TGU171/TGU173

Mini-ITX Industrial Motherboard
User's Manual

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Changes after the publication's first release will be based on the product's revision. The website will always provide the most updated information.

Trademarks

Product names or trademarks appearing in this manual are for identification purpose only and are the properties of the respective owners.

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

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 arise 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 TGU171/TGU173 motherboard

- 1 COM port cable (Length: 250mm, 1 x COM ports)

- 1 Serial ATA data with power cable (Length: 300mm)

- 1 Heat sink

    -(Wide/Normal Temp -Cooler for 28W)(Default)

    -(Normal Temp. Fanless HS for 15W)(By request)

    -(Wide Temp. Fanless for 15W)(By request)

Note: The items are subject to change in the developing stage.

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.

- Power adapter

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	11th Generation Intel® Core™ Processors
		Intel® Core™ i7-1185GRE, Quad Core, 12M Cache, 1.8GHz (4.4GHz), 15~28W
		Intel® Core™ i5-1145GRE, Quad Core, 8M Cache, 1.5GHz (4.1GHz), 15~28W
		Intel® Core™ i3-1115GRE, Dual Core, 6M Cache, 2.2GHz (3.9GHz), 15~28W
		Intel® Celeron® 6305E, Dual Core, 4M Cache, 1.8GHz (1.8GHz), 15W
	Memory	2 x 260-pin SO-DIMM up to 64GB (32GB per slot)
		Dual channel DDR4 up to 3200MHz (Support in-band ECC)
	BIOS	AMI SPI 256Mbit
GRAPHICS	Controller	Intel® Iris® Xe Graphics for i7/i5 Processors
		Intel® UHD Graphics for i3/Celeron Processors
	Feature	OpenGL 4.5, DirectX 12, OpenCL 2.1 HW Decode: WMV9, AVC/H264, JPEG/MJPEG, HEVC/H265, VP9, AV1 HW Encode: AVC/H264, JPEG, HEVC/H265, VP9
	Display	1 x LVDS (Resolution up to 1920x1200 @60Hz)
		1 x eDP (Resolution up to 3840x2160 @60Hz)
		1 x DP++ (Resolution up to 3840x2160 @60Hz)
		1 x HDMI (Resolution up to 3840x2160 @60Hz)
		1 x USB Type C (Resolution up to 3840x2160 @60Hz. Support USB3.1 Gen2, 15W power delivery and DP Alt mode)
	Quad Displays	LVDS + eDP + DP++ + HDMI + USB Type C
EXPANSION	Interface	1 x PCIe x4 (PCIe Gen 3 x4)
		1 x M.2 2242/2280 M Key (PCIe Gen4 x4) (Support NVMe and Intel® Optane memory) (Support DFI proprietary expansion module)
		1 x M.2 2242/3042/3052 B Key (PCIe Gen3 x1/SATA/USB 3.1 Gen1) (Support 4G/5G and storage module) (Opt.: PCIe Gen3 x2)
		1 x M.2 2230 E Key (USB2.0) (Support Intel® CNVi module only and Intel® vPro)
		1 x Nano-SIM Socket (Connect to M.2 Key B for 4G/5G module)
		**Note: Intel CNVi module Support List: AX201 & AC-9560
AUDIO	Audio Codec	Realtek ALC888
ETHERNET	Controller	2 x Intel® I211AT/I210IT PCIe (10/100/1000Mbps)
		1 x Intel® I225LM/I225IT PCIe (10/100/1000Mbps/2.5Gbps)
REAR I/O	Ethernet	2 x GbE (RJ-45)
		1 x 2.5GbE (RJ-45)
	USB	4 x USB 3.1 Gen2 (Type-A)
		1 x USB Type-C (Support USB 3.1 Gen2, 15W power delivery and DP Alt mode)
	Display	1 x DP++
		1 x HDMI

INTERNAL I/O	Serial	2 x RS-232/422/485 (2.0mm pitch) 2 x RS-232 (2.0mm pitch) (RS-232 w/ power)
	USB	4 x USB 2.0 (2.0mm pitch)
	Display	1 x LVDS 1 x eDP
	Audio	1 x Front Audio (2.0mm pitch)
	SATA	2 x SATA 3.0 (up to 6Gb/s) (RAID 0/1) 2 x SATA Power
	DIO	1 x 8-bit DIO 1 x DIO Power
	Cooling	1 x CPU fan 1 x System fan
WATCHDOG TIMER	Output & Interval	System Reset, Programmable via Software from 1 to 255 Seconds
SECURITY	TPM	fTPM (default) / dTPM (option)
POWER	Type	TGU171: Single 12V +/-5% DC
		TGU173: Wide Range 9~36V
	Connector	DC-in Jack
		Right Angle Connector (4-pin) (available upon request)
		Straightl Type Connector (4-pin) (available upon request)
	Consumption	Idle: TGU173-IE-1185GRE 15W: 12V@ 1.12A (13.44W)
		Max: TGU173-IE-1185GRE 15W: 12V@ 6.26A (75.12W)
	RTC Battery	CR2032 Coin Cell
OS SUPPORT	Microsoft	Windows 10 IoT Enterprise 64-bit
	Linux	Linux
ENVIRONMENT	Temperature	Operating: -5 to 65°C / -20 to 70°C Storage: -40 to 85°C
	Humidity	Operating: 5 to 90% RH Storage: 5 to 90% RH
	MTBF	TGU171-IE-1185GRE 414,291 hrs @ 25°C; 254,601 hrs @ 45°C; 166,963 hrs @ 60°; 124,264 hrs @ 70°C;
		TGU173-IE-1185GRE 397,863 hrs @ 25°C; 244,099 hrs @ 45°C; 160,483 hrs @ 60°; 119,765 hrs @ 70°C;
		Calculation model: Telcordia Issue 4 Environment: GB, GC – Ground Benign, Controlled
MECHANICAL	Dimensions	170mm (6.7") x 170mm (6.7")
	Height	Top Side: 16.5mm, Bottom Side: 3.5mm
CERTIFICATIONS	Certifications	CE, FCC, RoHS, UKCA

▶ **Block Diagram**
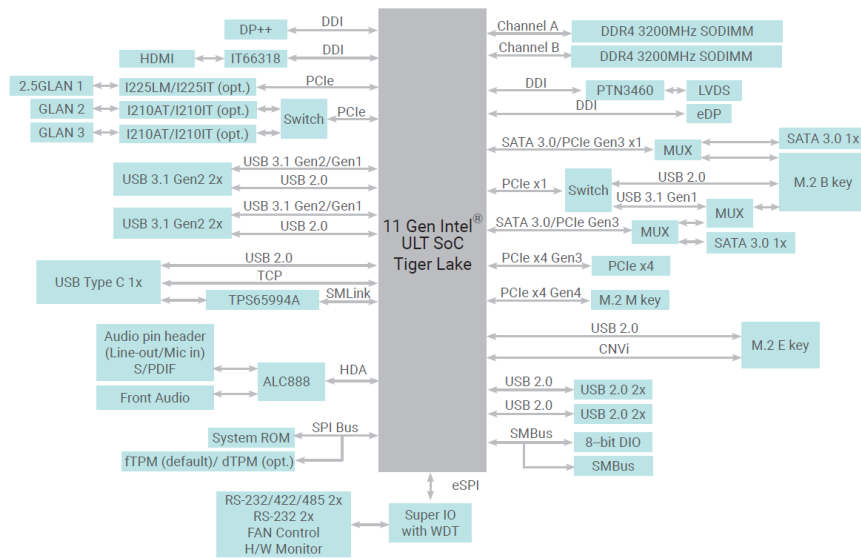
▶ **Dimension**
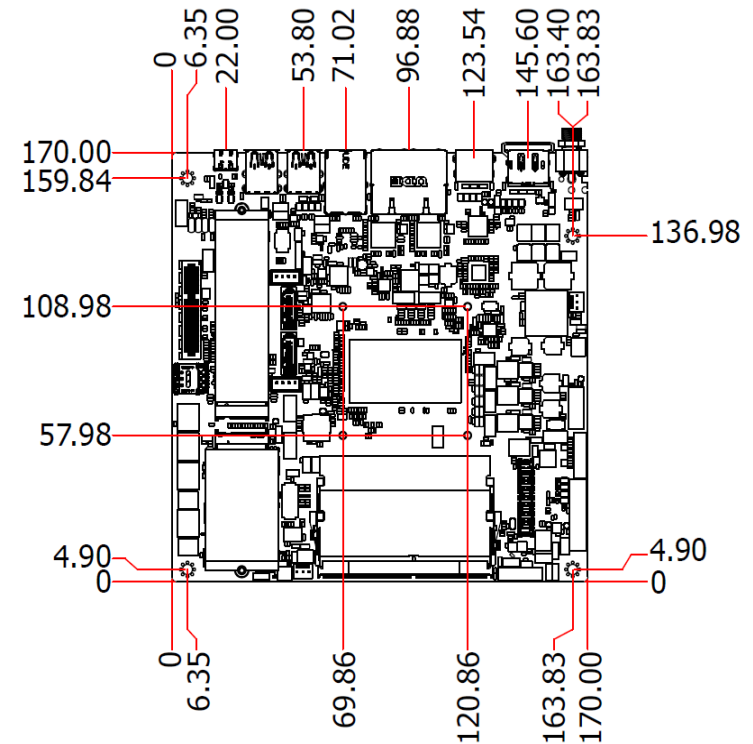
Chapter 2 - Hardware Installation

▶ **Board Layout**
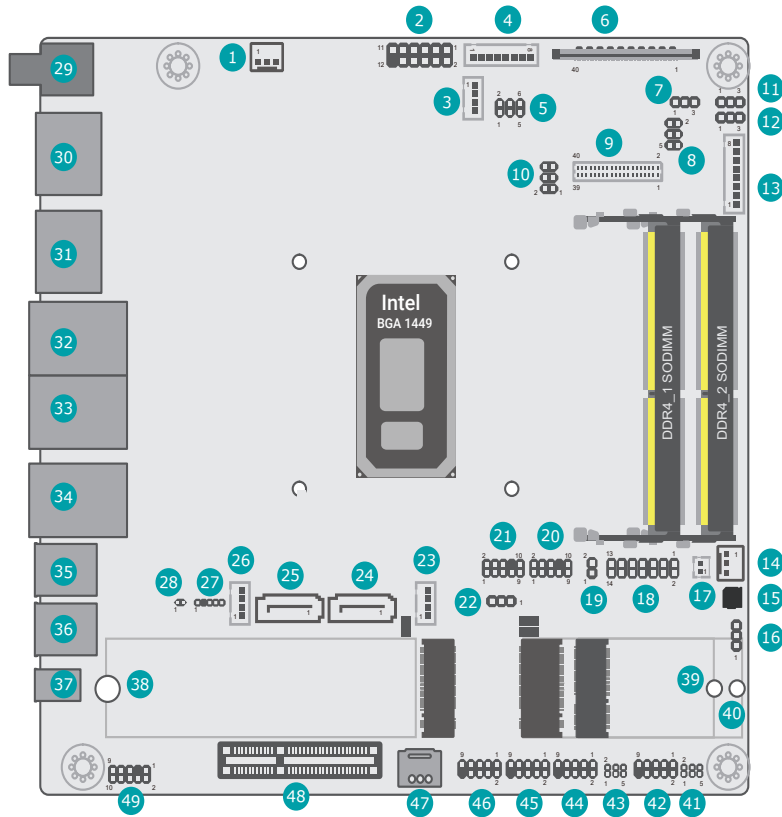
1	CPU FAN	13	LCD/Inverter Power
2	Front Panel	14	System FAN
3	Digital I/O Power	15	Buzzer
4	Digital I/O	16	Clear CMOS
5	SMBus	17	Battery
6	eDP	18	Debug Card
7	eDP Inverter Power	19	CASEOPEN-
8	Panel Power Jumper	20	USB 7/8
9	LVDS	21	USB 5/6
10	Innoage HDR1	22	SATA Selection
11	Panel Inverter Power	23	SATA1 Power
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25	SATA0	37	USB Type-C
26	SATA0 Power	38	M.2-M
27	Debug	39	M.2-E
28	Debug	40	M.2-B
29	DC-in	41	COM4 RS232 Power
30	HDMI	42	COM4
31	DP++	43	COM3 RS232 Power
32	LAN1	44	COM3
33	LAN2	45	COM2
34	2.5G LAN1	46	COM1
35	USB 1/2 (USB 3.1 Gen2)	47	SIM slot
36	USB 3/4 (USB 3.1 Gen2)	48	PCIe x4
		49	Front Audio

▶ **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 pre-applied 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.

