AV200

MIL-STD Rugged Fanless Computer

User's Manual

Revision Date: June. 15. 2020

Safety Information

Electrical safety

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.
- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.
- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.
- Make sure that your power supply is set to the correct voltage in your area.
- If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your local distributor.

Operation safety

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.
- Before using the product, make sure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.
- Place the product on a stable surface.
- If you encounter any technical problems with the product, contact your local distributor

Statement

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Revision History

Revision	Date (yyyy/mm/dd)	Changes
V1.0	2020/XX/XX	First release

Packing List

Item	Description	Q'ty
1	AV200 Embedded System	1
2	Driver CD	1

Ordering information

AV200

MIL-STD-810G Rugged Computer with Intel® Core™ i7-7820EQ

NVIDIA GTX1050Ti GPU, 4 Independent DP, Mini PCIe,

9V to 36V DC-in, Extend Temp -40 to 60°C

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RoHS Compliance

Perfectron RoHS Environmental Policy and Status Update

Perfectron is a global citizen for building the digital infrastructure. We are committed to providing green products and services, which are compliant with

European Union RoHS (Restriction on Use of Hazardous Substance in Electronic Equipment) directive 2011/65/EU, to be your trusted green partner and to protect our environment.

In order to meet the RoHS compliant directives, Perfectron has established an engineering and manufacturing task force to implement the introduction of green products. The task force will ensure that we follow the standard Perfectron development procedure and that all the new RoHS components and new manufacturing processes maintain the highest industry quality levels for which Perfectron are renowned.

The model selection criteria will be based on market demand. Vendors and suppliers will ensure that all designed components will be RoHS compliant

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Table Contents

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Chapter 1 : Product Introduction

1.1 Specifications

System

CPU	Intel® 7th Gen Core™ i7-7820EQ(Frequency 3.0GHz, Turbo Boost up to 3.7GHz),Quad-Core,8 Thread Support, 8MB SmartCache. Build-in HD Graphic 630 for excellent 3D, Turbo Boost Technology 2.0, Vpro and Hyper-Threading support
Memory type	1 x SO-DIMM DDR4 2133 MHz up to 32GB
Chipset	Intel® QM175
Expansion Slot	1 x Full size mPCIe(w/SIM card and mSATA supported) 1 x Half-size mPCIe

Display

Display Port	Resolution up to 3840x2160
GPU	NVIDIA GTX1050Ti
DVI-I	Resolution up to 1920x1200

Storage

mSATA	1 x mSATA Soild State Disk (SSD) – up to 521GB Capacity

Ethernet

Ethernet	2 x intel Gigabit Ethernet LAN Interface (10/100/1000 Mbps supported)

Rear I/O

Display Port	4 x DisplayPort connectors
DVI-I	1 x DVI-I connector
Ethernet	2 x RJ45 Gigabit Ethernet LAN
Audio	2 x 3.5mm Audio Jacks (1 x MIC, 1 x Line-Out)
Serial Port	1 x DB9 connector(RS-232/422/485)
USB	2 x USB 3.0 standard-A connector
DC-IN	1 x 4P Rugged Termial connector
Button	1 x Power Button
Indicator LED	Power, HDD, LAN(Link/Active/Speed)

Front I/O

USB Port	2 x USB 3.0 standard-A connector
HDD Tray	1 x 2.5''HDD Tray

Applications, Operating System

|	
Applications	Commercial and Military Platforms Requiring Compliance to MIL-STD-810G
	Embeeded Computing, Process Control, Intelligent Automation and
	Manufacturing applications where Harsh Temperture, Shock, Vibration,
	Altitude, Dust and EMI Conditions.
	Used in all aspects of the military.
Operating System	Windows 8, Windows 8.1, Windows 10
	Ubuntu13.04, Ubuntu13.10, Ubuntu14.04, Fedora20

Physical

|	
Dimension	315 x 150 x 120 mm (W x D x H)
Weight	6Kg(13.23lbs)
Chassis	Aluminum Alloy, Corrosion Resistant
Finish	Anodic aluminum oxide(Color Black)
Cooling	Nature Passive Convection/ Conduction. No Moving Parts
Ingress Protection	Dust Proof(Similar to IP50)

Environmental

|	
Operation Temperture	-20 to 60°C (ambient with air flow)
Storage Temperture	-40 to 70°C
Relative Humidity	10% to 90%, non-condensing
Reliability	No Moving Parts; Passive Cooling Designd & Manufactured using ISO 9001/2000 Certified Quality Program
EMC	CE and FCC compliance
Green Product	RoHS, WEEE compliance

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1.2 Front Panel I/O Placement

3) Indicator LED

1)HDD Tray   2) 2xUSB3.0   4)Power Button
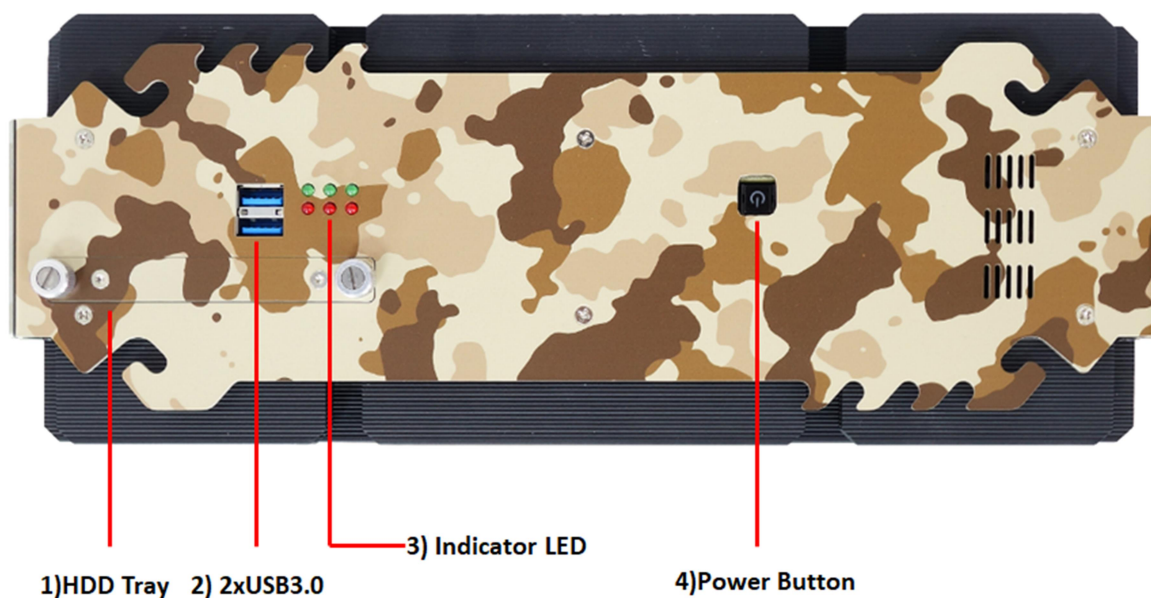
1)	HDD Tray
2)	2 x USB3.0
3)	Indicator LED
4)	Power Button

1.3 Rear Panel I/O Placement
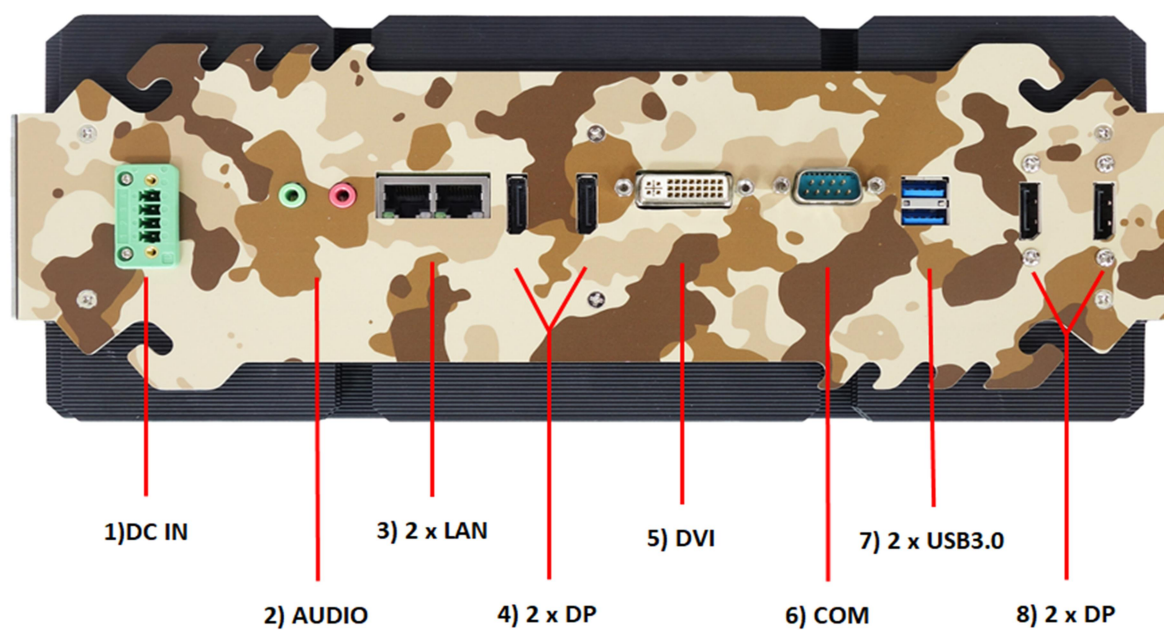
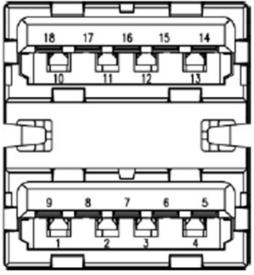| 1)	DC In
2)	AUDIO
3)	2 x LAN
4)	2 x DP
5)	DVI
6)	COM
7)	2 x COM
8)	2 x DP

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1.4 Mechanical Dimensions
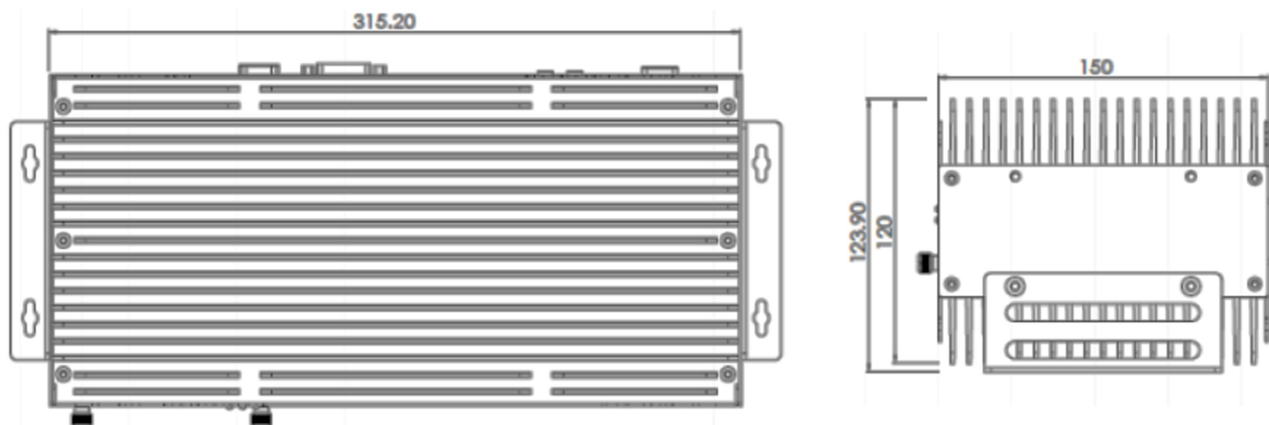
Chapter 2 : Jumpers and Connectors Loacation

