USER'S MANUAL

DSP302 Series

Digital Signage Player with Intel® Celeron® Processor N6210/J6413

AXIOMTEK

www.axiomtek.com

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Safety Precautions

Before getting started, please read the following important safety precautions.

1. The DSP302 does not come with an operating system which must be loaded first before installation of any software into the computer.
2. Be sure to ground yourself to prevent static charge when installing any internal components. Use a wrist grounding strap and place all electronic components in any static-shielded devices. Most electronic components are sensitive to static electrical charge.
3. Disconnect the power cord from the DSP302 prior to making any installation. Be sure both the system and all external devices are turned OFF. Sudden surge of power could ruin sensitive components. Make sure the DSP302 is properly grounded.
4. Make sure the voltage of the power source is correct before connecting it to any power outlet.
5. Turn Off system power before cleaning. Clean the system using a cloth only. Do not spray any liquid cleaner directly onto the screen.
6. Do not leave equipment in an uncontrolled environment where the storage temperature is below -40℃ or above 80℃ as it may damage the equipment.
7. Do not open the system's back cover. If opening the cover for maintenance is a must, only a trained technician is allowed to do so. Integrated circuits on computer boards are sensitive to static electricity. To avoid damaging chips from electrostatic discharge, observe the following precautions:
   - Before handling a board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. This will help discharge any static electricity on human body.
   - When handling boards and components, wear a wrist grounding strap available from most electronic component stores.

Classifications

1. Degree of production against electric shock: Not classified.
2. Degree of protection against ingress of water: IP40
3. Equipment not suitable for use in the presence of a flammable anesthetic mixture with air, oxygen or nitrous oxide.
4. Mode of operation: Continuous

General Cleaning Tips

Please keep the following precautions in mind while understanding the details fully before and during any cleaning of the computer and any components within.

A piece of dry cloth is ideal to clean the device.

1. Be cautious of any tiny removable components when using a vacuum cleaner to absorb dirt on the floor.
2. Turn the system off before clean up the computer or any components within.
3. Avoid dropping any components inside the computer or getting circuit board damp or wet.
4. For cleaning, be cautious of all kinds of cleaning solvents or chemicals which may cause allergy to certain individuals.
5. Keep foods, drinks or cigarettes away from the computer.

Cleaning Tools:

Although many companies have created products to help improve the process of cleaning computer and peripherals, users can also use house hold items accordingly for cleaning. Listed below are items available for cleaning computer or computer peripherals.

Pay special attention to components requiring designated products for cleaning as mentioned below.

- Cloth: A piece of cloth is the best tool to use when rubbing up a component. Although paper towels or tissues can be used on most hardware as well, it is recommended to use a piece of cloth.
- Water or rubbing alcohol: A piece of cloth may be somewhat moistened with water or rubbing alcohol before being rubbed on the computer. Unknown solvents may be harmful to plastic parts.
- Absorb dust, dirt, hair, cigarette and other particles outside of a computer can be one of the best methods of cleaning a computer. Over time these items may restrict the airflow in a computer and cause circuitry to corrode.
- Cotton swabs: Cotton swaps moistened with rubbing alcohol or water are applicable to reach areas in keyboard, mouse and other areas.
- Foam swabs: If possible, it is better to use lint free swabs such as foam swabs.

Note

It is strongly recommended that customer should shut down the system before starting to clean any single components.

Please follow the steps below:

1. Close all application programs.
2. Close operating software.
3. Turn off power switch.
4. Remove all devices.
5. Pull out power cable.

Scrap Computer Recycling

Please inform the nearest Axiomtek distributor as soon as possible for suitable solutions in case computers require maintenance or repair; or for recycling in case computers are out of order.

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Table of Contents

Section 1
Introduction

This section contains general information and detailed specifications of the DSP302. Section 1 consists of the following sub-sections:

- General Descriptions
- System Specifications
- Dimensions
- I/O Outlets
- Packing List

1.1 General Descriptions

The DSP302 is a fanless digital signage player that comes with an Intel® Elkhart Lake SoC Processors N6210/J6413 with low power consumption design. To fulfill the application needs of digital signage, smart retail, and smart cities, the embedded system supports Windows® 10 IoT, Windows® 11 IoT and can be wall-mounted as optional requests.

The DSP302 features an ultra-slim size, low power consumption, and functions fundamental to successful digital signage deployment. It is equipped with 4GB (8GB as option) LPDDR4 memory onboard, and has a full range of I/O interfaces to support audio, USB 3.2 signals. This compact fanless signage player is capable of serving two or three independent displays with 4K resolution through its HDMI ports. Furthermore, the DSP302 is offering 12 voltage DC power input and two antenna connectors for setting up Wi-Fi networks.

- **Features**
  1. Intel® Celeron® processor N6210/J6413
  2. 4GB LPDDR4 memory onboard (8GB option)
  3. 4 USB 3.2 Gen 2, 1GbE LANs
  4. 3 x HDMI 2.0 for 4K UHD content (CPU: J6413)
  5. 2 x HDMI 2.0 for 4K UHD content (CPU: N6210)
  6. 1 x M.2 Key M support SATA/PCIE x2 signal
  7. 1 x Full-size Mini-PCIe support PCIE x1, USB2.0 signal for WiFi/BT/3G/4G.
  8. Fanless, compact design
  9. Suitable for digital signage and smart retail applications

- **Reliable and Stable Design**
  The DSP302 signage player comes equipped with Intel® Celeron® N6210 processor, Intel® Celeron® J6413 processor, compact design size and basic functions, providing the best solution for smart retails and light industries.

- **Embedded OS Supported**
  The DSP302 supports Windows® 11 IoT, Windows® 10 IoT and Linux.

1.2 System Specifications

1.2.1 CPU

- **CPU**
  - Intel® Celeron® N6210 processor, Intel® Celeron® J6413 processor.

- **Chipset**
  - SoC integrated.

- **BIOS**
  - American Megatrends Inc. UEFI (Unified Extensible Firmware Interface) BIOS. (Elkhart Lake can not suppor Legacy mode under BIOS.)

- **System Memory**
  - 4GB LPDDR4 memory onboard (8GB option).

1.2.2 I/O System

- **Display**
  - 3 x HDMI2.0 (CPU:J6413) (HDMI 2.0 up to 4096 x 2160@60Hz).
  - 2 x HDMI2.0 (CPU:N6210) (HDMI 2.0 up to 4096 x 2160@60Hz).

- **Ethernet**
  - 1 x 10/100/1000 Ethernet port (Realtek RTL8111H).

- **USB Ports**
  - 4 x USB 3.2 GEN2.

- **Expansion Interface**
  - 1 x Full-size Mini-PCIe support PCIE x1, USB2.0 signal.
  - 1 x M.2 Key M 2242 supports SATA/PCIE x2 signal.
  - Optional: QCNFA324 for Wi-Fi/Bluetooth
  - Optional: LE910C4-NF for 4G/LTE

- **Storage**
  - 1 x eMMC 64GB (128GB option).
  - 1 x M.2 Key M 2242 supports SATA/PCIE x2 signal.
  - 1 x SIM slot.

- **Audio**
  - HD audio compliant with Realtek ALC888.
  - Support Line-out and MIC-in through 1 x audio jack.

- **Indicator**
  - 1 x Power LED.

- **Switch**
  - 1 x Power button.

- **Antenna**
  - 2 x SMA type connector openings for antenna.

1.2.3 System Specification

- **Watchdog Timer**
  - 1~255 seconds or minutes; up to 255 levels.
- **Power Supply**
  - 12VDC /36W AC to DC adapter.
- **Operation Temperature**
  - 0˚C ~ +45˚C (32˚F ~ 113˚F).
- **Humidity**
  - 10% ~ 95% (non-condensation).
- **Vibration Endurance**
  - 3Grm (5-500Hz, X, Y, Z directions).
- **Weight**
  - 1.15 kg (2.53 lb) without package.
  - 1.50 kg (3.3 lb) with package.
- **Dimension**
  - 106.2 mm (4.19") x 133 mm (5.24") x 39.6 mm (1.56").

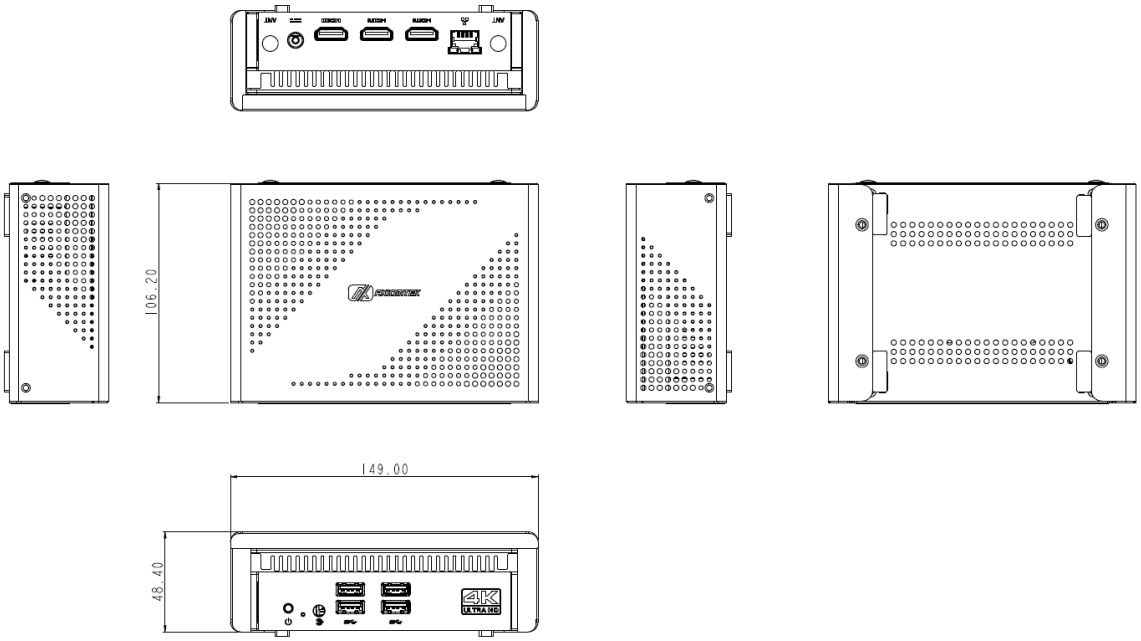
Note

All specifications and images are subject to change without notice.

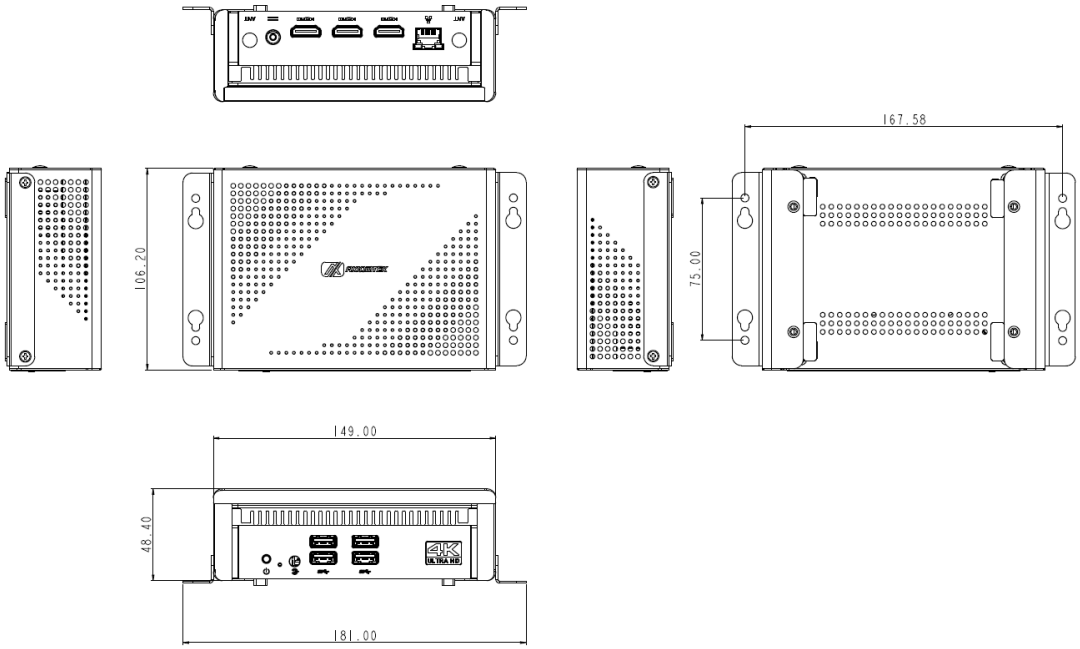
1.3 Dimensions

The following diagrams show dimensions and outlines of the DSP302.