Mounting holes
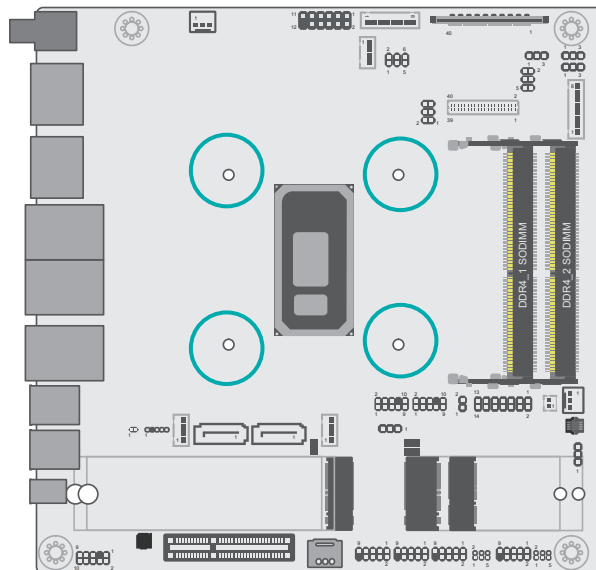
Note:

Some components are optional and only available upon request.

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.

▶ Jumper Settings

Clear CMOS (JP1)
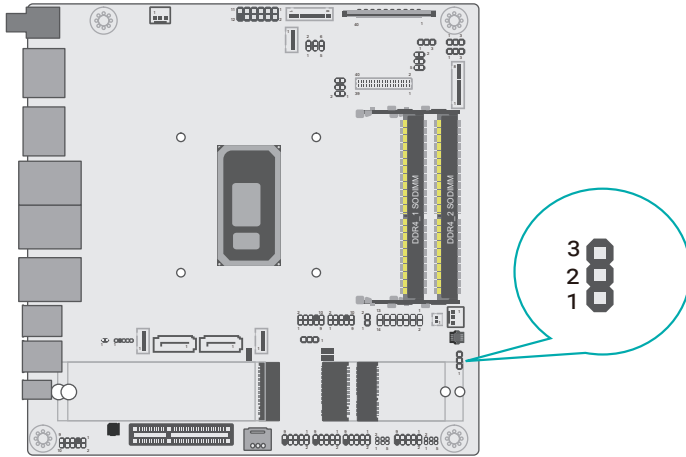
■ 1-2 On: Normal (default)   ■ 2-3 On: Clear CMOS Data

COM 4 RS232 Power (JP3)
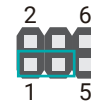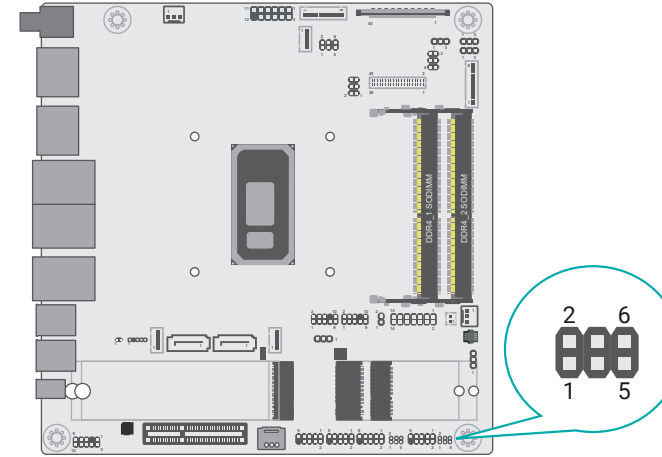
■ 1-3 On: Standard RS232 (default)   ■ 3-5 On: RS232 with Power
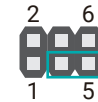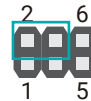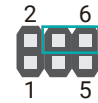
■ 2-4 On: Standard RS232(default)   ■ 4-6 On: RS232 with Power

COM 3 RS232 Power (JP2)
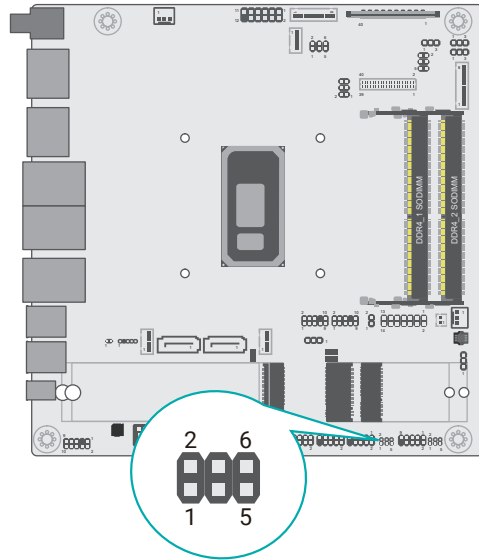
■ 1-3 On: Standard RS232 (default)

■ 3-5 On: RS232 with Power

■ 2-4 On: Standard RS232(default)

■ 4-6 On: RS232 with Power

SATA Selection (JP8)

3 2 1

3 2 1
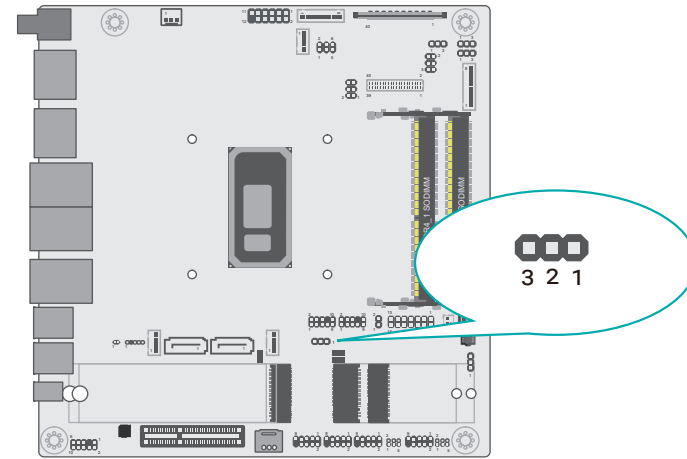
■ 1-2 On: M.2 Key B (default)

■ 2-3 On: SATA1

It can be able to swap each function below in BIOS :

JP8	SATA0	SATA1	M.2_B KEY	
1-2	SATA0 (via PCIe11)	N/A	PCIe x1/SATA (controled by M.2 Pin69)	USB3.0 (from PCIe Switch)
2-3	SATA0 (via PCIe11)	SATA1 (via PCIe12)	N/A	USB3.0 (from PCIe Switch)
1-2	N/A	N/A	PCIe x2 (via PCIe11/12)	

eDP Inverter Power (DPJP1)
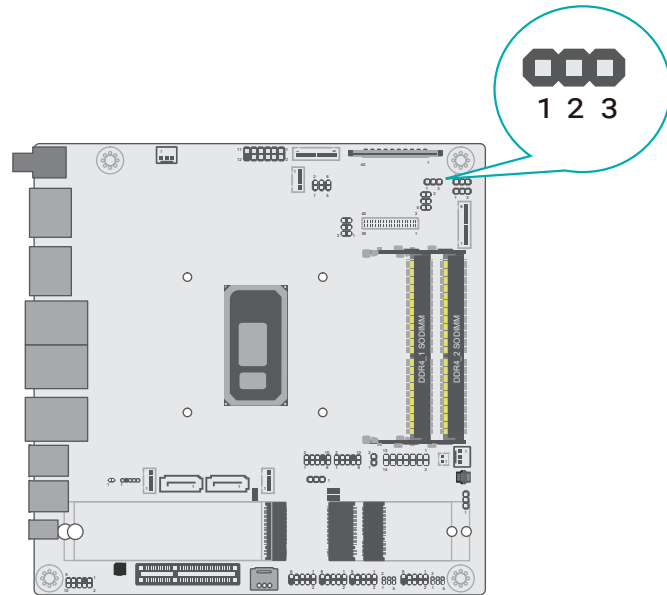
■ 1-2 On: +12V (default)

■ 2-3 On: 5V

Panel Inverter Power (DPJP2)
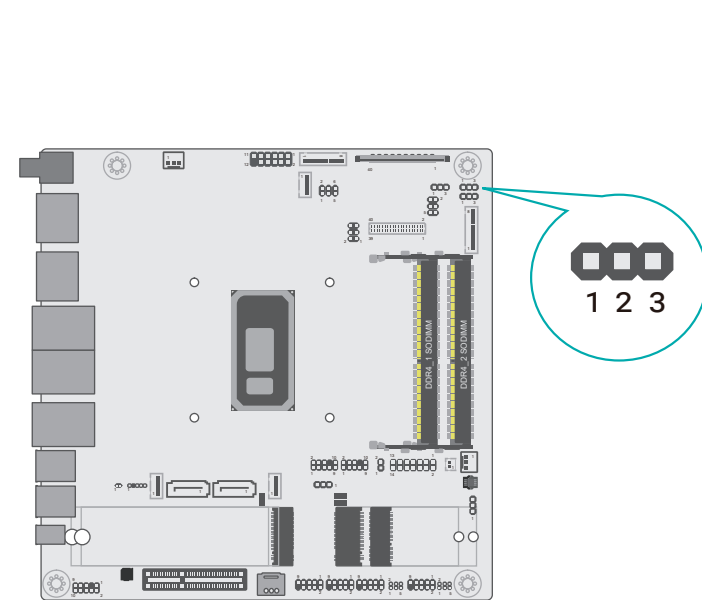
■ 1-2 On: 5V (default)

■ 2-3 On: 12V

Panel Power Jumper (DPJP3)

Panel Backlight Selection (DPJP4)
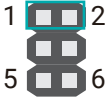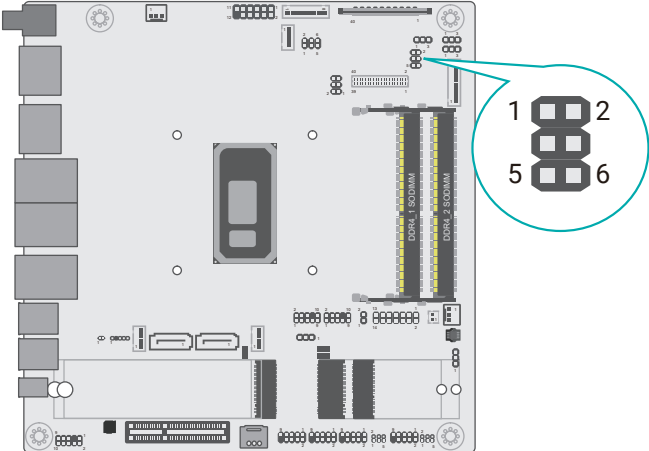
■ 1-2 On: 12V
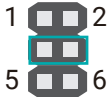
■ 3-4 On: 5V

■ 5-6 On: 3.3V (default)
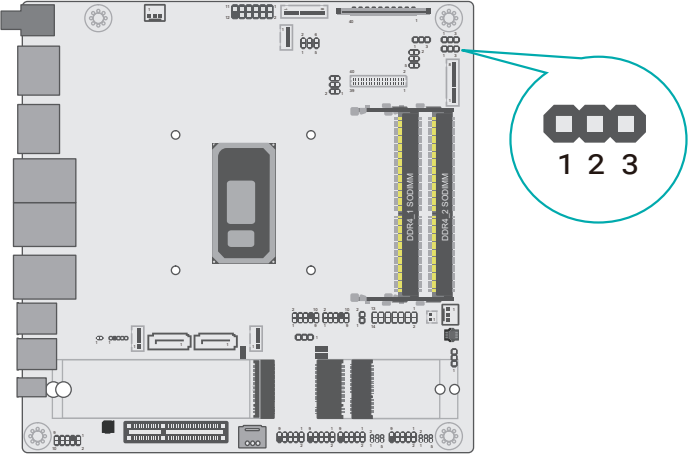
■ 1-2 On: 3.3V (default)