2.1 Front Panel Connector Pin Definitions
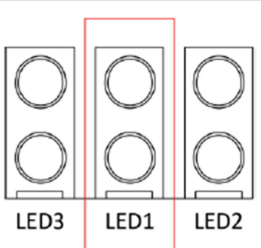
CN9: USB3.0*2

LOWER USB		UPPER USB	
PIN	DEFINITION	PIN	DEFINITION
1	USB_VCC2	10	USB_VCC3
2	USBD0-	11	USBD1-
3	USBD0+	12	USBD1+
4	GND	13	GND
5	USB_SSRX3N_C	14	USB_SSRX4N_C
6	USB_SSRX3P_C	15	USB_SSRX4P_C
7	GND	16	GND
8	USB3TN3	17	USB3TN4
9	USB3TP3	18	USB3TP4
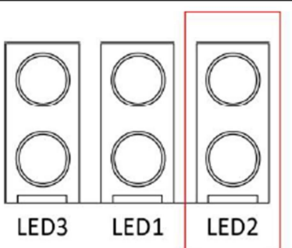
LED1: LAN1 LED STATUS

LED1	Light	Dark	Flash
RED	1000M	100M	NA
GREEN	LINK	UNLINK	ACTIVITY
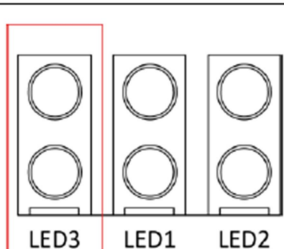
LED2: LAN2 LED STATUS

LED2	Light	Dark	Flash
RED	1000M	100M	NA
GREEN	Link	Un-link	Activity

LED3: LAN3 LED STATUS

LED2	Light	Dark	Flash
RED	NA	HDD un-access	HDD access
GREEN	Power On	Power Off	NA

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SW1: POWER BUTTON
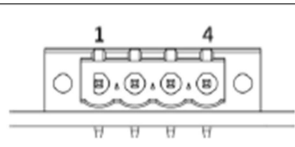
PIN	DEFINITION
ON	NO LIGHT
OFF	BLUE LIGHT

2.2 Rear Panel Connector Pin Definitions

DC Adapter Power Input

PIN	DEFINITION
1	+VIN
2	+VIN
3	GND
4	GND

CN6: Audio Jacks Connector (MIC)

PIN	DEFINITION
5	MIC_L
4	GND
3	NC
2	MIC1_R
1	GND
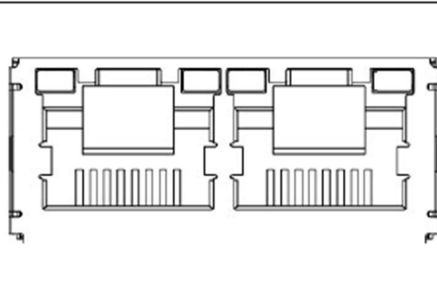
CN7: Audio Jacks Connector (Line-Out)

PIN	DEFINITION
5	FRONT_L
4	GND
3	NC
2	FRONT_R
1	GND
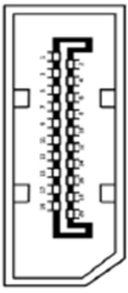
LAN1/LAN2: IntelI219LM/LAN2: Intel I210IT

LAN1		LAN2	
PIN	DEFINITION	PIN	DEFINITION
A1	I218_LAN1_MDI0_DP	B1	LAN2_MDIP0
A2	I218_LAN1_MDI0_DN	B2	LAN2_MDIN0
A3	I218_LAN1_MDI1_DP	B3	LAN2_MDIP1
A4	I218_LAN1_MDI1_DN	B4	LAN2_MDIN1
A7	I218_LAN1_MDI2_DP	B7	LAN2_MDIP2
A8	I218_LAN1_MDI2_DN	B8	LAN2_MDIN2
A9	I218_LAN1_MDI3_DP	B9	LAN2_MDIP3
A10	I218_LAN1_MDI3_DN	B10	LAN2_MDIN3
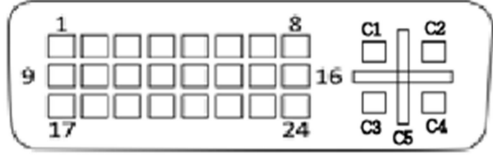
DISPLAY PORT

PIN	DEFINITION	PIN	DEFINITION
1	DPC_LANEP0	2	GND
3	DPC_LANEN0	4	DPC_LANEP1
5	GND	6	DPC_LANEN1
7	DPC_LANEP2	8	GND
9	DPC_LANEN2	10	DPC_LANEP3
11	GND	12	DPC_LANEN3
13	DDIC_DDC_AUX_SEL	14	GND
15	DPC_AUXP	16	GND
17	DPC_AUXN	18	DPC_DET
19	GND	20	DPC_PWR
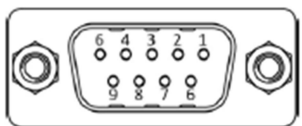
DVI: DVI-D

PIN	DEFINITION	PIN	DEFINITION
1	TMDS Data2-	13	NC
2	TMDS Data2+	14	+5V Power
3	GND	15	GND
4	NC	16	Hot Plug Detect
5	NC	17	TMDS Data0-
6	DDC Clock	18	TMDS Data0+
7	DDC Data	19	GND
8	Analog VSYNC	20	NC
9	TMDS Data1-	21	NC
10	TMDS Data1+	22	GND
11	GND	23	TMDS Clock+
12	NC	24	TMDS Clock-
C1	NC	C2	NC
C3	NC	C4	NC
C5	DVI_GND	C6	DVI_GND
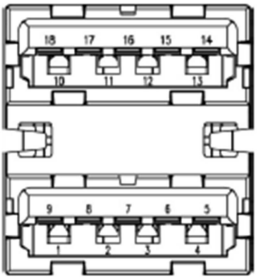
COM1: RS232/422/485 with 5V/12V selectable

PIN	DEFINITION	PIN	DEFINITION
1	DCD1#_OPTO	6	DSR1#_OPTO
2	RXD1_OPTO	7	RTS1#_OPTO
3	TDX1_OPTO	8	CTS1#_OPTO
4	DRT1#_OPTO	9	COM1P9SEL
5	GND	10	GND

CN8: USB3.0 *2

LOWER USB		UPPER USB	
PIN	DEFINITION	PIN	DEFINITION
1	USB_VCC0	10	USB_VCC1
2	USBD2-	11	USBD3-
3	USBD2+	12	USBD3+
4	GND	13	GND
5	USB_SSRX1N_C	14	USB_SSRX2N_C
6	USB_SSRX1P_C	15	USB_SSRX2P_C
7	GND	16	GND
8	USB3TN1	17	USB3TN2
9	USB3TP1	18	USB3TP2

Chapter 3: AMI BIOS UTILITY

This chapter provides users with detailed descriptions on how to set up a basic system configuration through the AMI BIOS setup utility.

3.1 Starting

To enter the setup screens, perform the following steps:

• Turn on the computer and press the <Del> key immediately.

• After the <Del> key is pressed, the main BIOS setup menu displays. Other setup screens can be accessed from the main BIOS setup menu, such as the Chipset and Power menus.

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3.2 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.

Some of the hot keys are <F1>, <F10>, <Enter>, <ESC>, and <Arrow> keys.

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

Left/Right	The Left and Right <Arrow> keys moves the cursor to select a menu.
Up/Down	The Up and Down <Arrow> keys moves the cursor to select a setup screen or sub-screen.
+− Plus/Minus	The Plus and Minus <Arrow> keys changes the field value of a particular setup setting.
Tab	The <Tab> key selects the setup fields.
F1	The <F1> key displays the General Help screen.
F10	The <F10> key saves any changes made and exits the BIOS setup utility.
Esc	The <Esc> key discards any changes made and exits the BIOS setup utility.
Enter	The <Enter> key displays a sub-screen or changes a selected or highlighted option in each menu.

3.3 Main Menu

The Main menu is the screen that first displays when BIOS Setup is entered, unless an error has occurred.

When you first enter the BIOS Setup Utility, you will encounter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab. There are two Main Setup options. They are described in this section. The Main BIOS Setup screen is shown below.

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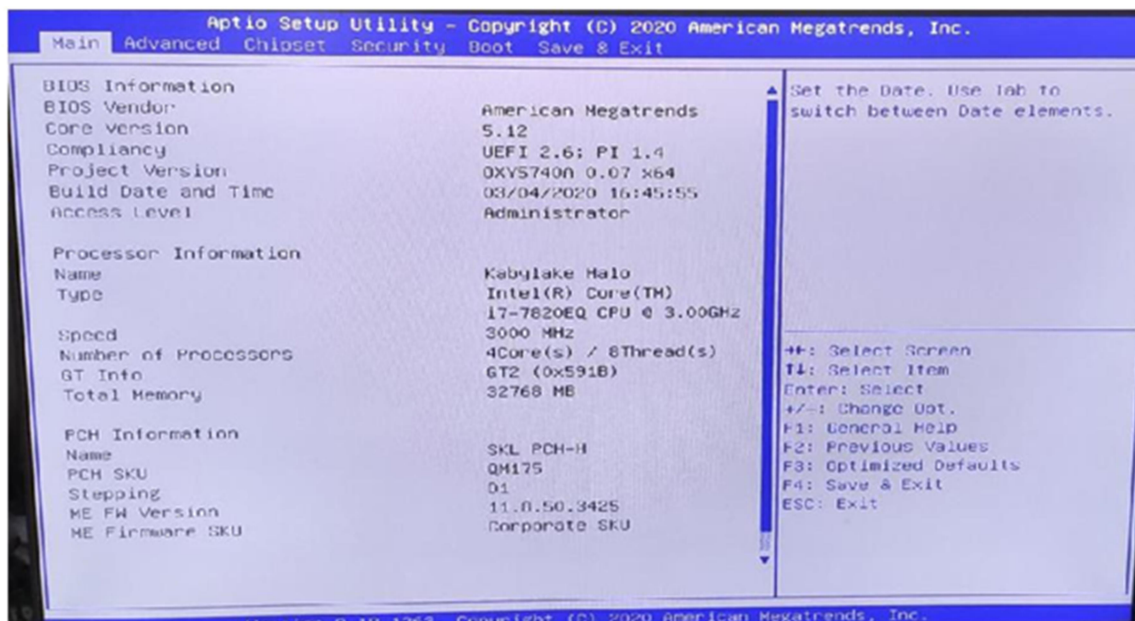
The Main BIOS setup screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured; options in blue can. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

- **System Date**

Use this function to change the system date.