1.3.1 System Dimensions



1.3.2 Optional Wall-mount Bracket Dimensions



Instruction
Step 1: Screw the two pieces of wall-mount (721000044900 DSP302 WALL MOUNT) kits to the bottom plate of the device. Total four screws (metric 3x6) are required.

Step 2: Use the device, with wall mount plate attached, as a guide to mark the correct locations of the four screws.

Step 3: Insert a tapping-screw (thread diameter less than 4mm) head through middle of the keyhole-shaped aperture on the plate, and then slide the device downwards. Tighten the screw head for added stability.

1.4 I/O Outlets

The following figures show I/O outlets on the DSP302.

Front View

Rear View

1.5 Packing List

The DSP302 comes with the following bundle package:

- **DSP302 System Unit x1**

- **DSP302 I/O mylar x 2**
  643000003400 Mylar Front 2HDMI version
  643000003500 Mylar Front 3HDMI version
  643000003600 Mylar Rear

- **AC 36W (12V/3A) Adaptor x1**

- **Optional Antenna**

- **Optional Full-size Mini-PCIe WIFI/BT/3G/4G module**

- **Optional M.2 Key M SSD**

- **Optional Power Cord**

- **Optional Wall-mount bracket**
  721000044900 WALL MOUNT

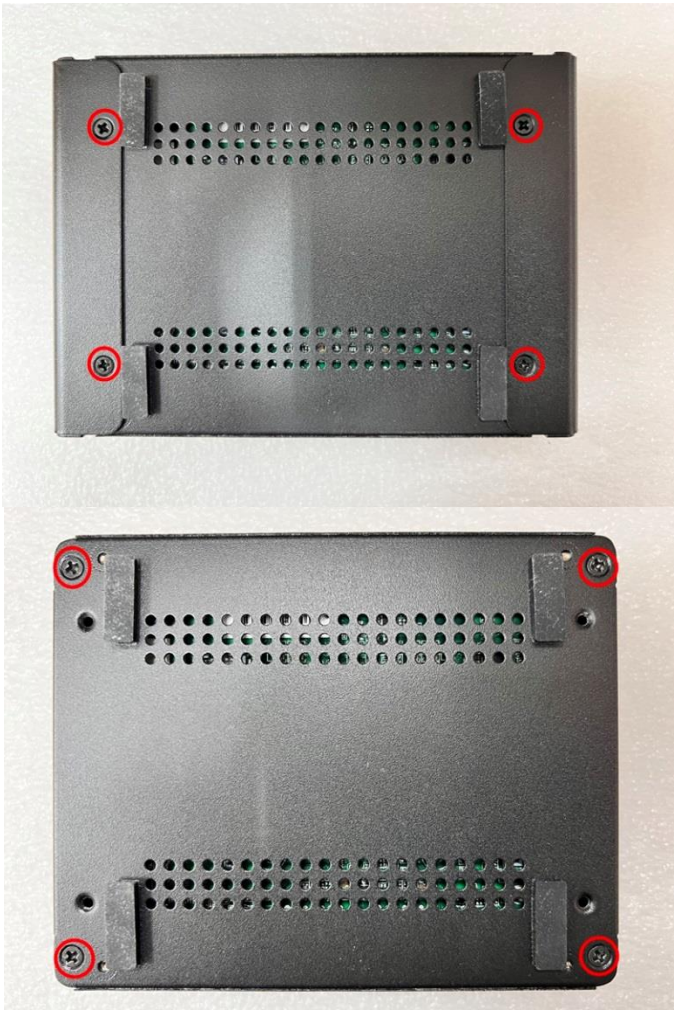
Section 2
Hardware Installation

The DSP302 is convenient for various hardware configurations such as, M.2 Device and Mini PCIe modules. Section 2 contains guidelines for hardware installation.

2.1 Installation of M.2 Device

Step 1 **Turn off the system and unplug the power cord.**

Step 2 **Turn the system upside down to locate screws at the bottom and back then loosen all screws.**



Step 3 **Open the TOP cover.**

Step 4 **Located the M.2 socket on main board.**

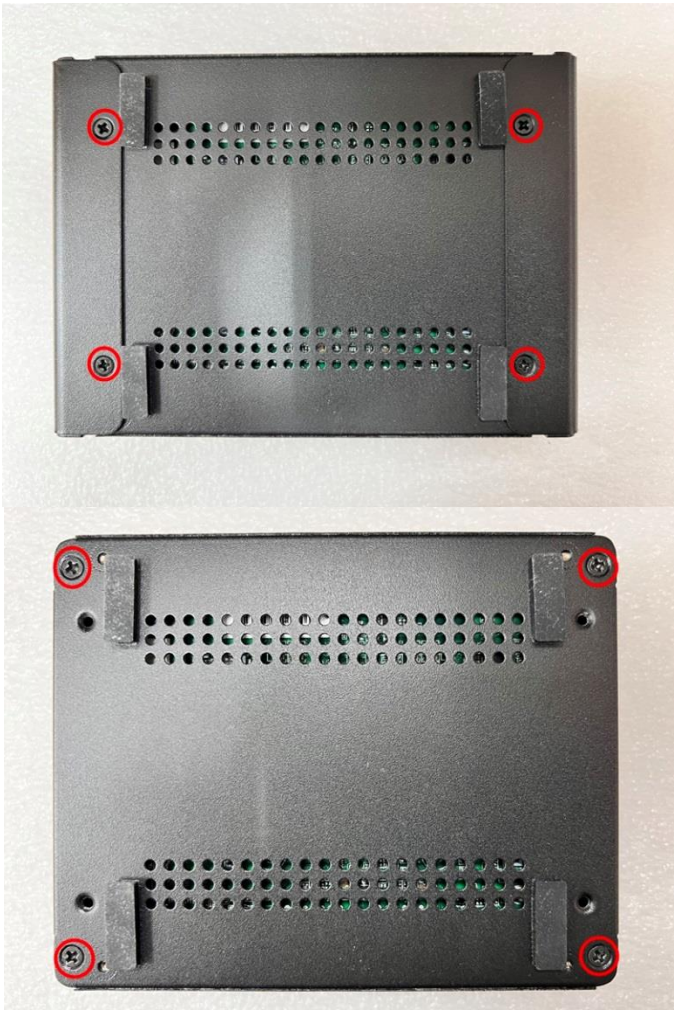
Step 5 **Locate the M.2 slot and insert a M.2 module into the socket and then tighten the screw.**

Step 6 **Put the TOP cover and tighten four screws back onto the system.**

2.2 Installation of Mini PCIe Module

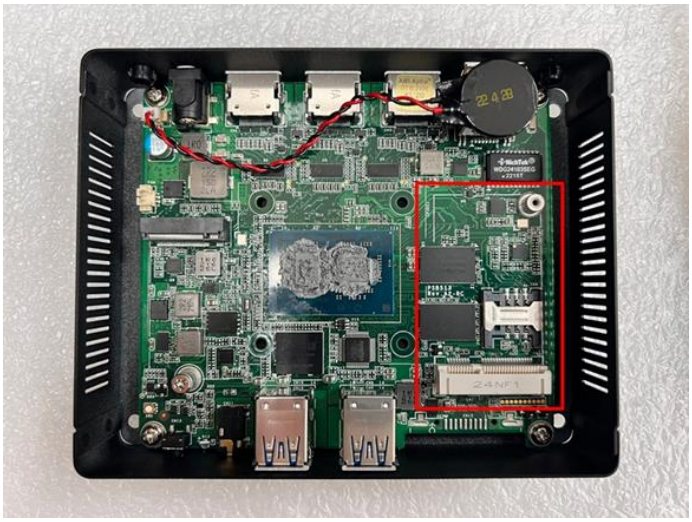
Step 1 **Turn off the system and unplug the power cord.**

Step 2 **Turn the system upside down to locate screws at the bottom and back then loosen all screw.**



Step 3 Open the TOP cover.

Step 4 Locate the M.2 socket on main board.



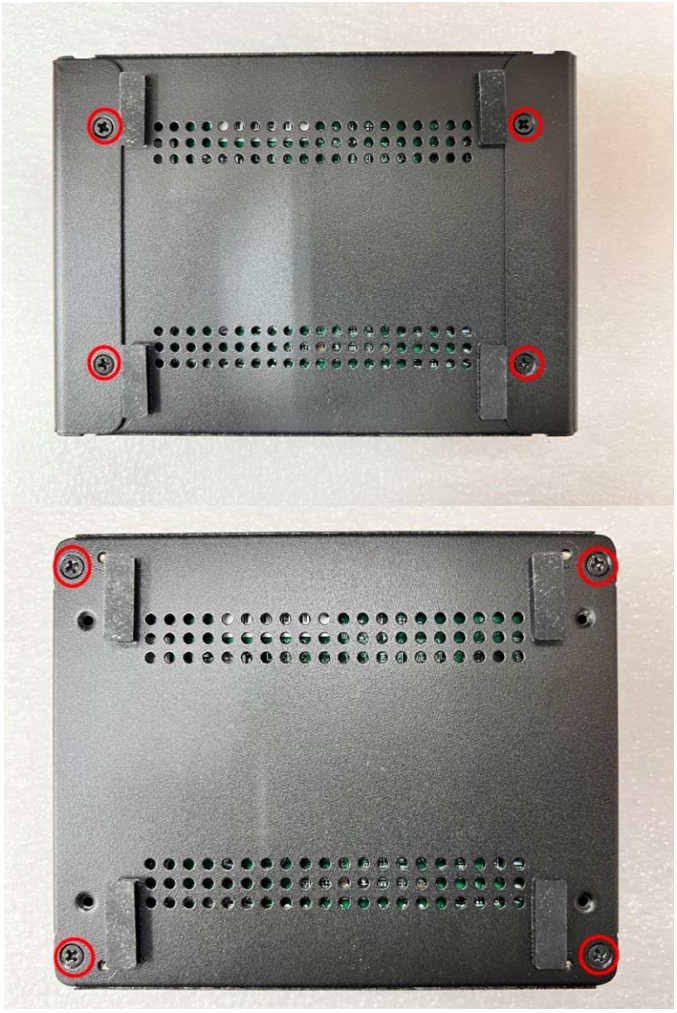
Step 5 Locate the Mini PCIe slot and insert a Mini PCIe module into the socket and then fasten a screw.

Step 6 **Put the TOP cover and fasten four screws back onto the system.**

2.3 Installation of SIM Card

Step 1 **Turn off the system and unplug the power cord.**

Step 2 **Turn the system upside down to locate screws at the bottom and back then loosen all screws.**



Step 3 Open the TOP cover.

Step 4 Locate the SIM Card socket on main board.

Step 5 Identify the SIM Card slot, insert a SIM Card device into the socket and then fasten a screw.

Step 6 Put the TOP cover and fasten all screws back onto the system.

