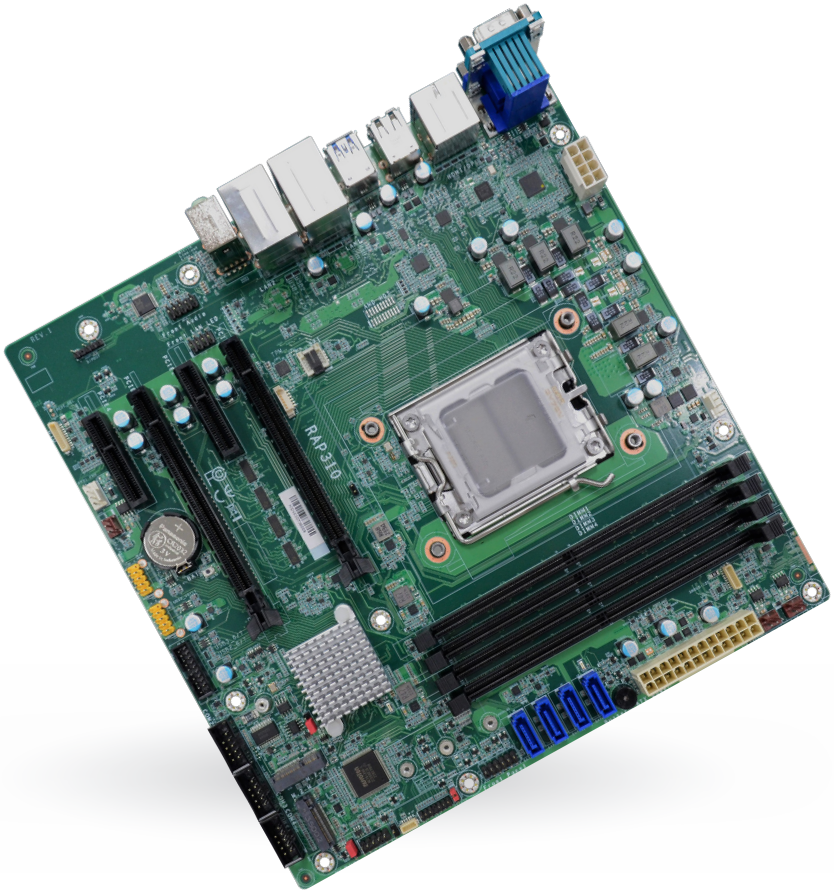
DFI



RAP310

microATX Industrial Motherboard
User's Manual

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FCC and DOC Statement on Class B

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio TV technician for help.

Notice:

1. The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
2. Shielded interface cables must be used in order to comply with the emission limits.

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About this Manual

This manual can be downloaded from the website.

The manual is subject to change and update without notice, and may be based on editions that do not resemble your actual products. Please visit our website or contact our sales representatives for the latest editions.

Warranty

1. Warranty does not cover damages or failures that occur from misuse of the product, inability to use the product, unauthorized replacement or alteration of components and product specifications.

2. The warranty is void if the product has been subjected to physical abuse, improper installation, modification, accidents or unauthorized repair of the product.

3. Unless otherwise instructed in this user's manual, the user may not, under any circumstances, attempt to perform service, adjustments or repairs on the product, whether in or out of warranty. It must be returned to the purchase point, factory or authorized service agency for all such work.

4. We will not be liable for any indirect, special, incidental or consequential damages to the product that has been modified or altered.

Static Electricity Precautions

It is quite easy to inadvertently damage your PC, system board, components or devices even before installing them in your system unit. Static electrical discharge can damage computer components without causing any signs of physical damage. You must take extra care in handling them to ensure against electrostatic build-up.

1. To prevent electrostatic build-up, leave the system board in its anti-static bag until you are ready to install it.

2. Wear an antistatic wrist strap.

3. Do all preparation work on a static-free surface.

4. Hold the device only by its edges. Be careful not to touch any of the components, contacts or connections.

5. Avoid touching the pins or contacts on all modules and connectors. Hold modules or connectors by their ends.



Important:
Electrostatic discharge (ESD) can damage your processor, disk drive and other components. Perform the upgrade instruction procedures described at an ESD workstation only. If such a station is not available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the system chassis. If a wrist strap is unavailable, establish and maintain contact with the system chassis throughout any procedures requiring ESD protection.

Safety Measures

- To avoid damage to the system, use the correct AC input voltage range.

- To reduce the risk of electric shock, unplug the power cord before removing the system chassis cover for installation or servicing. After installation or servicing, cover the system chassis before plugging the power cord.

About the Package

The package contains the following items. If any of these items are missing or damaged, please contact your dealer or sales representative for assistance.

- 1 RAP310-B650 motherboard
- 1 COM port cable (Length: 300mm, 2 x COM ports)
- 1 Serial ATA data cable (Length: 500mm)
- 1 I/O shield

The board and accessories in the package may not come similar to the information listed above. This may differ in accordance with the sales region or models in which it was sold. For more information about the standard package in your region, please contact your dealer or sales representative.

Before Using the System Board

When installing the system board in a new system, you will need at least the following internal components.

- Memory module
- Storage device such as a hard disk drive.
- Power supply

External system peripherals may also be required for navigation and display, including at least a keyboard, a mouse and a video display monitor.

Chapter 1 - Introduction

▶ Specifications

SYSTEM	Processor	AMD® Ryzen™ 9000/7000/EPYC 4005 Series AM5 Socket Processors, TDP support up to 65W Ryzen™ 7 9700X (8 Cores, 32M Cache, up to 5.5 GHz); 65W (life cycle only to Q1' 29) Ryzen™ 5 9600X (6 Cores, 32M Cache, up to 5.4 GHz); 65W (life cycle only to Q1' 29) Ryzen™ 9 PRO 7945 (12 Cores, 64M Cache, up to 5.4 GHz); 65W Ryzen™ 7 PRO 7745 (8 Cores, 32M Cache, up to 5.3 GHz); 65W Ryzen™ 5 PRO 7645 (6 Cores, 32M Cache, up to 5.1 GHz); 65W EPYC™ 4545P (16 Cores, 64M Cache, up to 5.4 GHz); 65W EPYC™ 4465P (12 Cores, 64M Cache, up to 5.4 GHz); 65W EPYC™ 4345P (8 Cores, 32M Cache, up to 5.5 GHz); 65W EPYC™ 4245P (6 Cores, 32M Cache, up to 5.4 GHz); 65W
	Chipset	AMD B650
	Memory	Four 288-pin UDIMM up to 128GB (ECC/Non-ECC) Dual Channel DDR5 5200 MHz ***Speed Support List: Please refer to page.8**
	BIOS	AMI SPI 256Mbit
GRAPHICS	Controller	Navi2 Graphics
	Feature	1WGP @2.2GHz max
	Display	1 x VGA, resolution up to 1920x1200 @ 60Hz 1 x DP++, resolution up to 3840x2160 @ 60Hz 1 x HDMI 2.0, resolution up to 4096x2160 @ 60Hz
	Triple Displays	1 VGA + 1 DP++ + 1 HDMI 2.0
EXPANSION	Interface	2 x PCIe x16 (Gen 4, x16 or x8+x8) Support PCIE1/PCIE3 : single at x16(PCIE1) Support PCIE1/PCIE3 : dual at x8(PCIE1)/x8(PCIE3) Support PCIE1 : Riser card x16 or x8/x8 selected by Jumper 2 x PCIe x4 (Gen 4)
		1 x M.2 2230 E key (PCIe/USB 2.0/Intel CNVi/Discrete Wifi 6E support) 1 x M.2 2242/2260/2280 M key (PCIe x4 Gen4 NVMe support)
REAR I/O	Ethernet	2 x 2.5GbE (RJ-45)
	Serial	1 x RS-232
	USB	6 x USB 3.2 Gen 2 2 x USB 2.0
	Display	1 x DP++ 1 x HDMI 1 x VGA
	Audio	1 x Line-out 1 x Mic-in 1 x Line-in (opt. by request, MOQ required)

AUDIO	Audio Codec	Realtek ALC888
ETHERNET	Controller	2 x Intel® I226-V
INTERNAL I/O	Serial	1 x RS-232/422/485 2 x RS-232
	USB	2 x USB 3.2 Gen1 4 x USB 2.0 (colay vertical Type A)
	Audio	1 x Front Audio Header 1 x S/PDIF
	SATA	4 x SATA 3.0 (RAID 0/1/5/10)
	DIO	1 x 8-bit DIO
	PS/2	1 x PS/2
	SMBus/ I²C	1 x SMBus/ I²C
WATCHDOG TIMER	Output & Interval	System Reset, Programmable via Software from 1 to 255 Seconds
SECURITY	TPM	Nuvoton TPM 2.0
POWER	Type	ATX
	Connector	8-pin ATX 12V power 24-pin ATX power
	Consumption	Typical: Ryzen 9 PRO 7945: 3.3V @ 0.14A (0.462W); 5V @ 0.96A (4.8W); 12V @ 0.66A (7.92W) Max.: Ryzen 9 PRO 7945: 3.3V @ 1.14A (3.762W); 5V @ 3.4A (17W); 12V @ 8.94A (107.28W)
	RTC Battery	CR2032 Coin Cell
OS SUPPORT	Microsoft	Windows 10 Windows 11 Enterprise
	Linux	Ubuntu 22.04
ENVIRONMENT	Temperature	Operating: -5 to 65°C Storage: -40 to 85°C
	Humidity	Operating: 5 to 95% RH Storage: 5 to 95% RH
	MTBF	481,630 hrs @ 25°C; 277,744 hrs @ 45°C; 177,053 hrs @ 60°C; 130,262 hrs @ 70°C Calculation Model: Telcordia Issue 4 Environment: GB, GC - Ground Benign, Controlled
MECHANISM	Dimensions	microATX Form Factor: 244mm (9.6") x 244mm (9.6")
	Height	PCB: 1.6mm Top Side: 38mm Bottom Side: 3mm
STANDARDS AND CERTIFICATIONS	Certifications	CE, FCC Class B, RoHS

▶ Speed Support List

DIMMs	RANK	POR	CHA		CHB	
			DIMM1	DIMM2	DIMM3	DIMM4
1DIMM	1R/2R	No support	V			
1DIMM	1R/2R	5200MHz		V		
1DIMM	1R/2R	No support			V	
1DIMM	1R/2R	5200MHz				V
2DIMM	1R/2R	No support	V		V	
2DIMM	1R/2R	5200MHz		V		V
2DIMM	1R/2R	3600MHz	V	V		
2DIMM	1R/2R	3600MHz			V	V
4DIMM	1R/2R	3600MHz	V	V	V	V

Note:

DDR ECC Support

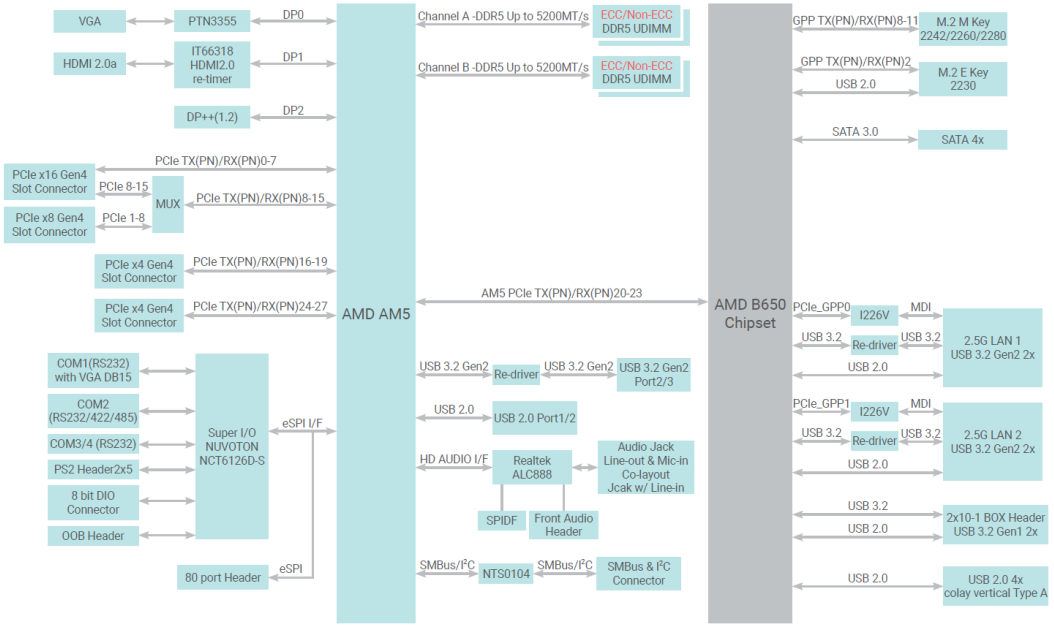
Please note that while the RAP310 hardware architecture fully routed and optimized for DDR ECC modules, the end-to-end ECC Error Reporting and Event Logging features are bounded by the CPU/chipset vendor's current RAS capabilities.

Currently, the system will boot and run reliably with ECC active, but error logs cannot be outputted to Windows/Linux utilities. For applications strictly requiring OS-level ECC telemetry, please contact our technical support for the latest platform patch status.

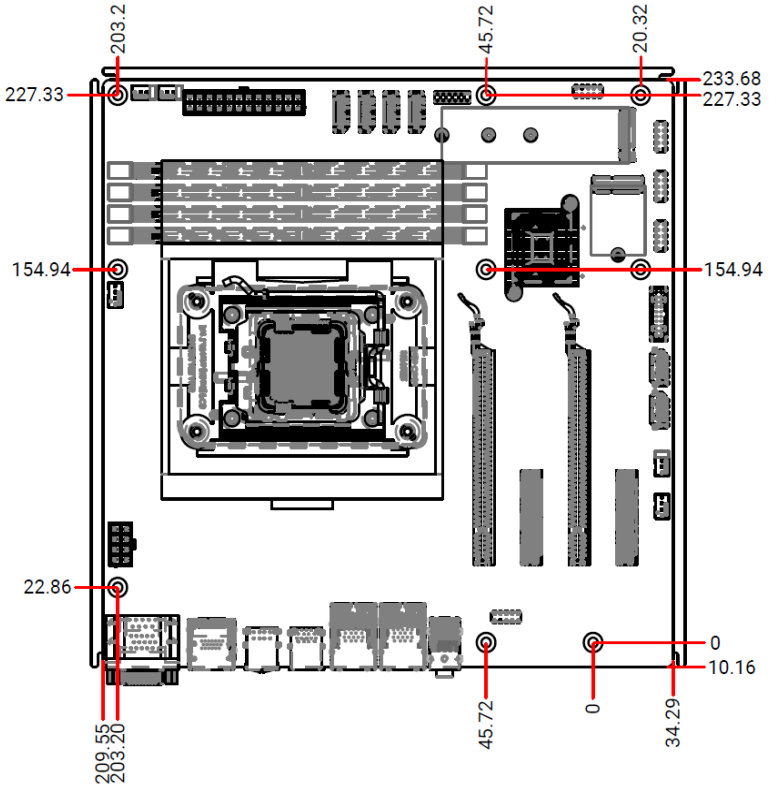
Important:

Electrostatic discharge (ESD) can damage your board, processor, disk drives, add-in boards, and other components. Perform installation procedures at an ESD workstation only. If such a station is not available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the system chassis. If a wrist strap is unavailable, establish and maintain contact with the system chassis throughout any procedures requiring ESD protection.