Select System Date using the Up and Down <Arrow> keys. Enter the new values through the keyboard. Press the Left and Right <Arrow> keys to move between fields.

The date setting must be entered in MM/DD/YY format.

- **System Time**

Use this function to change the system time.

Select System Time using the Up and Down <Arrow> keys. Enter the new values through the keyboard. Press the Left and Right <Arrow> keys to move between fields.

The time setting is entered in HH:MM:SS format.

Note: The time is in 24-hour format. For example, 5:30 A.M. appears as 05:30:00, and 5:30 P.M. as 17:30:00.

- **Access Level**

Display the access level of the current user in the BIOS.

3.4 Advanced Menu

The Advanced Menu allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference. *Setting incorrect field values may cause the system to malfunction.*
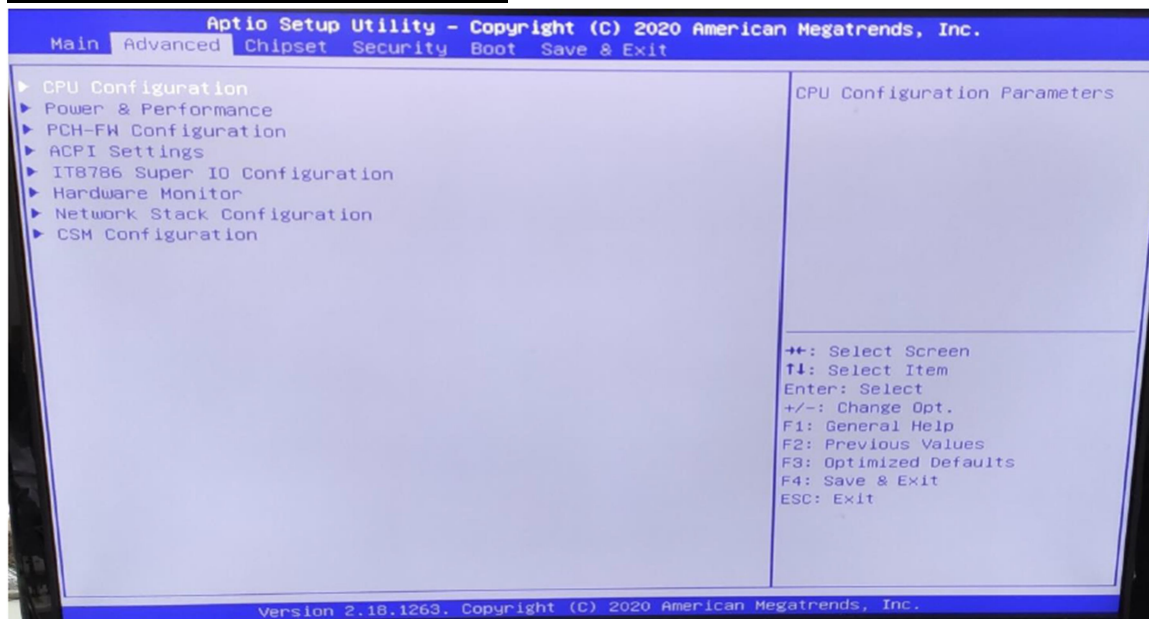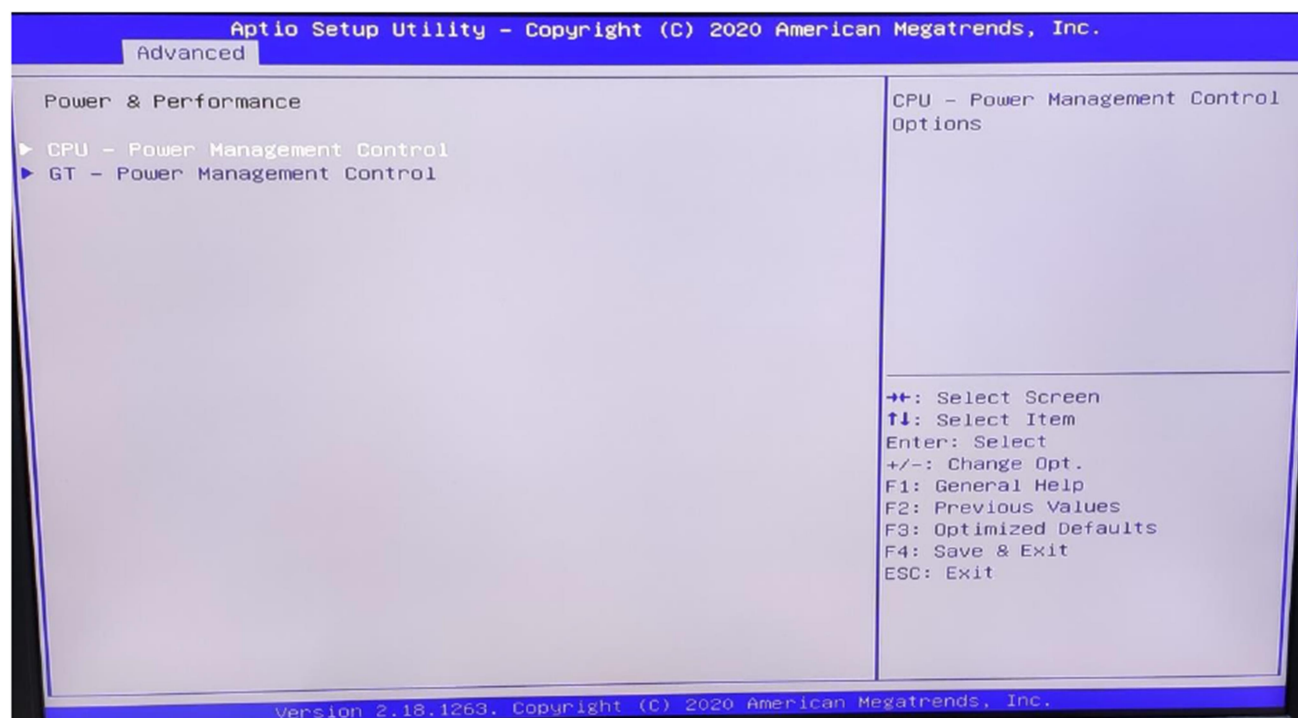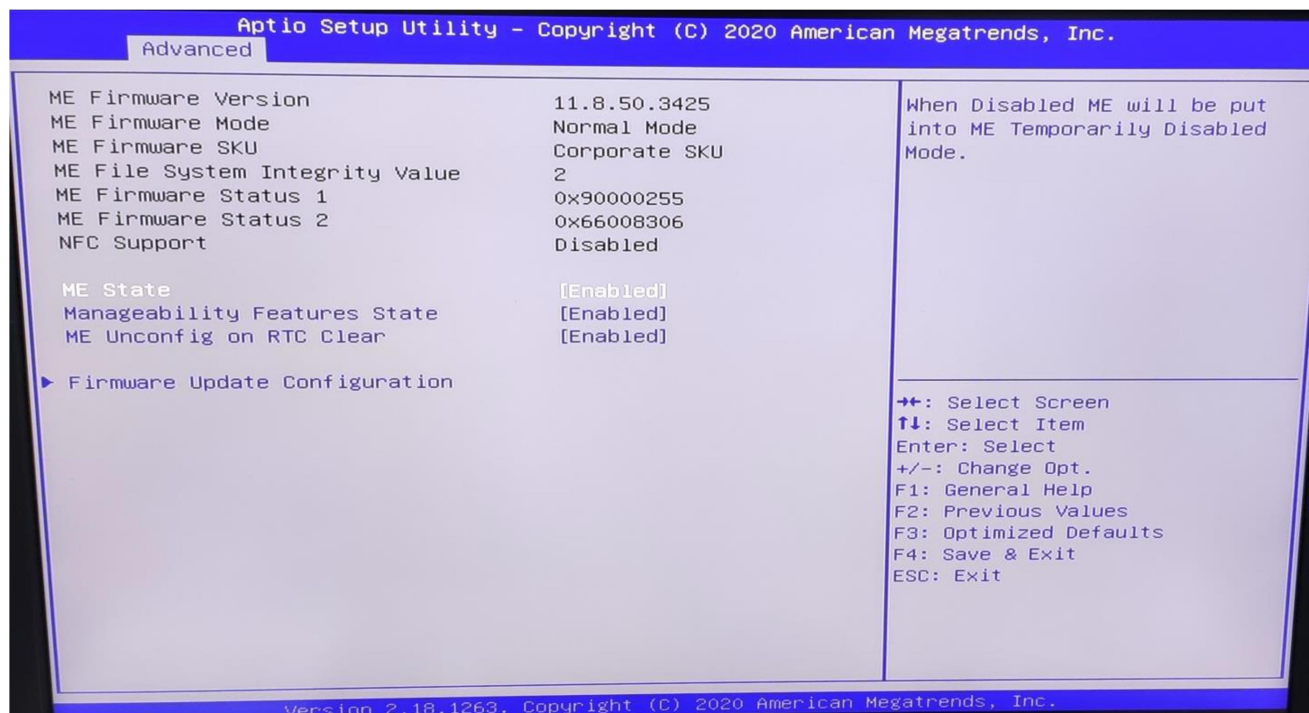
3.4.1 CPU Configuration

