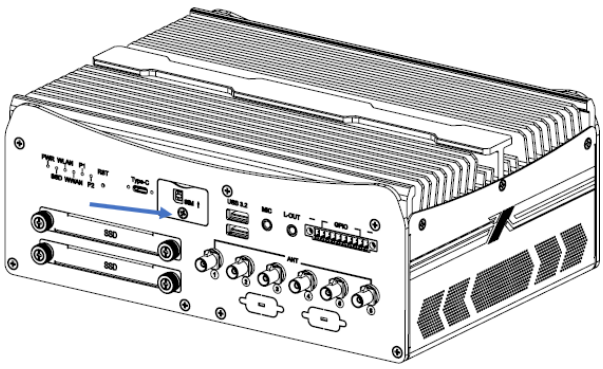
3. Put and secure the tray(s) back to the device.

Installation for M.2 and Mini Cards, and SIM Cards

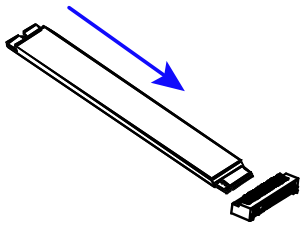
1. After removing the relevant screws as mentioned in the Essential Installation section, locate the components that need to be replaced, such as those shown in the image below, which includes:
   - M.2 (E-key) 2230 (USB 2.0 / PCIe x1)
   - M.2 (M-key) 2280 PCIe x4
   - M.2 (B-key) 3042/52
   - Half-sized Mini PCIe (USB 2.0)
   - Full-sized Mini PCIe (USB 2.0 / PCIe x1)



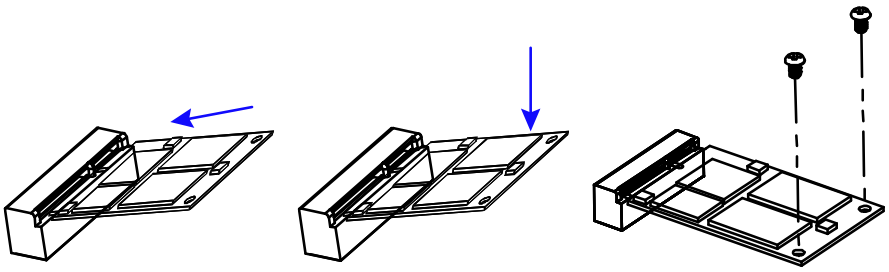
2. To access the SIM card sockets, remove the single screw of the socket cover as shown below. Insert the card to one of the nano-SIM card slots with the chip up and push the card by using your fingernail. To remove the nano-SIM card, push the card again.



3. To install an M.2 card, align the key of the M.2 card to the M.2 interface, and insert the card slantwise. Push the M.2 card down and fix the card with the brass standoff (if applicable).



4. To install a mini-PCIe card, align the key of the mini-PCIe card to the interface, and insert the card slantwise.



5. Push the mini-PCIe card down, fix it with the supplied 2 flat head screws for full-sized card and with one screw for half-sized card.

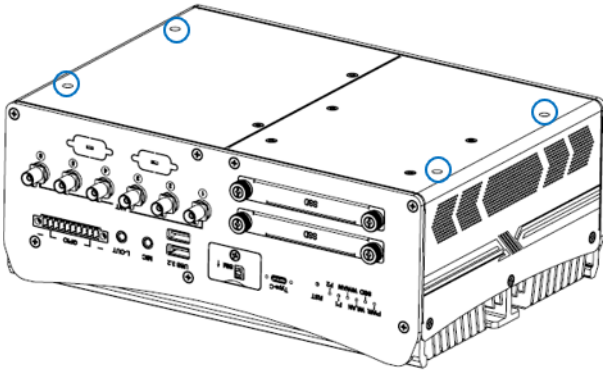
2.1.3 FAKRA Antenna Installation (Brief Guide)

FAKRA connectors are essential for secure and interference-free connections in automotive and telematics systems, commonly used for GPS, satellite radio, and video transmission. Follow these steps to ensure a proper installation and optimal signal performance.

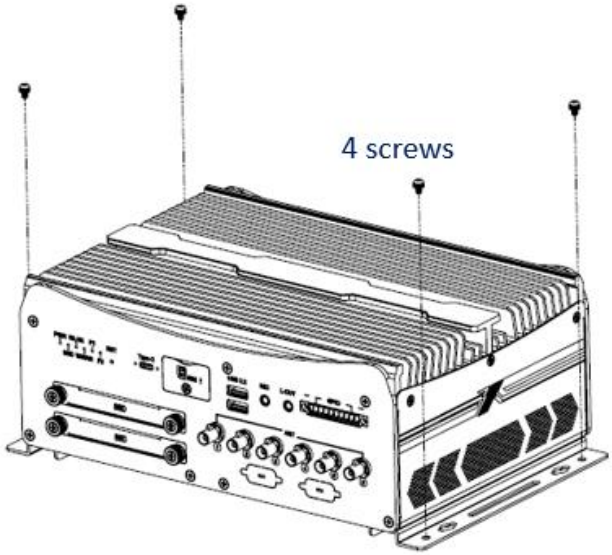
1. Preparation
   - Identify color-coded connectors (Red: Satellite, Blue: GPS, Yellow: Video).
   - Check cables and antenna for damage.
2. Connecting the FAKRA Antenna
   - Align connector with the port (keyed slots prevent mismatching).
   - Push until it clicks into place.
   - Gently pull to confirm secure connection.
3. Cable Routing
   - Avoid sharp bends and heat sources.
   - Secure cables using clips or zip ties.
4. Testing
   - Power on the system and check signal reception.
   - Troubleshoot loose connections or damaged cables if needed.
5. Disconnecting (if necessary)
   - Press the locking tab and pull straight out (no twisting).
6. Final Check
   - Ensure all connections are firm and signals are stable.

2.1.4 Mounting Brackets Installation

1. Turn your MPT-7100V upside down, attach the mounting brackets to MPT-7100V, and secure with the supplied 4 screws as below.

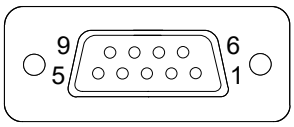


2. Prepare at least 4 screws (M3, 6 mm) to mount MPT-7100V on the intended wall surface .



2.1.5 Pinout for COM Ports, Power Input & GPIO Connectors

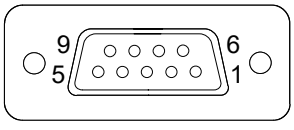
- **COM1 RS-232/422/485 Ports**



Pin	Assignment	Pin	Assignment
1	DCD, Data carrier detect	6	DSR, Data set ready
2	RXD, Receive data	7	RTS, Request to send
3	TXD, Transmit data	8	CTS, Clear to send
4	DTR, Data terminal ready	9	RI, Ring indicator
5	Ground		

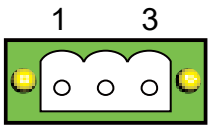
Pin	Assignment		
	RS-232	RS-422	RS-485
1	DCD	6	DATA-
2	RX	7	DATA+
3	TX	8	NC
4	DTR	9	NC
5	Ground	Ground	Ground
6	DSR	NC	NC
7	RTS	NC	NC
8	CTS	NC	NC
9	RI	NC	NC

- **COM2 RS-232 Port**



Pin	Assignment	Pin	Assignment
1	DCD, Data carrier detect	6	DSR, Data set ready
2	RXD, Receive data	7	RTS, Request to send
3	TXD, Transmit data	8	CTS, Clear to send
4	DTR, Data terminal ready	9	RI, Ring indicator
5	Ground		

- **DC Power 9V ~ 36V Input Connector (Terminal Block)**

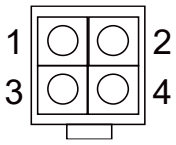


The system is designed for vehicle application powered by a battery. To prevent the car battery from being damaged at the system startup, a protection scheme that the input voltage level should be above 12.5V is designed for the system.

If you would like to run the system without the protection scheme (the input voltage level higher than 12.5V), please contact your distributor or sales representative.

Pin	Assignment	Pin	Assignment
1	Ignition	3	Ground
2	DC-Input		

- **UPS Battery / DC Power 12V Output Connector (ATX Jack)**



Make sure the UPS battery voltage level is above 12.5V before using the battery in order to prolong the life of the UPS battery.

Use only lead-acid batteries for the system.

DO NOT connect a DC source to be used as the UPS voltage input. This could damage the system. This connector has a charging feature.

Pin	Assignment	Pin	Assignment
1	Ground	2	Ground
3	UPS	4	12V Out

- **GPIO Connector (terminal block)**

Pin	Assignment	Pin	Assignment
1	DI0	6	DO1
2	DI1	7	DO2
3	DI2	8	DO3
4	DI3	9	VDO_ISO_COM
5	DO0	10	GND

- **LAN Connector (M12, 8-pin, Female, X-code)**

Pin	Assignment	Pin	Assignment
1	MX1+	5	MX4+
2	MX1-	6	MX4-
3	MX2+	7	MX3+
4	MX2-	8	MX3-

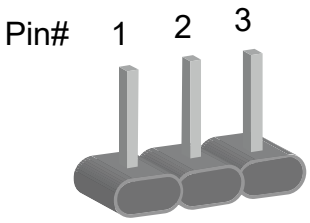
- **CAN BUS**

Pin	Assignment	Pin	Assignment
1	CAN_DH1	4	GND_ISO_CAN2
2	CAN_DL1	5	CAN_DL2
3	GND_ISO_CAN1	6	CAN_DH2

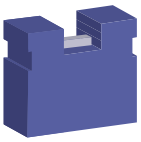
2.2 Setting the Jumpers

Set up and configure your device by using jumpers for various settings and features according to your needs and applications. Contact your supplier if you have doubts about the best configuration for your use.

Jumpers are short-length conductors consisting of several metal pins with a non-conductive base mounted on the circuit board. Jumper caps are used to have the functions and features enabled or disabled. If a jumper has 3 pins, you can connect either PIN1 to PIN2 or PIN2 to PIN3 by shorting.

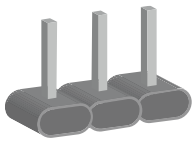
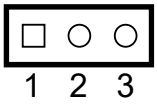
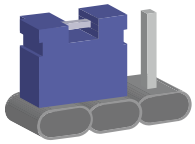
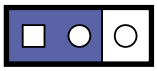
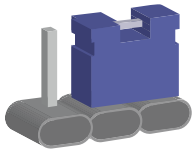
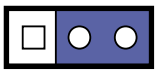


A 3-pin jumper



A jumper cap

Refer to the illustration below to set jumpers.

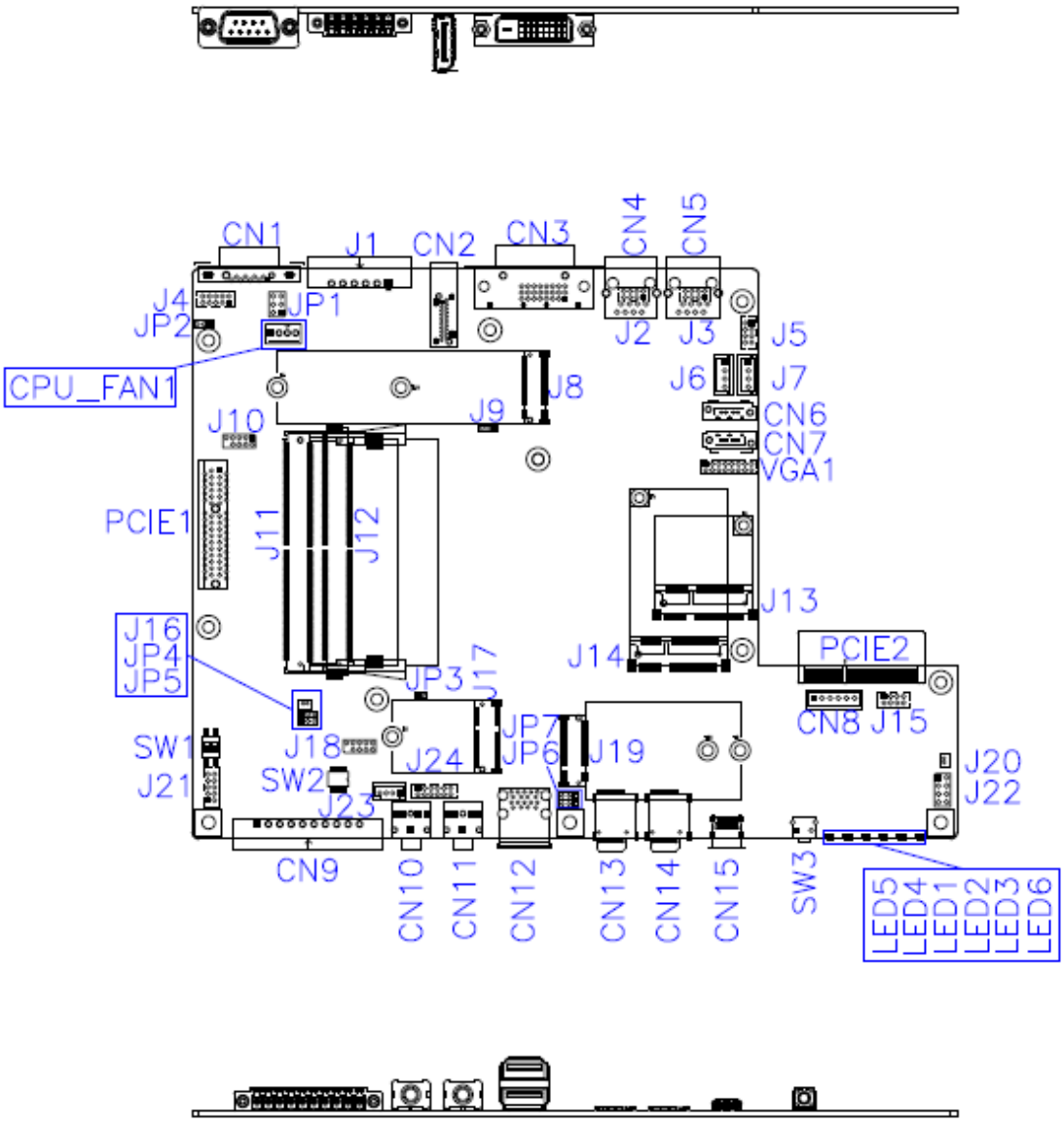
Pin closed	Oblique view	Schematic illustration in the manual
Open		
1-2		
2-3		

When two pins of a jumper are encased in a jumper cap, this jumper is **closed**, i.e. turned **On**.

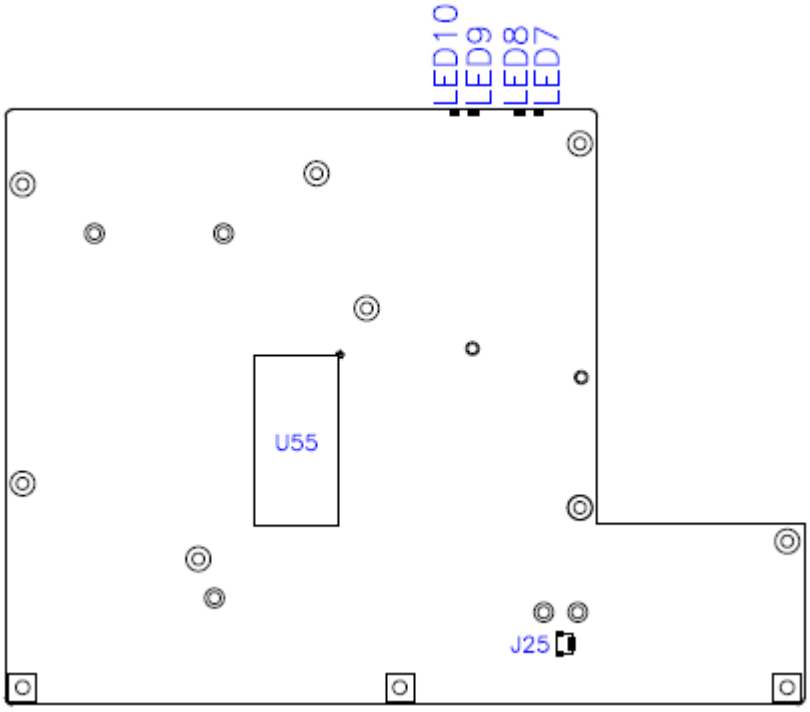
When a jumper cap is removed from two jumper pins, this jumper is **open**, i.e. turned **Off**.

2.3 Jumper & Connector Locations on Motherboard

Motherboard: MBT-7100V



MBT-7100V - top

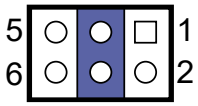


MBT-7100V - bottom

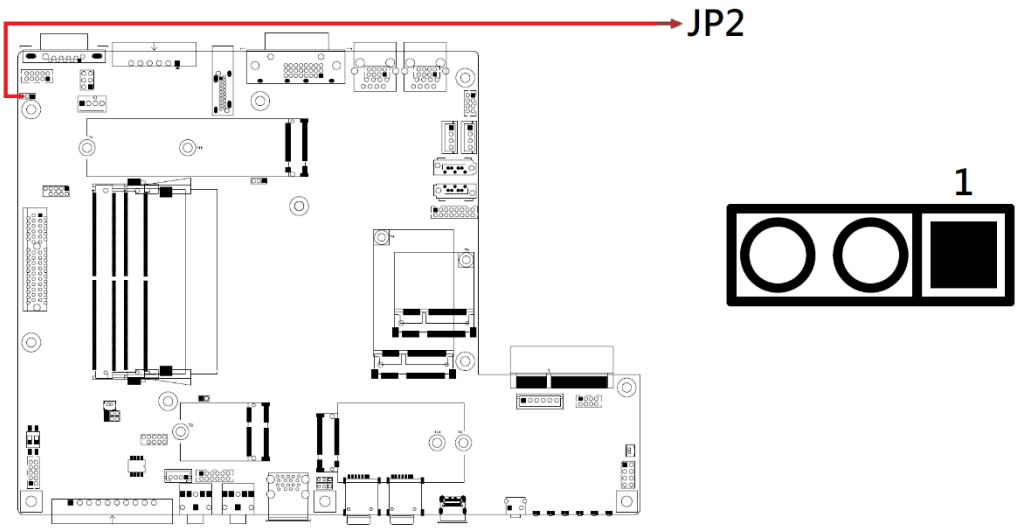
2.4 Jumpers Quick Reference

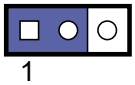
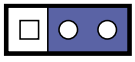
Jumper	Function
JP1	COM1 RS232 RI/+5V/+12V Power Setting
JP2	ATX/AT Mode Setting
JP3	Flash Descriptor Security Override
JP4	Clear CMOS Contents
JP5	Clear ME Contents
JP6	SIM Card Select

2.4.1 JP1: COM1 RS232 RI/+5V/+12V Power Setting

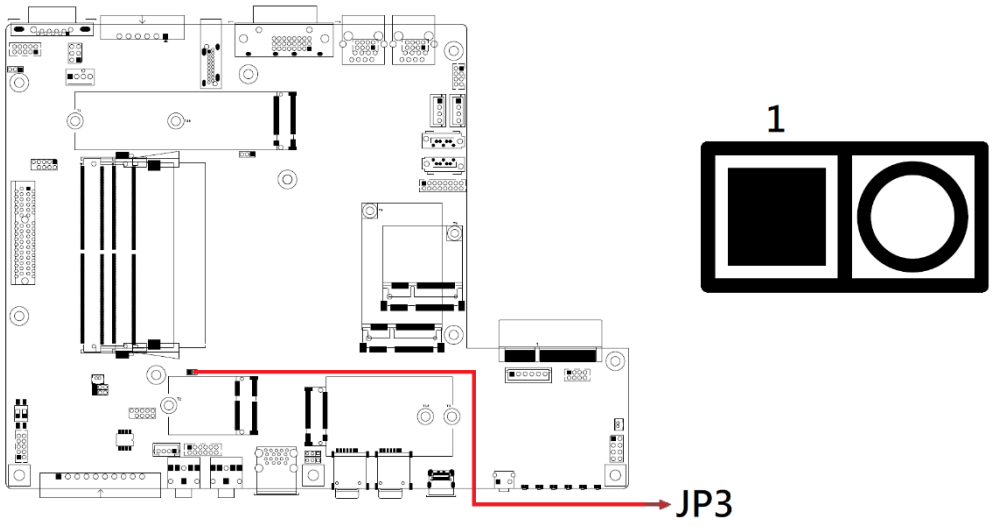
JP1	Setting	Function
	Pin 1-3 Short/Closed	+12V
	Pin 3-4 Short/Closed	RI
	Pin 5-3 Short/Closed	+5V

2.4.2 JP2: ATX / AT Mode Setting



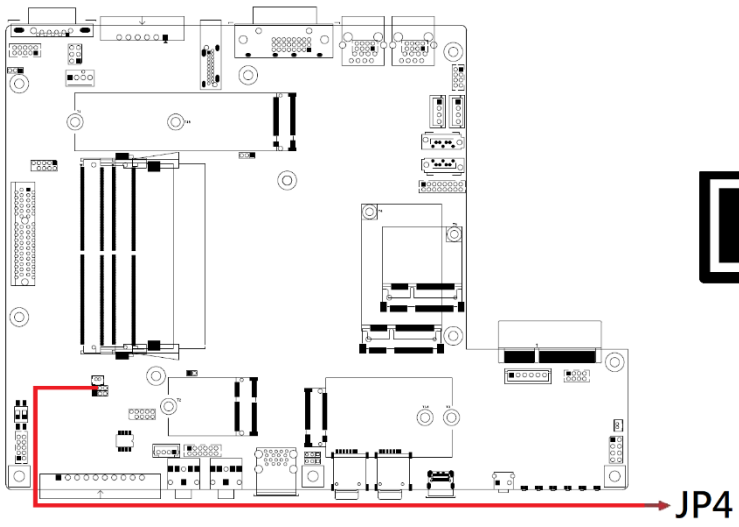
JP2	Setting	Function
 1	Pin 1-2 Short/Closed	ATX
 1	Pin 2-3 Short/Closed	AT

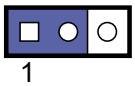
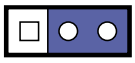
2.4.3 J3: Flash Descriptor Security Override



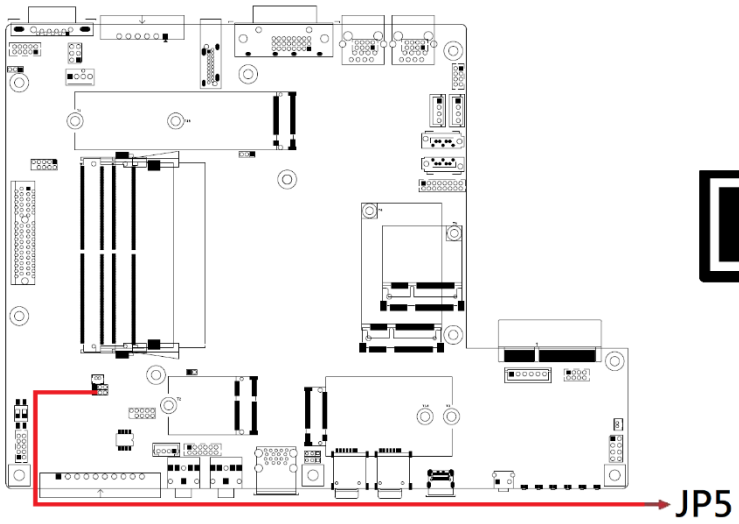
JP3	Flash Descriptor Security Override
Open	Disabled (Default)
Close	Enabled

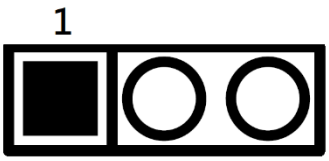
2.4.4 JP4: Clear CMOS Contents

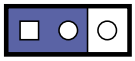
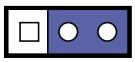


JP4	Function	Setting
 1	Normal (default)	1-2 closed
 1	Clear CMOS	2-3 closed

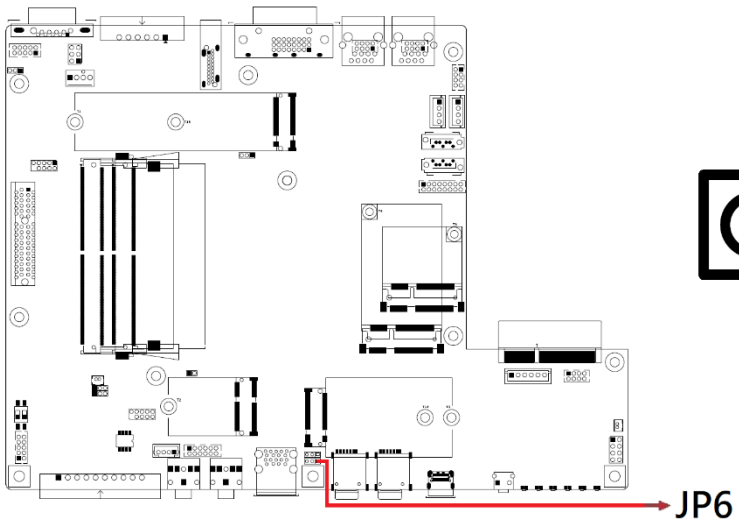
2.4.5 JP5: Clear ME Contents

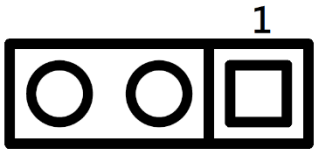


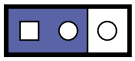
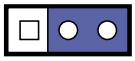


JP5	Function	Setting
 1	Normal (default)	1-2 closed
 1	Clear ME Register	2-3 closed

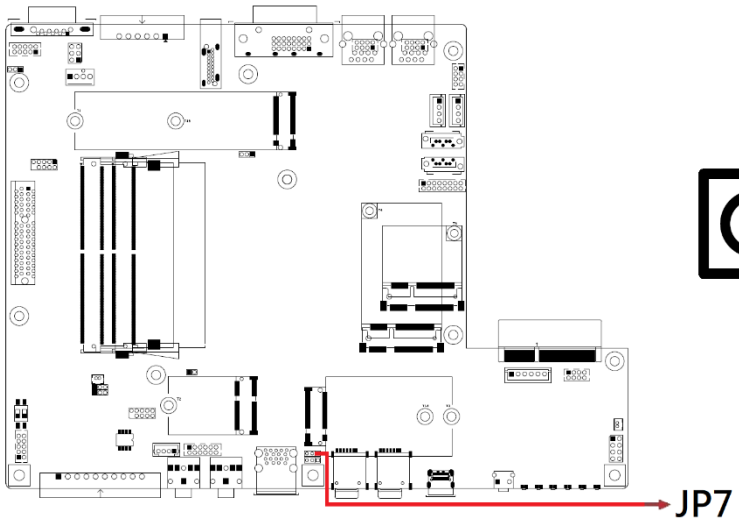
2.4.6 JP6: SIM Card Select (for CN14 SIM2)