▶ Block Diagram

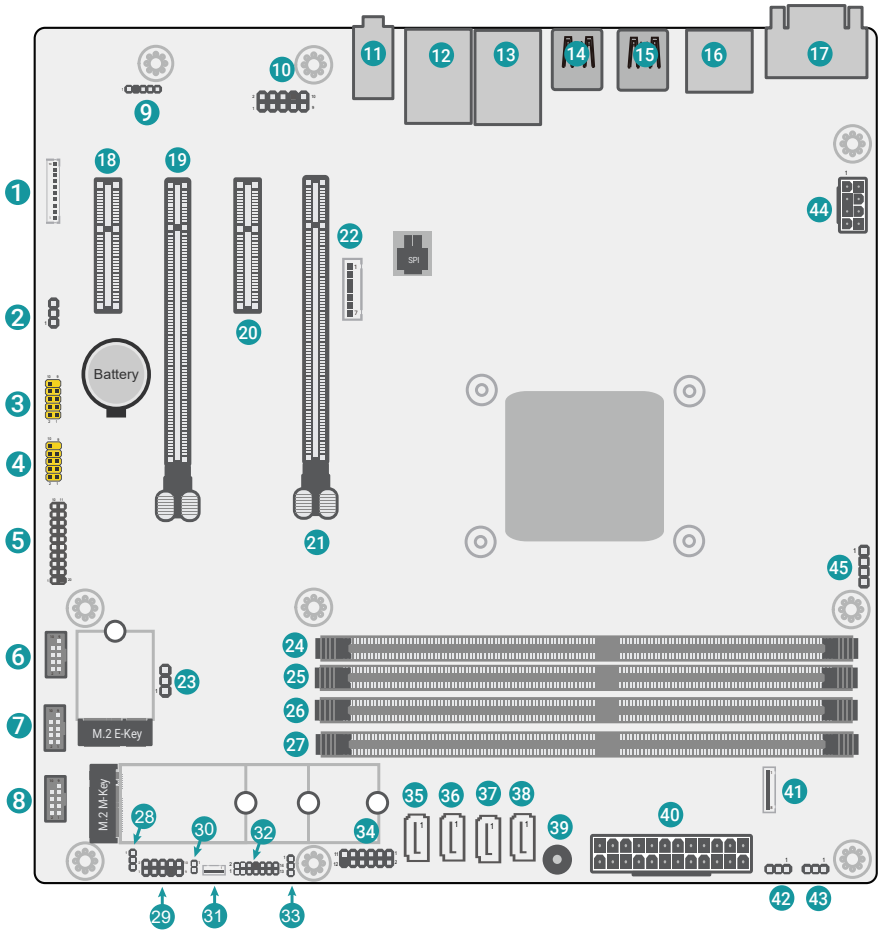


▶ Dimension



Chapter 2 - Hardware Installation

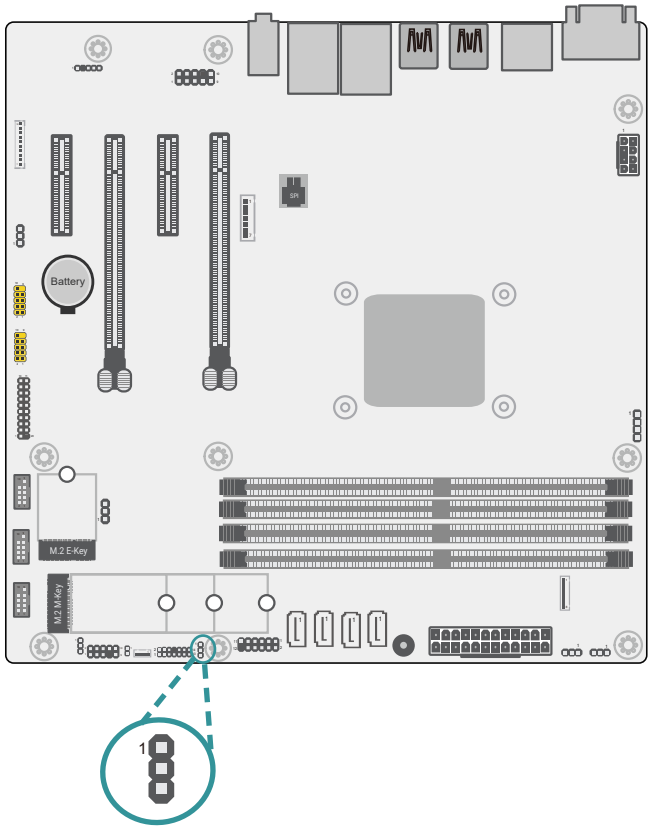
▶ Board Layout



1	DIO	19	PCIE3	38	SATA0
2	System Fan3	20	PCIE2	39	Buzzer
3	USB2_12/13	21	PCIE1	40	ATX Power
4	USB2_10/11	22	OOB SPIROM Update	41	SMBus+I2C Header
5	USB3_6/7	23	M.2 E Power Select	42	System Fan1
6	COM2	24	DIMM1	43	System Fan2
7	COM3	25	DIMM2	44	+12V Power
8	COM4	26	DIMM3	45	CPU Fan
9	SPDIF	27	DIMM4		
10	Front Audio	28	M.2 M Power Select		
11	▲MIC-In ▼Line-Out ▼Line-In	29	PS2		
12	▲LAN2 ▼USB2_4/5 ▼USB3_4/5	30	Case Open		
13	▲LAN1 ▼USB2_2/3 ▼USB3_2/3	31	OOB I2C		
14	USB3.2 Gen2	32	ESPI Header		
15	USB2.0	33	AT/ATX Mode Select		
16	▲DP++ ▼HDMI	34	Front Panel		
17	▲COM1 ▼VGA	35	SATA3		
18	PCIE4	36	SATA2		
		37	SATA1		

▶ Jumper Settings

AT/ATX Mode Select (JP2)



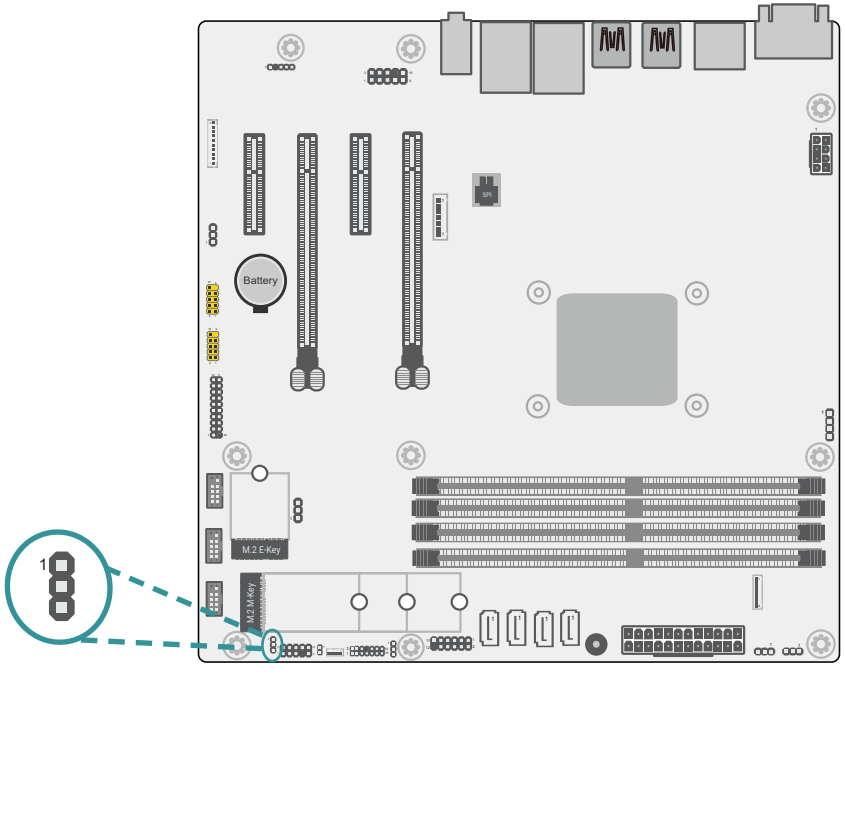


■ 1-2 On: AT mode (default)



■ 2-3 On: ATX mode

M.2 M Power Select (JP3)



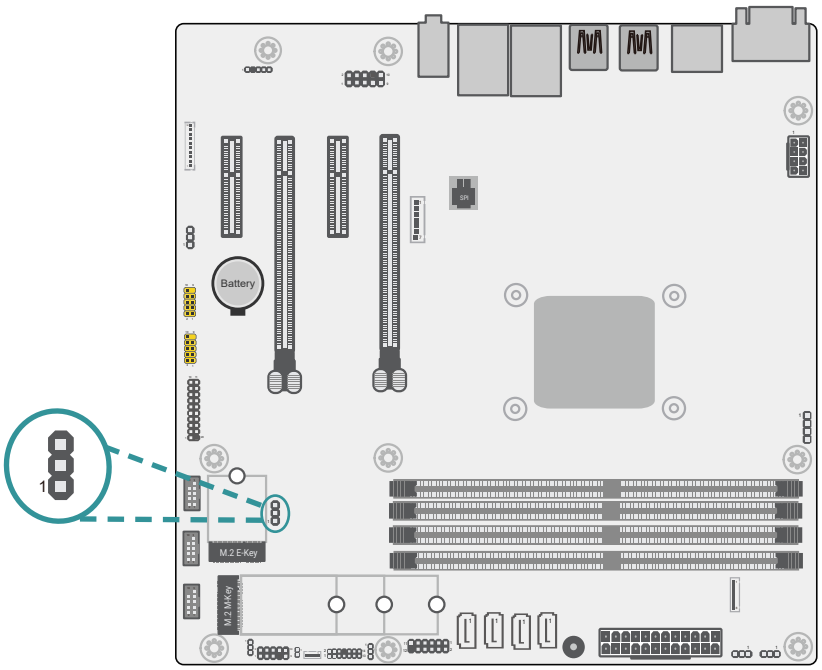


■ 1-2 On: 3.3V_RUN (default)



■ 2-3 On: 3.3V_ALW

M.2 E Power Select (JP4)





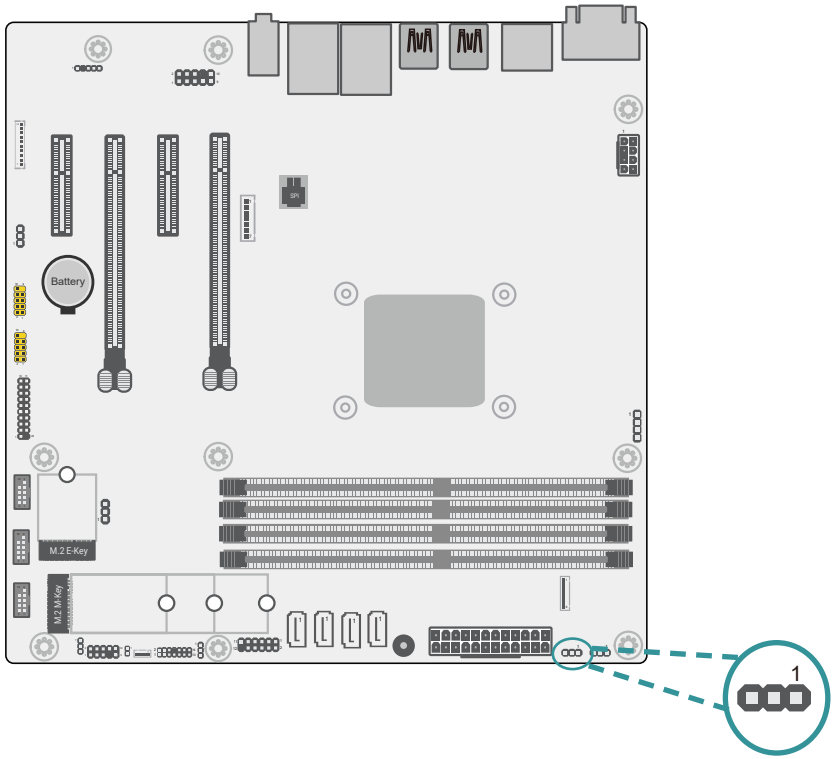
■ 1-2 On: 3.3V_RUN (default)



■ 2-3 On: 3.3V_ALW

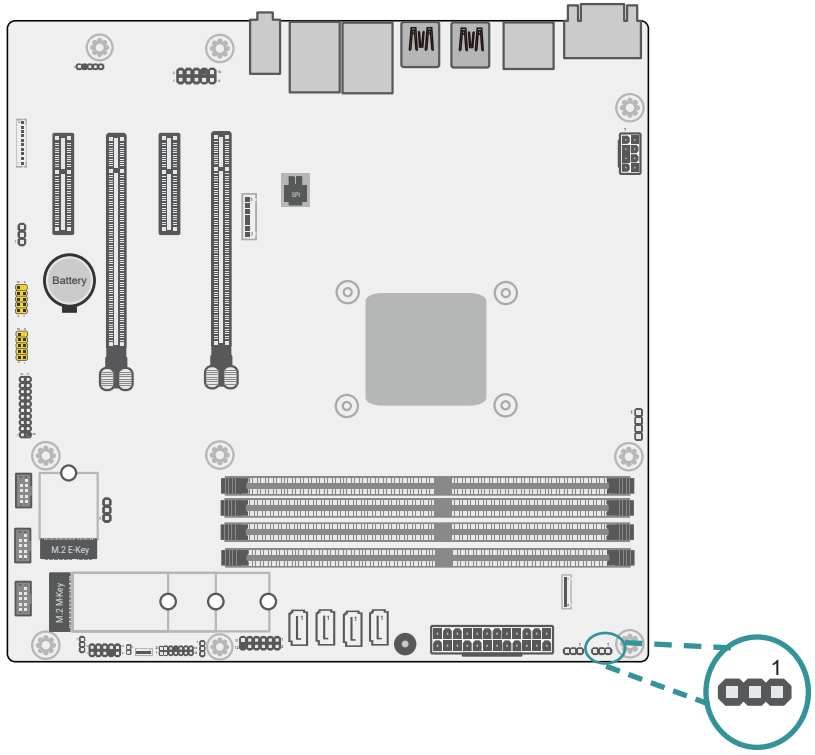
▶ Pin Assignment

System Fan1 (J11)



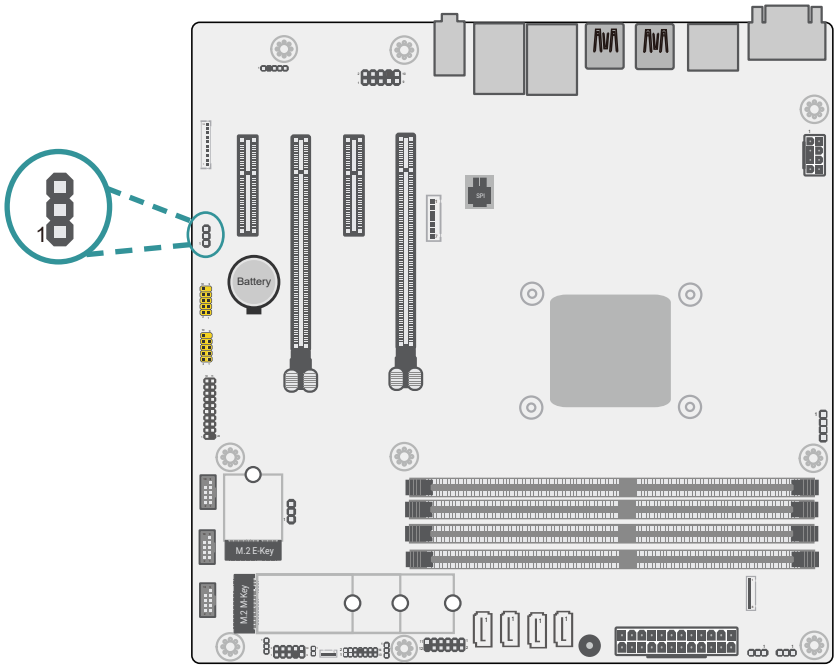
Pin	Assignment
1	GND
2	PWM
3	TACH

System Fan2 (J12)



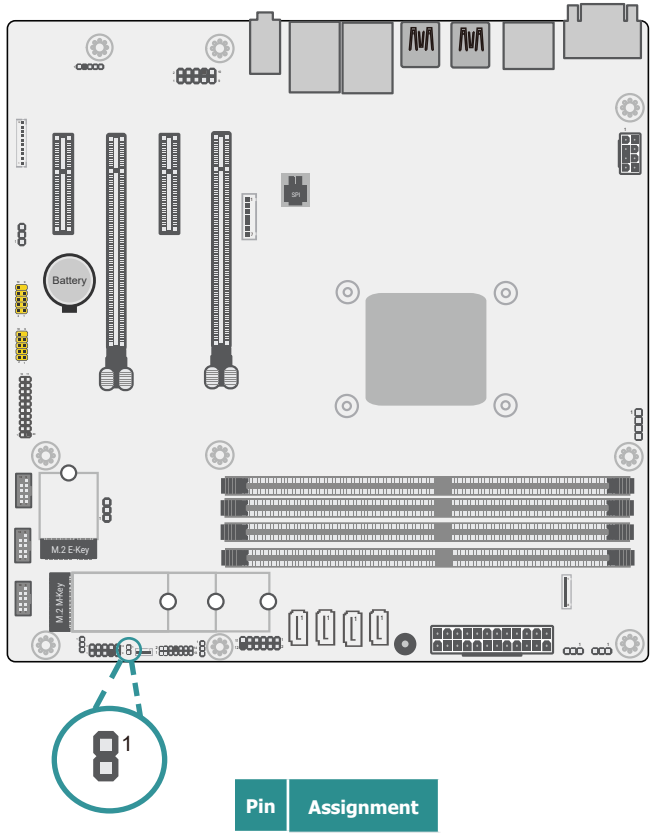
Pin	Assignment
1	GND
2	PWM
3	TACH

System Fan3 (J13)