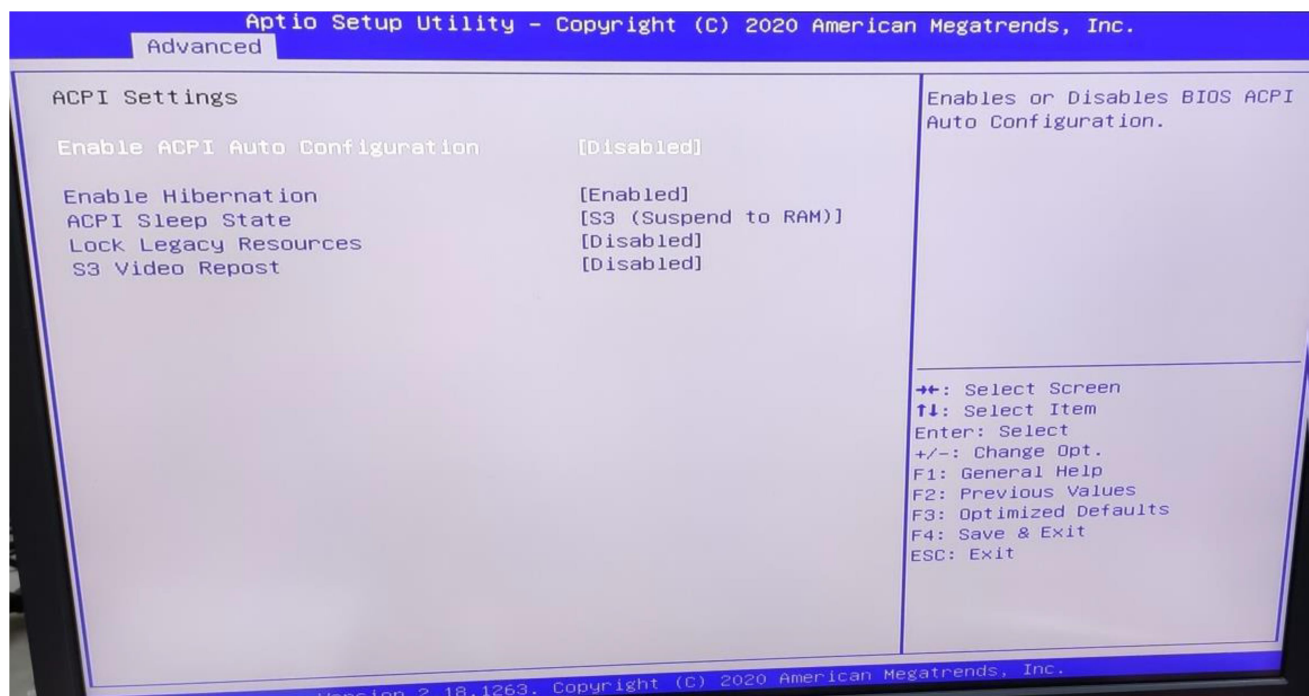This section is used to view CPU status and configure CPU parameters.
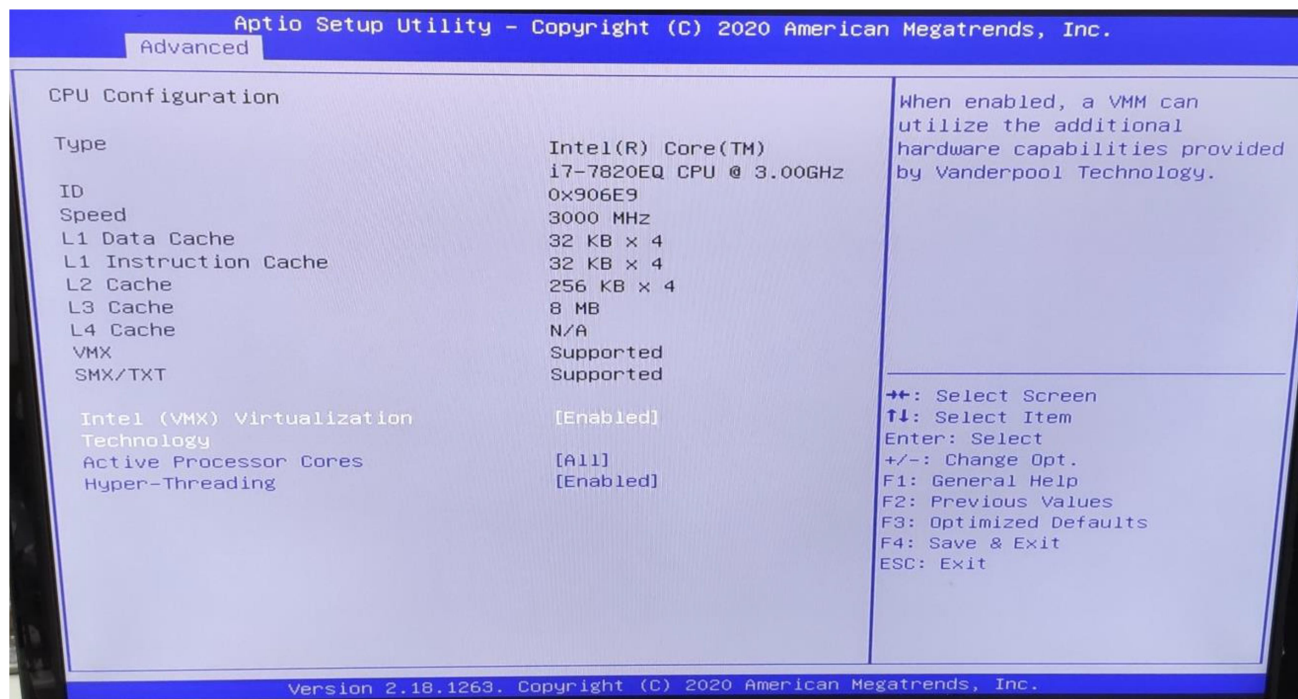
3.4.2 Power & Performance

3.4.3 PCH-FW Configuration

3.4.4 ACPI Setting

- **Enable ACPI Auto Configuration**

Enable or disable BIOS ACPI auto configuration.

- **Enable Hibernation**

Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.
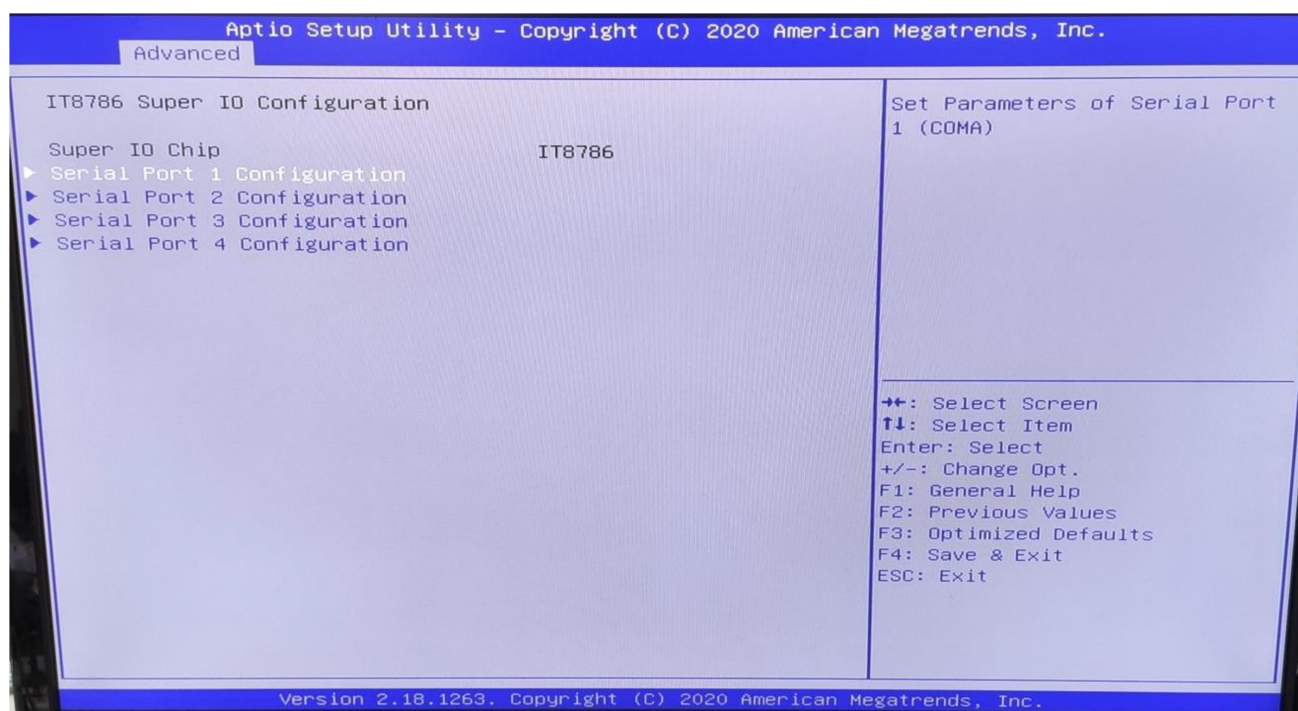
- **ACPI Sleep State**

Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.

- **Lock Legacy Resources**

Enables or Disables Lock of Legacy Resources

3.4.5 IT8786 Super IO Configuration

User can choose a mode (RS232/RS422/RS485) on Serial Port 1.

