DFI



ASL171_ASL173

Mini-ITX 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.

Table of Contents

Chapter 1 - Introduction 6
Specifications 6
Block Diagram 8
Dimension 8
Chapter 2 - Hardware Installation 9
Board Layout 9
Installing the heat sink 11
Installing the Heat Sink 11
Jumper Settings 12
Clear CMOS Data (SW1) 12
SATA1 CONN/M.2 B-KEY (PBJP1) 12
PCIE Slotx2/M.2 E-KEY (PBJP2) 13
USB3-A/M.2 B-KEY (PBJP3) 13
Panel Backlight ON Level Select (DPJP1) 14
VCC Panel Power Select (DPJP3) 14
Inverter Panel Power Select (DPJP4) 15
M2A Panel Power Selection (DPJP5) 15
LVDS/eDP Backlight Enable (DPJP6) 16
LVDS/eDP VCC Panel Power Enable (DPJP7) 16
DIO_0~3 Power Select (JP2) 17
DIO_4~7 Power Select (JP5) 17
Pin Assignment 18
RTC Battery (J19) 18
Case Open (J2) 18
UART Header (Debug) (JP4) 19
CPU Fan (J20) 19
System Fan (J10) 20
DIO (J16) 20
SATA POWER (CN8) 21
SATA POWER (CN12) 21
S/PDIF (AUJ2) 22
SATA1 (J12) 22
SATA0 (J4) 23
Backlight CON (DPJ2) 23
COM1 Power Select (TSJP1) 24
COM2 Power Select (TSJP2) 24
COM1 (TSJ1) 25
COM2 (TSJ2) 25
COM1 RS232/RS422/RS485 (TSJ1) 25
COM3 (TSJ3) 25
COM4 (TSJ4) 25
COM5 (TSJ5) 25
COM6 (TSJ6) 25
COM2/COM3/COM4/COM5/COM6 25
Front Audio (AUJ1) 25
USB2.0 Pin Header (J3) 26
USB2.0 Pin Header (J21) 26
eSPI Header(Debug) (J5) 27
Front Panel (J17) 27
Expansion Slots 28
Installing the M.2 Module 28
Chapter 3 - BIOS Settings 30
Overview 30
Main 31
Advanced 31
RC ACPI Settings 32
CPU Configuration 32
Power & Performance 33
PCH-FW Configuration 33
Trusted Computing 34
IT8786 Super IO Configuration 34
IT8786 Super IO Configuration ► **Serial Port 1, 2 Configuration** **35**
IT8786 Super IO Configuration ► **Serial Port 3, 4 Configuration** **35**
IT8786 Super IO Configuration ► **Serial Port 5, 6 Configuration** **36**
IT8786 HW Monitor 36
Serial Port Console Redirection 37
Serial Port Console Redirection ► **Console Redirection Settings** **37**
Network Stack Configuration 38
USB Power Control 39
Chipset 40
System Agent (SA) Configuration 40
PCH-IO Configuration 41
PCH-IO Configuration► **PCI Express Configuration** **41**
PCH-IO Configuration► **SATA Configuration** **42**
PCH-IO Configuration► **HD Audio Configuration** **42**
Security 43
Secure Boot 43
Boot 44
Save & Exit 44
Updating the BIOS 45
Notice: BIOS SPI ROM 45

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 ASL171/ASL173 Motherboard
- 1 COM port cable (Length: 250mm, 1 x COM ports)
- 1 Serial ATA data & power cable w/lock (Length: 300mm)
- 1 Heat Sink

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.

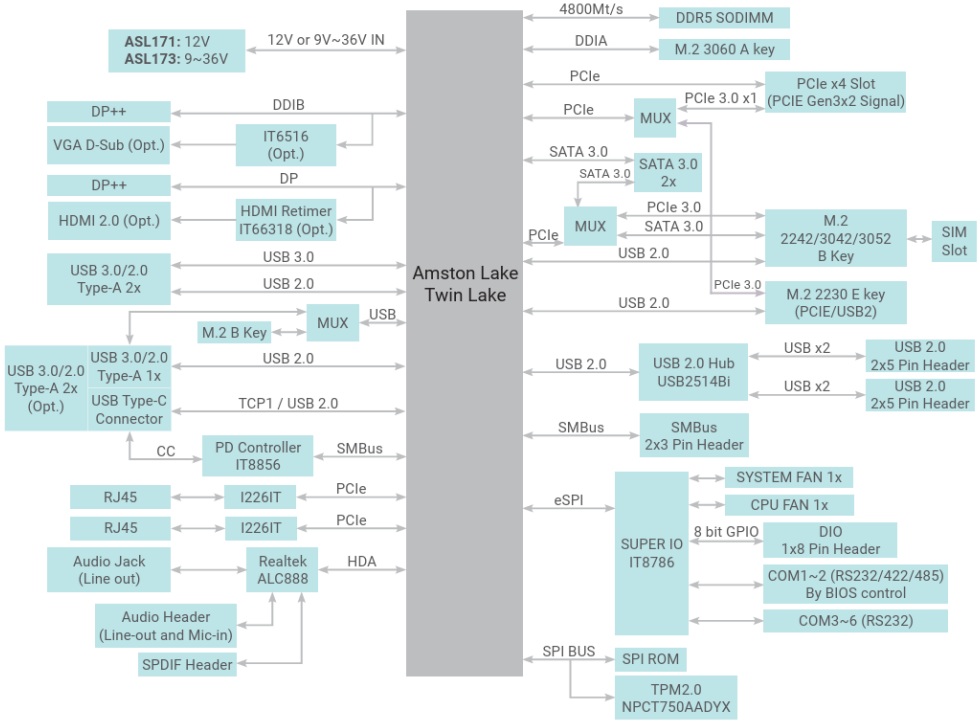
Chapter 1 - Introduction

▶ Specifications

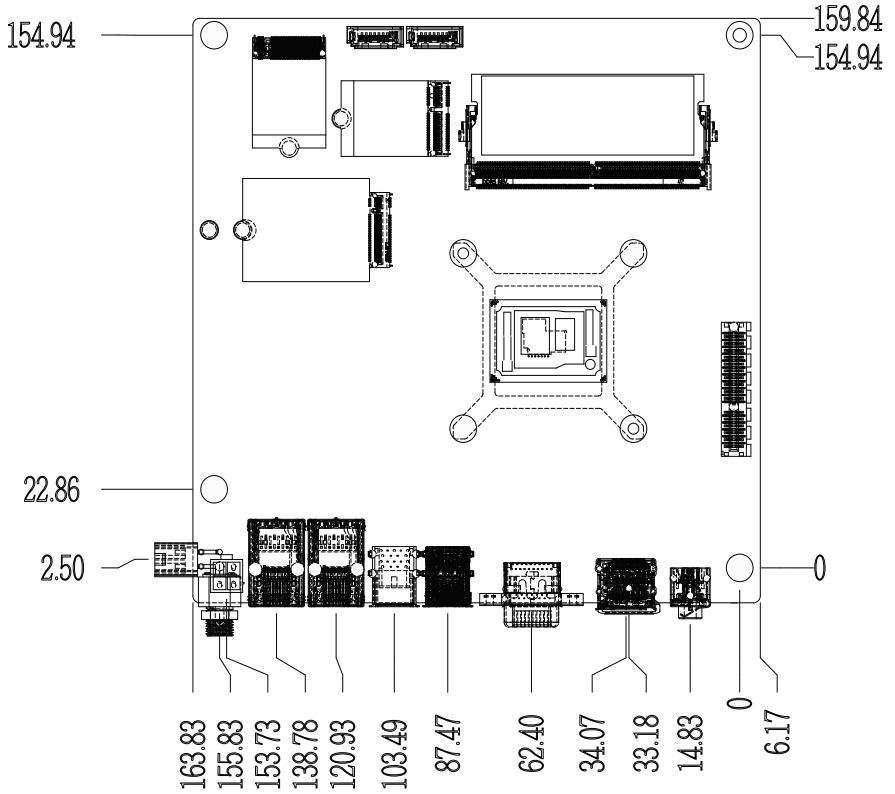
SYSTEM	Processor	Intel® Atom x7000RE series processors (Code Name : Amston Lake) Intel® Processor N-series processors(Code Name : Twin Lake) Intel® Atom Processor x7835RE, 8 Cores, 1.3~3.6GHz, 12W Intel® Atom Processor x7433RE, 4 Cores, 1.5~3.4GHz, 9W Intel® Atom Processor x7213RE, 2 Cores, 2.0~3.4GHz, 9W Intel® Atom Processor x7211RE, 2 Cores, 1.0~3.2GHz, 6W Intel® Atom Processor N150, 4 Cores, 1.0~3.6GHz, 6W
	Memory	One 262-pin SODIMM up to 16GB Single Channel DDR5 4800MHz
	BIOS	AMI SPI 256Mbit
GRAPHICS	Controller	Intel® UHD Graphics
	Feature	OpenGL 4.6, Direct X 12.1, OpenCL 3.0 HW Decode: HEVC, VP9, AV1, AVC HW Encode: HEVC, VP9, AVC
	Display	1 x DP++/ VGA (Co-layout) 1 x DP++/ HDMI2.0 (Co-layout) 1 x USB Type C (DP alt-mode/USB3.2 Gen2/PD 15W) HDMI: resolution up to 3840x2160 @ 24Hz DP++: resolution up to 3840x2160 @ 60Hz VGA: resolution up to 2048x1536 @ 60Hz USB-C: resolution up to 3840x2160 @24Hz
	Triple Displays	DP++/VGA + HDMI/DP++ + USB Type C (DP alt-mode/USB3.2 Gen2/PD 15W) + M2A-Display (optional)
EXPANSION	Interface	1 x PCIe x4 (PCIe signal x2)
		1 x M.2 2242/3042/3052 B Key (PCIE Gen3x1 or SATA3 and USB2.0 wi USB3(opt.))
		1 x M.2 2230 E Key (PCIE Gen3x1, USB2.0)
		1 x M.2 3060 A Key support DFI M2A-display module (opt. MOQ required)
		1 x Nano SIM socket (connected to M.2 B key)
AUDIO	Audio Codec	Realtek ALC888S
WATCHDOG TIMER	Output & Interval	System Reset, Programmable via Software from 1 to 255 Seconds
ETHERNET	Controller	2 x Intel® I226IT (10/100/1000/2500Mbps)
REAR I/O	Ethernet	2 x 2.5GbE RJ45
	USB	4 x USB 3.2 Gen2 or 3 USB 3.2 Gen2 + 1 USB2.0 or 3 USB 3.2 Gen2+1 USB Type C
	Display	1 x HDMI /DP++ (opt., MOQ may required) 1 x DP++ /VGA (opt., MOQ may required) 1 x USB Type C (DP alt-mode/USB3.2 Gen2/PD 15W)
	Audio	1 x Line-out

INTERNAL I/O	Serial	2 x RS-232/422/485 (RS-232 w/ power) (2.0mm pitch) 4 x RS-232 (2.0mm pitch)
	USB	4 x USB 2.0 (2.0mm pitch) or 3 x USB 2.0 (2.00mm pitch) + 1 x Vertical USB 2.0 (type A) (opt., MOQ required)
	Audio	1 x S/PDIF 1 x Line-out/Mic-in
	SATA	2 x SATA 3.0 (up to 6Gb/s)
	DIO	1 x 8-bit DIO
	SMBus	1 x SMBus
SECURITY	TPM	dTPM (default) fTPM (option)
POWER	Type	Single 12VDC (+/-5%) (ASL171) Wide Range 9~36V (ASL173)
	Connector	DC-in (Default) Right Angle Connector (4-pin) (By Request) Vertical Type Connector (4-pin) (By Request)
	Consumption	**ASL171:** Idle: x7835RE 12W: 12V @ 0.53A (6.36W) / Max: x7835RE 12W: 12V @ 4.36A (52.32W) **ASL173:** Idle: x7835RE 12W: 9V @ 0.82A (7.38W) / Max: x7835RE 12W: 9V @ 6.12A (55.08W) Idle: x7835RE 12W: 36V @ 0.3A (10.8W) / Max: x7835RE 12W: 36V @ 1.52A (54.72W)
	RTC Battery	CR2032 Coin Cell
OS SUPPORT	Microsoft	Windows IoT Enterprise 10 LTSB Windows 11
	Linux	Linux
ENVIRONMENT	Temperature	Operating: -40 to 85°C/ -5 to 65°C Storage: -40 to 85°C
	Humidity	Operating: 5 to 90% RH Storage: 5 to 90% RH
	MTBF	**ASL173-CT-x7835RE** MTBF 455,085 hrs @ 25°C; 278,736 hrs @ 45°C; 183,740 hrs @ 60°C; 137,635 hrs @ 70°C; 88,893 hrs @ 85°C Calculation model: Telcordia Issue 4 Environment: GB, GC – Ground Benign, Controlled **ASL171-CT-x7211RE** MTBF 472,343 hrs @ 25°C; 291,391 hrs @ 45°C; 192,586 hrs @ 60°C; 144,364 hrs @ 70°C; 93,242 hrs @ 85°C Calculation model: Telcordia Issue 4 Environment: GB, GC – Ground Benign, Controlled
MECHANISM	Dimensions	Mini-ITX Form Factor: 170mm (6.7") x 170mm (6.7")
	Height	PCB: 1.6mm Top Side: 20mm Bottom Side: 3mm
STANDARDS AND CERTIFICATIONS	Certifications	CE, FCC, RoHS

▶ Block Diagram

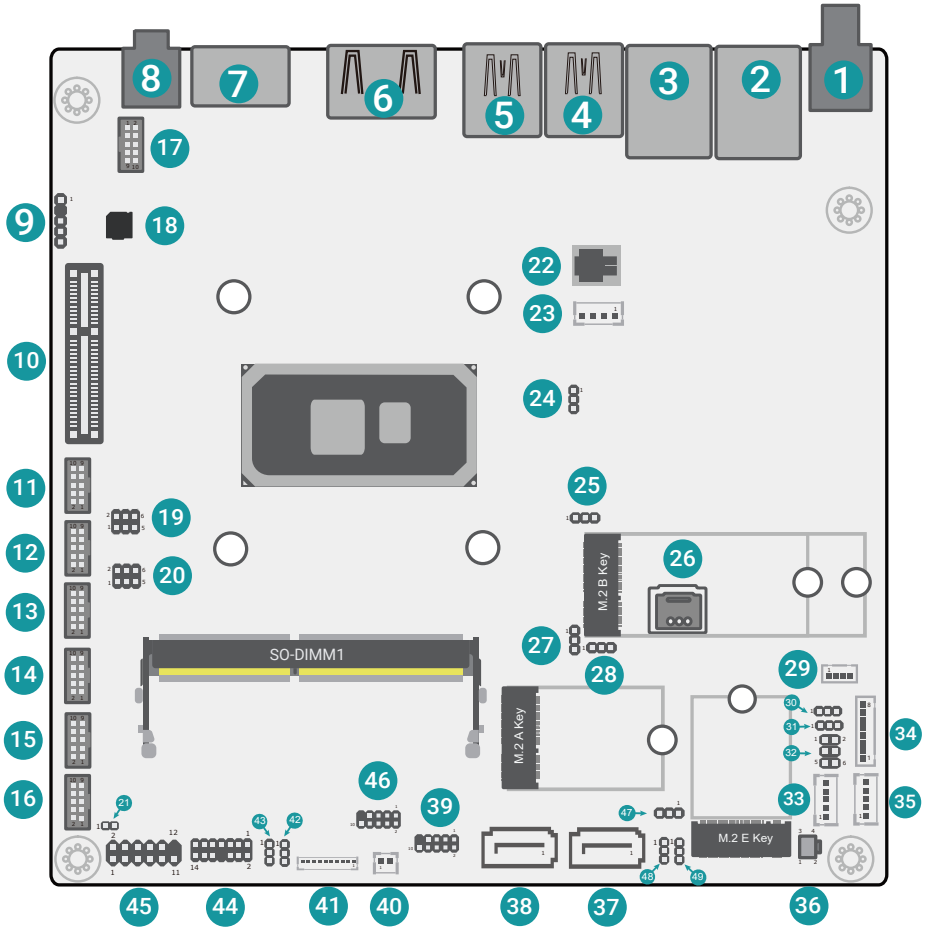


▶ Dimension



Chapter 2 - Hardware Installation

▶ Board Layout



1	DC-in	21	Case Open
2	2.5G LAN 1	22	SPI
3	2.5G LAN 2	23	CPU Fan
4	USB3.2 Gen2	24	UART Header (Debug)
5	USB3.2 Gen2	25	SATA1 CONN/ M.2 B-KEY
6	DP++	26	SIM Card Slot
7	HDMI	27	USB3-A/ M.2 B-KEY
8	Line-out	28	PCIE Slotx2/ M.2 E-KEY
9	S/PDIF	29	System Fan
10	PCIE1	30	Panel Backlight ON Level Select
11	COM1	31	Panel Inverter Power Select
12	COM2	32	VCC Panel Power Select
13	COM3	33	SATA Power
14	COM4	34	Backlight CON
15	COM5	35	SATA Power
16	COM6	36	Clear CMOS Data
17	Front Audio	37	SATA1
18	Buzzer	38	SATA0
19	COM1 Power Select	39	USB2.0 Pin Header
20	COM2 Power Select	40	RTC Battery