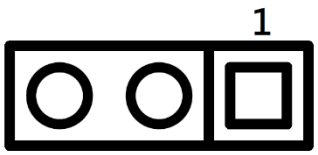


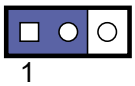
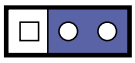


JP6	Setting	Function
 1	Pin 1-2 Short/Closed	For M.2-2
 1	Pin 2-3 Short/Closed	For Mini- PCIE

2.4.7 JP7: M.2 B-key Sierra EM9191 USB/PCIE Select

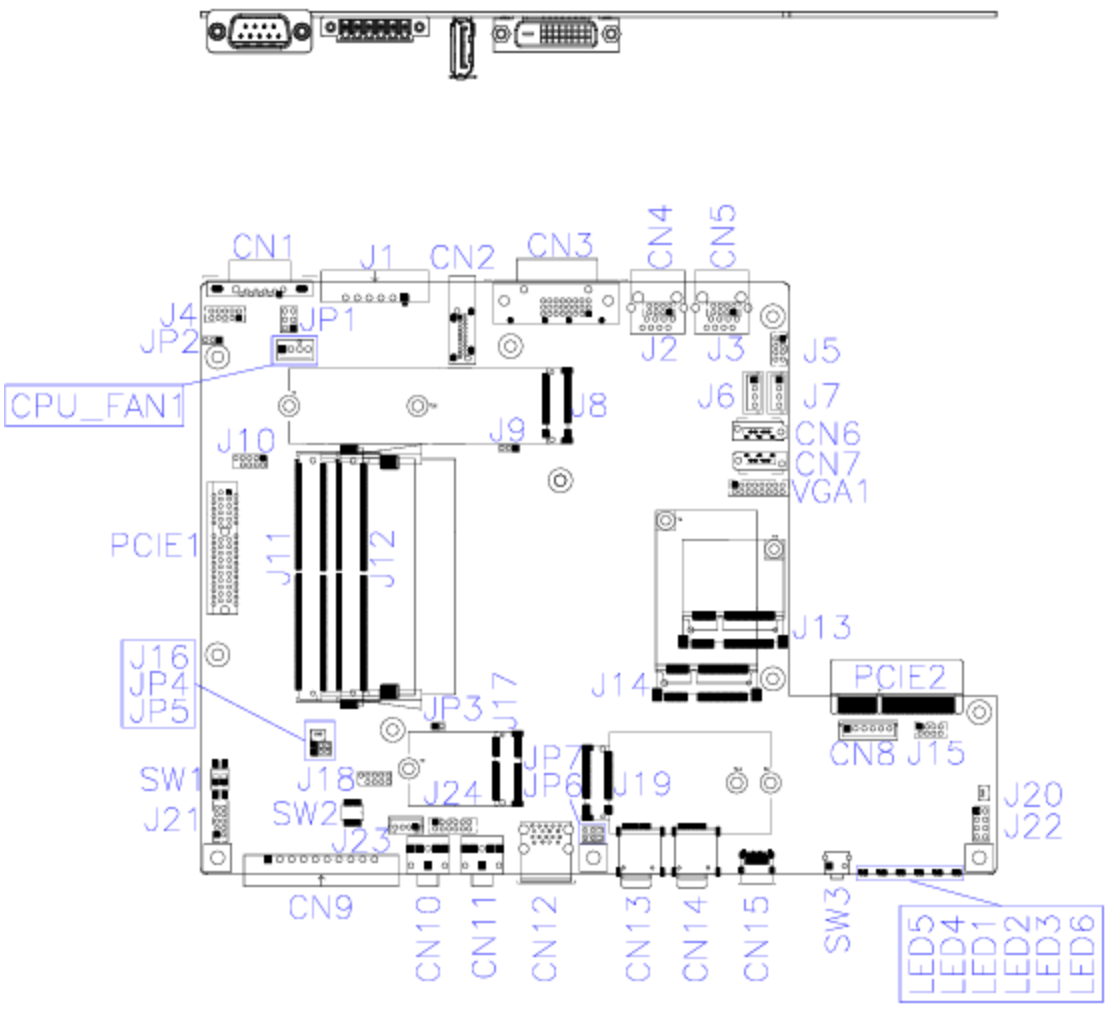




JP7	Setting	Function
 1	Pin 1-2 Short/Closed	For PCI-E
 1	Pin 2-3 Short/Closed	For USB 3.0

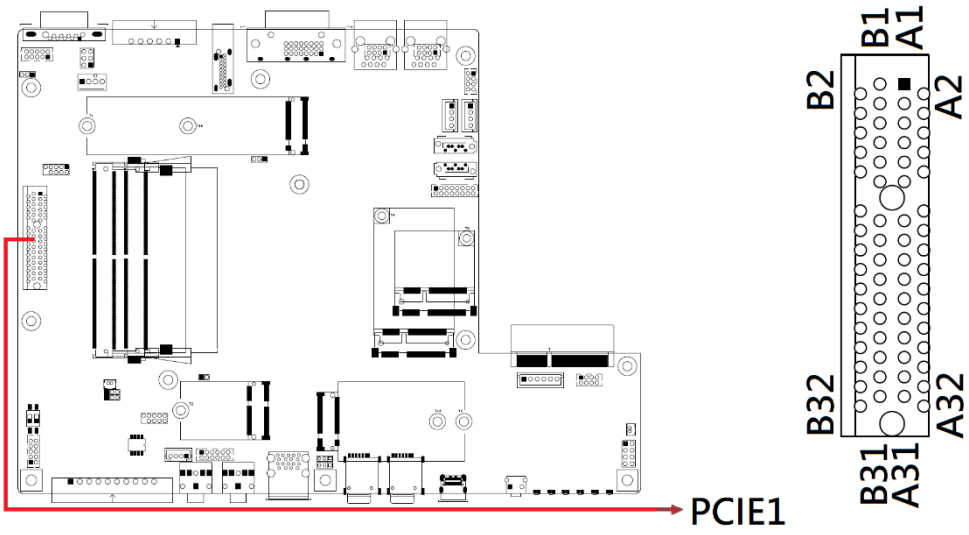
2.5 Connectors on MBT-7101

Connector	Function
PCIE1	PCIEX4 Slot
PCIE2	DC_in Connector (+12V)
CN1	COM1 RS232/422/485 Port
CN2	DisplayPort Connector
CN3	DVI-D Connector
CN4, CN5 (option)	Gigabit LAN Connectors
CN6, CN7	SATA2 Connector
CN8	+12V Connector
CN9	Digital I/O Connector
CN10, CN11	Audio (Front) Connector
CN12	USB3.0 Connector
CN13	SIM (J19-1) Connector
CN14	SIM2 (J14, J19-2) Connector
CN15	Type-C Connector
J1	CAN Port Pin header
J2, J3	Gigabit LAN Pin Headers
J4	COM2 RS232 Connector
J6, J7	SATA HDD Power Connectors
J8	M.2 (M) 2080 PCIE X4 Connector
J11	DDR5 SO-DIMM (CH-A) Sockets
J12	DDR5 SO-DIMM (CH-B) Sockets
J13	Half-sized Mini PCIE (USB 2.0) Connector
J14	Full-sized Mini PCIE (USB 2.0/ PCIe x1) Connector
J15	Signals for the Power Board
J16	Battery Connector
J17	M.2 (E) 2230 Connector (USB 2.0/ PCIe x1)
J18	For SPI Debug Tools Pin Header
J19	M.2 (B) 3042/52 Connector (PCIE x1 / USB 3.0)
J20	Power Button Pin Header
J21	COM3~COM4 RS485 Connector
J24	Audio Pin Header
SW1_1	COM3 RS-485 Terminal Register
SW1_2	COM4 RS-485 Terminal Register
SW2	Digital IO Pull High to +5V Switch
SW3	Reset Button
VGA1	CRT Pin Header

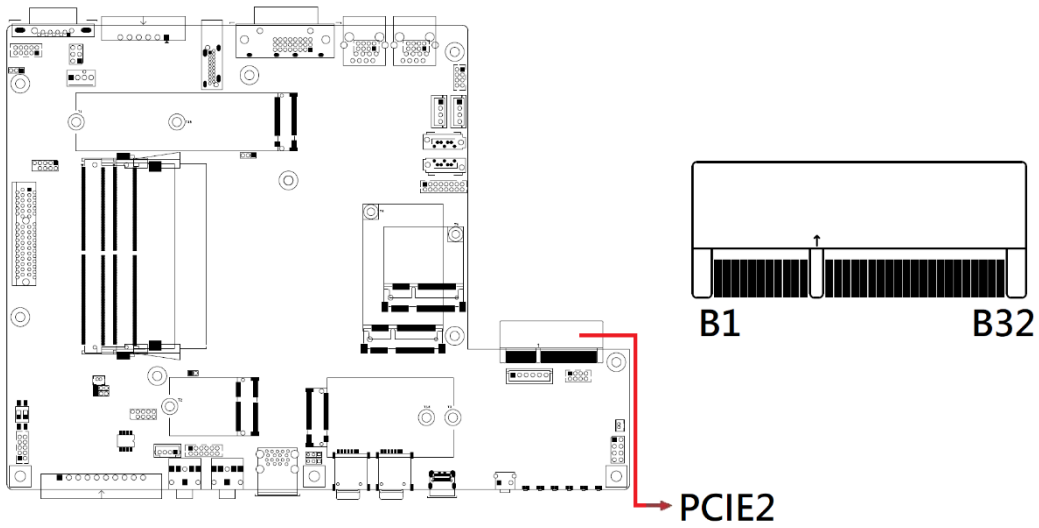


Jumper/Switch/Connector Locations

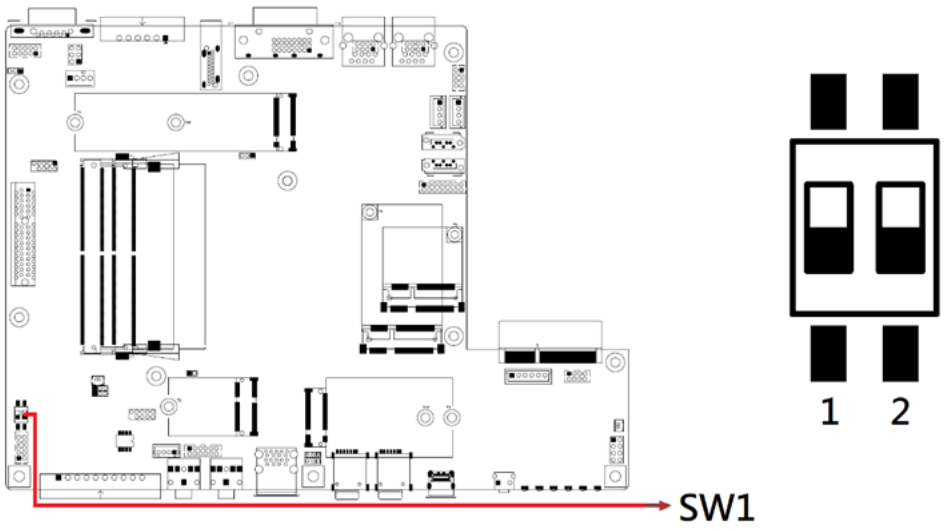
2.5.1 PCIE1: PCIEx4 Slot



2.5.2 PCIE2: DC_in Connector (+12V)

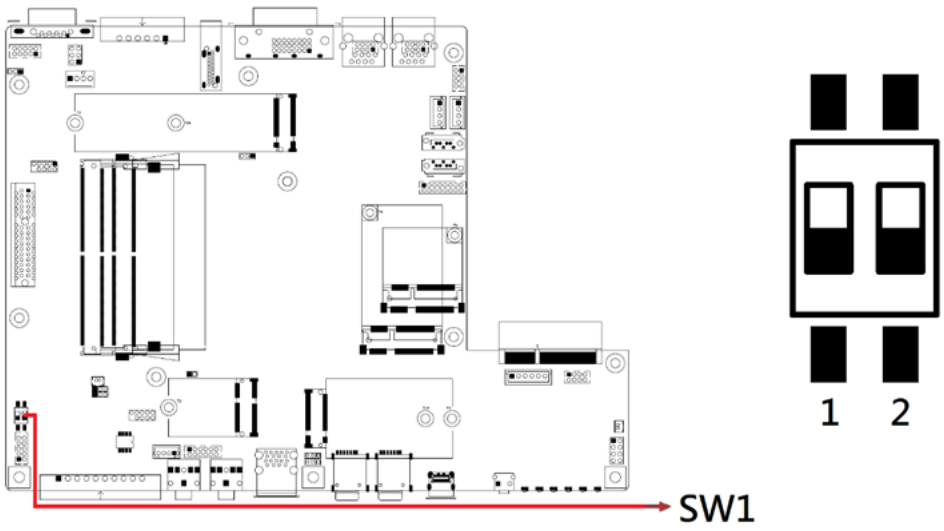


2.5.3 SW1_1: COM3 RS-485 Terminal Register



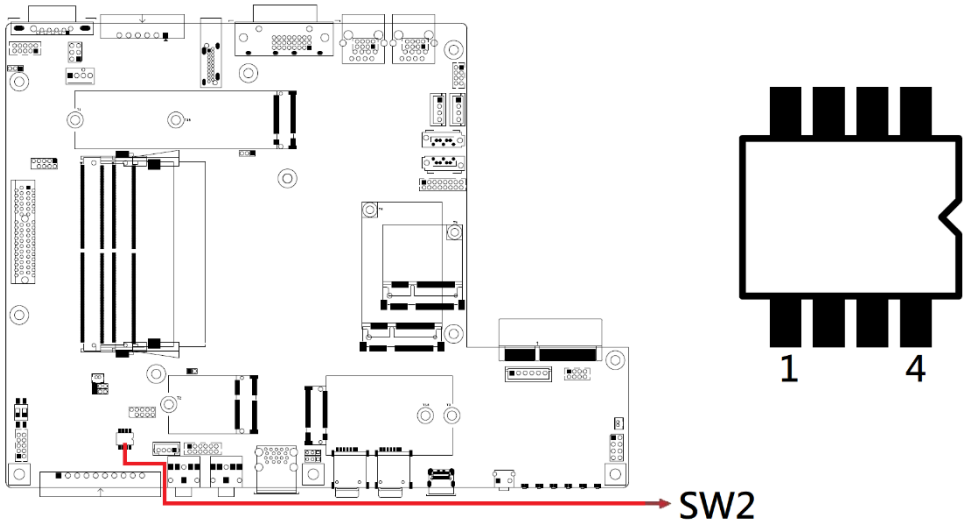
Setting	Function
Pin_1 Off	COM3 Terminal Disable (default)
Pin_1 On	COM3 Terminal Enable

2.5.4 SW1_2: COM4 RS-485 Terminal Register



Setting	Function
Pin_2 Off	COM4 Terminal Disable (default)
Pin_2 On	COM4 Terminal Enable

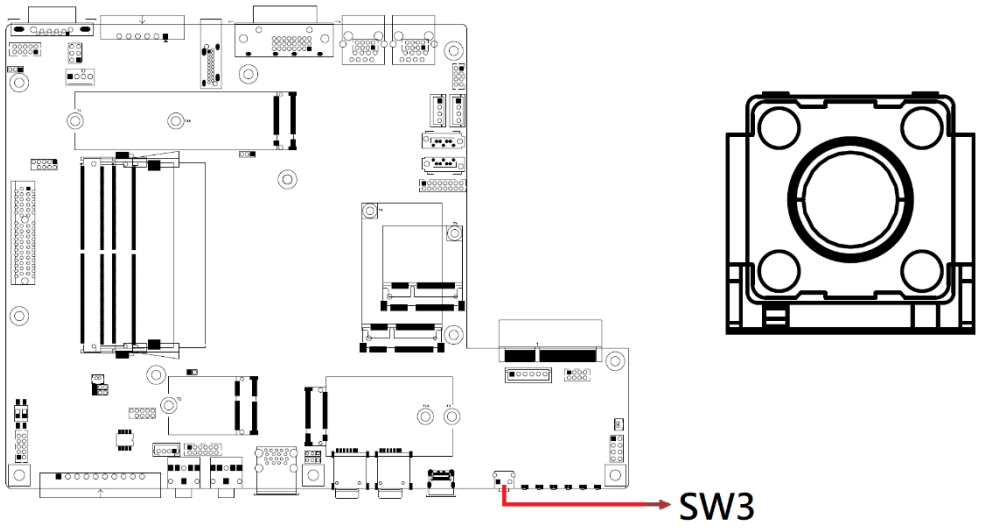
2.5.5 SW2: Digital IO Pull High to +5V Switch



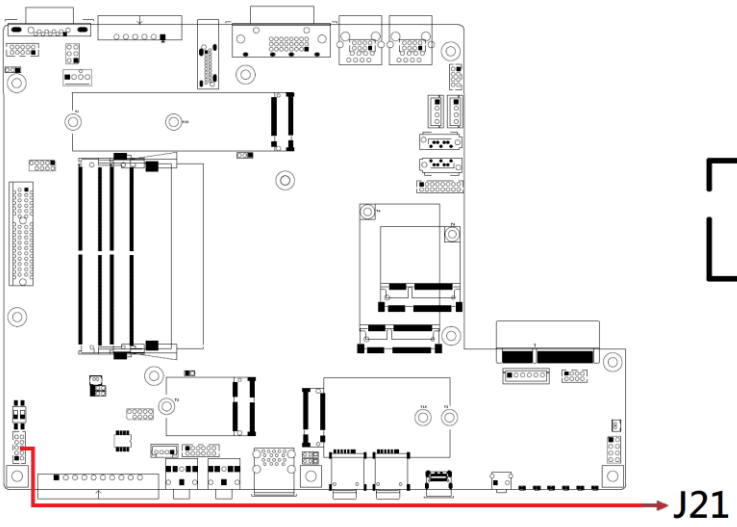
Pin	Assignment	Pin	Assignment
1	DO3	5	5V
2	DO2	6	5V
3	DO1	7	5V
4	DO0	8	5V

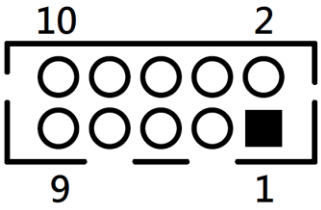
(On: Pull High to +5V)

2.5.6 SW3: Reset Button



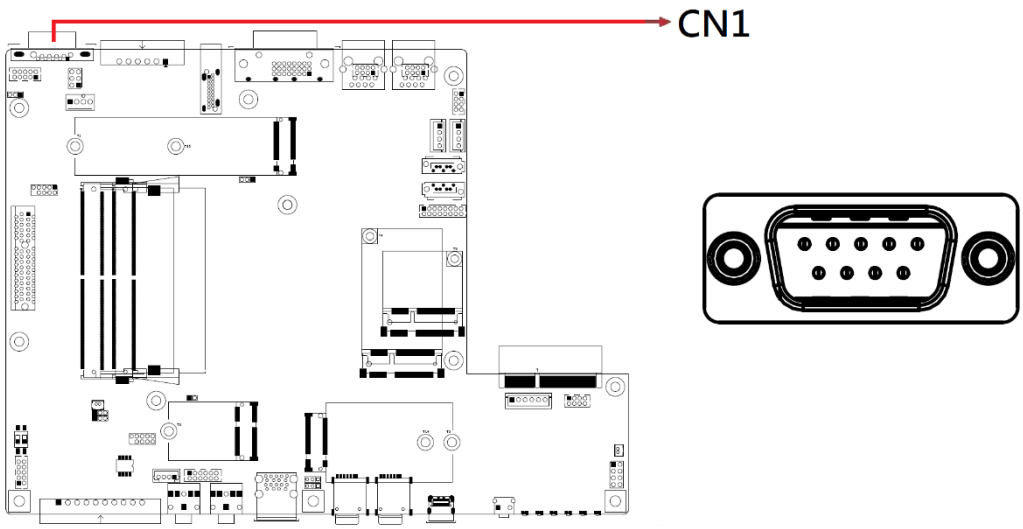
2.5.7 J21: COM3 / COM4 RS485 Connector





Pin	Assignment	Pin	Assignment
1	NC	2	NC
3	GND	4	GND
5	RS485-DATA3-	6	RS485-DATA4- 4-
7	RS485-DATA3+	8	RS485-DATA4+
9	GND	10	GND

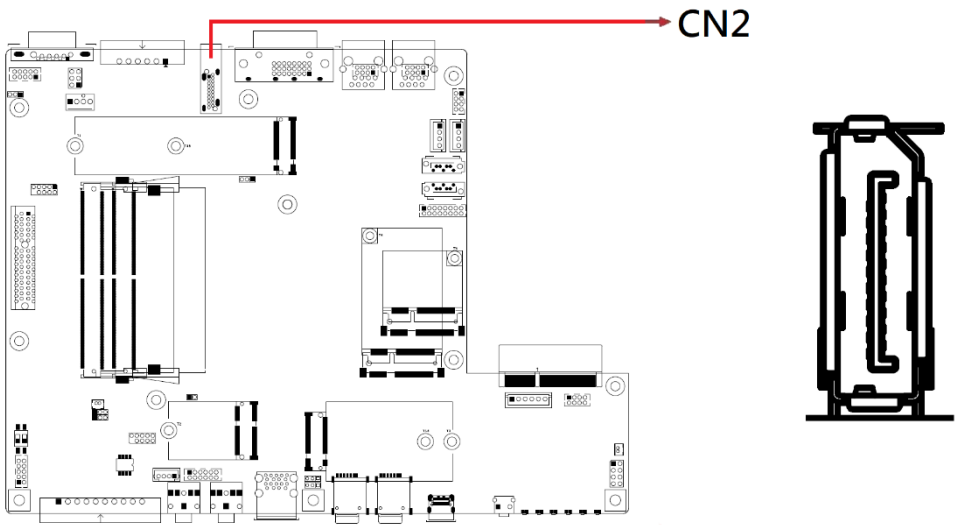
2.5.8 CN1: COM1 RS232/422/485 Port



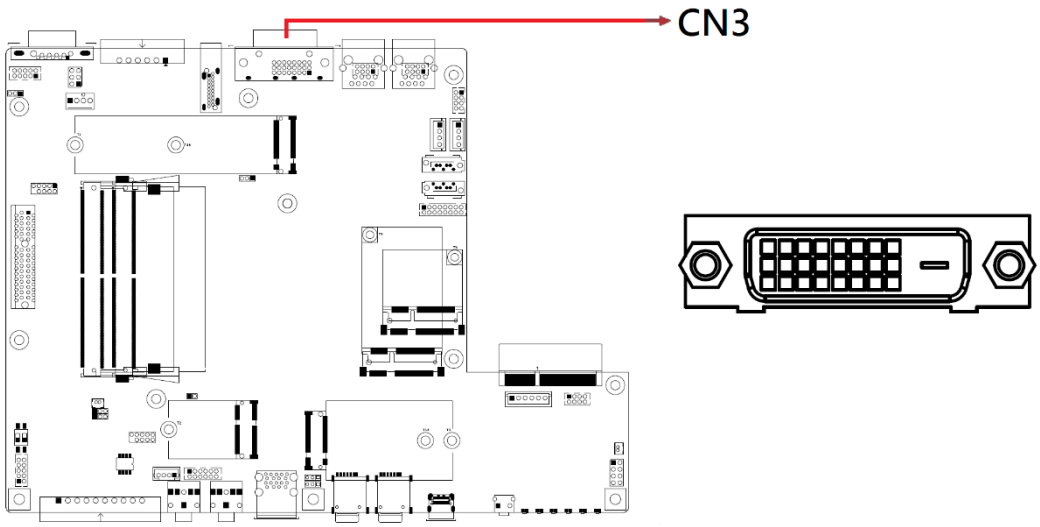
*COM1 setting is selectable in BIOS.

