USER'S MANUAL

DSP500-523 Series

Digital Signage Player with 9/8th Gen Intel® Core™ i5/i3 & Celeron® Processor

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Safety Precautions

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

1. The DSP501-527 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 DSP501-527 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 DSP501-527 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.

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【**Note**】**:** *It is strongly recommended that customer should shut down the system before start 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 DSP500-523. Section 1 consists of the following sub-sections:

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

1.1 General Descriptions

The DSP500-523 is a 4K@60Hz digital signage player that powered by LGA1151 socket 8th/9th gen Intel® Core™ i7/i5/i3 & Celeron® processor (formally codename: Coffee Lake) 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 and can be wall-mounted and VESA mounted as optional requests.

The DSP500-523 features an slim size, low power consumption, and functions fundamental to successful digital signage deployment. It is equipped with dual 260-pin DDR4 SO-DIMMs with up to 32GB memory capacity and has a full range of I/O interfaces to support RS-232, audio, USB 3.0 and USB 2.0 signals. This compact signage player is capable of serving two independent displays with 4K resolution through its HDMI ports. Furthermore, the DSP500-523 is offering 12 voltage DC power input and four antenna connectors for setting up Wi-Fi or 4G LTE networks.

Features

- LGA1151 socket 8th/9th generation Intel® Core™ i7/i5/i3 & Celeron® processor (CPU TDP max. up to 35W)
- 2 x DDR4-2400/2666 SO-DIMM max. up to 32GB
- 1 COM port, 4 USB ports and 1 GbE LANs
- 3 HDMI 2.0 for 4K@60Hz UHD content
- 1 x M.2 M Key 2280 (SATA/NVMe) for storage
- 1 x M.2 E Key 2230 for WLAN and WWAN
- 1 x M.2 B Key 3042 for 4G/LTE option
- Slim and compact design
- Suitable for digital signage and smart retail applications

Reliable and Stable Design

The DSP500-523 signage player comes equipped with LGA1151 socket 8th/9th gen Intel® Core™ i7/i5/i3 & Celeron® processors (TDP up to 35W), slim size and basic functions, providing the best solution for smart retails and light industries.

Flexible Connectivity

The DSP500-523 comes with basic interfaces including one RS-232 port, four USB 3.1 ports, three HDMI 2.0, and one GbE LAN port.

Embedded O.S. Supported

The DSP500-523 supports Windows® 10 IoT and Linux.

1.2 System Specifications

1.2.1 CPU

- **CPU**
  - LGA1151 socket 8th/9th gen Intel® Core™ i7/i5/i3 & Celeron® processors (CPU TDP max. up to 35W)

- **Chipset**
  - Intel® Q370

- **BIOS**
  - American Megatrends Inc. UEFI (Unified Extensible Firmware Interface) BIOS.

- **System Memory**
  - Two 260-pin DDR4-2400/2666 SO-DIMM sockets, up to 32GB at the maximum.

1.2.2 I/O System

- **Display**
  - 3 x HDMI (HDMI 2.0 up to 4096 x 2160＠60Hz)

- **Ethernet**
  - 1 x 10/100/1000 Ethernet ports (i219LM)

- **USB Ports**
  - 4 x USB 3.1

- **Serial Ports**
  - 1 x RS-232 (9-pin D-Sub male connector)

- **Expansion Interface**
  - 1 x M.2 E Key 2230 socket for WiFi/Bluetooth options
  - 1 x M.2 B Key 3042 socket for 4G/LTE options
  - 1 x M.2 M Key 2280 (SATA/NVMe)

- **Storage**
  - 1 x M.2 M Key 2280 (SATA/NVMe)
  - 1 x SIM slot

- **Audio**
  - HD audio compliant with Realtek ALC662
  - Support Line-out through one audio jack.

- **Indicator**
  - 1 x Yellow LED as indicator for HDD active

- **Switch**
  - 1 x ATX PWR switch
  - 1 x Remote PWR switch
  - 1 x Reset switch
  - 1 x Clear EDID switch

- **Antenna**
  - 4 x SMA type connector openings for antenna

1.2.3 System Specifications

- **Watchdog Timer**
  - 1~255 seconds or minutes; up to 255 levels.

- **Power Supply**
  - 12VDC /84W AC to DC adapter

- **Operation Temperature**
  - 0℃ ~+45℃ (32 ºF ~ 122ºF)

- **Humidity**
  - 10% ~ 90% (non-condensation)

- **Weight**
  - 1.50 kg (3.3 lb) without package
  - 1.80 kg (4.4 lb) with package

- **Dimension**
  - 202 mm (7.94") x 196 mm (7.7") x 32.4 mm (1.27")

【Note】: *All specifications and images are subject to change without notice.*

1.3 Dimensions

The following diagrams show dimensions and outlines of the DSP500-523.

1.3.1 System Dimensions
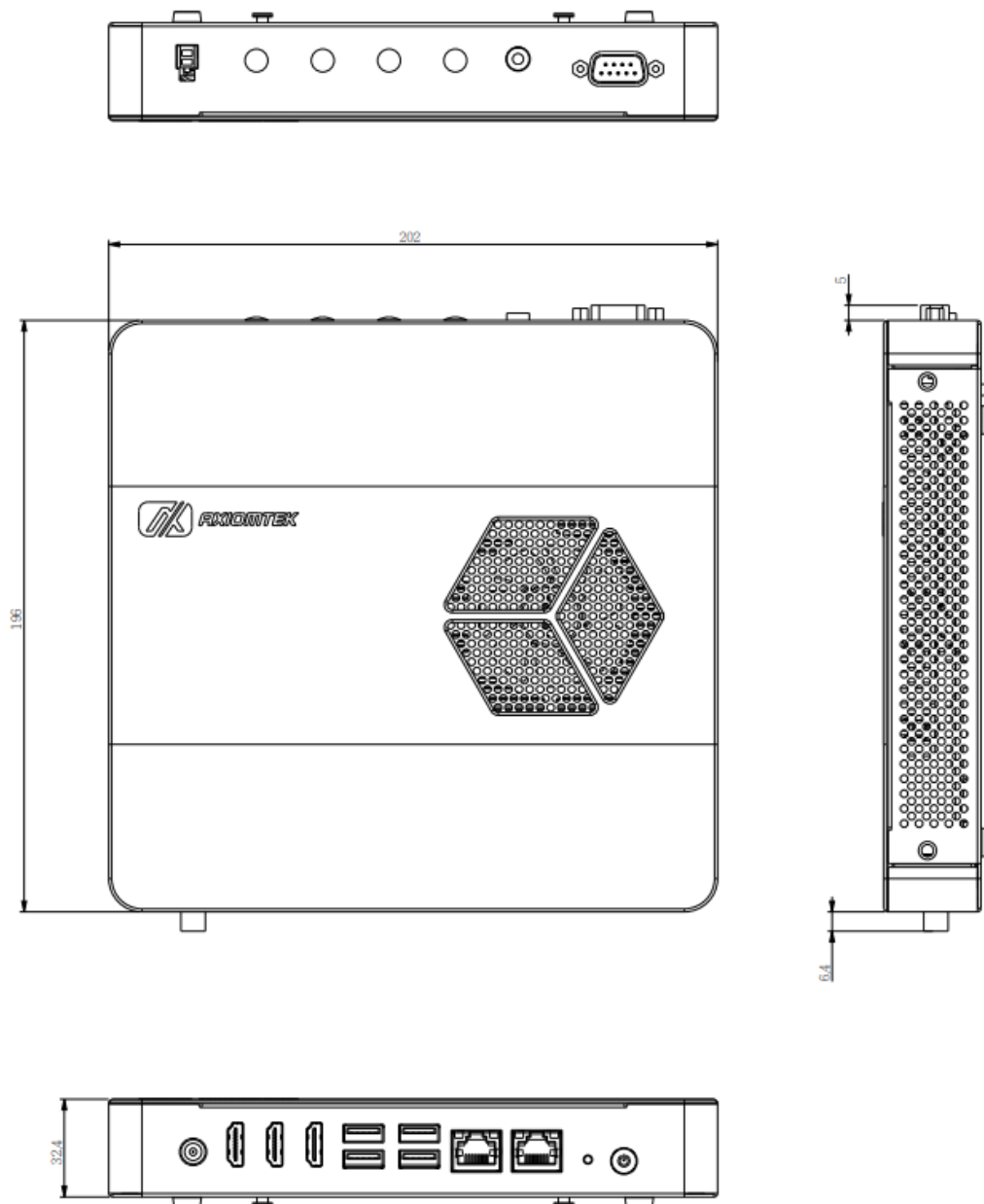
1.3.2 Wall-mount Bracket Dimensions
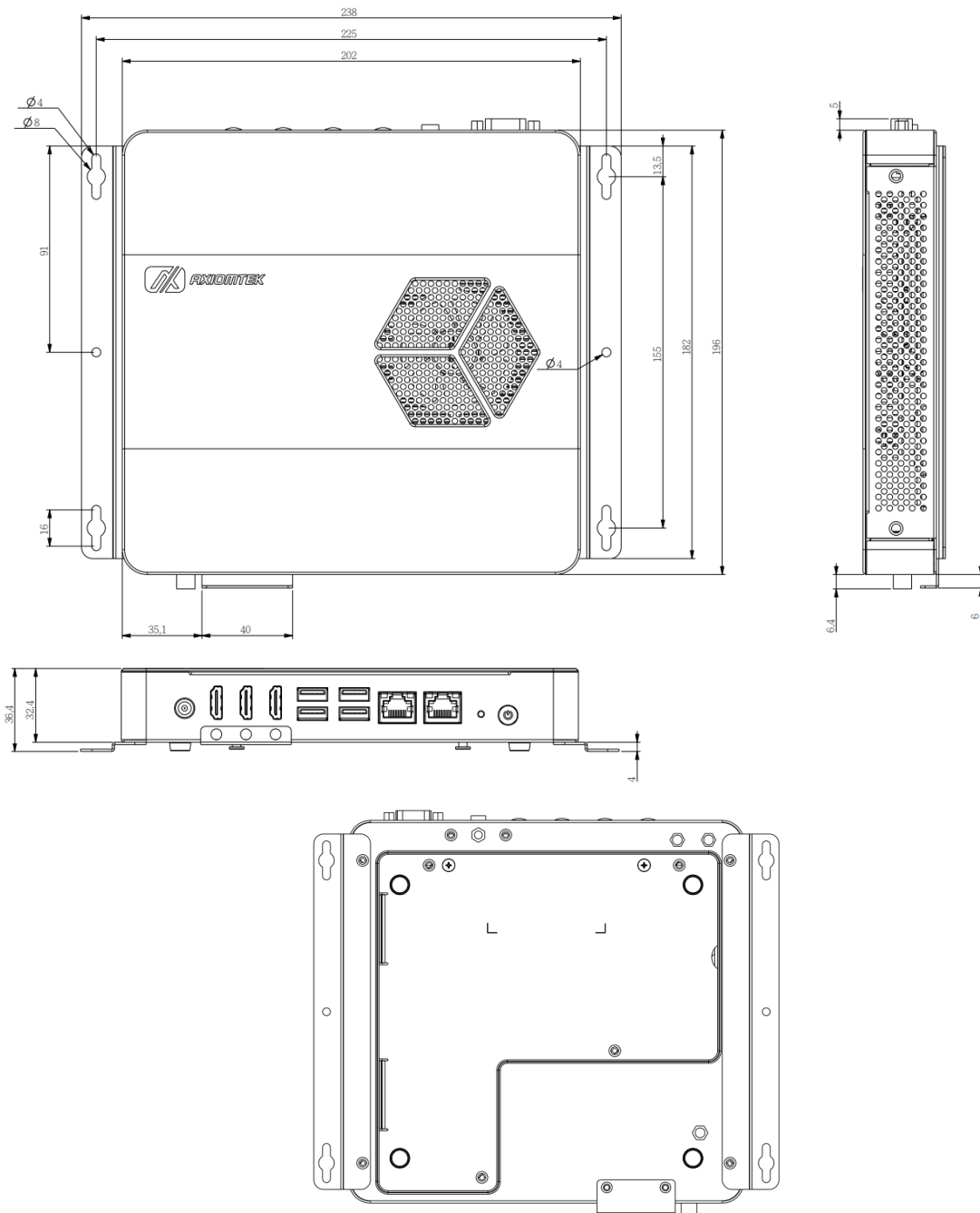
Instruction

Step 1: Screw the two pieces of wall-mount kits to the bottom plate of the device. Total four screws (metric 3 x6) 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.