41 DIO

42 DIO_4~7 Power Select

43 DIO_0~3 Power Select

44 eSPI Header(Debug)

45 Front Panel

46 USB2.0 Pin Header

47 M2A Panel Power Selection

48 LVDS/eDP Backlight Enable
(base on M.2 A-KEY SKU)

49 LVDS/eDP VCC Panel Power Enable
(base on M.2 A-KEY SKU)

▶ Installing the heat sink

Installing the Heat Sink

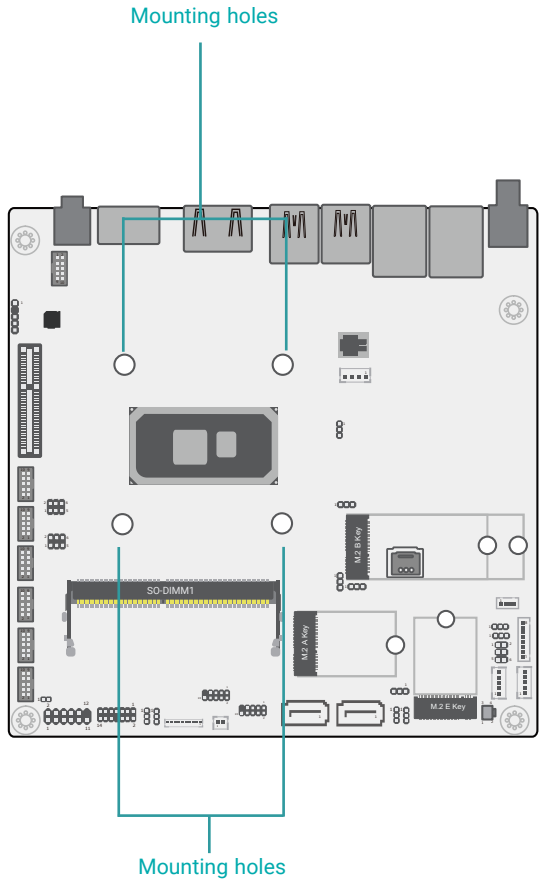
The CPU must be kept cool by using a heat sink, otherwise the CPU will overheat damaging both the CPU and system board.

1. Before you install the fan / heat sink, you must apply a thermal paste onto the top of the CPU. The thermal paste is usually supplied when you purchase the fan / heat sink assembly. Do not spread the paste all over the surface. When you later place the heat sink on top of the CPU, the compound will disperse evenly.

   Some heat sinks come with a patch of preapplied thermal paste. Do not apply thermal paste if the fan / heat sink already has a patch of thermal paste on its underside. Peel the strip that covers the paste before you place the fan / heat sink on top of the CPU.

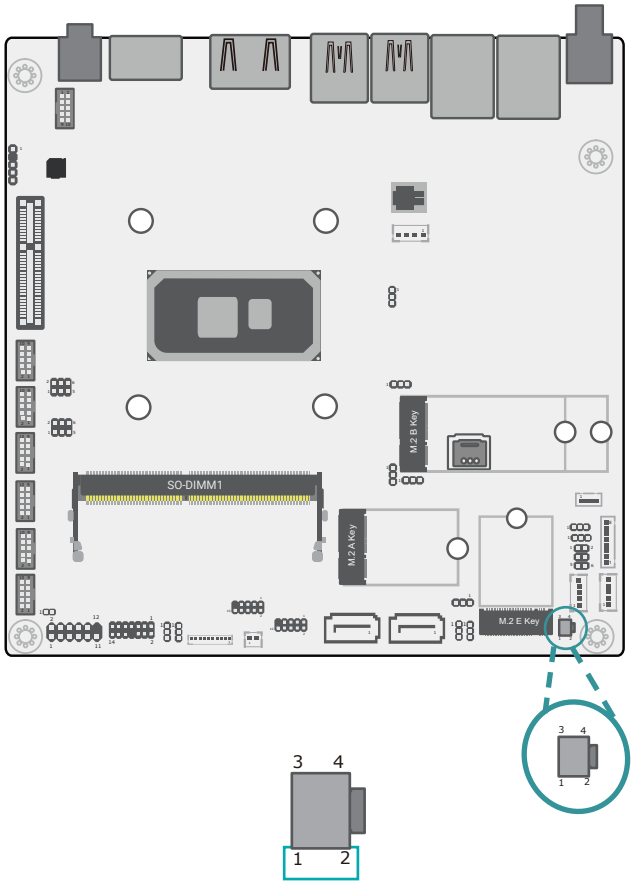
2. Place the heat sink on top of the CPU. The 4 spring screws around the heat sink, which are used to secure the heat sink onto the system board, must match the 4 mounting holes around the board.

3. Screw tight two of the spring screws at opposite corners into the mounting holes. And then proceed with the other two spring screws.



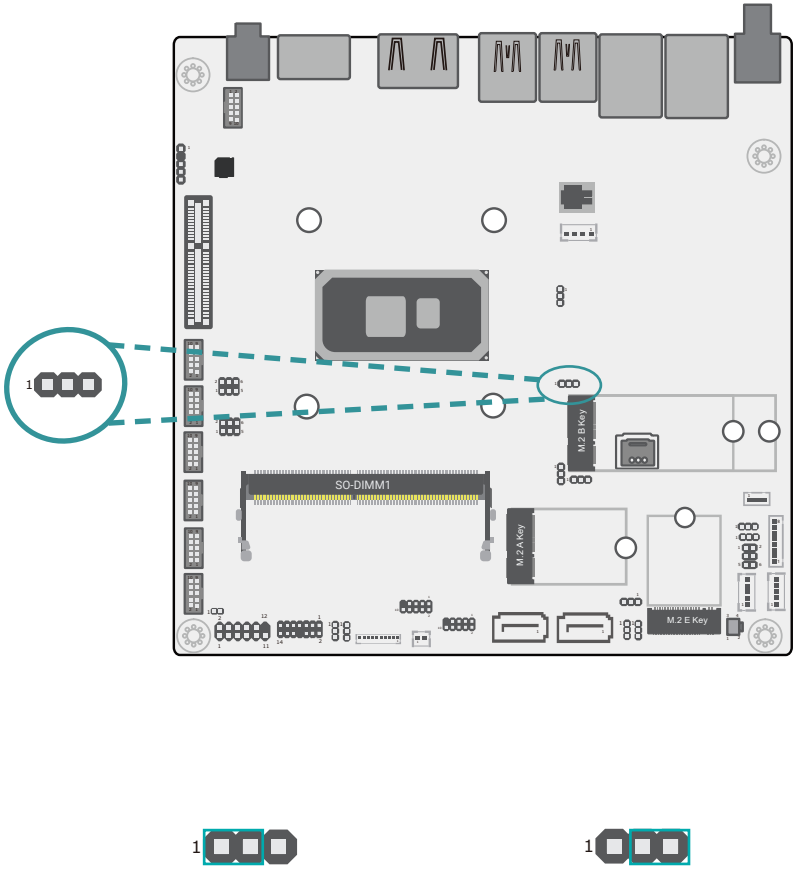
▶ Jumper Settings

Clear CMOS Data (SW1)



- 1-2 Open: Normal (Default)
- 1-2 Short: Clear CMOS Data

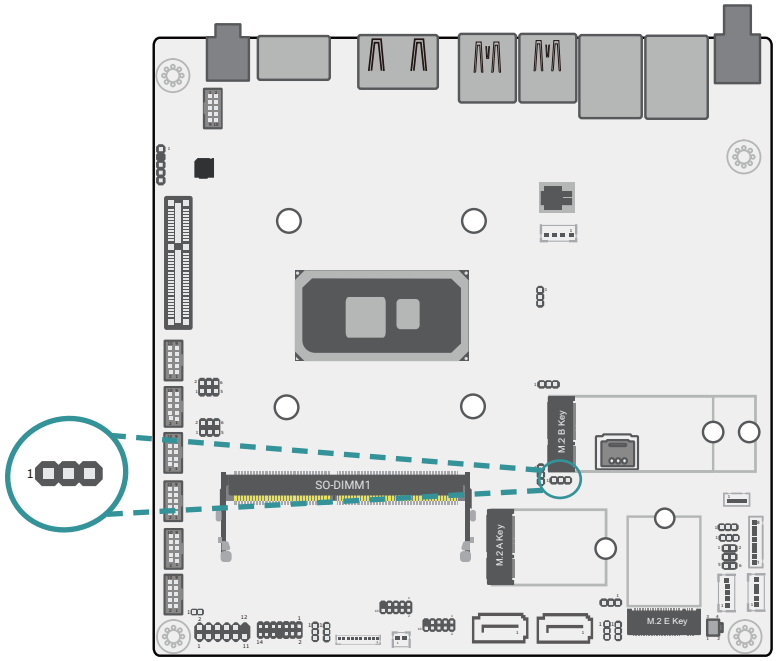
SATA1 CONN/M.2 B-KEY (PBJP1)



- 1-2 Short: M.2 B-KEY, SATA (Default)

- 2-3 Short: SATA1 CONN

PCIE Slotx2/M.2 E-KEY (PBJP2)



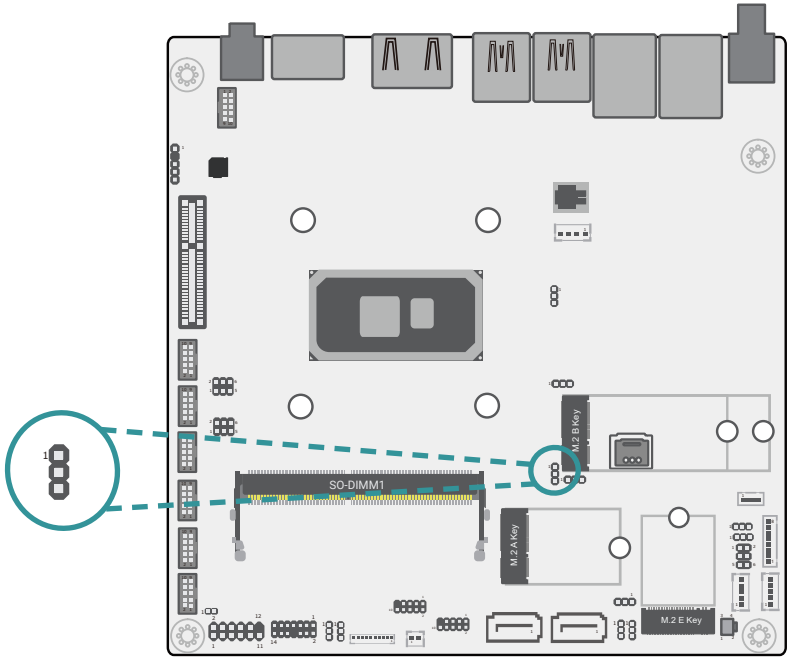


■ 1-2 Short: M.2 E-KEY, PCIEx1 (Default)



■ 2-3 Short: PCIEx2 Slotx2 (Optional)

USB3-A/M.2 B-KEY (PBJP3)



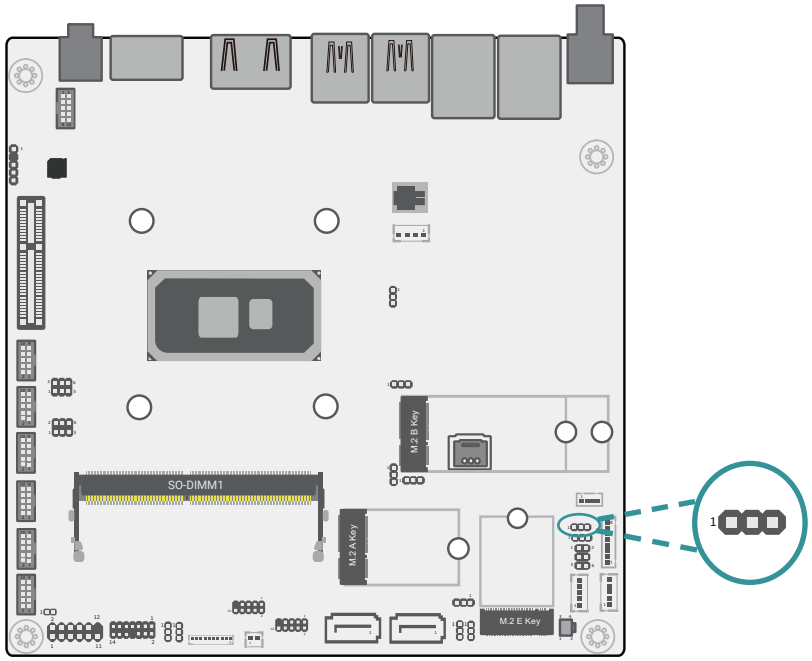


■ 1-2 Short: M.2 B-KEY, USB3 (Default)



■ 2-3 Short: USB3-TYPE-A

Panel Backlight ON Level Select (DPJP1)



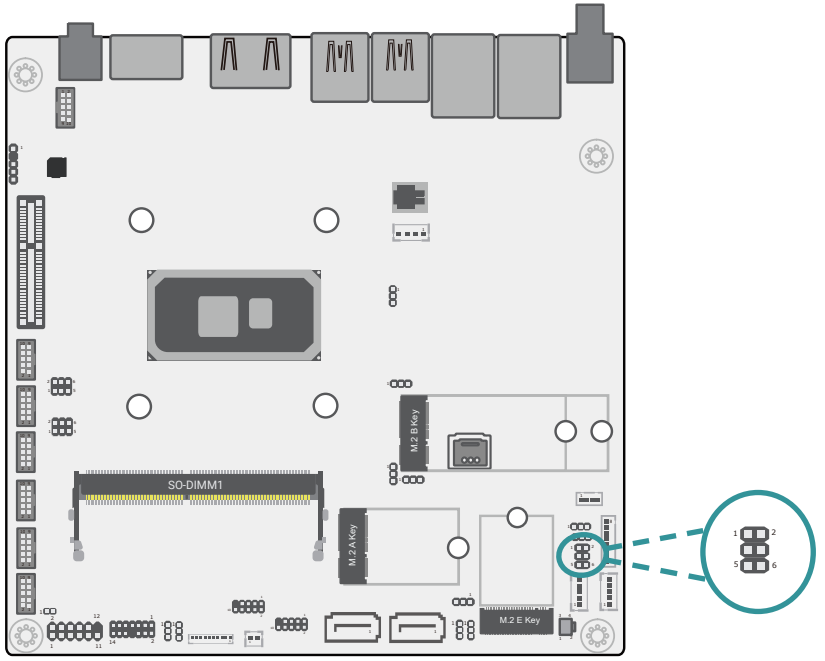


■ 1-2 Short: 3V3 (Default)



■ 2-3 Short: 5V

VCC Panel Power Select (DPJP3)





■ 1-2 Short: 12V

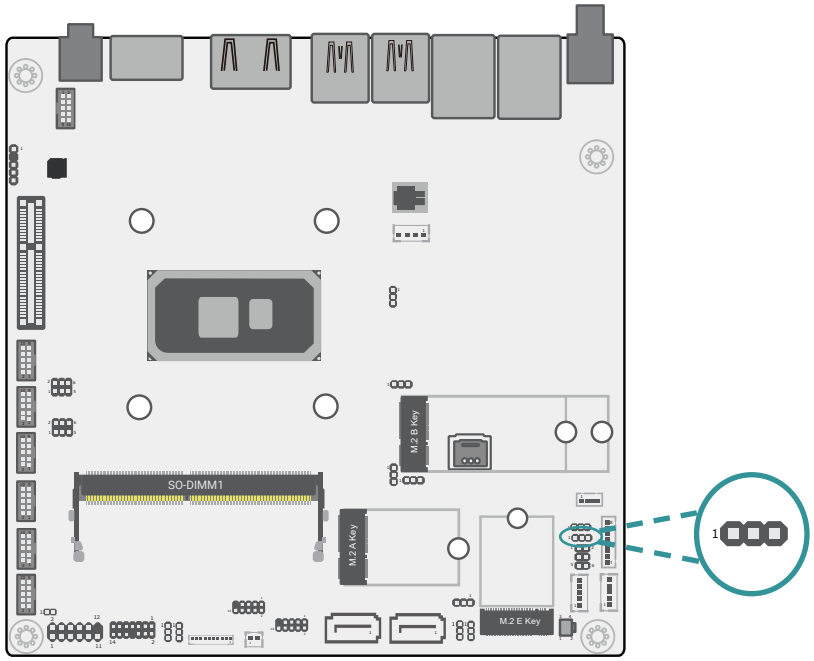


■ 3-4 Short: 5V



■ 5-6 Short: 3V3 (Default)