Pin	Assignment		
	RS-232	RS-422	RS-485
1	DCD	TX-	DATA-
2	RX	TX+	DATA+
3	TX	RX+	NC
4	DTR	RX-	NC
5	Ground	Ground	Ground
6	DSR	NC	NC
7	RTS	NC	NC
8	CTS	NC	NC
9	RI	NC	NC

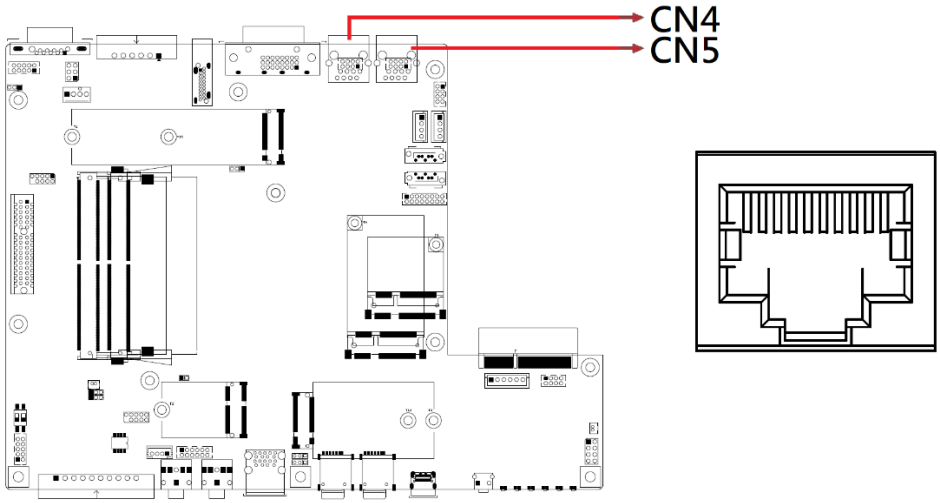
2.5.9 CN2: DisplayPort connector



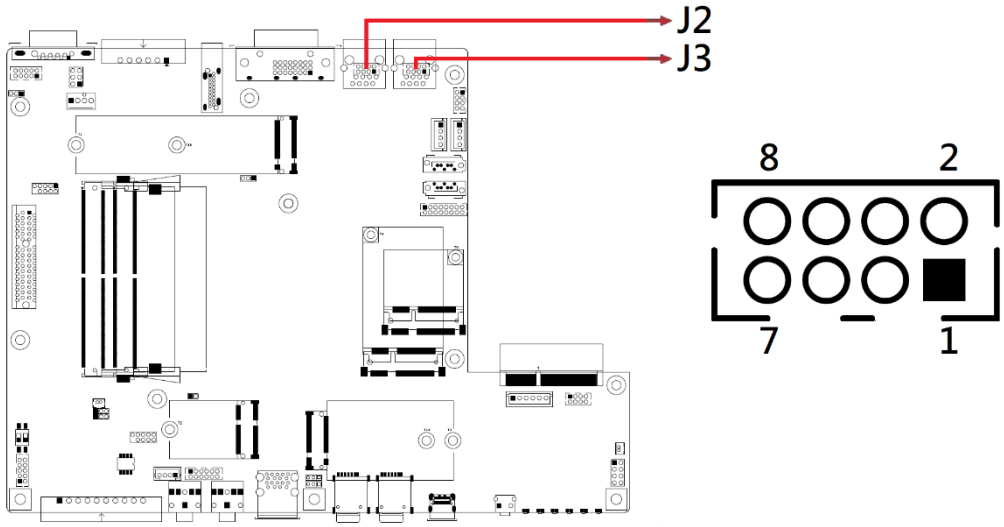
2.5.10 CN3: DVI-D Connector



2.5.11 CN4, CN5: 2.5G LAN Connectors (option)

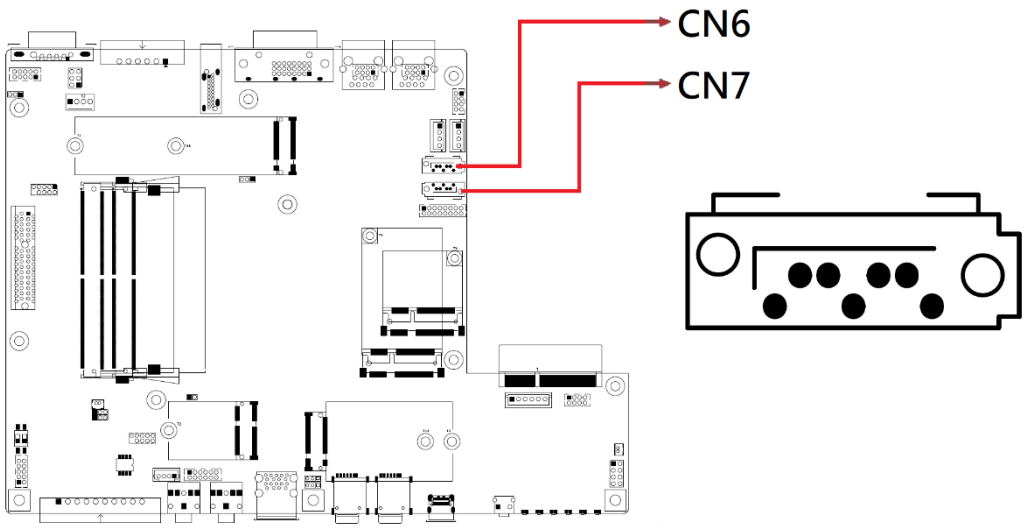


2.5.12 J2, J3: 2.5G LAN Pin Header

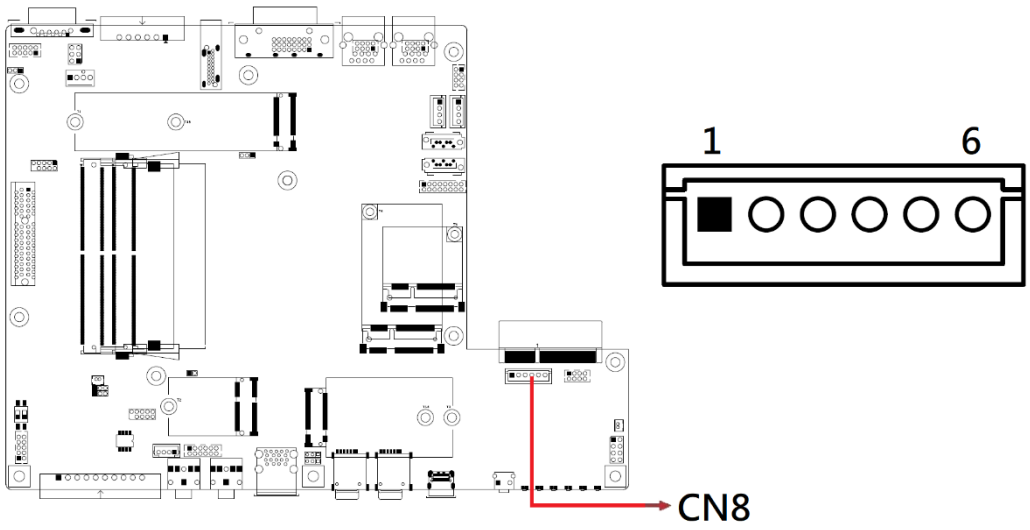


Pin	Assignment	Pin	Assignment
1	MXP0	2	MXN0
3	MXP1	4	MXN1
5	MXN2	6	MXP2
7	MXP3	8	MXN3

2.5.13 CN6, CN7: SATA2 Connector

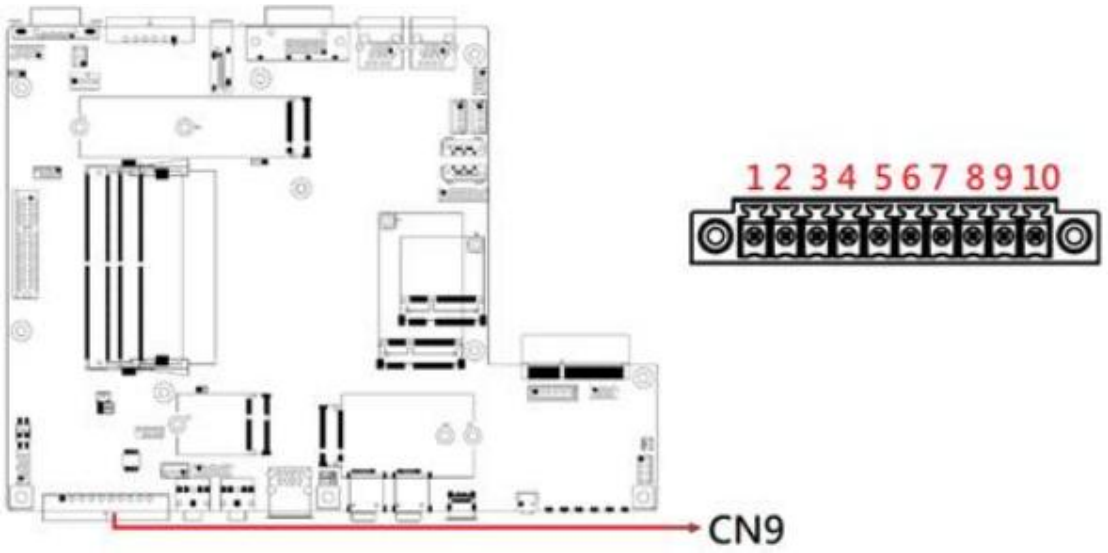


2.5.14 CN8: +12V Connector



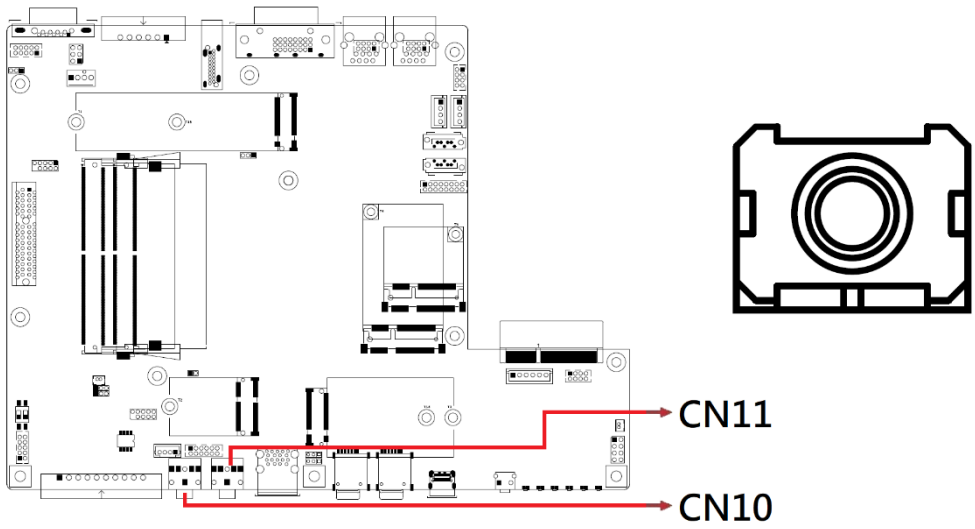
Pin	Assignment	Pin	Assignment
1	+12V	2	+12V
3	+12V	4	GND
5	GND	6	GND

2.5.15 CN9: Digital I/O Connector

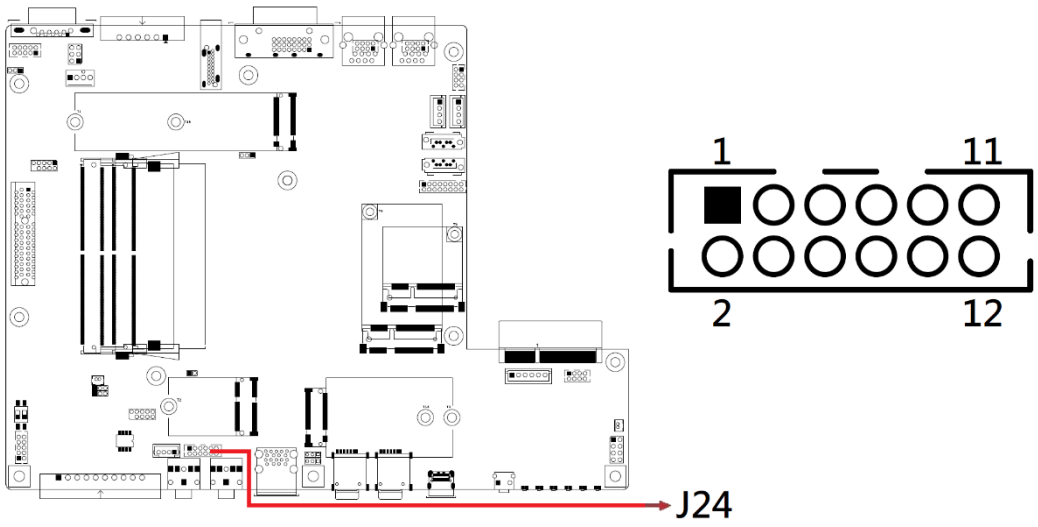


Pin	Assignment	Pin	Assignment
1	DI0	6	DO1
2	DI1	7	DO2
3	DI2	8	DO3
4	DI3	9	VDO_ISO_COM
5	DO0	10	GND

2.5.16 CN10, CN11: Audio (Front) Connector

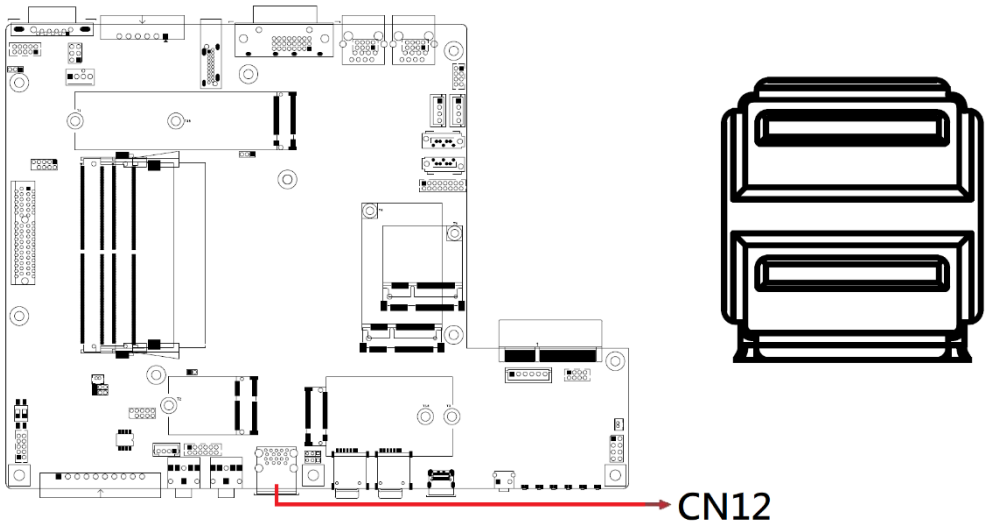


2.5.17 J24: Audio Pin Header



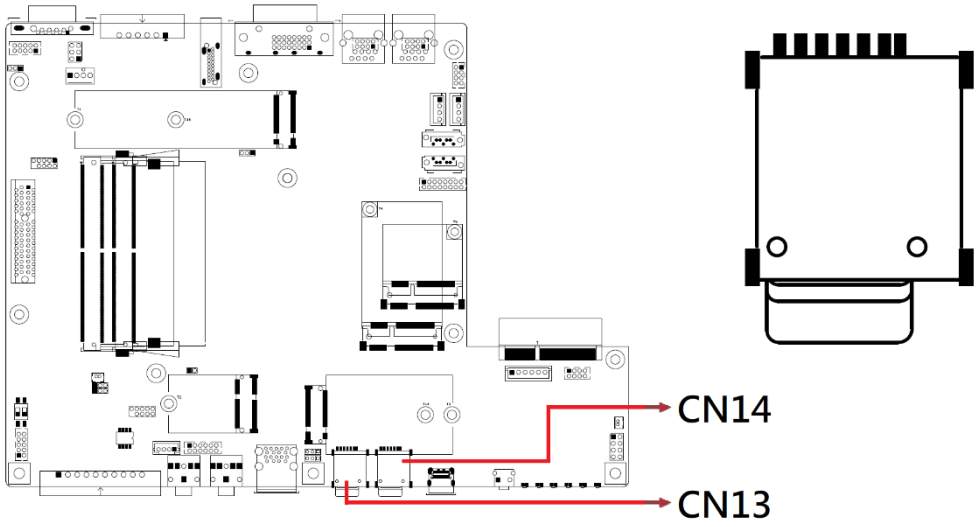
Pin	Assignment	Pin	Assignment
1	LINE OUT_L	2	LINE OUT_R
3	FRONT_JD	4	GND
5	LINE IN_L	6	LINE IN_R
7	LINE _JD	8	GND
9	MIC_L	10	MIC_R
11	MIC_JD	12	GND

2.5.18 CN12: Dual USB 3.0 Connector



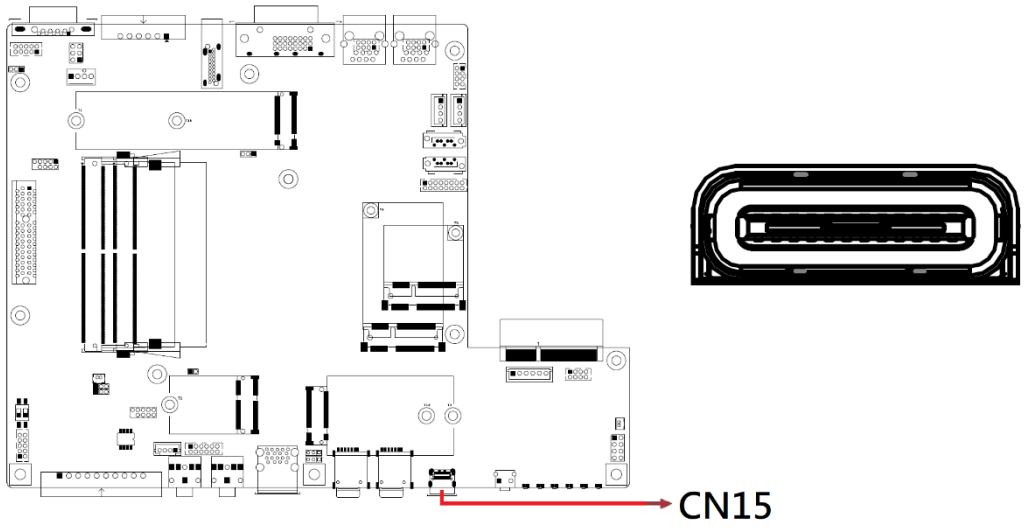
2.5.19 CN13: SIM (J19-1) Connector

2.5.20 CN14: SIM2 (J14, J19-2) Connector

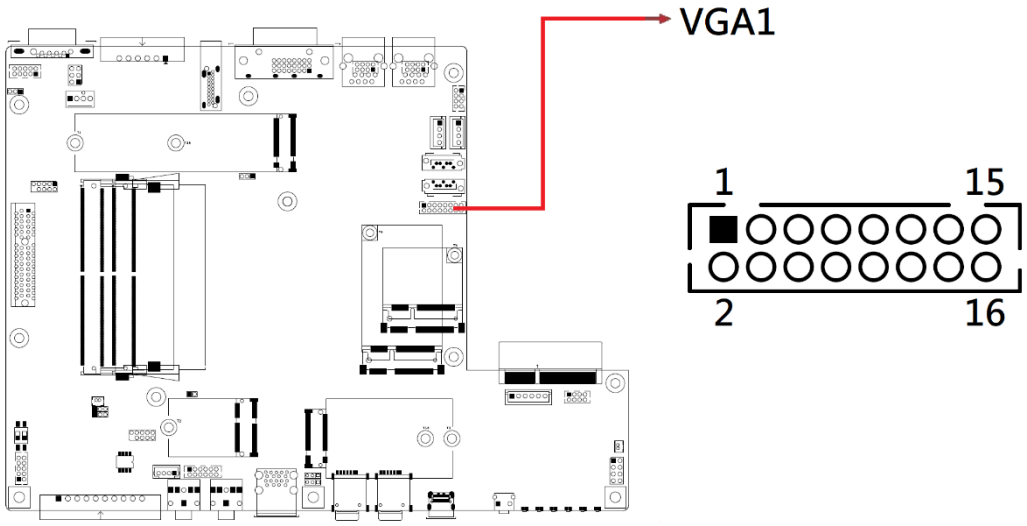


*CN14 SIM2 settings via JP6

2.5.21 CN15: Type-C Connector for 5,9.15.20V Power Out USB3.DP

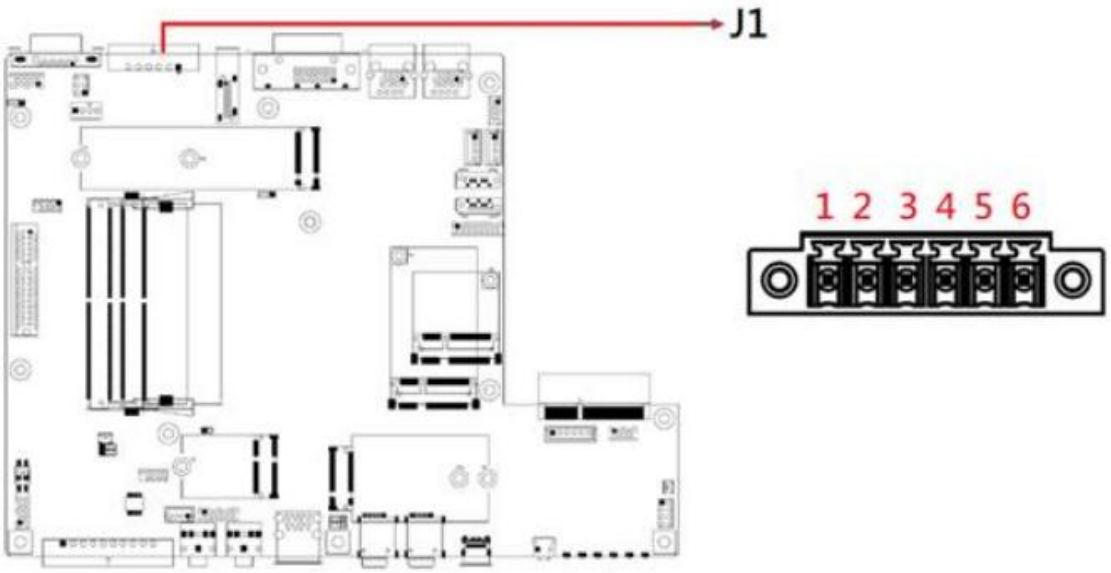


2.5.22 VGA1: CRT Connector



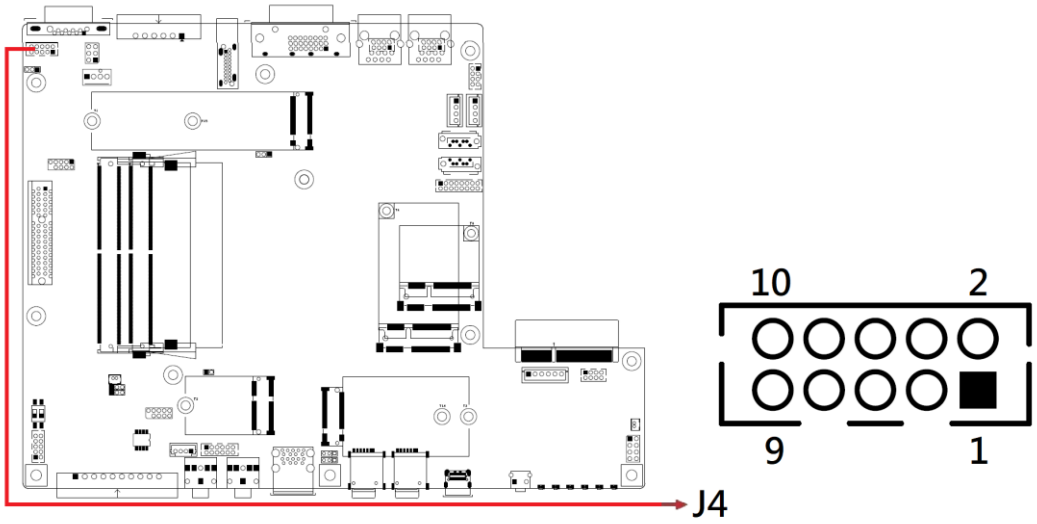
Pin	Assignment	Pin	Assignment
1	Red	2	VCC
3	Green	4	GND
5	Blue	6	N.C.
7	N.C.	8	DDCDATA
9	GND	10	HSYNC
11	GND	12	VSYNC
13	GND	14	DDCCLK
15	GND	16	N.C.

2.5.23 J1: CAN Port Connector



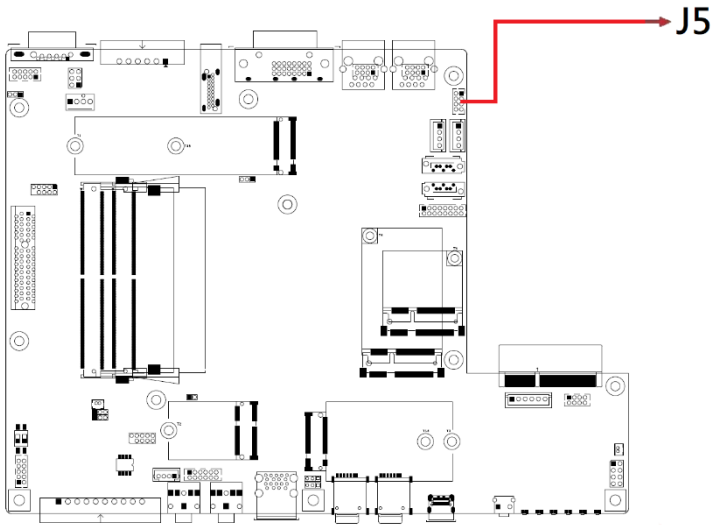
Pin	Assignment	Pin	Assignment
1	CAN_DH1	4	GND_ISO_CAN2
2	CAN_DL1	5	CAN_DL2
3	GND_ISO_CAN1	6	CAN_DH2

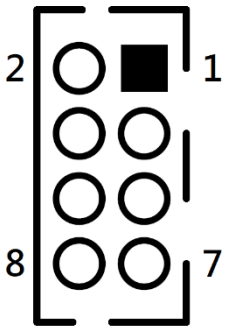
2.5.24 J4: COM2 RS232 Connector



Pin	Assignment	Pin	Assignment
1	DCD	2	SIN
3	SOUT	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI	10	N/C

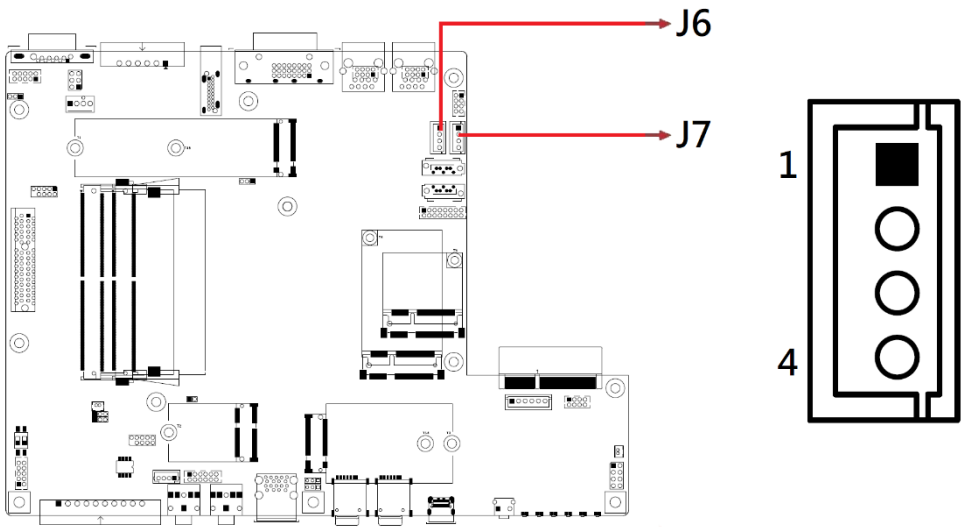
2.5.25 J5: USB 2.0 x2 Pin Header





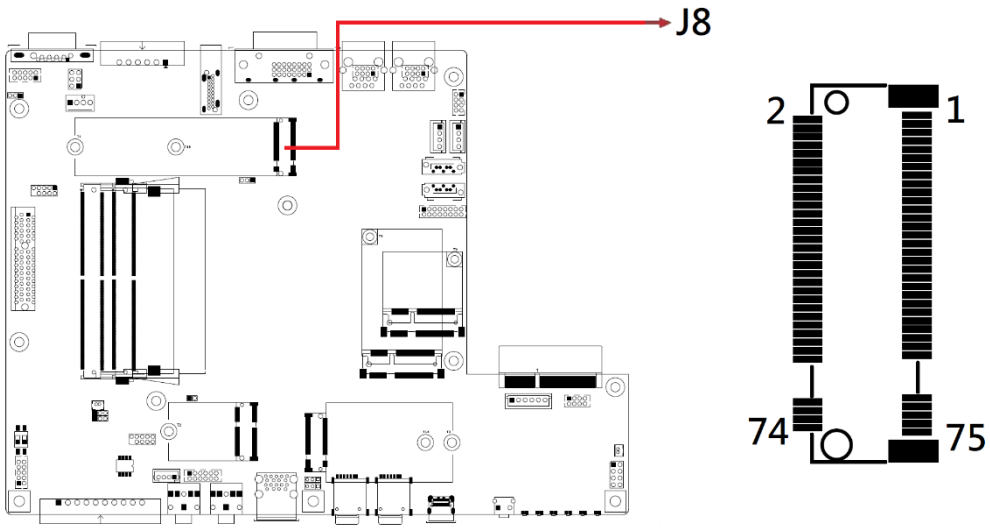
Pin	Assignment	Pin	Assignment
1	VCC	2	GND
3	P5-	4	P6+
5	P5+	6	P6-
7	GND	8	VCC

