User Manual

BPC-5080

**Fanless Embedded Box PC
with 9th / 8th Generation Coffee Lake
6-Core Intel® Core™ i9/ i7/i5/i3 Processor**

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Record of Revisions

Version	Issue Date	Descriptions	Made By
1.0	2021/07/27	First Release	Derek

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Safety Instructions

1. Read these safety instructions carefully.
2. Keep this User Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.

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6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. DO NOT COVER THE OPENINGS.
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
12. Never pour any liquid into an opening. This may cause fire or electrical shock.
13. For safety reasons, the equipment should be opened only by qualified service personnel. If one of the following situations arises, get the equipment checked by service personnel:
    - The power cord or plug is damaged.
    - Liquid has penetrated into the equipment.
    - The equipment has been exposed to moisture.
    - The equipment does not work well, or you cannot get it to work according to the user manual.
    - The equipment has been dropped and damaged.
    - The equipment has obvious signs of breakage.
14. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO BELOW -20° C (-4° F) OR ABOVE 55° C (131° F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.
15. CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER, DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.

Safety Precaution - Static Electricity

Follow these simple precautions to protect yourself from harm and the products from damage:
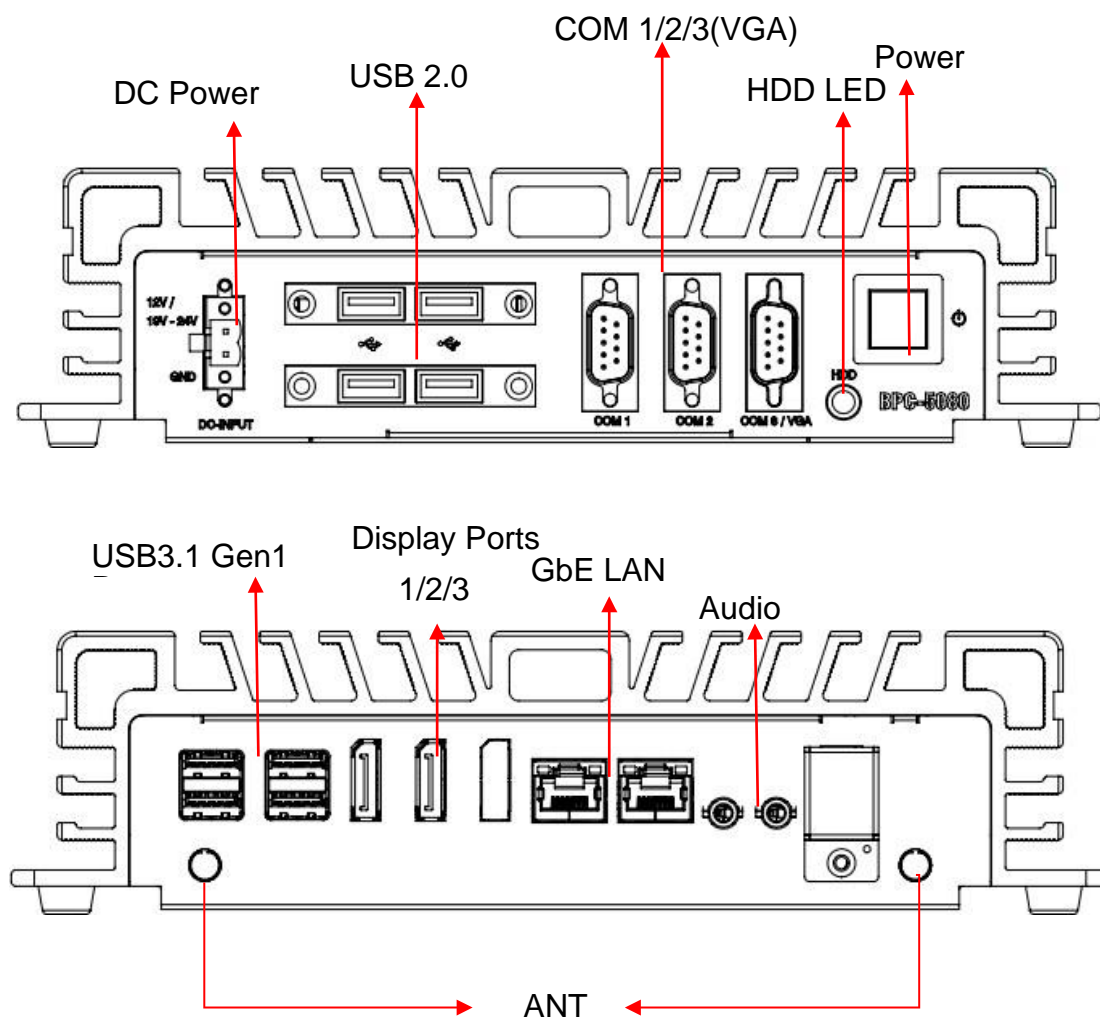1. To avoid electrical shock, always disconnect the power from your PC chassis before you work on it. Don't touch any components on the CPU card or other cards while the PC is on.
2. Disconnect power before making any configuration changes. The sudden rush of power as you connect a jumper or install a card may damage sensitive electronic components.

Contents

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Chapter 1. General Introduction

1.1 I/O Arrangement

COM 1/2/3(VGA)

DC Power   USB 2.0   Power

HDD LED

USB3.1 Gen1   Display Ports 1/2/3   GbE LAN   Audio

ANT

- ■ **Power Button**

  Press this button to turn on the system.

  The LED is on when the system is operating.