Inverter Panel Power Select (DPJP4)



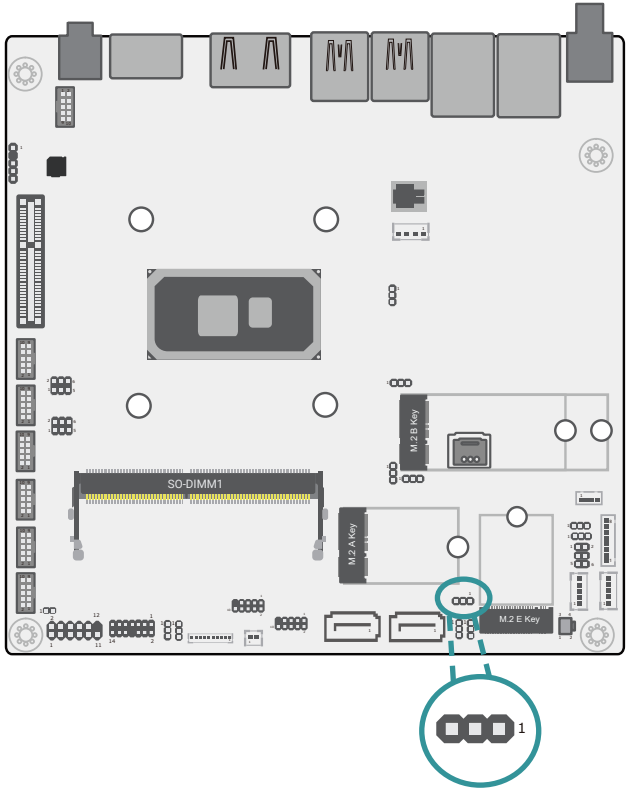


■ 1-2 Short: 12V (Default)



■ 2-3 Short: 5V

M2A Panel Power Selection (DPJP5)





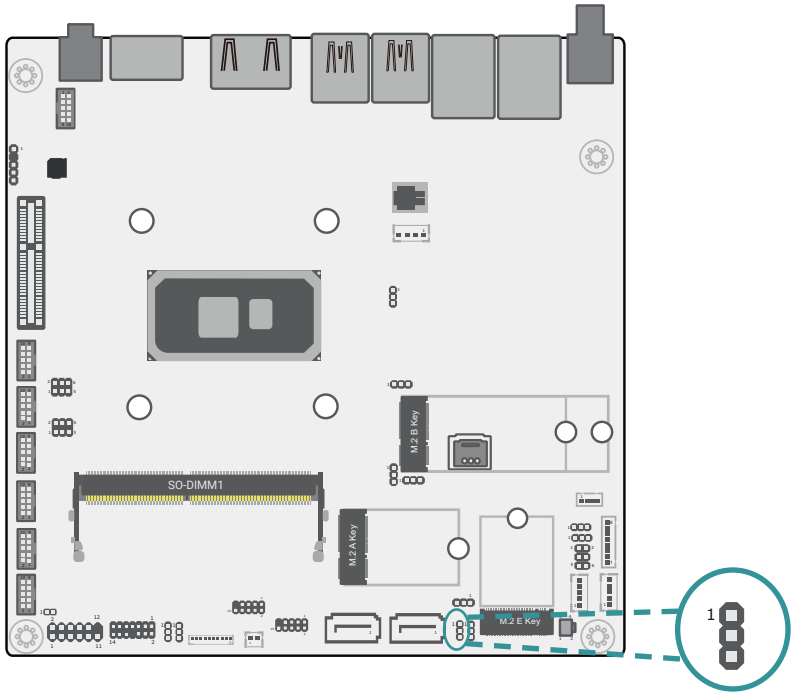
■ 1-2 Short: Panel Power (Default)



■ 2-3 Short: NC

LVDS/eDP Backlight Enable (DPJP6)

(base on M.2 A-KEY SKU)





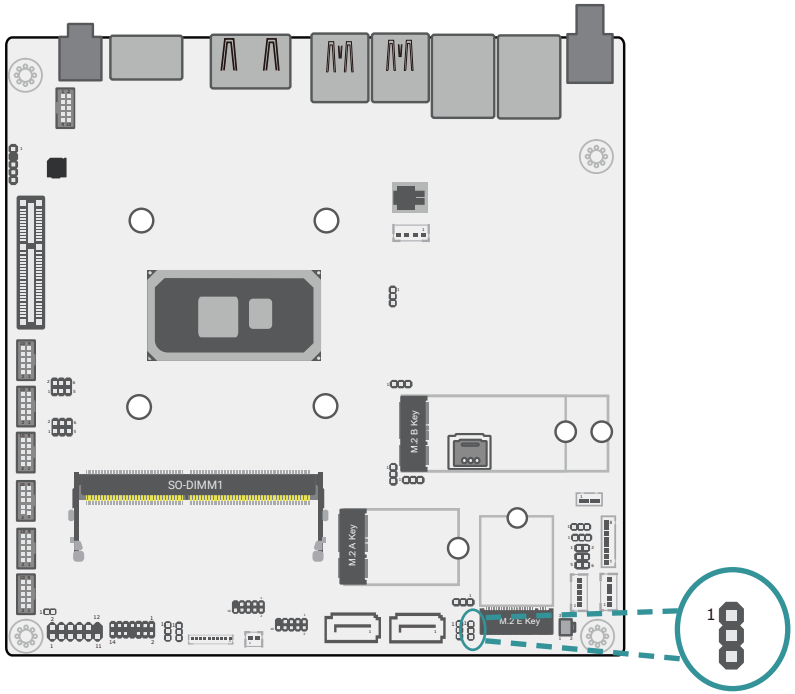
■ 1-2 Short: LVDS (Default)



■ 2-3 Short: eDP

LVDS/eDP VCC Panel Power Enable (DPJP7)

(base on M.2 A-KEY SKU)



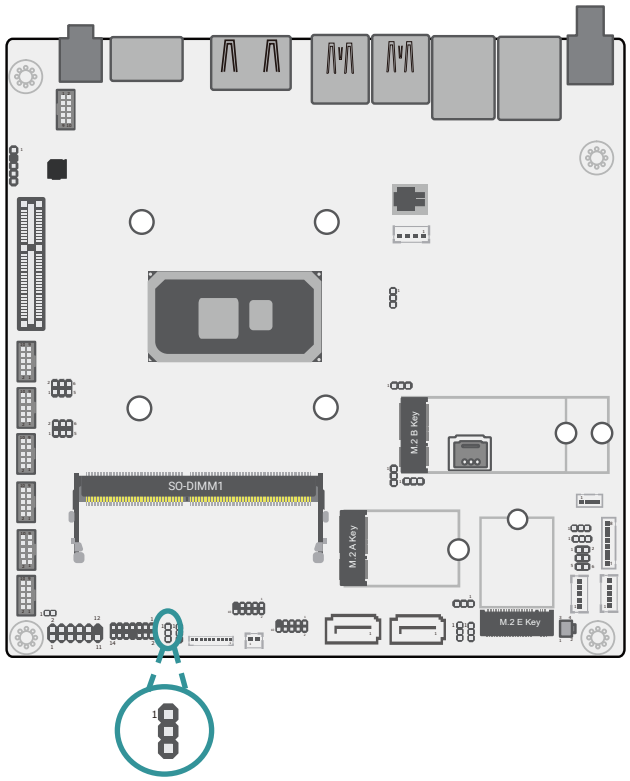


■ 1-2 Short: LVDS (Default)



■ 2-3 Short: eDP

DIO_0~3 Power Select (JP2)



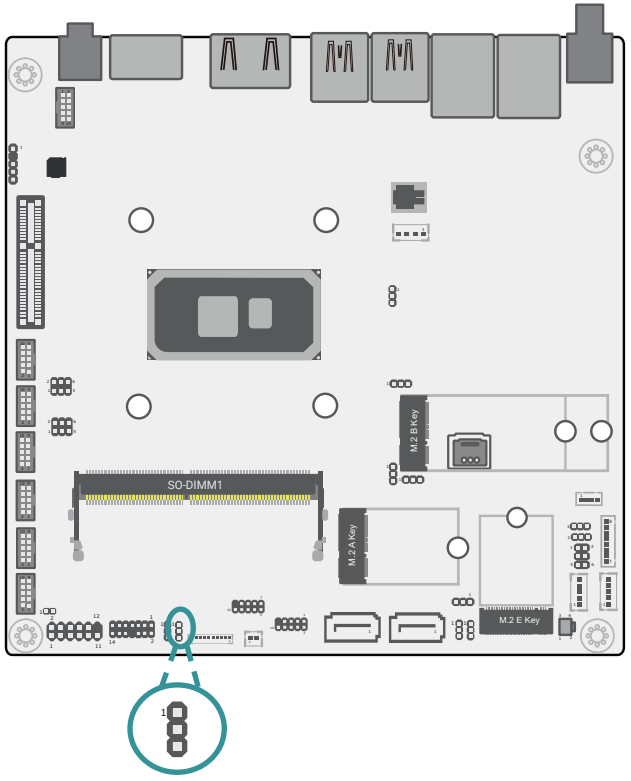


■ 1-2 Short to 5VSB: Normal (Default)



■ 2-3 Short: GND

DIO_4~7 Power Select (JP5)





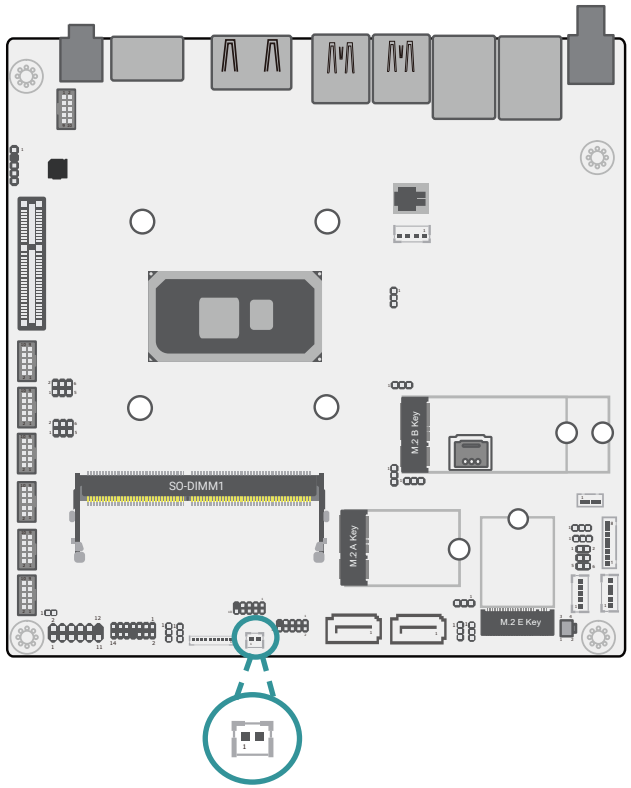
■ 1-2 Short to 5VSB: Normal (Default)



■ 2-3 Short: GND

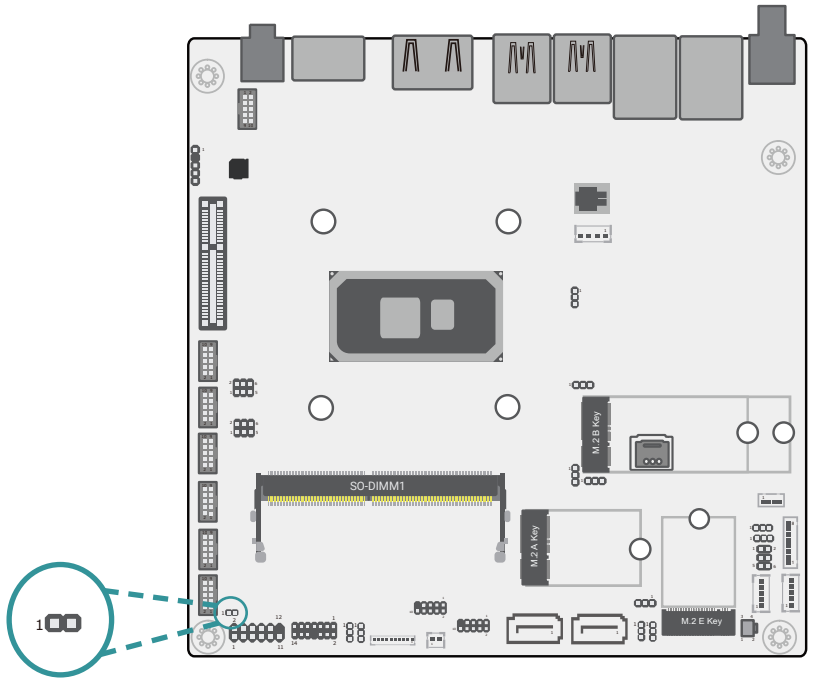
▶ Pin Assignment

RTC Battery (J19)



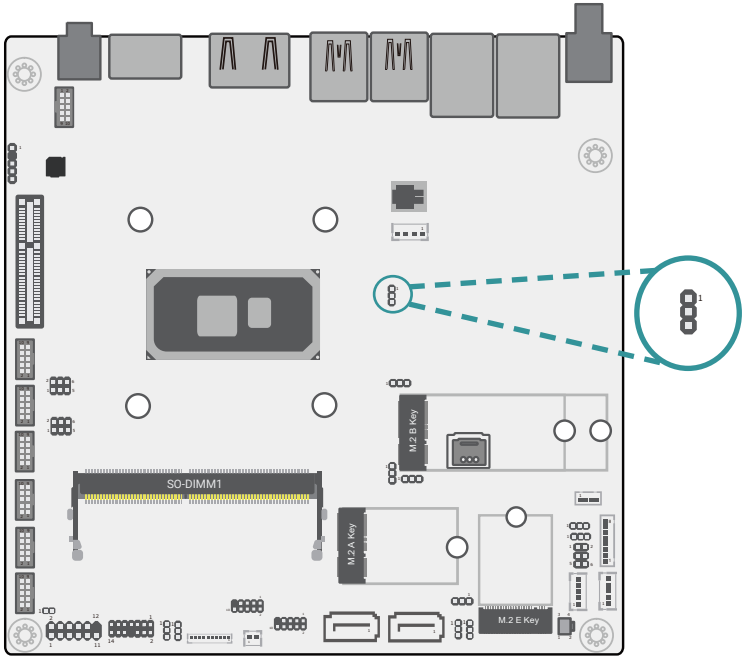
Pin	Assignment
1	V_BAT
2	GND

Case Open (J2)



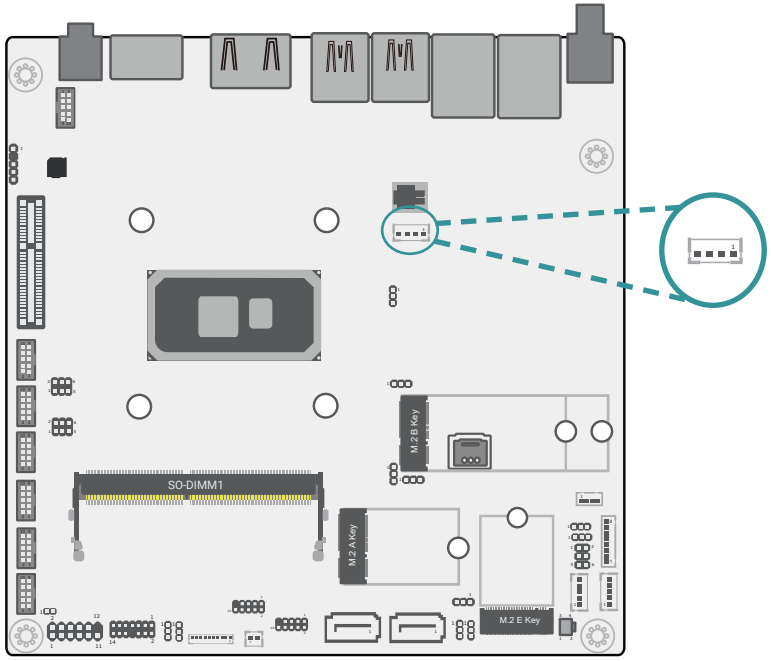
Pin	Assignment
1	Case Open-
2	GND

UART Header (Debug) (JP4)