2.5.26 J6, J7: SATA HDD Power Connectors

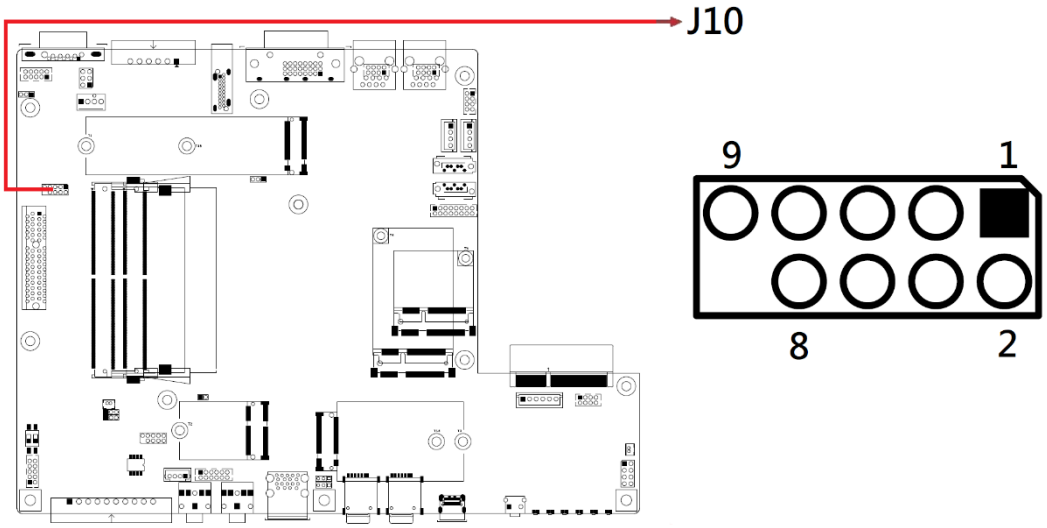


Pin	Assignment
1	+5V
2	Ground
3	Ground
4	+12V

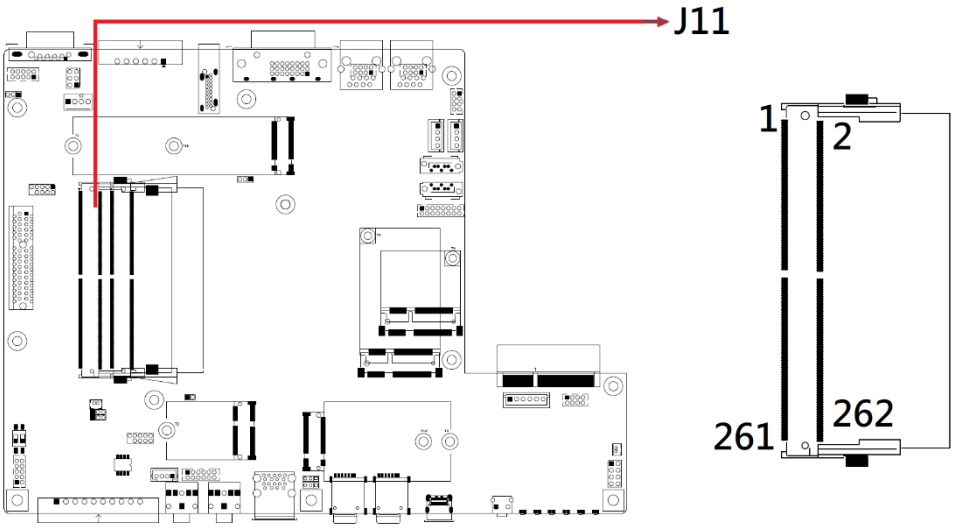
2.5.27 J8: M.2(M) 2080 PCIE X4 Connector



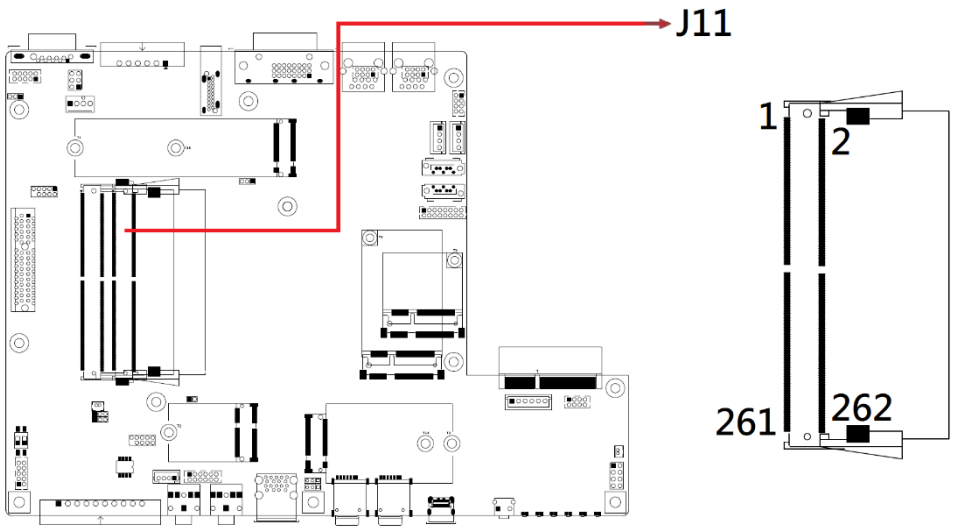
2.5.28 J10: Debug Port



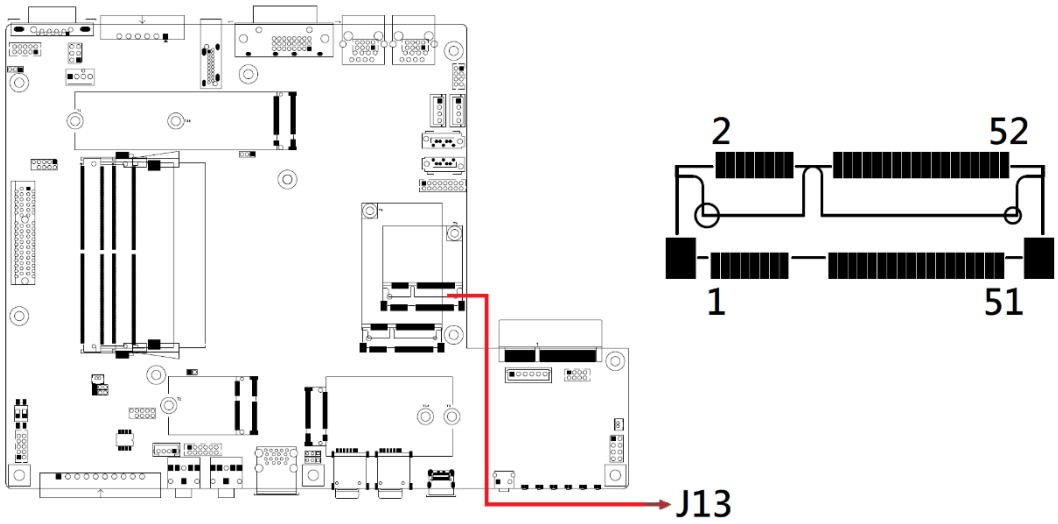
2.5.29 J11: DDR5 SO-DIMM (CH-A) Sockets



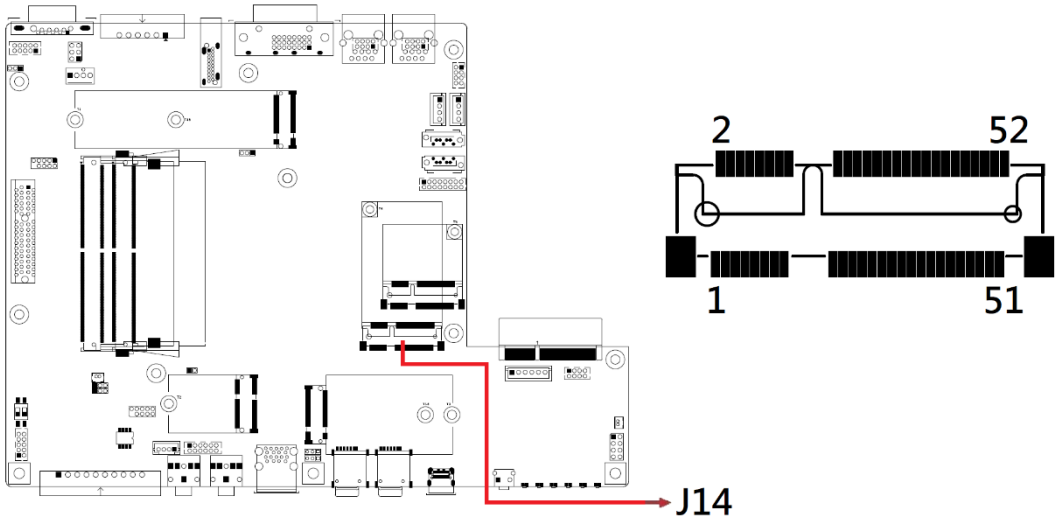
2.5.30 J12: DDR5 SO-DIMM (CH-B) Sockets



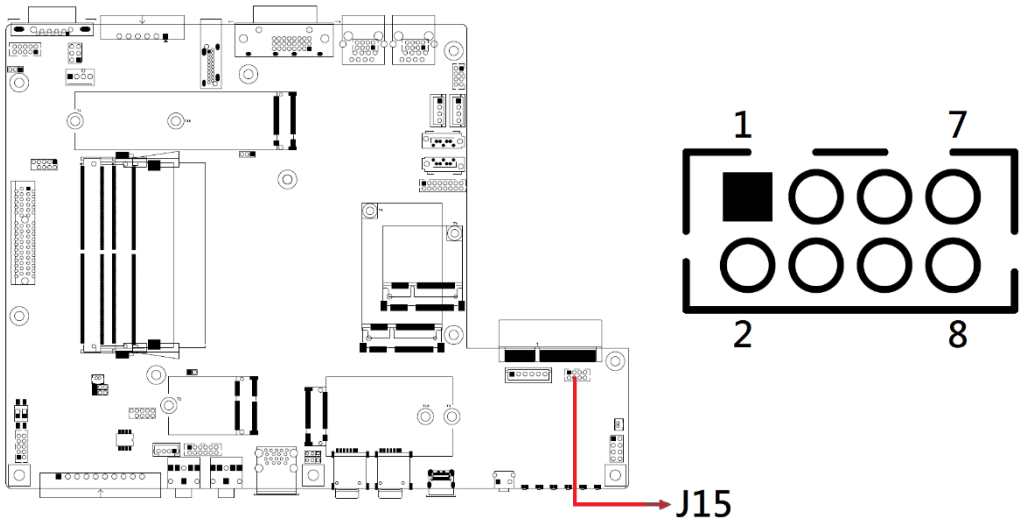
2.5.31 J13: Half-sized Mini PCIE (USB2.0) Connector



2.5.32 J14: Full-sized Mini PCIE (USB2.0/ PCIe x1) Connector

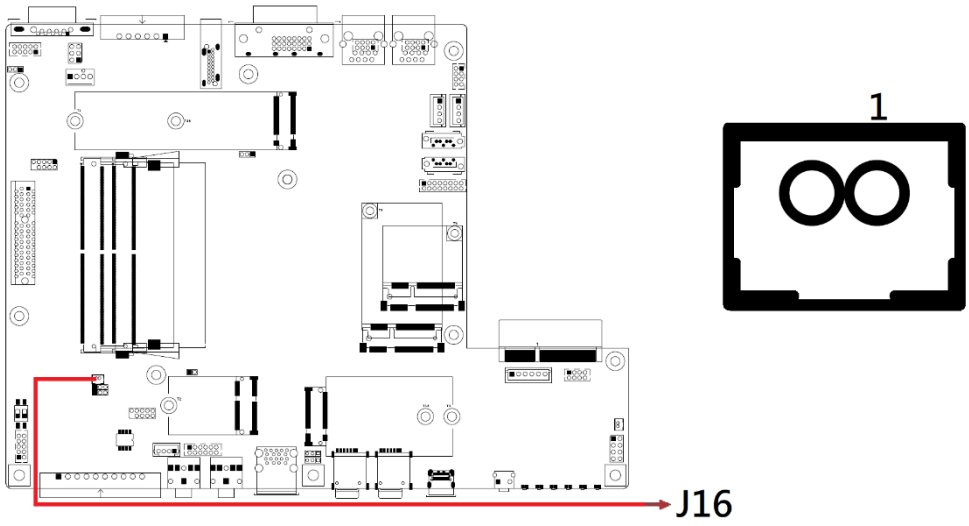


2.5.33 J15: Signals for the Power Board

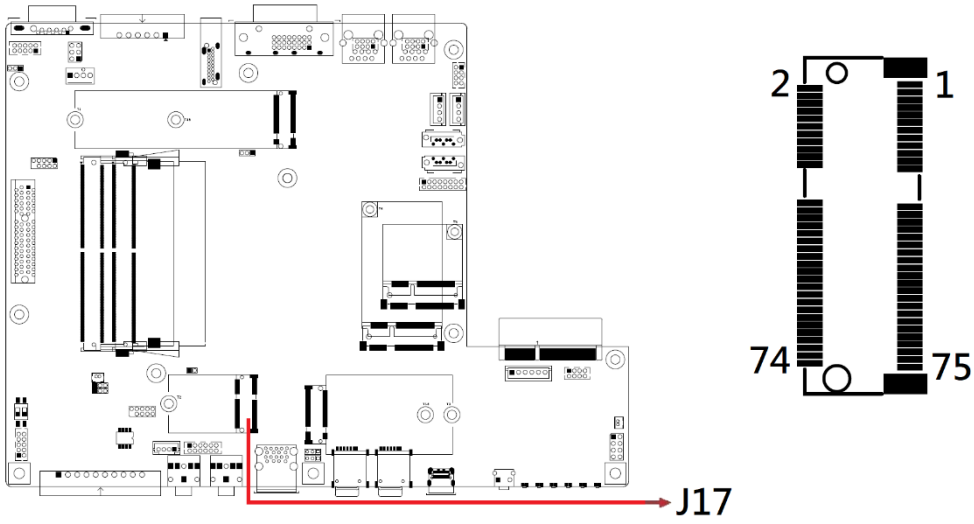


Pin	Assignment	Pin	Assignment
1	GPIA	2	+5V
3	GPIB	4	USB-
5	GPOA	6	USB+
7	GPOB	8	GND

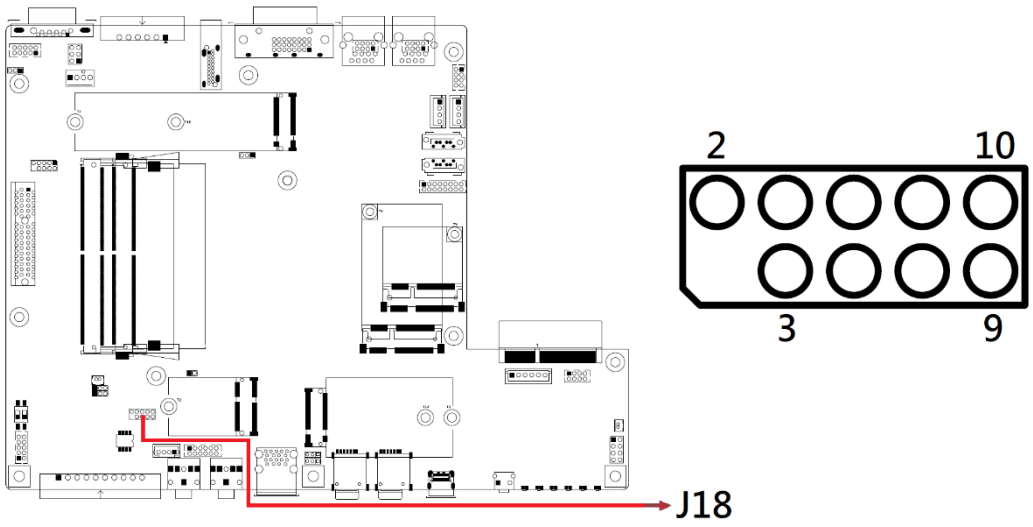
2.5.34 J16: Battery Connector



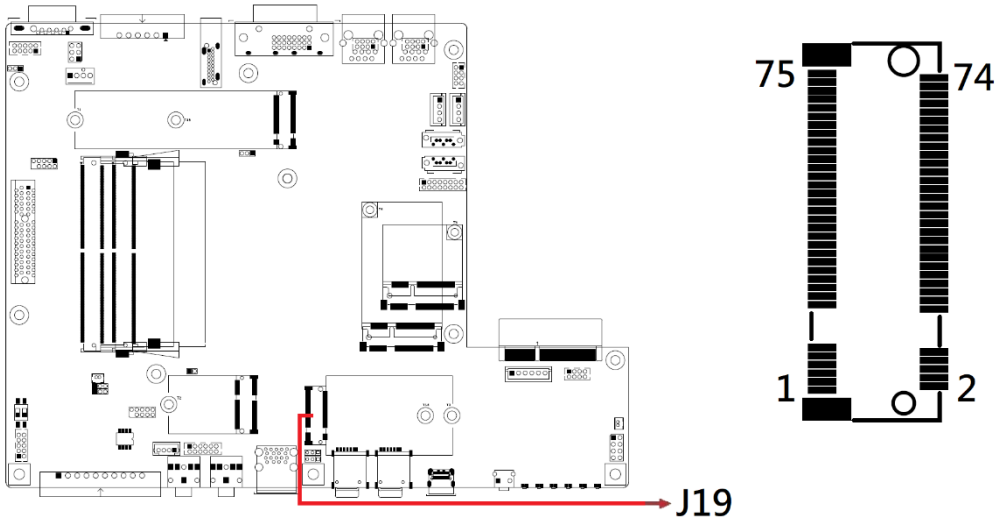
2.5.35 J17: M.2(E) 2230 (USB2.0/ PCIe x1) Connector



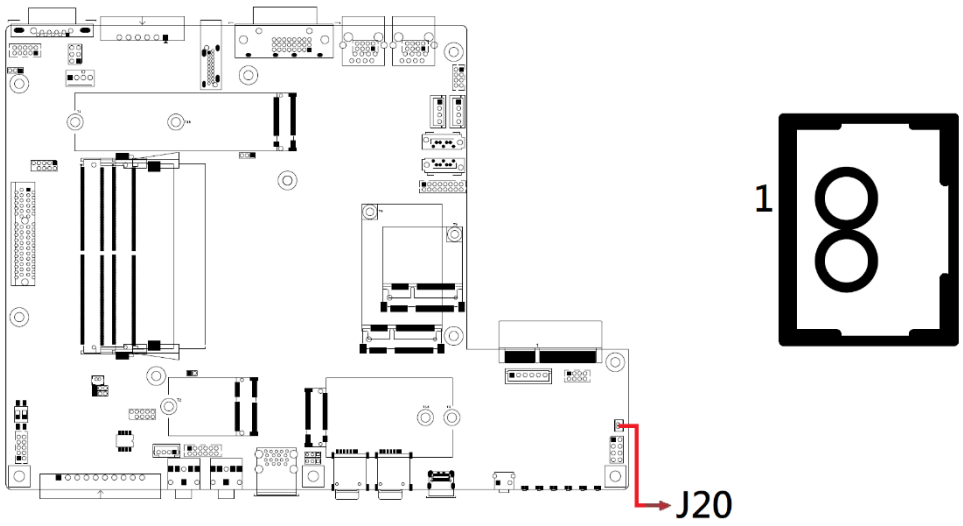
2.5.36 J18: SPI Flash Connector (Factory use only)



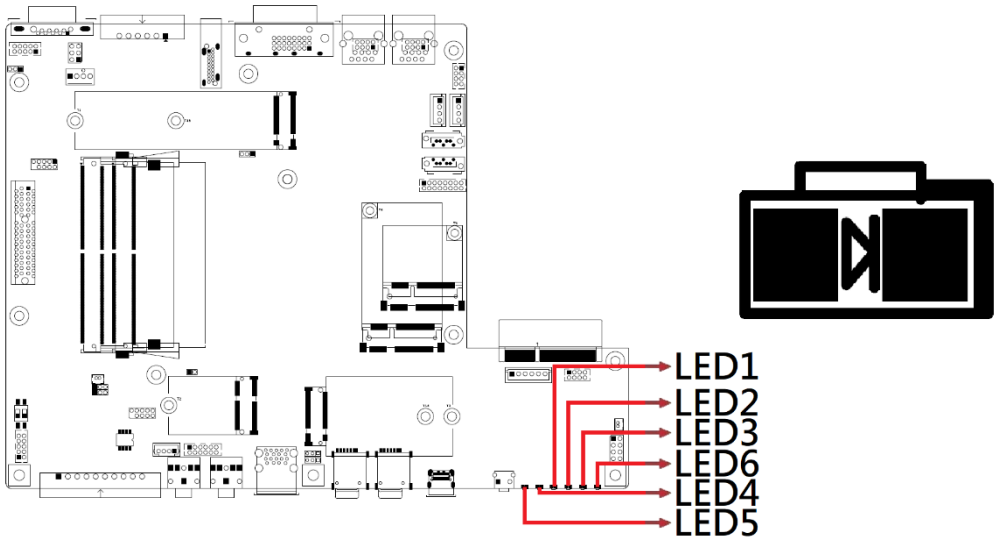
2.5.37 J19: M.2(B) 3042/52 Connector (PCIE x1 / USB 3.0)



2.5.38 J20: Power Button Pin Header

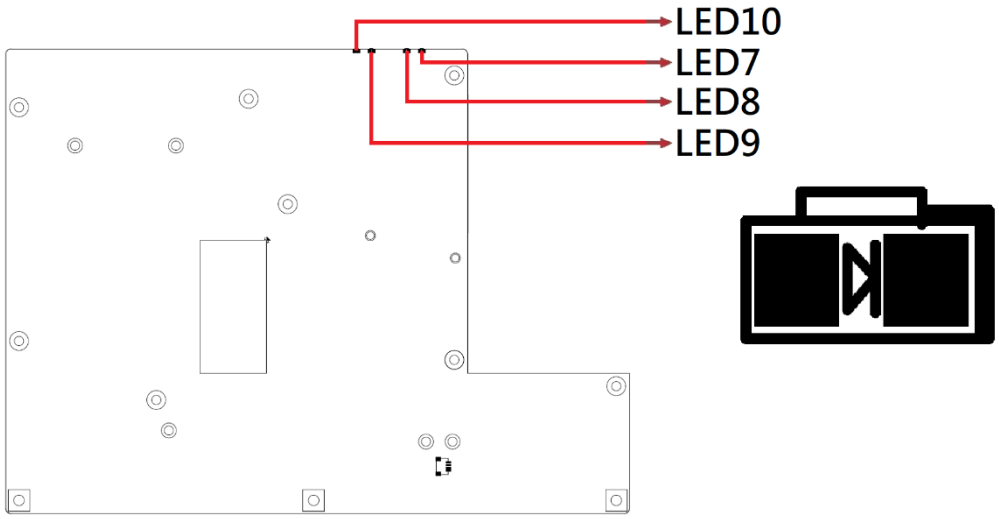


2.5.39 LED1, LED2, LED3, LED4, LED5, LED6



LED	Assignment
LED1	WWAN LED (amber color)
LED2	WLAN LED (blue color)
LED3	Storage LED (white color)
LED4	FP1(white color)
LED5	FP2(white color)
LED6	Power Status (green color)

2.5.40 LED7, LED8, LED9, LED10



LED	Assignment
LED7	Link 2.5G (yellow color)
LED8	Link/active LED (green color)
LED9	Link 2.5G (yellow color)
LED10	Link/active Led (green color)

Chapter 3
Driver Installation

The information provided in this chapter includes:

- Intel® Chipset Software Installation Utility
- Graphics Drivers Installation
- Realtek Audio Drivers Installation
- LAN Drivers Installation
- CAN Bus Drivers Installation
- Intel® ME Drivers Installation

3.1 Introduction

This section describes the installation procedures for software drivers. The drivers can be downloaded from the IBASE website.

Note: After installing your Windows operating system, you must install the Intel® Chipset Software Installation Utility first before proceeding with other drivers.

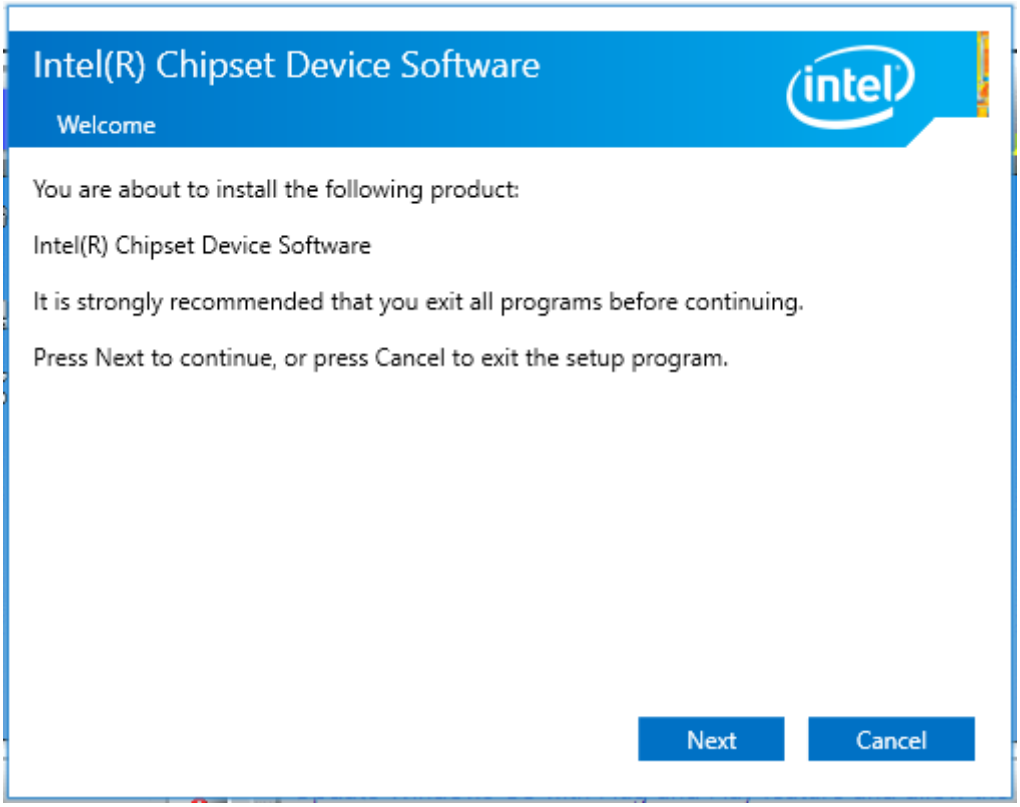
3.2 Intel® Chipset Software Installation Utility

The Intel® Chipset drivers should be installed first before the software drivers to install INF files for Plug & Play function for the chipset components. Follow the steps below.