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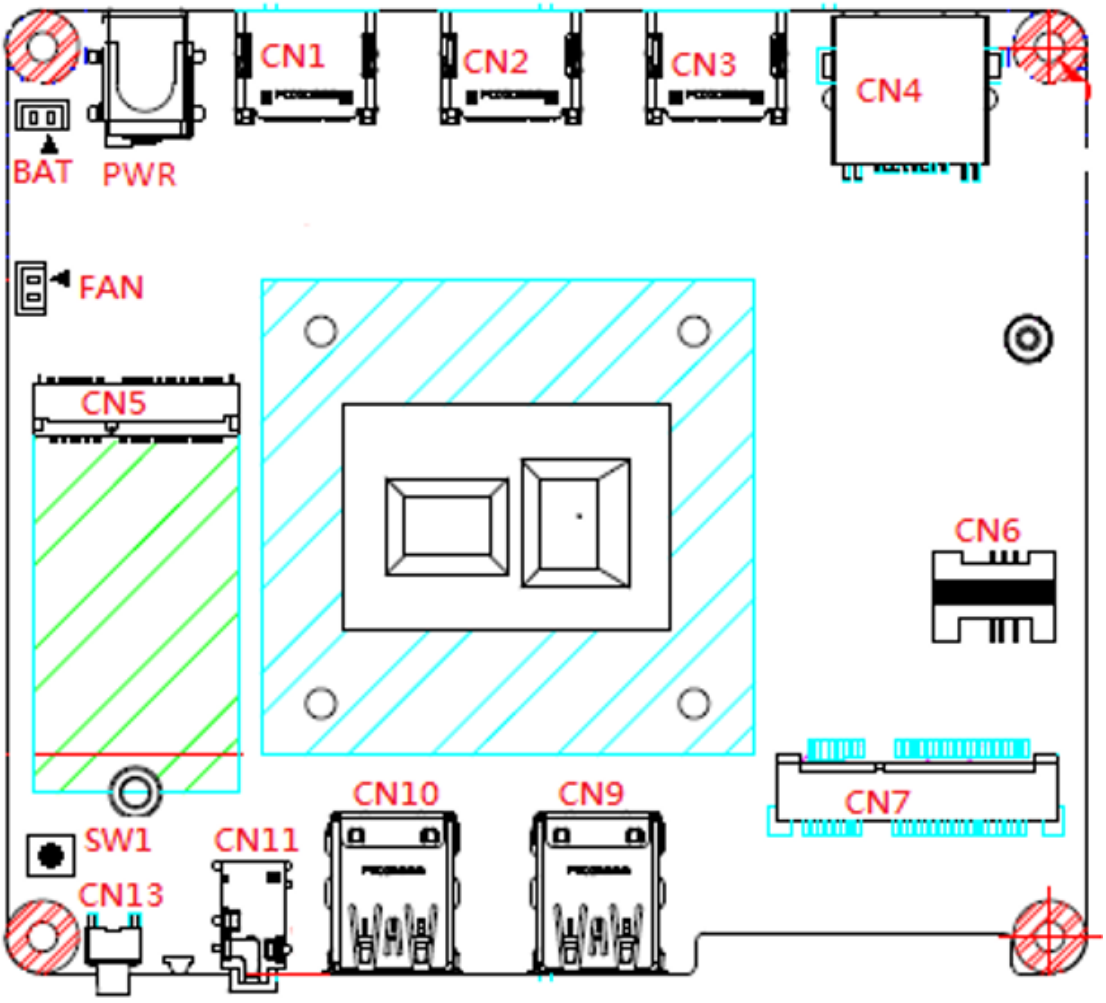
Section 3
Switch and Connector Settings

Proper jumper settings configure the DSP302 to meet various application needs. Hereby all jumpers settings along with their default settings are listed for devices onboard.

3.1 Locations of Switch and Connectors



PSB513 Top View

Note

It is strongly recommended that any unmentioned jumper settings should not be modified without instructions by Axiomtek FAEs. Any modifications without instructions might cause system failure.

3.2 Summary of Switch Settings

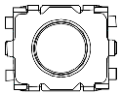
Proper switch setting configures the DSP302 to meet various application purposes. A table of default setting is listed below.

Switch	Description	Setting
SW1	Restore BIOS optimal defaults Default: Normal operation	Release

3.2.1 Restore BIOS Optimal Defaults (SW1)

Use SW1 to restore CMOS. To restore BIOS optimal defaults, press the tact switch for at least 3 seconds, then release.

Function	Setting
Normal (Default)	Release
Restore BIOS optimal defaults	Press



3.3 Connectors

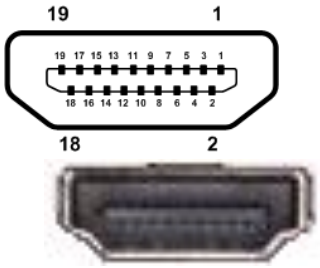
Signals go to the other parts of the system through connectors. Loose or improper connection might cause problems. Please make sure all connectors are properly and firmly connected. Here is a table summarizing the connectors on the hardware.

Connector	Description
CN1	HDMI3 Connector
CN2	HDMI2 Connector
CN3	HDMI1 Connector
CN4	Ethernet Port
CN5	M.2 Key M Connector (PCIe/SATA)
CN6	SIM Card Slot
CN7	Full-size PCI-Express Mini Card Connector
CN9	USB 3.2 GEN2 Type A Ports (Dual Port)
CN10	USB 3.2 GEN2 Type A Ports (Dual Port)
CN11	Audio Jack
PWR	DC Power Jack
BAT1	CMOS Battery Connector
FAN	CPU FAN Connector
CN13	Power On/Off Button

3.3.1 HDMI Connectors (CN1~CN3)

The HDMI (High-Definition Multimedia Interface) is a compact digital interface which is capable of transmitting high-definition video and high-resolution audio over a single cable.

Pin	Signal	Pin	Signal
1	HDMI OUT_DATA2+	2	GND
3	HDMI OUT_DATA2-	4	HDMI OUT_DATA1+
5	GND	6	HDMI OUT_DATA1-
7	HDMI OUT_DATA0+	8	GND
9	HDMI OUT_DATA0-	10	HDMI OUT_Clock+
11	GND	12	HDMI OUT_Clock-
13	N.C.	14	N.C.
15	HDMI OUT_SCL	16	HDMI OUT_SDA
17	GND	18	+5V
19	HDMI_HTPLG		

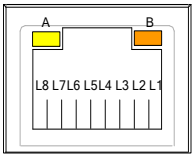


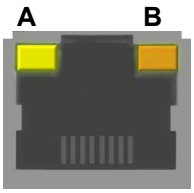
3.3.2 Ethernet Port (CN4)

The board has two RJ-45 connectors: LAN Connection can be established by plugging one end of the Ethernet cable into:

- LAN (RTL888H) and the other end (phone jack) to a 1000/100/10-Base-T hub.

Pin	1000 Base-T	100/10 Base-T	Description
L1	BI_DA+	TX+	Bidirectional or Transmit Data+
L2	BI_DA-	TX-	Bidirectional or Transmit Data-
L3	BI_DB+	RX+	Bidirectional or Receive Data+
L4	BI_DC+	N.C.	Bidirectional or Not Connected
L5	BI_DC-	N.C.	Bidirectional or Not Connected
L6	BI_DB-	RX-	Bidirectional or Receive Data-
L7	BI_DD+	N.C.	Bidirectional or Not Connected
L8	BI_DD-	N.C.	Bidirectional or Not Connected
A	Active Link LED Off: No link Blinking: Data activity detected		
B	Speed LED Green: 100 (for LAN1) Orange: 1000 OFF: 10 (for LAN1)		



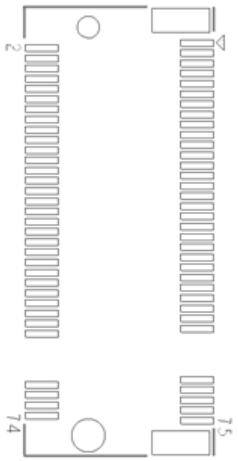


3.3.3 M.2 Key M Connector (CN5)

This system has one M.2 Key M socket for inserting M.2 2242 SATA & NVMe PCIE X2 SSD module.

PCH will automatically detect SATA/NVMe (since they share the same pinout) without the need for BIOS configuration.

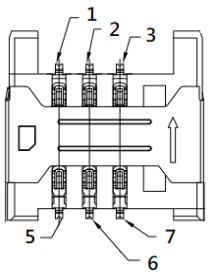
Pin	Signal	Pin	Signal
1	GND	2	+3.3V_SBY
3	GND	4	+3.3V_SBY
5	NC	6	NC
7	NC	8	NC
9	GND	10	NC
11	GND	12	+3.3V_SBY
13	NC	14	+3.3V_SBY
15	NC	16	+3.3V_SBY
17	GND	18	+3.3V_SBY
19	NC	20	NC
21	GND	22	NC
23	NC	24	NC
25	NC	26	NC
27	GND	28	NC
29	PCIE_8_RXN	30	NC
31	PCIE_8_RXP	32	NC
33	GND	34	NC
35	PCIE_8_TXN	36	NC
37	PCIE_8_TXP	38	DEVSLP1
39	GND	40	NC
41	PCIE_9_RXP/ SATA_1_RXP	42	NC
43	PCIE_9_RXN/ SATA_1_RXN	44	NC
45	GND	46	NC
47	PCIE_9_TXN/ SATA_1_TXN	48	NC
49	PCIE_9_TXP/ SATA_1_TXP	50	PERST#
51	GND	52	CLK_REQ2
53	PCIE_CLK2_N	54	PEWAKE#
55	PCIE_CLK2_P	56	NC
57	GND	58	NC
59	**KEY M**	60	**KEY M**
61		62	
63		64	
65		66	
67	NC	68	SUSCLK
69	PEDET	70	+3.3V_SBY
71	GND	72	+3.3V_SBY
73	GND	74	+3.3V_SBY
75	GND		



3.3.4 SIM Card Slot (CN6)

- 1 x External SIM Card slot (for PCI-Express Mini Card socket)
- 2 x Antenna holes

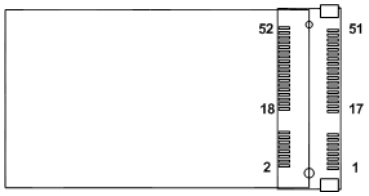
Pin	Signal
1	SIM_PWR
2	SIM_RESET
3	SIM_CLK
5	GND
6	SIM_VPP
7	SIM_DATA

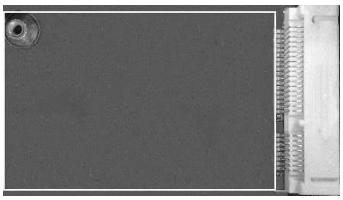


3.3.5 Full-size PCI-Express Mini Card Connector (CN7)

This is a full-size PCI-Express Mini Card connector complying with PCI-Express Mini Card Spec. V1.2. Located on the bottom side of the board and supports either PCI-Express or USB.

Pin	Signal	Pin	Signal
1	WAKE#	2	+3.3V_SBY
3	NC	4	GND
5	NC	6	+1.5VS
7	CLK_REQ1	8	SIM_PWR
9	GND	10	SIM_DATA
11	PCIE_CLK1_N	12	SIM_CLK
13	PCIE_CLK1_P	14	SIM_REST
15	GND	16	SIM_VPP
17	NC	18	GND
19	NC	20	NC
21	GND	22	PERST#
23	PCIE_RX2_N	24	+3.3V_SBY
25	PCIE_RX2_P	26	GND
27	GND	28	+1.5VS
29	GND	30	SMB_CLK
31	PCIE_TX2_N	32	SMB_DATA
33	PCIE_TX2_P	34	GND
35	GND	36	USB_DN4
37	GND	38	USB_DP4
39	+3.3V_SBY	40	GND
41	+3.3V_SBY	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	+1.5VS
49	NC	50	GND
51	NC	52	+3.3V_SBY

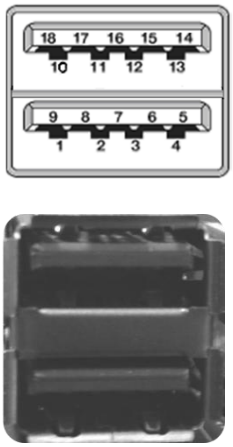




3.3.6 USB 3.2 Gen2 Type A Ports (CN9 and CN10)

The board comes with one Universal Serial Bus (compliant with USB 3.2 Gen 2 (10Gb/s)) ports on the rear I/O for installing USB peripherals such as keyboard, mouse, scanner, etc.