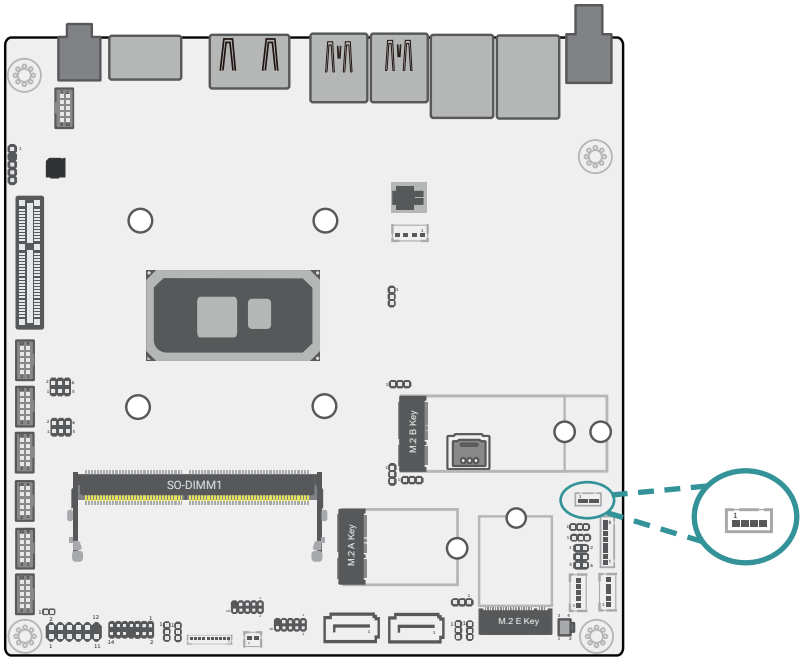
Pin	Assignment
1	DEBUG_UART_TX
2	DEBUG_UART_RX
3	GND

CPU Fan (J20)



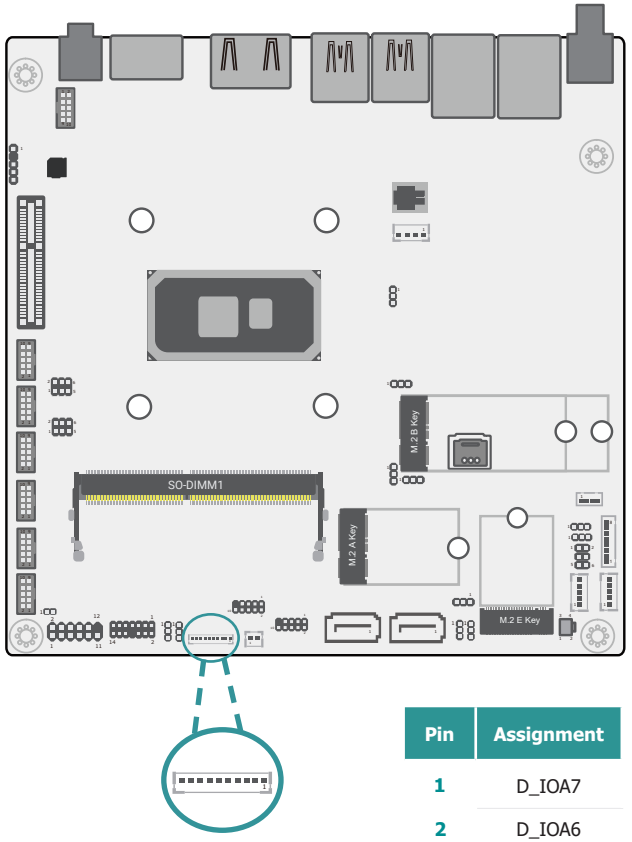
Pin	Assignment
1	GND
2	+12V
3	TACH
4	PWM

System Fan (J10)



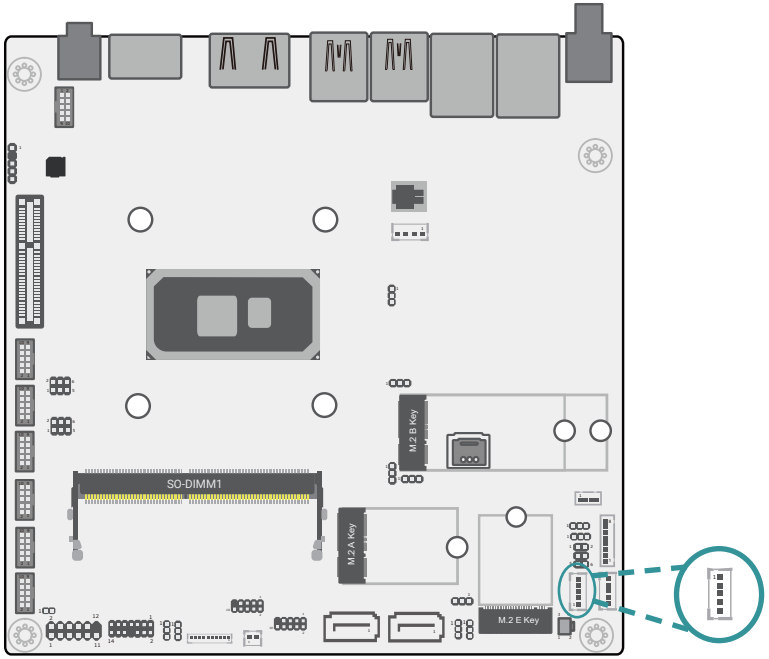
Pin	Assignment
1	GND
2	+12V
3	TACH
4	PWM

DIO (J16)



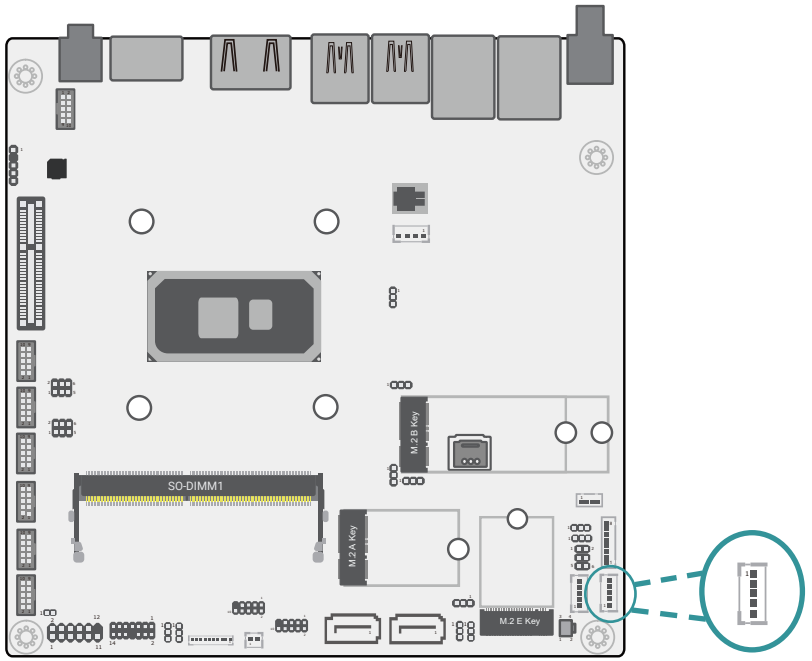
Pin	Assignment
1	D_IOA7
2	D_IOA6
3	D_IOA5
4	D_IOA4
5	D_IOA3
6	D_IOA2
7	D_IOA1
8	D_IOA0
9	5VSB
10	GND

SATA POWER (CN8)



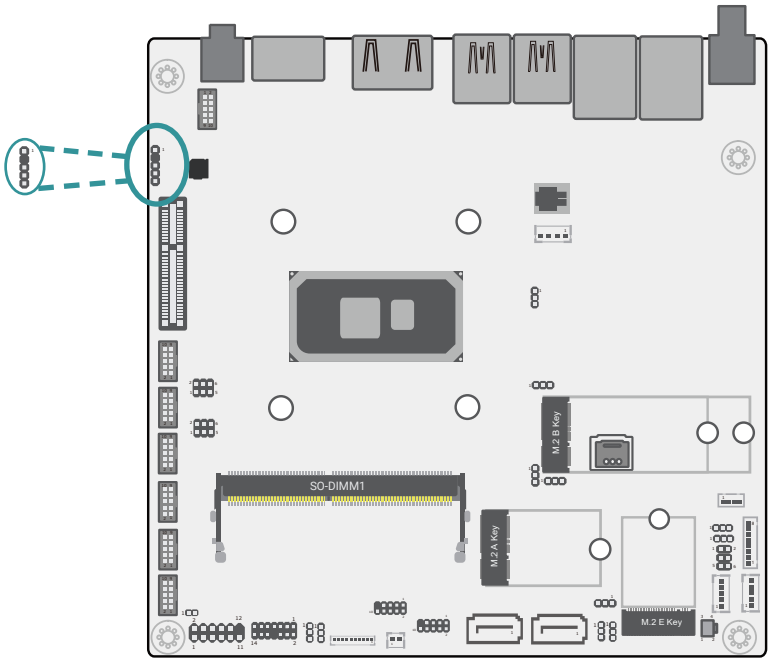
Pin	Assignment
1	5V
2	5V
3	12V
4	GND
5	GND

SATA POWER (CN12)



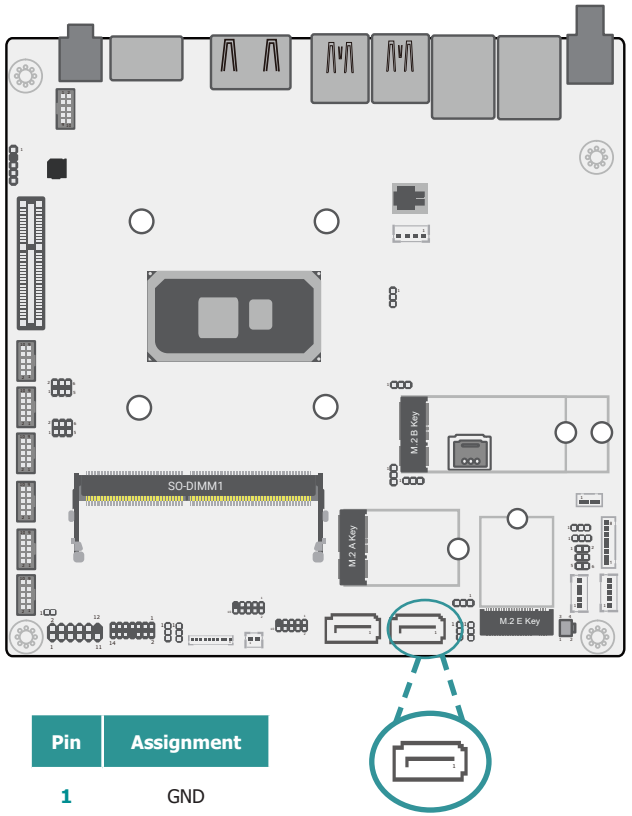
Pin	Assignment
1	5V
2	5V
3	12V
4	GND
5	GND

S/PDIF (AUJ2)



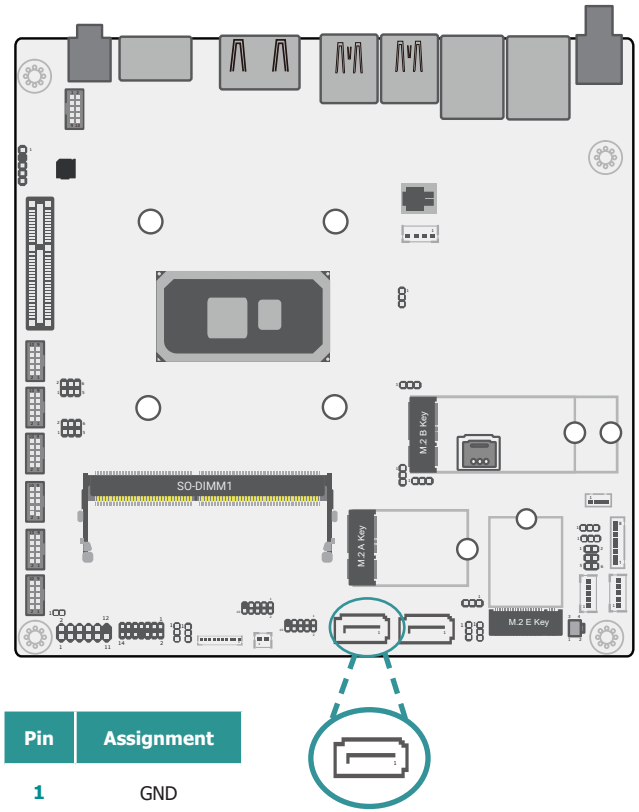
Pin	Assignment
1	5V
2	NC
3	SPDIF OUT
4	GND
5	SPDIF IN

SATA1 (J12)



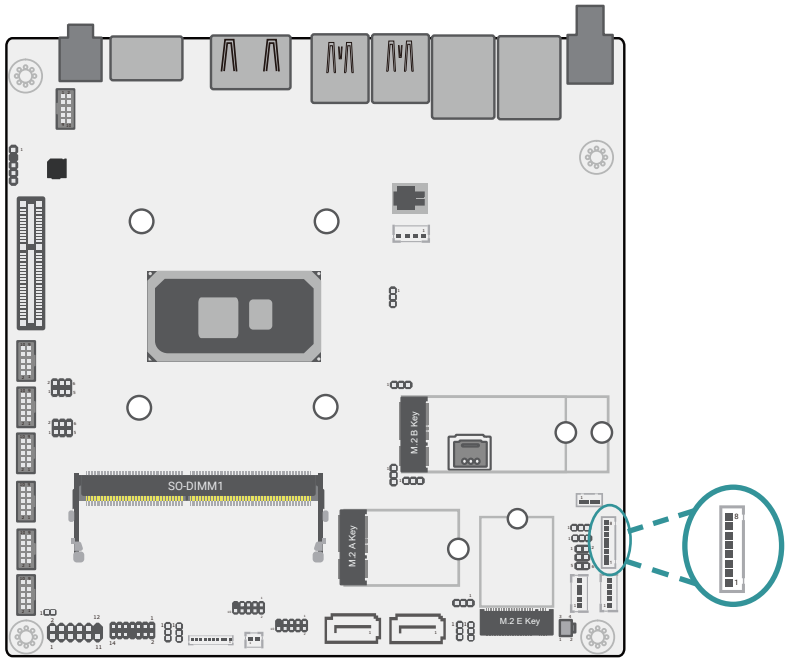
Pin	Assignment
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

SATA0 (J4)



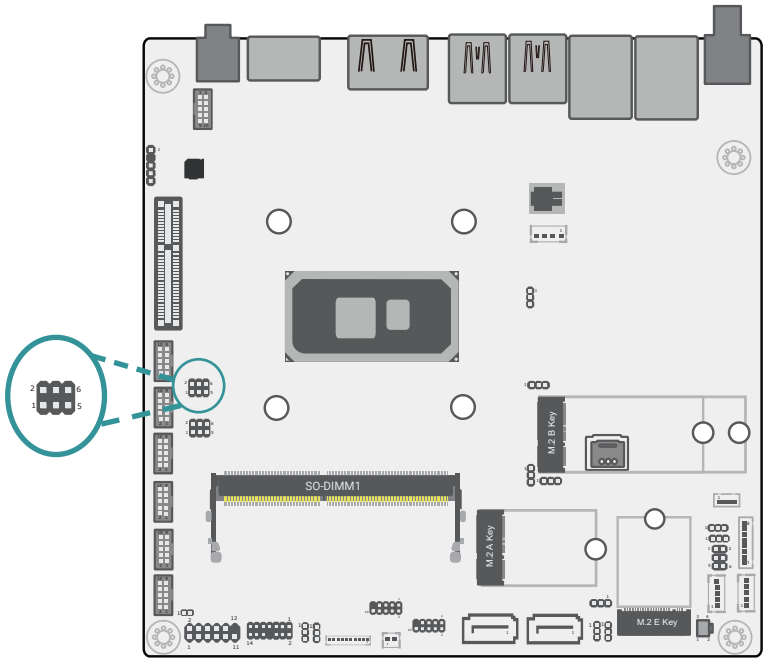
Pin	Assignment
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