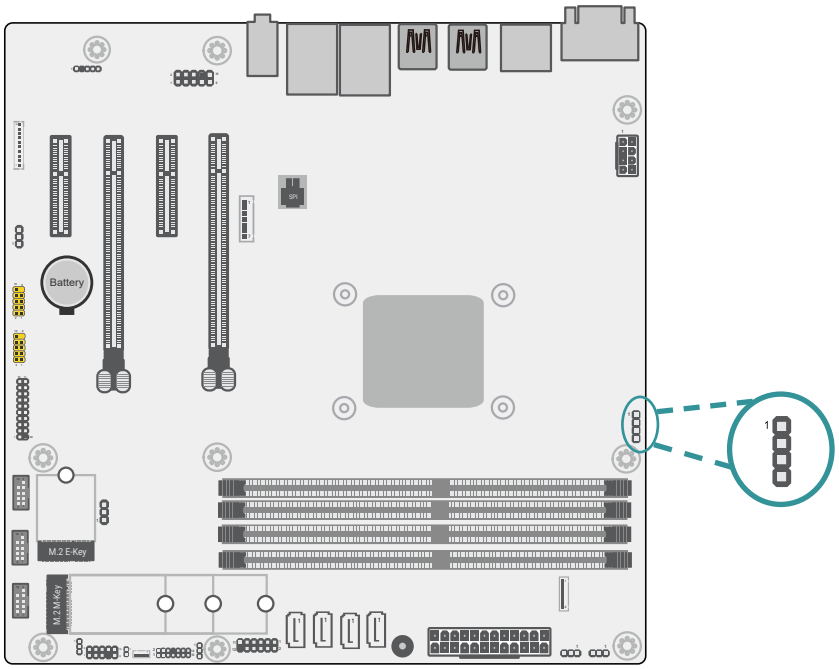
Pin	Assignment
1	GND
2	PWM
3	TACH

Case Open (SOJ1)



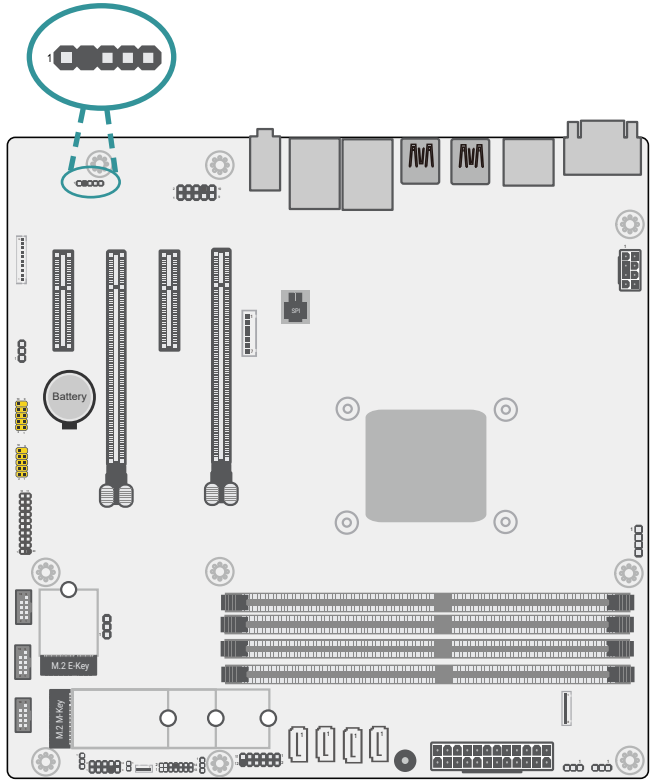
Pin	Assignment
1	Case Open#
2	GND

CPU Fan (J9)



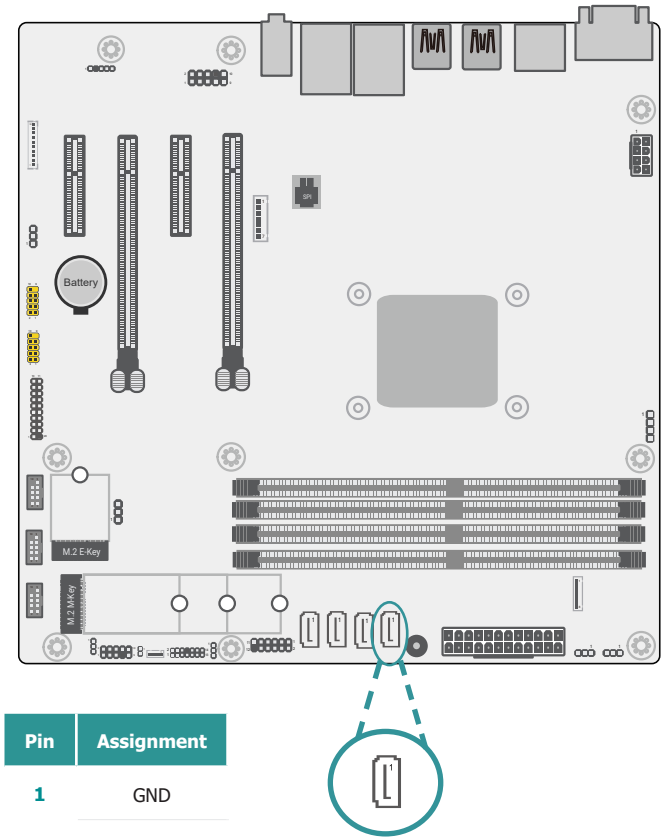
Pin	Assignment
1	GND
2	12V
3	RPM
4	CTRL

S/PDIF (AUJ1)



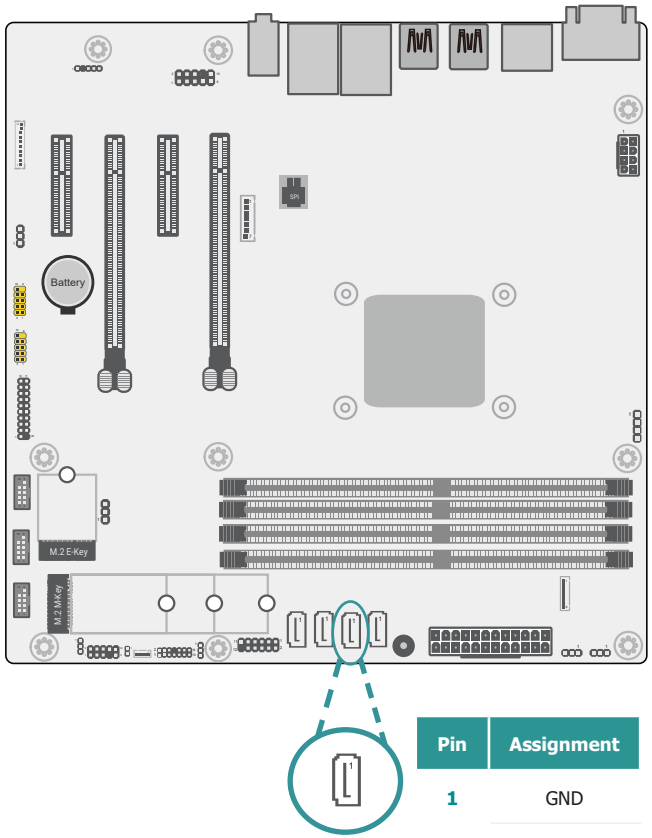
Pin	Assignment
1	A5V
2	---
3	SPOUT
4	GND
5	SPIN

SATA0 (J3)



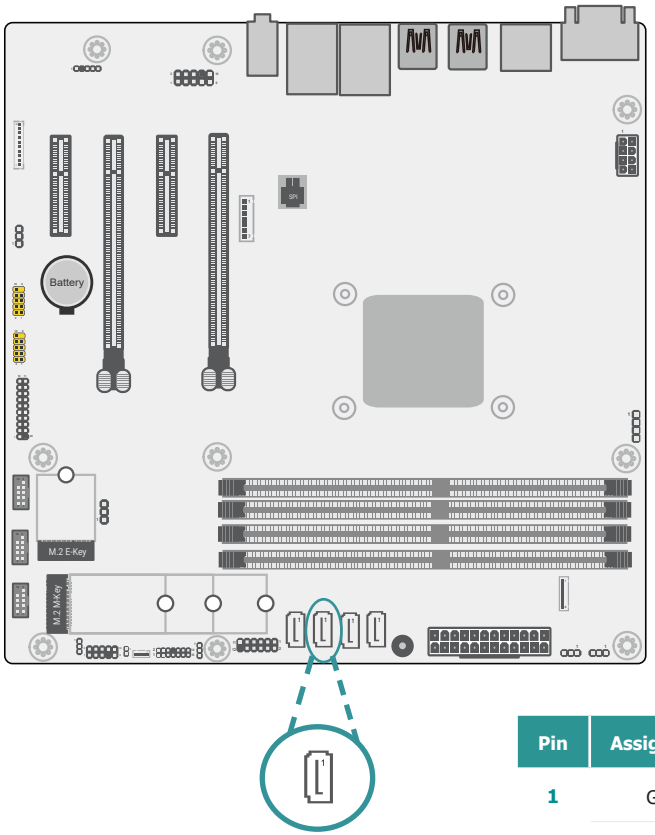
Pin	Assignment
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

SATA1 (J4)



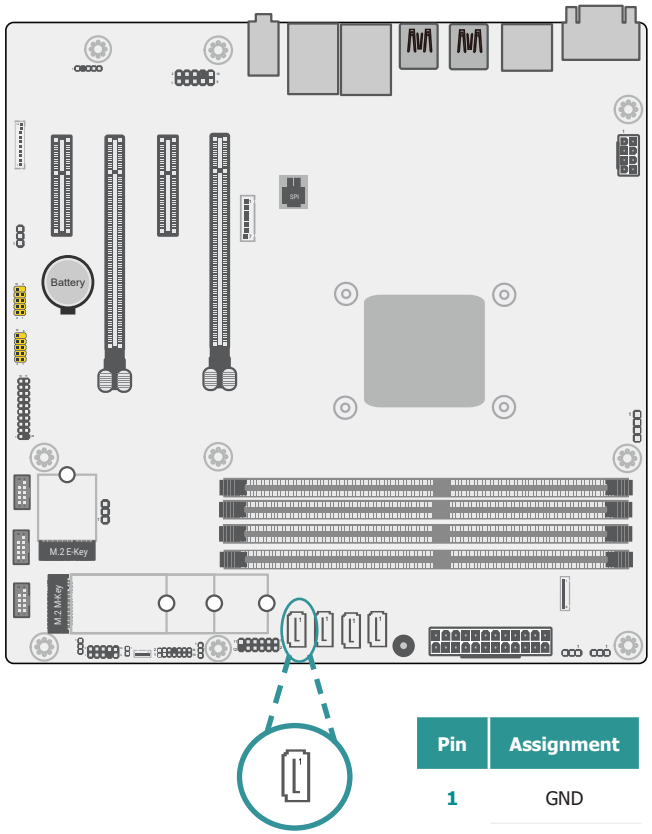
Pin	Assignment
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

SATA2 (J5)



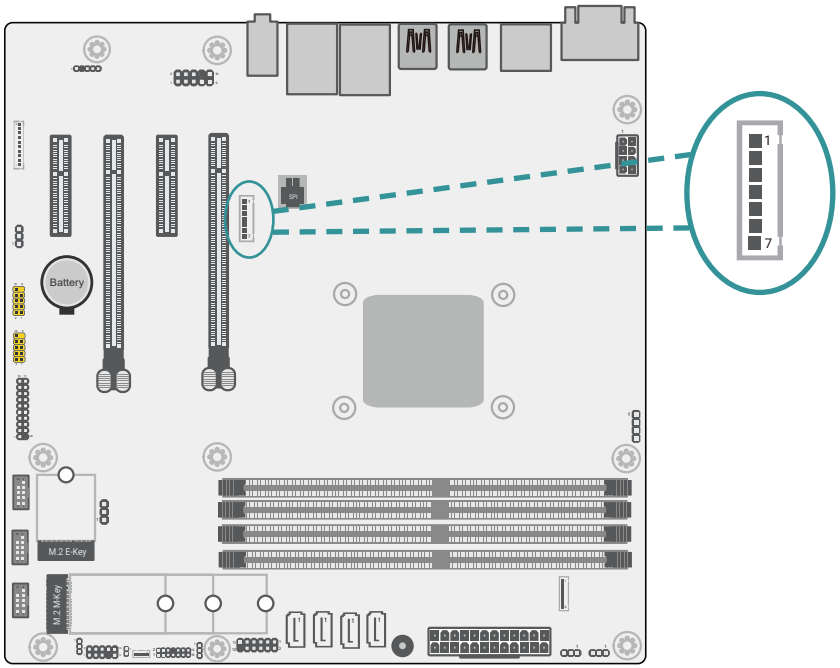
Pin	Assignment
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

SATA3 (J6)



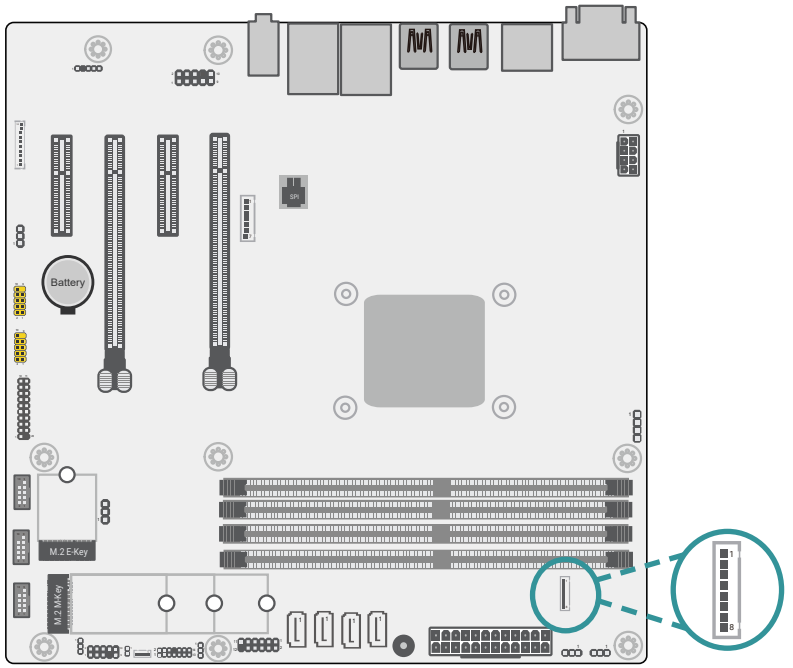
Pin	Assignment
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

OOB SPIROM Update (J1)



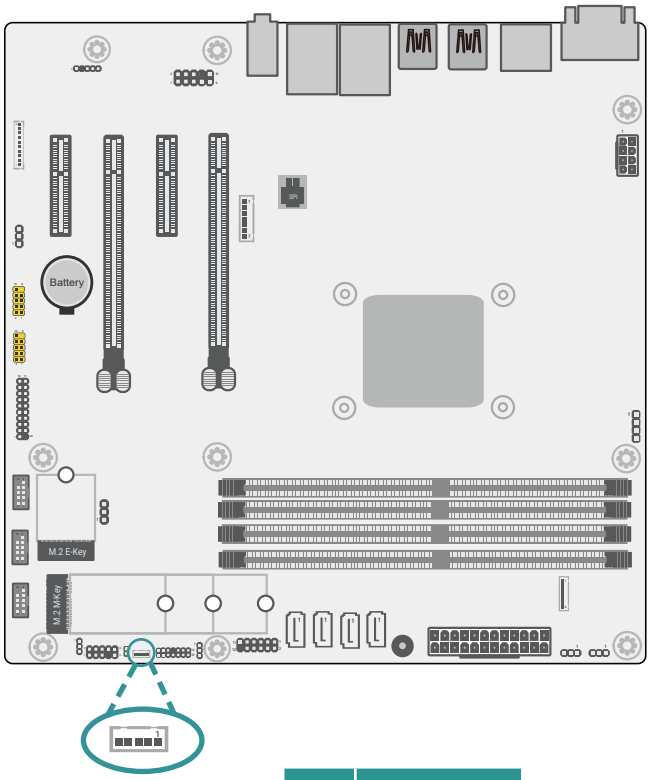
Pin	Assignment
1	GPI_SPI_SW
2	SPI_SO-R
3	SPI_SI-R
4	SPI_CLK-R
5	SPI_CS0-
6	GND
7	1.8V_ALW

SMBus Header (J37)