Serial Port 2/3/4 only support RS232

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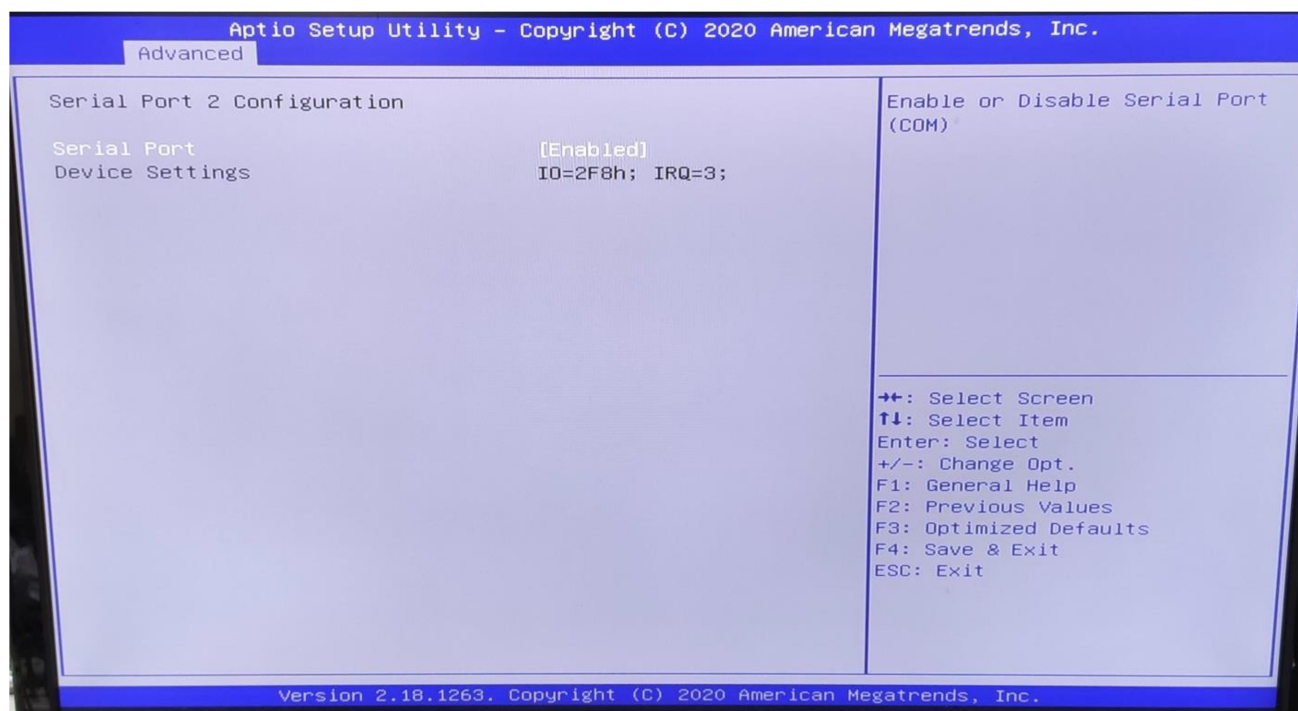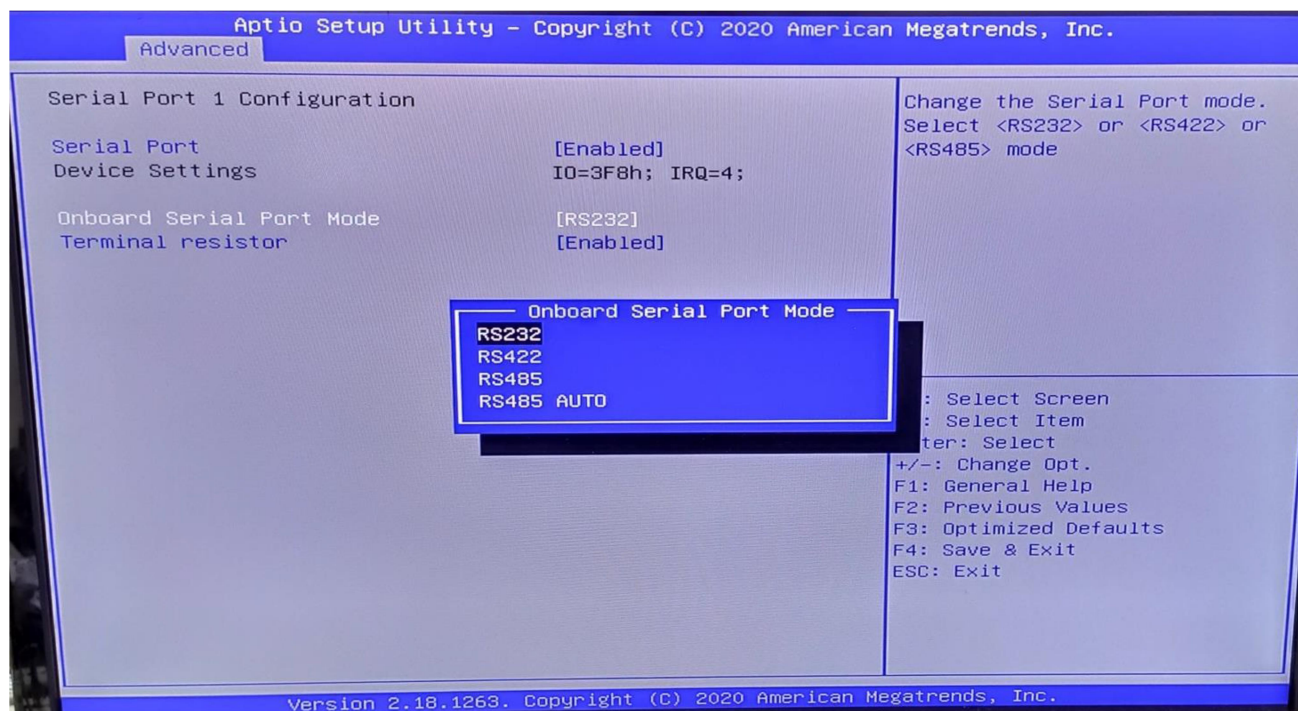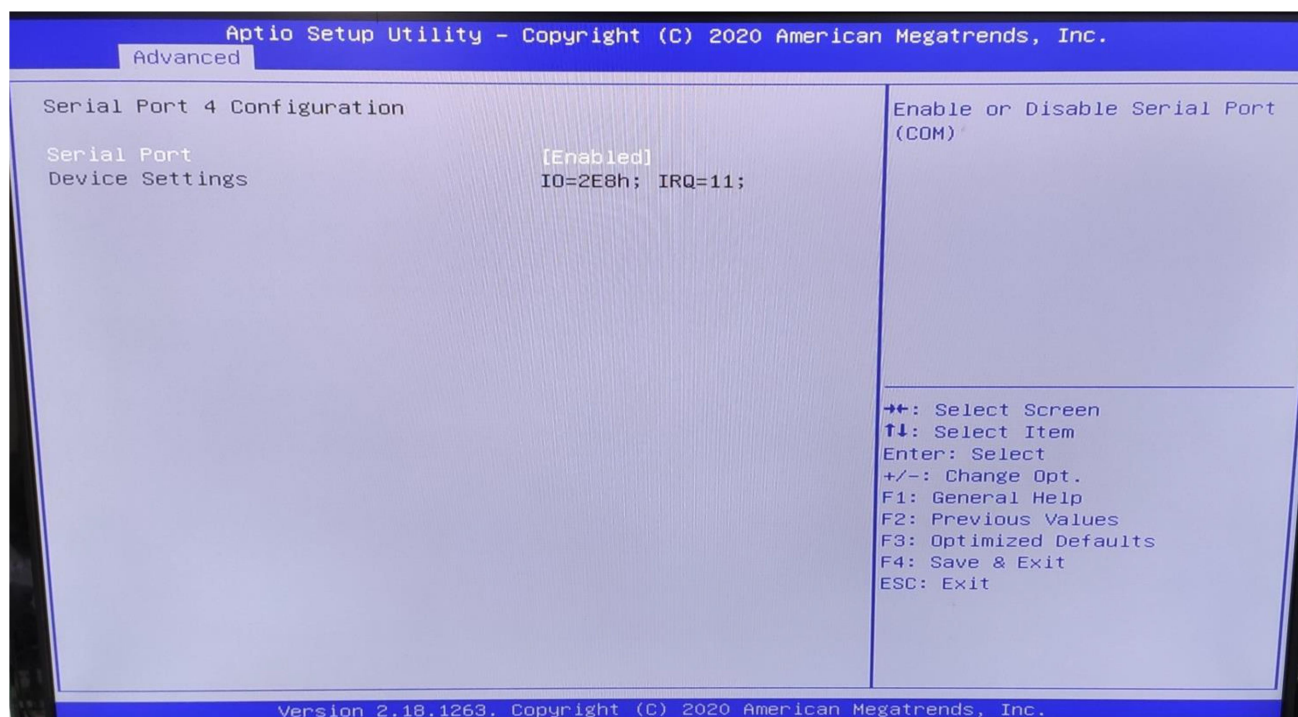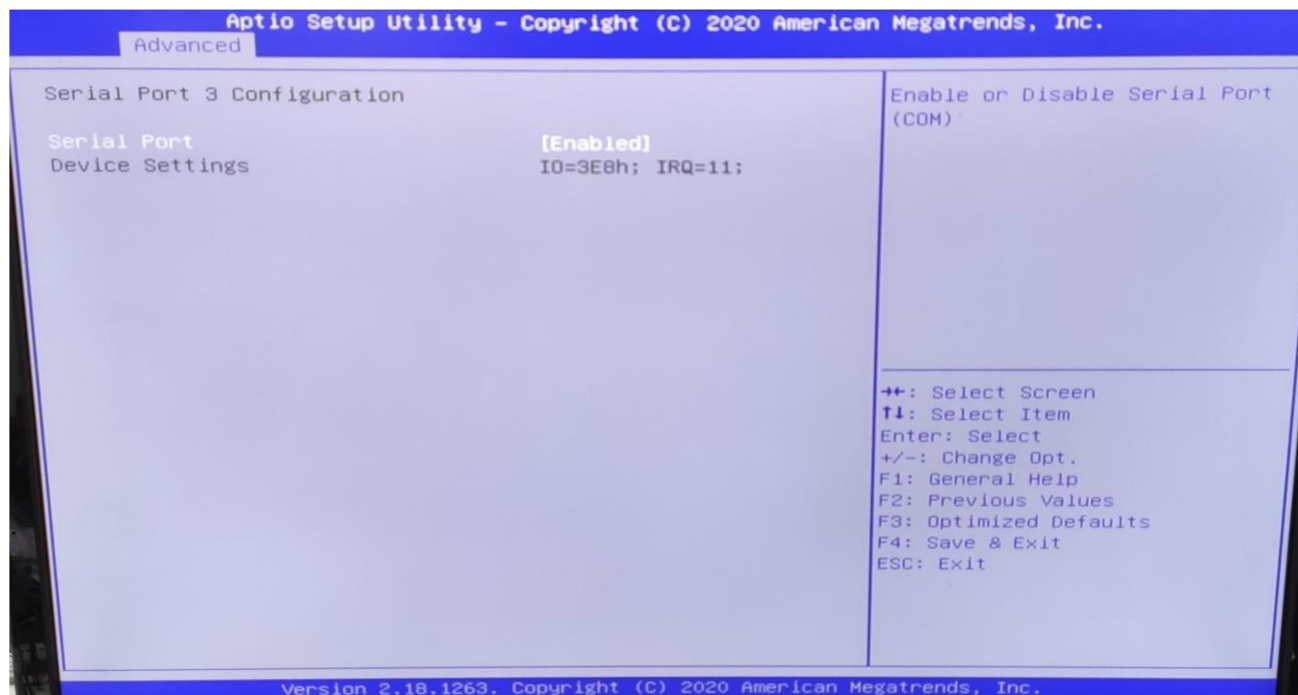
3.4.6HardwareMonitor