Backlight CON (DPJ2)



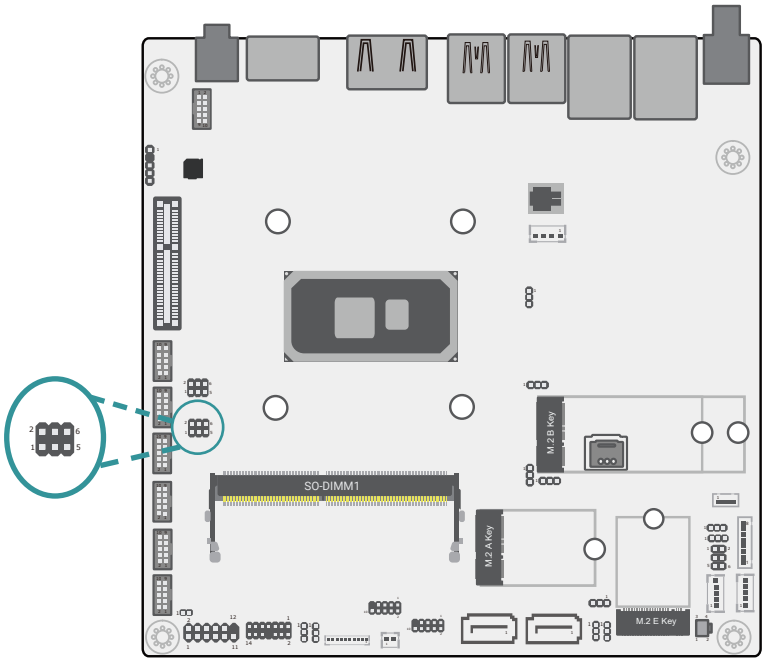
Pin	Assignment
1	GND
2	GND
3	PWM
4	VCC_PANEL_PWR
5	LVDS_3V3
6	BLONOFF
7	INV_PWR
8	INV_PWR

COM1 Power Select (TSJP1)



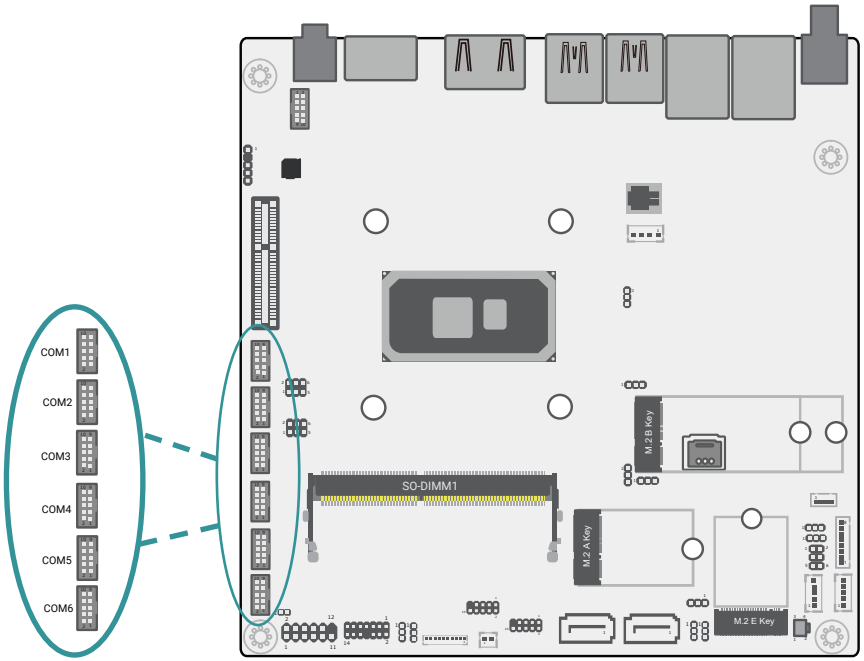
Pin	Assignment	Pin	Assignment
1	MRI-	2	MDCD-
3	X_MRI-	4	X_MDCD-
5	5V	6	12V

COM2 Power Select (TSJP2)

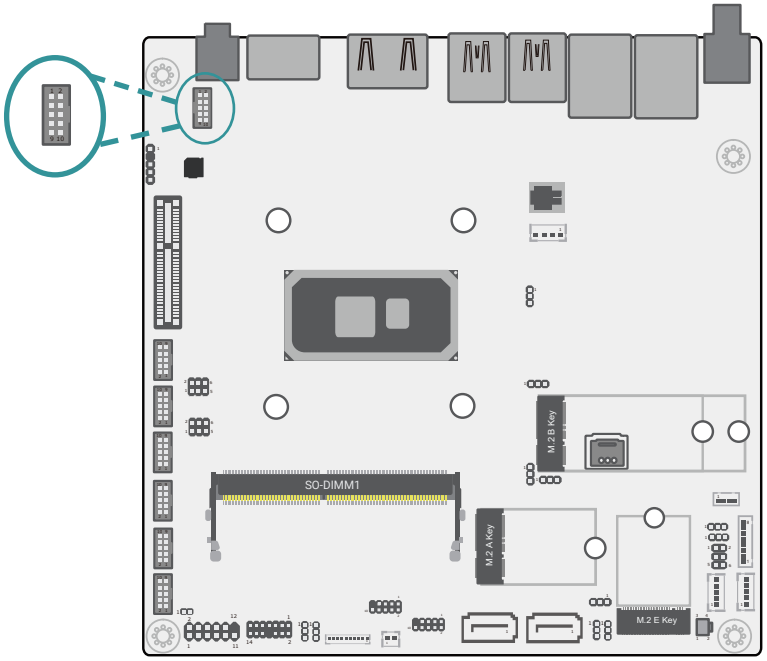


Pin	Assignment	Pin	Assignment
1	MRI-	2	MDCD-
3	X_MRI-	4	X_MDCD-
5	5V	6	12V

COM1 (TSJ1) COM3 (TSJ3) COM5 (TSJ5)
COM2 (TSJ2) COM4 (TSJ4) COM6 (TSJ6)



Front Audio (AUJ1)



▶ **COM1 RS232/RS422/RS485 (TSJ1)**

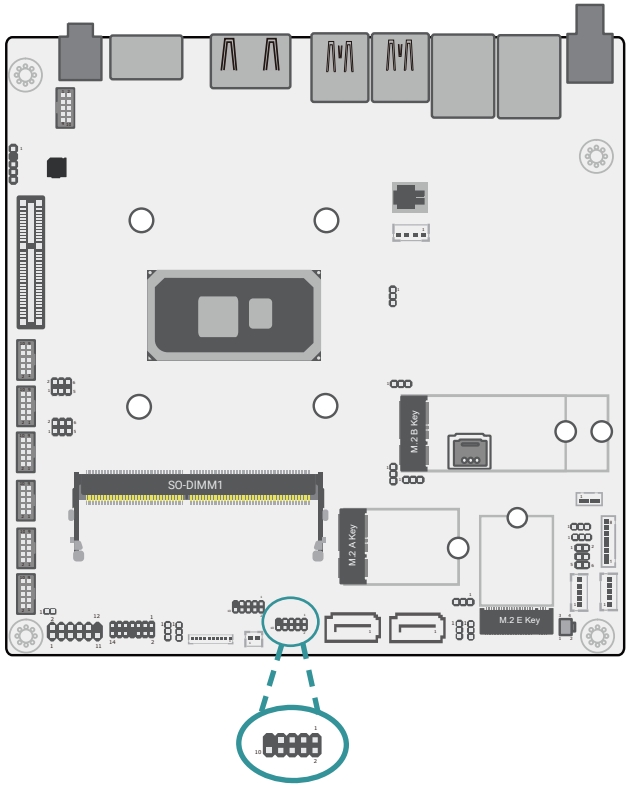
Pin	RS232	RS422 Full Duplex	RS485
1	DCD-	TX-	Data-
2	RD	TX+	Data+
3	TD	RX+	N.C
4	DTR-	RX-	N.C
5	GND	GND	GND
6	DSR-	N.C	N.C
7	RTS-	N.C	N.C
8	CTS-	N.C	N.C
9	RI-	N.C	N.C
10	N.C	N.C	N.C

▶ **COM2/COM3/COM4/COM5/COM6**

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

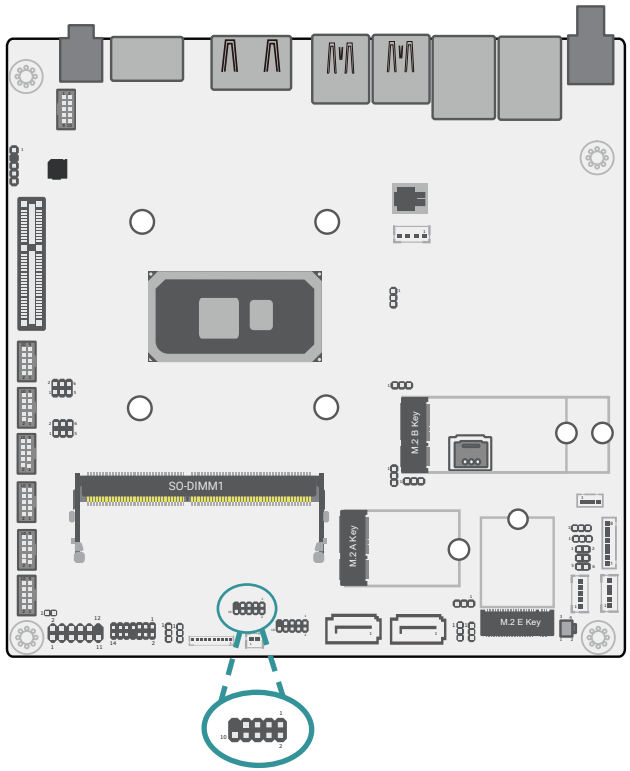
Pin	Assignment	Pin	Assignment
1	MIC2_L	2	GND
3	MIC2_R	4	NC
5	LINE2_R	6	MIC2_JD
7	GND	8	NC
9	LINE2_L	10	LINE2_JD

USB2.0 Pin Header (J3)



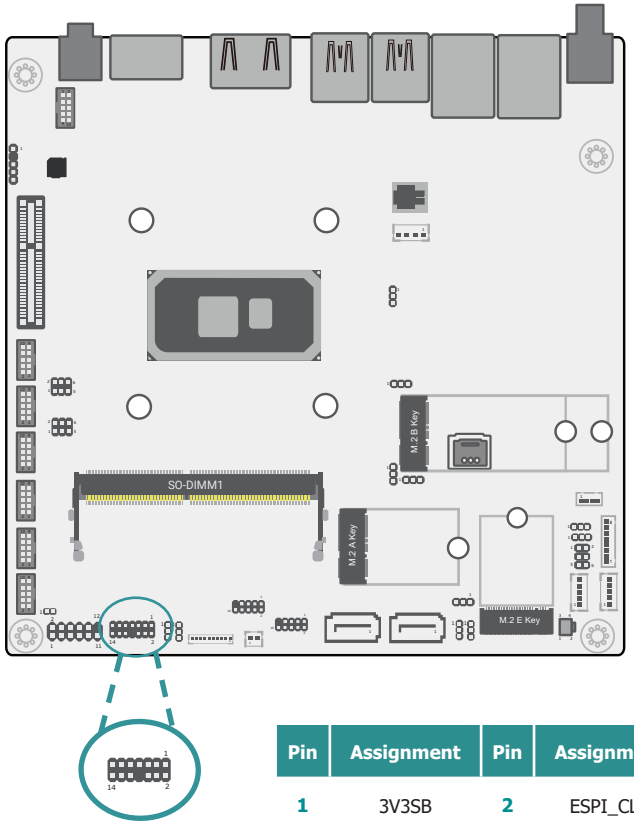
Pin	Assignment	Pin	Assignment
1	5V	2	5V
3	USB2_4_C_N	4	USB2_3_C_N
5	USB2_4_C_P	6	USB2_3_C_P
7	GND	8	GND
9	----	10	NC

USB2.0 Pin Header (J21)



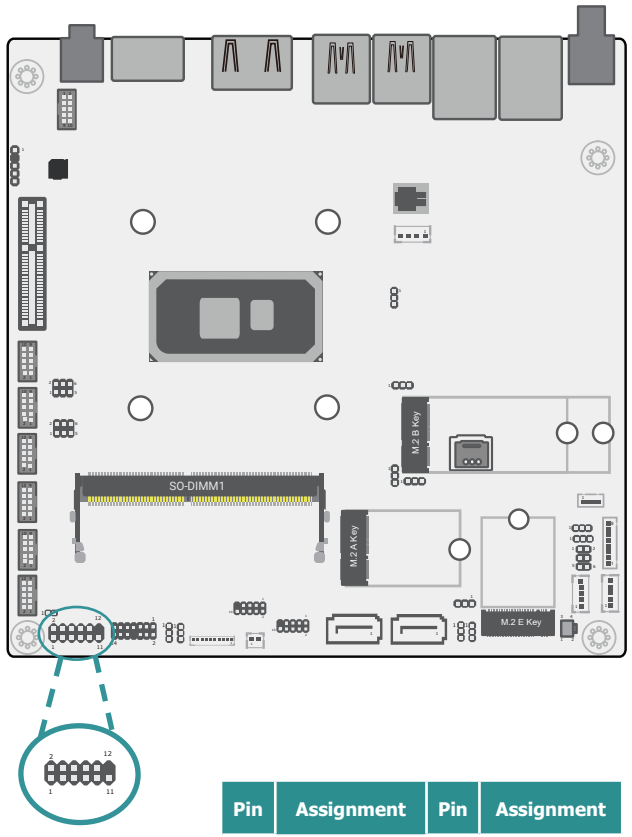
Pin	Assignment	Pin	Assignment
1	5V	2	5V
3	USB2_1_HUB_C_N	4	USB2_2_HUB_C_N
5	USB2_1_HUB_C_P	6	USB2_2_HUB_C_P
7	GND	8	GND
9	----	10	NC

eSPI Header(Debug) (J5)



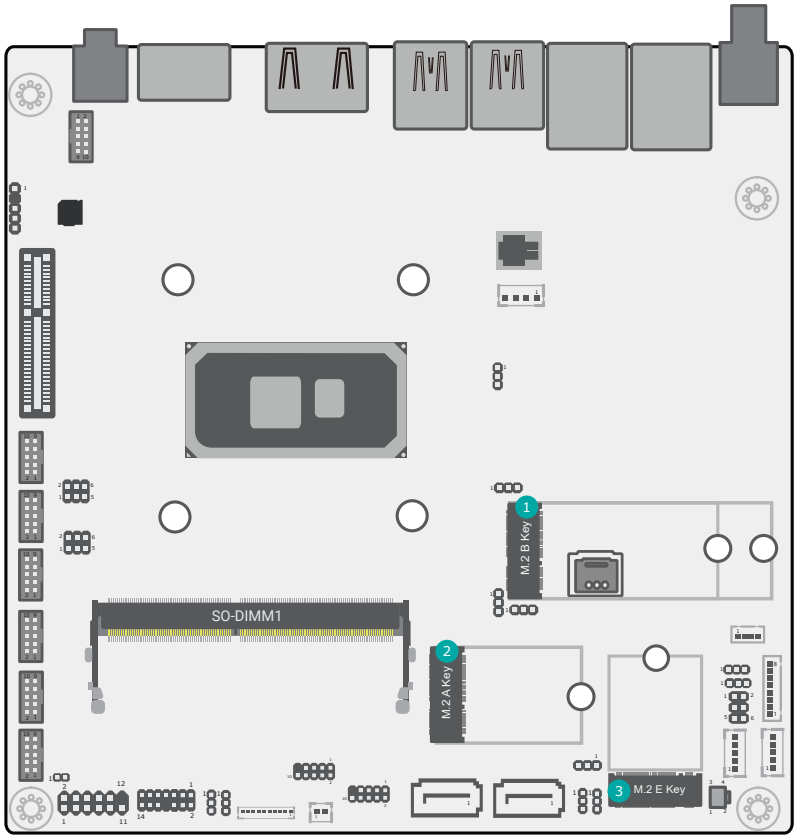
Pin	Assignment	Pin	Assignment
1	3V3SB	2	ESPI_CLK
3	ESPI_RESET#	4	GND
5	ESPI_ALT#	6	GND
7	ESPI_D0	8	---
9	ESPI_D1	10	ESPI_CS
11	ESPI_D2	12	3V3SB
13	ESPI_D3	14	3V3SB