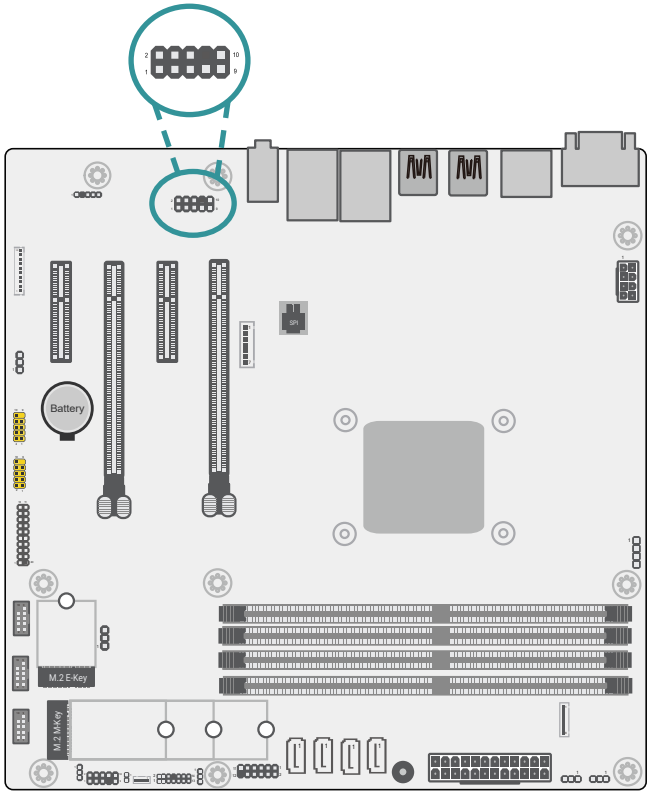
Pin	Assignment	Pin	Assignment
1	3.3V_ALW	2	GND
3	SMB_CLK	4	SMB_DATA
5	SMB_INT	6	I2C_CLK
7	I2C_SDA	8	I2C_INT

OOB I2C Header (J7)



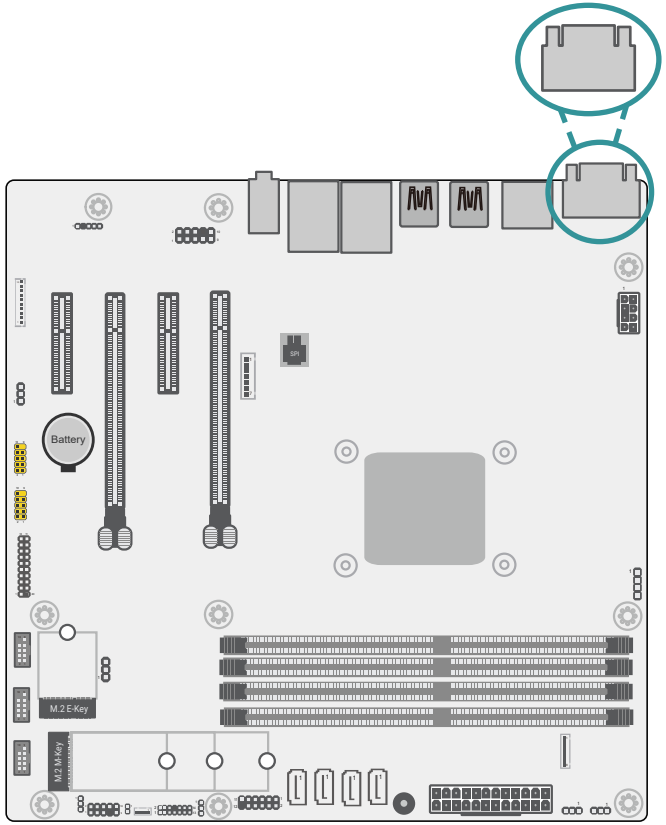
Pin	Assignment
1	NC
2	GND
3	SIO_SCL
4	SIO_SDA
5	NC

Front Audio (AUJ2)



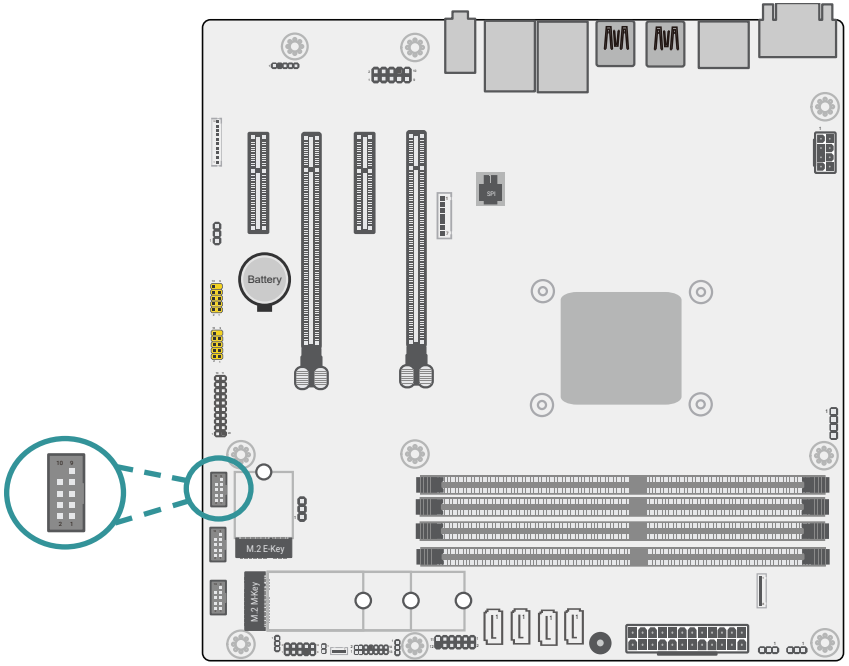
Pin	Assignment	Pin	Assignment
1	MIC2_L	2	GND
3	MIC2_R	4	NC
5	LINE2_R	6	MIC2_JD
7	GND	8	---
9	LINE2_L	10	LINE2_JD

COM1 (DPCN3)



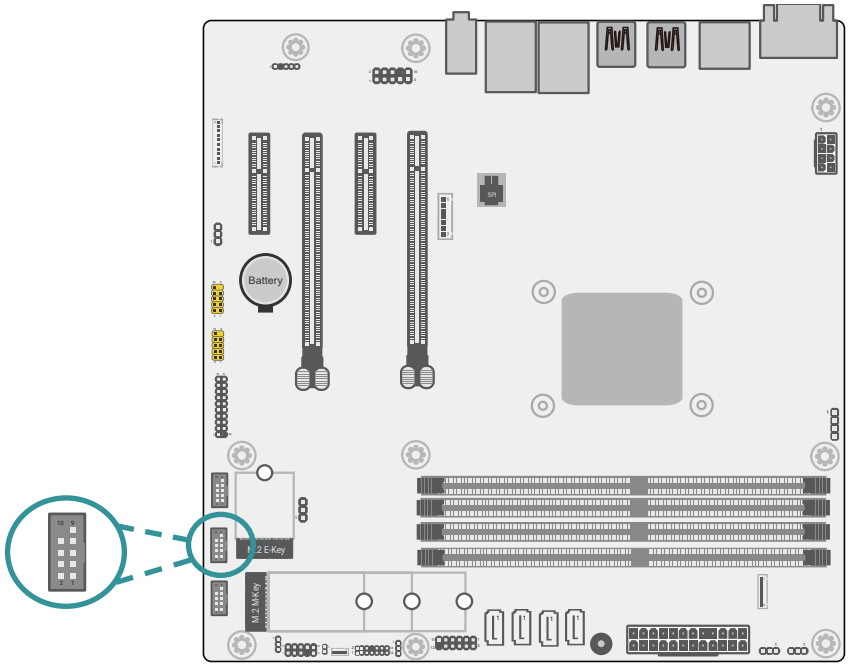
Pin	Assignment	Pin	Assignment
1	MDCD-	2	MSIN-
3	MSO-	4	MDTR-
5	GND	6	MDSR-
7	MRTS-	8	MCTS-
9	MRI-	10	----

COM2 (TSJ1)



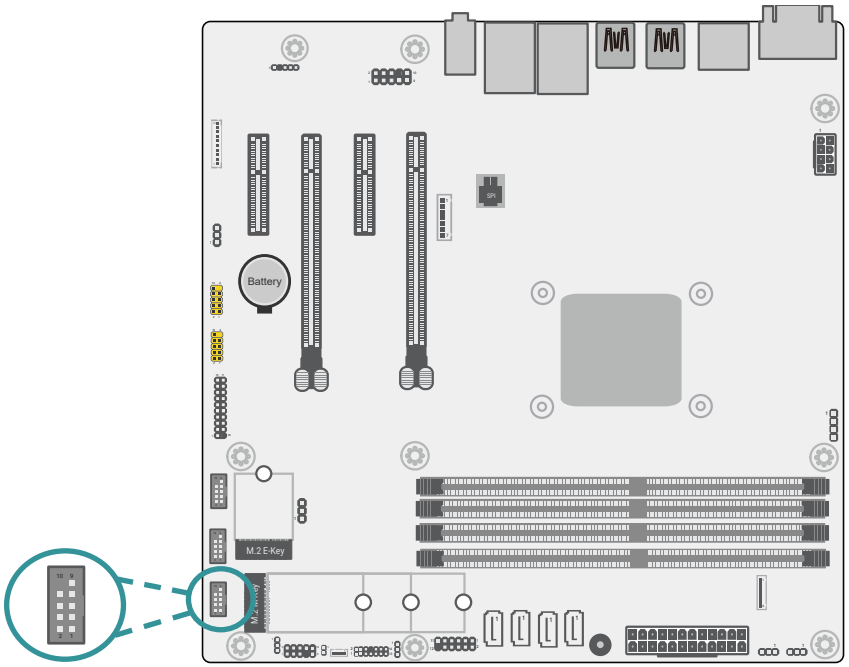
Pin	Assignment	Pin	Assignment
1	MDCD-/RS422_RX+ / RS485_D+	2	MSIN-/RS422_RX- / RS485_D-
3	MSO-/RS422_TX+	4	MDTR-/RS422_TX-
5	GND	6	MDSR-
7	MRTS-	8	MCTS-
9	MRI-	10	----

COM3 (TSJ2)



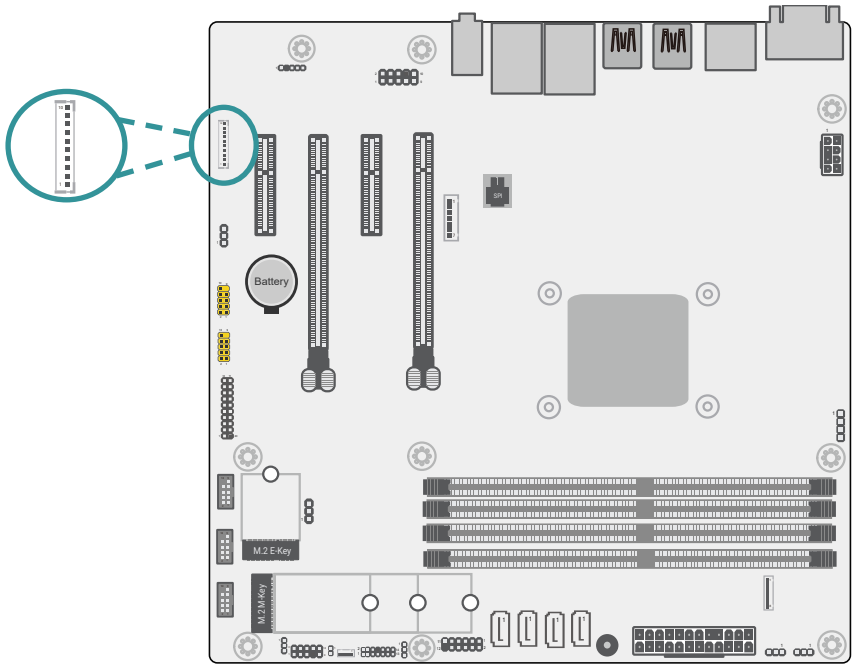
Pin	Assignment	Pin	Assignment
1	MDCD-	2	MSIN-
3	MSO-	4	MDTR-
5	GND	6	MDSR-
7	MRTS-	8	MCTS-
9	MRI-	10	----

COM4 (TSJ3)



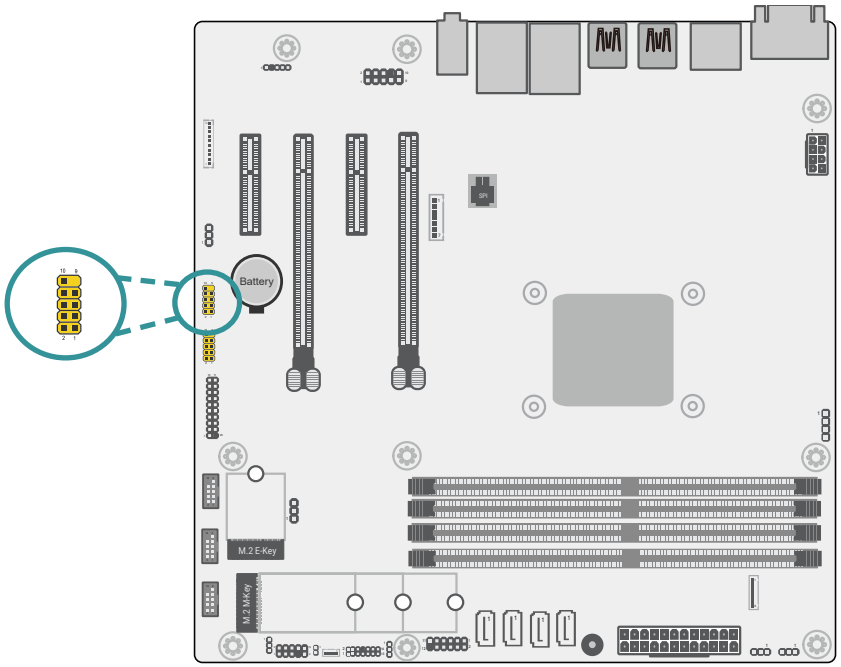
Pin	Assignment	Pin	Assignment
1	MDCD-	2	MSIN-
3	MSO-	4	MDTR-
5	GND	6	MDSR-
7	MRTS-	8	MCTS-
9	MRI-	10	----

DIO (J15)



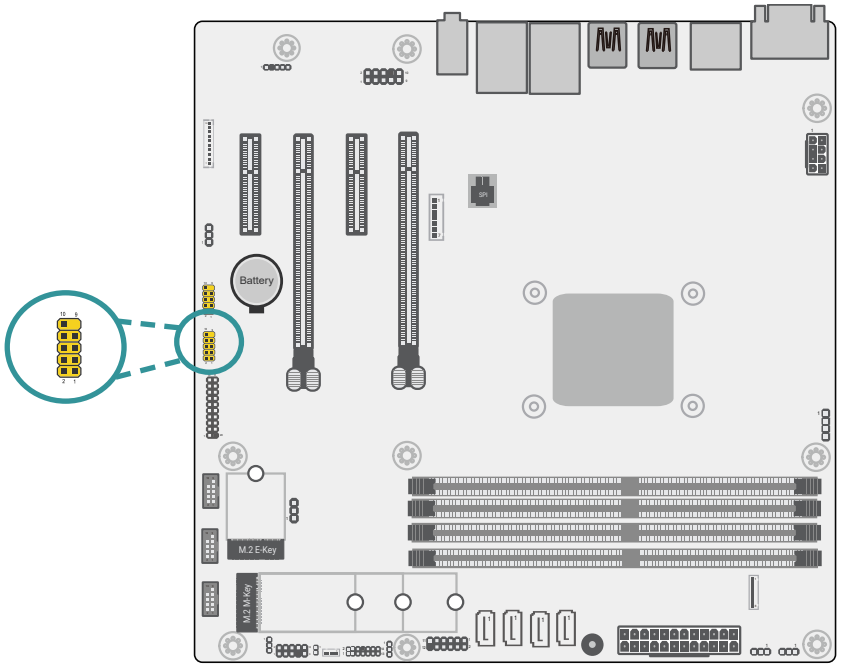
Pin	Assignment
1	DI_3
2	DI_2
3	DI_1
4	DI_0
5	DO_3
6	DO_2
7	DO_1
8	DO_0
9	+5V_ALW
10	GND

USB2_12/13 (UBJ2)



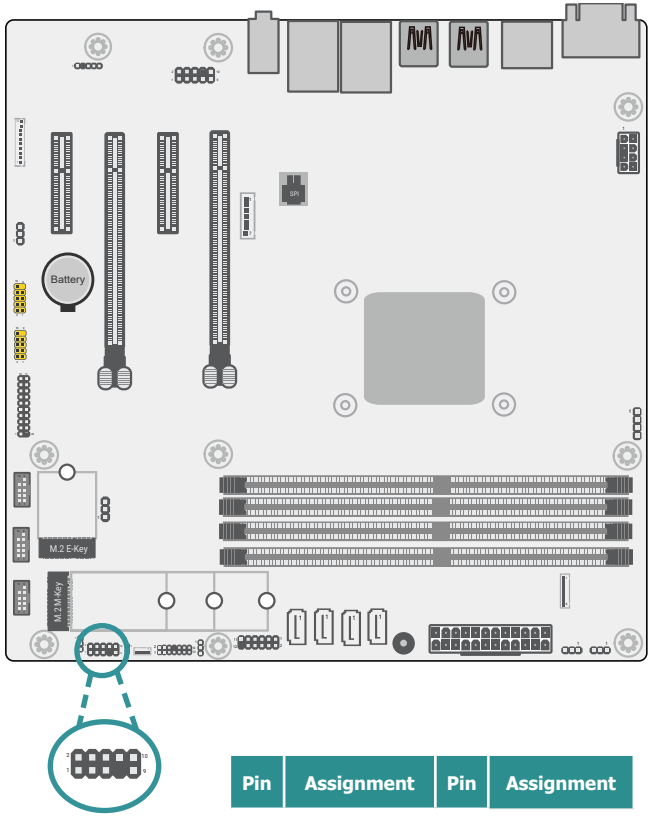
Pin	Assignment	Pin	Assignment
1	SBV6	2	SBV6
3	USBP_C_3N	4	USBP_C_6N
5	USBP_C_3P	6	USBP_C_6P
7	GND	8	GND
9	----	10	NC