■ 2-3 On: 5V

▶ **PIN Assignment**

CASEOPEN-

SMBus
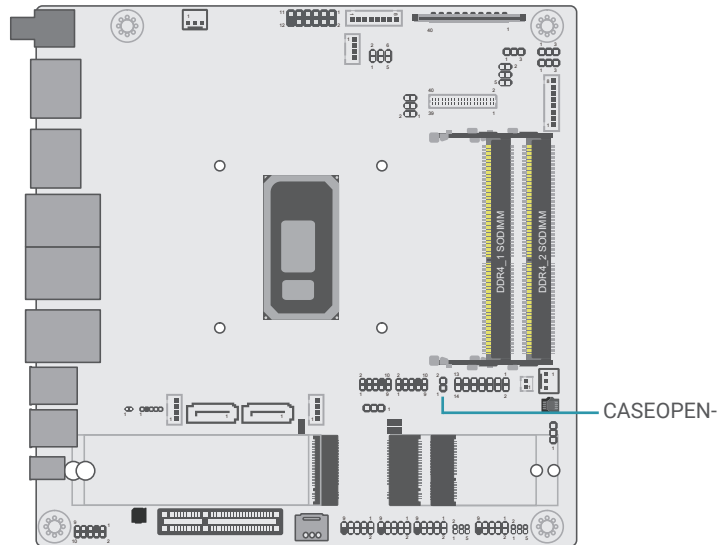
CASEOPEN-

SMBus

Pin	Function	Pin	Function
1	CASEOPEN-	2	GND
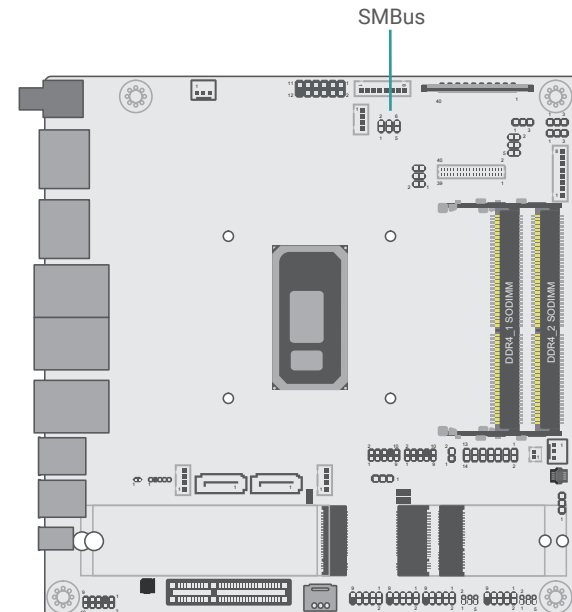
Pin	Assignment	Pin	Assignment
1	3V3SB	2	GND
3	SMB_CLK	4	SMB_DATA
5	SMB_ALERT	6	--

Digital I/O Power
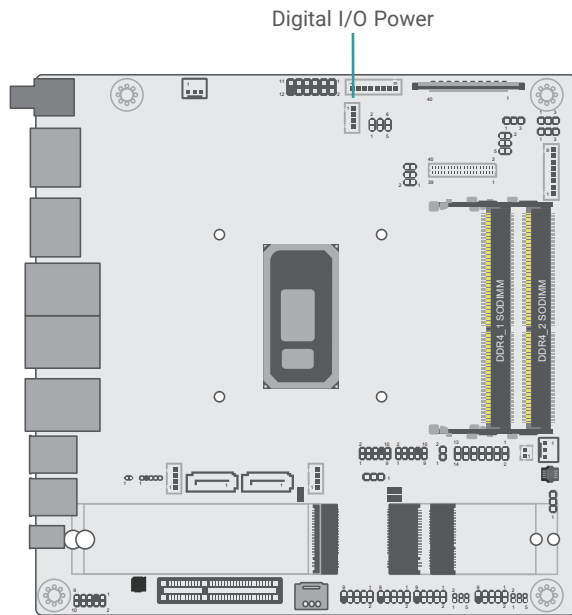
Digital I/O Power

Pin	Function	Pin	Function
1	+12V	2	GND
3	5VSB	4	5V

Digital I/O

Digital I/O
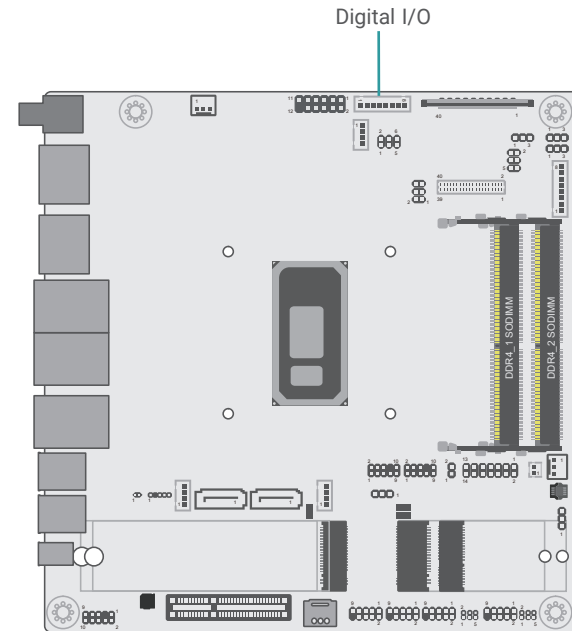
Pin	Function	Pin	Function
1	DIO_0	5	DIO_4
2	DIO_1	6	DIO_5
3	DIO_2	7	DIO_6
4	DIO_3	8	DIO_7

COM 1 & COM 2

COM 3 & COM 4

COM 1
COM 2
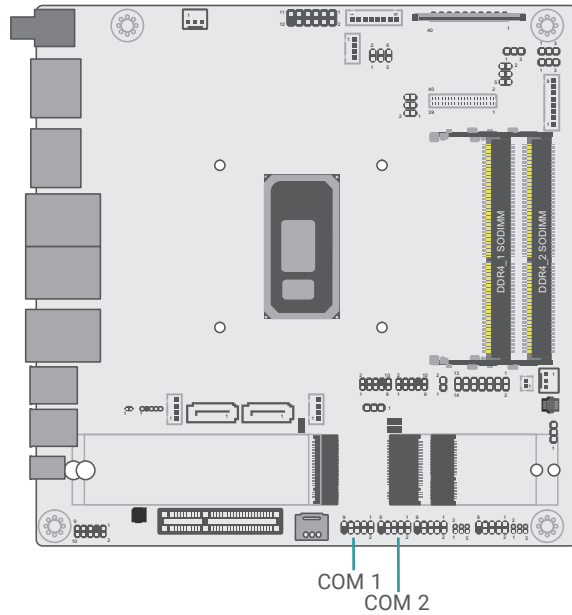
COM 3
COM 4

Pin	Function	Pin	Function
1	MDCD1(2)#	2	MSIN1(2)
3	MSOUT1(2)	4	MDTR1(2)#
5	GND	6	MDSR1(2)#
7	MRTS1(2)#	8	MCTS1(2)#
9	MRI1(2)#	10	--

	RS422/Half	RS422/Full	RS485
PIN 1 (DCD)		TX-	DATA-
PIN 2 (SIN)		TX+	DATA+
PIN 3 (SOUT)	RX+	RX+	
PIN 4 (DTR)	RX-	RX-	
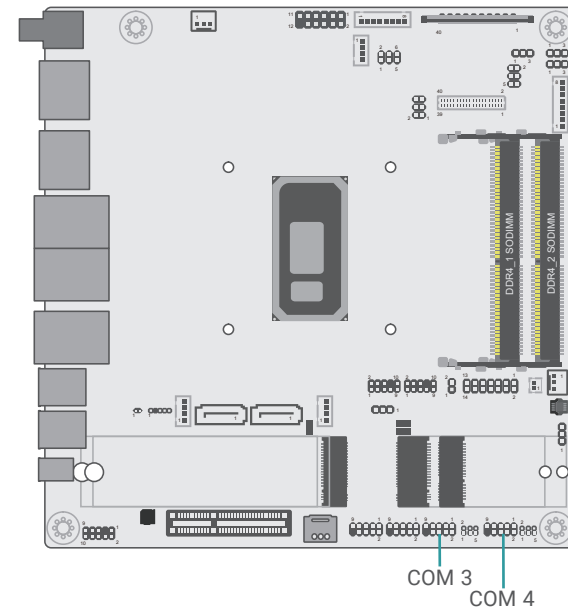
Pin	Function	Pin	Function
1	X_MDCD3(4)#	2	MSIN3(4)#
3	MSO3(4)#	4	MDTR3(4)#
5	GND	6	MDSR3(4)#
7	MRTS3(4)#	8	MCTS3(4)#
9	X_MRI3(4)#	10	--

USB 5/6

USB 7/8

USB 5/6
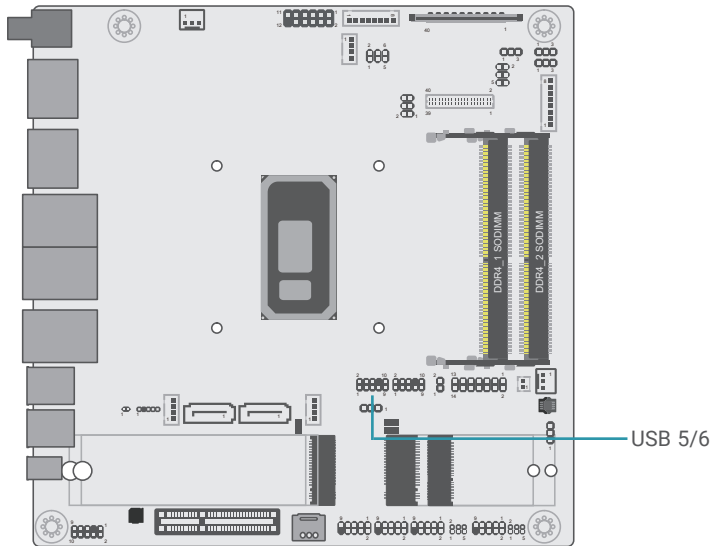
USB 7/8

Pin	Assignment	Pin	Assignment
1	5V	2	5V
3	USB2_5_C_N	4	USB2_6_C_N
5	USB2_5_C_P	6	USB2_6_C_P
7	GND	8	GND
9	---	10	N.C.
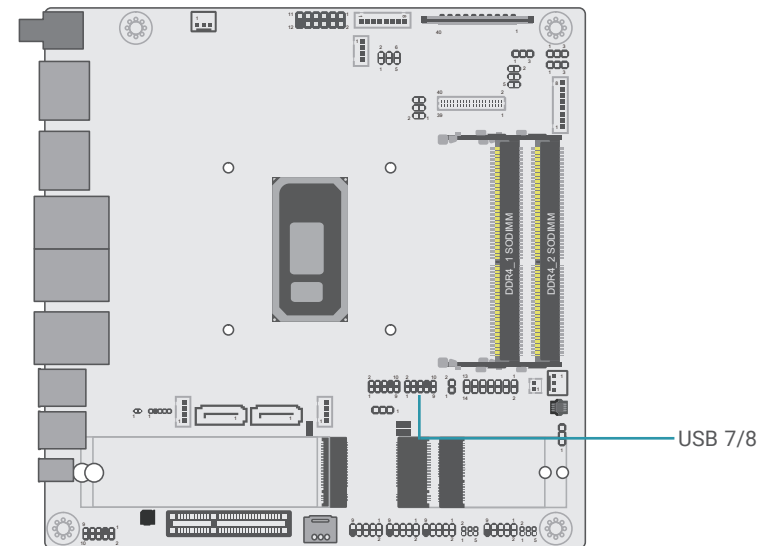
Pin	Assignment	Pin	Assignment
1	5V	2	5V
3	USB2_7_C_N	4	USB2_8_C_N
5	USB2_7_C_P	6	USB2_8_C_P
7	GND	8	GND
9	---	10	N.C.