Front Panel (J17)



Pin	Assignment	Pin	Assignment
1	NC	2	3V3SB
3	3V3	4	3V3SB
5	HD_LED#	6	SUS_LED#
7	GND	8	GND
9	SYS_RST0	10	PWR_BTN0
11	NC	12	---

▶ Expansion Slots

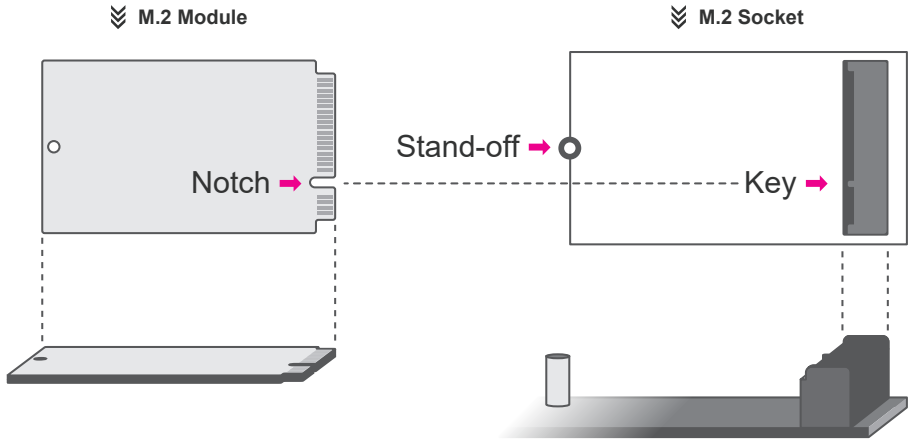


1. M.2 B-Key
2. M.2 A-Key
3. M.2 E-Key

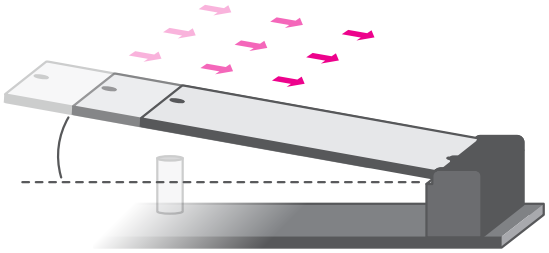
Installing the M.2 Module

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

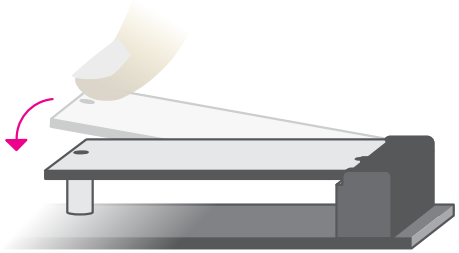
1. Make sure the PC and all other peripheral devices connected to it has been powered down.
2. Disconnect all power cords and cables.
3. Locate the M.2 socket on the system board
4. Make sure the notch on card is aligned to the key on the socket.
5. Make sure the standoff screw is removed from the standoff.



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

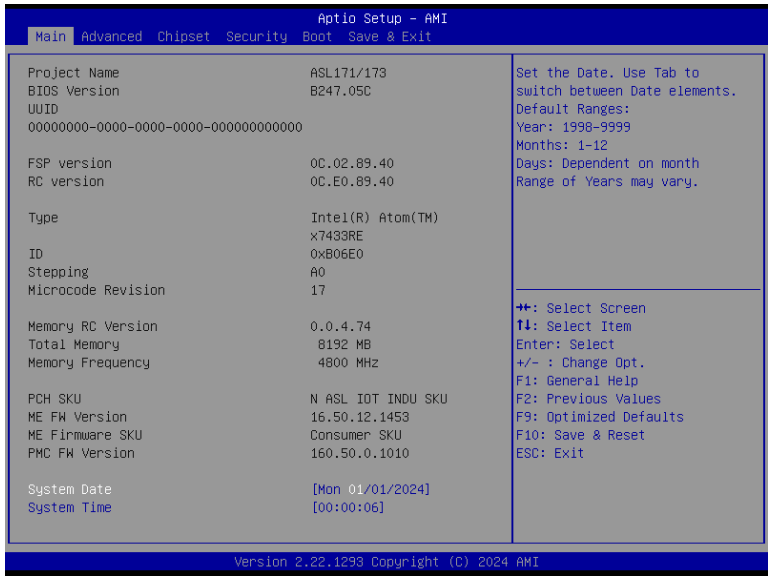
Keys	Function
Right / Left arrow	Move the highlight left or right to select a menu
Up / Down arrow	Move the highlight up or down between submenus or fields
<Enter>	Enter the highlighted submenu
+ (plus key)/F6	Scroll forward through the values or options of the highlighted field
- (minus key)/F5	Scroll backward through the values or options of the highlighted field
<F1>	Display general help
<F2>	Display previous values
<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.

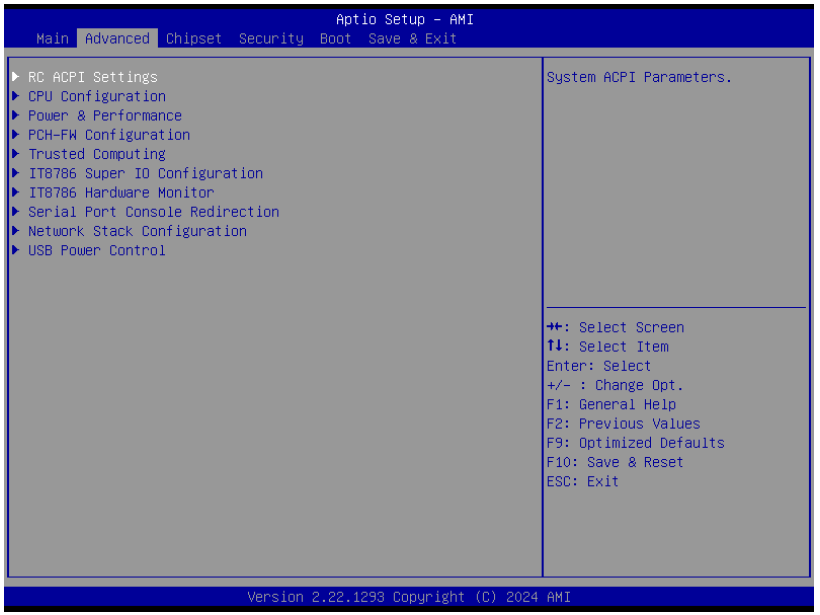
System Time

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

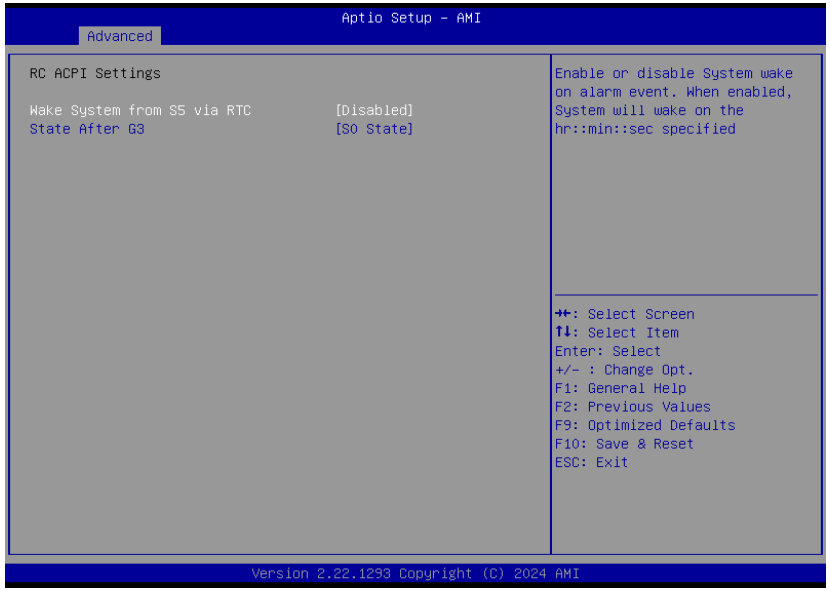
The Advanced menu allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference.

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



▶ Advanced

RC ACPI Settings



Wake system from S5 via RTC

When Enabled, the system will automatically power up at a designated time every day. Once it's switched to [Enabled], please set up the time of day — hour, minute, and second — for the system to wake up.

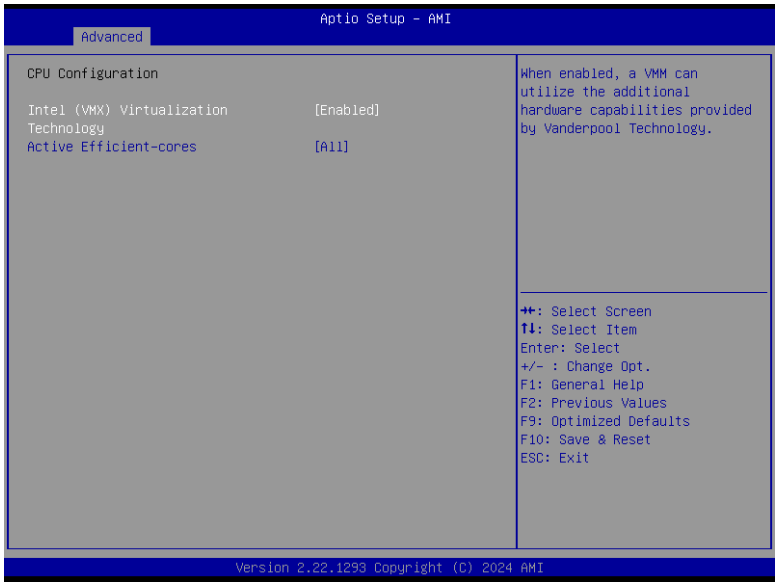
State After G3

Select between S0 State, and S5 State. This field is used to specify what state the system is set to return to when power is re-applied after a power failure (G3 state).

- **S0 State** The system automatically powers on after power failure.
- **S5 State** The system enter soft-off state after power failure. Power-on signal input is required to power up the system.

▶ Advanced

CPU Configuration



Intel (VMX) Virtualization Technology

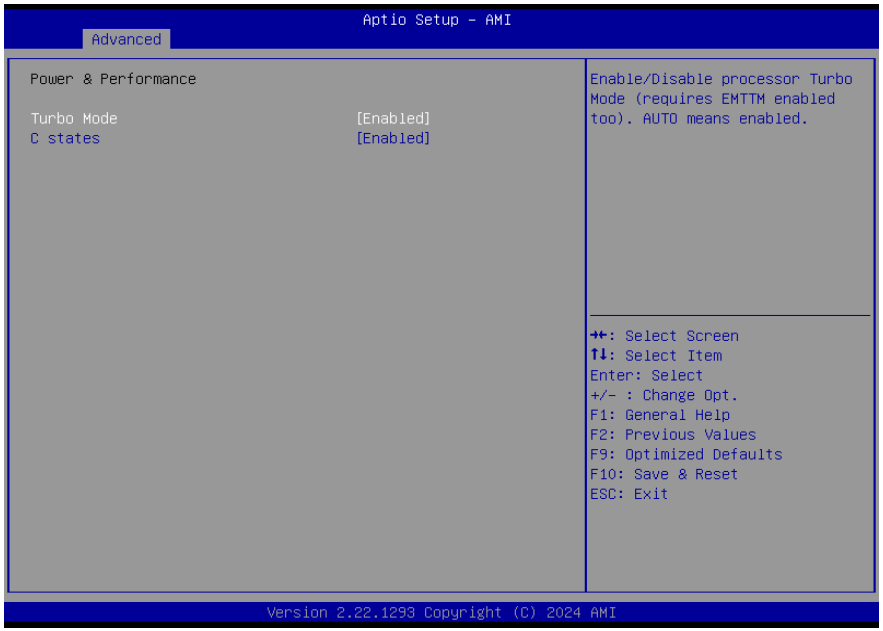
When this field is set to Enabled, the VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

Active Processor Cores

Select number of cores to enable in each processor package: all or 1.

▶ Advanced

Power & Performance



Turbo Mode

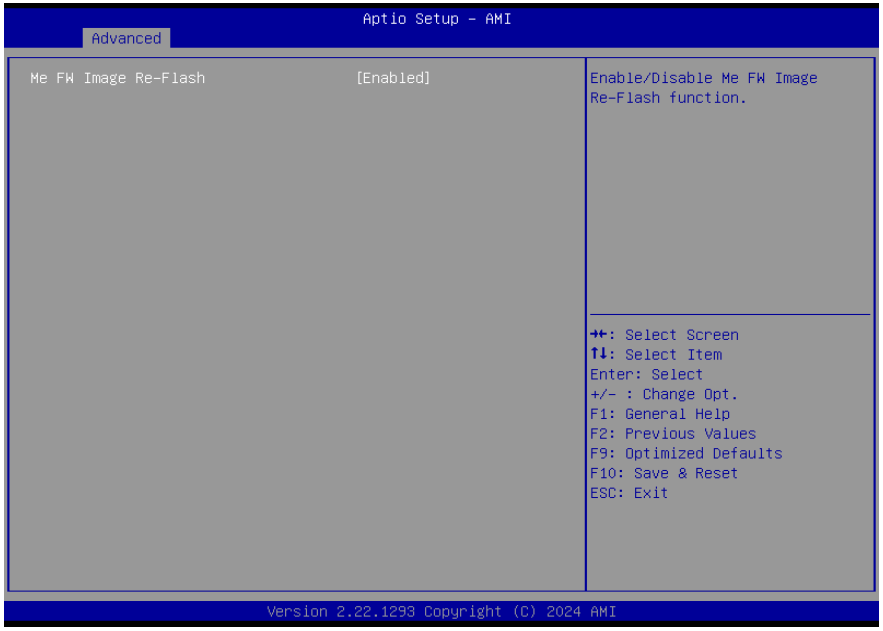
Enable or disable turbo mode of the processor. This field will only be displayed when EIST is enabled.

C states

Enable or disable CPU Power Management. It allows CPU to enter "C states" when it's idle and nothing is executing.

▶ Advanced

PCH-FW Configuration

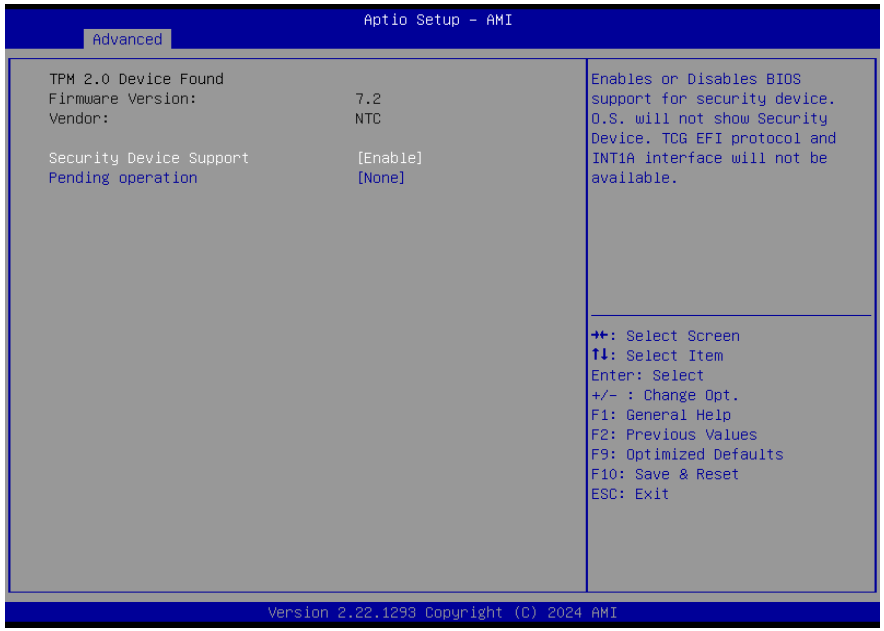


ME State

When this field is set to Disabled, ME will be put into ME Temporarily Disabled Mode.