1.3.3 VESA-mount Bracket Dimensions
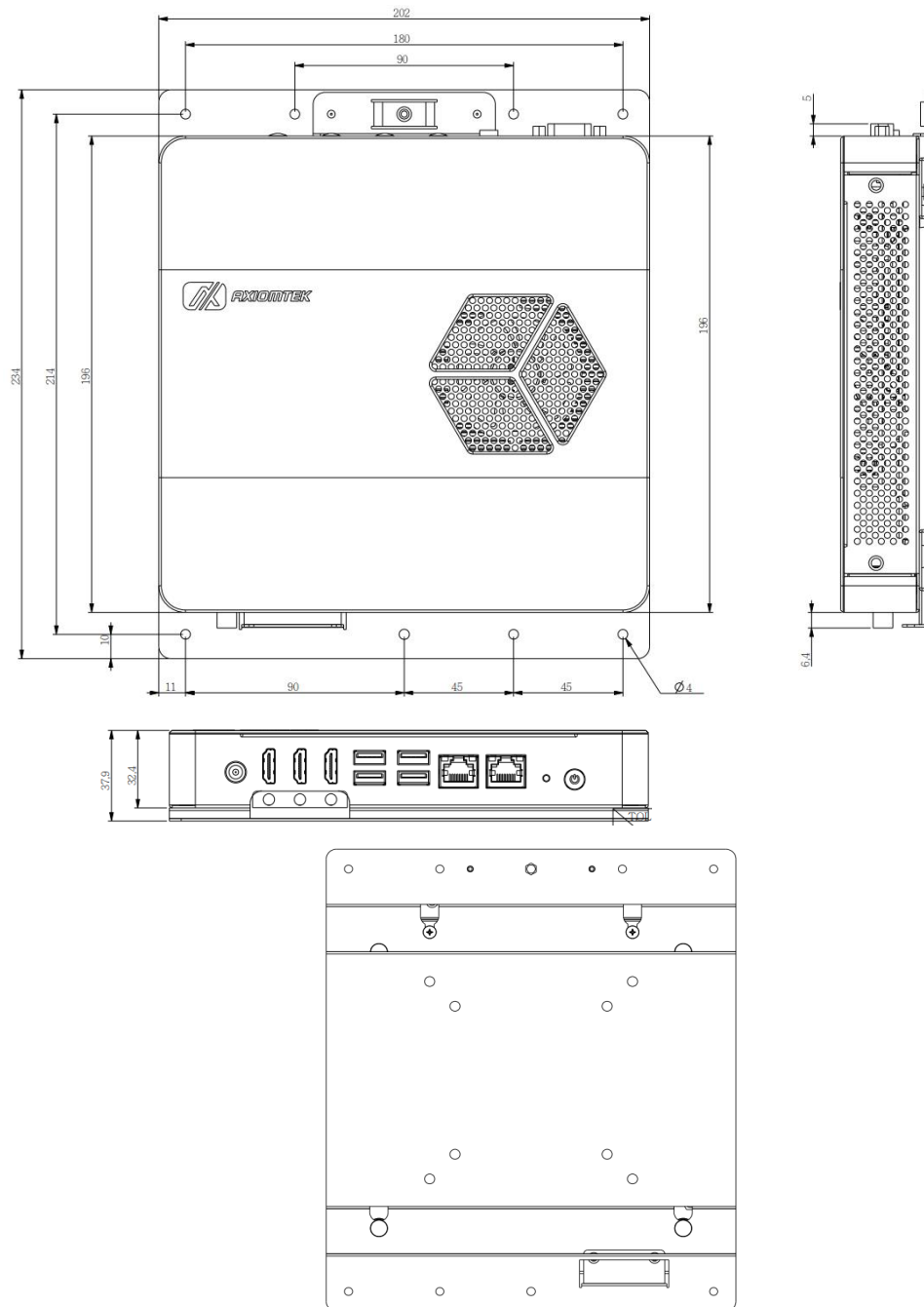
Instruction

Step 1: Screw the two pieces of wall-mount kits to the bottom plate of the device. Total four screws (metric 3 x6) 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 DSP500-523.

Front View
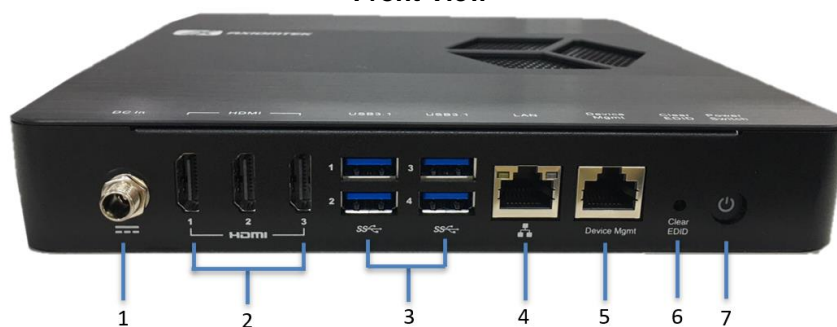
Rear View

1	12VDC power input	7	Power Button
2	HDMI 1~3	8	COM port
3	USB 3.1	9	Line_Out
4	GbE LAN port	10	Antenna hole
5	Device management port	11	Remote switch
6	Clear EDID		

1.5 Packing List

The DSP500-523 comes with the following bundle package:

- DSP500-523 System Unit x 1
- Foot Pad x 4
- Screw Type AC 84W (12V/7A) Adaptor x 1
- Optional DDR4 SO-DIMM Memory
- Optional Antenna
- Optional M.2 WiFi/BT module
- Optional M.2 2280 SSD
- Optional Power Cord

SECTION 2
HARDWARE INSTALLATION

The DSP500-523 is convenient for various hardware configurations such as DRAM, SSD (Solid State Drive) and M.2 modules. Section 2 contains guidelines for hardware installation.

2.1 Installation of the CPU Processor

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 then loosen four screws.

Step 3   Open the TOP cover and CPU cooler.

Step 4   Disengage load lever and remove the CPU cover.

● Disengage the load lever by pushing its hook down and then pulling it slightly outward.

● Rotate the load lever to the open position at approximately 135°.

● Rotate the load plate to the open position at approximately 150°.

【Note】 *Apply pressure to corner with the right-hand thumb when opening or closing the load lever - otherwise the lever will bounce back (as a mouse trap does) causing bent contacts.*
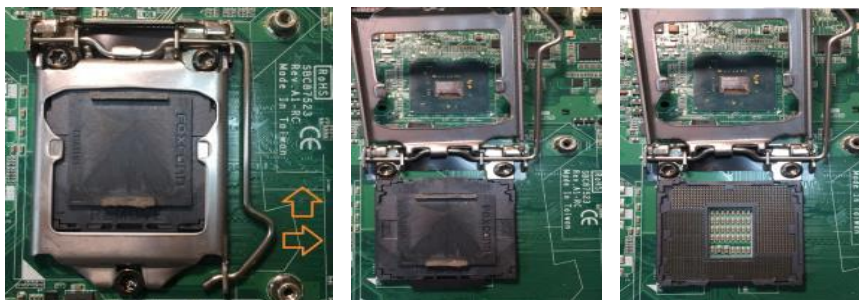
Step 5 Installation steps of the CPU Processor

● Lift the processor package from shipping media by grasping the substrate edges.

● Scan the processor package gold pads for any presence of foreign material.

● Locate connection 1 indicator on the processor which aligns with connection 1 indicator chamfer on the socket, and notice processor keying features that line up with posts along socket walls.

● Grasp the processor with the thumb and index finger along the top and bottom edges. The socket will have cutouts for your fingers to fit into.

● Carefully place the processor into the socket body vertically.
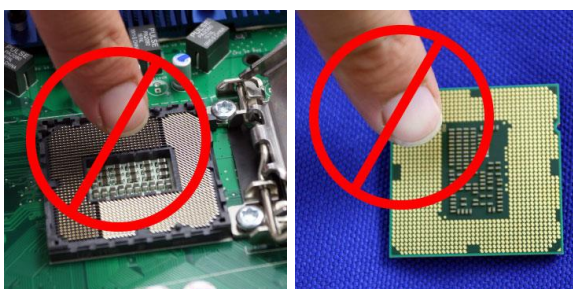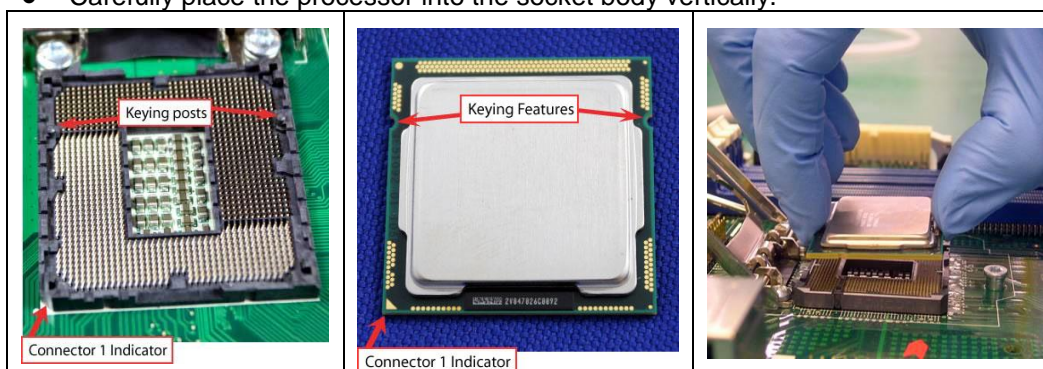
【Note】 *Never touch the fragile socket contacts to avoid damage and do not touch the processor's sensitive contacts at any time during installation.*

Step 6   Installation steps of the CPU processor

Align pins of the CPU with pin holes of the socket. Be careful of the CPU's orientation that users need to align the arrow mark on the CPU with the arrow key on the socket.

Step 7   Apply thermal grease on top of the CPU

Step 8   Put the cooler kit back and fasten all screws.
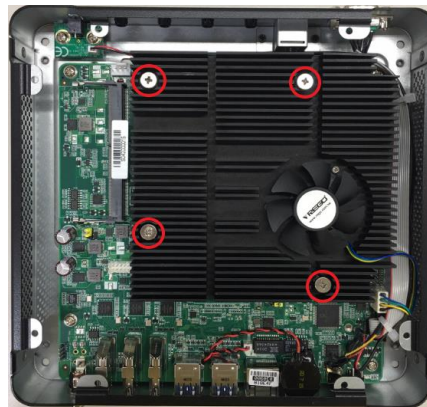
Step 9   Put the TOP cover back and fasten all screws.