USB2_10/11 (UBJ3)



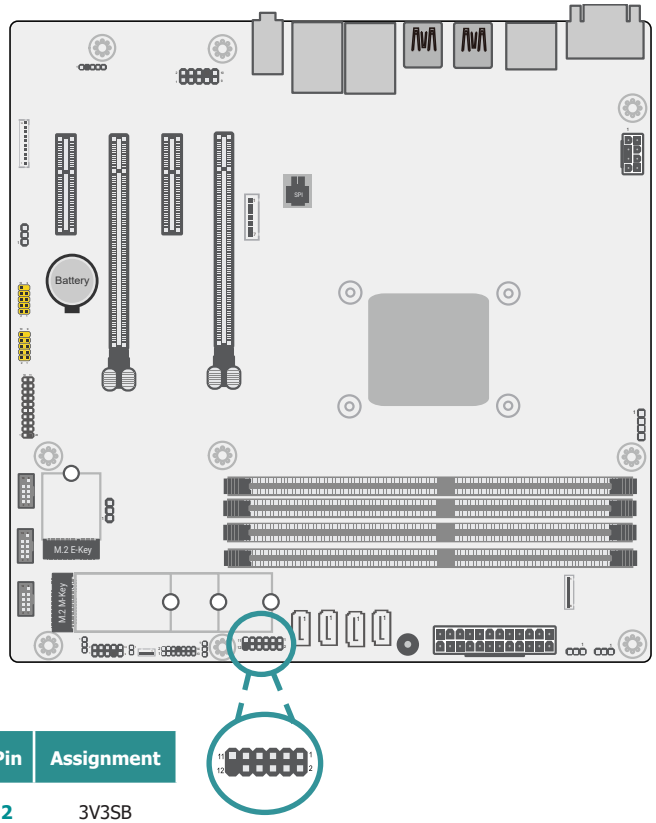
Pin	Assignment	Pin	Assignment
1	SBV6	2	SBV6
3	USBP_C_7N	4	USBP_C_10N
5	USBP_C_7P	6	USBP_C_10P
7	GND	8	GND
9	----	10	NC

PS2 Header (SOJ3)



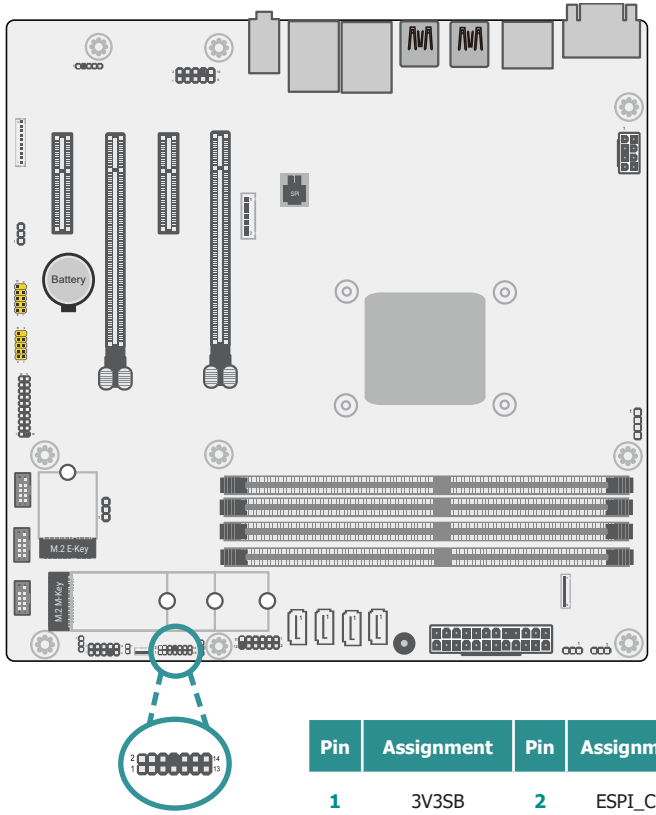
Pin	Assignment	Pin	Assignment
1	PS2_KCLK	2	PS2_MCLK
3	PS2_KDAT	4	PS2_MDAT
5	GND	6	GND
7	----	8	GND
9	BVCC	10	BVCC

Front Panel (J8)



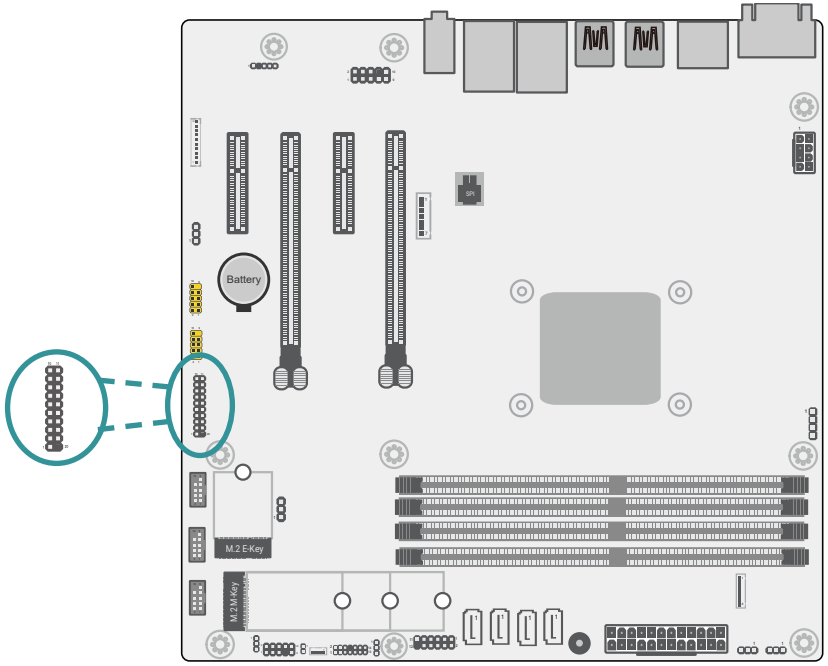
Pin	Assignment	Pin	Assignment
1	NC	2	3V3SB
3	3V3_RUN	4	3V3SB
5	HDD_LED	6	SUS_LED
7	GND	8	GND
9	SYS_RST-	10	PWR_BTN-
11	NC	12	---

eSPI Header (J14)



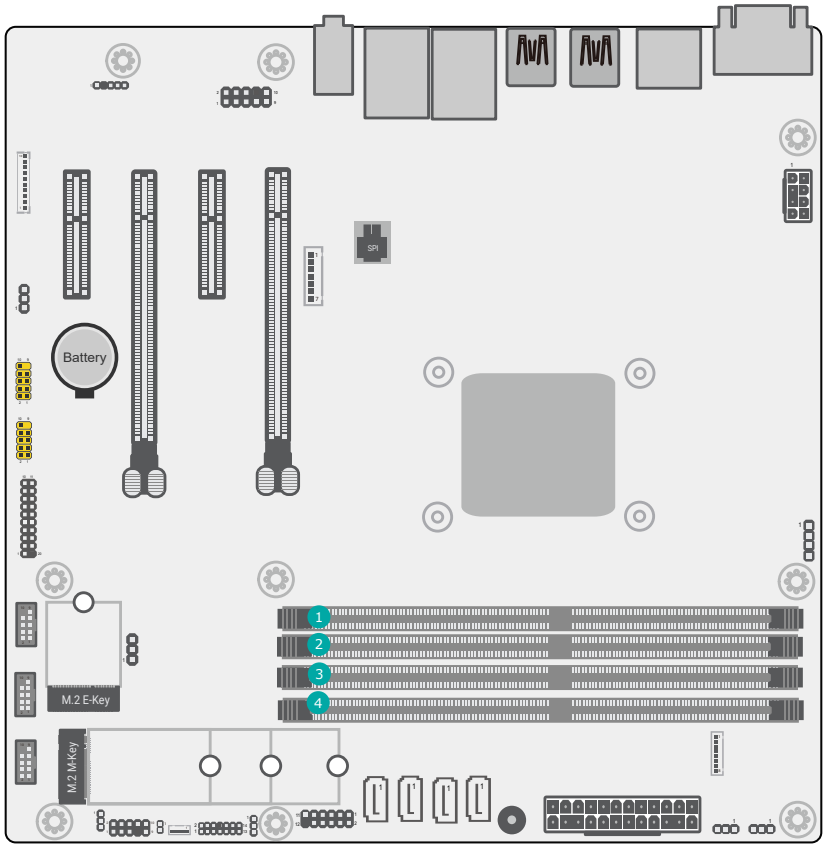
Pin	Assignment	Pin	Assignment
1	3V3SB	2	ESPI_CLK
3	ESPI_RESET#	4	GND
5	ESPI_ALT#	6	UART_TX
7	ESPI_D0	8	---
9	ESPI_D1	10	ESPI_CS
11	ESPI_D2	12	UART_RX
13	ESPI_D3	14	3V3SB

USB3_6/7 , USB2_6/7 (UBJ1)



Pin	Assignment	Pin	Assignment
1	SBV3	11	USBP_C_9P
2	USB3_RX5_DN	12	USBP_C_9N
3	USB3_RX5_DP	13	GND
4	GND	14	USB3_TX4_DP
5	USB3_TX5_DN	15	USB3_TX4_DN
6	USB3_TX5_DP	16	GND
7	GND	17	USB3_RX4_DP
8	USBP_C_8N	18	USB3_RX4_DN
9	USBP_C_8P	19	SBV3
10	NC	20	---

▶ System Memory

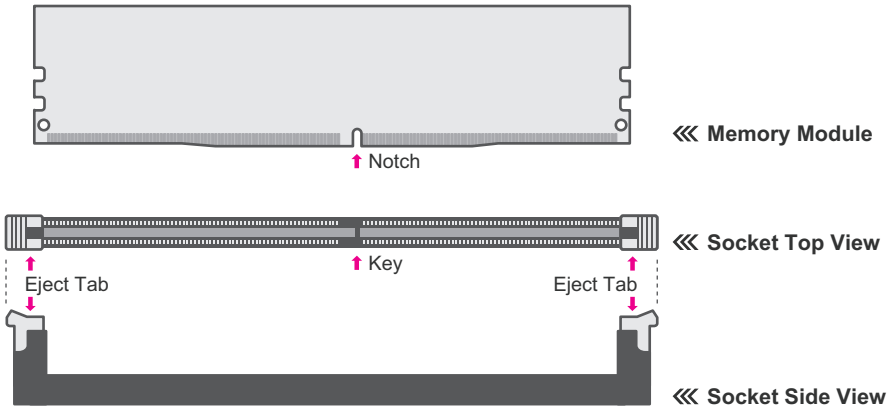


1. DIMM1
2. DIMM2
3. DIMM3
4. DIMM4

Installing the DIMM Module

Before installing the memory module, please make sure that the following safety cautions are well-attended.

1. Make sure the PC and all other peripheral devices connected to it has been powered down.
2. Disconnect all power cords and cables.
3. Locate the DIMM socket on the system board
4. Make sure the notch on memory card is aligned to the key on the socket.



The system board supports the following memory interface.

Single Channel (SC)
Data will be accessed in chunks of 64 bits from the memory channels. DIMMs are on the same channel. DIMMs in a channel can be identical or completely different. However, we highly recommend using identical DIMMs. Not all slots need to be populated.

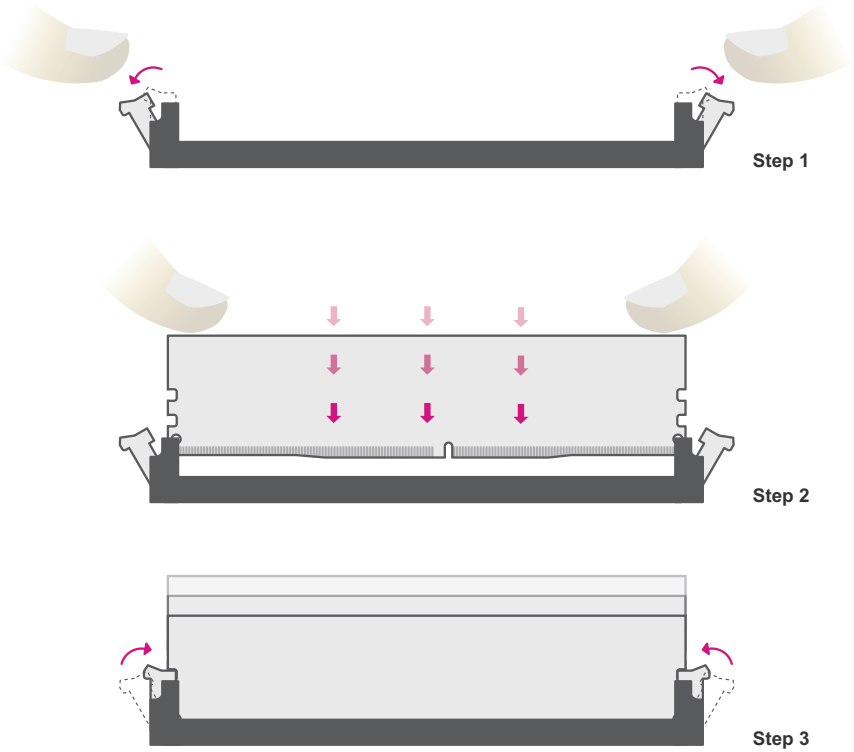
Dual Channel (DC)
Data will be accessed in chunks of 128 bits from the memory channels. Dual channel provides better system performance because it doubles the data transfer rate.

Please follow the steps below to install the memory card into the socket.

Step 1:
Press the eject tabs at both ends of the socket outward and downward to release them from the locked position.

Step 2:
Insert the memory card into the slot while making sure the notch and the key are aligned. Press the card down firmly with fingers while applying and maintaining even pressure on both ends.

Step 3:
The tabs snap automatically to the edges of the card and lock the card in place.



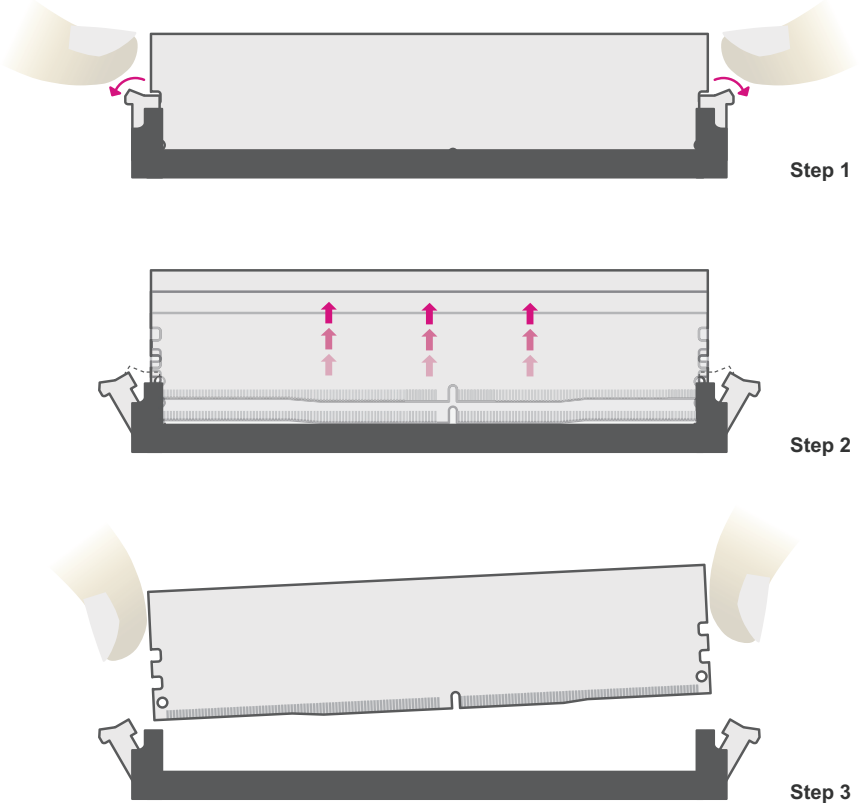
Removing the DIMM Module

Please follow the steps below to remove the memory card from the socket.