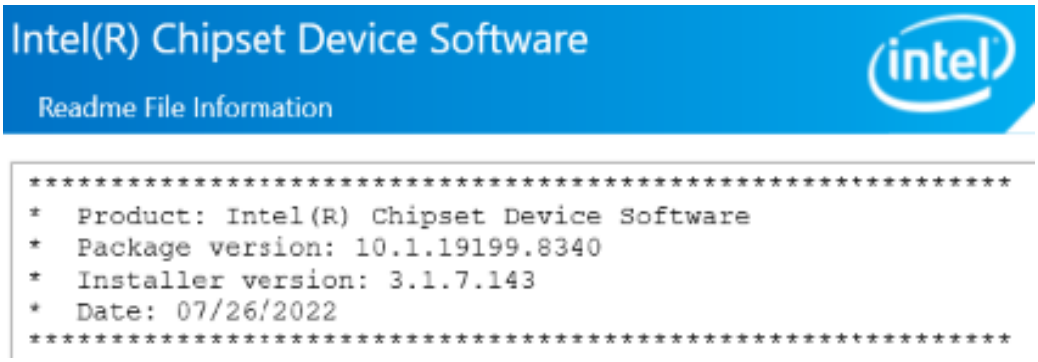
1. Visit the IBASE download page and navigate to your product's support section. Download the compressed driver package and copy it to your system. Double-click the file to extract its contents. Run the CDGuide to open the main driver interface. In the left navigation pane, click Intel, then select Intel® RaptorLake-P/PS/U Chipset Drivers on the right.

2. Click **Intel(R) Chipset Software Installation Utility**.

3. When the *Welcome* screen appears, click **Next**.



4. Read and accept the license agreement.
5. On the *Readme File Information* screen, click **Install**.

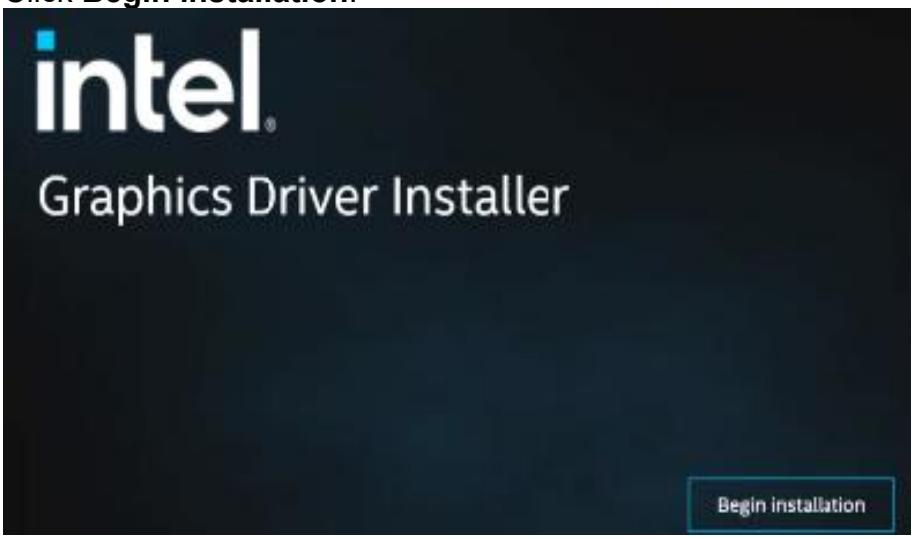


6. When installation is complete, click **Finish** to exit setup.

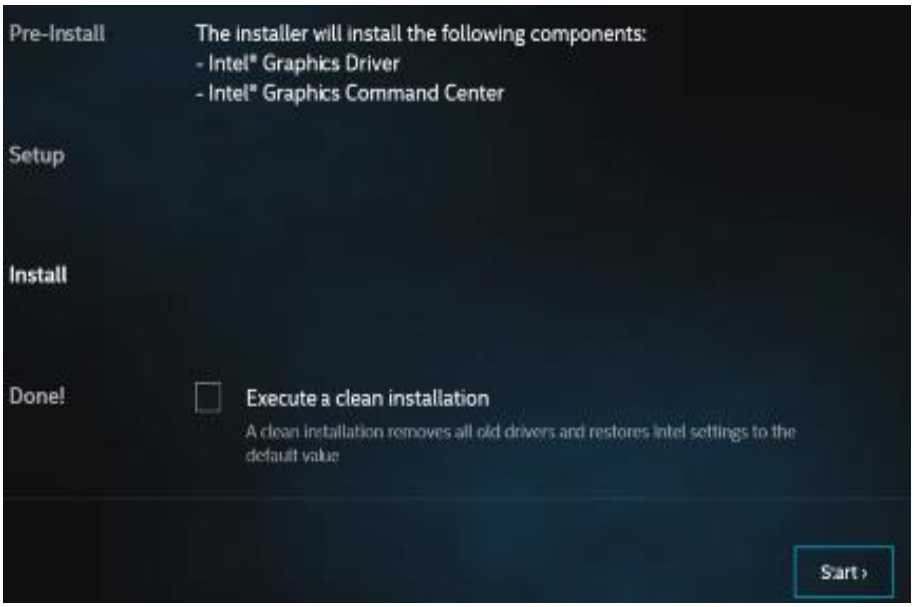
3.3 VGA Drivers Installation

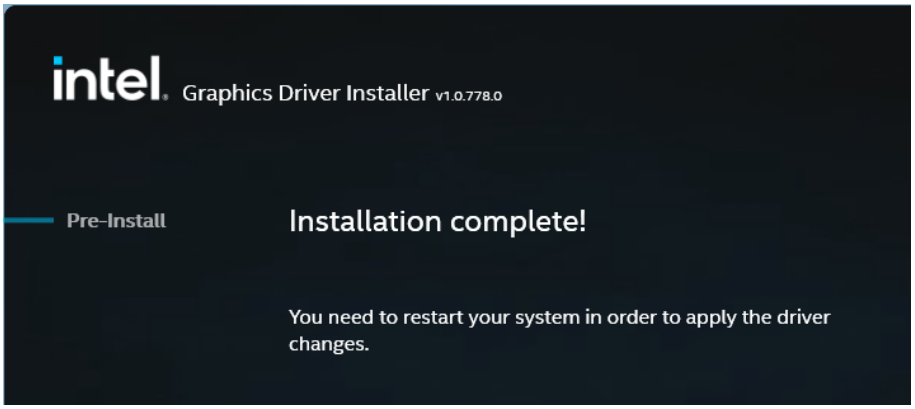
1. Click **Intel** on the left pane and then **Intel(R) RaptorLake-P/PS/U Chipset Drivers** on the right pane.
2. Click **Intel(R) HD Graphics Driver**.

3. Click **Begin installation**.



4. Agree to the INTEL SOFTWARE LICENSE AGREEMENT.
5. Check the “Execute a clean installation” option. Click **Start** to begin installation.



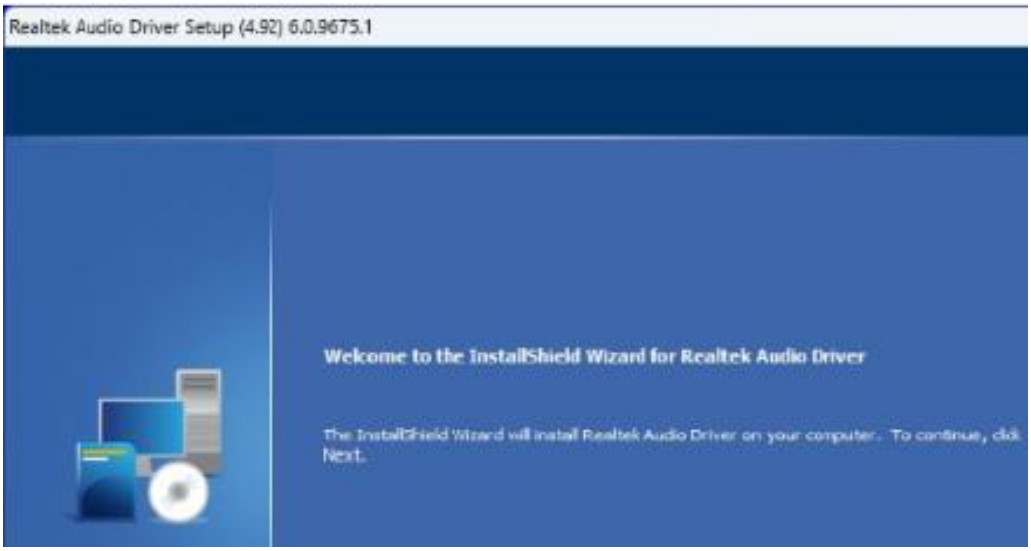
6. When the installation is completed, click **Finish**.
7. 

3.4 HD Audio Driver Installation

1. Click **Intel** on the left pane and then choose **Intel(R) RaptorLake-P/PS/U Chipset Drivers** on the right.
2. Click **Realtek Audio Drivers**.

3. Click **Realtek Audio DCH Drivers**.

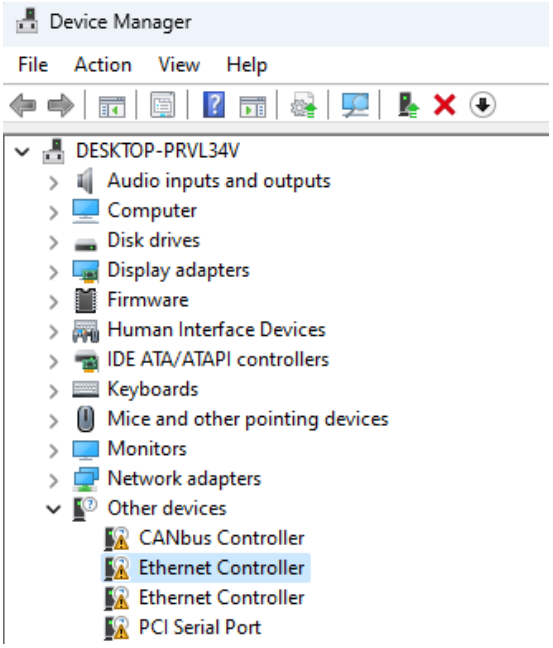
4. On the *Welcome* screen of the InstallShield Wizard, click **Next**.



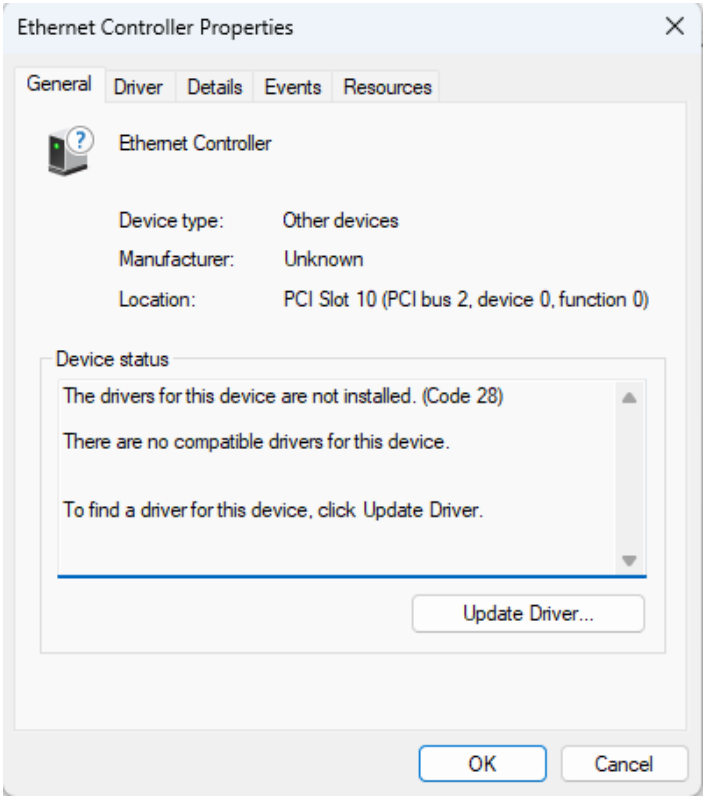
5. When installation is complete, click **Finish**.

3.5 LAN Driver Installation

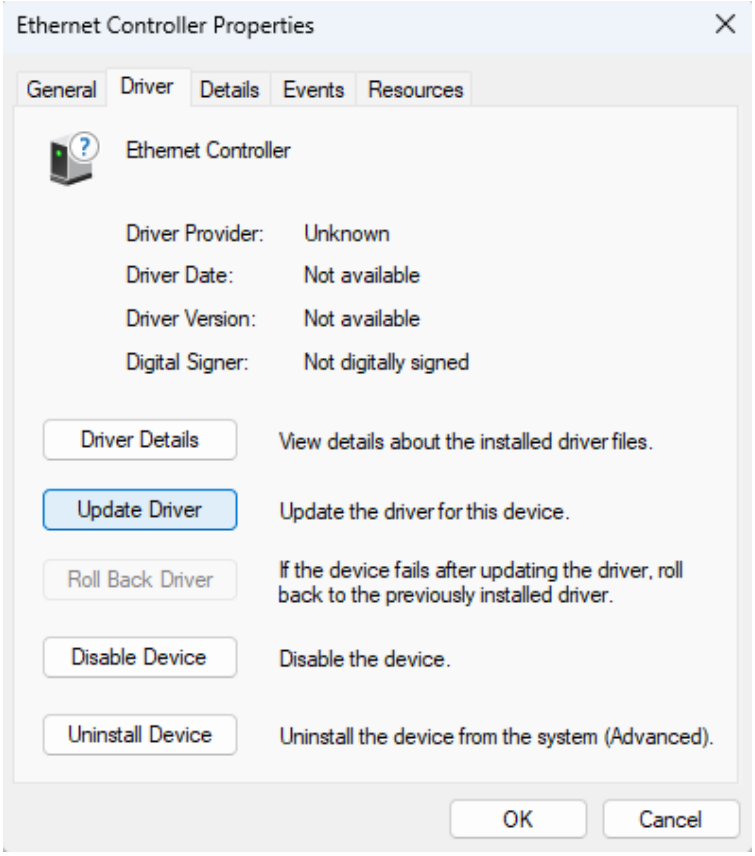
1. Go to the Windows' Device Manager as shown below and choose Ethernet Controller.



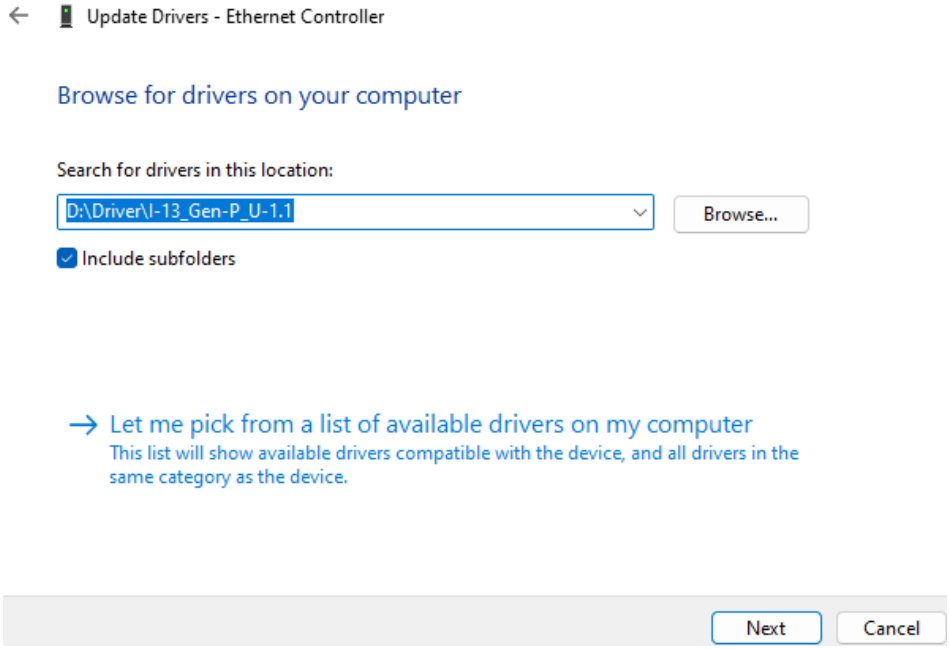
2. Click **Update Driver**.



3. Choose **Update Driver** and click **OK**.

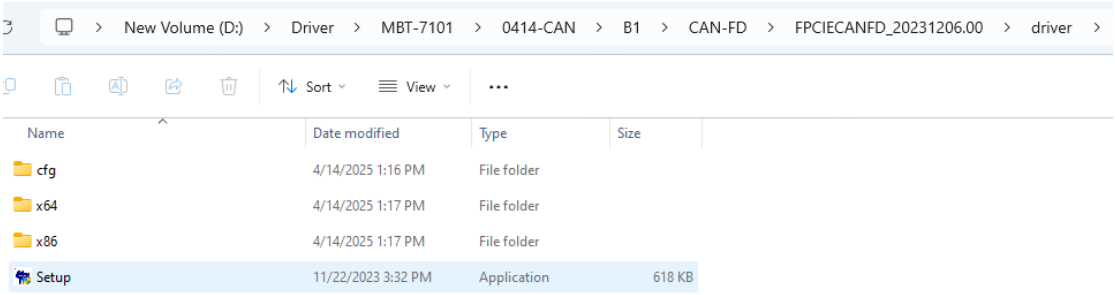


4. Browse for the drivers on your computer and click **Next** as shown below. The list will show available drivers compatible with the device, and all the drivers in the same category as the device. Proceed accordingly to finish the installation.

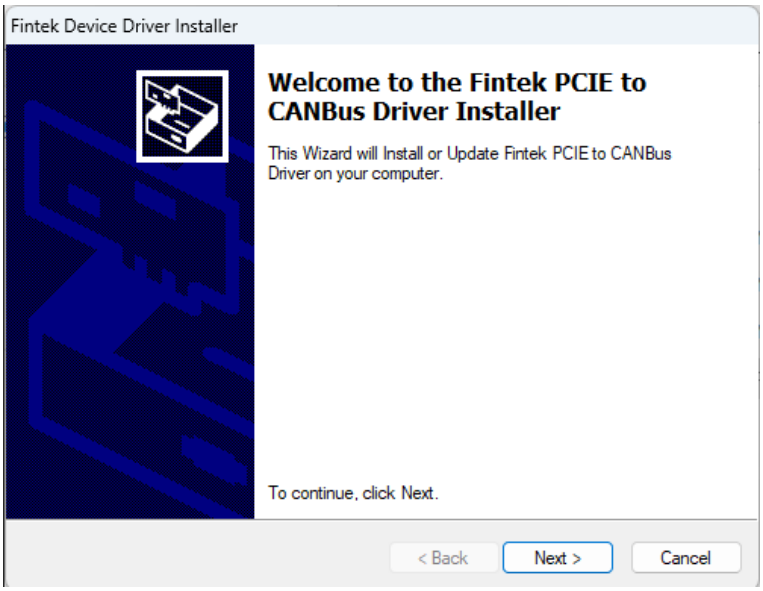


3.6 CAN Bus Drivers Installation

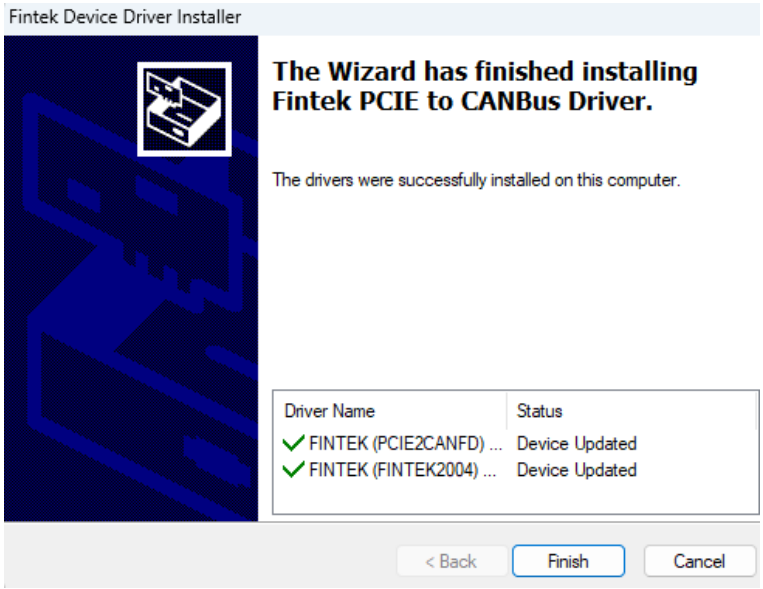
1. Locate the CAN Bus driver files, as shown in the subdirectory below. Run the **Setup** file.



2. In the **Welcome** screen, click **Next** to start installing the drivers.



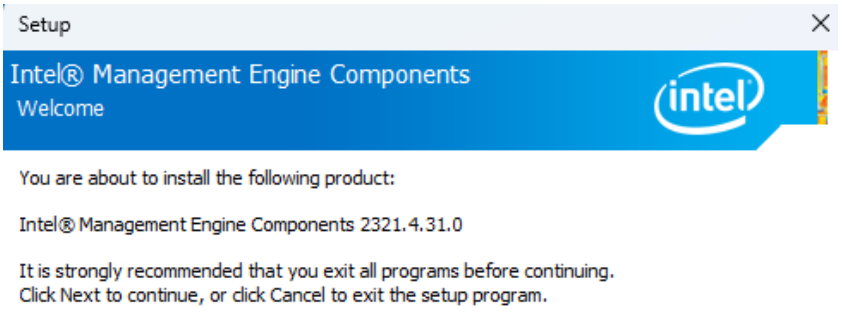
3. After the Wizard has finished the installation, click **Finish**.



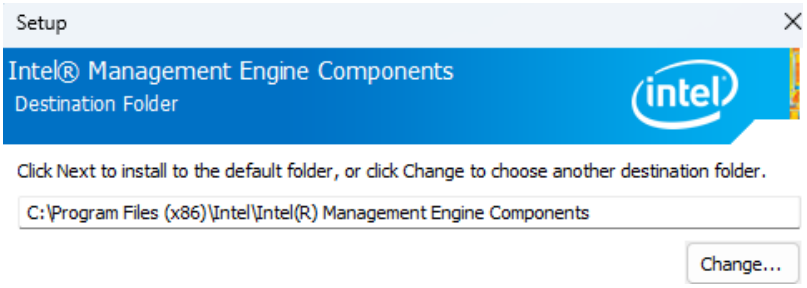
3.7 Intel® Management Engine Components Drivers Installation

1. Click **Intel** on the left pane and then select **Intel(R) RaptorLake-P/PS/U Chipset Drivers** on the right pane.
2. Click **Intel(R) ME Drivers**.

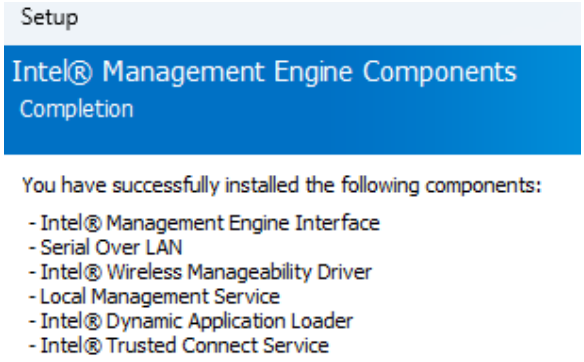
3. When the Welcome screen appears, click **Next**.



4. Accept the terms in license agreement, then click **Next**.
5. In the Destination Folder screen, click **Next** to install to the default folder, or click Change to choose another destination folder.



6. After installation is complete, click **Finish** to close the setup.



Chapter 4
BIOS Setup

This chapter describes the different settings available in the AMI BIOS that comes with the board. The topics covered in this chapter are as follows:

- Main Settings
- Advanced Settings
- Security Settings
- Boot Settings
- Save & Exit

4.1 Introduction

The BIOS (Basic Input/Output System) installed in the ROM of your computer system supports Intel® processors. The BIOS provides critical low-level support for standard devices such as disk drives and serial ports. It also provides password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system.

4.2 BIOS Setup

The BIOS provides a Setup utility program for specifying the system configurations and settings. The BIOS ROM of the system stores the Setup utility. When you turn on the computer, the BIOS is immediately activated. Press the <Del> key immediately allows you to enter the Setup utility. If you are a little bit late pressing the <Del> key, POST (Power On Self Test) will continue with its test routines, thus preventing you from invoking the Setup.

If you still need to enter Setup, restart the system by pressing the ”Reset” button or simultaneously pressing the <Ctrl>, <Alt> and <Delete> keys. You can also restart by turning the system Off and back On again.

The following message will appear on the screen:

```
Press <DEL> to Enter Setup
```

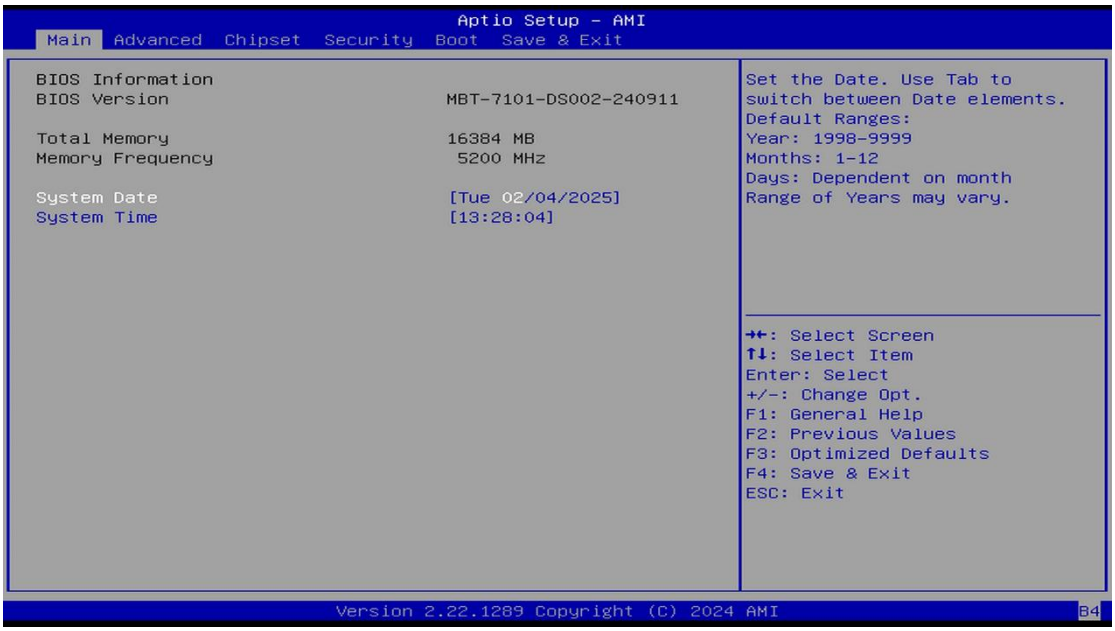
In general, press the arrow keys to highlight items, <Enter> to select, the <PgUp> and <PgDn> keys to change entries, <F1> for help, and <Esc> to quit.