2.2 Installation of SO-DIMM Memory

1 Installation of DIMM1 Memory

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 then loosen four screws.

Step 3 Located the DIMM1 socket on main board.

Step 4 Locate the memory module, insert a gold colored contact into the socket and push the module end latches till locked.
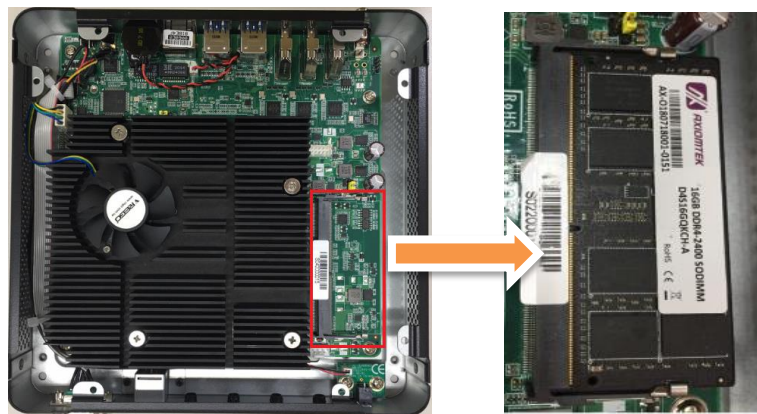
Step 5 Put the top cover back and fasten four screws back onto the system.

2 Installation of SDIMM1 Memory

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 then loosen four screws. Open the BOTTOM cover.

Step 3   Located the SDIMM1 socket on main board.

Step 4   Locate the memory module, insert a gold colored contact into the socket and push the module end latches till locked.
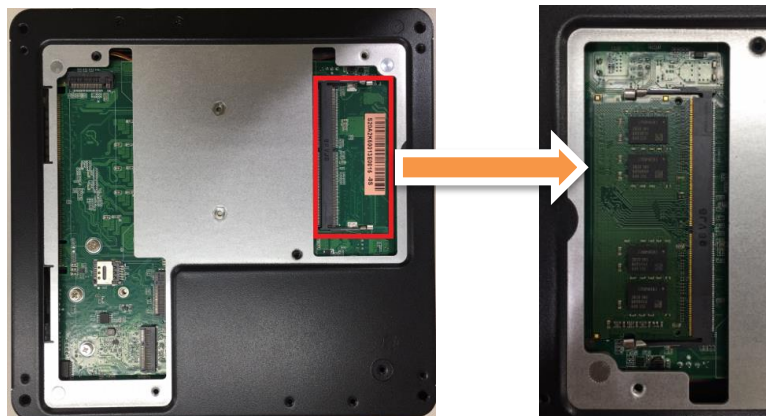
Step 5   Put the bottom cover back and fasten all screws back onto the system.

2.3 Installation of M.2 SATA/NVMe SSD

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 then loosen four screws. Open the BOTTOM cover.**

Step 3   **Located the M.2 socket on main board.**
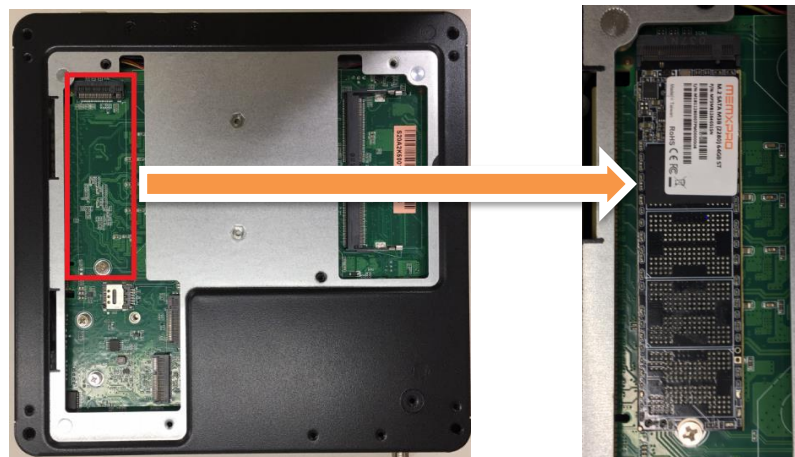
Step 4   **Identify the M.2 slot, insert a M.2 module into the socket and then fasten a screw.**

Step 5   **Put the BOTTOM cover and fasten all screws back to the system.**

2.3 Installation of M.2 Key B 4G/LTE Module

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

Step 2 Turn the system upside down. Locate and loosen the four screws at the bottom, as illustrated below.

Step 3 Open the BOTTOM cover.

Step 4 Identify the M.2 Key B for 4G/LTE socket on the main board.

Step 5 Insert a M.2 Key B for 4G/LTE module into the socket and then fasten a screw to secure the module in place.
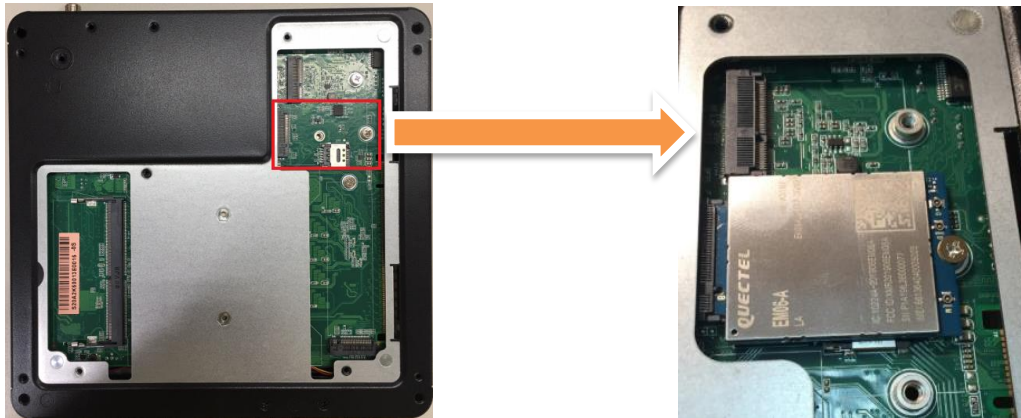
Step 6 Put the BOTTOM cover and fasten four screws back onto the system.

2.4 Installation of M.2 Key E WiFi/BT Module

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

Step 2 Turn the system upside down. Locate and loosen the four screws at the bottom, as illustrated below.

Step 3 Open the top cover.

Step 4 Identify the M.2 Key E 2230 for Wi-Fi socket on the main board.

Step 5 Insert a M.2 Key E 2230 for WiFi module into the socket and then fasten a screw to secure the module in place.
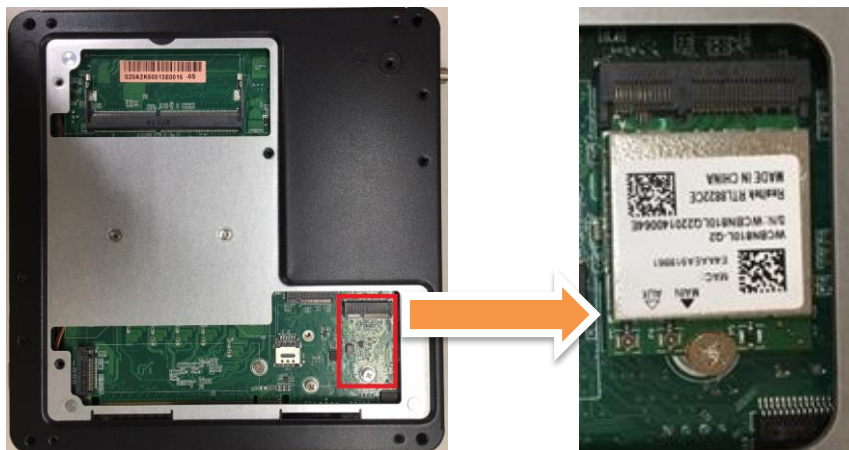
Step 6 Put the top cover and fasten four screws back onto the system.

SECTION 3
JUMPER & CONNECTOR SETTINGS

Proper jumper settings configure the DSP501-527 to meet various application needs. Hereby all jumpers settings along with their default settings are listed for devices onboard.