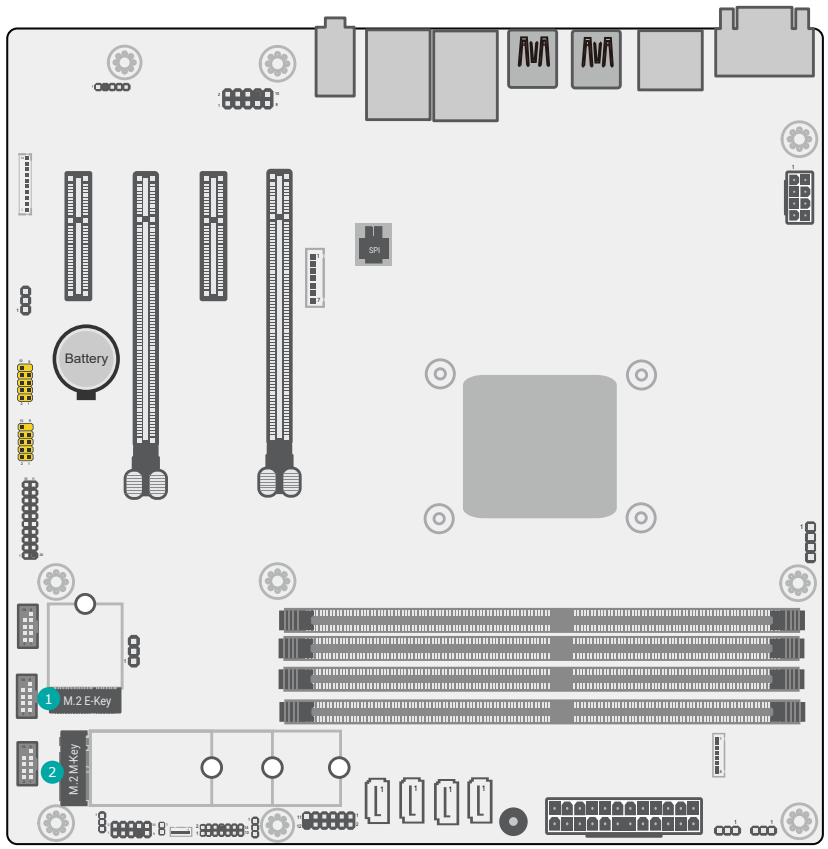
Step 1:
Press the eject tabs at both ends of the socket outward and downward to release them from the locked position.

Step 2:
The memory card ejects from the slot automatically.

Step 3:
Hold the card by its edges and remove it from the slot.



▶ Expansion Slots

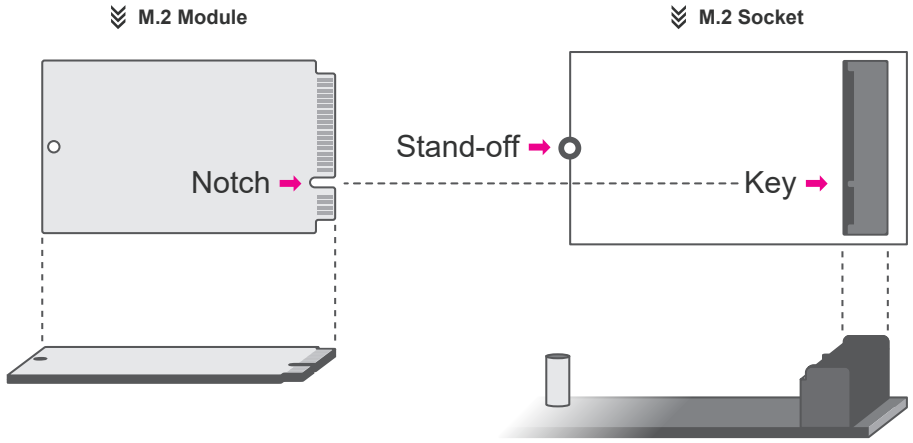


1. M.2 E-Key
2. M.2 M-Key

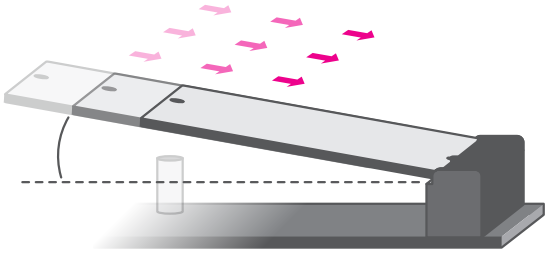
Installing the M.2 Module

Before installing the M.2 module into the M.2 socket, please make sure that the following safety cautions are well-attended.

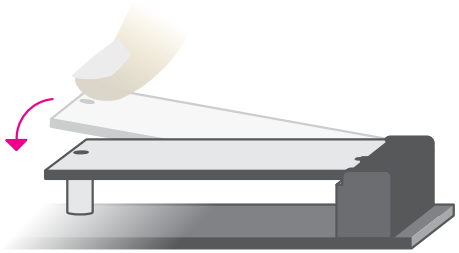
1. Make sure the PC and all other peripheral devices connected to it has been powered down.
2. Disconnect all power cords and cables.
3. Locate the M.2 socket on the system board
4. Make sure the notch on card is aligned to the key on the socket.
5. Make sure the standoff screw is removed from the standoff.



Please follow the steps below to install the card into the socket.



Step 1:
Insert the card into the socket at an angle while making sure the notch and key are perfectly aligned.



Step 2:
Press the end of the card far from the socket down until against the stand-off.



Step 3:
Screw tight the card onto the stand-off with a screw driver and a stand-off screw until the gap between the card and the stand-off closes up. The card should be lying parallel to the board when it's correctly mounted.

Chapter 3 - BIOS Settings

▶ Overview

The BIOS is a program that takes care of the basic level of communication between the CPU and peripherals. It contains codes for various advanced features found in this system board. The BIOS allows you to configure the system and save the configuration in a battery-backed CMOS so that the data retains even when the power is off. In general, the information stored in the CMOS RAM of the EEPROM will stay unchanged unless a configuration change has been made such as a hard drive replaced or a device added.
It is possible that the CMOS battery will fail causing CMOS data loss. If this happens, you need to install a new CMOS battery and reconfigure the BIOS settings.

Note:
The BIOS is constantly updated to improve the performance of the system board; therefore the BIOS screens in this chapter may not appear the same as the actual one. These screens are for reference purpose only.

Default Configuration
Most of the configuration settings are either predefined according to the Load Optimal Defaults settings which are stored in the BIOS or are automatically detected and configured without requiring any actions. There are a few settings that you may need to change depending on your system configuration.

Entering the BIOS Setup Utility
The BIOS Setup Utility can only be operated from the keyboard and all commands are keyboard commands. The commands are available at the right side of each setup screen.
The BIOS Setup Utility does not require an operating system to run. After you power up the system, the BIOS message appears on the screen and the memory count begins. After the memory test, the message “Press DEL to run setup” will appear on the screen. If the message disappears before you respond, restart the system or press the “Reset” button. You may also restart the system by pressing the <Ctrl> <Alt> and <Del> keys simultaneously.

Legends

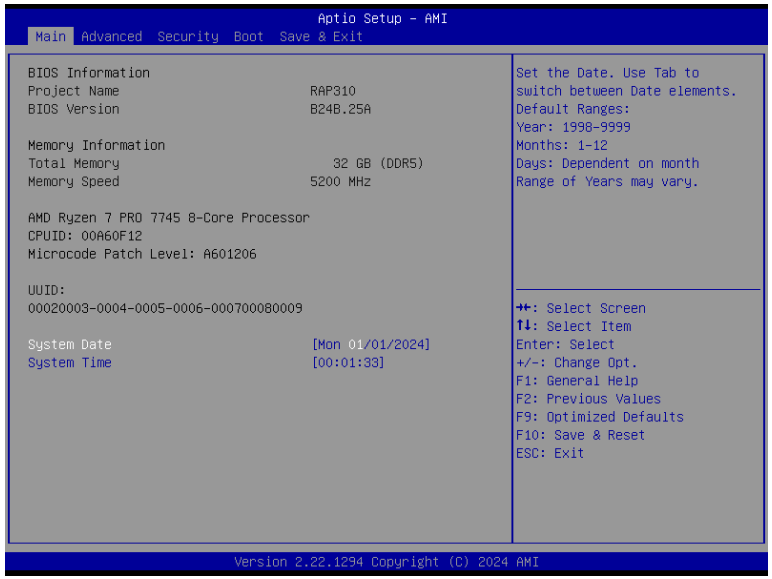
Keys	Function
Right / Left arrow	Move the highlight left or right to select a menu
Up / Down arrow	Move the highlight up or down between submenus or fields
<Enter>	Enter the highlighted submenu
+ (plus key)/F6	Scroll forward through the values or options of the highlighted field
- (minus key)/F5	Scroll backward through the values or options of the highlighted field
<F1>	Display general help
<F2>	Display previous values
<F7>	Popup Boot Device List
<F9>	Optimized defaults
<F10>	Save and Exit
<Esc>	Return to previous menu

Scroll Bar
When a scroll bar appears to the right of the setup screen, it indicates that there are more available fields not shown on the screen. Use the up and down arrow keys to scroll through all the available fields.

Submenu
When “▶” appears on the left of a particular field, it indicates that a submenu which contains additional options are available for that field. To display the submenu, move the highlight to that field and press <Enter>.

▶ Main

The Main menu is the first screen that you will see when you enter the BIOS Setup Utility.



System Date

The date format is <month>, <date>, <year>. Press "Tab" to switch to the next field and press "-" or "+" to modify the value.

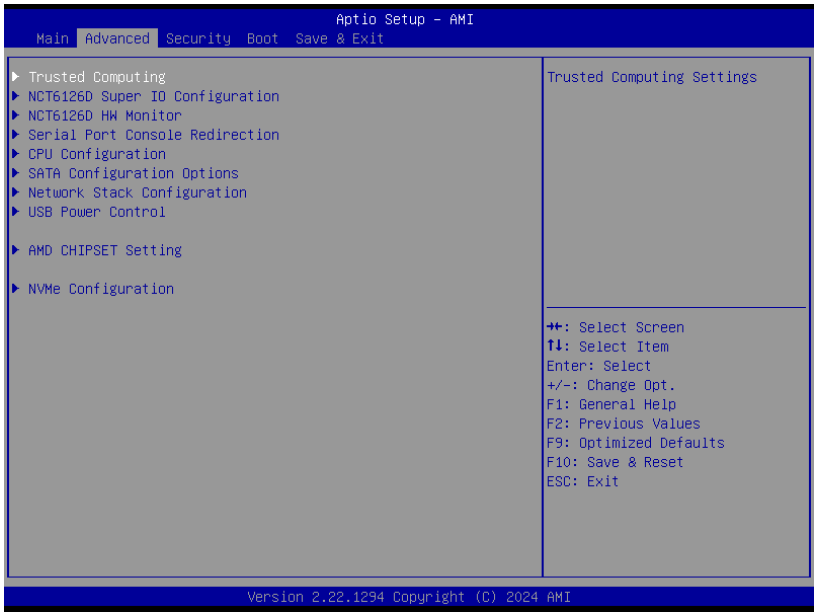
System Time

The time format is <hour>, <minute>, <second>. The time is based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00. Hour displays hours from 00 to 23. Minute displays minutes from 00 to 59. Second displays seconds from 00 to 59.

▶ Advanced

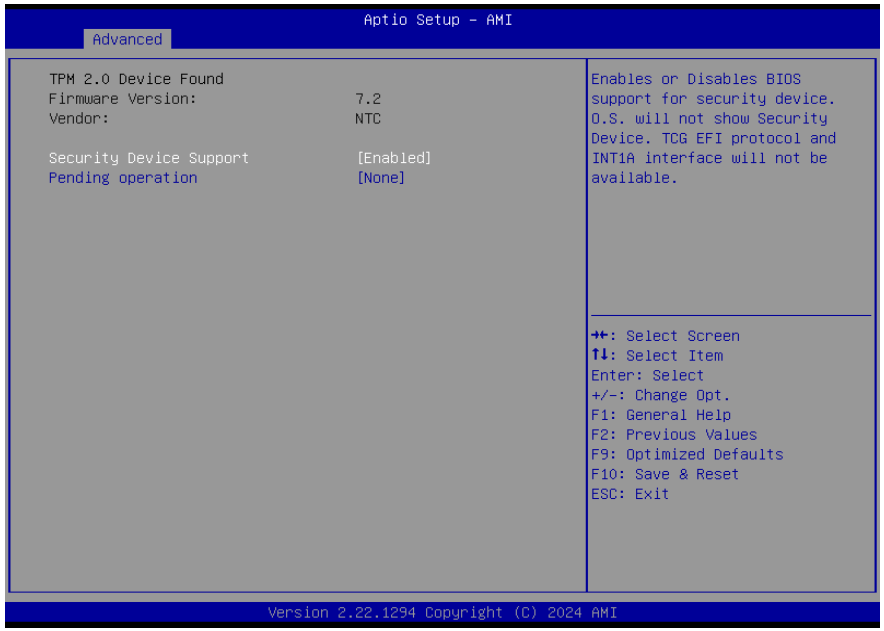
The Advanced menu allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference.

Important:
Setting incorrect field values may cause the system to malfunction.



▶ Advanced

Trusted Computing



Security Device Support

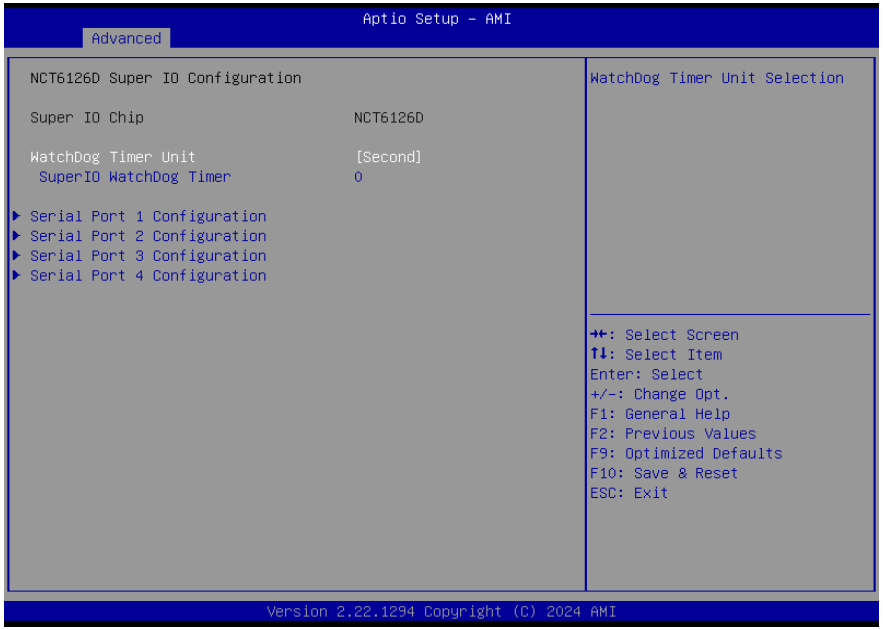
This field is used to enable or disable BIOS support for the security device such as an TPM 2.0 to achieve hardware-level security via cryptographic keys.

Pending operation

To clear the existing TPM encryption, select "TPM Clear" and restart the system. This field is not available when "Security Device Support" is disabled.