SATA0/1 HDD Power

SATA0 Power

SATA1 Power
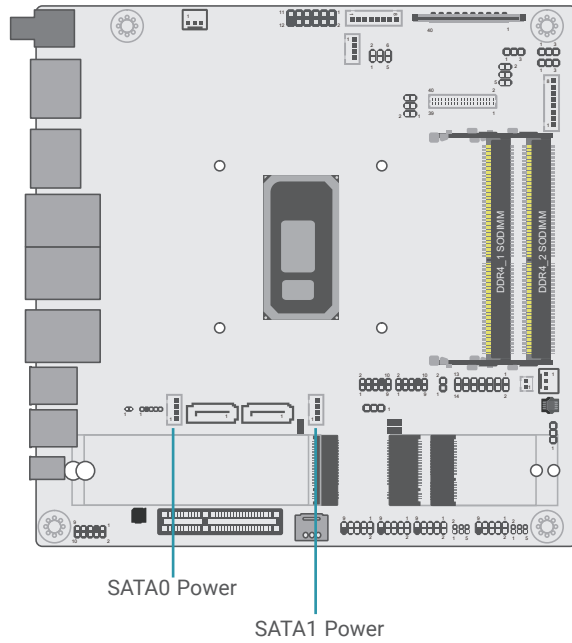
Pin	Assignment	Pin	Assignment
1	+12V_SATA	2	GND
3	GND	4	5V_SATA

Front Audio

Front Audio
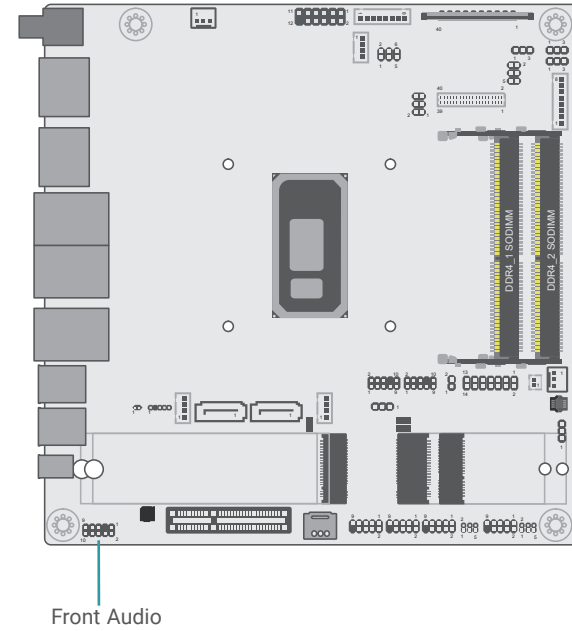
Pin	Assignment	Pin	Assignment
1	Mic2-L	2	GND
3	Mic2-R	4	N.C.
5	Line2-R	6	Mic2-JD
7	GND	8	---
9	Line2-L	10	Line2-JD

LCD/Inverter Power

LCD/Inverter Power
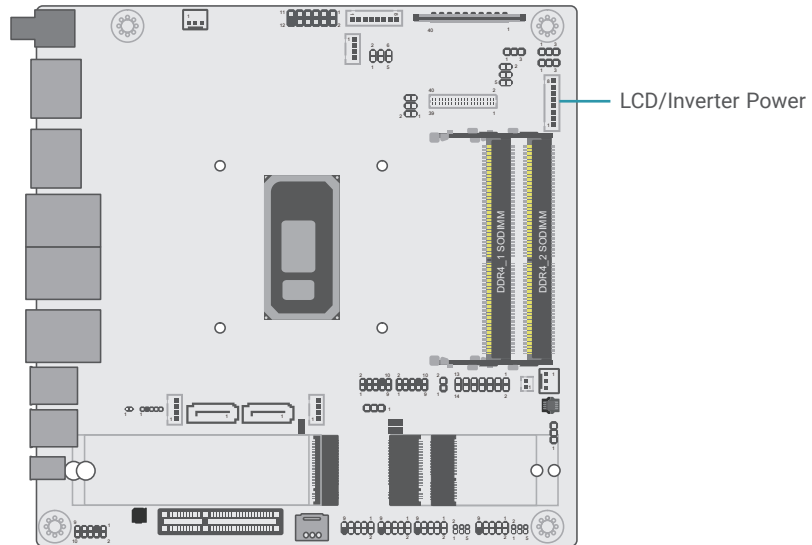
Pin	Assignment
1	GND
2	GND
3	Panel Inverter Brightness Voltage Control
4	Panel Power
5	+3.3V
6	Panel Backlight On/Off Control
7	12V / 5V (default)
8	12V / 5V (default)

LVDS
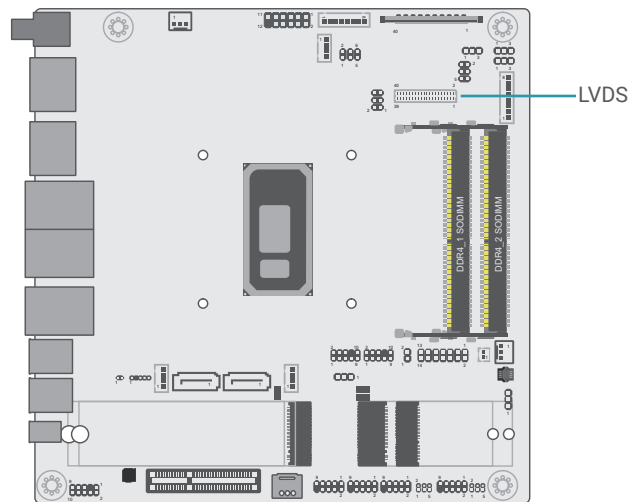
LVDS

Pin	Assignment	Pin	Assignment
1	GND	2	GND
3	LVDS_A3+	4	LVDS_B3+
5	LVDS_A3-	6	LVDS_B3-
7	GND	8	GND
9	LVDS_A2+	10	LVDS_B2+
11	LVDS_A2-	12	LVDS_B2-
13	GND	14	GND
15	LVDS_A1+	16	LVDS_B1+
17	LVDS_A1-	18	LVDS_B1-
19	GND	20	GND
21	LVDS_A0+	22	LVDS_B0+
23	LVDS_A0-	24	LVDS_B0-
25	GND	26	GND
27	LVDS_CLK1+	28	LVDS_CLK2+
29	LVDS_CLK1-	30	LVDS_CLK2-
31	GND	32	GND
33	LVDS_DDC_CLK	34	NC
35	LVDS_DDC_DATA	36	+3.3V
37	Panel Power	38	Panel Power
39	Panel Power	40	Panel Power

eDP

eDP
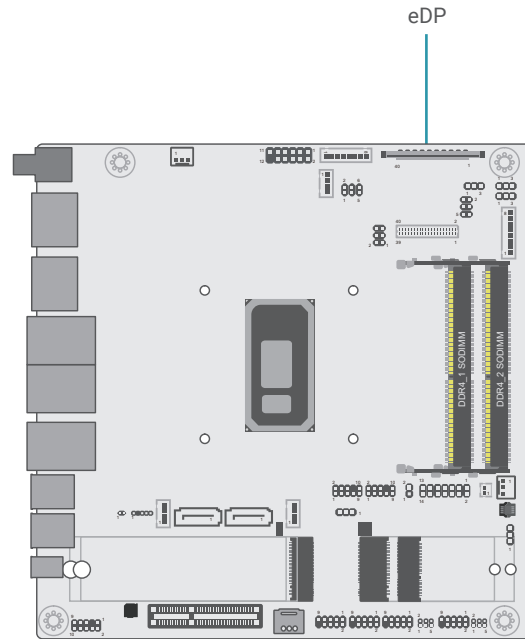
Pin	Assignment	Pin	Assignment
1	--	2	GND
3	eDPA_LANE3_C_N	4	eDPA_LANE3_C_P
5	GND	6	eDPA_LANE2_C_N
7	eDPA_LANE2_C_P	8	GND
9	eDPA_LANE1_C_N	10	eDPA_LANE1_C_P
11	GND	12	eDPA_LANE0_C_N
13	eDPA_LANE0_C_P	14	GND
15	eDPA_AUXP_C	16	eDPA_AUXN_C
17	GND	18	EDP_VDD
19	EDP_VDD	20	EDP_VDD
21	EDP_VDD	22	--
23	GND	24	GND
25	GND	26	GND
27	eDPA_HPD	28	GND
29	GND	30	GND
31	GND	32	EDP_BKLTEN
33	EDP_BKLTCTL	34	--
35	--	36	eDP_INV_PWR
37	eDP_INV_PWR	38	eDP_INV_PWR
39	eDP_INV_PWR	40	--

▶ **Expansion Slots**

A PCIe 1 (PCIe Gen3 x4 signal)

B M.2 M KEY

C M.2 B KEY

D M.2 E KEY

E SIM Card Slot
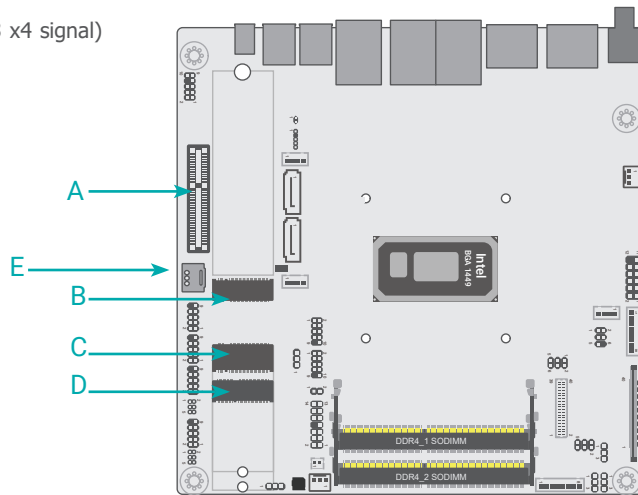
PCI Express x4 Slot

Install PCI Express cards such as network cards or other expansion cards.

M.2 Socket

The M.2 socket is the Next Generation Form Factor (NGFF) which is designed to support multiple modules and make the M.2 more suitable in application for solid-state storage.

SIM Card Slot

For SIM card usage.

▶ **Expansion Slots**

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.
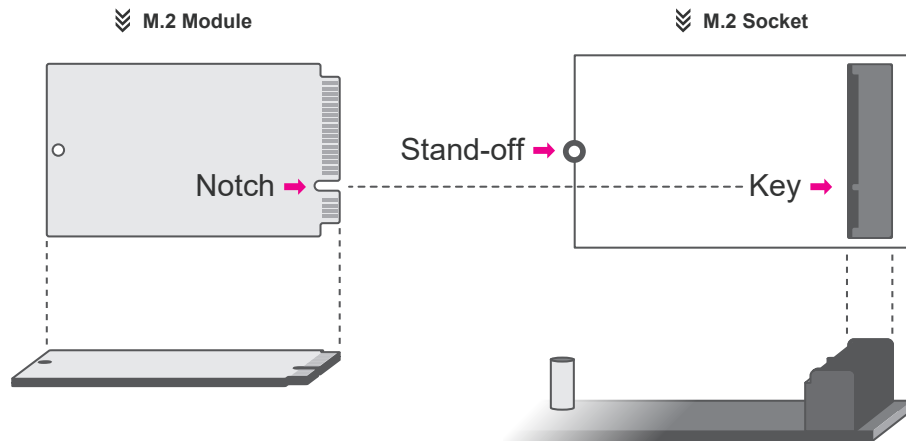
Please follow the steps below to install the card into the socket.
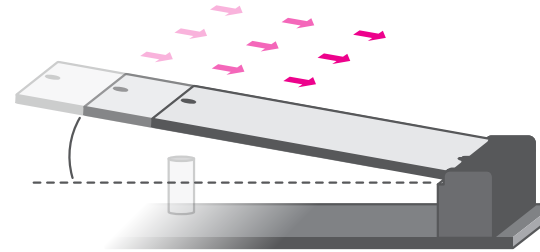
Step 1:

Insert the card into the socket at an angle while making sure the notch and key are perfectly aligned.
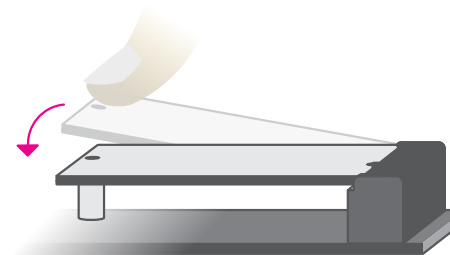
Step 2:

Press the end of the card far from the socket down until against the stand-off.
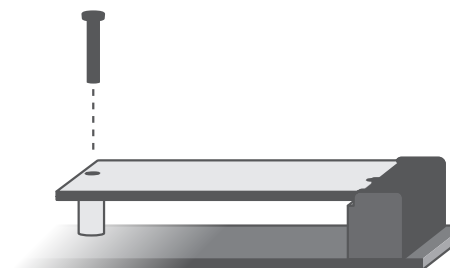
Step 3:

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.