When you enter the BIOS Setup utility, the *Main Menu* screen will appear on the screen. The Main Menu allows you to select from various setup functions and exit choices.

Warning: It is strongly recommended that you avoid making any changes to the chipset defaults.

These defaults have been carefully chosen by both AMI and your system manufacturer to provide the absolute maximum performance and reliability. Changing the defaults could make the system unstable and crash in some cases.

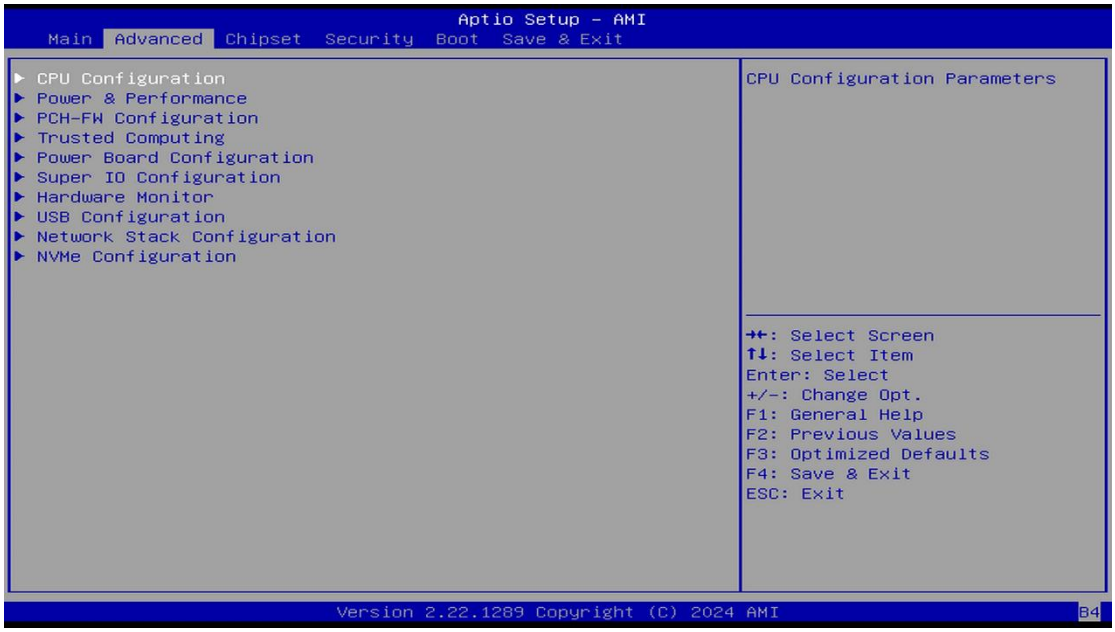
4.3 Main Settings



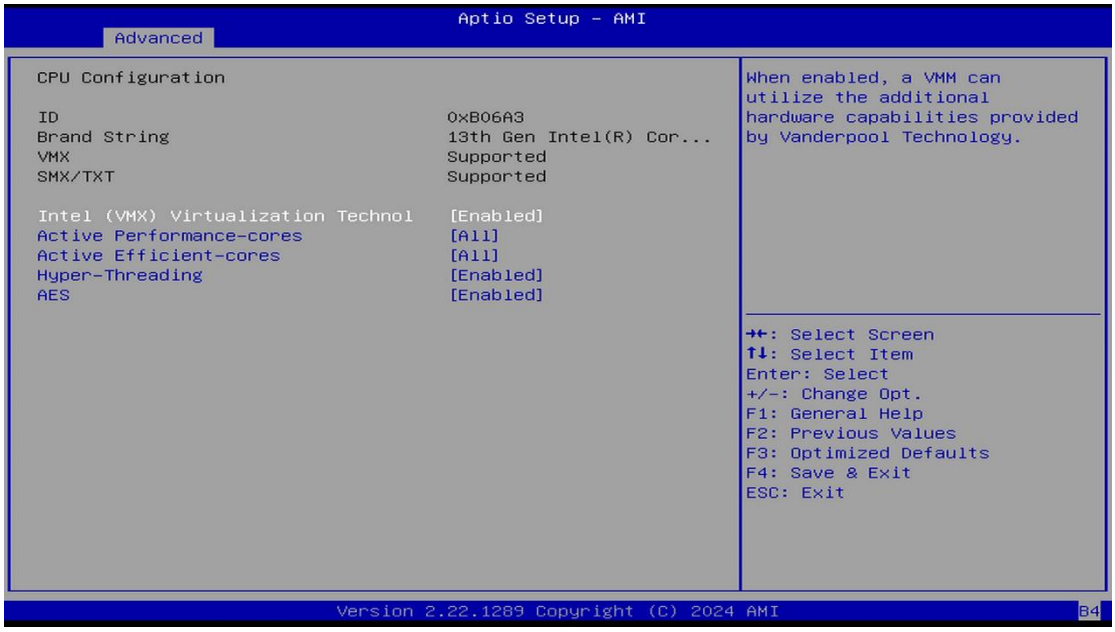
BIOS Setting	Description
System Date	Sets the date. Use the <Tab> key to switch between the data elements.
System Time	Set the time. Use the <Tab> key to switch between the data elements.

4.4 Advanced Settings

This section allows you to configure, improve your system and allows you to set up some system features according to your preference.

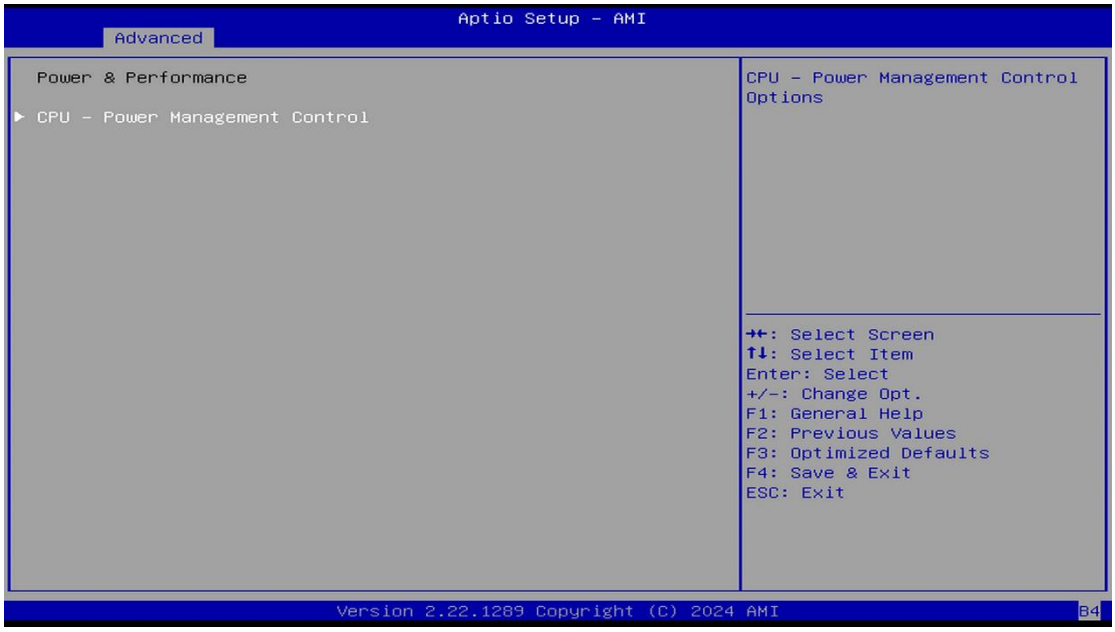


4.4.1 CPU Configuration



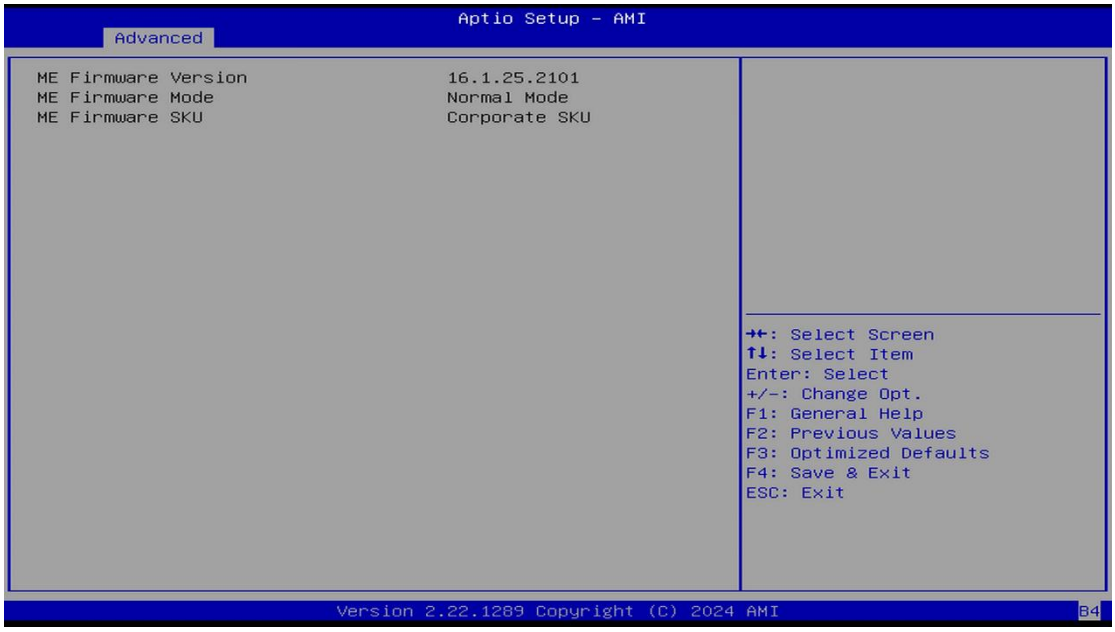
BIOS Setting	Description
Intel (VMX) Virtualization Technology	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.
Active Performance-cores Active Efficient-cores	Number of P-cores to enable in each processor package. Note: Number of Cores and E-cores are looked at together. When both are (0,0), Pcode will enable all cores
Hyper-Threading	Enable or disable Hyper-Threading Technology.
AES	Enable/Disable AES (Advanced Encryption Standard)

4.4.2 Power & Performance

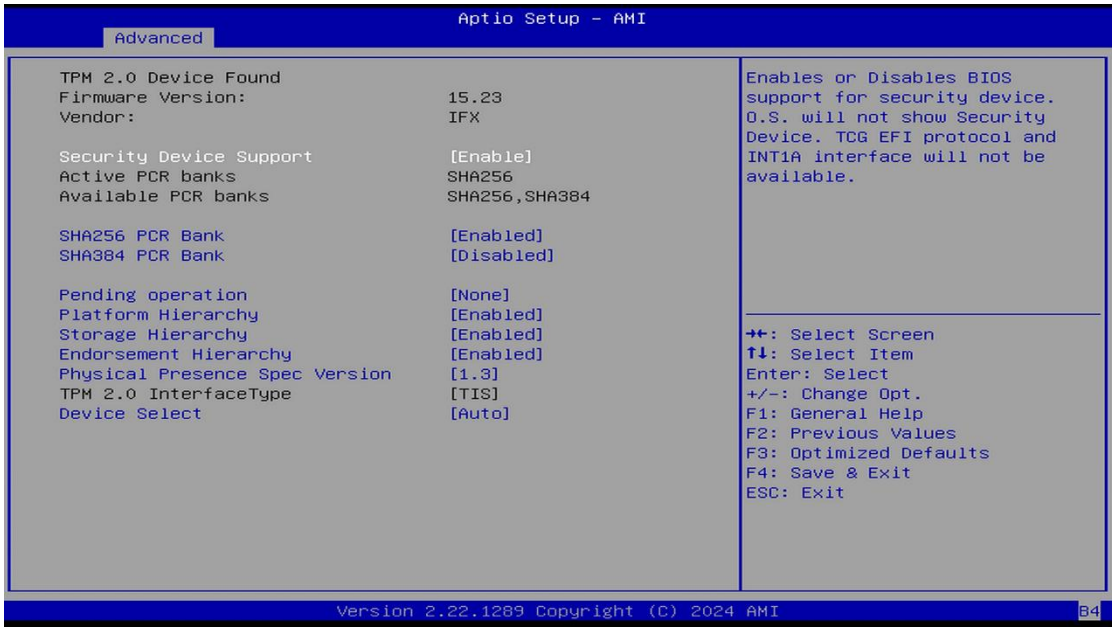


BIOS Setting	Description
CPU – Power Management Control	CPU – Power Management Control Options

4.4.3 PCH-FW Configuration

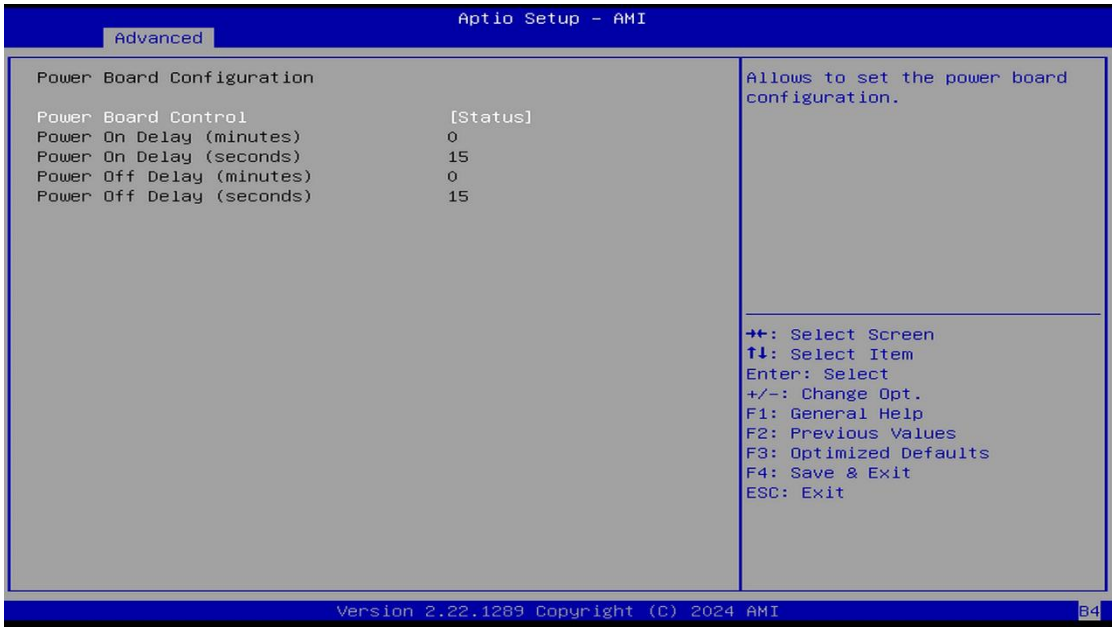


4.4.4 Trusted Computing



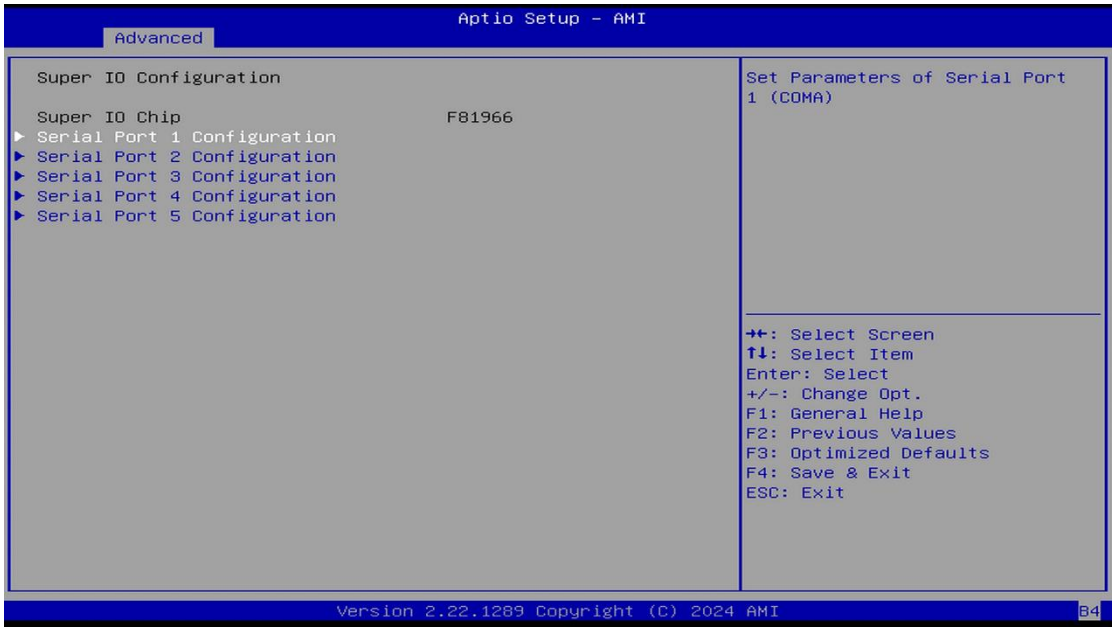
BIOS Setting	Description
Security Device Support	Enables / Disables BIOS support for security device. The OS will not show security device. TCG EFI protocol and INTIA interface will not be available.
SHA256 / SHA384 Bank	Option: Enabled / Disabled
Pending operation	Schedule an operation for the security device. Note: Your computer will reboot to change state of security device.
Platform Hierarchy	Enables / Disables platform hierarchy.
Storage Hierarchy	Enables / Disables storage hierarchy.
Endorsement Hierarchy	Enables / Disables endorsement hierarchy.
Physical Presence Spec Version	Selects to show the PPI Spec Version (1.2 or 1.3) that the OS supports. **Note:** Some HCK tests might not support 1.3.
Device Select	• **TPM 1.2** will restrict support to TPM 1.2 devices only. • **TPM 2.0** will restrict support to TPM 2.0 devices only. • **Auto** will support both with the default being set to TPM 2.0 devices if not found, and TPM 1.2 device will be enumerated.

4.4.5 Power Board Configuration



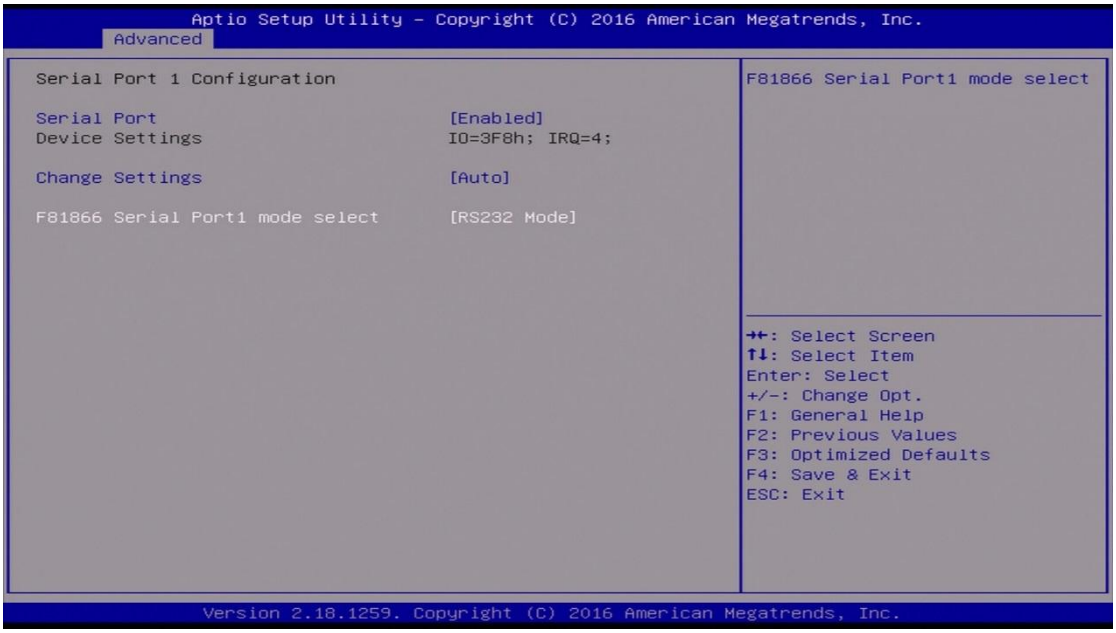
BIOS Setting	Description
Power Board Delay Control	Allows to set the delay timer for turning on or off the power board.
Power On Delay (minutes) / (seconds)	Sets the power-on-delay timer for minutes / seconds.
Power Off Delay (minutes) / (seconds)	Sets the power-off-delay timer for minutes / seconds.

4.4.6 Super IO Configuration



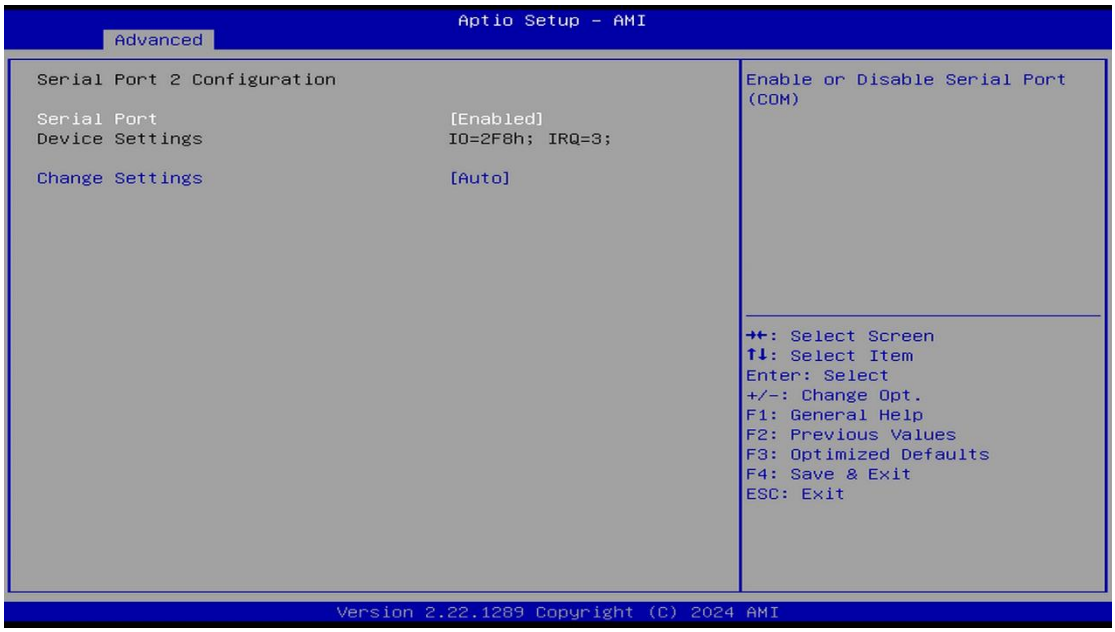
BIOS Setting	Description
Serial Port Configuration	Configures serial ports. You can enable / disable the serial port and select an optimal settings for the Super IO device.

4.4.6.1. Serial Port 1 Configuration



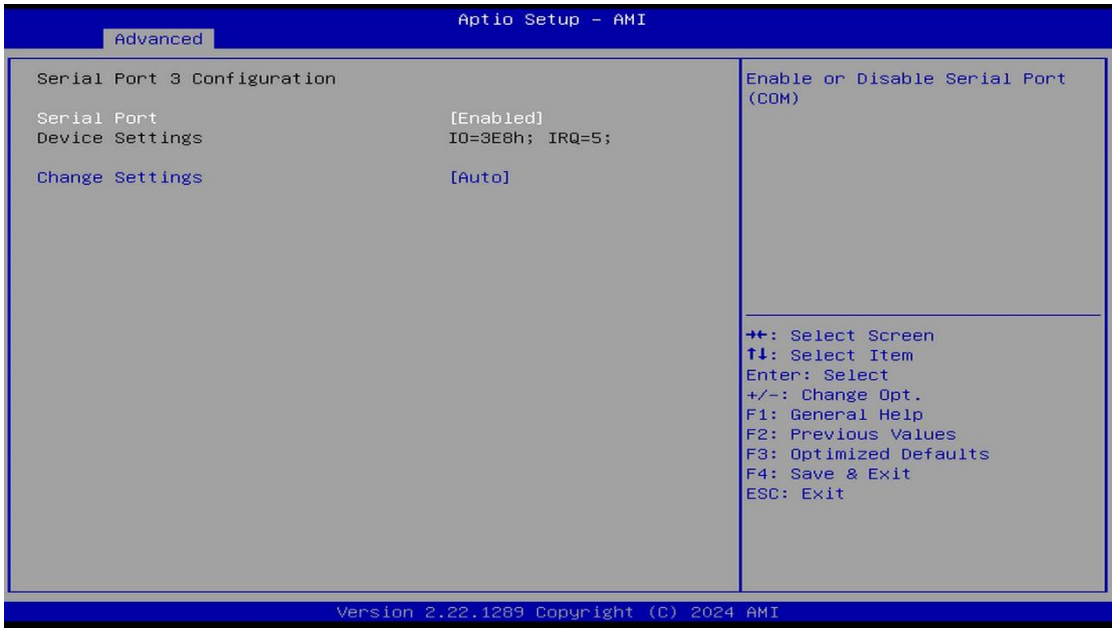
BIOS Setting	Description
Serial Port	Enables / Disables the serial port (COM).
Change Settings	Selects an optimal settings for the Super I/O device.
F81866 Serial Port1 Mode Select	Changes the mode of serial port.