This section is used to monitor hardware status such as temperature, fan speed and voltages.
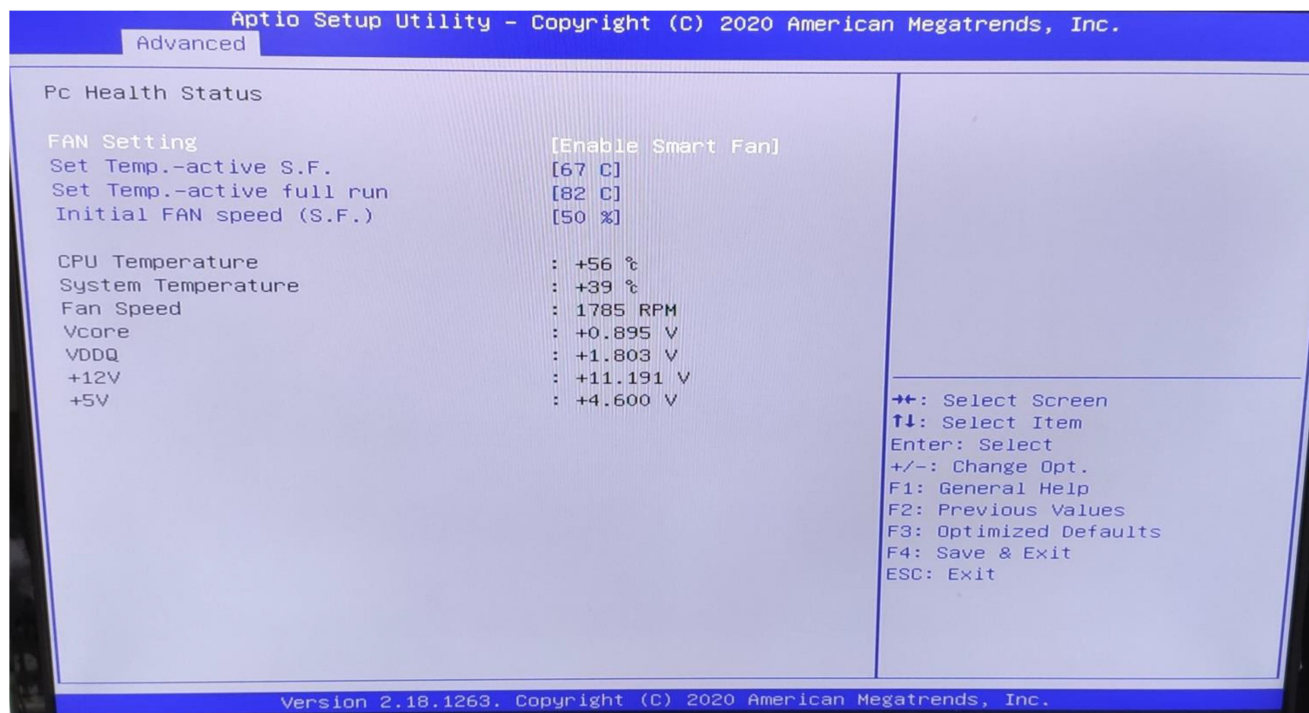
- **CPU Temperature**

Detects and displays the current CPU temperature.

- **System Temperature**

Detects and displays the current system temperature.

- **CPU Fan Speed**

Detects and displays the current CPU fan speed.

- **VCORE to 1.35VDUAL**

Detects and displays the output voltages.

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3.4.7CSM Configuration   24
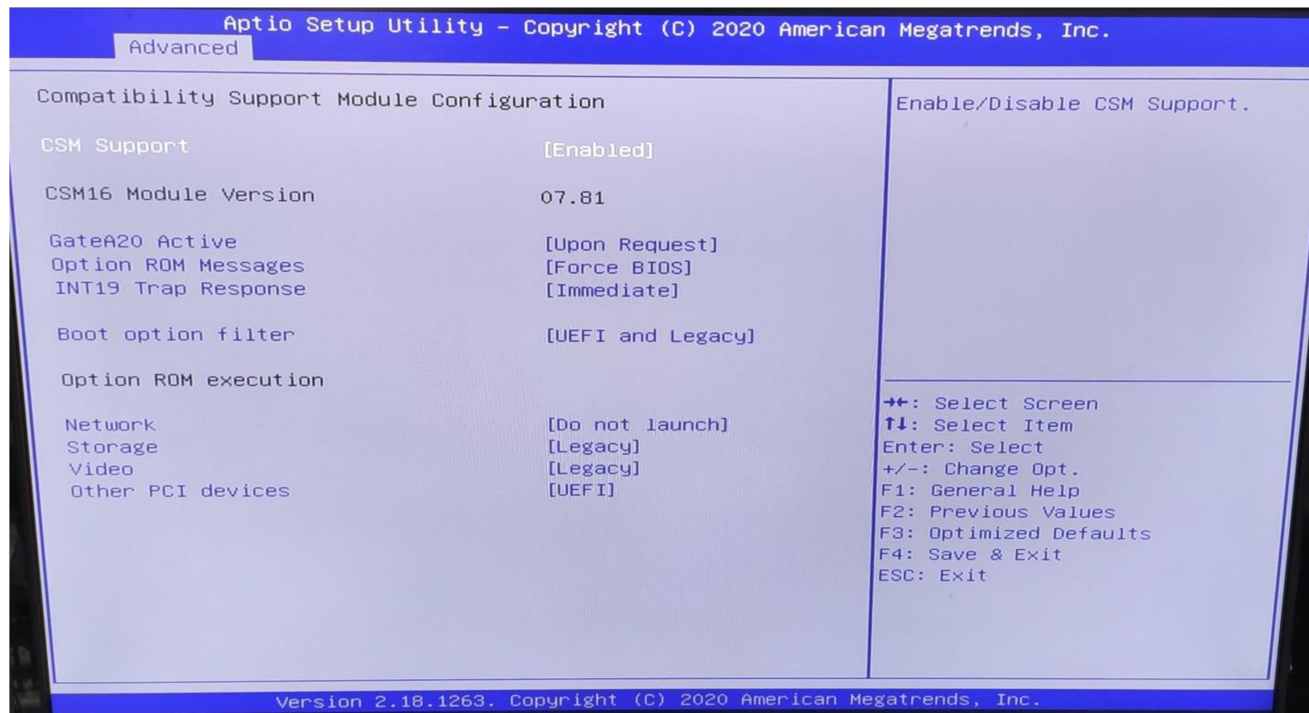
<p align="center">CSM Support for debug purpose</p>

- **CSM Support**

Enable/Disable CSM Support.

- **GateA20 Active**

UPON REQUEST - GA20 can be disabled using BIOS services. ALWAYS - do
not allow disabling GA20; this option is useful when any RT code is executed
above 1MB.

- **INT19 Trap Response**

BIOS reaction on INT19 trapping by Option ROM: IMMEDIATE - execute the
trap right away; POSTPONED - execute the trap during legacy boot.

- **Boot option filter**

This option controls Legacy/UEFI ROMs priority.

- **Network**

Controls the execution of UEFI and Legacy PXE OpROM.

- **Storage**

Controls the execution of UEFI and Legacy Storage OpROM.

- **Video**

Controls the execution of UEFI and Legacy Video OpROM.

- **Other PCI devices**

Determines OpROM execution policy for devices other than Network, Storage, or Video.