3.1 Locations of Jumpers & Connectors

SBC87523 Top View
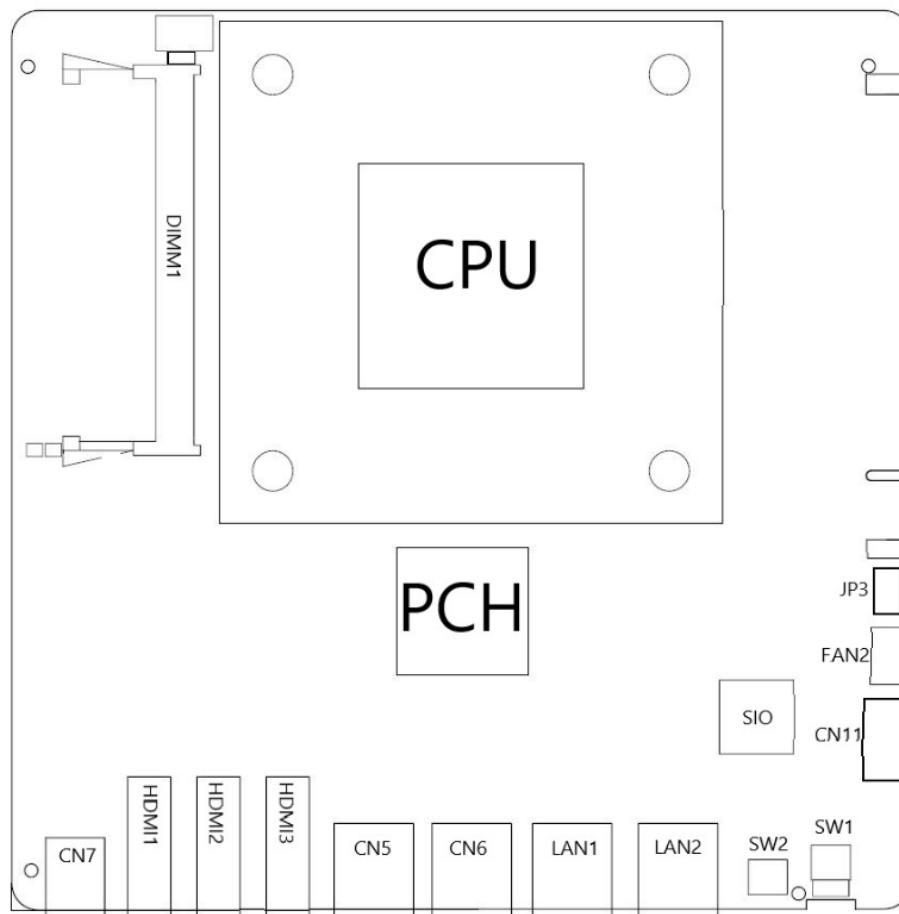
SBC87523 Bottom View
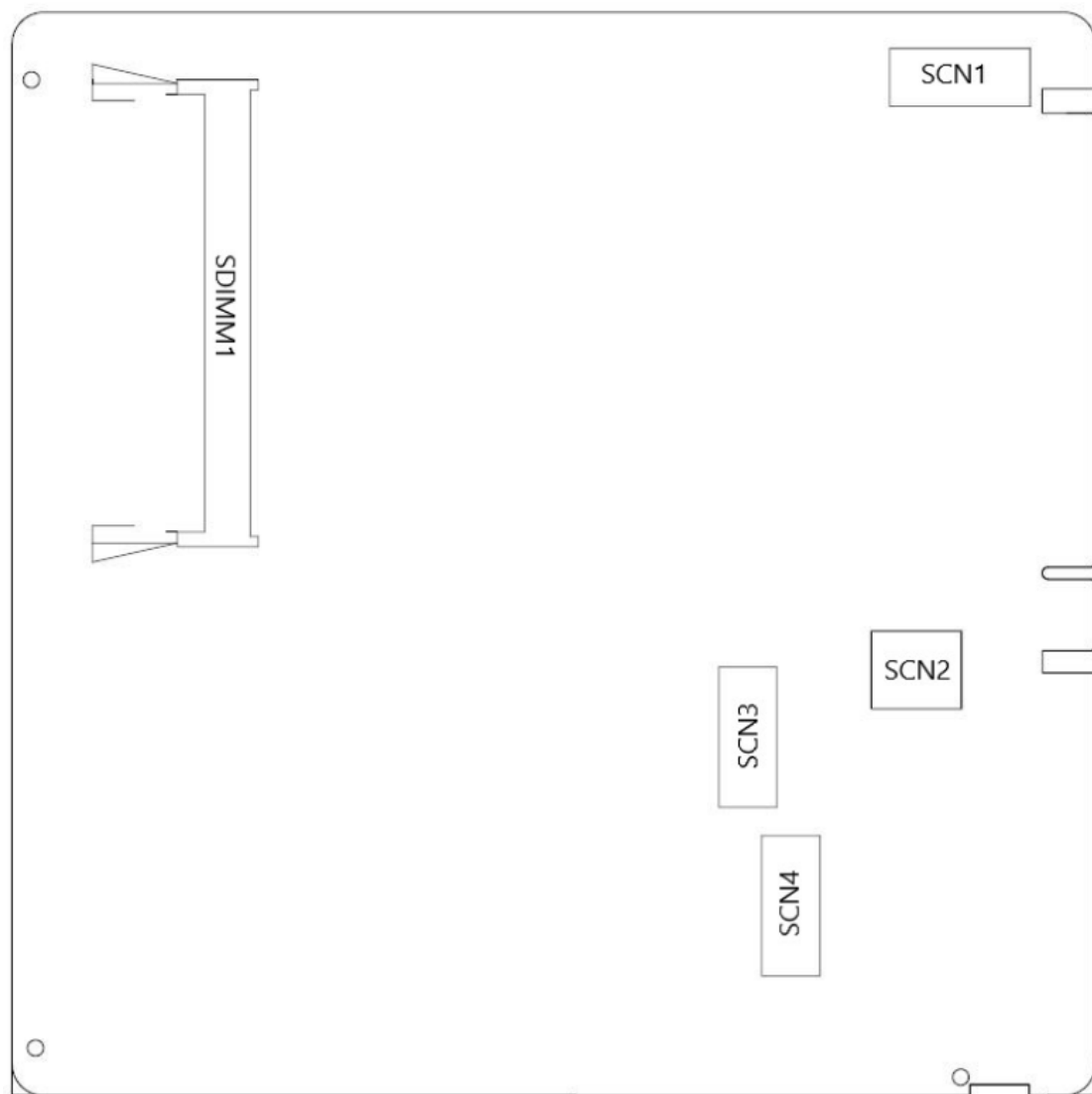
【Note】：*It is strongly recommended that any unmentioned jumper settings should not be modified without instructions by Axiomtek FAEs. Any modifications without instructions might cause system failure.*

3.2 Summary of Jumper Settings

Proper jumper settings configure the DSP300-318 to meet various application purposes. A table of all jumpers and their default settings is listed below.

Jumper	Description	Setting
JP1	Auto Power On	1-2 Enable (Default)
	Default: Enable	2-3 Disable
JP2	Restore BIOS Optimal Defaults Default: Normal Operation	1-2 Normal (Default)
		2-3 Enable

【Note】: How to setup Jumpers

A jumper is a small component consisting of a jumper clip and jumper pins. Place a jumper clip on two jumper pins to close; remove a jumper clip from two jumper pins to open. The following illustration shows how to set up a jumper.
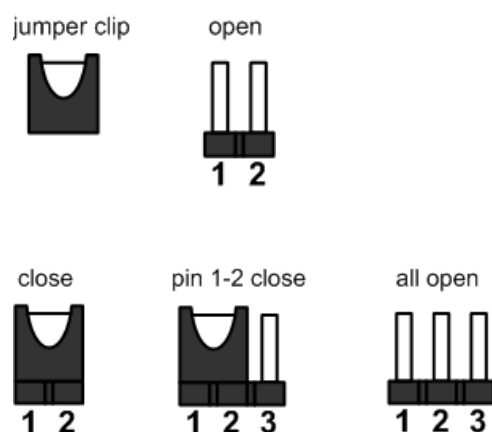
【Note】: *Once the default jumper or switch setting needs to be changed, please do it under power-off condition.*

3.2.1 Auto Power On (JP1)

If the pin 1_2 of JP1 is shorted, the system will be automatically power on without pressing soft power button. If the pin 2_3 of JP1 is shorted, it is necessary to manually press soft power button to power on the system.

Functions	Settings
Auto Power On: Enabled (Default)	1-2 close
Auto Power On: Disabled	2-3 close

3.2.2 Restore BIOS Optimal Defaults (JP2)

To restore BIOS optimal defaults, please put jumper clip to pin 2-3 for a few seconds then move it back to pin 1-2.

Functions	Settings
Normal (Default)	1-2 close
Restore BIOS optimal defaults	2-3 close

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
CN7	DC Power Jack
CN11	COM1 DB9 Connector
HDMI1~3	HDMI Connector
LAN1	Ethernet Port
SW1	ATX Power On/Off Button
SW2	Clear EDID Button
PWRBT1	Remote Power Switch Connector
CN5/6	USB 3.1 Port
J3	Audio Jack(Line Out)
SCN3	M.2 B Key Socket
SCN2	SIM Card Slot
SCN1	M.2 M Key Socket
SCN4	M.2 E Key Socket
LAN2	Device Management Port
DIMM1	260-Pin DDR4 Channel A SO-DIMM Socket
SDIMM1	260-Pin DDR4 Channel B SO-DIMM Socket

3.3.1 DC Power Jack Connector (screw type) (CN7)

The system supports 12V DC-in connector for system power input. The CN16 is a DC jack with a screw. Firmly insert an adapter with at least 60W power output into this connector. To prevent system instability caused by loose connection, make sure all components/devices are properly installed before connecting.
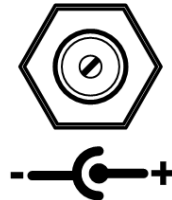
3.3.2 COM1 DB9 Connector (CN11)

The system has one serial port. COM1 is an RS-232 port.

Pins	Signals
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI
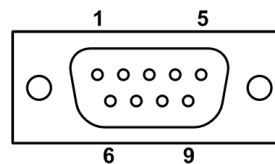
3.3.3 HDMI Connector (HDMI1~3)

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.

Pins	Signals	Pins	Signals
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		
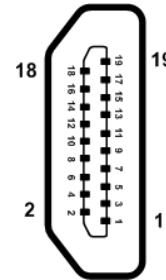
3.3.4 Ethernet Ports (LAN1)

The system has one RJ-45 connectors: LAN1. Ethernet connection can be established by plugging one end of the Ethernet cable into this RJ-45 connector and the other end (phone jack) to a 1000/100/10-Base-T hub.

Pins	1000 Base-T	100/10 Base-T	Descriptions
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 (Yellow) Off: No link Blinking: Data activity detected		
B	Speed LED 1000: Orange 100: Green 10: OFF		
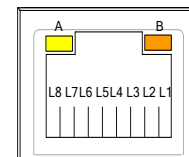
3.3.5 ATX Power On/Off button (SW1)

The ATX power button is on the I/O side. It allows users to control DSP500-523 power on/off.

Functions	Descriptions
On	Turn on/off system
Off	Keep system status

3.3.6 Clear EDID button (SW2)

The clear EDID button allows users to clear the EDID data when the connected display monitors cannot be recognized. Please press the button at least 3 seconds to make sure the EDID data have been reset.

Functions	Descriptions
Pressed	Reset EDID
Off	Keep the original EDID data

Clear
EDID

3.3.7 Remote Power Switch Connector (PWRBT1)

The system has one 2-pin connector output for remote power on/off switch.

Functions	Descriptions
Short(1-2)	Turn on/off system
Open	Keep system status
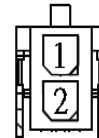
3.3.8 USB 3.0 Port (CN5/CN6)

The Universal Serial Bus (compliant with USB 3.0 (5Gb/s)) connector on the rear I/O is for installing USB peripherals such as keyboard, mouse, scanner, etc.

Pin	Signal	Pin	Signal
1	USB_VCC (+5V_SBY)	10	USB_VCC (+5V_SBY)
2	USB_Data3-	11	USB_Data4-
3	USB_Data3+	12	USB_Data4+
4	GND	13	GND
5	SSRX3-	14	SSRX4-
6	SSRX3+	15	SSRX4+
7	GND	16	GND
8	SSTX3-	17	SSTX4-
9	SSTX3+	18	SSTX4+

CN5/6
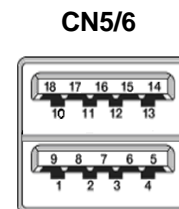
3.3.9 Audio Jack Line-out Connector (J3)

The DSP500-523 provides one HD audio jack Line_out connector.

Pin Color	Signal
Pink	Line-out

3.3.10 M.2 B Key Connector (SCN3)

The DSP500-523 has one M.2 B Key 3042 socket.

Pins	Signals	Pins	Signals
1	CONFIG_3	2	+3.3V
3	GND	4	+3.3V
5	GND	6	FULL_CARD_POWER_OFF
7	USB_D+	8	W_DISABLE1#
9	USB_D-	10	GPIO_9/DAS/DSS#(I/O)/LED1#
11	GND	12	NC
13	NC	14	NC
15	NC	16	NC
17	NC	18	NC
19	NC	20	GPIO_5(I/O)
21	CONFIG_0	22	GPIO_6(I/O)
23	GPIO_11	24	GPIO_7(I/O)
25	DPR	26	GPIO_10(I/O)
27	GND	28	GPIO_8(I/O)
29	PERn1/USB3.0-Rx-/SSIC-RxN	30	UIM-RESET
31	PERp1/USB3.0-Rx+/SSIC-RxP	32	UIM-CLK
33	GND	34	UIM-DATA
35	PETn1/USB3.0-Tx-/SSIC-TxN	36	UIM-PWR
37	PETp1/USB3.0-Tx+/SSIC-TxP	38	DEVSLP
39	GND	40	GPIO_0(I/O)
41	PERn0/SATA-B+	42	GPIO_1(I/O)
43	PERp0/SATA-B-	44	GPIO_2(I/O)
45	GND	46	GPIO_3(I/O)
47	PETn0/SATA-A-	48	GPIO_4(I/O)
49	PETp0/SATA-A+	50	PERST#
51	GND	52	CLKREQ#
53	REFCLKN	54	PEWAKE#
55	REFCLKP	56	N/C_56
57	GND	58	N/C_58
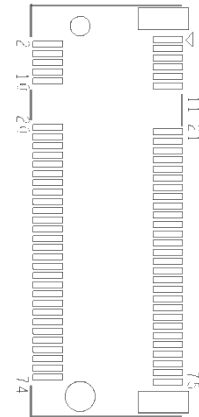
59	ANTCTL0	60	COEX3
61	ANTCTL1	62	COEX2
63	ANTCTL2	64	COEX1
65	ANTCTL3	66	SIM DETECT
67	RESET#	68	SUSCLK(32kHz)
69	CONFIG_1	70	+3.3V
71	GND	72	+3.3V
73	GND	74	+3.3V
75	CONFIG_2		

3.3.11 SIM Card slot (SCN2)

This system has one SCN2 socket for inserting a SIM Card. In order to work properly, the SIM Card must be used together with a 4G/LTE module which is inserted into SCN3. It is mainly used in 4G/LTE wireless network application.