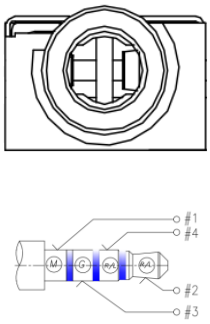
Pin	Signal	Pin	Signal
1	USB_VCC (+5V)	10	USB_VCC (+5V)
2	USB_DN0	11	USB_DN1
3	USB_DP0	12	USB_DP1
4	GND	13	GND
5	USB3_RXN0	14	USB3_RXN1
6	USB3_RXP0	15	USB3_RXP1
7	GND	16	GND
8	USB3_TXN0	17	USB3_TXN1
9	USB3_TXP0	18	USB3_TXP1



3.3.7 Audio Jack Line-out (CN11)

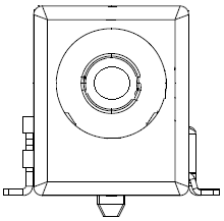
The board provides one HD audio combo jack Line out/Mic in connector.

Pin	Signal
1	SLEEVE
2	RING
3	LINEOUT_L
4	LINEOUT_R
5	GND
6	HPOUT_JD



3.3.8 DC Power Jack (PWR)

The system supports 12V DC-in connector for system power input.



3.3.9 CMOS Battery Connector (BAT1)

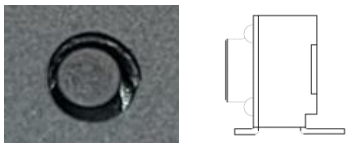
This is a connector for CMOS battery interface.

Pin	Signal
1	BAT1 (+3.3V level)
2	GND

3.3.10 Power On/Off Button (CN13)

It allows users to control PSB513 power on/off.

Function	Description
On	Turn on/off system
Off	Keep system status



Section 4
AMI BIOS Setup Utility

This section provides users with detailed descriptions in term of how to set up basic system configuration through the BIOS setup utility.

4.1 Entering Setup

To enter the setup screens, follow the steps below:

1. Turn on the computer and press <Del> key immediately.
2. After you press the <Del> key, the main BIOS setup menu displays. You can access the other setup screens from the main BIOS setup menu, such as the Advanced and Chipset menus.

It is strongly recommended that users should avoid changing the chipset's defaults. Both AMI and system manufacturer have carefully set up these defaults that provide the best performance and reliability.

4.2 Navigation Keys

The BIOS setup/utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process. These keys include <F1>, <F2>, <Enter>, <ESC>, <Arrow> keys, and so on.

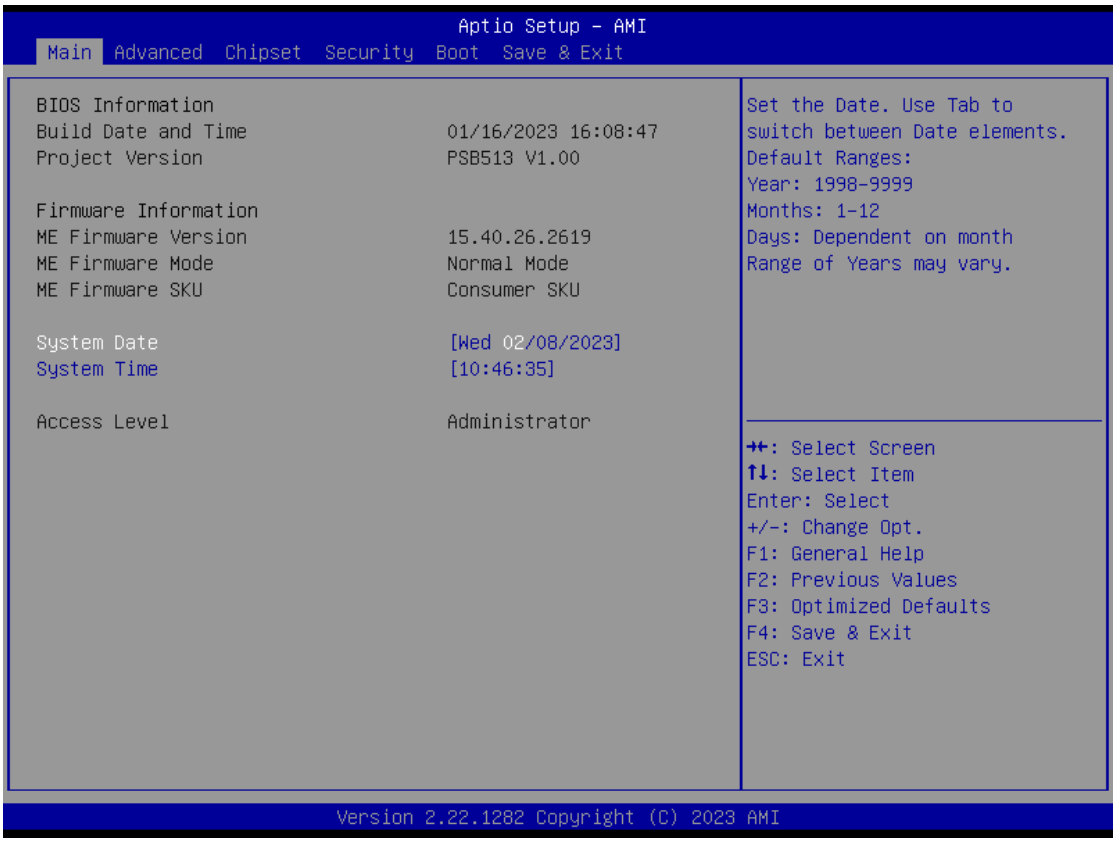
Note

Some of the navigation keys differ from one screen to another.

Hot Keys	Description
→← **Left/Right**	The Left and Right <Arrow> keys allow you to select a setup screen.
↑↓ **Up/Down**	The Up and Down <Arrow> keys allow you to select a setup screen or sub screen.
Enter	The <Enter> key allows you to display or change the setup option listed for a particular setup item. The <Enter> key can also allow you to display the setup sub screens.
+– Plus/Minus	The Plus and Minus <Arrow> keys allow you to change the field value of a particular setup item.
F1	The <F1> key allows you to display the General Help screen.
F2	The <F2> key allows you to Load Previous Values.
F3	The <F3> key allows you to Load Optimized Defaults.
F4	The <F4> key allows you to save any changes you have made and exit Setup. Press the <F4> key to save your changes.
Esc	The <Esc> key allows you to discard any changes you have made and exit the Setup. Press the <Esc> key to exit the setup without saving any changes.

4.3 Main Menu

When you first enter the setup utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab. System Time/Date can be set up as described below. The Main BIOS setup screen is shown below.



BIOS/Firmware Information
Display the BIOS/Firmware information.

System Date/Time
Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format.

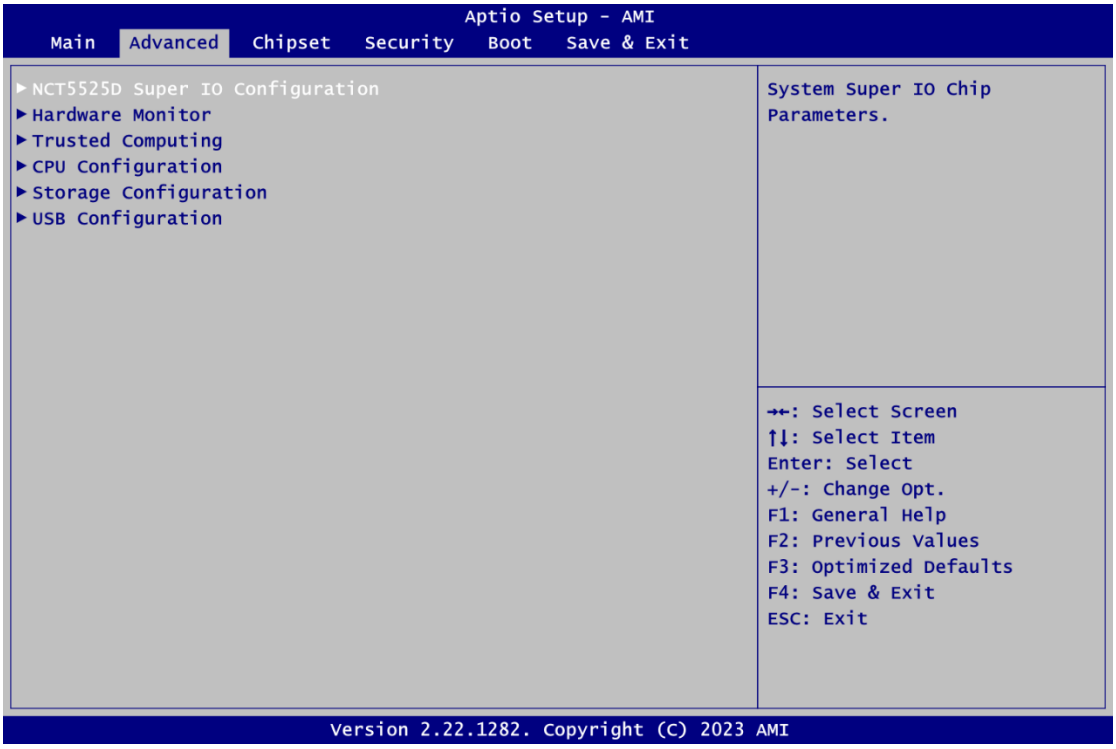
Access Level
Display the access level of current user.

4.4 Advanced Menu

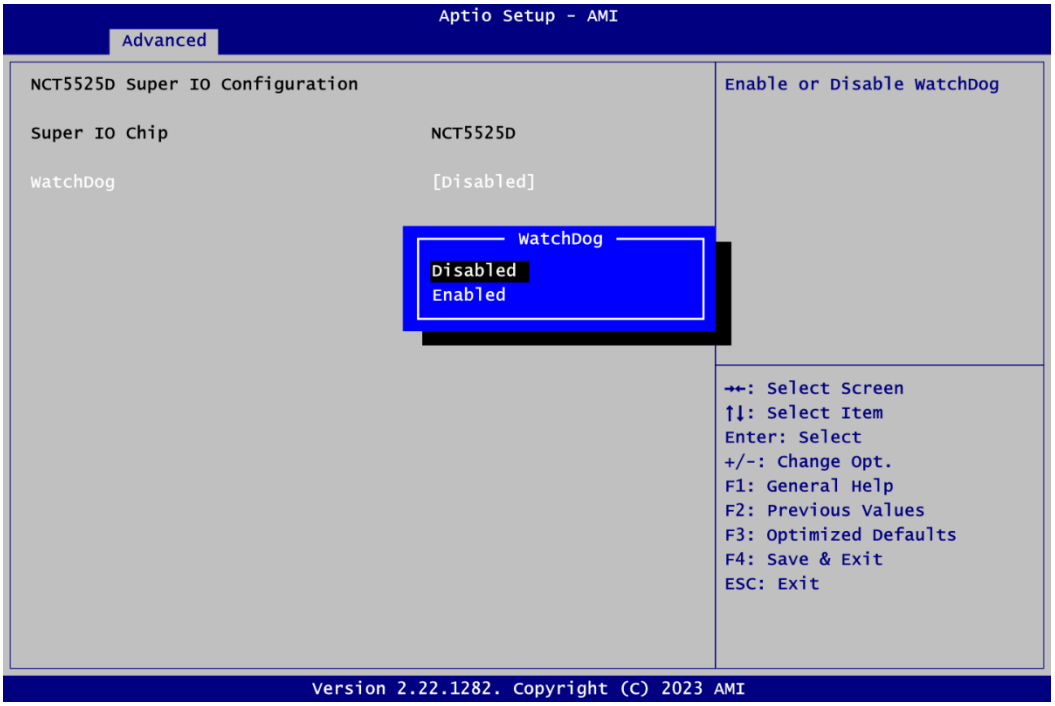
This Advanced section allows users to configure and improve the system, or to set up some system features according to preference. You can select any of the items in the left frame of the screen to go to the sub menus:

- ▶ NCT5525D Super IO Configuration
- ▶ Hardware Monitor
- ▶ Trusted Computing
- ▶ CPU Configuration
- ▶ Storage Configuration
- ▶ USB Configuration

For items marked with "▶", please press <Enter> for more options.