M.2 Module **M.2 Socket**

Stand-off ➡

Notch ➡ Key ➡

Installing the SO-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 SO-DIMM socket on the system board

4. Make sure the notch on memory card is aligned to the key on the socket.
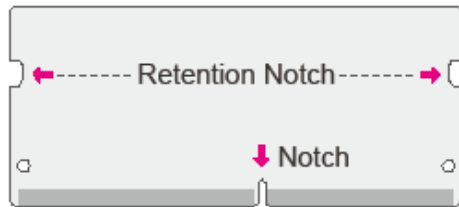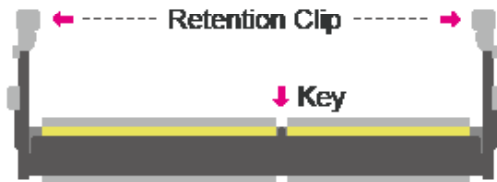
Please follow the steps below to install the memory card into the socket.
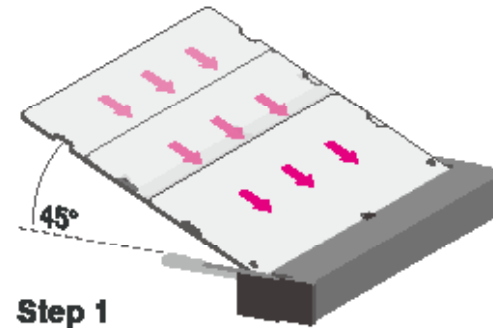
the memory card into the slot
making sure 1) the notch and
y are aligned, and 2) the non-
tor end rises approximately 45
s horizontally. Press the card
into the socket while applying
aintaining even pressure on both

Step 1
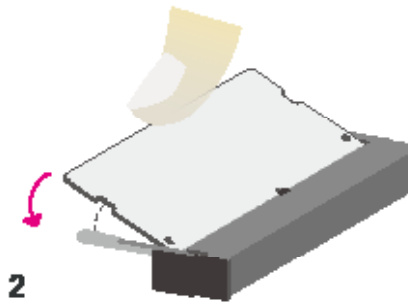
the end of the card far from
cket down while making sure
ention notch and the clip align
cated by the dotted line in the
tion. If the retention notch and
do not align, please remove the
nd re-insert it. Press the card all
y down.

Step 2
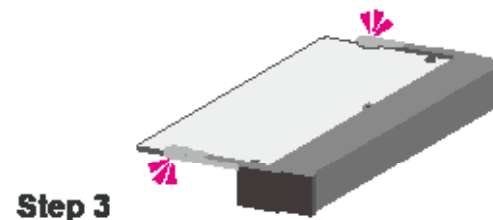
lips snap automatically and
y to the retention notches of the
ounding a distinctive click, and
e card in place. Inspect that the
s in the notch. If not, please pull
ps outward, release and remove
the card, and mount it again.

Step 3

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>.

▶ 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.

▶ **Main**

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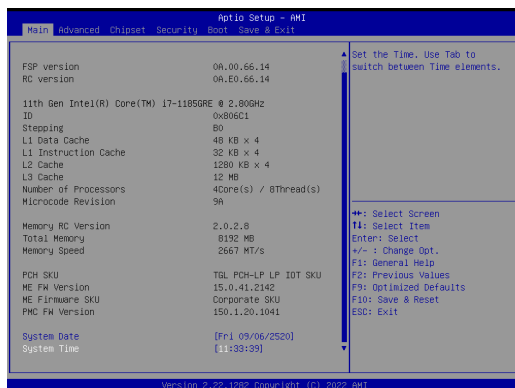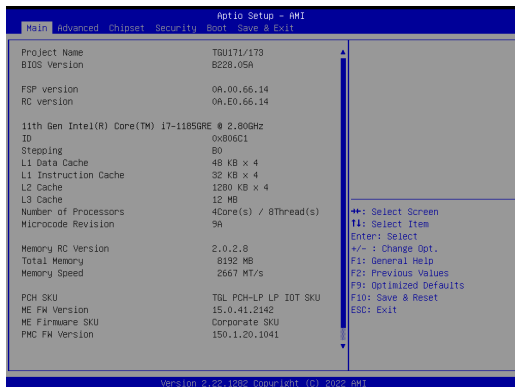
System Date

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**

CPU Configuration

```
                              Aptio Setup – AMI
        ┌─────────┐
        │ Advanced│
        └─────────┘
  CPU Configuration                                    When enabled, a VMM can
                                                       utilize the additional
  Intel (VMX) Virtualization      [Enabled]            hardware capabilities provided
  Technology                                           by Vanderpool Technology.
  AVX                             [Enabled]
  AVX3                            [Enabled]
  Active Processor Cores          [All]
  Hyper-Threading                 [Enabled]
  AES                             [Enabled]


                                                       ↔: Select Screen
                                                       ↑↓: Select Item
                                                       Enter: Select
                                                       +/- : Change Opt.
                                                       F1: General Help
                                                       F2: Previous Values
                                                       F9: Optimized Defaults
                                                       F10: Save & Reset
                                                       ESC: Exit



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```

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, 1, 2, 3.

Hyper-threading

Enables this field for Windows XP and Linux which are optimized for Hyper-Threading technology. Select disabled for other OSes not optimized for Hyper-Threading technology. When disabled, only one thread per enabled core is enabled.

AES

Enable / Disable AES (Advanced Encryption Standard)

▶ **Advanced**

Power & Performance

```
                              Aptio Setup – AMI
        ┌─────────┐
        │ Advanced│
        └─────────┘
  Power & Performance                                  CPU – Power Management Control
                                                       Options
  ▶ CPU – Power Management Control
  ▶ GT – Power Management Control




                                                       ↔: Select Screen
                                                       ↑↓: Select Item
                                                       Enter: Select
                                                       +/- : Change Opt.
                                                       F1: General Help
                                                       F2: Previous Values
                                                       F9: Optimized Defaults
                                                       F10: Save & Reset
                                                       ESC: Exit



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```

▶ **Advanced**

Power & Performance ▶ **CPU- Power Management Control**

```
                           Aptio Setup - AMI
     ┌─────────────────────────────────────────────────────────────────────┐
     │ Advanced                                                            │
     ├─────────────────────────────────────────────┬───────────────────────┤
     │ CPU - Power Management Control                │ Allows more than two frequency │
     │                                               │ ranges to be supported.       │
     │   Intel(R) SpeedStep(tm)         [Enabled]    │                               │
     │     Turbo Mode                   [Enabled]    │                               │
     │ ▶   Config TDP Configurations                 │                               │
     │   C states                       [Enabled]    │                               │
     │                                               │                               │
     │                                               │                               │
     │                                               │                               │
     │                                               │ →←: Select Screen             │
     │                                               │ ↑↓: Select Item               │
     │                                               │ Enter: Select                 │
     │                                               │ +/- : Change Opt.             │
     │                                               │ F1: General Help              │
     │                                               │ F2: Previous Values           │
     │                                               │ F9: Optimized Defaults        │
     │                                               │ F10: Save & Reset             │
     │                                               │ ESC: Exit                     │
     │                                               │                               │
     │             Version 2.22.1282 Copyright (C) 2022 AMI                 │
     └─────────────────────────────────────────────────────────────────────┘
```

Intel (R) SpeedStep(tm)

This field is used to enable or disable the Intel SpeedStep® Technology, which helps optimize the balance between system's power consumption and performance. After it is enabled in the BIOS, EIST features can then be enabled via the operating system's power management.

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**

Power & Performance ▶ **GT- Power Management Control**

```
                           Aptio Setup - AMI
     ┌─────────────────────────────────────────────────────────────────────┐
     │ Advanced                                                            │
     ├─────────────────────────────────────────────┬───────────────────────┤
     │ GT - Power Management Control                 │ Check to enable render standby │
     │                                               │ support.                      │
     │   RC6(Render Standby)            [Enabled]    │                               │
     │   Maximum GT frequency        [Default Max Frequency] │                       │
     │   Disable Turbo GT frequency     [Disabled]   │                               │
     │                                               │                               │
     │                                               │                               │
     │                                               │                               │
     │                                               │ →←: Select Screen             │
     │                                               │ ↑↓: Select Item               │
     │                                               │ Enter: Select                 │
     │                                               │ +/- : Change Opt.             │
     │                                               │ F1: General Help              │
     │                                               │ F2: Previous Values           │
     │                                               │ F9: Optimized Defaults        │
     │                                               │ F10: Save & Reset             │
     │                                               │ ESC: Exit                     │
     │                                               │                               │
     │             Version 2.22.1282 Copyright (C) 2022 AMI                 │
     └─────────────────────────────────────────────────────────────────────┘
```
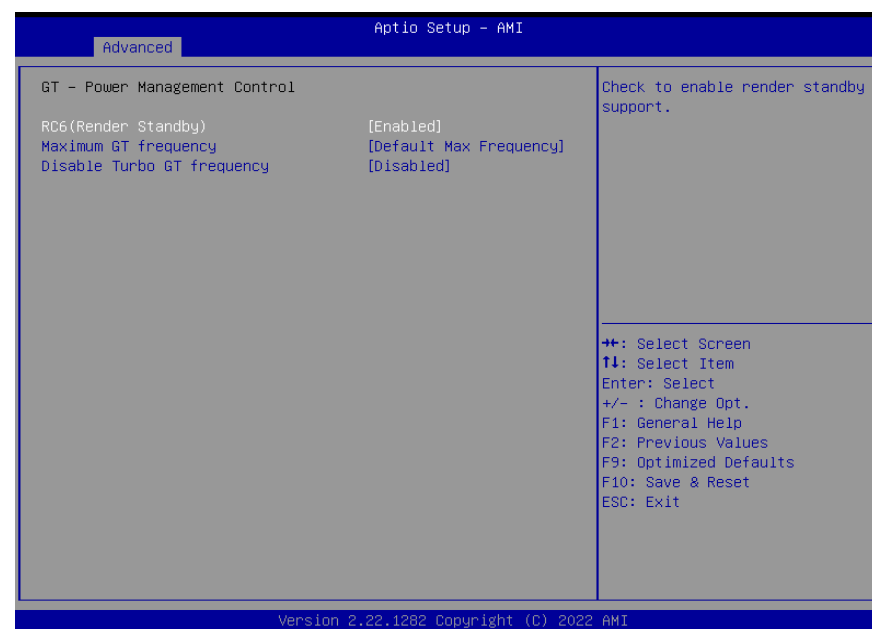
RC6 (Render Standby)

Check to enable render standby support.

Maximum GT frequency

Maximum GT frequency limited by the user. Choose between 100MHz (RPN) and

1350MHZ(RPO). Value beyond the range will be clipped to min/max supported by SKU

Disable Turbo GT frequency

Enabled: Disables Turbo GT frequency. Disabled: GT frequency is not limited

▶ **Advanced**

PCH-FW Configuration

```
                        Aptio Setup - AMI
 ┌──────────────┐
 │  Advanced    │
 └──────────────┘
  ME State                          [Enabled]       When Disabled ME will be put
  Manageability Features State      [Enabled]       into ME Temporarily Disabled
  AMT BIOS Features                 [Enabled]       Mode.
▶ AMT Configuration
  ME Unconfig on RTC Clear          [Enabled]

▶ Firmware Update Configuration

                                                    →←: Select Screen
                                                    ↑↓: Select Item
                                                    Enter: Select
                                                    +/- : Change Opt.
                                                    F1: General Help
                                                    F2: Previous Values
                                                    F9: Optimized Defaults
                                                    F10: Save & Reset
                                                    ESC: Exit

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```

ME State

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

Manageability Features State

Enable or disable Intel(R) Manageability features. This option disables/enables Manageability Features support in FW. To disable, support platform must be in an unprovisioned state first.

AMT BIOS Features

When disabled, AMT BIOS features are no longer supported and user is no longer able to access MEBx Setup. This option does not disable manageability features in FW.

AMT Configuration

Configure Intel(R) Active Management Technology Parameters.

ME Unconfig on RTC Clear

When Disabled ME will not be unconfigured on RTC Clear.

Firmware Update Configuration

Configure Management Engine Technology Parameters.

▶ **Advanced**

Trusted Computing

```
                        Aptio Setup - AMI
 ┌──────────────┐
 │  Advanced    │
 └──────────────┘
  TPM 2.0 Device Found                              Enables or Disables BIOS
  Firmware Version:               7.2               support for security device.
  Vendor:                         NTC               O.S. will not show Security
                                                    Device. TCG EFI protocol and
  Security Device Support         [Enable]          INT1A interface will not be
  Active PCR banks                SHA256            available.
  Available PCR banks             SHA256,SHA384

  SHA256 PCR Bank                 [Enabled]
  SHA384 PCR Bank                 [Disabled]

  Pending operation               [None]
  Platform Hierarchy              [Enabled]
  Storage Hierarchy               [Enabled]         →←: Select Screen
  Endorsement Hierarchy           [Enabled]         ↑↓: Select Item
                                                    Enter: Select
                                                    +/- : Change Opt.
                                                    F1: General Help
                                                    F2: Previous Values
                                                    F9: Optimized Defaults
                                                    F10: Save & Reset
                                                    ESC: Exit

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```

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.