▶ Advanced

Trusted Computing



Security Device Support

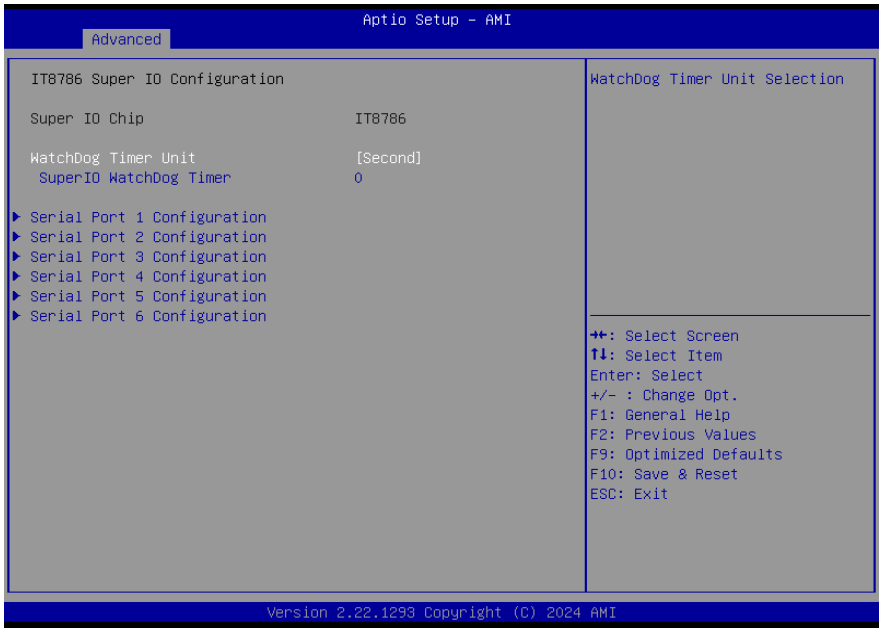
This field is used to enable or disable BIOS support for the security device such as an TPM 2.0 to achieve hardware-level security via cryptographic keys.

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

IT8786 Super IO Configuration



WatchDog Timer Unit

Select WatchDog Timer Unit — Second or Minute.

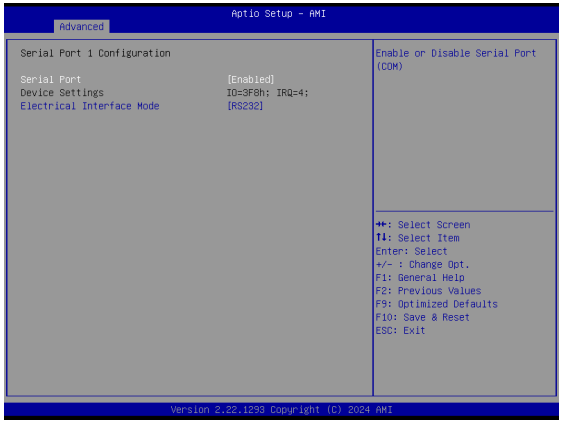
SuperIO WatchDog Timer

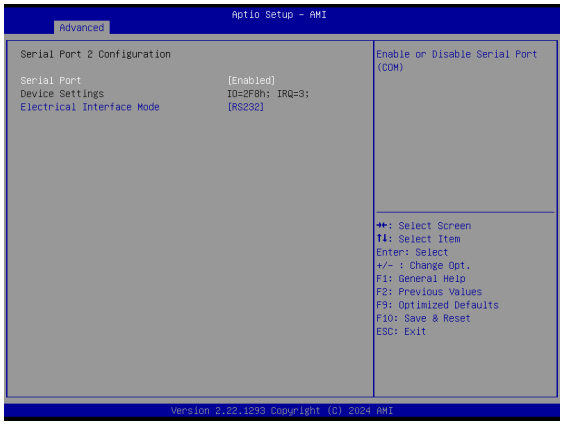
Set SuperIO WatchDog Timer Timeout value. The range is from 0 (disabled) to 255.

Note:
The sub-menus are detailed in following sections.

▶ Advanced

IT8786 Super IO Configuration ▶ Serial Port 1, 2 Configuration

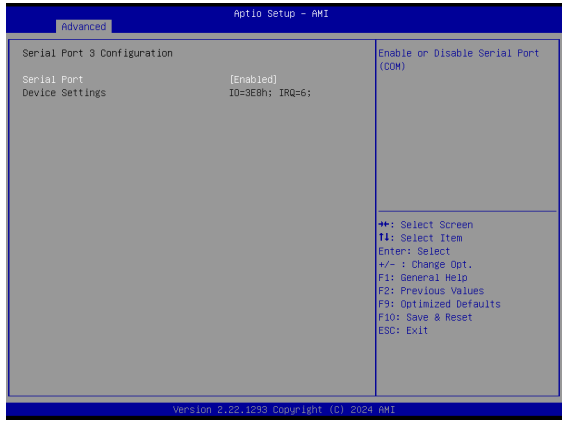


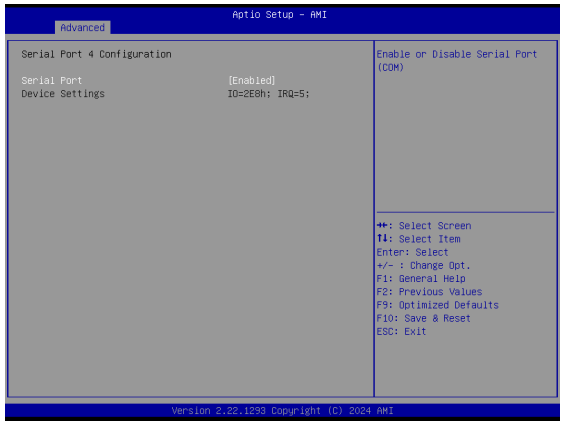


Serial Port
Enable or disable serial port.

▶ Advanced

IT8786 Super IO Configuration ▶ Serial Port 3, 4 Configuration

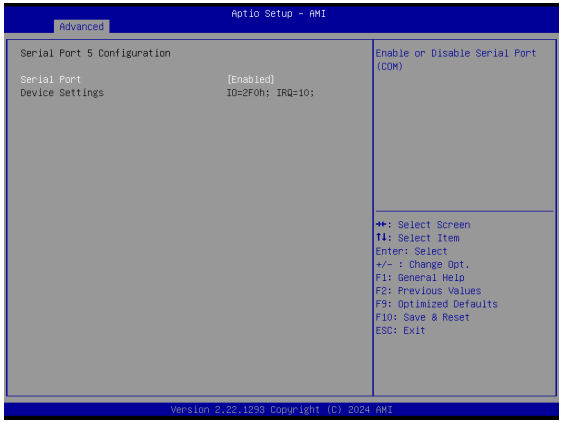


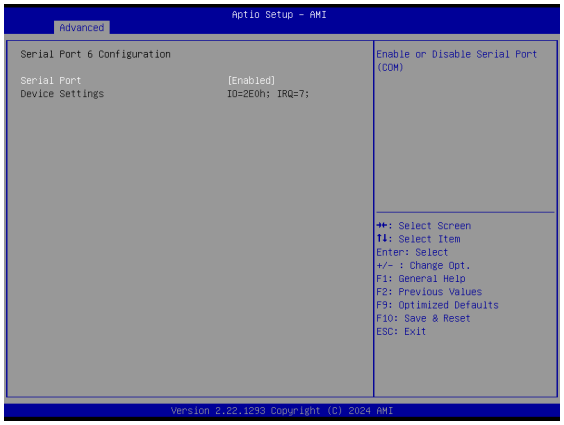


Serial Port
Enable or disable serial port.

▶ Advanced

IT8786 Super IO Configuration ▶ Serial Port 5, 6 Configuration

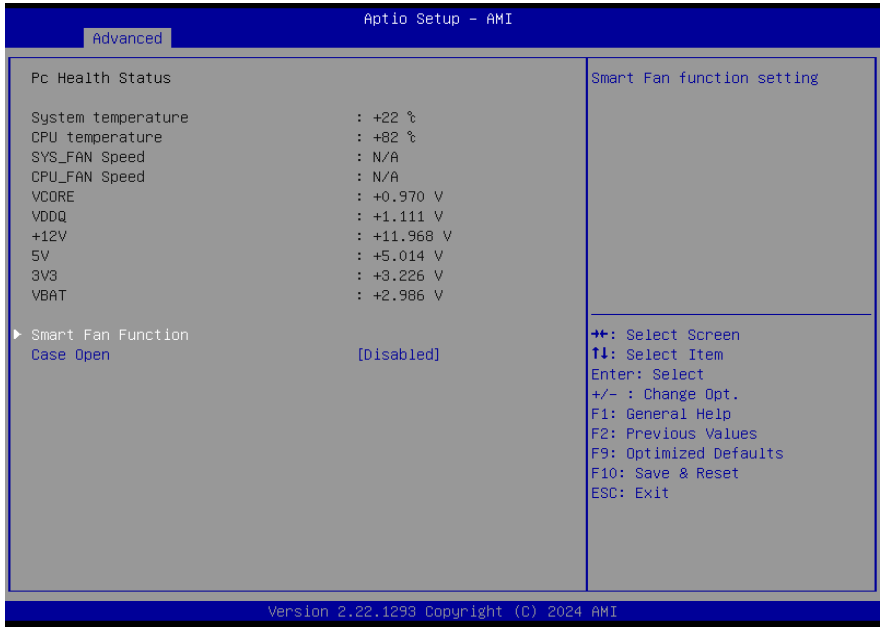




Serial Port
Enable or disable serial port.

▶ Advanced

IT8786 HW Monitor



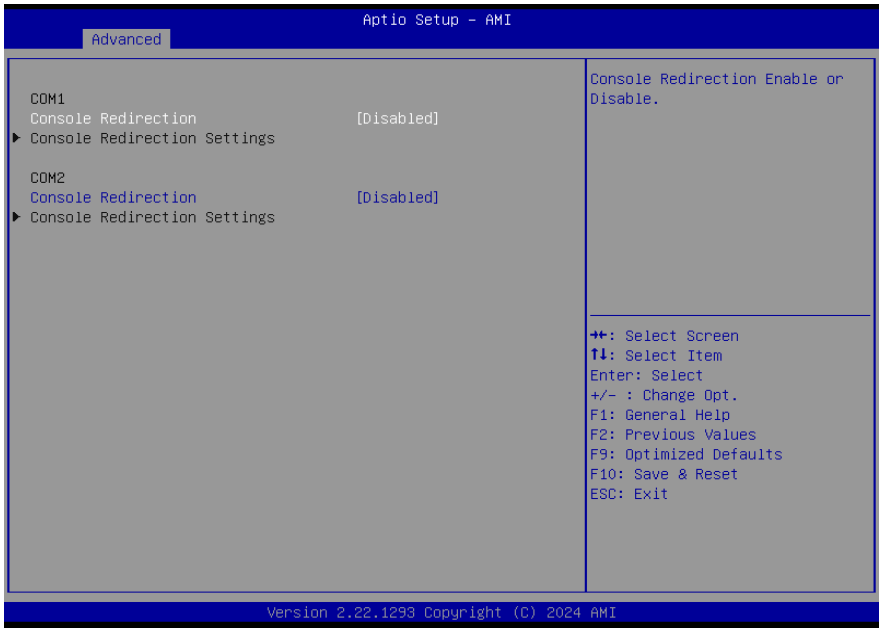
This section displays the system's health information, i.e. voltage readings, CPU and system temperatures, and fan speed readings

Case Open

Enable or disable the case open detection function.

▶ Advanced

Serial Port Console Redirection

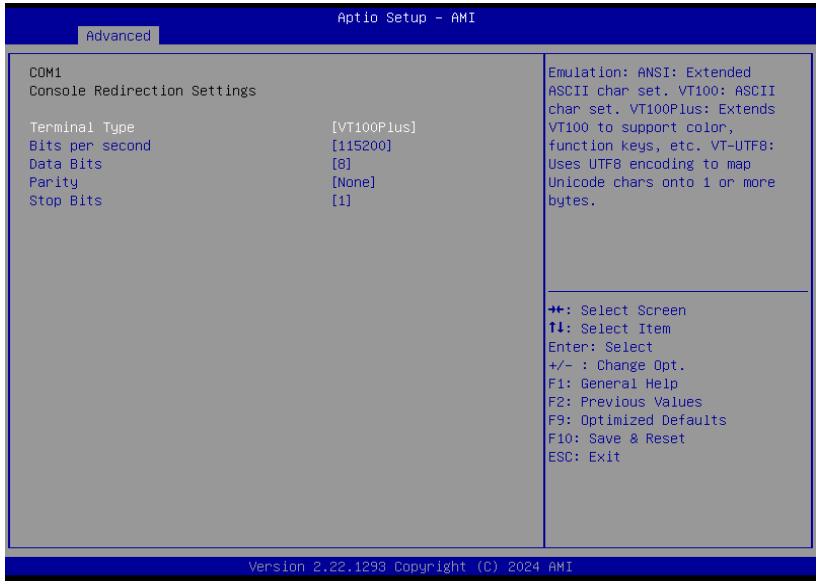


Console Redirection

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

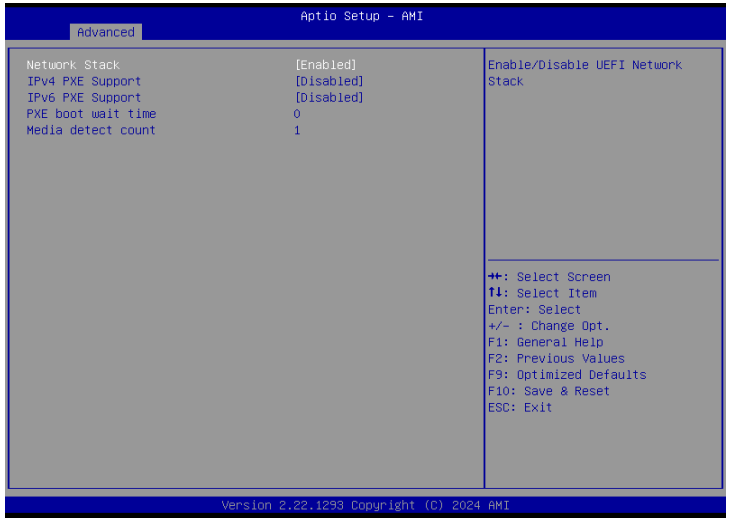
Select stop bits: 1 bit or 2 bits.

Flow Control

Select flow control type: None or Hardware RTS/CTS. Flow Control is for RS485 mode and is only supported by Serial Port 1 (COM1).

▶ Advanced

Network Stack Configuration



Network Stack

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

Ipv4 PXE Support

Enable or disable IPv4 PXE boot support. If disabled, IPv4 PXE boot support will not be avail-able.

Ipv6 PXE Support

Enable or disable IPv6 PXE boot support. If disabled, IPv6 PXE boot support will not be avail-able.

PXE boot wait time

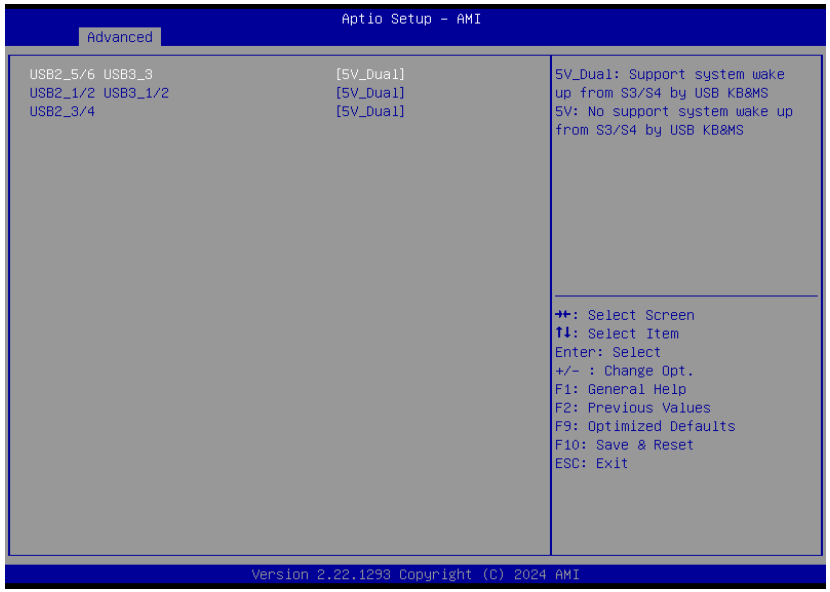
Set the wait time in seconds to press ESC key to abort the PXE boot. Use either +/- or numeric keys to set the value.