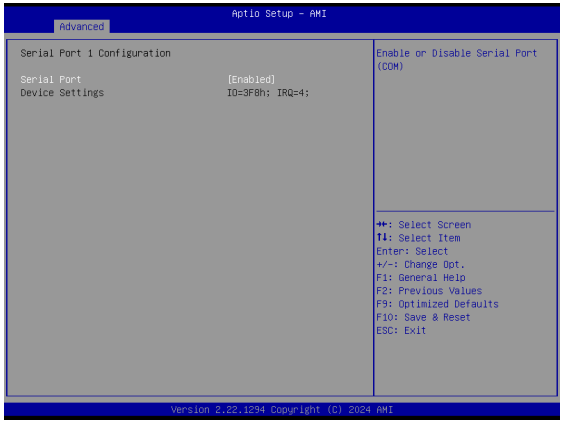
▶ Advanced

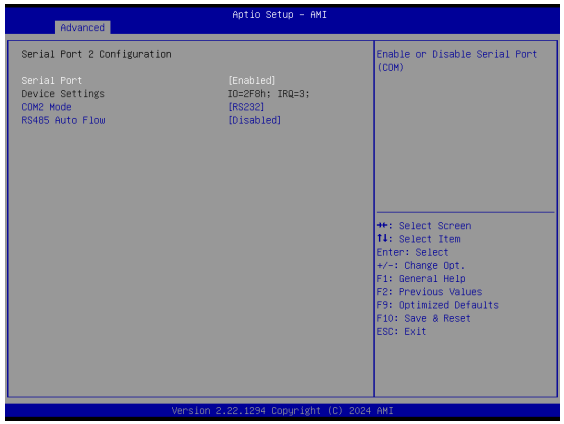
NCT6126D Super IO Configuration



▶ Advanced

NCT6126D Super IO Configuration ▶ Serial Port 1, 2 Configuration

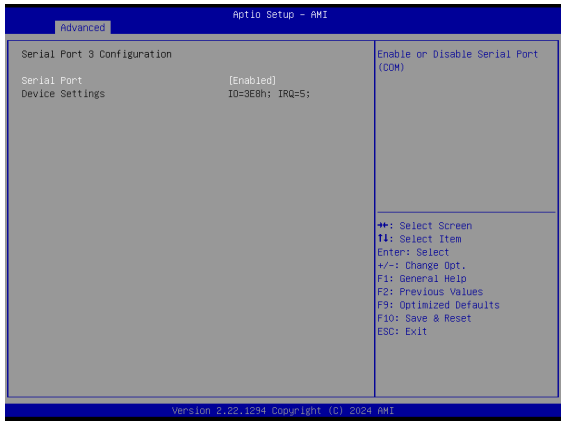


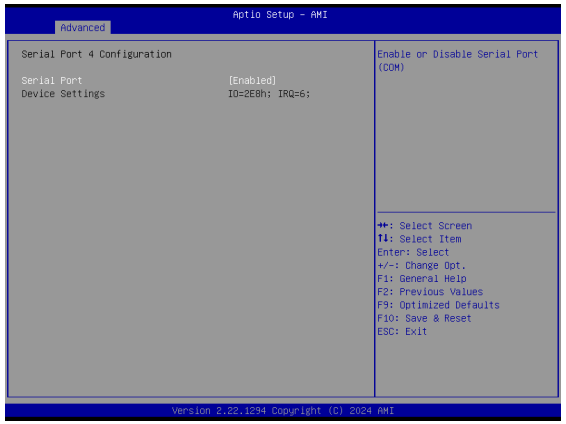


Serial Port
Enable or disable serial port.

▶ Advanced

NCT6126D Super IO Configuration ▶ Serial Port 3, 4 Configuration

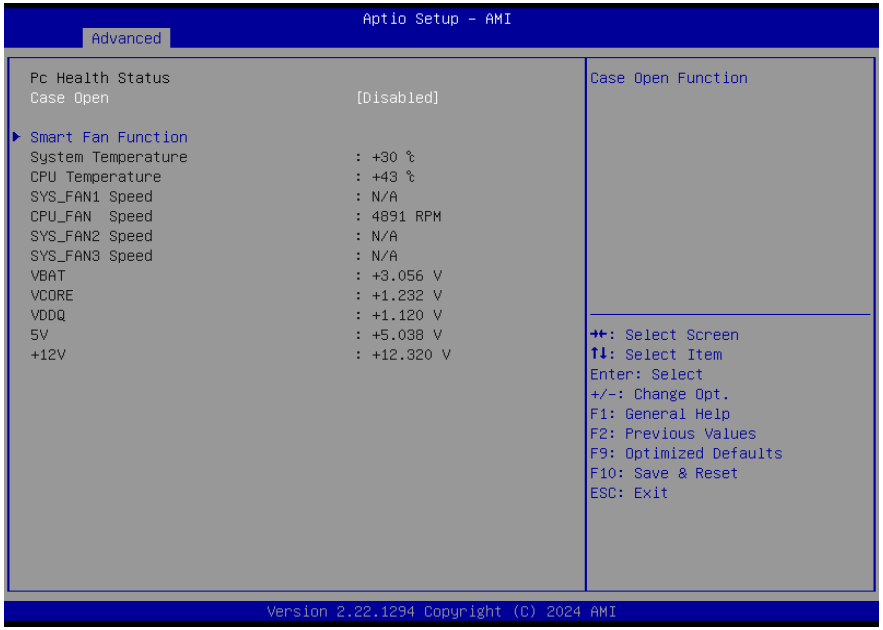




Serial Port
Enable or disable serial port.

▶ Advanced

NCT6126D HW Monitor



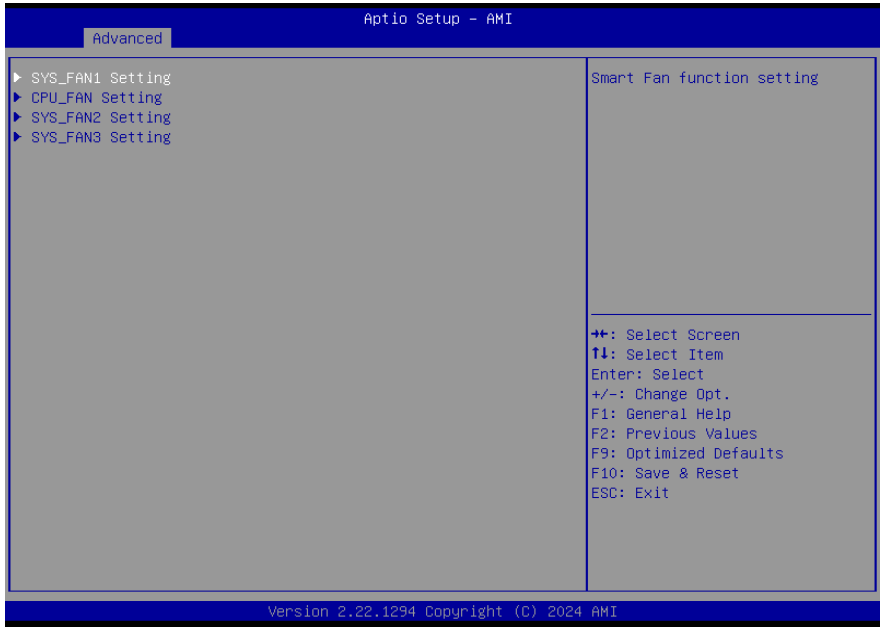
This section displays the system's health information, i.e. voltage readings, CPU and system temperatures, and fan speed readings

Smart Fan Function

Smart Fan Function Setting.

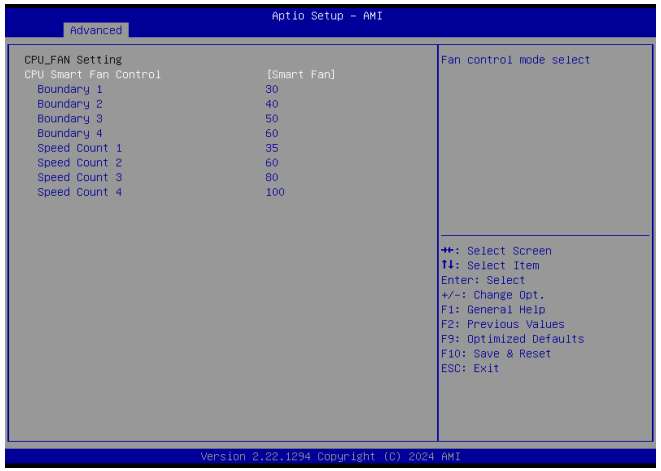
▶ Advanced

NCT6126D HW Monitor ▶ Smart FAN Function

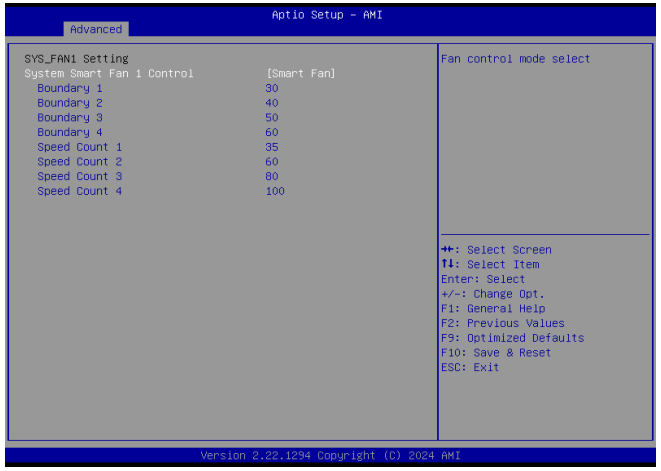


▶ Advanced

NCT6126D HW Monitor ▶ Smart FAN Function ▶ CPU FAN Setting

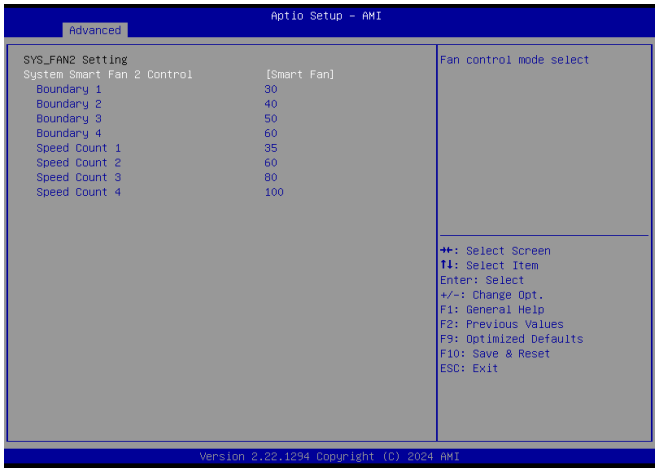


NCT6126D HW Monitor ▶ Smart FAN Function ▶ SYS_FAN1 Setting

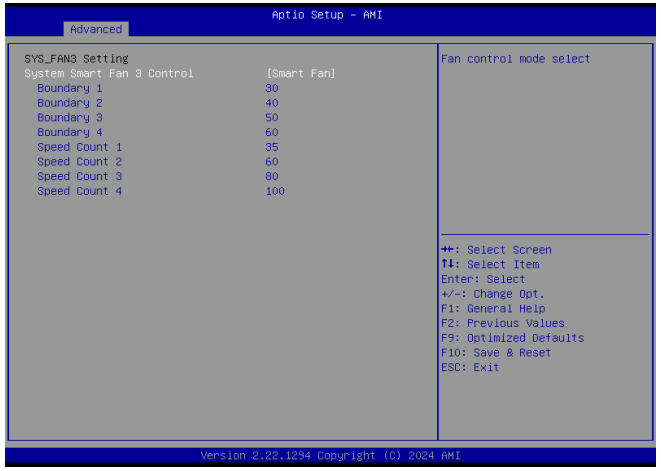


▶ Advanced

NCT6126D HW Monitor ▶ Smart FAN Function ▶ SYS_FAN 2 Setting



NCT6126D HW Monitor ▶ Smart FAN Function ▶ SYS_FAN 3 Setting



Smart Fan is a fan speed moderation strategy dependent on the current system temperature. When the system temperature goes higher than the Boundary setting, the fan speed will be turned up to the setting of the Fan Speed Count that bears the same index as the Boundary field.

▼ SYS Smart Fan/CPU Smart Fan Control = [Enabled]

Boundary 1 to Boundary 4

Set the boundary temperatures that determine the fan speeds accordingly, the value ranging from 0-127 ℃. For example, when the system temperature reaches Boundary 1 setting, the fan speed will be turned up to the designated speed of the Fan Speed Count 1 field.

Fan Speed Count 1 to Fan Speed Count 4

Set the fan speed, the value ranging from 1-100%, 100% being full speed. The fans will operate according to the specified boundary temperatures above-mentioned.

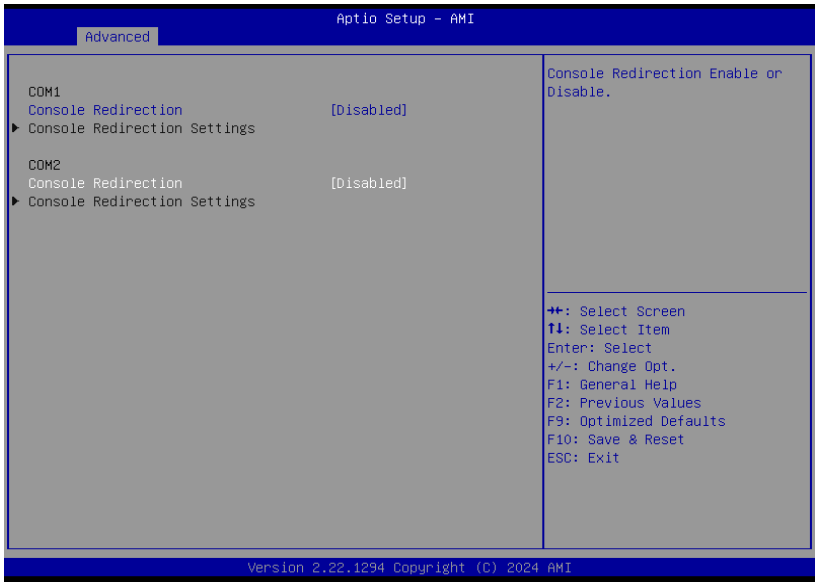
▼ SYS Smart Fan/CPU Smart Fan Control = [Disabled]

Fix Fan Speed Count

Set the fan speed, the value ranging from 1-100%, 100% being full speed. The fans will always operate at the specified speed regardless of gauged temperatures.

▶ **Advanced**

Serial Port Console Redirection



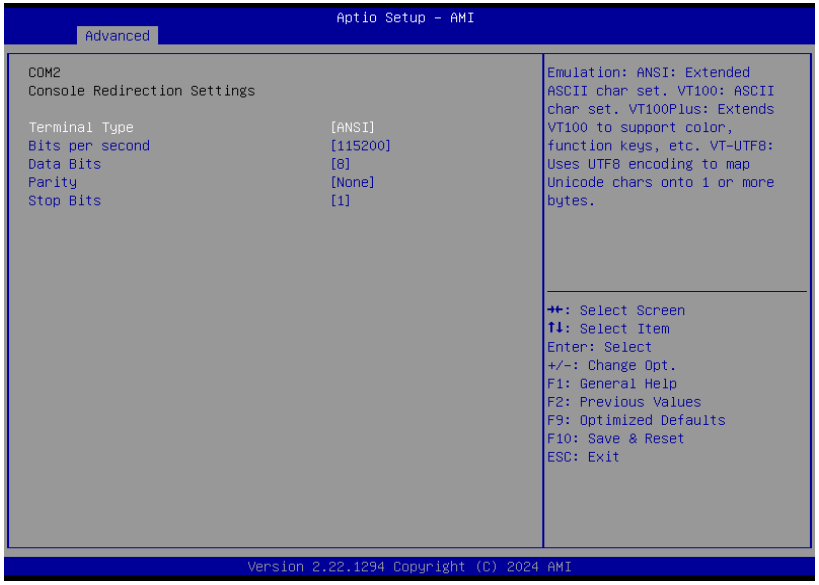
Console Redirection

By enabling Console Redirection of a COM port, the sub-menu of console redirection settings will become available for configuration as detailed in the following.

▶ Advanced

Serial Port Console Redirection ▶ Console Redirection Settings





Configure the serial settings of the current COM port.

Terminal Type

Select terminal type: VT100, VT100+, VT-UTF8 or ANSI.

Bits per second

Select serial port transmission speed: 9600, 19200, 38400, 57600 or 115200.

Data Bits

Select data bits: 7 bits or 8 bits.

Parity

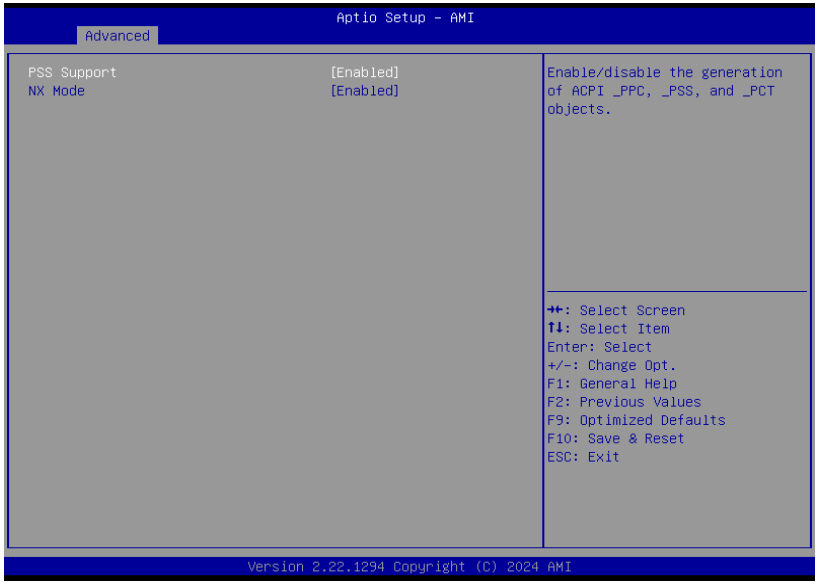
Select parity bits: None, Even, Odd, Mark or Space.

Stop Bits

Select stop bits: 1 bit or 2 bits.