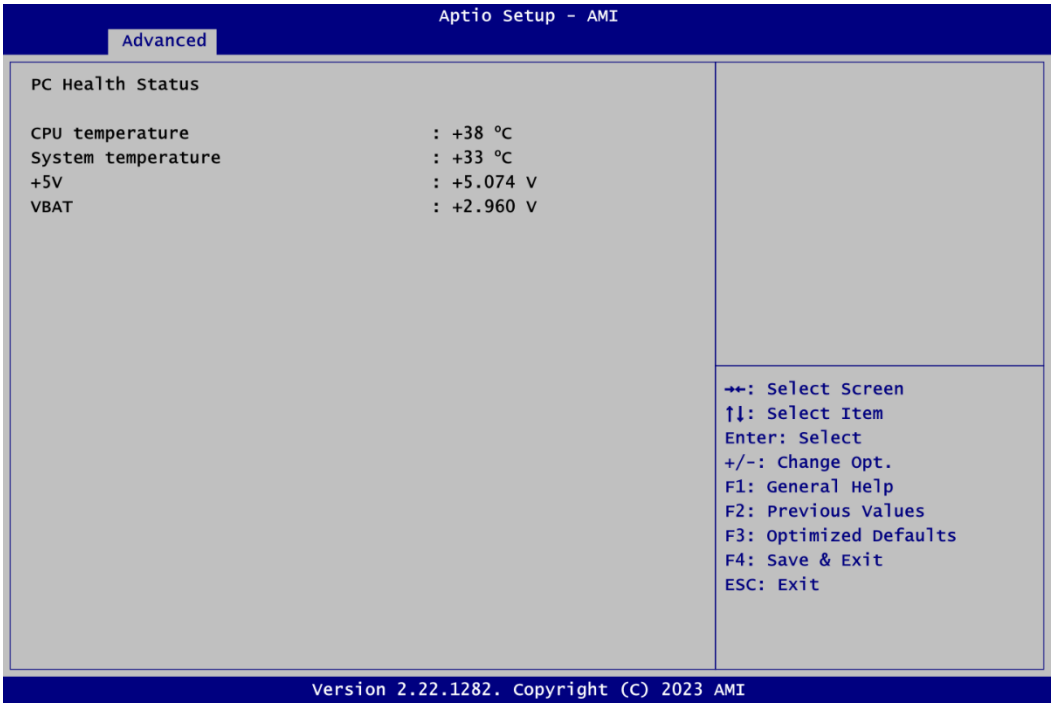


- **NCT5525D Super IO Configuration**
  You can use this screen to select options for the Super IO Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen. For items marked with "▶", please press <Enter> for more options.

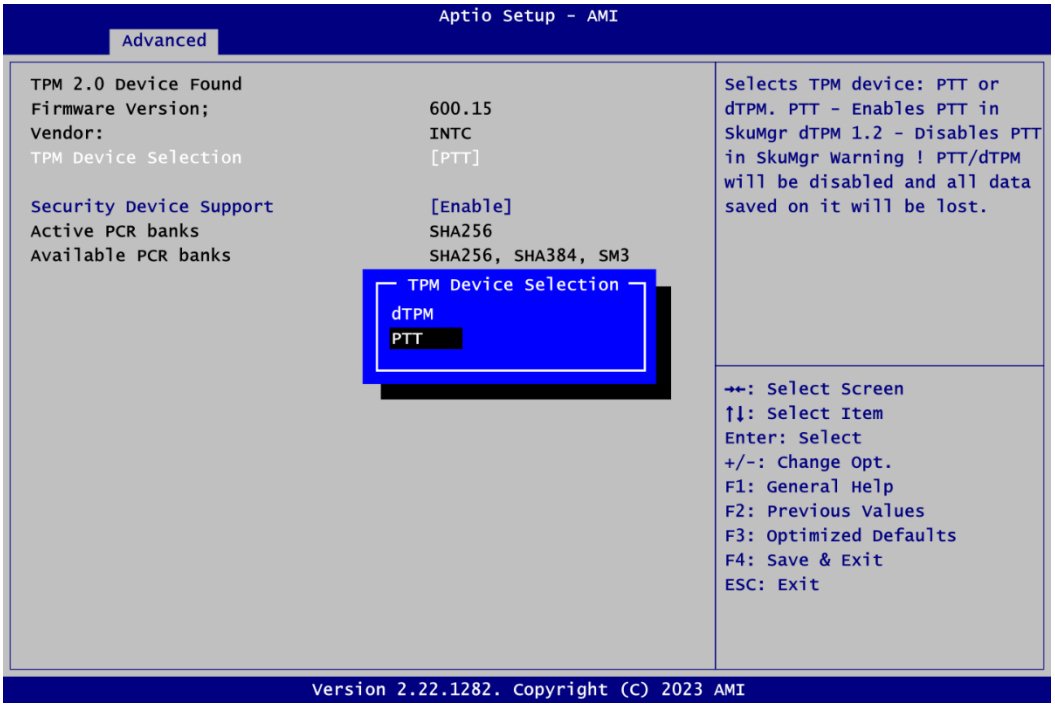


WatchDog
Enable or disable WatchDog.

- **Hardware Monitor**
  This screen displays the temperature of system and CPU, as well as system voltages (+5V and VBAT).



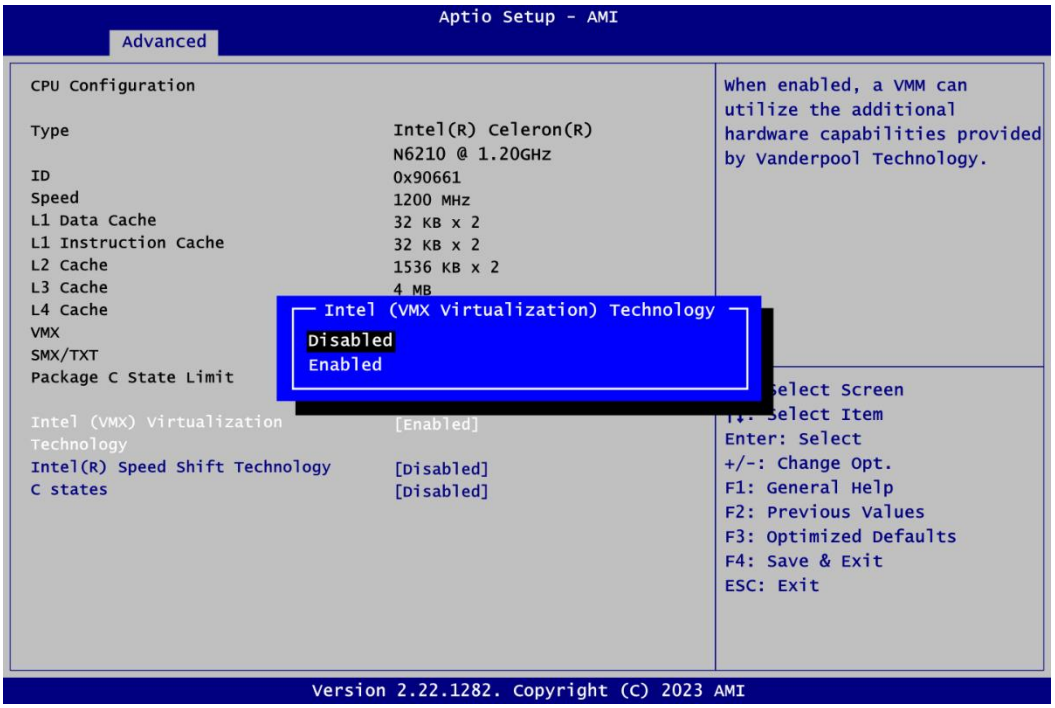
- **Trusted Computing**
  In terms of Trusted Platform Module Device, users can choose between disabling TPM and enabling Platform Trust Technology.



TPM Device Selection
Select TPM device:
- PTT: Intel® built-in TPM.
- dTPM: External extended Infineon's TPM (optional).

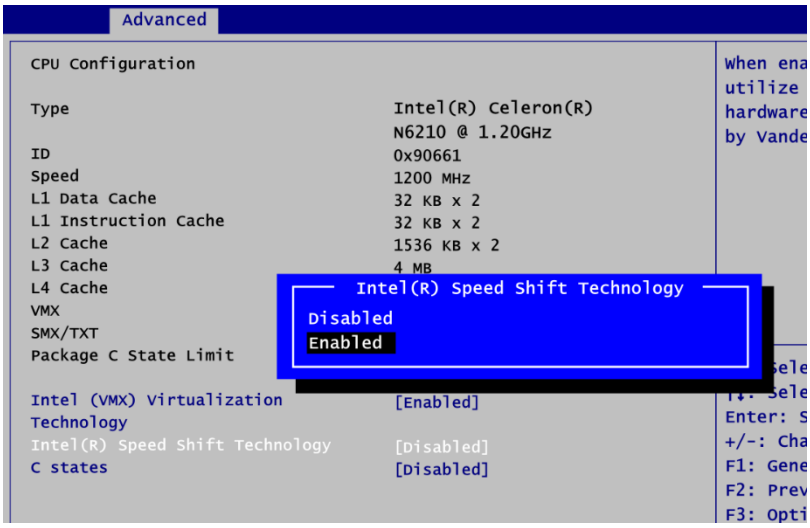
Security Device Support
Enable or disable BIOS support for security device, see image below. OS will not show security device. TCG EFI protocol and INT1A interface will not be available.

- **CPU Configuration**
  This screen shows CPU information, and you can change the value of the selected option.



Intel (VMX) Virtualization Technology
Enable or disable Intel Virtualization Technology. When enabled, a VMM (Virtual Machine Mode) can utilize the additional hardware capabilities. It allows a platform to run multiple operating systems and applications independently, hence enabling a single computer system to work as several virtual systems.

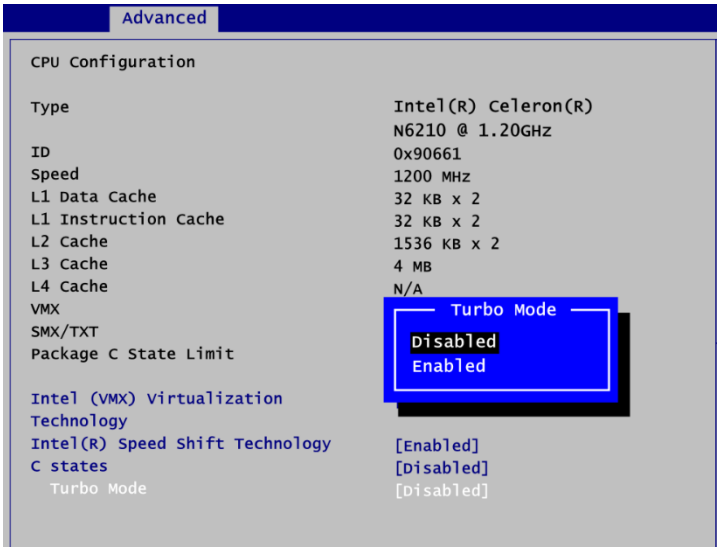
Intel® Speed Shift Technology
Enable or disable to Intel® Speed Shift Technology. The default is disabled.