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

▶ **Advanced**

PTN3460 Configuration

```
                           Aptio Setup - AMI
    ┌─────────────┐
    │  Advanced   │
    └─────────────┘
     PTN3460 Function              [Enabled]          Enabled or Disabled PTN3460
     EDID Emulation                [Enabled]          LCD Features
       LCD Panel Type              [1366X768]
     LCD Panel Color Depth         [VESA 24bpp]
     LVDS Bus Mode                 [Dual LVDS Bus]




                                                      →←: Select Screen
                                                      ↑↓: Select Item
                                                      Enter: Select
                                                      +/- : Change Opt.
                                                      F1: General Help
                                                      F2: Previous Values
                                                      F9: Optimized Defaults
                                                      F10: Save & Reset
                                                      ESC: Exit



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```

PTN3460 Function

Enable or Disable PTN3460 LCD Features. When this field is disabled, the following fields will remain hidden.

EDID Emulation

Enable or Disable PTN3460 EDID Emulation Mode

LCD Panel Type

Select the resolution of the LCD Panel — 800X480, 800X600, 1024X768, 1366X768, 1280X1024, 1920X1080, or 1920X1200.

LCD Panel Color Depth

Select the color depth of the LCD Panel — VESA 24bpp, JEIDA 24bpp, VESA and JEIDA 18 bpp.

LVDS Bus Mode

Select PTN3460 LVDS BUS Mode : Single LVDS Bus /Dual LVDS Bus

> **Note:**
> The configuration must match the specifications of your LCD Panel in order for the LCD Panel to display properly.

▶ **Advanced**

NCT6126D Super IO Configuration

```
                           Aptio Setup - AMI
    ┌─────────────┐
    │  Advanced   │
    └─────────────┘
     NCT6126D Super IO Configuration                  WatchDog Timer Unit Selection

     Super IO Chip                 NCT6126D

     WatchDog Timer Unit           [Second]
       SuperIO WatchDog Timer      0

    ▶ Serial Port 1 Configuration
    ▶ Serial Port 2 Configuration
    ▶ Serial Port 3 Configuration
    ▶ Serial Port 4 Configuration

                                                      →←: Select Screen
                                                      ↑↓: Select Item
                                                      Enter: Select
                                                      +/- : Change Opt.
                                                      F1: General Help
                                                      F2: Previous Values
                                                      F9: Optimized Defaults
                                                      F10: Save & Reset
                                                      ESC: Exit


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```

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

NCT6126D HW Monitor
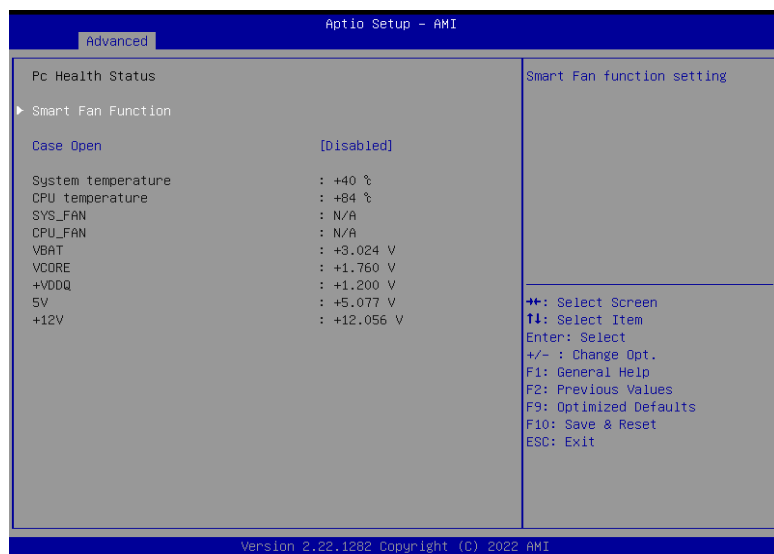
Smart Fan Function

Smart Fan Function Setting.

Case Open

Enable or disable the case open detection function.

▶ Advanced

NCT6126D HW Monitor ▶ **Smart FAN Function**
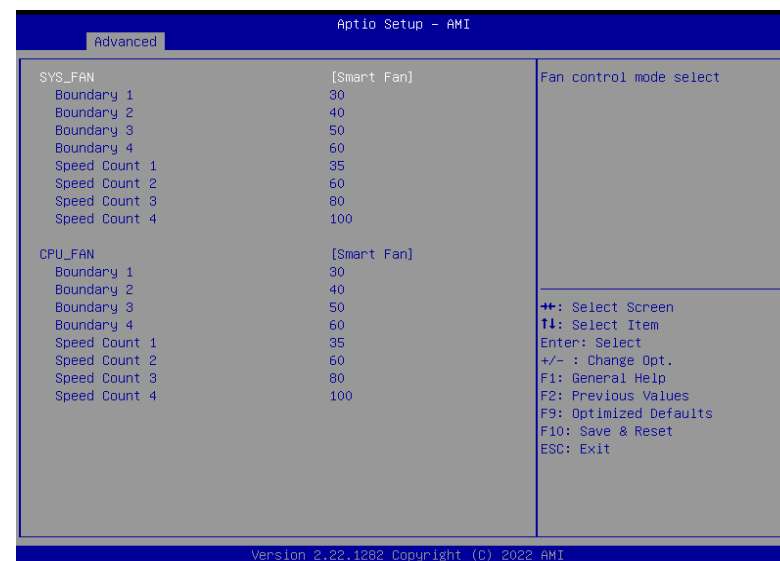
▼ CPU/SYS Smart Fan Mode = [Smart Fan]

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.

▼ CPU/SYS Smart Fan Mode = [Manual Mode]

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.

▶

Serial Port Console Redirection

```
                        Aptio Setup - AMI
        Advanced

    COM1                                        Console Redirection Enable or
    Console Redirection         [Disabled]      Disable.
  ▶ Console Redirection Settings

    COM2
    Console Redirection         [Disabled]
  ▶ Console Redirection Settings

    COM3
    Console Redirection         [Disabled]
  ▶ Console Redirection Settings

    COM4
    Console Redirection         [Disabled]       ↔: Select Screen
  ▶ Console Redirection Settings                 ↑↓: Select Item
                                                 Enter: Select
    Serial Port for Out-of-Band Management/      +/- : Change Opt.
    Windows Emergency Management Services (EMS)   F1: General Help
    Console Redirection EMS     [Disabled]        F2: Previous Values
  ▶ Console Redirection Settings                 F9: Optimized Defaults
                                                 F10: Save & Reset
                                                 ESC: Exit

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```

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**

```
                        Aptio Setup - AMI
        Advanced

    COM1                                        Emulation: ANSI: Extended
    Console Redirection Settings                ASCII char set. VT100: ASCII
                                                char set. VT100Plus: Extends
    Terminal Type               [VT100Plus]     VT100 to support color,
    Bits per second             [115200]        function keys, etc. VT-UTF8:
    Data Bits                   [8]             Uses UTF8 encoding to map
    Parity                      [None]          Unicode chars onto 1 or more
    Stop Bits                   [1]             bytes.
    Flow Control                [None]
    VT-UTF8 Combo Key Support   [Enabled]
    Recorder Mode               [Disabled]
    Resolution 100x31           [Enabled]
    Putty KeyPad                [VT100]
                                                 ↔: Select Screen
                                                 ↑↓: Select Item
                                                 Enter: Select
                                                 +/- : Change Opt.
                                                 F1: General Help
                                                 F2: Previous Values
                                                 F9: Optimized Defaults
                                                 F10: Save & Reset
                                                 ESC: Exit

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```

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.

▶ **Advanced**

VT-UTF8 Combo Key Support

Enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals.

Recorder Mode

With this mode enbaled only text will be sent. This is to capture Terminal data.

Resolution 100x31

Enables or disables extended terminal resolution

Putty KeyPad

Select FunctionKey and KeyPad on Putty.

▶ **Advanced**

ACPI Settings

```
                          Aptio Setup - AMI
        Advanced

   ACPI Settings                                    Specify what state to go to
                                                    when power is re-applied after
   Wake System from S5 via RTC    [Disabled]        a power failure (G3 state).
   State After G3                 [S0 State]




                                                    →←: Select Screen
                                                    ↑↓: Select Item
                                                    Enter: Select
                                                    +/- : Change Opt.
                                                    F1: General Help
                                                    F2: Previous Values
                                                    F9: Optimized Defaults
                                                    F10: Save & Reset
                                                    ESC: Exit



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```
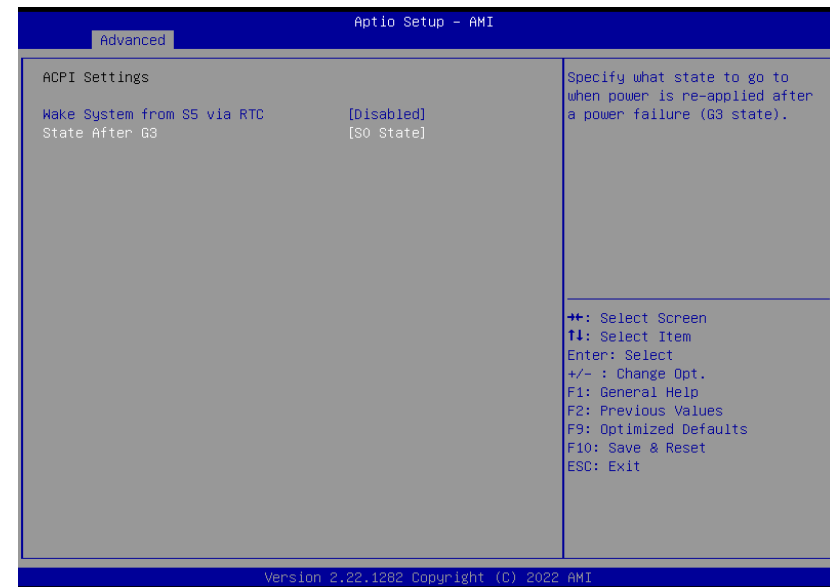
Wake system from S5 via RTC

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.

• **Last State**   The system returns to the last state right before power failure.

▶ Advanced

USB Configuration

```
                          Aptio Setup - AMI
      ┌─────────┐
      │Advanced │
      └─────────┘
  USB Configuration                            Enables Legacy USB support.
                                               AUTO option disables legacy
  Legacy USB Support            [Enabled]      support if no USB devices are
  XHCI Hand-off                 [Enabled]      connected. DISABLE option will
  USB Mass Storage Driver Support [Enabled]    keep USB devices available
  Port 60/64 Emulation          [Disabled]     only for EFI applications.

  USB hardware delays and time-outs:
  USB transfer time-out         [20 sec]
  Device reset time-out         [20 sec]
  Device power-up delay         [Auto]

  Mass Storage Devices:
  Generic Flash Disk 8.07       [Auto]         →←: Select Screen
                                               ↑↓: Select Item
                                               Enter: Select
                                               +/- : Change Opt.
                                               F1: General Help
                                               F2: Previous Values
                                               F9: Optimized Defaults
                                               F10: Save & Reset
                                               ESC: Exit



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```

Legacy USB Support

• **Enabled**   Enable Legacy USB support.

• **Disabled**   Keep USB devices available only for EFI applications.

• **Auto**   Disable Legacy support if no USB devices are connected.

XHCI Hand-off
Enable or disable XHCI Hand-off.

USB Mass Storage Driver Support
Enable or disable USB Mass Storage Driver Support.

Port 60/64 Emulation
Enables I/O port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-USB aware OSes.

▶ Advanced

USB hardware delays and time-outs

• **USB transfer time-out**   The time-out value for **Control**, **Bulk**, and **Interrupt transfers**.

• **Device reset time-out**   USB mass storage device Start Unit command time-out.

• **Device power-up delay**   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.