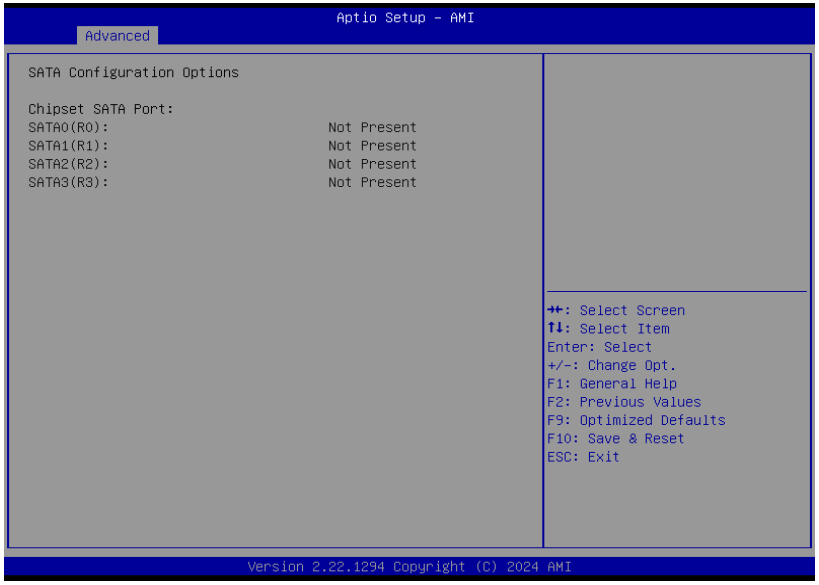
▶ Advanced

CPU Configuration



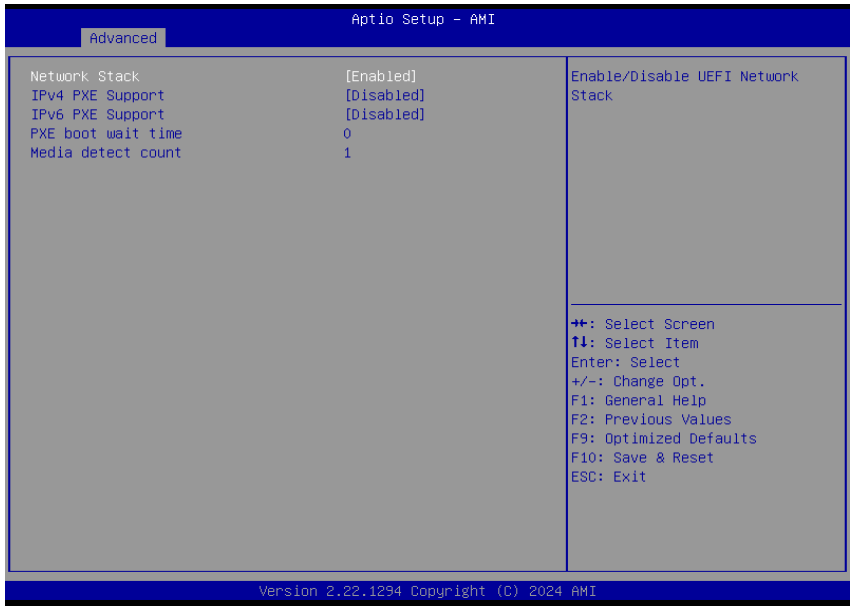
▶ Advanced

SATA Configuration Options



▶ Advanced

Network Stack Configuration



Network Stack

Enable or disable UEFI network stack. The following fields will appear when this field is enabled.

Ipv4 PXE Support

Enable or disable IPv4 PXE boot support. If disabled, IPv4 PXE boot support will not be available.

Ipv6 PXE Support

Enable or disable IPv6 PXE boot support. If disabled, IPv6 PXE boot support will not be available.

PXE boot wait time

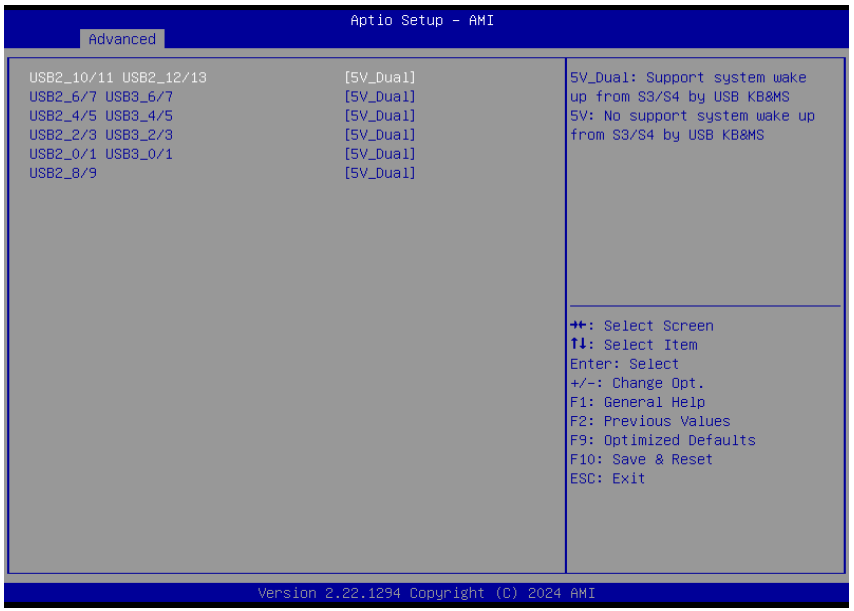
Set the wait time in seconds to press ESC key to abort the PXE boot. Use either +/- or numeric keys to set the value.

Media detect count

Set the number of times the presence of media will be checked. Use either +/- or numeric keys to set the value.

▶ Advanced

USB Power Control



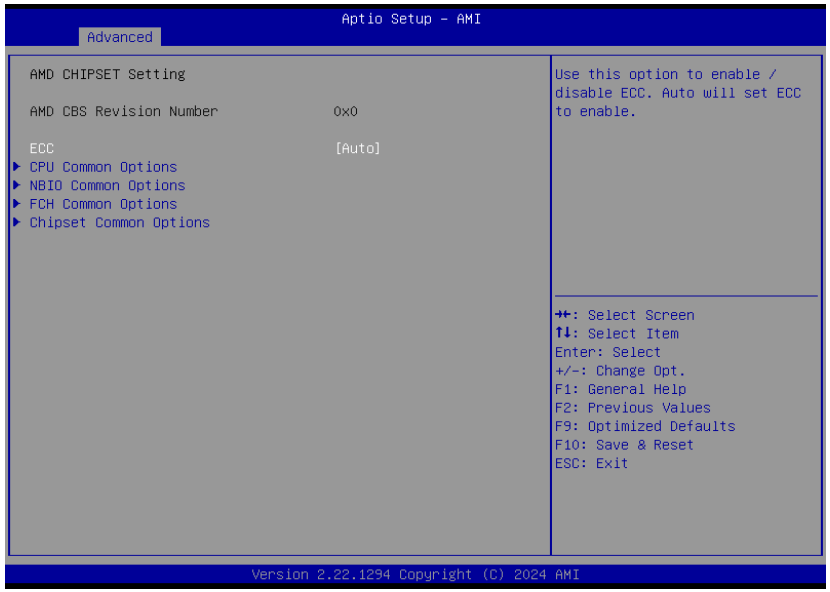
Server CA Configuration

5_Dual: Support system wake up from S3/S4 by USB KB&MS

5V: No support system wake up from S3/S4 by USB KB&MS

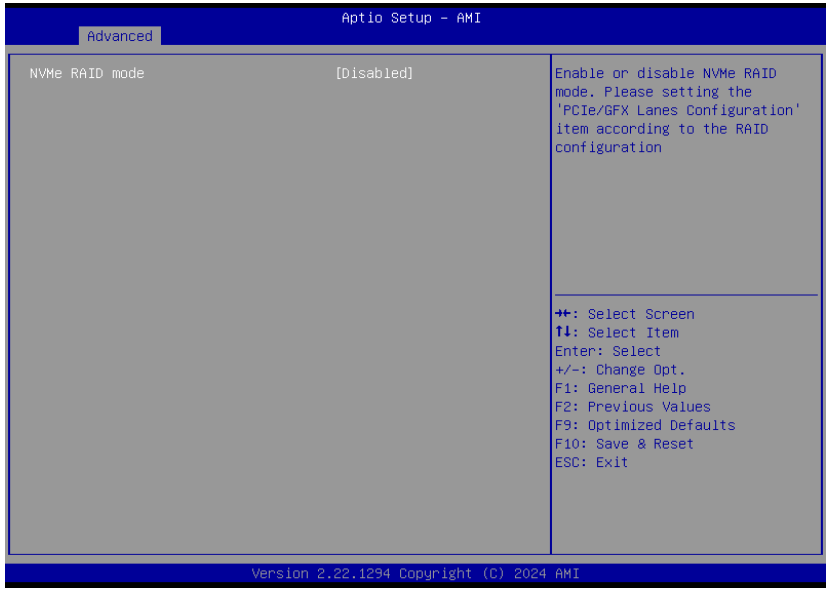
▶ Advanced

AMD CHIPSET Setting

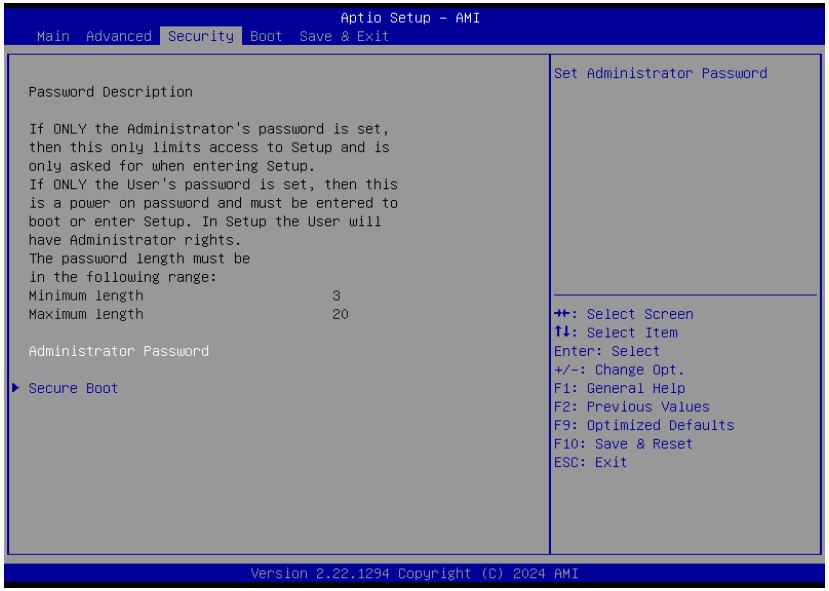


▶ Advanced

NvMe Configuration



▶ Security



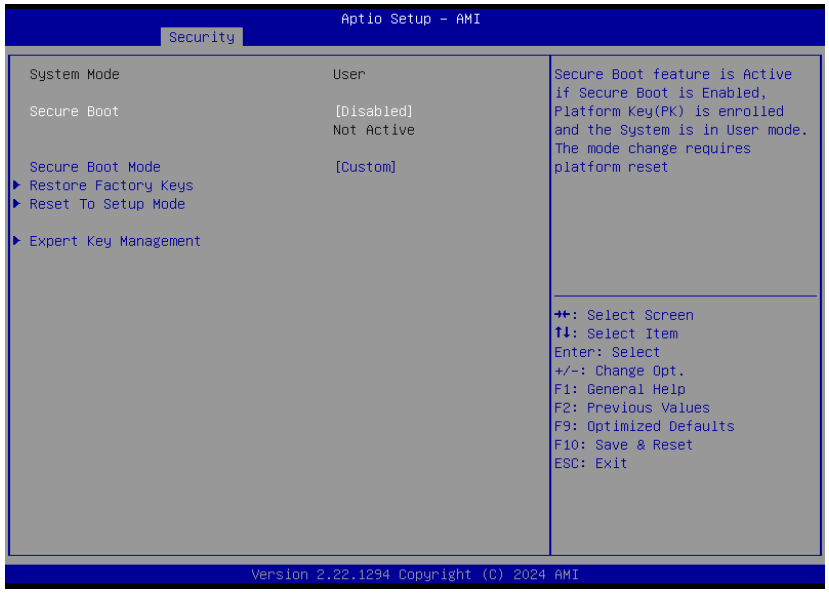
Administrator Password

Set the administrator password. To clear the password, input nothing and press enter when a new password is asked. Administrator Password will be required when entering the BIOS.

User Password

Set the user password. To clear the password, input nothing and press enter when a new password is asked. User Password will be required when powering up the system.

Secure Boot



Secure Boot

The Secure Boot store a database of certificates in the firmware and only allows the OSes with authorized signatures to boot on the system. To activate Secure Boot, please make sure that “Secure Boot” is “[Enabled]”, Platform Key (PK) is enrolled, “System Mode” is “User”, and CSM is disabled. After enabling/disabling Secure Boot, please save the configuration and restart the system. When configured and activated correctly, the Secure Boot status will be “Active”.

Secure Boot Mode

Select the secure boot mode — Standard or Custom. When set to Custom, the following fields will be configurable for the user to manually modify the key database.

Restore Factory Keys

Force system to User Mode. Load OEM-defined factory defaults of keys and databases onto the Secure Boot. Press Enter and a prompt will show up for you to confirm.

Reset To Setup Mode

Clear the database from the NVRAM, including all the keys and signatures installed in the Key Management menu. Press Enter and a prompt will show up for you to confirm.

Expert Key Management

Enables expert users to modify Secure Boot Policy variables without full authentication.

▶ Boot



Setup Prompt Timeout

Set the number of seconds to wait for the setup activation key. 65535 (0xFFFF) denotes indefinite waiting.

Bootup NumLock State

Select the keyboard NumLock state: On or Off.

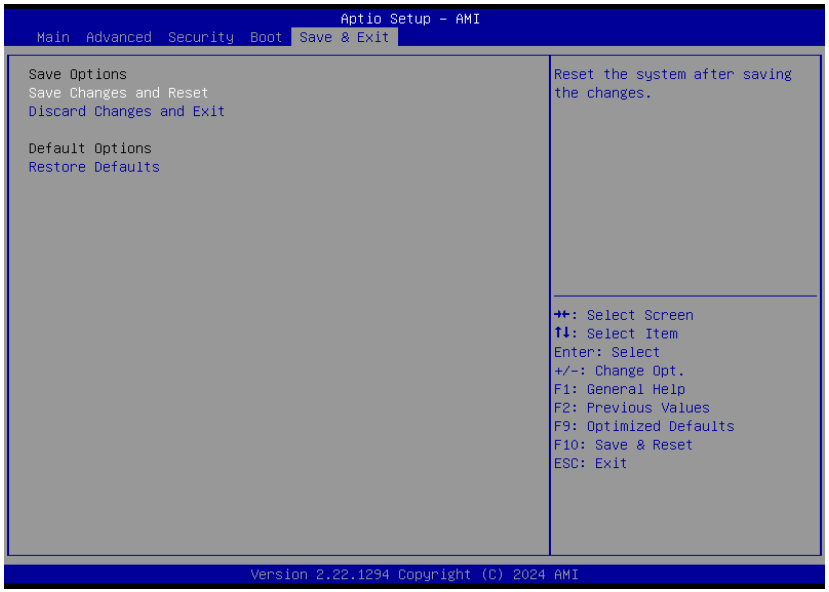
Quiet Boot

This section is used to enable or disable quiet boot option.

Boot Option Priorities

Rearrange the system boot order of available boot devices.

▶ Save & Exit



Save Changes and Reset

To save the changes, select this field and then press <Enter>. A dialog box will appear. Select Yes to reset the system after saving all changes made.

Discard Changes and Exit

To discard the changes, select this field and then press <Enter>. A dialog box will appear.

Restore Defaults

To restore and load the optimized default values, select this field and then press <Enter>. A dia-log box will appear. Select Yes to restore the default values of all the setup options.

▶ Updating the BIOS

To update the BIOS, you will need the new BIOS file and a flash utility. Please contact technical support or your sales representative for the files and specific instructions about how to update BIOS with the flash utility.

▶ Notice: BIOS SPI ROM

1. The Intel® Management Engine has already been integrated into this system board. Due to the safety concerns, the BIOS (SPI ROM) chip cannot be removed from this system board and used on another system board of the same model.

2. The BIOS (SPI ROM) on this system board must be the original equipment from the factory and cannot be used to replace one which has been utilized on other system boards.

3. If you do not follow the methods above, the Intel® Management Engine will not be updated and will cease to be effective.

Note:
a. You can take advantage of flash tools to update the default configuration of the BIOS (SPI ROM) to the latest version anytime.

b. When the BIOS IC needs to be replaced, you have to populate it properly onto the system board after the EEPROM programmer has been burned and follow the technical person's instructions to confirm that the MAC address should be burned or not.

c. After updating unique MAC Address from manufacturing, NVM will be protected immediately after power cycle.
Users cannot update NVM or MAC address.