4.4.6.2. Serial Port 2 Configuration



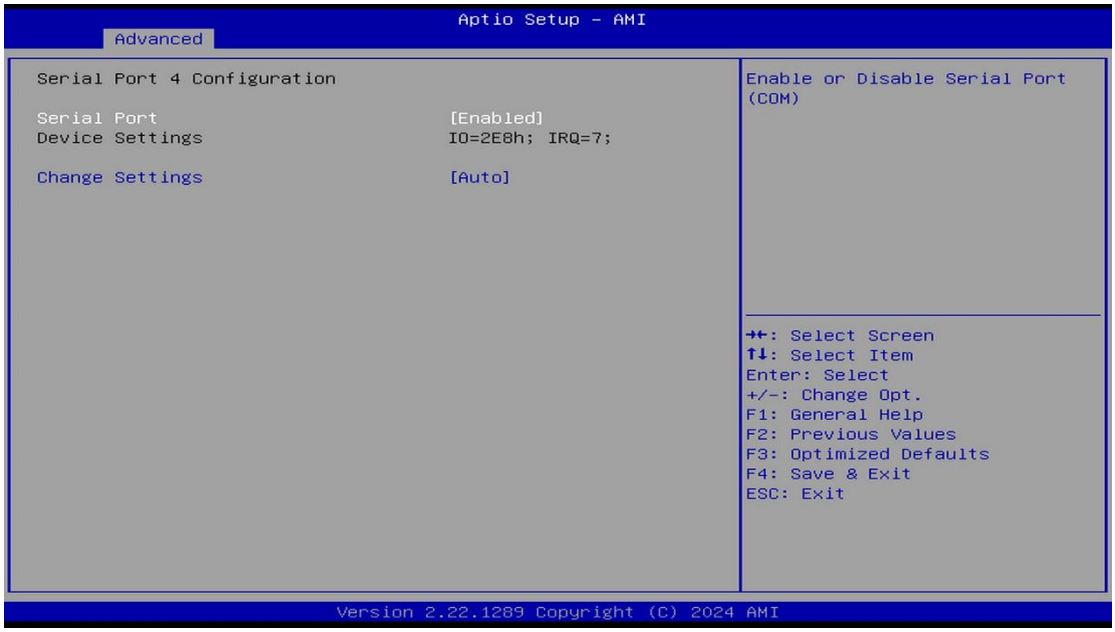
BIOS Setting	Description
Serial Port	Enables / Disables the serial port (COM).
Change Settings	Selects an optimal setting for the Super I/O device.

4.4.6.3. Serial Port 3 Configuration



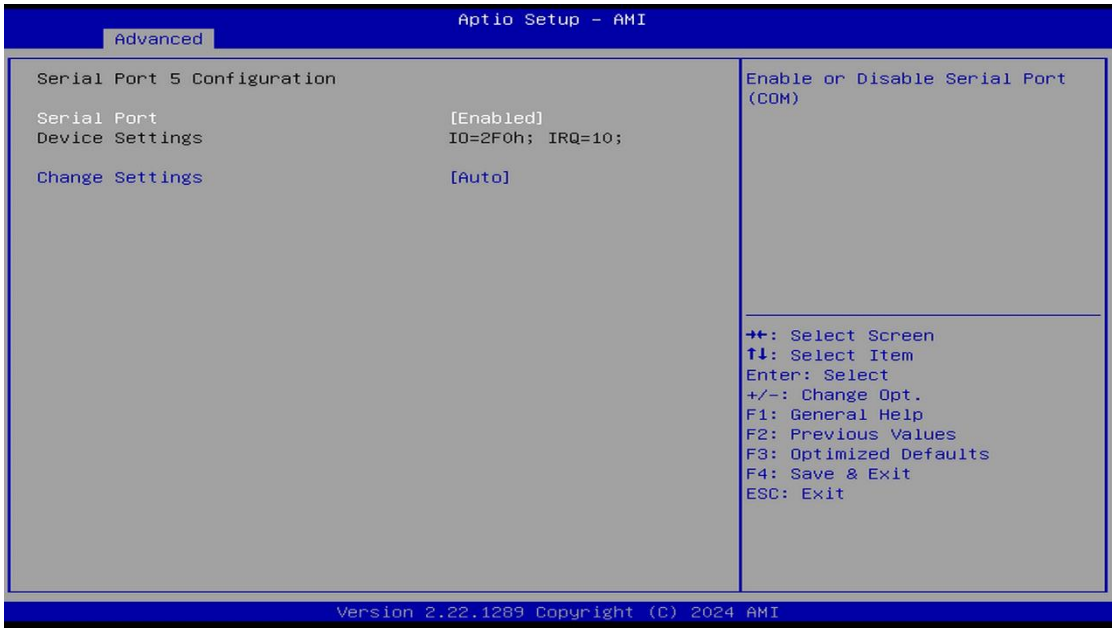
BIOS Setting	Description
Serial Port	Enables / Disables the serial port (COM).
Change Settings	Selects an optimal setting for the Super I/O device.

4.4.6.4. Serial Port 4 Configuration



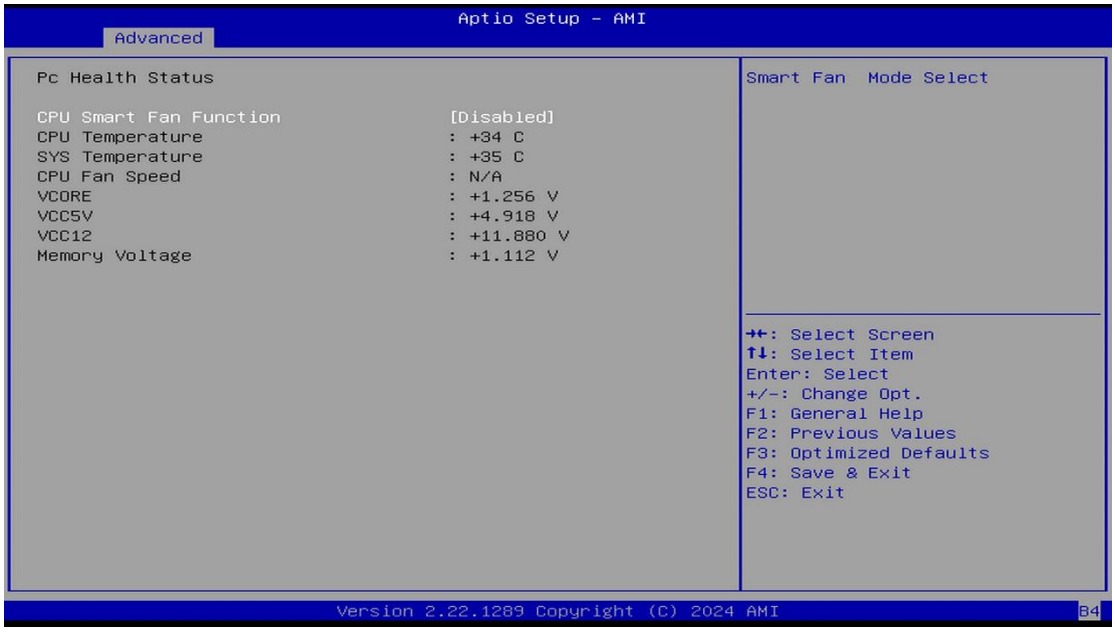
BIOS Setting	Description
Serial Port	Enables / Disables the serial port (COM).
Change Settings	Selects an optimal settings for the Super I/O device.

4.4.6.5. Serial Port 5 Configuration



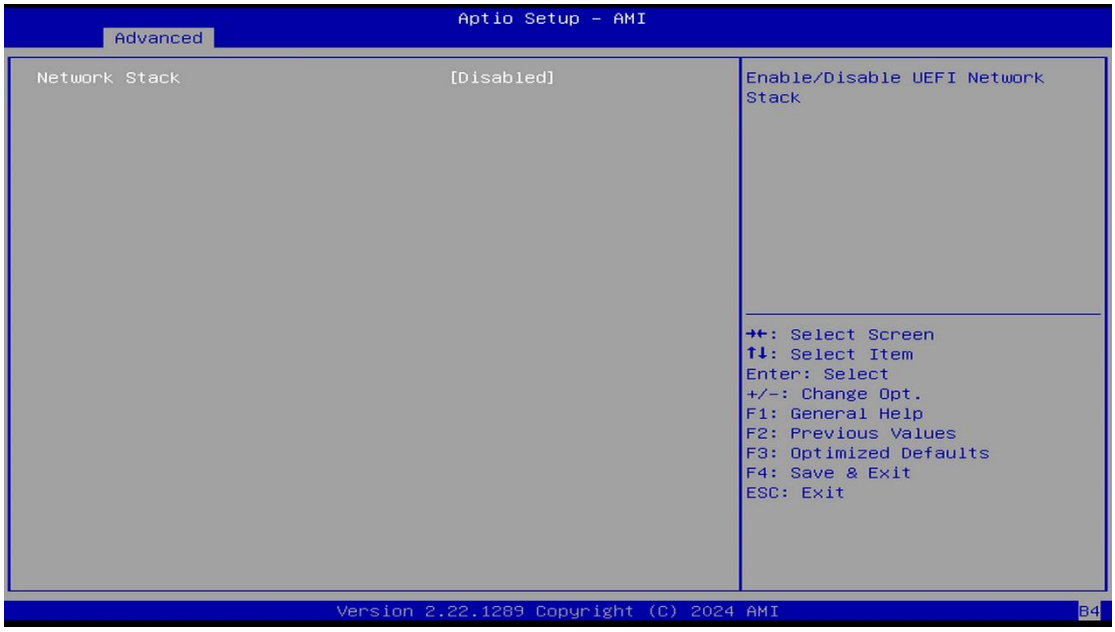
BIOS Setting	Description
Serial Port	Enables / Disables the serial port (COM).
Change Settings	Selects an optimal settings for the Super I/O device.

4.4.7 Hardware Monitor

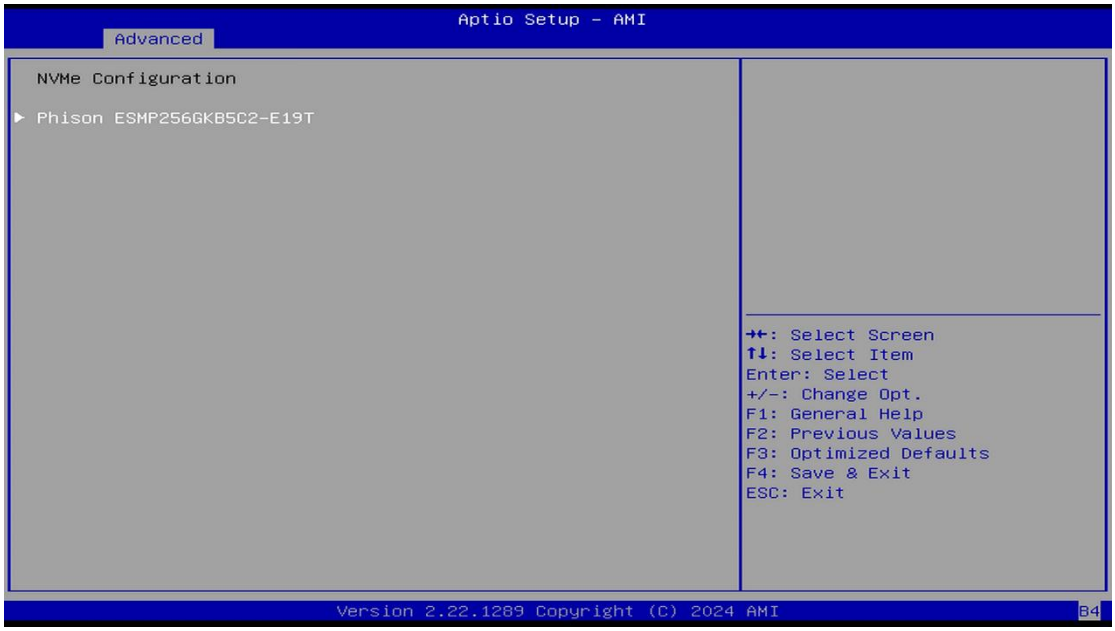


BIOS Setting	Description
CPU Smart Fan Function	Selects the Smart Fan Mode operating mode
Temperatures / Voltages	These fields are the parameters of the hardware monitoring function feature of the motherboard. The values are read-only values as monitored by the system and show the PC health status

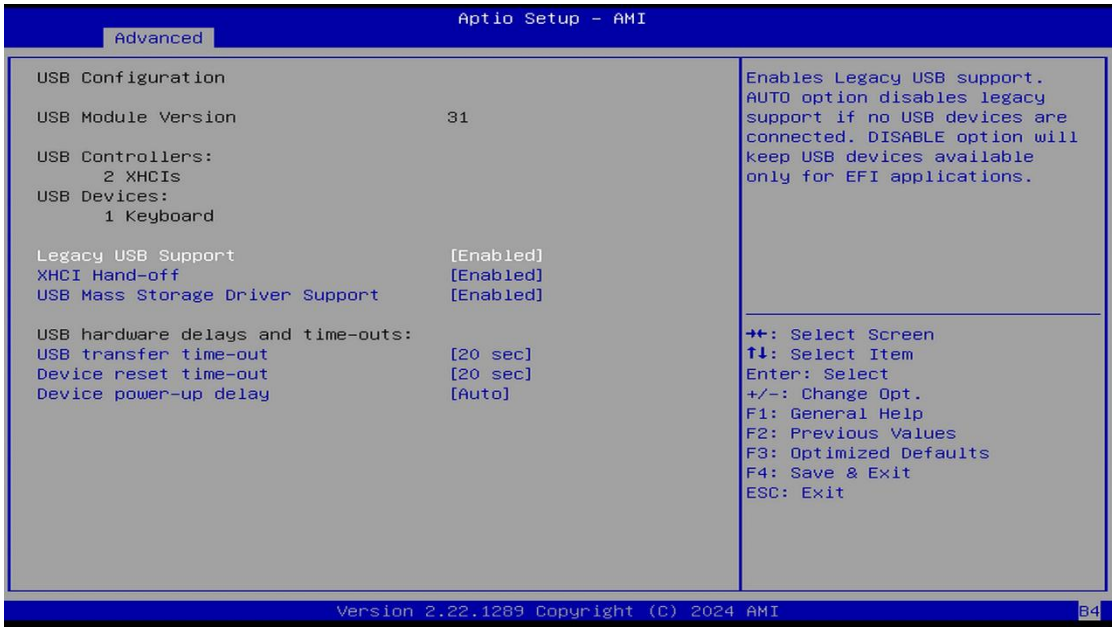
4.4.8 Network Stack Configuration



4.4.9 NVMe Configuration

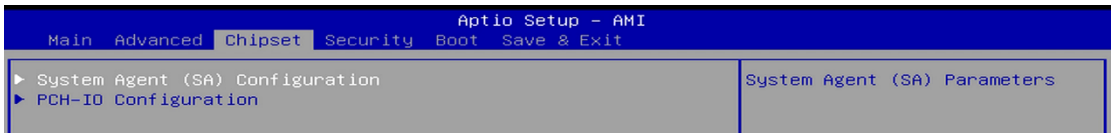


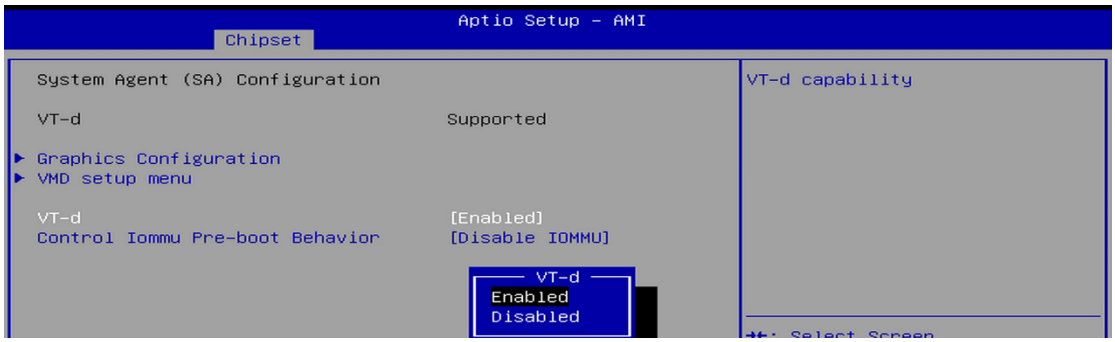
4.4.10 USB Configuration



BIOS Setting	Description
Legacy USB Support	Enables / Disables Legacy USB support. • **Auto** disables legacy support if there is no USB device connected. • **Disable** keeps USB devices available only for EFI applications.
XHCI Hand-off	This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
USB Mass Storage Driver Support	Enables / Disables USB mass storage driver support.
USB Transfer time-out	Sets the time-out value 1, 5, 10 or 20 sec(s) for Control, Bulk, and Interrupt transfers.
Device reset time-out	Sets the seconds (10, 20, 30, 40 secs) of delaying execution of start unit command to USB mass storage device.
Device power-up delay	The maximum time the device will take before it properly reports itself to the Host Controller. Auto uses default value. For a Root port, it is 100 ms. For a Hub port, the delay is taken from Hub descriptor.

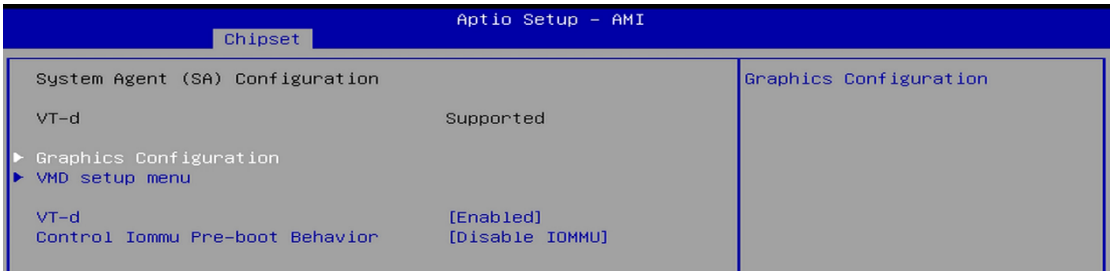
4.5 Chipset Settings





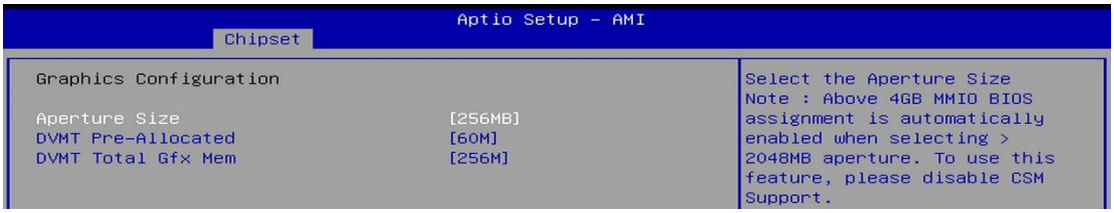
BIOS Setting	Description
System Agent (SA) Configuration	System Agent (SA) parameters
PCH-IO Configuration	PCH parameters

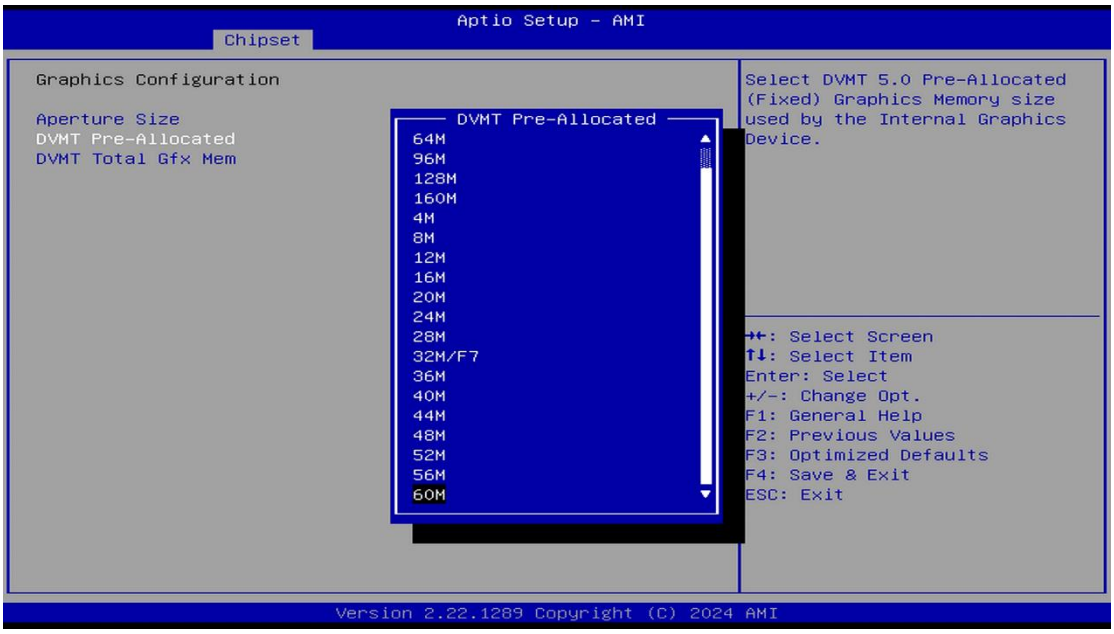
4.5.1 System Agent (SA) Configuration

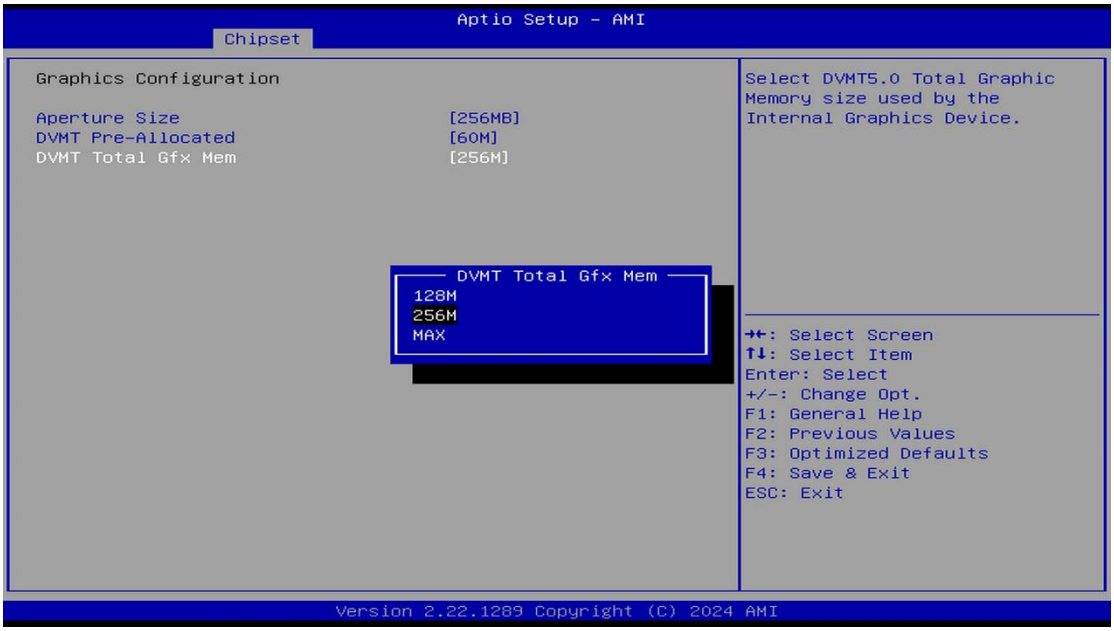


BIOS Setting	Description
Graphics Configuration	Configures the graphics settings.
VT-d	VT-d capability, Enabled/Disabled
Control Iommu Pre-boot Behavior	Default: Disable