Network Stack Configuration
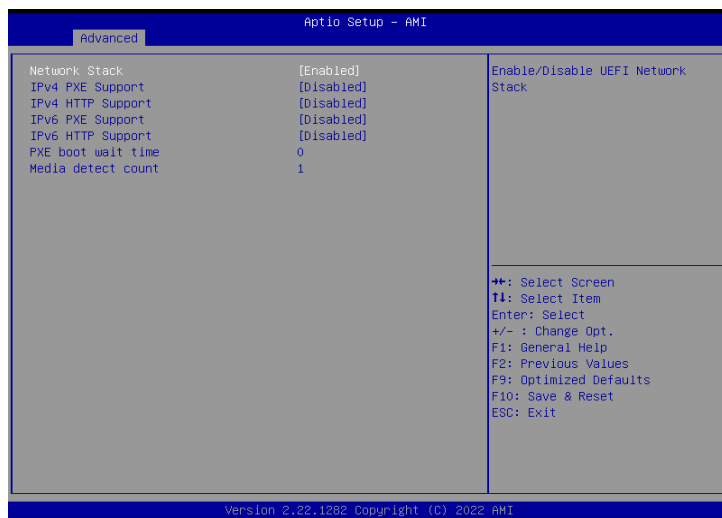
Network Stack

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 avail-able.

Ipv4 HTTP Support

Enable or disable IPv4 HTTP boot support. If disabled, IPv4 HTTP 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.

Ipv6 HTTP Support

Enable or disable IPv6 HTTP boot support. If disabled, IPv6 HTTP 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

```
                        Aptio Setup - AMI
    ┌──────────────┐
    │   Advanced   │
    └──────────────┘
    USB2_1/2 USB3_1/2            [5V_Dual]        5V_Dual: Support system wake
    USB2_3/4 USB3_3/4           [5V_Dual]        up from S3/S4 by USB KB&MS
    USB2_5/6                    [5V_Dual]        5V: No support system wake up
    USB2_7/8                    [5V_Dual]        from S3/S4 by USB KB&MS




                                                 →←: Select Screen
                                                 ↑↓: Select Item
                                                 Enter: Select
                                                 +/- : Change Opt.
                                                 F1: General Help
                                                 F2: Previous Values
                                                 F9: Optimized Defaults
                                                 F10: Save & Reset
                                                 ESC: Exit


              Version 2.22.1282 Copyright (C) 2022 AMI
```
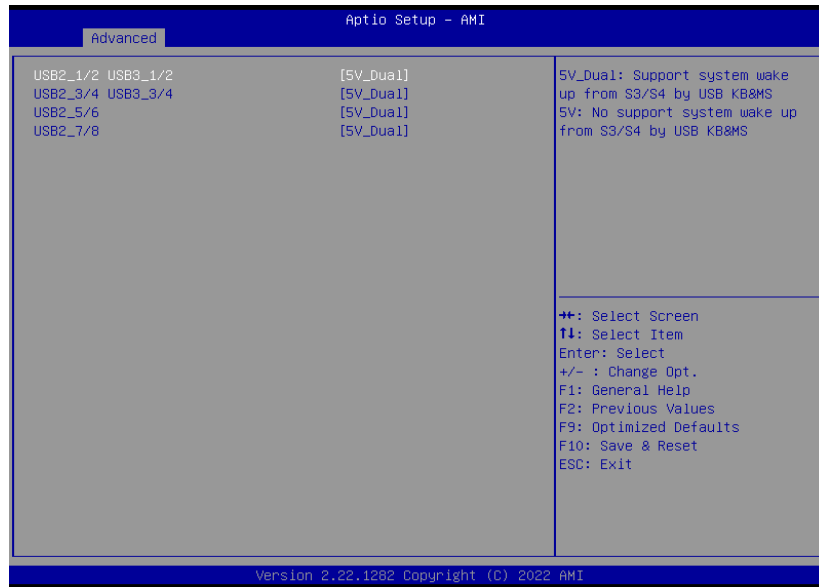
Server CA Configuration

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

▶ **Advanced**

Tls Auth Configuration

```
                        Aptio Setup - AMI
    ┌──────────────┐
    │   Advanced   │
    └──────────────┘
    ▶ Server CA Configuration                    Press <Enter> to configure
                                                 Server CA.
    ▶ Client Cert Configuration




                                                 →←: Select Screen
                                                 ↑↓: Select Item
                                                 Enter: Select
                                                 +/- : Change Opt.
                                                 F1: General Help
                                                 F2: Previous Values
                                                 F9: Optimized Defaults
                                                 F10: Save & Reset
                                                 ESC: Exit


              Version 2.22.1282 Copyright (C) 2022 AMI
```
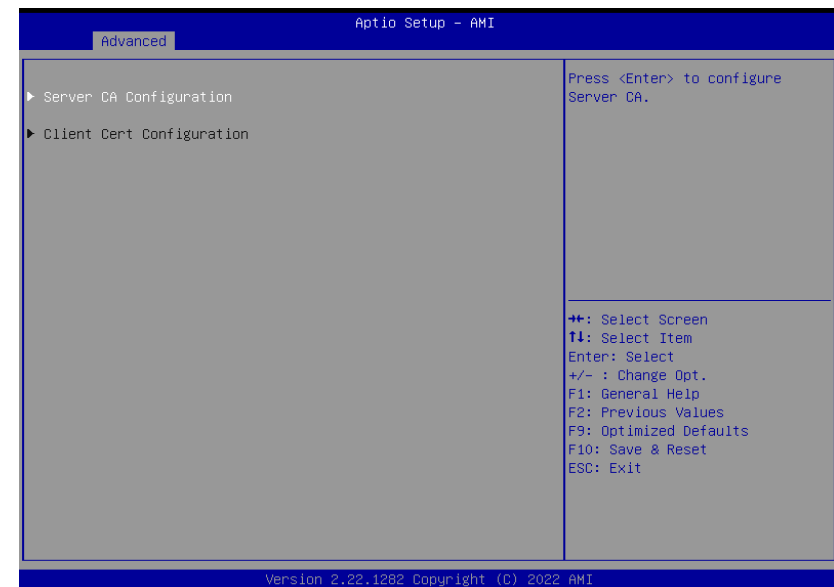
Server CA Configuration

Press <Enter> to configure Server CA.

▶ **Chipset**

```
                          Aptio Setup - AMI
     Main  Advanced  Chipset  Security  Boot  Save & Exit

 ▶ System Agent (SA) Configuration        System Agent (SA) Parameters
 ▶ PCH-IO Configuration




                                          →←: Select Screen
                                          ↑↓: Select Item
                                          Enter: Select
                                          +/- : Change Opt.
                                          F1: General Help
                                          F2: Previous Values
                                          F9: Optimized Defaults
                                          F10: Save & Reset
                                          ESC: Exit



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```

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

System Agent (SA) Configuration

```
                          Aptio Setup - AMI
            Chipset

   System Agent (SA) Configuration          Memory Configuration Parameters

 ▶ Memory Configuration
 ▶ Graphics Configuration
 ▶ VMD setup menu
 ▶ PCI Express Configuration

   VT-d                        [Enabled]
   X2APIC Opt Out              [Disabled]
   DMA Control Guarantee       [Disabled]


                                          →←: Select Screen
                                          ↑↓: Select Item
                                          Enter: Select
                                          +/- : Change Opt.
                                          F1: General Help
                                          F2: Previous Values
                                          F9: Optimized Defaults
                                          F10: Save & Reset
                                          ESC: Exit


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```

Memory Configuration
Memory Configuration Parameter.

Graphics Configuration
Settings about graphic.

VMD setup menu
VMD Configuration Settings

PCI Express Configuration :

VT-d
VT-d capability.

X2APIC Opt Out
Enable/Disable X2APIC_OPT_OUT bit

DMA Control Guarantee
Enable/Disable DMA_Control_Guarantee bit

▶ **Chipset**

System Agent (SA) Configuration▶ **Graphics Configuration**

```
                              Aptio Setup - AMI
          Chipset

   Graphics Configuration                              Select which of IGFX/PEG/PCH
                                                       PCI Graphics device should be
   Primary Display              [Auto]                 Primary Display.
   Internal Graphics            [Auto]
   GTT Size                     [8MB]
   Aperture Size                [256MB]
   DVMT Pre-Allocated           [60M]
   DVMT Total Gfx Mem           [256M]




                                                       ↔: Select Screen
                                                       ↑↓: Select Item
                                                       Enter: Select
                                                       +/- : Change Opt.
                                                       F1: General Help
                                                       F2: Previous Values
                                                       F9: Optimized Defaults
                                                       F10: Save & Reset
                                                       ESC: Exit



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```

Primary Display

Select which of IGFX/PEG/PCI Graphics device to be the primary display.

Internal Graphics

Keep IGFX "Enabled" or "Disabled" based on the setup options, or select "Auto" for auto-detection.

GTT Size

Select the GTT Size

Aperture Size

Select the Aperture Size. Note: Above 4GB MMIO BIOS assignment is automatically enabled when selecting 2048MB aperture. To use this feature, please disable CSM Support.

DVMT Pre-Allocated

Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory Size used by the Internal Graphics Device.

DVMT Total Gfx Mem

Select DVMT 5.0 Total Graphic Memory Size used by the Internal Graphics Device.

▶ **Chipset**

PCH-IO Configuration

```
                              Aptio Setup - AMI
             Chipset

   PCH-IO Configuration                                PCI Express Configuration
                                                       settings
 ▶ PCI Express Configuration
 ▶ SATA And RST Configuration
 ▶ HD Audio Configuration




                                                       ↔: Select Screen
                                                       ↑↓: Select Item
                                                       Enter: Select
                                                       +/- : Change Opt.
                                                       F1: General Help
                                                       F2: Previous Values
                                                       F9: Optimized Defaults
                                                       F10: Save & Reset
                                                       ESC: Exit



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```
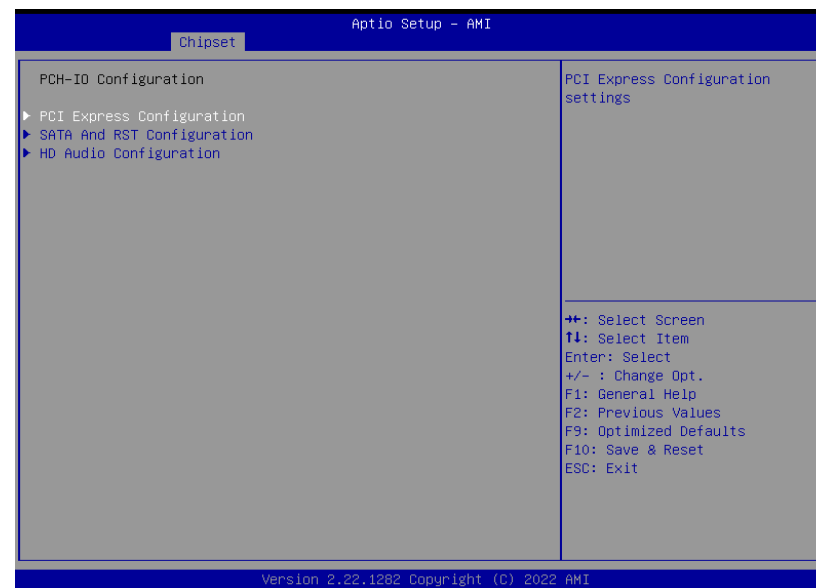
PCI Express Configuration

PCI Express Configuration Settings

SATA And RST Configuration

SATA Device Otpions Settings

HD Audio Configuration

HD Audio Subsystem Configuration Settings

▶ **Chipset**

PCH-IO Configuration▶ **PCI Express Configuration**

```
                          Aptio Setup - AMI
          ┌─────────┐
          │ Chipset │
          └─────────┘
  PCI Express Configuration                        PCI Express Root Port Settings.

  ▶ PCIE1
  ▶ M.2-E
  ▶ M.2-B



                                                   →←: Select Screen
                                                   ↑↓: Select Item
                                                   Enter: Select
                                                   +/- : Change Opt.
                                                   F1: General Help
                                                   F2: Previous Values
                                                   F9: Optimized Defaults
                                                   F10: Save & Reset
                                                   ESC: Exit



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```
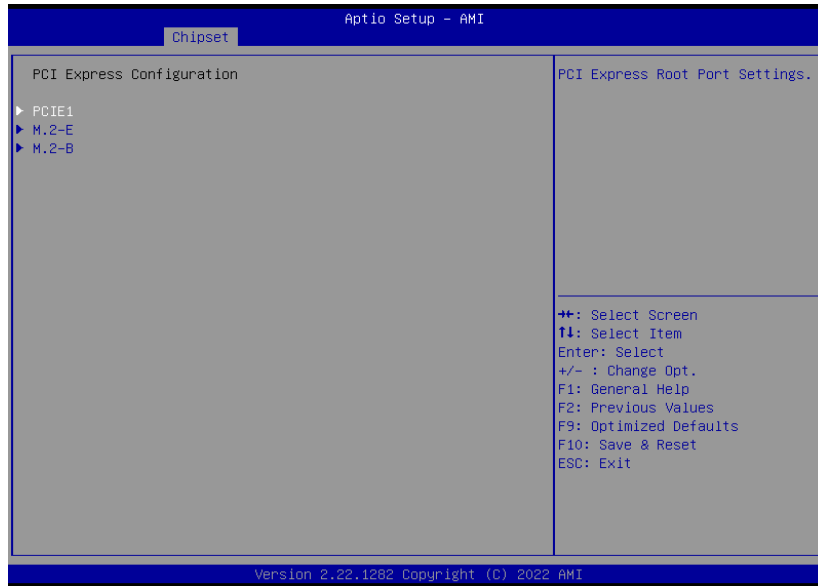
PCIE1, M.2-E, M.2-B

Control the PCI Express Root Port.

PCIe Speed

Select PCIe Speed of the current port — AUTO, Gen1, Gen 2, or Gen3. This field may not appear when the speed of the port is not configurable.

▶ **Chipset**

PCH-IO Configuration▶ **SATA And RST Configuration**

```
                          Aptio Setup - AMI
          ┌─────────┐
          │ Chipset │
          └─────────┘
  SATA And RST Configuration                       Enable/Disable SATA Device.