Turbo Mode

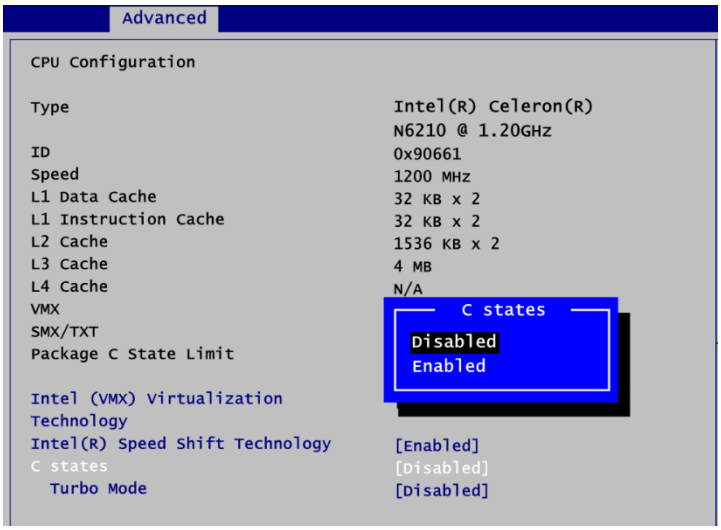
When set default of Intel® Speed Shift Technology to Enabled, the setup item "Turbo Mode" will be shown in BIOS setup.

Enable or disable processor Turbo Mode. The processor can be up to maximum turbo frequency when the workload of system becomes higher.

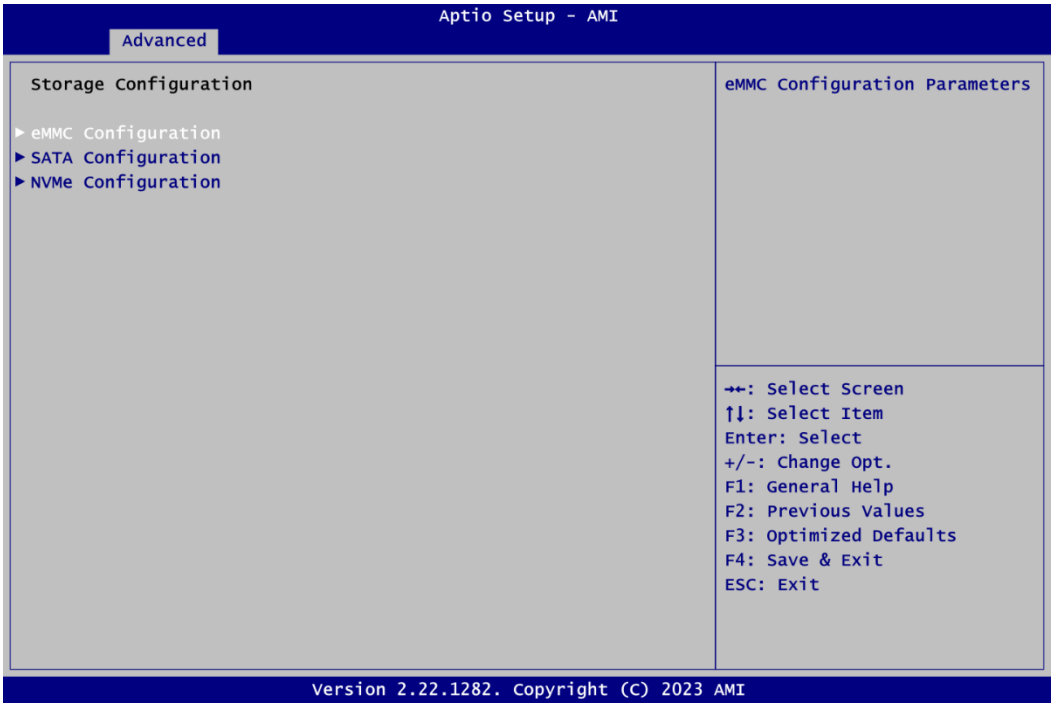


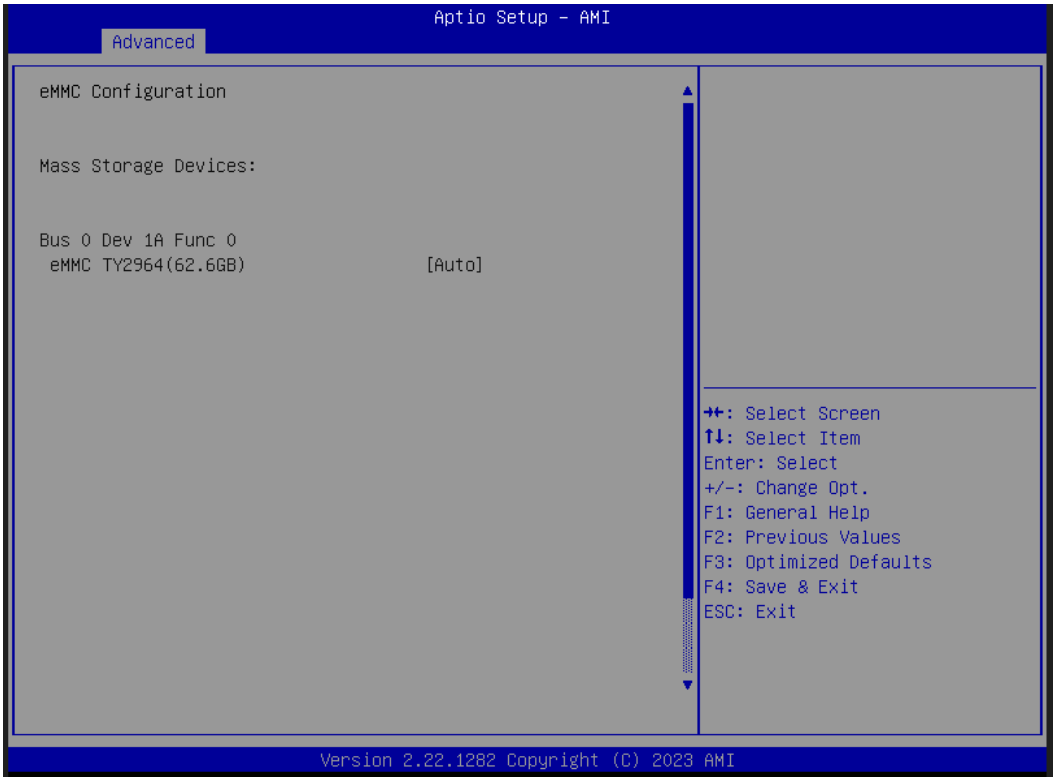
C states

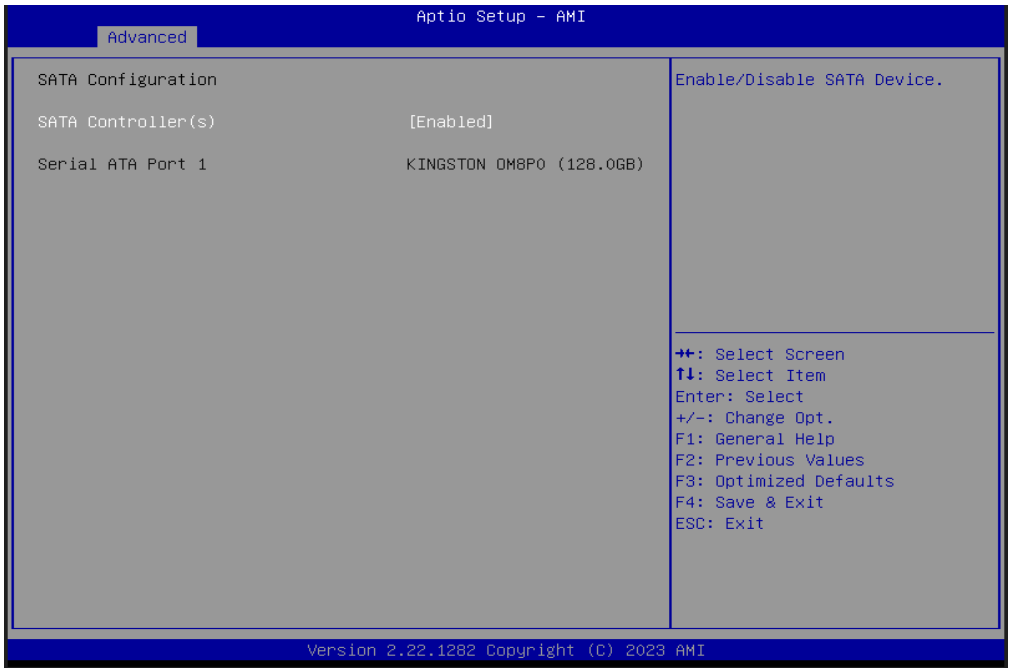
Enabled or disabled C states. The default is disabled.

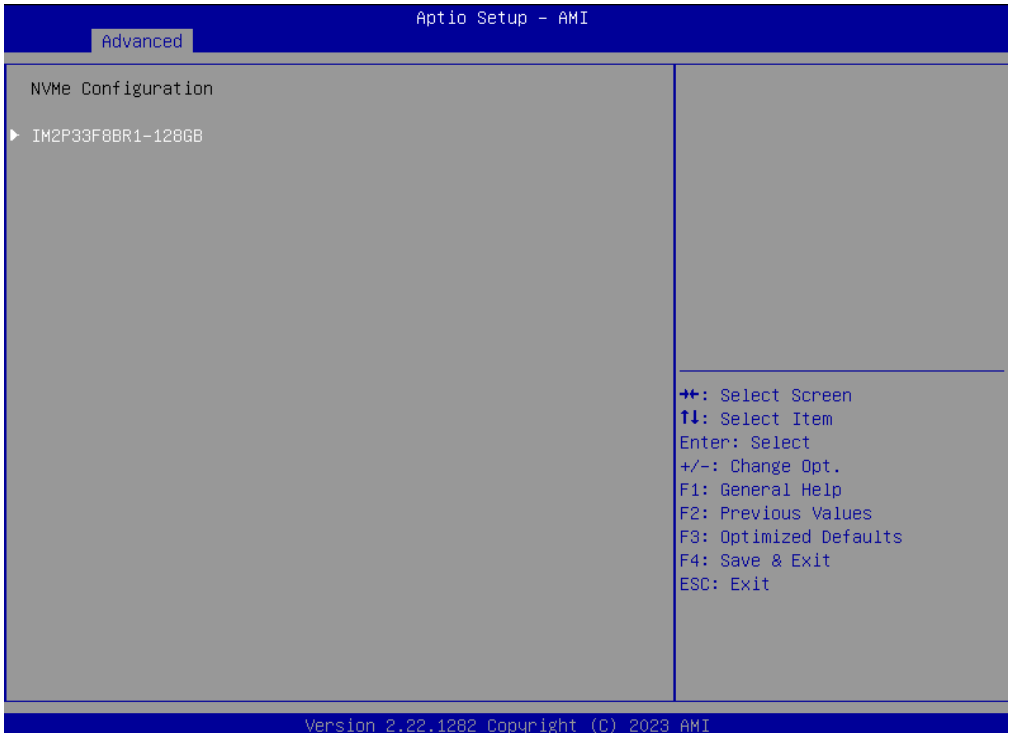


- **Storage Configuration**
  This screen specifies eMMC storage information. For items marked with "▸", please press <Enter> for more options.