Pin	Signal
C1	PWR
C2	SIM_REST
C3	SIM_CLK
C5	GND
C6	SIM_VPP
C7	SIM_DATA
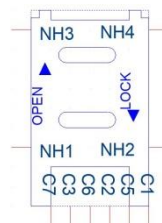
3.3.12 M.2 M KEY Connector (SCN1)

This system has one M.2 M key socket for inserting M.2 2280 SATA/NVMe SSD module.

Pins	Signals	Pins	Signals
1	GND	2	+3.3V
3	GND	4	+3.3V
5	NC	6	NC
7	NC	8	NC
9	GND	10	LED1#
11	NC	12	+3.3V
13	NC	14	+3.3V
15	GND	16	+3.3V
17	NC	18	+3.3V
19	NC	20	NC
21	GND	22	NC
23	NC	24	NC
25	NC	26	NC
27	GND	28	NC
29	NC	30	NC
31	NC	32	NC
33	GND	34	NC
35	NC	36	NC
37	NC	38	DEVSLP
39	GND	40	NC
41	SATA2_RXP	42	NC
43	SATA2_RXN	44	NC
45	GND	46	NC
47	SATA2_TXN	48	NC
49	SATA2_TXP	50	PERST#
51	GND	52	NC
53	NC	54	PEWARK#
55	NC	56	NC
57	GND	58	NC
59	NC	60	NC
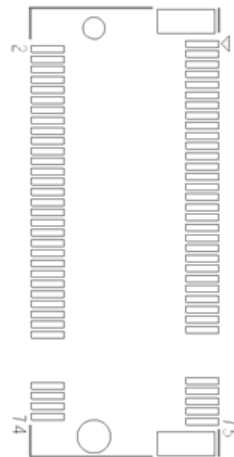
Pins	Signals	Pins	Signals
61	NC	62	NC
63	NC	64	NC
65	NC	66	NC
67	NC	68	NC
69	GND	70	+3.3V
71	GND	72	+3.3V
73	GND	74	+3.3V
75	GND		-

3.3.13 M.2 E KEY Connector (SCN4)

The system has one M.2 E Key 2230 socket on the top side supporting PCI E xpress x1 and USB 2.0.

Pin	Signal	Pin	Signal
1	GND	2	+3.3V
3	USB_D+	4	+3.3V
5	USB_D-	6	LED1#(I)(OD)
7	GND	8	PCM_CLK/I2S SCK
9	SDIO CLK(O)(0/1.8V)	10	PCM_SYNC/I2S WS
11	SDIO CMD(IO)(0/1.8V)	12	PCM_IN/I2S SD_IN
13	SDIO DATA0(IO)(0/1.8V)	14	PCM_OUT/I2S SD_OUT
15	SDIO DATA1(IO)(0/1.8V)	16	LED2#(I)(OD)
17	SDIO DATA2(IO)(0/1.8V)	18	GND
19	SDIO DATA3(IO)(0/1.8V)	20	UART WAKE#(I)(0/3.3V)
21	SDIO WAKE#(I)(0/1.8V)	22	UART RXD(I)(0/1.8V)
23	SDIO RESET#(O)(0/1.8V)	24	NC
25	NC	26	NC
27	NC	28	NC
29	NC	30	NC
31	NC	32	UART_TXD(O)(0/1.8V)
33	GND	34	UART_CTS(I)(0/1.8V)
35	PETp0	36	UART_RTS(O)(0/1.8V)
37	PETn0	38	VENDOR DEFINED_38
39	GND	40	VENDOR DEFINED_40
41	PERp0	42	VENDOR DEFINED_42
43	PERn0	44	COEX3(IO)(0/1.8V)
45	GND	46	COEX2(IO)(0/1.8V)
47	REFCLKP0	48	COEX1(IO)(0/1.8V)
49	REFCLKN0	50	SUSCLK(32kHz)(O)(0/3.3V)
51	GND	52	PERST0#(I)(0/3.3V)
53	CLKREQ0#(IO)(0/3.3V)	54	W_DIS2#(I)(0/3.3V)
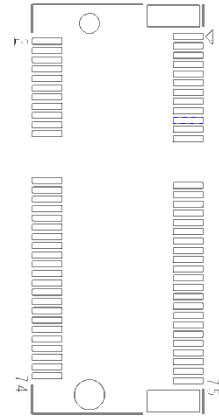
55	PEWAKE0#(IO)(0/3.3V)	56	W_DIS1#(I)(0/3.3V)
57	GND	58	I2C DATA(I0)(0/3.3V)
59	RSVD/PETp1	60	I2C CLK(I)(0/3.3V)
61	RSVD/PETn1	62	ALERT#(O)(0/3.3V)
63	GND	64	RSVD_64
65	RSVD/PERp1	66	UIM_SWP/PERST1#
67	RSVD/PERn1	68	UIM_PWR_SNK/CLKREQ 1#
69	GND	70	UIM_PWR_SRC/GPIO1/P EWAKE1#
71	RSVD/REFCLKP1	72	+3.3V
73	RSVD/REFCLKN1	74	+3.3V
75	GND		-

3.3.14 Device Management Port (LAN2)

The system provides one device management port supporting remote device management (RDM) function. Please contact with FAE to get detailed information.

Pin	Signal
L1	MCU_TXP1
L2	MCU_TXN1
L3	MCU_RXP1
L4	GND
L5	GND
L6	MCU_RXN1
L7	GND
L8	GND
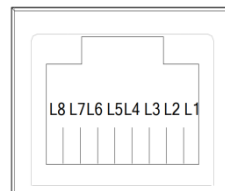
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SECTION 4
BIOS SETUP UTILITY

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

4.1 Starting

To enter the setup screens, follow the steps below:

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

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

4.3 Main Menu

The Main Menu screen is the first screen users see when entering the setup utility. Users 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 also shown below.

```
         Aptio Setup Utility - Copyright (C) 2020 American Megatrends, Inc.
          Main  Advanced  Chipset  Security  Boot  Save & Exit

         BIOS Information                                    Set the Date. Use Tab to
         Project Version           SBC87523 V1.00            switch between Date elements.
         Build Date and Time       07/24/2020 16:17:24       Default Ranges:
                                                             Year: 2005-2099
         MCU Information                                     Months: 1-12
         MCU Version               1.0.2                     Days: dependent on month

         System Date               [Mon 11/02/2020]
         System Time               [06:06:02]

         Access Level              Administrator

                                                             →←: Select Screen
                                                             ↑↓: Select Item
                                                             Enter: Select
                                                             +/-: Change Opt.
                                                             F1: General Help
                                                             F2: Previous Values
                                                             F3: Optimized Defaults
                                                             F4: Save & Exit
                                                             ESC: Exit

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```

BIOS Information
Display the auto-detected BIOS 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.

4.4 Advanced Menu

The Advanced menu also allows users to set configuration of the CPU and other system devices. Users can select any items in the left frame of the screen to go to sub menus:

► F81803 Super IO Configurations
► Hardware Monitor
► CPU Configurations
► Power & Performance
► PCH-FW Configuration
► Trusted Computing
► ACPI Settings
► MCU Configuration
► NCT6102D Super IO Configurations
► S5 RTC Wake Settings
► USB Configuration
► CSM Configuration
► NVMe Configuration
► Network Stack Configuration

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

```
          Aptio Setup Utility - Copyright (C) 2020 American Megatrends, Inc.
        Main  Advanced  Chipset  Security  Boot  Save & Exit

     M.2 Storage Interface              [PCIE]              M.2 Storage Interface
                                                           (PCIE/mSATA).
   ▶ F81803 Super IO Configuration
   ▶ Hardware Monitor
   ▶ ACPI Settings
   ▶ MCU Configuration
   ▶ Trusted Computing
   ▶ CPU Configuration
   ▶ SATA And RST Configuration
   ▶ PCH-FW Configuration
   ▶ AMT Configuration
   ▶ CSM Configuration
   ▶ NVMe Configuration
   ▶ S5 RTC Wake Settings
                                                        ➡◀: Select Screen
                                                        ↑↓: Select Item
                                                        Enter: Select
                                                        +/-: Change Opt.
                                                        F1: General Help
                                                        F2: Previous Values
                                                        F3: Optimized Defaults
                                                        F4: Save & Exit
                                                        ESC: Exit




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```

F81803 Super IO Configurations

Use this screen to select options for the F81803 Super IO Configurations, 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.

```
         Aptio Setup Utility - Copyright (C) 2020 American Megatrends, Inc.
          Advanced

     F81803 Super IO Configuration                        Set Parameters of Serial Port
                                                          1 (COMA)
     Super IO Chip                      F81803
   ▶ Serial Port 1 Configuration




                                                          ++: Select Screen
                                                          ↑↓: Select Item
                                                          Enter: Select
                                                          +/-: Change Opt.
                                                          F1: General Help
                                                          F2: Previous Values
                                                          F3: Optimized Defaults
                                                          F4: Save & Exit
                                                          ESC: Exit



             Version 2.20.1271. Copyright (C) 2020 American Megatrends, Inc.
```
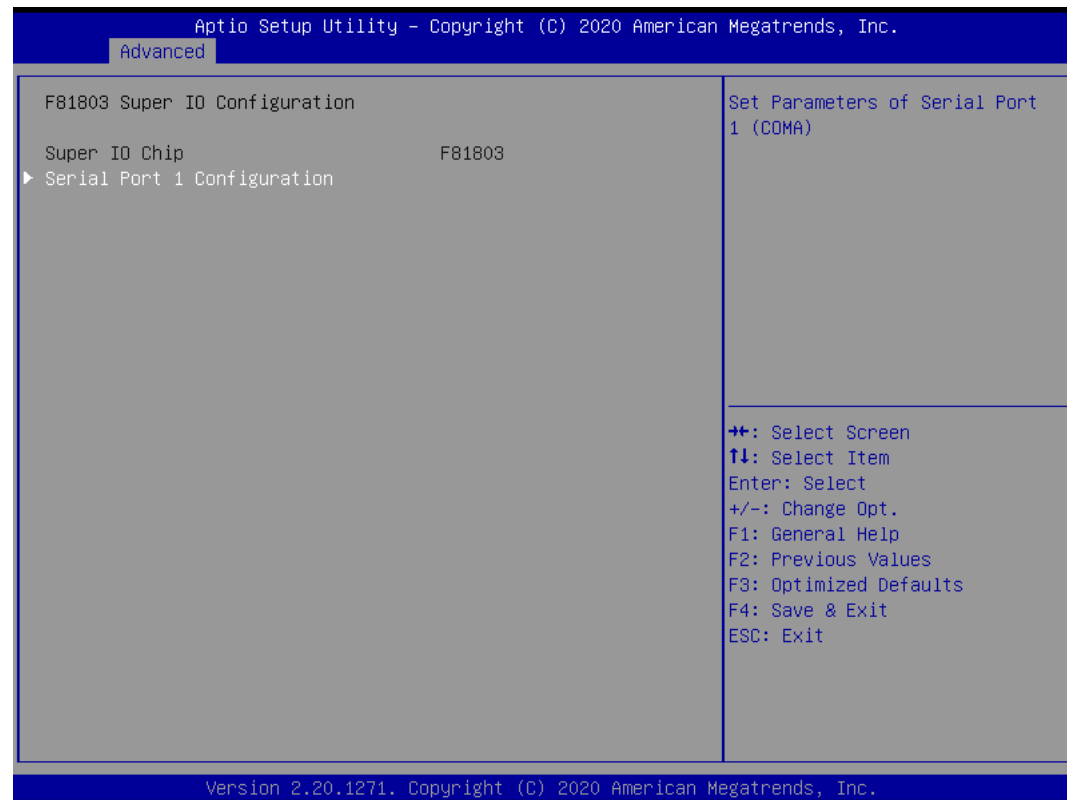
Serial Port 1 (COM1) Configuration