  SATA Controller(s)            [Enabled]
  SATA Speed                    [Auto]
  SATA Mode Selection           [AHCI]

  Serial ATA Port 0             Empty
    Port 0                      [Enabled]
    Hot Plug                    [Disabled]
  Serial ATA Port 1             Empty
    Port 1                      [Enabled]
    Hot Plug                    [Disabled]
                                                   →←: Select Screen
                                                   ↑↓: Select Item
                                                   Enter: Select
                                                   +/- : Change Opt.
                                                   F1: General Help
                                                   F2: Previous Values
                                                   F9: Optimized Defaults
                                                   F10: Save & Reset
                                                   ESC: Exit


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```

SATA Controller(s)

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

SATA Speed

This field is used to select SATA speed generation limit: Auto, Gen1, Gen2 or Gen3.

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 and Hot Plug

Enable or disable the Serial ATA port and its hot plug function.

▶ **Chipset**

PCH-IO Configuration▶ **HD Audio Configuration**

```
                              Aptio Setup - AMI
              Chipset

    HD Audio Subsystem Configuration Settings        Control Detection of the
                                                     HD-Audio device.
    HD Audio                          [Enabled]      Disabled = HDA will be
                                                     unconditionally disabled
                                                     Enabled = HDA will be
                                                     unconditionally enabled.


                                                     →←: Select Screen
                                                     ↑↓: Select Item
                                                     Enter: Select
                                                     +/- : Change Opt.
                                                     F1: General Help
                                                     F2: Previous Values
                                                     F9: Optimized Defaults
                                                     F10: Save & Reset
                                                     ESC: Exit



                       Version 2.22.1282 Copyright (C) 2022 AMI
```
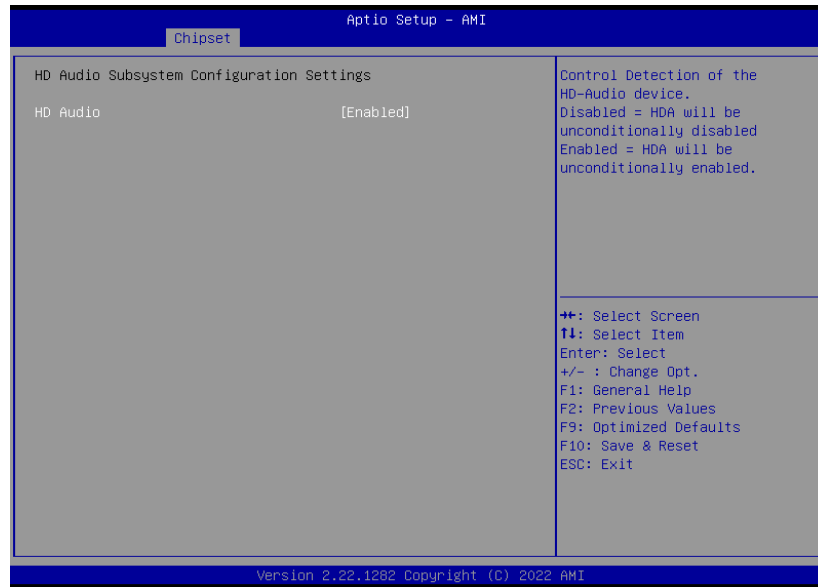
HD Audio

Control the detection of the HD Audio device.

• **Disabled** HDA will be unconditionally disabled.

• **Enabled** HDA will be unconditionally enabled.

▶ **Security**

Secure Boot

```
                         Aptio Setup - AMI
      Main  Advanced  Chipset  Security  Boot  Save & Exit

   Password Description                       Set Administrator Password

   Minimum length                  3
   Maximum length                  20

   Administrator Password

 ▶ Secure Boot
                                              →←: Select Screen
                                              ↑↓: Select Item
                                              Enter: Select
                                              +/- : Change Opt.
                                              F1: General Help
                                              F2: Previous Values
                                              F9: Optimized Defaults
                                              F10: Save & Reset
                                              ESC: Exit

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```

```
                         Aptio Setup - AMI
                             Security

   System Mode              Setup            Secure Boot feature is Active
                                             if Secure Boot is Enabled,
   Secure Boot              [Disabled]       Platform Key(PK) is enrolled
                            Not Active        and the System is in User mode.
                                             The mode change requires
   Secure Boot Mode         [Custom]         platform reset
 ▶ Restore Factory Keys
 ▶ Reset To Setup Mode

 ▶ Key Management
                                              →←: Select Screen
                                              ↑↓: Select Item
                                              Enter: Select
                                              +/- : Change Opt.
                                              F1: General Help
                                              F2: Previous Values
                                              F9: Optimized Defaults
                                              F10: Save & Reset
                                              ESC: Exit

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```
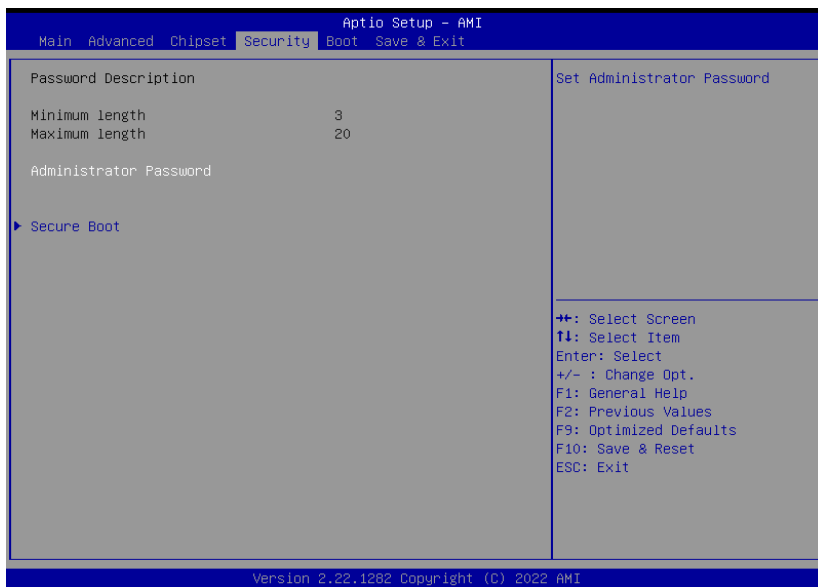
Administrator Password

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

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.
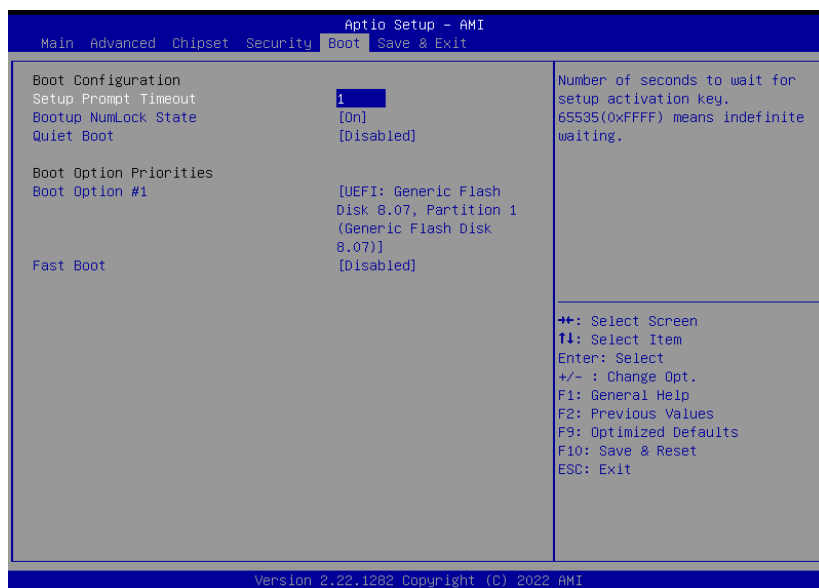
Reset To Setup Mode

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**

```
                           Aptio Setup - AMI
        Main  Advanced  Chipset  Security  Boot  Save & Exit

   Boot Configuration                               Number of seconds to wait for
   Setup Prompt Timeout           1                 setup activation key.
   Bootup NumLock State           [On]              65535(0xFFFF) means indefinite
   Quiet Boot                     [Disabled]        waiting.

   Boot Option Priorities
   Boot Option #1                 [UEFI: Generic Flash
                                  Disk 8.07, Partition 1
                                  (Generic Flash Disk
                                  8.07)]
   Fast Boot                      [Disabled]

                                                    →←: Select Screen
                                                    ↑↓: Select Item
                                                    Enter: Select
                                                    +/- : Change Opt.
                                                    F1: General Help
                                                    F2: Previous Values
                                                    F9: Optimized Defaults
                                                    F10: Save & Reset
                                                    ESC: Exit

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```

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

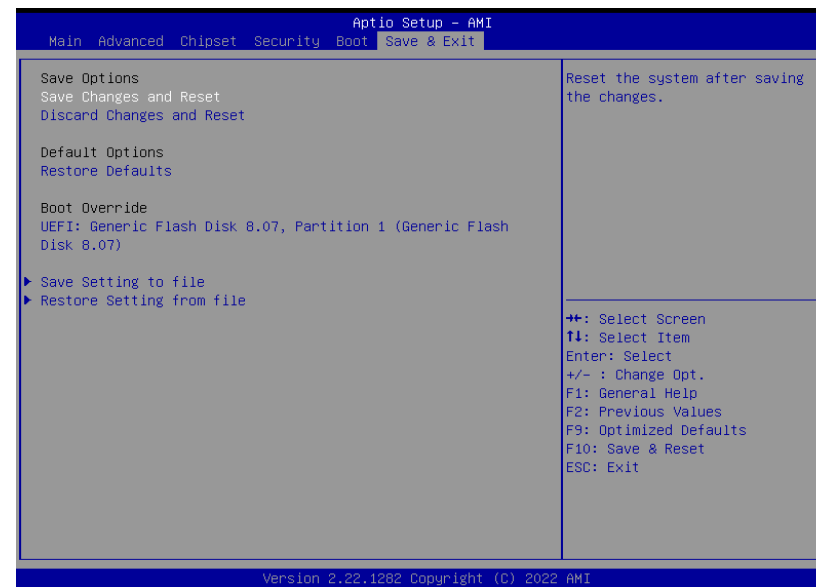Rearrange the system boot order of available boot devices.

Fast Boot

Enables or disables boot with initialization of a minimal set of devices required to launch active boot option. Has no effect for BBS boot options.

> **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 configura-tion. Refer to the Advanced > CSM Configuration submenu for more information.

▶ **Save & Exit**

```
                           Aptio Setup - AMI
        Main  Advanced  Chipset  Security  Boot  Save & Exit

   Save Options                                     Reset the system after saving
   Save Changes and Reset                           the changes.
   Discard Changes and Reset

   Default Options
   Restore Defaults

   Boot Override
   UEFI: Generic Flash Disk 8.07, Partition 1 (Generic Flash
   Disk 8.07)

   ▶ Save Setting to file
   ▶ Restore Setting from file
                                                    →←: Select Screen
                                                    ↑↓: Select Item
                                                    Enter: Select
                                                    +/- : Change Opt.
                                                    F1: General Help
                                                    F2: Previous Values
                                                    F9: Optimized Defaults
                                                    F10: Save & Reset
                                                    ESC: Exit

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```

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.