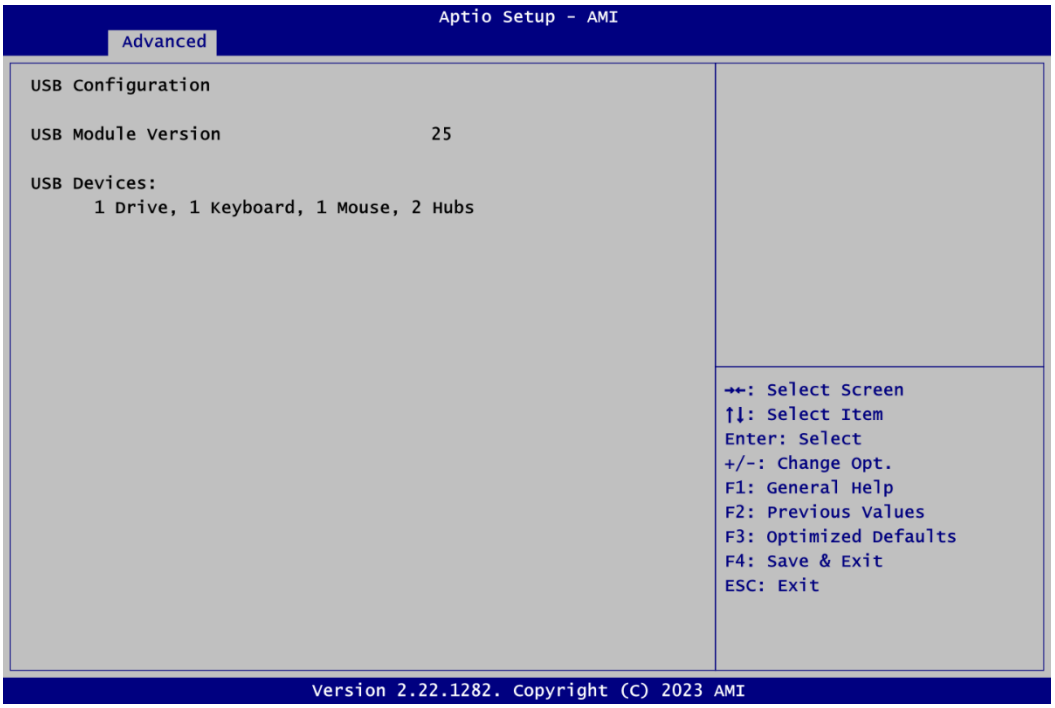





Aptio Setup – AMI
Advanced
SATA Configuration
SATA Controller(s) [Enabled]
Serial ATA Port 1 KINGSTON OM8PO (128.0GB)
Enable/Disable SATA Device.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.22.1282 Copyright (C) 2023 AMI

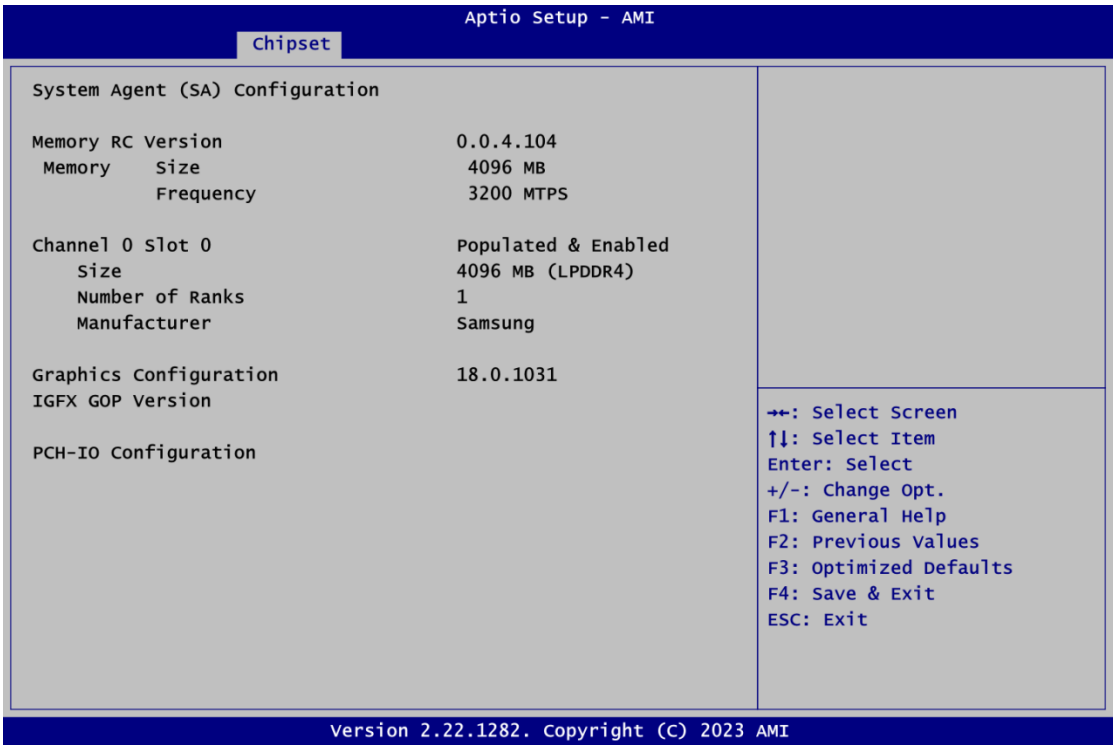

Aptio Setup – AMI
Advanced
NVMe Configuration
IM2P33F8BR1-128GB
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.22.1282 Copyright (C) 2023 AMI

- **USB Configuration**
  This screen specifies USB settings.



4.5 Chipset Menu

The Chipset menu allows users to change the advanced chipset settings.



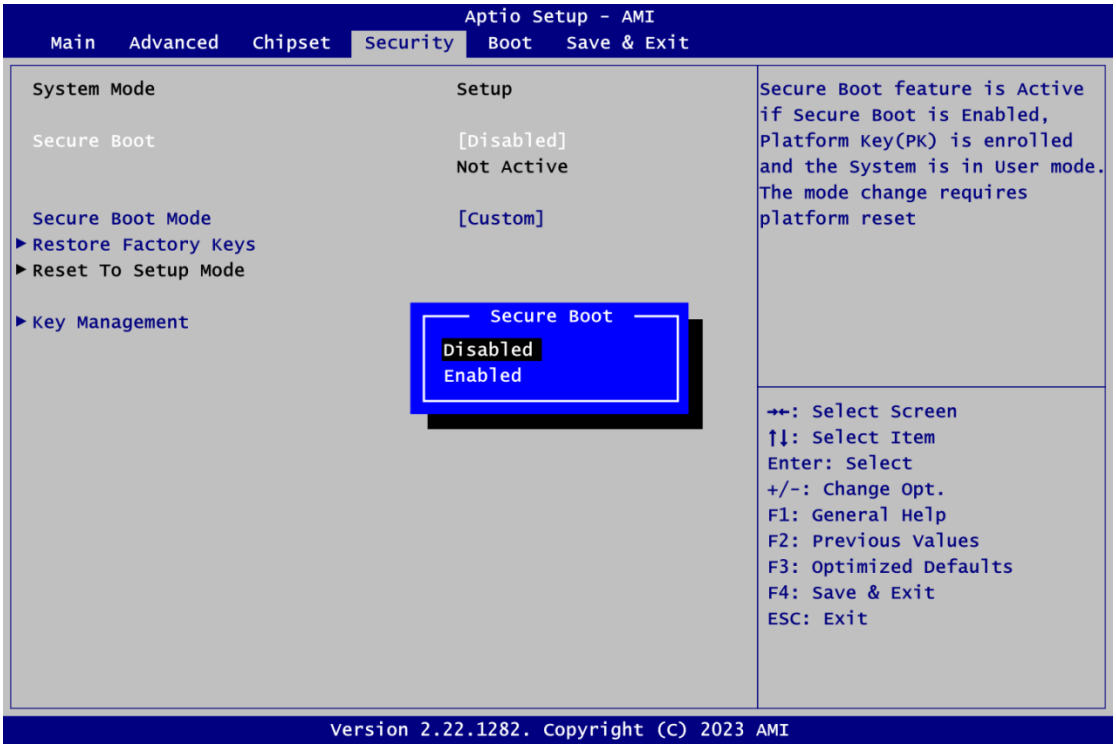
4.6 Security Menu

The Security menu allows users to change the security settings for the system.

Administrator Password
This item indicates whether an administrator password has been set (installed or uninstalled).

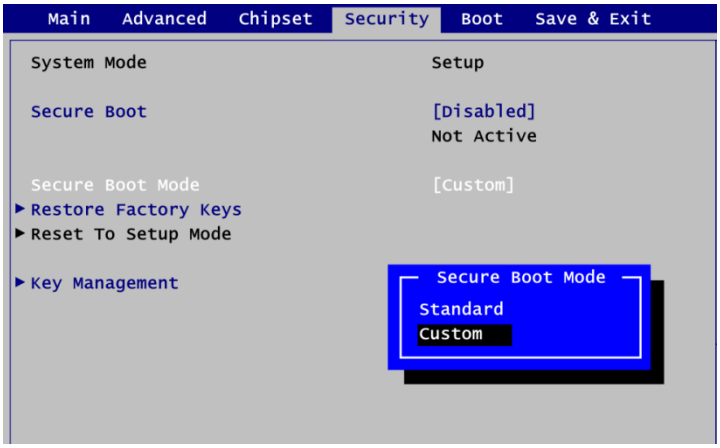
User Password
This item indicates whether a user password has been set (installed or uninstalled).

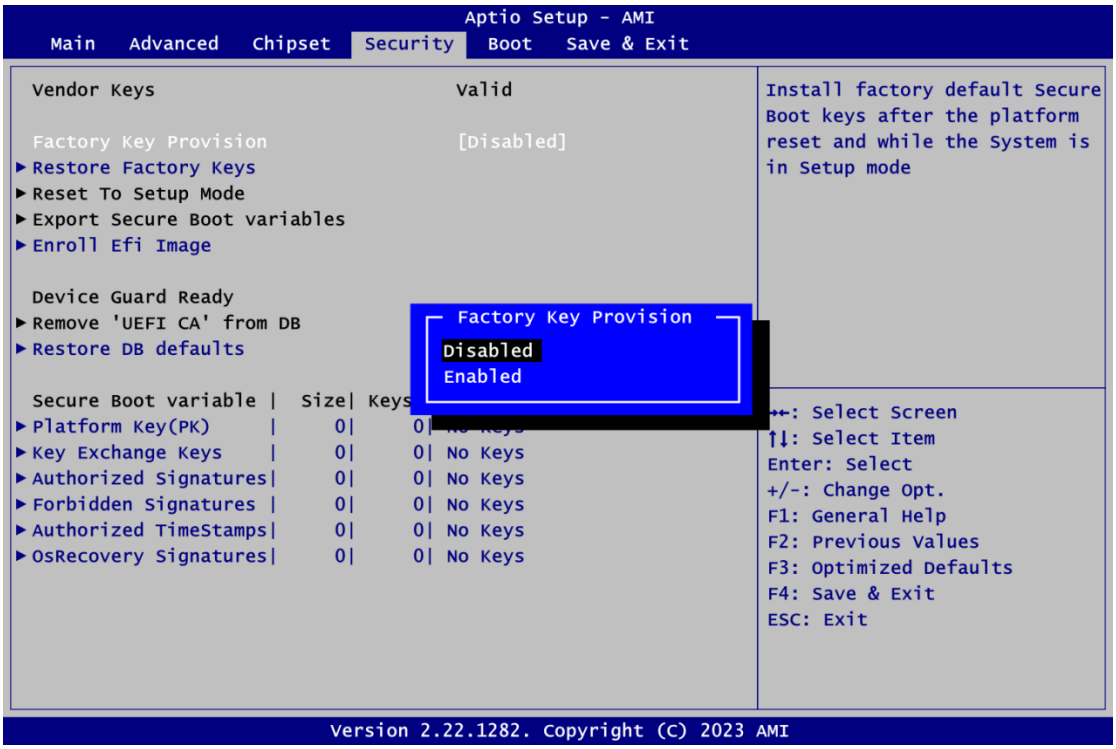
- **Secure Boot**



Secure Boot
Secure Boot feature is Active if Secure Boot is Enabled, Platform Key (PK) is enrolled and the System is in User mode. The mode change requires platform reset. Secure Boot ensures that the system only boots from trusted software, preventing malicious software from loading and compromising the device. It checks the digital signatures of boot loaders, firmware, and operating systems to verify that they are from trusted sources and have not been tampered with. Users can choose to enable it or not, between standard and custom mode.