Enable or disable serial port(COM).

```
         Aptio Setup Utility - Copyright (C) 2020 American
          Advanced

     Serial Port 1 Configuration

     Serial Port                        [Enabled]
     Device Settings                    IO=3F8h; IRQ=4;
```
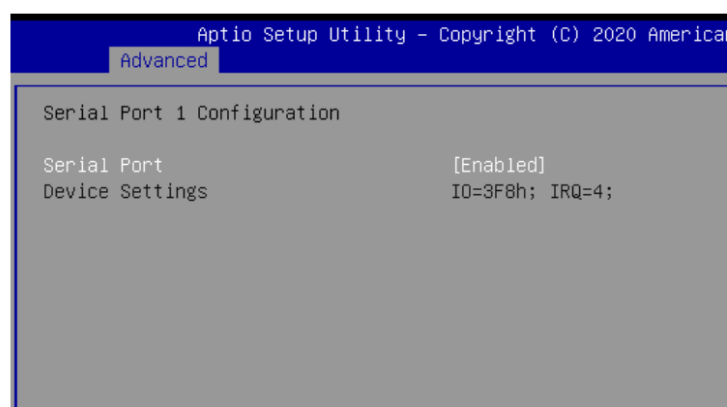
Hardware Monitor

This screen monitors hardware health status.

```
                  Aptio Setup Utility – Copyright (C) 2020 American Megatrends, Inc.
          Advanced

    Hardware Monitor                                          Enable or Disable Smart Fan
                                                              Enable
    Smart Fan Function              [Enabled]                  - Fan speed would change by
                                                              temp
    CPU temperature               : +39 C                     Disable
    System temperature            : +28 C                      - Fan would keep full speed
    Fan1 Speed                    : 4918 RPM
    Fan2 Speed                    : N/A
    +3.3V                         : +3.264 V
    +5V                           : +5.036 V
    +3.3VSB                       : +3.296 V
    +5VSB                         : +5.040 V
    VBAT                          : +2.672 V
                                                              ──────────────────────────

                                                              →←: Select Screen
                                                              ↑↓: Select Item
                                                              Enter: Select
                                                              +/-: Change Opt.
                                                              F1: General Help
                                                              F2: Previous Values
                                                              F3: Optimized Defaults
                                                              F4: Save & Exit
                                                              ESC: Exit




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```

This screen displays the temperature of the system and CPU as well as system voltages (VBAT, +3.3V and +5V).

ACPI Settings

Use this screen to select options for the ACPI configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen.

```
Aptio Setup Utility - Copyright (C) 2020 American Megatrends, Inc.
 Advanced

ACPI Settings                                          Select the highest ACPI sleep
                                                       state the system will enter
ACPI Sleep State                [S3 (Suspend to RAM)]  when the SUSPEND button is
                                                       pressed.


                                                       _____

                                                       ➕➕: Select Screen
                                                       ↑↓: Select Item
                                                       Enter: Select
                                                       +/-: Change Opt.
                                                       F1: General Help
                                                       F2: Previous Values
                                                       F3: Optimized Defaults
                                                       F4: Save & Exit
                                                       ESC: Exit



        Version 2.20.1271. Copyright (C) 2020 American Megatrends, Inc.
```
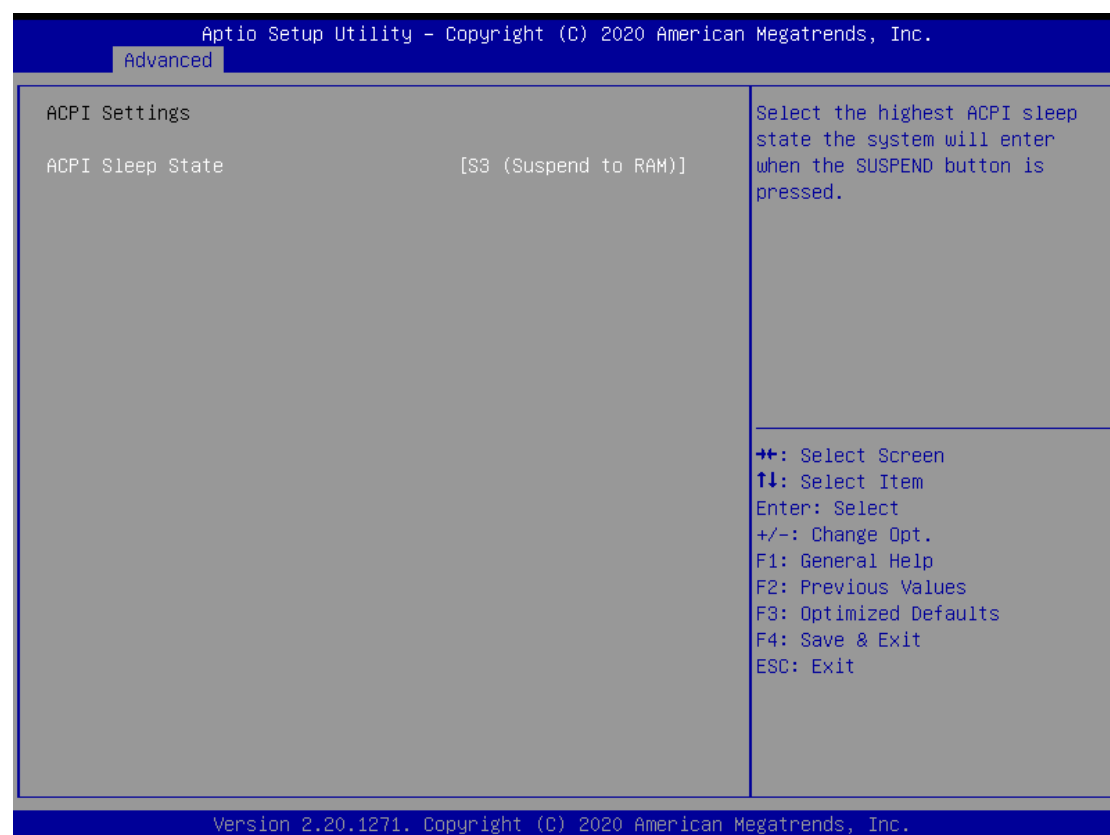
ACPI Sleep State

When the sleep button is pressed, the system will be in the ACPI sleep state.

The default is S3 (Suspend to RAM).

MCU Configurations
Use this screen to Enabled or Disable EDID auto emulate function. The default is Disabled.

```
                 Aptio Setup Utility - Copyright (C) 2020 American Megatrends, Inc.
      Advanced

  MCU Configuration                                          EDID auto emulate function

  EDID auto emulate                   [Disabled]




                                                           →←: Select Screen
                                                           ↑↓: Select Item
                                                           Enter: Select
                                                           +/-: Change Opt.
                                                           F1: General Help
                                                           F2: Previous Values
                                                           F3: Optimized Defaults
                                                           F4: Save & Exit
                                                           ESC: Exit



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```

Trusted Computing

You can use this screen for TPM (Trusted Platform Module) configuration. It also shows current TPM status information.

```
        Aptio Setup Utility – Copyright (C) 2020 American Megatrends, Inc.
    Advanced

    Firmware Version:                                    Enables or Disables BIOS
    Vendor:                                              support for security device.
                                                         O.S. will not show Security
    Security Device Support          [Enable]            Device. TCG EFI protocol and
                                                         INT1A interface will not be
                                                         available.




                                                         →←: Select Screen
                                                         ↑↓: Select Item
                                                         Enter: Select
                                                         +/-: Change Opt.
                                                         F1: General Help
                                                         F2: Previous Values
                                                         F3: Optimized Defaults
                                                         F4: Save & Exit
                                                         ESC: Exit


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```

Security Device Support
Enable or disable BIOS support for security device. The default is Disabled. Once the Security Device Support is enabled, you will see the following screen.

CPU Configurations

This screen shows the CPU version and its detailed information.

```
          Aptio Setup Utility - Copyright (C) 2020 American Megatrends, Inc.
   Advanced

  CPU Configuration                                            When enabled, a VMM can
                                                               utilize the additional
  Type                        Intel(R) Core(TM)                hardware capabilities provided
                              i3-8100T CPU @ 3.10GHz           by Vanderpool Technology.
  ID                          0x906EB
  Speed                       3100 MHz
  L1 Data Cache               32 KB x 4
  L1 Instruction Cache        32 KB x 4
  L2 Cache                    256 KB x 4
  L3 Cache                    6 MB
  L4 Cache                    N/A
  VMX                         Supported
  SMX/TXT                     Not Supported
                                                               →←: Select Screen
  Intel (VMX) Virtualization  [Enabled]                        ↑↓: Select Item
  Technology                                                   Enter: Select
                                                               +/-: Change Opt.
                                                               F1: General Help
                                                               F2: Previous Values
                                                               F3: Optimized Defaults
                                                               F4: Save & Exit
                                                               ESC: Exit




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```

Intel 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.

SATA And RST Configurations

During system boot up, BIOS automatically detects the presence of SATA devices. In the SATA Configuration menu, you can see the currently installed hardware in the SATA ports.

```
         Aptio Setup Utility - Copyright (C) 2020 American Megatrends, Inc.
             Advanced

  SATA And RST Configuration                                  Enable/Disable SATA Device.

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

  SATA1                           Empty
  SATA2                           Empty
  SATA3                           Empty


                                                             ↔: Select Screen
                                                             ↑↓: Select Item
                                                             Enter: Select
                                                             +/-: Change Opt.
                                                             F1: General Help
                                                             F2: Previous Values
                                                             F3: Optimized Defaults
                                                             F4: Save & Exit
                                                             ESC: Exit

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```

SATA Controller(s)

Enable or disable the SATA Controller feature. The default is Enabled.

```
         Aptio Setup Utility - Copyright (C) 2020 American Megatrends, Inc.
             Advanced

  SATA And RST Configuration                        Determines how SATA
                                                    controller(s) operate.
  SATA Controller(s)              [Enabled]         This PCH SKU dosen't support
  SATA Mode Selection             [AHCI]            RST feature

  Serial ATA Port 0               Empty
  Serial ATA Port 1               Empty
  Serial ATA Port 3               Empty


                       ┌──── SATA Mode Selection ────┐
                       │ AHCI                          │
                       │                               │   ↔: Select Screen
                       └───────────────────────────────┘   ↑↓: Select Item
                                                            Enter: Select
                                                            +/-: Change Opt.
                                                            F1: General Help
                                                            F2: Previous Values
                                                            F3: Optimized Defaults
                                                            F4: Save & Exit
                                                            ESC: Exit

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```

SATA Mode Selection
Determine how SATA controller(s) operate.