3.5 Chipset

This section is used to configure the system based on the specific features of the chipset.
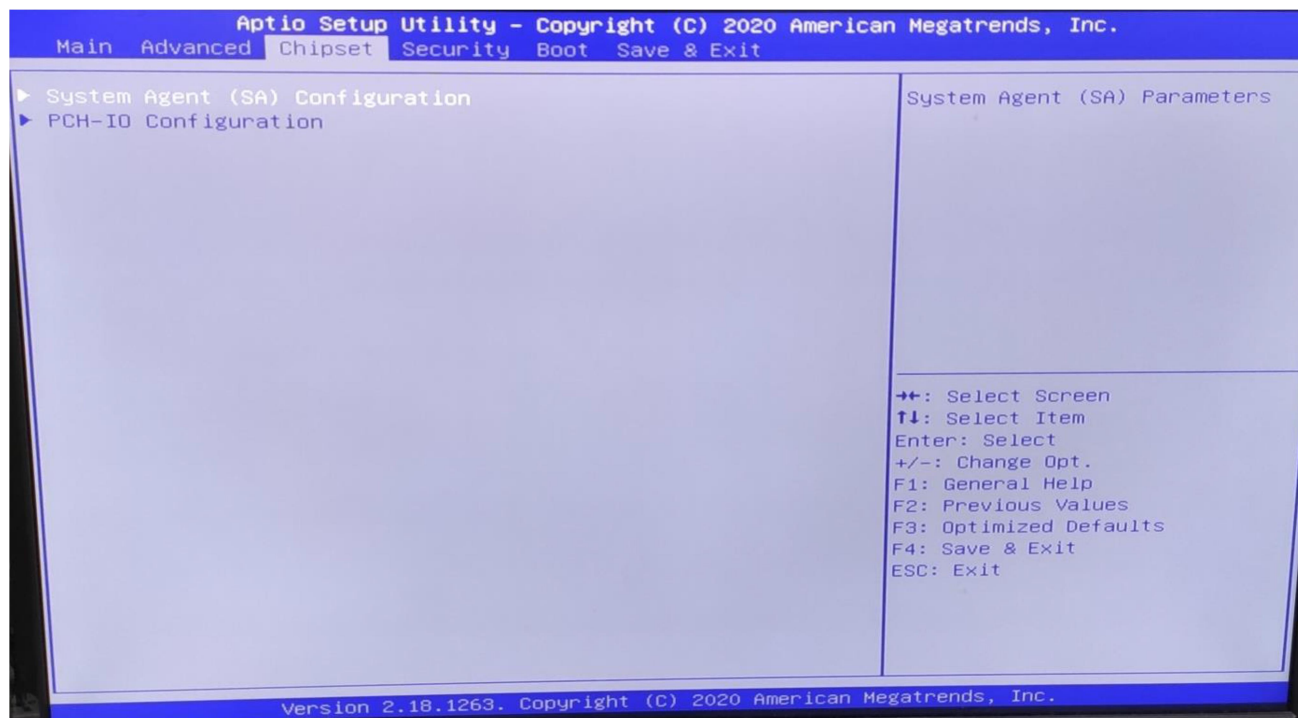
3.5.1 SA Configuration
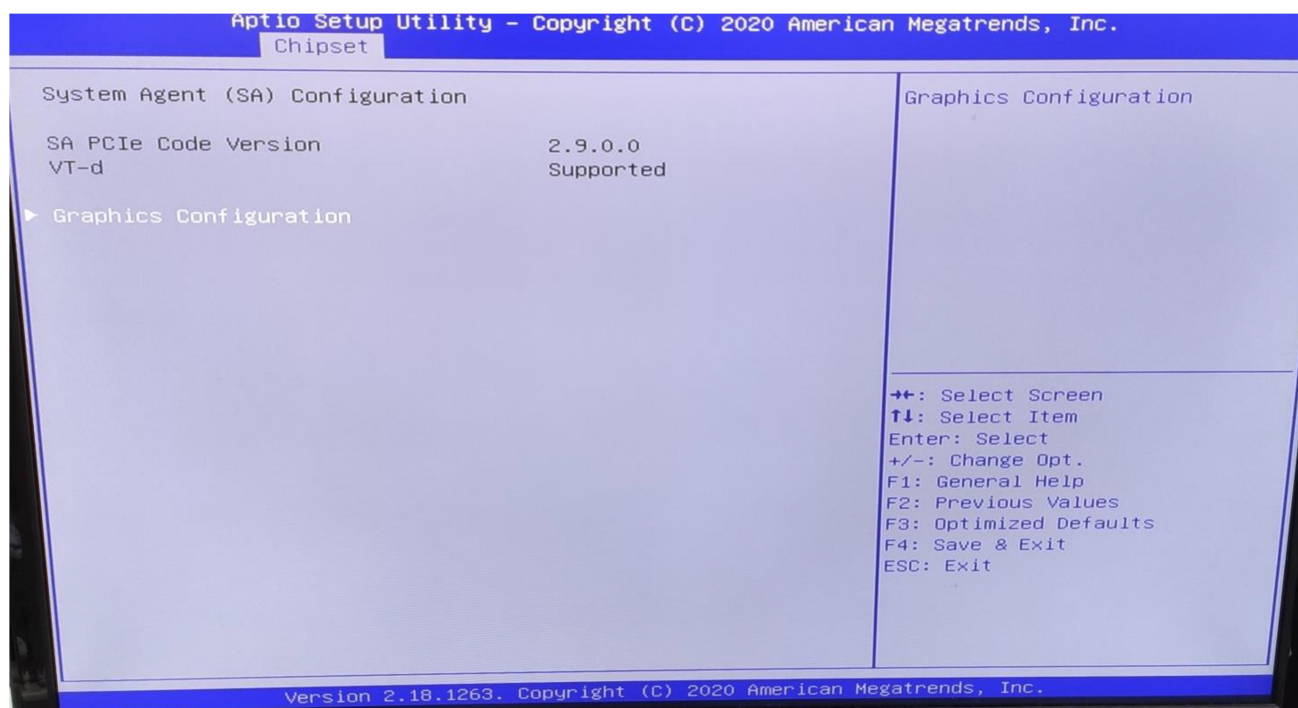
3.5.1.1 Graphics Configuration
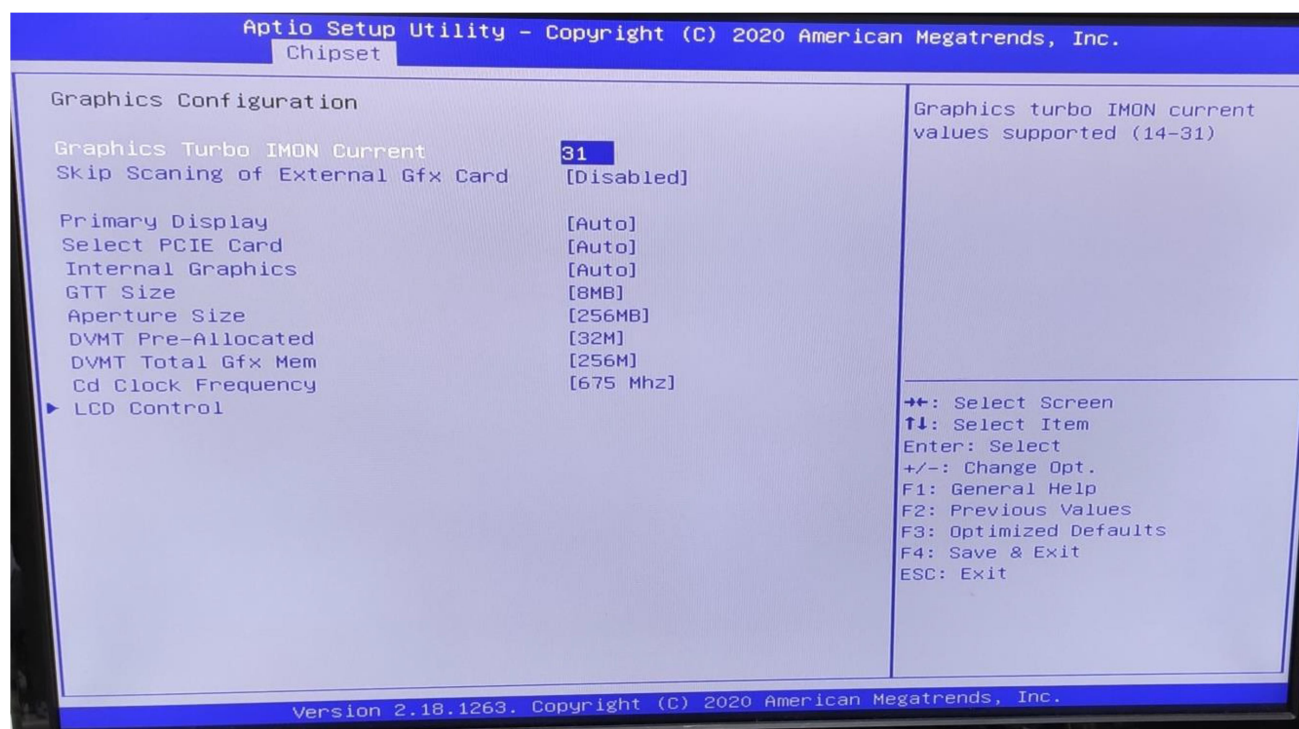
3.5.1.2 LCD Control
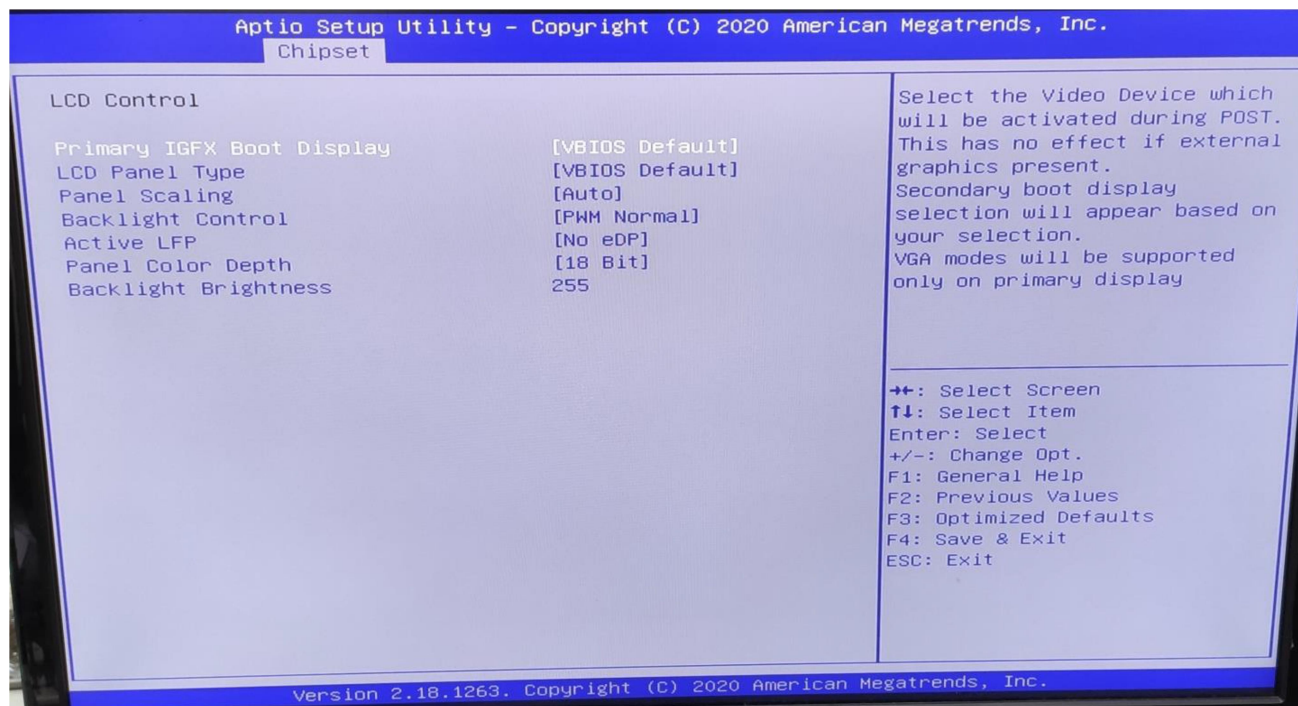
- **Primary IGFX Boot Display:**

Select the Video Device which will be activated during POST. This has noeffect if external graphics present. Secondary boot display selection will appear based on yourselection. VGA modes will be supported only on primary display.

- **LCD Panel Type:**

Select LCD panel used byInternal Graphics Device by selecting the appropriate setupitem.

- **SDVO-LFP Panel Type:**

Select SDVO panel used by Internal Graphics Device by selecting the appropriatesetup item.

- **Panel Scaling:**

Select the LCD panel scaling option used by the Internal Graphics Device.

- **Backlight control:**

backlight control setting

- **Panel Color Depth:**

select the LFP panel color depth.

3.5.2 PCH-IO Configuration

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

PCH-IO Configuration                              SATA Device Options Settings

 ▶ SATA And RST Configuration
 ▶ Security Configuration




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


        Version 2.18.1263. Copyright (C) 2020 American Megatrends, Inc.
```

3.6 Security