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

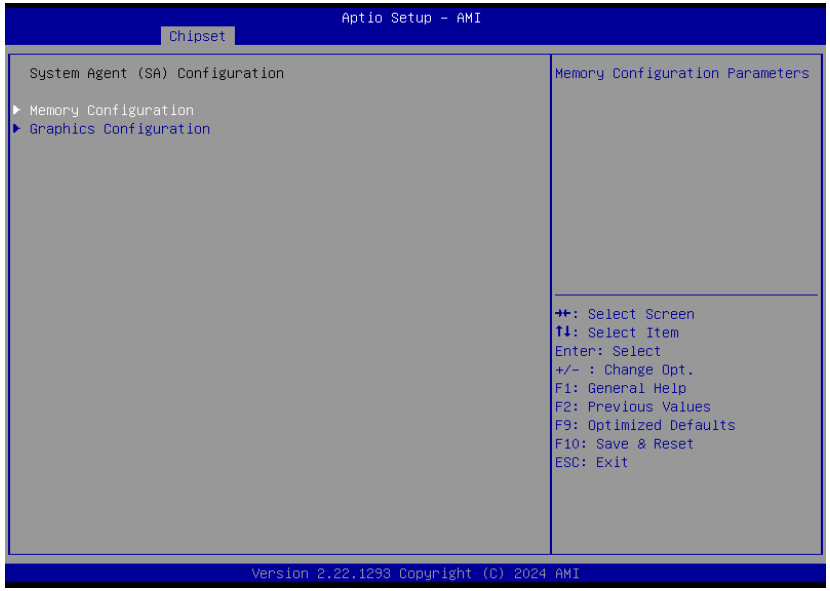
5V: No support system wake up from S3/54 by USB KB&MS

▶ Chipset



Please select a submenu and press Enter. The submenus are detailed in the following pages.

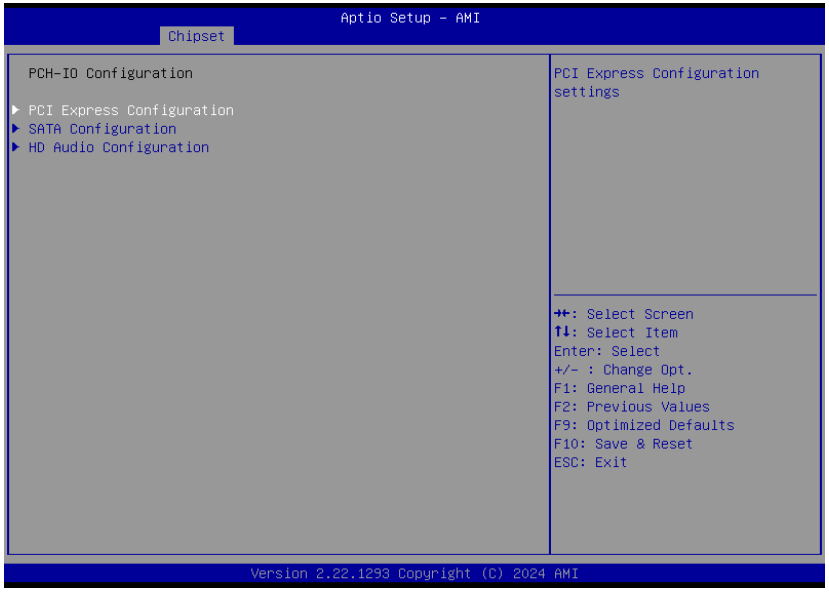
System Agent (SA) Configuration



Memory Configuration
Memory Configuration Parameters

Graphics Configuration
Graphics Configuration

PCH-IO Configuration



PCI Express Configuration

PCI Express Configuration Settings

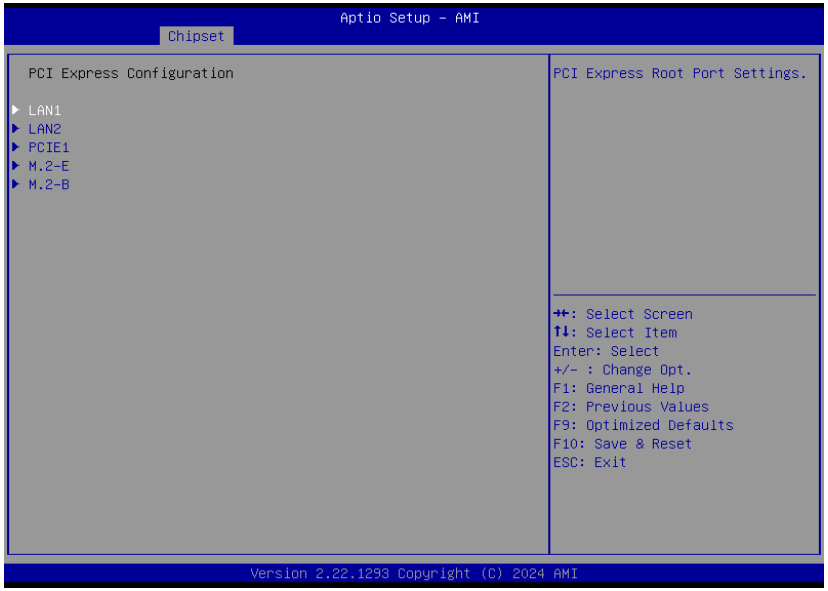
SATA And RST Configuration

SATA Device Otpions Settings

HD Audio Configuration

HD Audio Subsystem Configuration Settings

PCH-IO Configuration▶ PCI Express Configuration



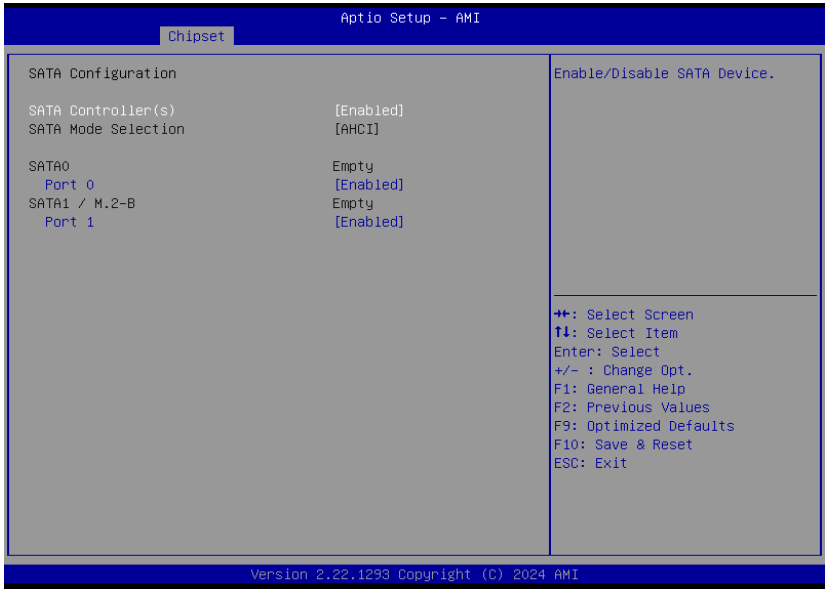
Select one of the PCI Express channels and press enter to configure the following settings.

LAN1, LAN2, PCIE1, M.2-E, M.2-B

Control the PCI Express Root Port.

▶ Chipset

PCH-IO Configuration▶ SATA Configuration



SATA Controller(s)

This field is used to enable or disable the Serial ATA controller.

SATA Mode Selection

The mode selection determines how the SATA controller(s) operates.

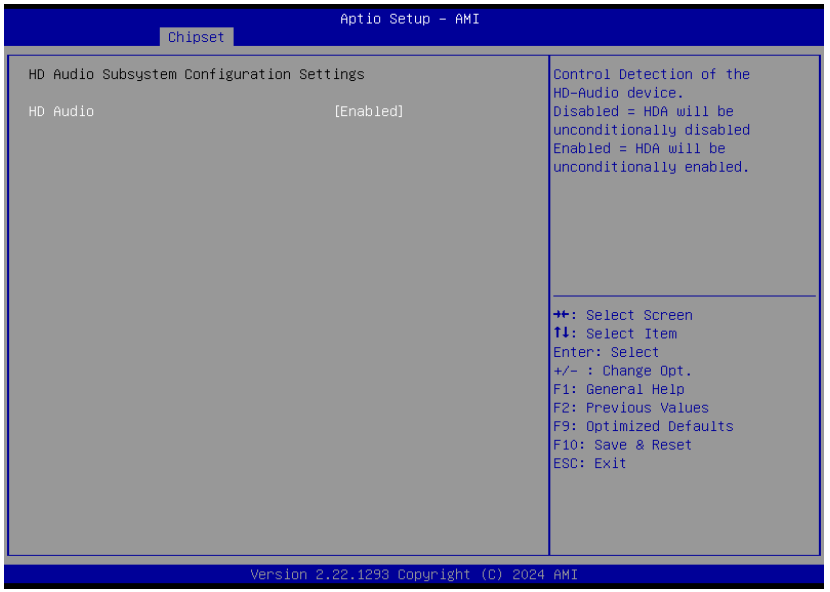
- **AHCI** This option allows the Serial ATA controller(s) to use AHCI (Advanced Host Controller Interface).

Ports

Enable or disable the Serial ATA port.

▶ Chipset

PCH-IO Configuration▶ HD Audio Configuration

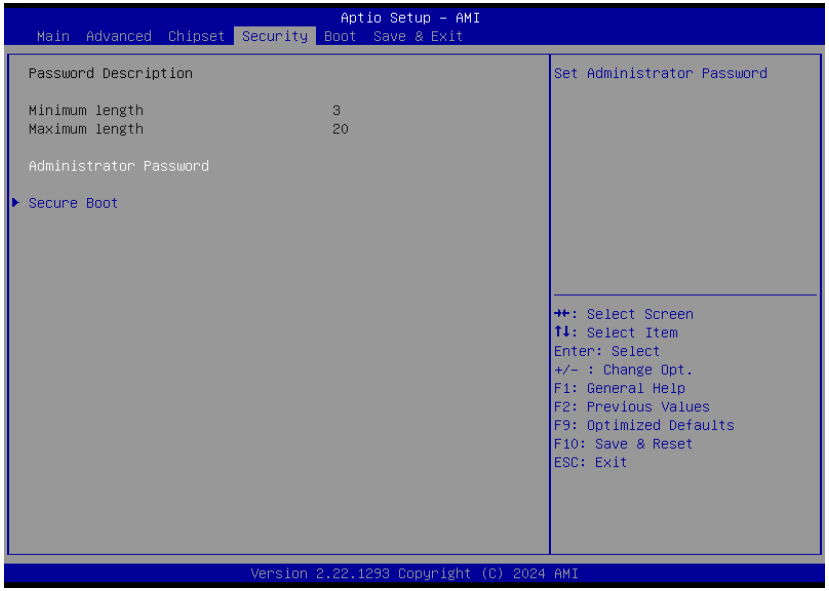


HD Audio

Control the detection of the HD Audio device.

- **Disabled** HDA will be unconditionally disabled.
- **Enabled** HDA will be unconditionally enabled.

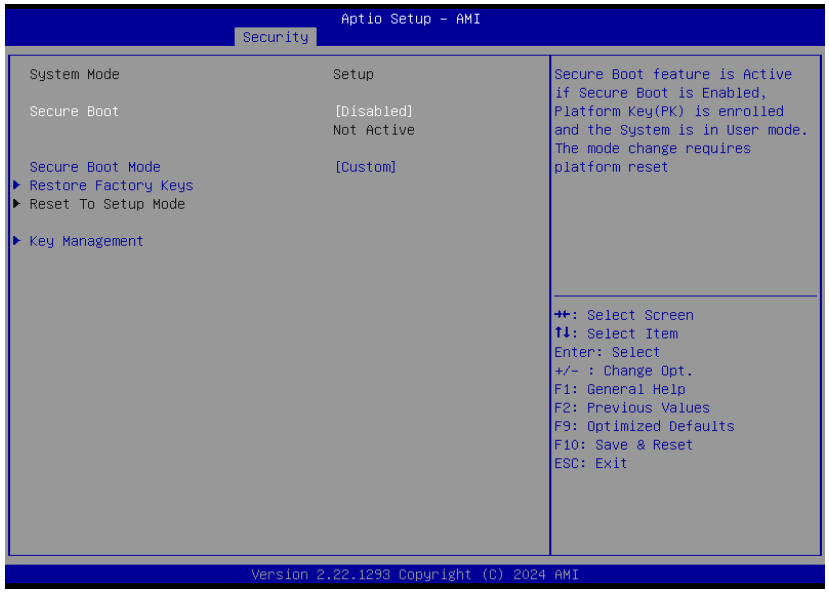
▶ Security



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.

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.

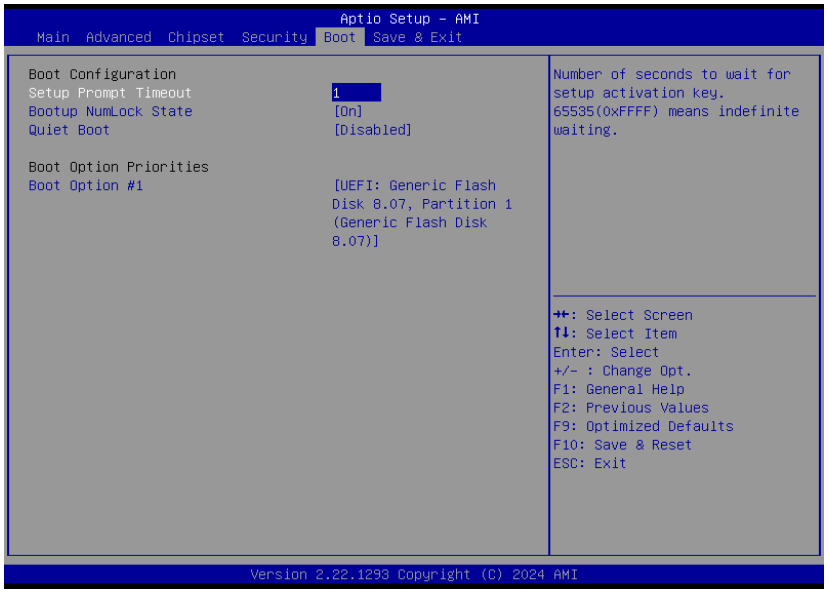
Reset To Setup Mode

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.

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

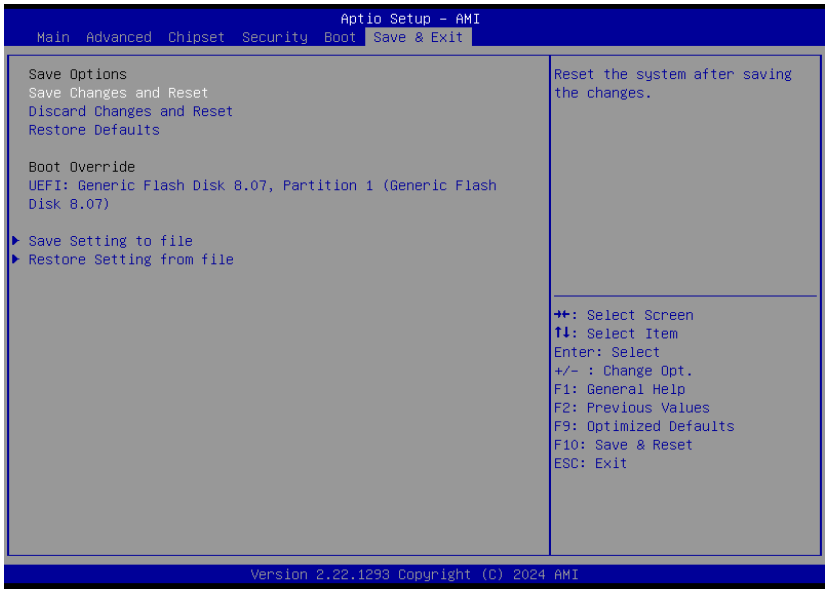
This section is used to enable or disable quiet boot option.

Boot Option Priorities

Rearrange the system boot order of available boot devices.

Note:
If "Boot option filter" of "CSM Configuration" is set to "UEFI and Legacy" or "UEFI only", and "Quiet Boot" is set to enabled, "BGRT Logo" will show up for configuration. Refer to the Advanced > CSM Configuration submenu for more information.

▶ 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 Reset

To discard the changes, select this field and then press <Enter>. A dialog box will appear. Select Yes to reset the system setup without saving any changes.

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.

Boot Override

Move the cursor to an available boot device and press Enter, and then the system will immediately boot from the selected boot device. The Boot Override function will only be effective for the current boot. The "Boot Option Priorities" configured in the Boot menu will not be changed.

- **Save Setting to file** Select this option to save BIOS configuration settings to a USB flash device.
- **Restore Setting from file** This field will appear only when a USB flash device is detected. Select this field to restore set-ting from the USB flash device.

▶ 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.