PCH-FW Configuration

This screen shows the ME firmware information.

```
          Aptio Setup Utility - Copyright (C) 2020 American Megatrends, Inc.
     Advanced

  ME Firmware Version              12.0.0.1068
  ME Firmware Mode                 Normal Mode
  ME Firmware SKU                  Corporate SKU




                                                       →←: Select Screen
                                                       ↑↓: Select Item
                                                       Enter: Select
                                                       +/-: Change Opt.
                                                       F1: General Help
                                                       F2: Previous Values
                                                       F3: Optimized Defaults
                                                       F4: Save & Exit
                                                       ESC: Exit




          Version 2.20.1271. Copyright (C) 2020 American Megatrends, Inc.
```

AMT Configuration

This screen shows the ME firmware information.

```
            Aptio Setup Utility - Copyright (C) 2020 American Megatrends, Inc.
    Advanced

 AMT BIOS Features                 [Enabled]           When disabled AMT BIOS
                                                       Features are no longer
                                                       supported and user is no
                                                       longer able to access MEBx
                                                       Setup.
                                                       Note:
                                                       This option does not disable
                                                       Manageability Features in FW.



                                                       ──────────────────────────

                                                       �... : Select Screen
                                                       ↑↓: Select Item
                                                       Enter: Select
                                                       +/-: Change Opt.
                                                       F1: General Help
                                                       F2: Previous Values
                                                       F3: Optimized Defaults
                                                       F4: Save & Exit
                                                       ESC: Exit




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```

CSM (Compatibility Support Module) Configuration

Use this screen to enable/disable CSM support.

```
            Aptio Setup Utility - Copyright (C) 2020 American Megatrends, Inc.
       Advanced

   Compatibility Support Module Configuration              This option controls
                                                           Legacy/UEFI ROMs priority
   CSM16 Module Version              07.82

   Boot option filter               [UEFI and Legacy]

   Option ROM execution

   Launch PXE OpROM policy          [Do not launch]
   Video                            [Legacy]
                                                           �: Select Screen
                                                           ↑↓: Select Item
                                                           Enter: Select
                                                           +/-: Change Opt.
                                                           F1: General Help
                                                           F2: Previous Values
                                                           F3: Optimized Defaults
                                                           F4: Save & Exit
                                                           ESC: Exit

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```

Boot optional filter

Controls the priority of UEFI and Legacy ROMs.

Launch PXE OpROM policy

Controls the execution of UEFI and Legacy PXE OpROM.

Video

Controls the execution of UEFI and Legacy Video OpROM.

NVMe Configuration

This screen specifies NVMe storage information. For items marked with "►", please press <Enter> for more options.

```
        Aptio Setup Utility - Copyright (C) 2020 American Megatrends, Inc.
    Advanced

   NVMe Configuration

   No NVME Device Found




                                                     ++: Select Screen
                                                     ↑↓: Select Item
                                                     Enter: Select
                                                     +/-: Change Opt.
                                                     F1: General Help
                                                     F2: Previous Values
                                                     F3: Optimized Defaults
                                                     F4: Save & Exit
                                                     ESC: Exit




        Version 2.20.1271. Copyright (C) 2020 American Megatrends, Inc.
```
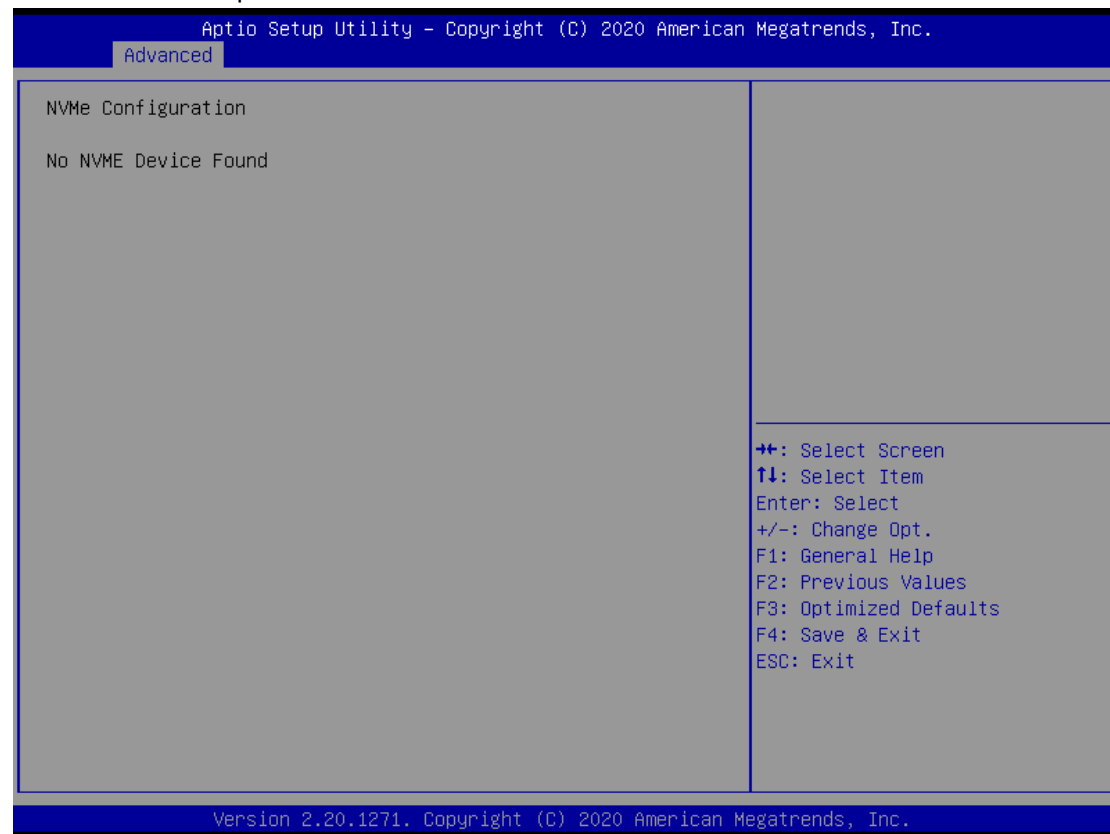
S5 RTC Wake Settings

This screen monitors hardware health status.

```
           Aptio Setup Utility - Copyright (C) 2020 American Megatrends, Inc.
    Advanced

  Wake system from S5                    [Disabled]              Enable or disable System wake
                                                                 on alarm event. Select
                                                                 FixedTime, system will wake on
                                                                 the hr::min::sec specified.
                                                                 Select DynamicTime , System
                                                                 will wake on the current time
                                                                 + Increase minute(s)


                                                                 →←: Select Screen
                                                                 ↑↓: Select Item
                                                                 Enter: Select
                                                                 +/-: Change Opt.
                                                                 F1: General Help
                                                                 F2: Previous Values
                                                                 F3: Optimized Defaults
                                                                 F4: Save & Exit
                                                                 ESC: Exit



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```

Wake system from S5

Enable or disable system alarm event. The default is Disabled.

4.5 Chipset Menu

The Chipset menu allows users to change the advanced chipset settings. Users can select any of the items in the left frame of the screen to go to the sub menus:

► System Agent (SA) Configuration
► PCH-IO Configuration

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

```
            Aptio Setup Utility - Copyright (C) 2020 American Megatrends, Inc.
     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
                                                │ F3: Optimized Defaults
                                                │ F4: Save & Exit
                                                │ ESC: Exit

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```
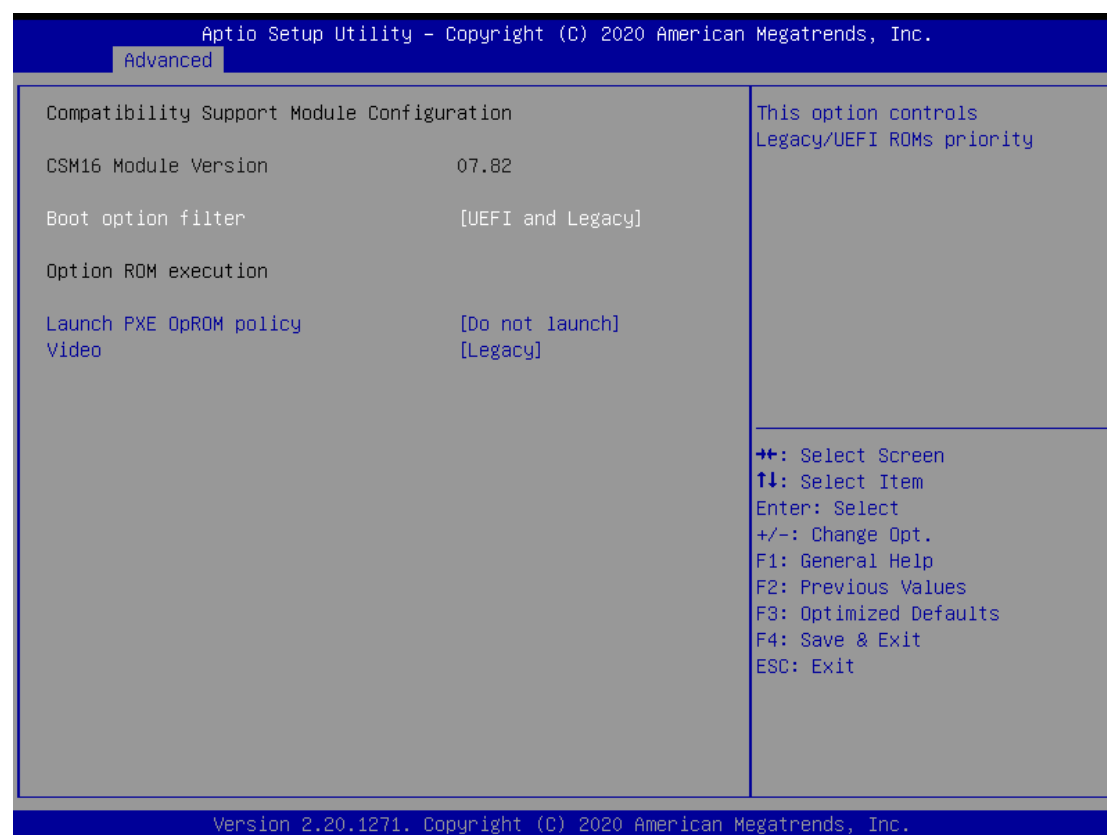
System Agent (SA) Configuration

This screen allows users to configure memory parameters.

```
           Aptio Setup Utility – Copyright (C) 2020 American Megatrends, Inc.
           Chipset

 System Agent (SA) Configuration                          Memory Configuration Parameters

 SA PCIe Code Version                 7.0.46.80

 ▶ Memory Configuration




                                                          →←: Select Screen
                                                          ↑↓: Select Item
                                                          Enter: Select
                                                          +/-: Change Opt.
                                                          F1: General Help
                                                          F2: Previous Values
                                                          F3: Optimized Defaults
                                                          F4: Save & Exit
                                                          ESC: Exit



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```

Memory Information

Display system memory information.