Secure Boot Mode
Secure Boot mode options: Standard or Custom. In Custom mode, the policy of Secure Boot variables can be configured by a physically present user without full authentication.



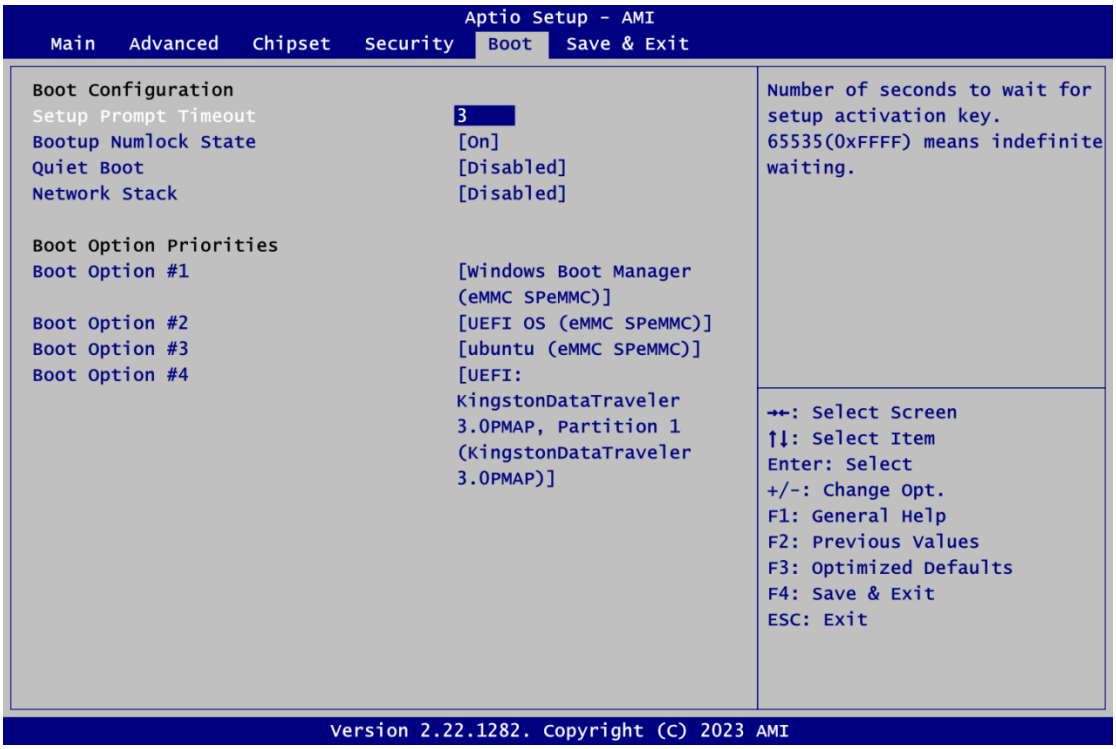


The Factory Key Provision

The Factory Key Provision ensures that the device has secure access to encrypted resources, such as data storage or communication. The keys are often unique to each device and can be used to secure firmware updates, secure boot processes, and to encrypt data at rest. The factory key provisioning process is an important step in securing devices and maintaining the confidentiality of sensitive information.

4.7 Boot Menu

The Boot menu allows users to change boot options of the system.



- **Setup Prompt Timeout**
  Setup Prompt Timeout is to delay the BIOS post before entering the operating system for a period of seconds according to user's setting.

- **Bootup NumLock State**
  Use this item to select the power-on state for the keyboard NumLock.

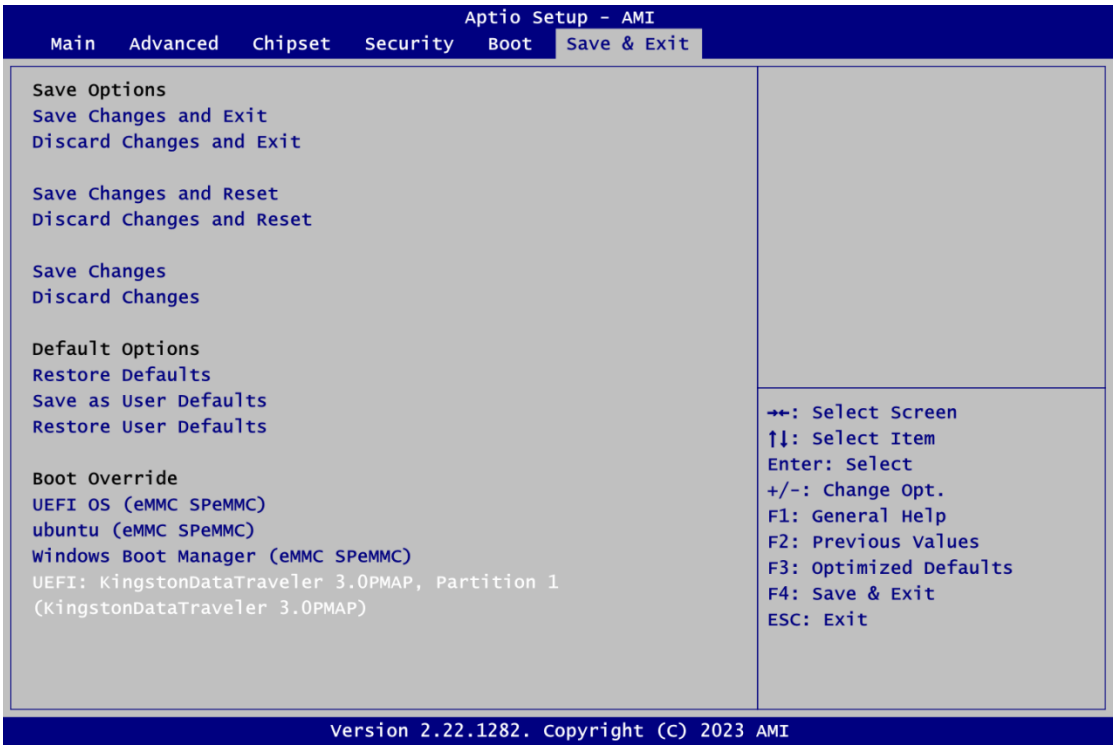
- **Quiet Boot**
  Quiet boot is a boot process that is performed without displaying diagnostic or status information on the screen.

- **Network stack**
  Network stack enables to load operating system from a remote server via LAN.

- **Boot Option Priorities**
  These are settings for boot priority. Specify the boot device priority sequence from the available devices.

4.8 Save & Exit Menu

The Save & Exit menu allows users to load your system configuration with optimal or fail-safe default values.



- **Save Changes and Exit**
  When you have completed the system configuration changes, select this option to leave Setup and return to Main Menu. Select Save Changes and Exit from the Save & Exit menu and press <Enter>. Select Yes to save changes and exit.

- **Discard Changes and Exit**
  Select this option to quit Setup without making any permanent changes to the system configuration and return to Main Menu. Select Discard Changes and Exit from the Save & Exit menu and press <Enter>. Select Yes to discard changes and exit.

- **Save Changes and Reset**
  When you have completed the system configuration changes, select this option to leave Setup and reboot the computer so the new system configuration parameters can take effect. Select Save Changes and Reset from the Save & Exit menu and press <Enter>. Select Yes to save changes and reset.

- **Discard Changes and Reset**
  Select this option to quit Setup without making any permanent changes to the system configuration and reboot the computer. Select Discard Changes and Reset from the Save & Exit menu and press <Enter>. Select Yes to discard changes and reset.

- **Save Changes**
  When you have completed the system configuration changes, select this option to save changes. Select Save Changes from the Save & Exit menu and press <Enter>. Select Yes to save changes.

- **Discard Changes**
  Select this option to quit Setup without making any permanent changes to the system configuration. Select Discard Changes from the Save & Exit menu and press <Enter>. Select Yes to discard changes.

- **Restore Defaults**
  It automatically sets all Setup options to a complete set of default settings when you select this option. Select Restore Defaults from the Save & Exit menu and press <Enter>.

- **Save as User Defaults**
  Select this option to save system configuration changes done so far as User Defaults. Select Save as User Defaults from the Save & Exit menu and press <Enter>.

- **Restore User Defaults**
  It automatically sets all Setup options to a complete set of User Defaults when you select this option. Select Restore User Defaults from the Save & Exit menu and press <Enter>.

- **Boot Override**
  Select a drive to immediately boot that device regardless of the current boot order.

Appendix A
Watchdog Timer

About Watchdog Timer

Software stability is major issue in most applications. Some embedded systems are not watched by human for 24 hours. It is usually too slow to wait for someone to reboot when computer hangs. The systems need to be able to reset automatically when things go wrong. The watchdog timer gives us solutions in this regard.

The watchdog timer is a counter that triggers a system to reset when it counts down to zero from a preset value. The software starts the counter with an initial value and must reset it periodically. If the counter ever reaches zero, it means the software has crashed, the system will reboot.

Sample Program

```
#include <pc.h>
#include <stdio.h>

#define SIO_Index_Port                  0x2E
#define SIO_Data_Port                   0x2F
#define SIO_Enter_Configuration_Mode    0x01
#define SIO_Entry_key                   0x87
#define SIO_LDN_SEL_REGISTER            0x07
#define SIO_LogicalDevice_WDT           0x08
#define SIO_LogicalDevice_EnableOffset 0x30
#define SIO_LogicalDevice_Enable        0x01
#define SIO_LogicalDevice_Disable       0x00
#define SIO_Offset_Countdown_Type       0xF0
#define SIO_Offset_Countdown_Timer      0xF1
#define SIO_Countdown_Type_Second       0x00
#define SIO_Countdown_Type_Minute       0x08
#define SIO_Exit_Configuration_Mode     0xAA

void main() {
              int CountdownType=0;
              int WDTtimer=0;

             printf("Input Watch Dog Timer type, 1:Second ; 2:Minute   :");
              scanf("%d",&CountdownType);

              printf("\nInput Timer to countdown:");
              scanf("%d",&WDTtimer);
              printf("Start to countdown...");

                //
              // Enter Configuration Mode
              //
              outportw(SIO_Index_Port,SIO_Entry_key);
              outportw(SIO_Index_Port,SIO_Entry_key);

              //
              // Select Logical device : WDT
              //
              outportw(SIO_Index_Port,SIO_LDN_SEL_REGISTER);
              outportw(SIO_Data_Port,SIO_LogicalDevice_WDT);

              //
              // Enable WDT Timer
              //
              outportw(SIO_Index_Port,SIO_LogicalDevice_EnableOffset);
              outportw(SIO_Data_Port,SIO_LogicalDevice_Enable);
```

```
        //
        // Select count type for minute type or second type to execute WDT timer
        // by below method.
        //
        outportw(SIO_Index_Port,SIO_Offset_Countdown_Type);
        if(CountdownType == 1)
        outportw(SIO_Data_Port,SIO_Countdown_Type_Second);
        else if(CountdownType == 2)
        outportw(SIO_Data_Port,SIO_Countdown_Type_Minute);

        //Set Timer
        outportw(SIO_Index_Port,SIO_Offset_Countdown_Timer);
        outportw(SIO_Data_Port,WDTtimer);

        //
        // Exit Configuration Mode
        //
        outportw(SIO_Index_Port,SIO_Exit_Configuration_Mode);
        outportw(SIO_Index_Port,SIO_Exit_Configuration_Mode);

}
```