```
            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 2.18.1263. Copyright (C) 2020 American Megatrends, Inc.
```
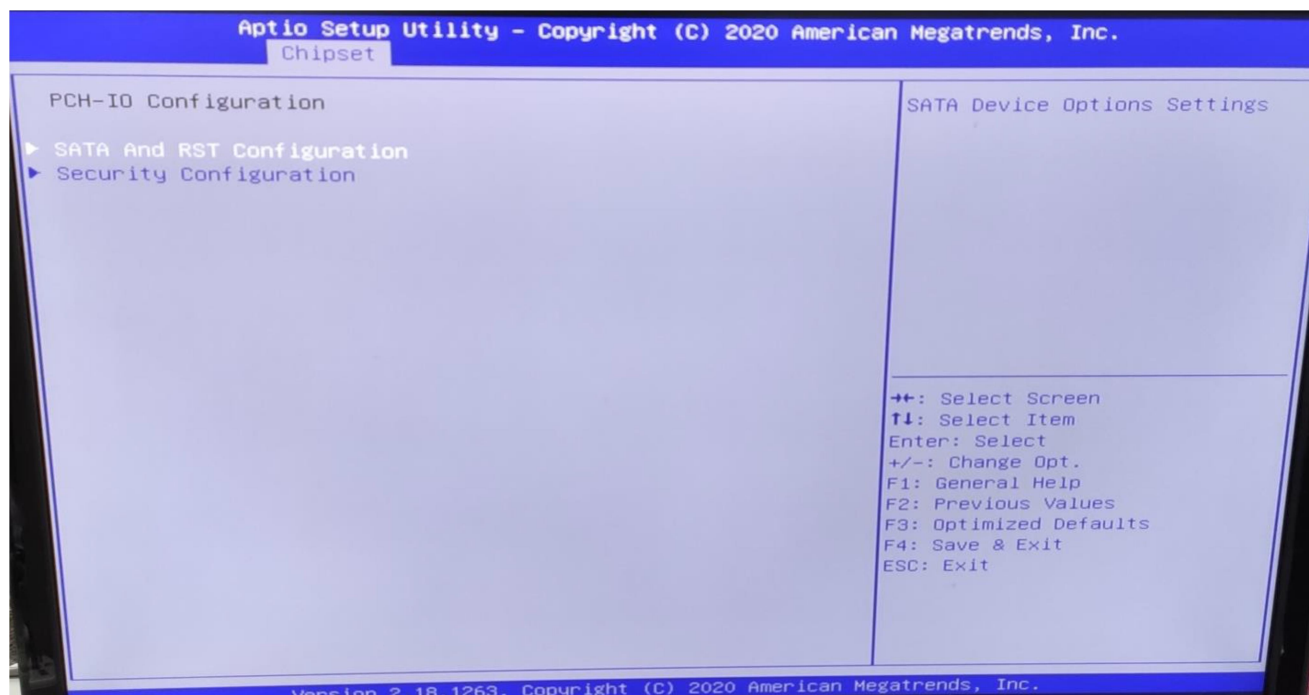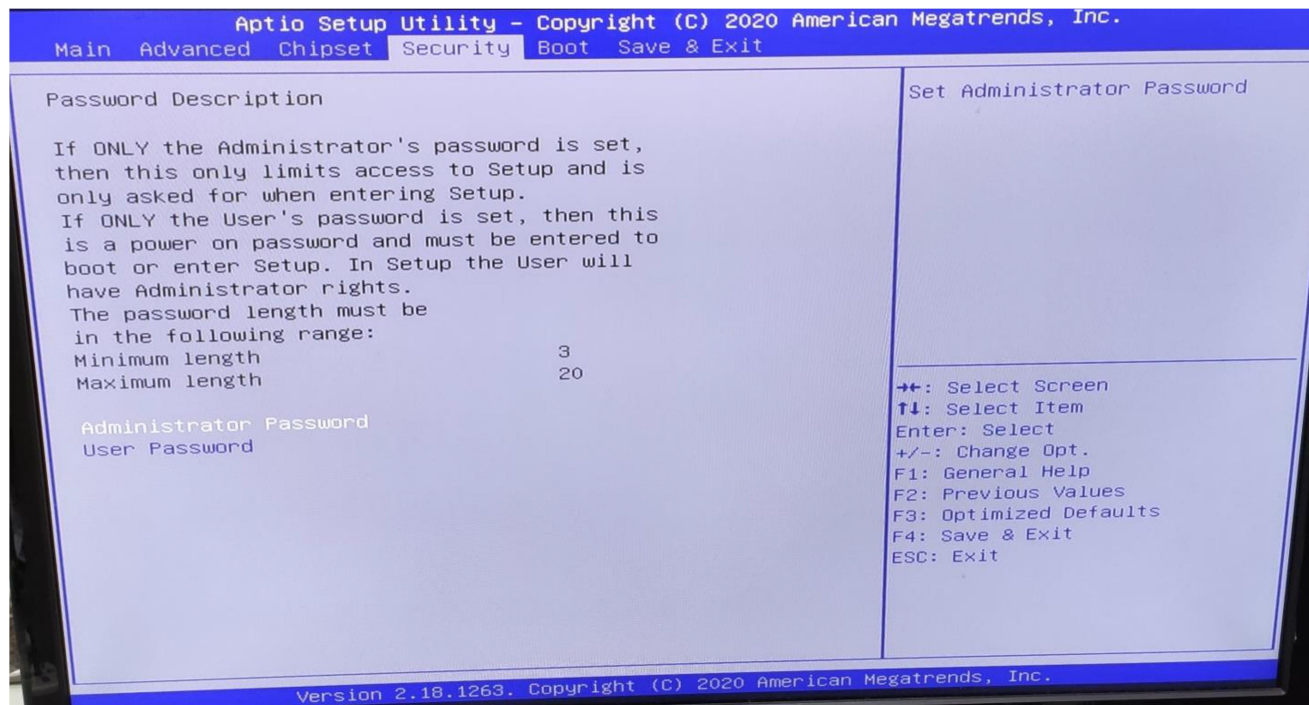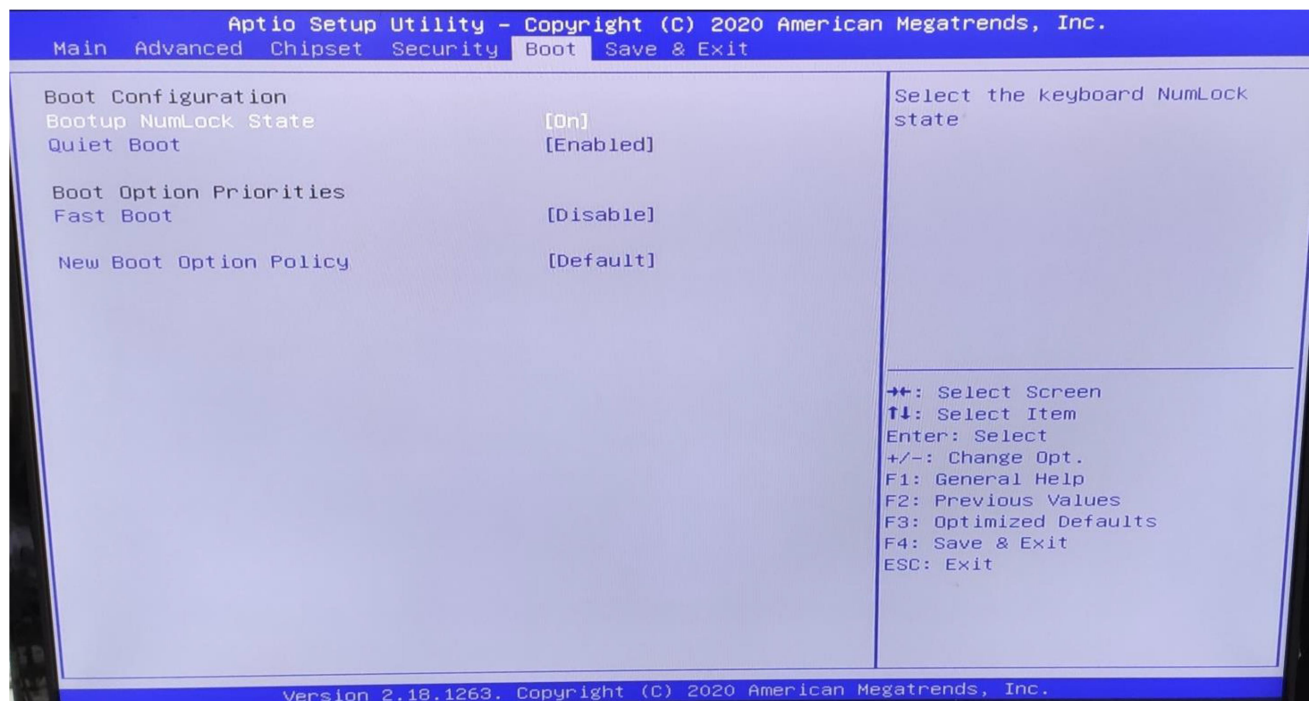
All Security Setup options, such as password protection and virus protection are described in this section. To access the sub menu for the following items, select the item and press

<Enter>:

- **Change Administrator / User Password**

Select this option and press to access the sub menu, and then type in the password.

3.7 Boot

- **Bootup NumLock State:**

Select the keyboard NumLock state.

- **Quiet Boot:**
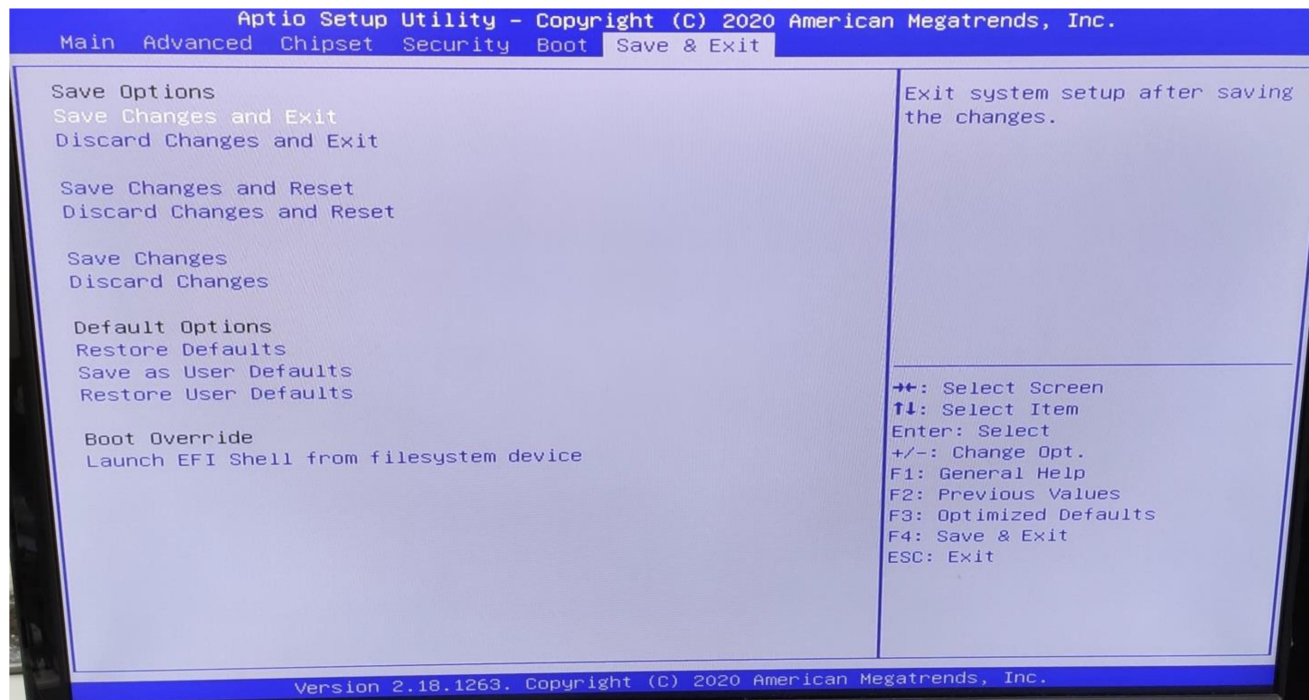
Enables or disables Quiet Boot option.

- **Fast Boot:**

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

- **Boot option priorities**

- **Boot Option #1:**

Sets the system boot order.

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3.8 Save & Exit

This screen provides functions for handling changes made to the BIOS settings and the exiting of the Setup program.

- **Save Changes and Exit**

Exit system setup after saving the changes.

- **Discard Changes and Exit**

Exit system setup without saving any changes.

- **Save Changes and Reset**

Reset the system after saving the changes.

- **Discard Changes and Reset**

Reset system setup without saving any changes.

Save Options

- **Save Changes:**

Save Changes done so far to any of the setup options.

- **Discard Changes:**

Discard Changes done so far to any of the setup options.