```
           Aptio Setup Utility – Copyright (C) 2020 American
           Chipset


 Memory RC Version              0.7.1.65
 Total Memory                    4096 MB
 DIMM#1                         Not Populated / Disabled
 DIMM#2                         Populated & Enabled
    Size                        4096 MB (DDR4)
```
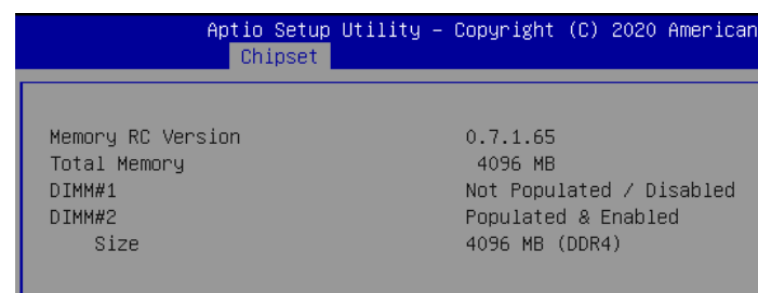
4.6 PCH-IO Configuration

This screen shows the information of South Bridge chipset. For items marked with "▶", please press <Enter> for more options.

```
          Aptio Setup Utility - Copyright (C) 2020 American Megatrends, Inc.
           Chipset

     PCH-IO Configuration                                    Enable/Disable onboard NIC.

     Name                              CNL PCH-H
     PCH SKU                           Q370
     Stepping                          B0

     PCH LAN Controller                [Enabled]
        Wake on LAN Enable             [Enabled]




                                                             →←: Select Screen
                                                             ↑↓: Select Item
                                                             Enter: Select
                                                             +/-: Change Opt.
                                                             F1: General Help
                                                             F2: Previous Values
                                                             F3: Optimized Defaults
                                                             F4: Save & Exit
                                                             ESC: Exit



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```

4.7 Security Menu

```
          Aptio Setup Utility – Copyright (C) 2020 American Megatrends, Inc.
  Main  Advanced  Chipset  Security  Boot  Save & Exit

  Password Description                                    Set Administrator Password

  If ONLY the Administrator's password is set,
  then this only limits access to Setup and is
  only asked for when entering Setup.
  If ONLY the User's password is set, then this
  is a power on password and must be entered to
  boot or enter Setup. In Setup the User will
  have Administrator rights.
  The password length must be
  in the following range:
  Minimum length                    3
  Maximum length                    20                   ─────────────────────────

                                                         →←: Select Screen
  Administrator Password                                 ↑↓: Select Item
  User Password                                          Enter: Select
                                                         +/-: Change Opt.
                                                         F1: General Help
                                                         F2: Previous Values
                                                         F3: Optimized Defaults
                                                         F4: Save & Exit
                                                         ESC: Exit




          Version 2.20.1271. Copyright (C) 2020 American Megatrends, Inc.
```
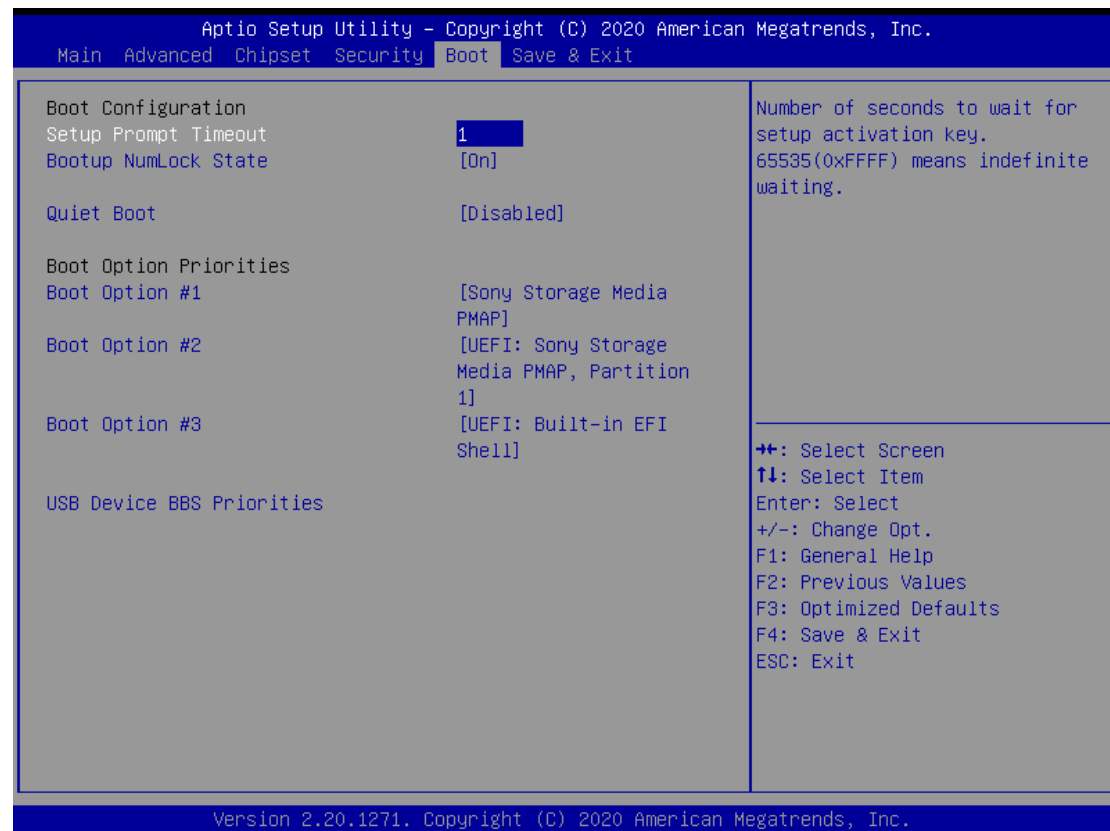
Administrator Password

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

Boot Menu

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

```
              Aptio Setup Utility – Copyright (C) 2020 American Megatrends, Inc.
     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
                                                           waiting.
     Quiet Boot                      [Disabled]

     Boot Option Priorities
     Boot Option #1                  [Sony Storage Media
                                     PMAP]
     Boot Option #2                  [UEFI: Sony Storage
                                     Media PMAP, Partition
                                     1]
     Boot Option #3                  [UEFI: Built-in EFI
                                     Shell]                ──────────────────────────────
                                                           →←: Select Screen
     USB Device BBS Priorities                             ↑↓: Select Item
                                                           Enter: Select
                                                           +/-: Change Opt.
                                                           F1: General Help
                                                           F2: Previous Values
                                                           F3: Optimized Defaults
                                                           F4: Save & Exit
                                                           ESC: Exit




              Version 2.20.1271. Copyright (C) 2020 American Megatrends, Inc.
```
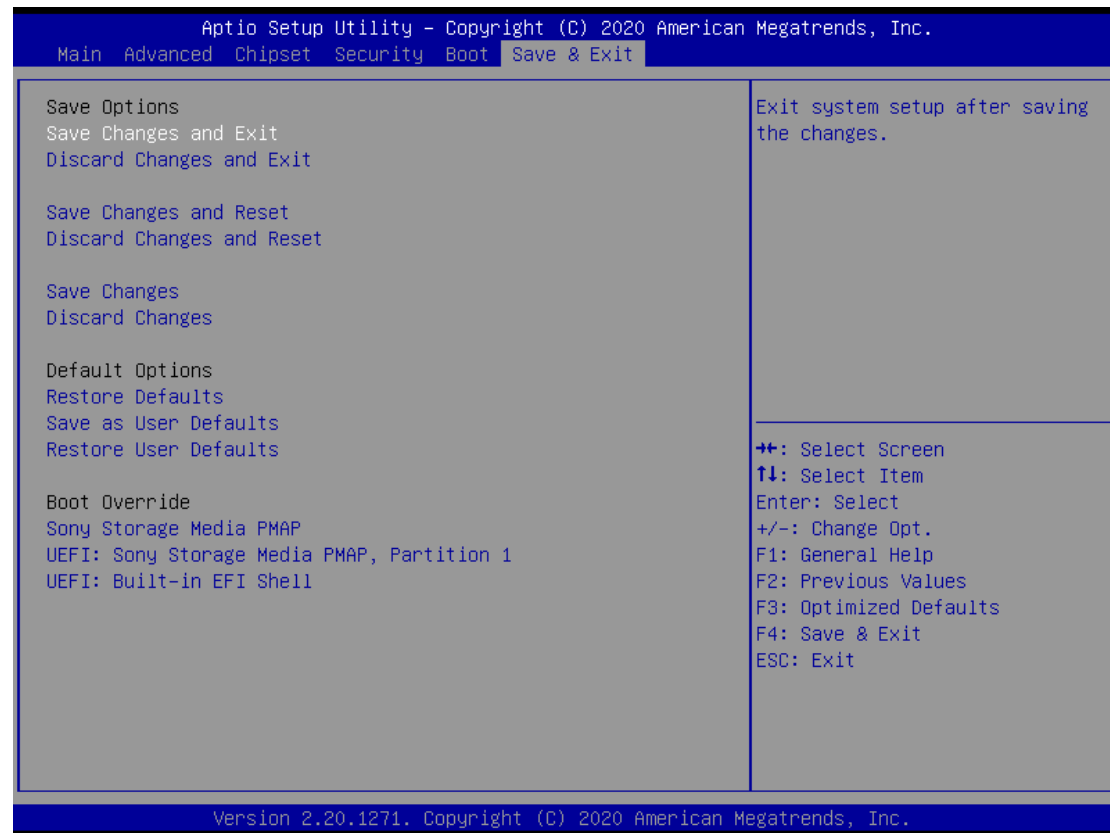
Setup Prompt Timeout

Use this item to set up number of seconds to wait for setup activation key where 65535(0xFFFF) means indefinite waiting.

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 system configurations with optimal or fail-safe default values.

```
             Aptio Setup Utility – Copyright (C) 2020 American Megatrends, Inc.
     Main  Advanced  Chipset  Security  Boot  Save & Exit

    Save Options                                      Exit system setup after saving
    Save Changes and Exit                             the changes.
    Discard Changes and Exit

    Save Changes and Reset
    Discard Changes and Reset

    Save Changes
    Discard Changes

    Default Options
    Restore Defaults
    Save as User Defaults
    Restore User Defaults                             →←: Select Screen
                                                      ↑↓: Select Item
    Boot Override                                     Enter: Select
    Sony Storage Media PMAP                           +/–: Change Opt.
    UEFI: Sony Storage Media PMAP, Partition 1        F1: General Help
    UEFI: Built-in EFI Shell                          F2: Previous Values
                                                      F3: Optimized Defaults
                                                      F4: Save & Exit
                                                      ESC: Exit


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```

Save Changes and Exit

When users 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 configurations 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 completed the system configuration changes, select this option to leave Setup and reboot the computer so the new system configurations 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 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 configurations. 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 users 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 users 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

The following example enables configurations using debug tool.

Enable WDT

↓

Enable configuration:

                           O 2E 87; Un-lock super I/O

                           O 2E 87

↓

Select logic device:

                           O 2E 07

                           O 2F 08

↓

WDT device enable:

                           O 2E 30

                           O 2F 01

↓

Set timer unit:

                           O 2E F0

                           O 2F 00 ; (00: Sec; 08:Minute)

↓

Set base timer:

                           O 2E F1

                           O 2F 0A; Set reset time (where 0A (hex) = 10sec)

Disable WDT

↓

Enable configuration:

                           O 2E 87; Un-lock super I/O

                           O 2E 87

↓

Select logic device:

                           O 2E 07

                           O 2F 08

↓

WDT device disable:

                           O 2E 30

                           O 2F 00