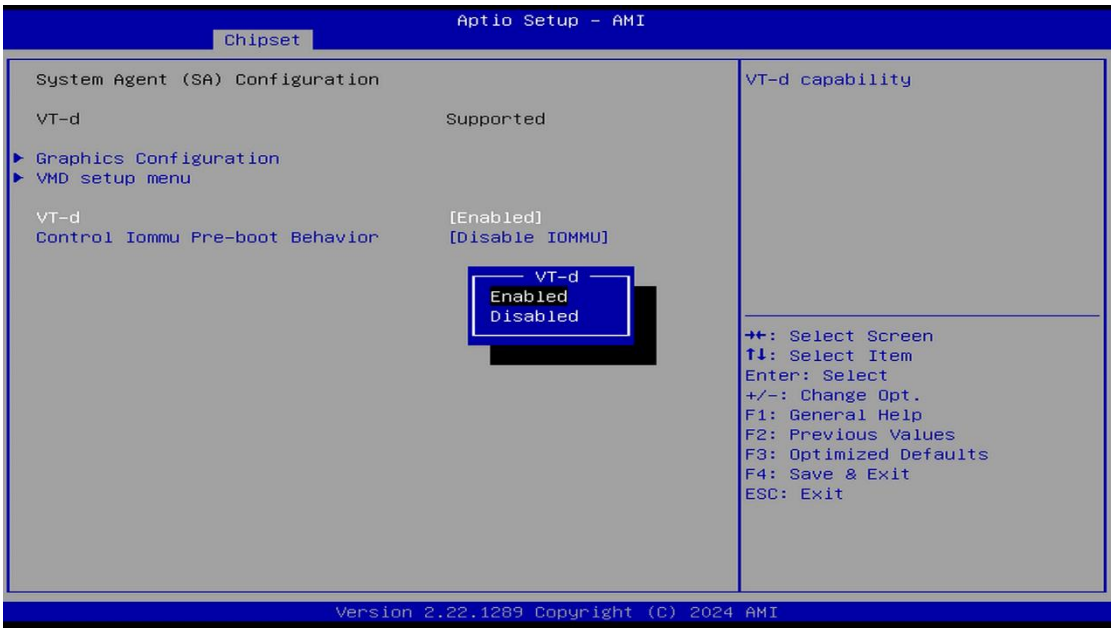
4.5.1.1. Graphics Configuration

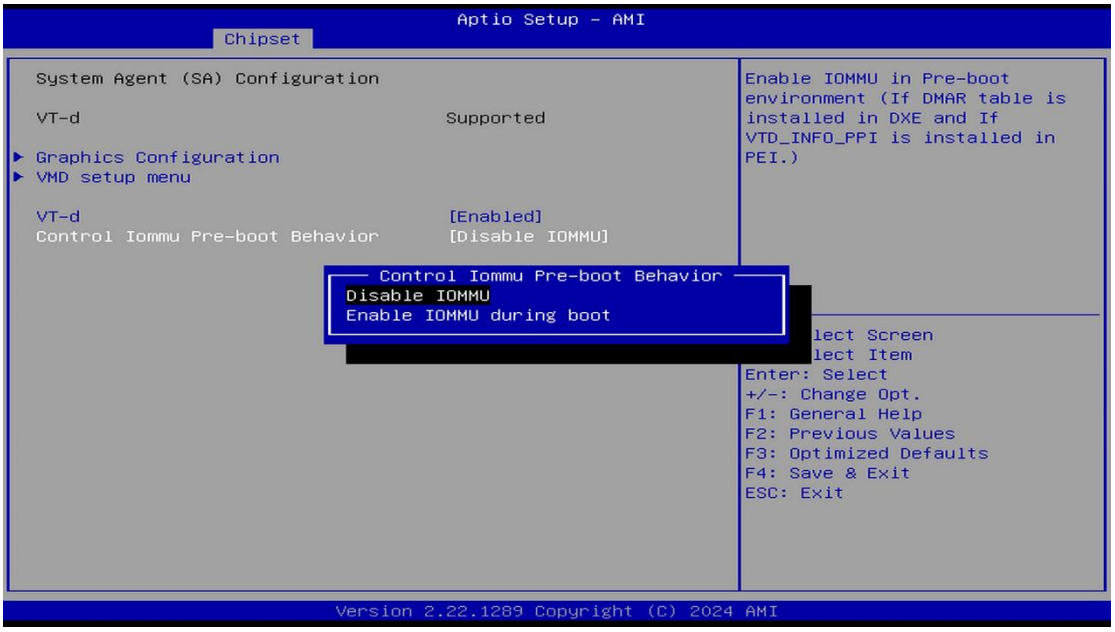




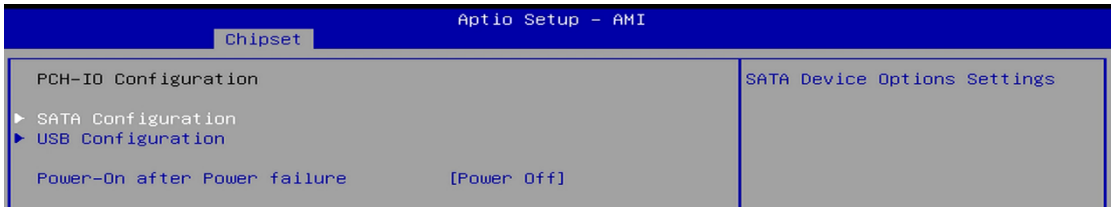


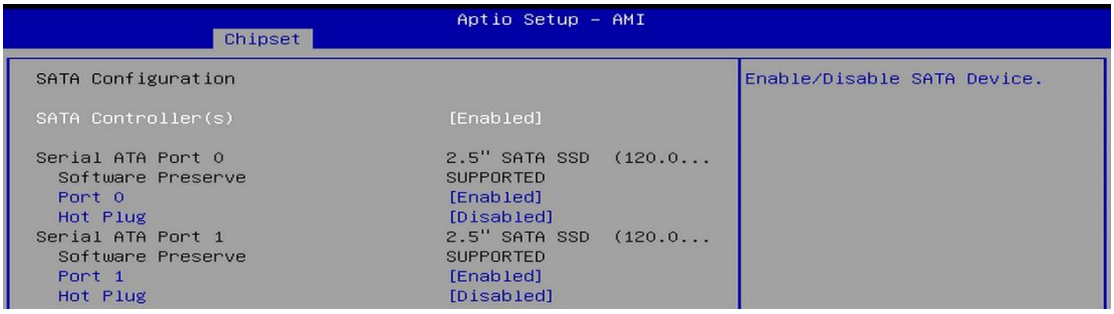
4.5.1.2. VMD Setup Menu

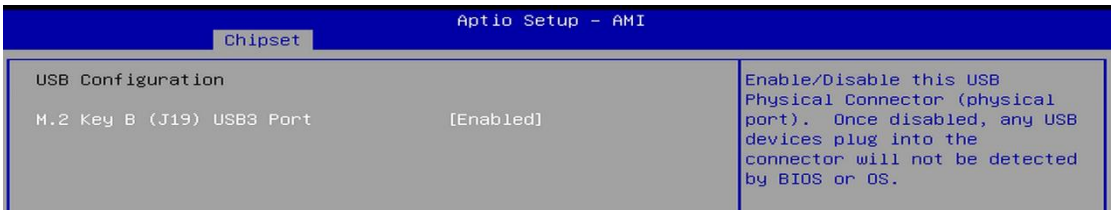


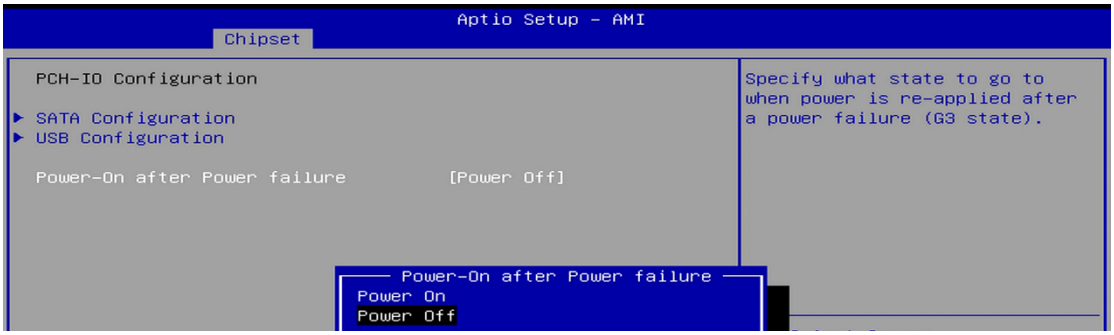


4.5.6 PCH-IO Configuration



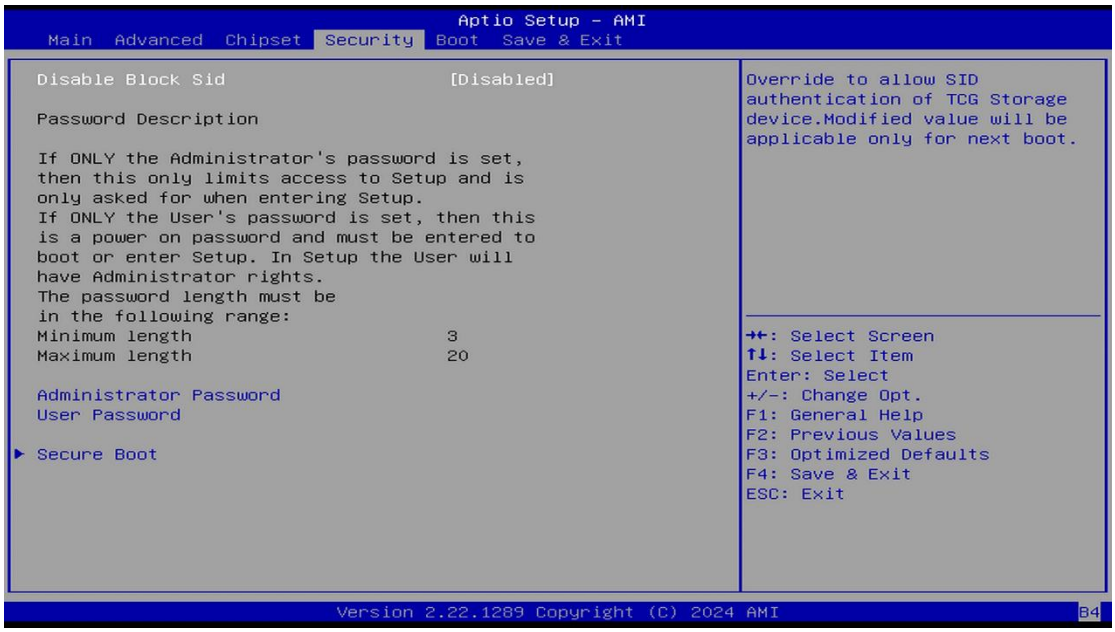






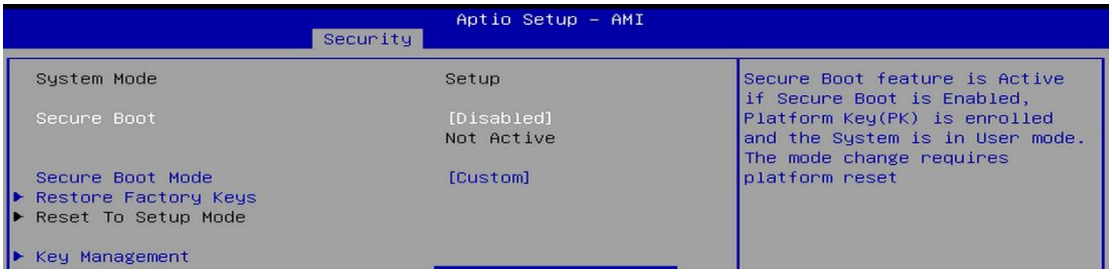
BIOS Setting	Description
SATA Controller(s)	Enables / Disables the SATA device.
Serial ATA Ports	Enables / Disables SATA ports.
Hot Plug	Designates the port as Hot Pluggable.
Power-On after Power failure	Specify what state to go to when power is re-applied after a power failure (S3 state)

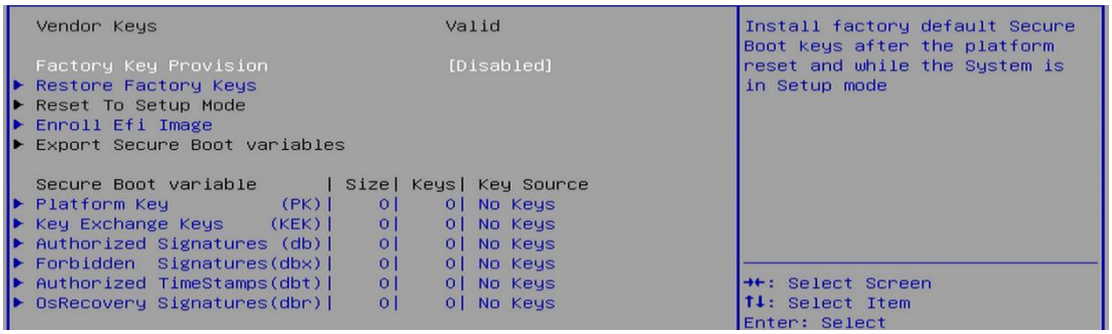
4.6 Security Settings

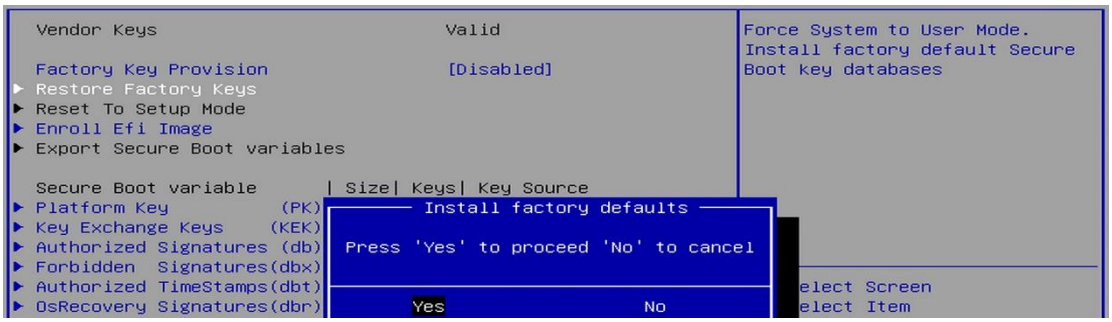


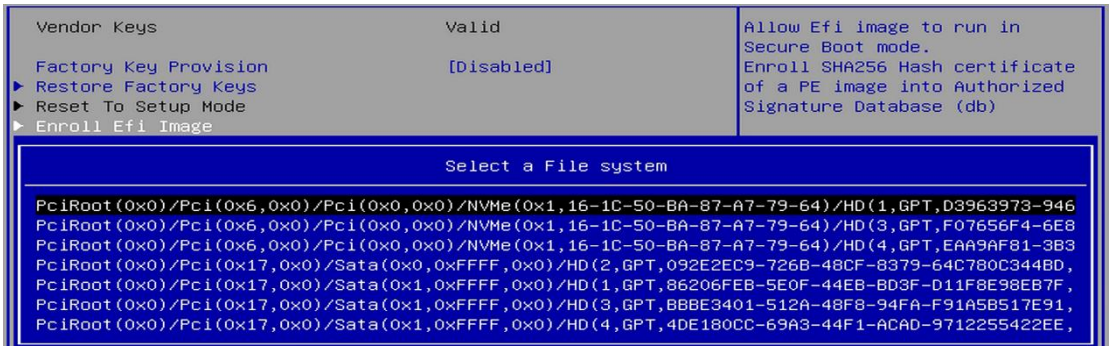
BIOS Setting	Description
Administrator Password	Sets an administrator password for the setup utility.
User Password	Sets a user password.
Secure Boot	Allows override for SID authentication of TCG storage device. Modified value will be applicable only for next boot.

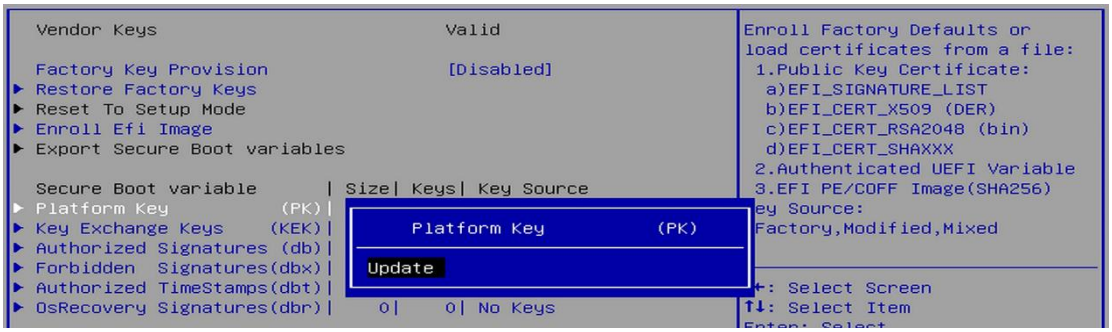
4.6.1 Secure Boot



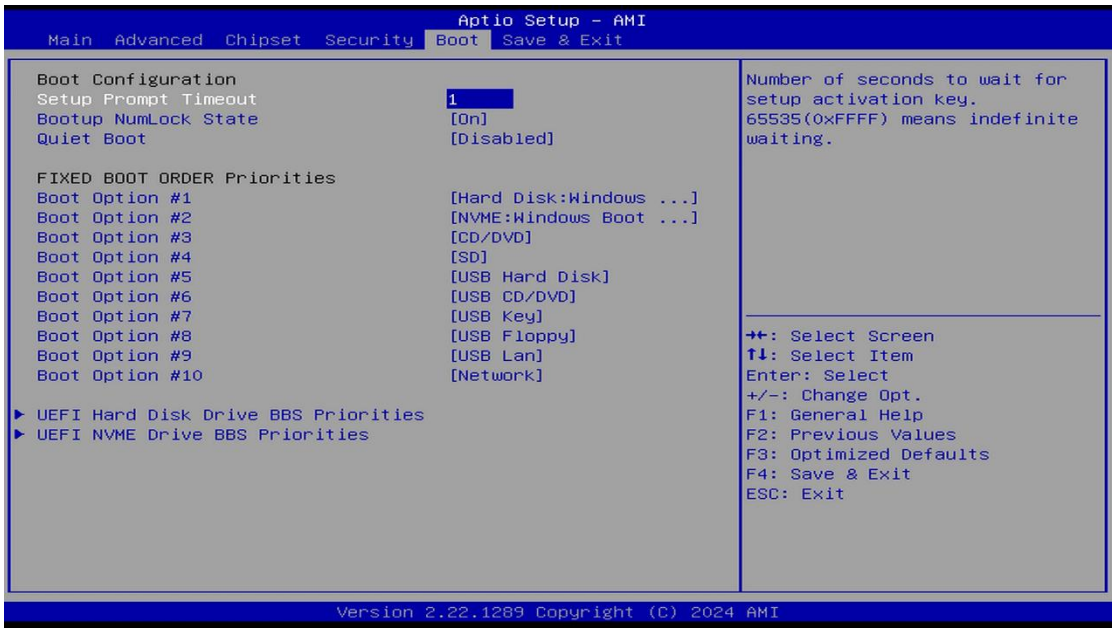








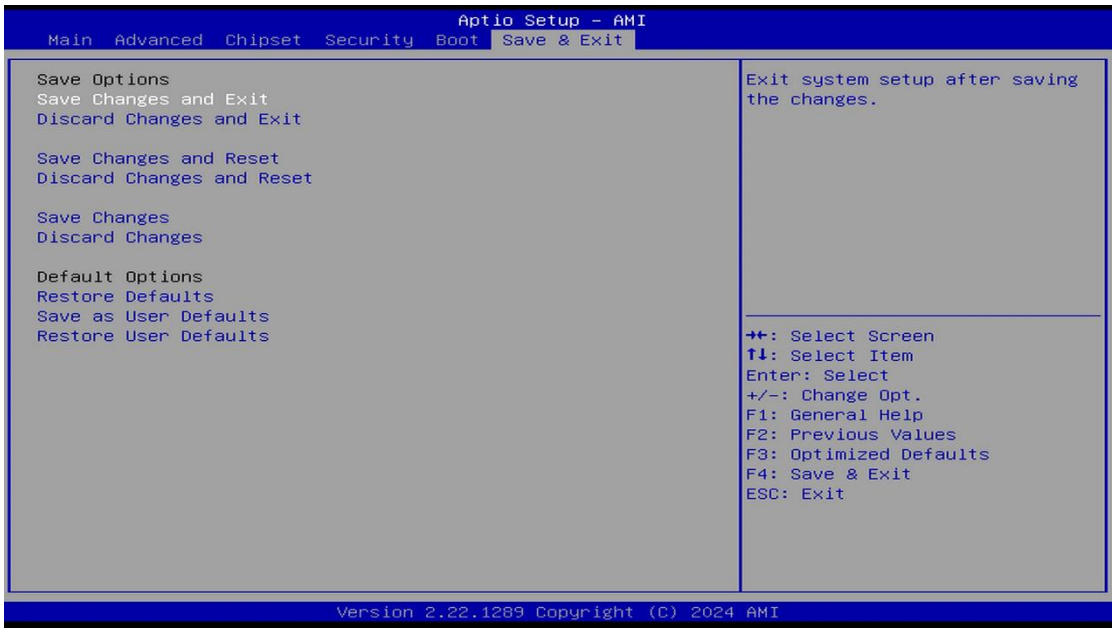
4.7 Boot Settings



BIOS Setting	Description
Setup Prompt Timeout	Number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting.
Bootup NumLock State	Selects the keyboard NumLock state.
Quiet Boot	Enables / Disables Quiet Boot option.
Fixed Boot Option Priorities	Sets the system boot order.
Hard Disk Drive BBS Priorities	Specifies the boot device priority sequence from available Hard Disk Drives.
NVME Drive BBS Priorities	Specifies the boot device priority sequence from available NVME drives.

* UEFI (Unified Extensible Firmware Interface)

4.8 Save & Exit Settings



BIOS Setting	Description
Save Changes and Exit	Exits system setup after saving the changes.
Discard Changes and Exit	Exits system setup without saving any changes.
Save Changes and Reset	Resets the system after saving the changes.
Discard Changes and Reset	Resets system setup without saving any changes.
Save Changes	Saves changes done so far to any of the setup options.
Discard Changes	Discards changes done so far to any of the setup options.
Restore Defaults	Restores / Loads defaults values for all the setup options.
Save as User Defaults	Saves the changes done so far as User Defaults.
Restore User Defaults	Restores the user defaults to all the setup options.

Appendix

This section provides the mapping addresses of peripheral devices and the sample code of watchdog timer configuration.

- I/O Port Address Map
- Interrupt Request Lines (IRQ)
- Watchdog Timer Configuration
- Software Development Kit for WDT.DLL

A. I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses which also becomes the identity of the device. The following table lists the I/O port addresses used.

Address	Device Description
070h – 077h	Real Time Clock
2E8h – 2EFh	Serial Port #4(COM4)
2F0h – 2F7h	• Serial Port #3(COM5) * COM5 is for internal use only.
2F8h – 2FFh	Serial Port #2(COM2)
3E8h – 3EFh	Serial Port #5(COM3)
3F8h – 3FFh	Serial Port #1(COM1)
0D00h – FFFFh	PCI-e Root Complex
5000h – 503Fh	Intel(R) UHD Graphics

B. Interrupt Request Lines (IRQ)

Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

Level	Function
IRQ0	System Timer
IRQ3	Serial Port #2
IRQ4	Serial Port #1
IRQ5	Serial Port #3
IRQ7	Serial Port #4
IRQ8	System CMOS/real time clock
IRQ10	Serial Port #5

C. Watchdog Timer Configuration

The Watchdog Timer (WDT) is used to generate a variety of output signals after a user programmable count. The WDT is suitable for the use in the prevention of system lock-up, such as when software becomes trapped in a deadlock. Under these sorts of circumstances, the timer will count to zero and the selected outputs will be driven.

Under normal circumstance, you will need to restart the WDT at regular intervals before the timer counts to zero.

Sample Code:

```
//---------------------------------------------------------------------------
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A
// PARTICULAR PURPOSE.
//---------------------------------------------------------------------------
#include <dos.h>
#include <conio.h>
#include <stdio.h>
#include <stdlib.h>
#include "F81966.H"
//---------------------------------------------------------------------------
int main (int argc, char *argv[]);
void EnableWDT(int);
void DisableWDT(void);
//---------------------------------------------------------------------------
int main (int argc, char *argv[])
{
        unsigned char bBuf;
        unsigned char bTime;
        char **endptr;

        char SIO;

        printf("Fintek 81966 watch dog program\n");
        SIO = Init_F81966();
        if (SIO == 0)
        {
                printf("Can not detect Fintek 81966, program abort.\n");
                return(1);
        }//if (SIO == 0)

        if (argc != 2)
        {
                printf(" Parameter incorrect!!\n");
                return (1);
        }
```

```
        bTime = strtol (argv[1], endptr, 10);
        printf("System will reset after %d seconds\n", bTime);

        if (bTime)
        { EnableWDT(bTime); }
        else
        { DisableWDT();  }
        return 0;
}
//---------------------------------------------------------------------------
void EnableWDT(int interval)
{
    unsigned char bBuf;

    bBuf = Get_F81966_Reg(0x27);
    bBuf &= (~0x0C);
    bBuf |= (0x08);
    Set_F81966_Reg(0x2B, bBuf);       //Switch to bank 2

    bBuf = Get_F81966_Reg(0x2A);
    bBuf &= (~0x70);
    bBuf |= (0x60);
    Set_F81966_Reg(0x2A, bBuf);       //Enable WDTO

    Set_F81966_LD(0x07);               //Switch to logic device 7
    Set_F81966_Reg(0x30, 0x01);       //Enable timer

    bBuf = Get_F81966_Reg(0xF5);
    bBuf &= (~0x0F);
    bBuf |= 0x52;
    Set_F81966_Reg(0xF5, bBuf);       //Count mode is second

    Set_F81966_Reg(0xF6, interval); //Set timer

    bBuf = Get_F81966_Reg(0xFA);
    bBuf |= 0x01;
    Set_F81966_Reg(0xFA, bBuf);       //Enable WDTO output

    bBuf = Get_F81966_Reg(0xF5);
    bBuf |= 0x20;
    Set_F81966_Reg(0xF5, bBuf);       //Start counting
}
//---------------------------------------------------------------------------
void DisableWDT(void)
{
        unsigned char bBuf;

        Set_F81966_LD(0x07);        //switch to logic device 7

        bBuf = Get_F81966_Reg(0xFA);
        bBuf &= ~0x01;
        Set_F81966_Reg(0xFA,    bBuf);  //disable WDTO output

        bBuf = Get_F81966_Reg(0xF5);
        bBuf &= ~0x20;
        bBuf |= 0x40;
        Set_F81966_Reg(0xF5,    bBuf); //disable WDT
}
//---------------------------------------------------------------------------
```

```
//---------------------------------------------------------------------------
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A
// PARTICULAR PURPOSE.
//
//---------------------------------------------------------------------------
#include "F81966.H"
#include <dos.h>
//---------------------------------------------------------------------------
unsigned int F81966_BASE;
void Unlock_F81966 (void);
void Lock_F81966 (void);
//---------------------------------------------------------------------------
unsigned int Init_F81966(void)
{
	unsigned int result;
	unsigned char ucDid;

	F81966_BASE = 0x4E;
	result = F81966_BASE;

	ucDid = Get_F81966_Reg(0x20);
	if (ucDid == 0x15)	//Fintek 81966
	{ goto Init_Finish; }

	F81966_BASE = 0x2E;
	result = F81966_BASE;

	ucDid = Get_F81966_Reg(0x20);
	if (ucDid == 0x15)	//Fintek 81966
	{ goto Init_Finish; }

	F81966_BASE = 0x00;
	result = F81966_BASE;

Init_Finish:
	return (result);
}
//---------------------------------------------------------------------------
void Unlock_F81966 (void)
{
		outportb(F81966_INDEX_PORT, F81966_UNLOCK);
		outportb(F81966_INDEX_PORT, F81966_UNLOCK);
}
//---------------------------------------------------------------------------
void Lock_F81966 (void)
{
		outportb(F81966_INDEX_PORT, F81966_LOCK);
}
//---------------------------------------------------------------------------
void Set_F81966_LD( unsigned char LD)
{
		Unlock_F81966();
		outportb(F81966_INDEX_PORT, F81966_REG_LD);
		outportb(F81966_DATA_PORT, LD);
		Lock_F81966();
```

```
}
//---------------------------------------------------------------------------
void Set_F81966_Reg( unsigned char REG, unsigned char DATA)
{
        Unlock_F81966();
        outportb(F81966_INDEX_PORT, REG);
        outportb(F81966_DATA_PORT, DATA);
        Lock_F81966();
}
//---------------------------------------------------------------------------
unsigned char Get_F81966_Reg(unsigned char REG)
{
        unsigned char Result;
        Unlock_F81966();
        outportb(F81966_INDEX_PORT, REG);
        Result = inportb(F81966_DATA_PORT);
        Lock_F81966();
        return Result;
}
//---------------------------------------------------------------------------

//---------------------------------------------------------------------------
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// PURPOSE.
//
//---------------------------------------------------------------------------
#ifndef      F81966_H
#define      F81966_H            1
//---------------------------------------------------------------------------
#define     F81966_INDEX_PORT     (F81966_BASE)
#define     F81966_DATA_PORT      (F81966_BASE+1)
//---------------------------------------------------------------------------
#define     F81966_REG_LD     0x07
//---------------------------------------------------------------------------
#define     F81966_UNLOCK     0x87
#define     F81966_LOCK  0xAA
//---------------------------------------------------------------------------
unsigned int Init_F81966(void);
void Set_F81966_LD( unsigned char);
void Set_F81966_Reg( unsigned char,
unsigned char); unsigned char
Get_F81966_Reg( unsigned char);
//---------------------------------------------------------------------------
#endif   //     F81966_H
```