  The LED keeps blinking when the system is in S1 sleep state.

  The LED is off when the system is in S3/S4 sleep state or powered off (S5).

- ■ **HDD LED**

  This LED indicator will flicker when the hard disk drive or solid state drive is loading.

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■ **DC 12/19~28 V Power Input Connector**

This system supports DC 12/19-28V power input. The connector must be connected to DC 12 or 19~28 V power adaptor. After plugging in the phoenix connector, be sure to fasten the two screws to lock the connector.
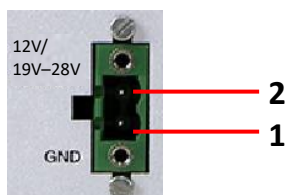
Pin	Definition
1	GND
2	Vin+ (12/19-28V DC)

■ **VGA Port**

This port can be connected to a VGA monitor, supporting max. resolution 1920 x 1200. BPC-5080-1A1 supports triple displays, and BPC-5080-2A1 supports dual displays.

■ **Display Port**

This port can be connected to a Display Port monitor. It supports Display Port 2.0 with max resolution 4096 x 2160 @ 60Hz. BPC-5080-1A1 supports triple displays, and BPC-5080-2A1 supports dual displays.

■ **LAN Port**

This port can be connected to Ethernet via RJ-45 connector.
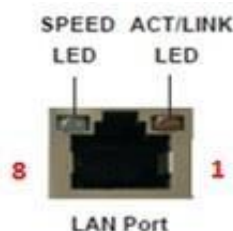
10/100BASE-T:

Pin	Definition	Pin	Definition
1	TX_D0+	5	NC
2	TX_D0-	6	RX_D1-
3	RX_D1+	7	NC
4	NC	8	NC

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10000BASE-T:

Pin	Definition	Pin	Definition
1	TX_D0+	5	BI_D2-
2	TX_D0-	6	RX_D1-
3	RX_D1+	7	BI_D3+
4	BI_D2+	8	BI_D3-

Activity/Link LED	
Status	**Description**
Off	No Link
Blinking	Data Activity
On	Link

Speed LED	
Status	**Description**
Off	10Mbps connection
Green	100Mbps connection
Orange	1Gbps connection

■ **USB 3.1 Gen 1 Port**

Pin	Definition
1	+5
2	USB-
3	USB+
4	GND
5	StdA_SSRX-
6	StdA_SSRX+
7	GND_DRAIN
8	StdA_SSTX-
9	StdA_SSTX+
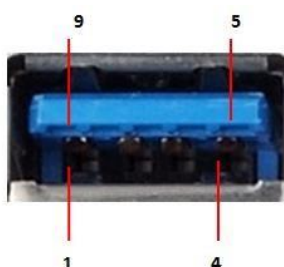
Basically, USB3.1 Gen 1 supports 900mA @ 5 V.

■ **COM 1 / 2 (RS-232); COM 3 (RS-232/422/485)**

Users can change the configuration of COM3 through BIOS setup utility.

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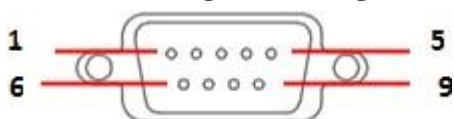
(RS-232)

Pin	Definition	Pin	Definition
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	PWR
5	GND		

(RS-422)

Pin	Definition	Pin	Definition
1	TX-	6	N/A
2	RX+	7	N/A
3	TX+	8	N/A
4	RX-	9	PWR
5	GND		

(RS-485)

Pin	Definition	Pin	Definition
1	RTX-	6	N/A
2	N/A	7	N/A
3	RTX+	8	N/A
4	N/A	9	PWR
5	GND		

◎ NOTE: PLEASE REFER TO CHAPTER 3, BIOS SETTING - 3.2.4 SUPER IO CONFIGURATION

■ **Audio Port**

Green connector means **LINE OUT,** and pink connector means **MIC IN**.

■ **Digital I/O Ports (Optional)**

1	SIO_GP20	2	SIO_GP21
3	SIO_GP22	4	SIO_GP23
5	SIO_GP24	6	SIO_GP25
7	SIO_GP26	8	SIO_GP27
9	JGPIO_PWR		Outer Shielding

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Guide:

1. DI ports have default high (3.3V) voltage. Users have to input a low (GND) voltage to give a trigger signal.
2. Users can define high (3.3V) or low (GND) voltage by themselves for the output **DO** ports.
3. **VCC** port always provides DC high (5V) voltage.
4. **GND** port always provides DC low (GND) voltage.

■ **ANT**

These are reserved holes for SMA connectors of antennas. When a customer selects a 3G or a Wi-Fi module, they will need the ANT hole for plugging in a SMA connector.

1.2 Internal Interfaces

■ **SATA Connector**

SATA3 connectors support SATA data cables for internal storage devices. The current SATA3 interface allows data transfer rate up to 6.0 Gb/s.

Pin	Definition
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

■ **SATA Power Connector**
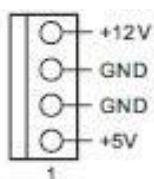
Pin	Definition
1	+5V
2	GND
3	GND
4	+12V

■ **mini-PCIe Slot**

mini-PCIe slot (full/half size) is used for PCI Express mini cards.

■   **M.2 Slot**

1x M.2 (Key E, 2230) with PCIe x1, CNVI and USB 2.0 for Wi-Fi modules.

1x M.2 (Key M, 2242/2260/2280) with SATA3 for SSD (Bottom).

1.3 Mechanical Dimensions

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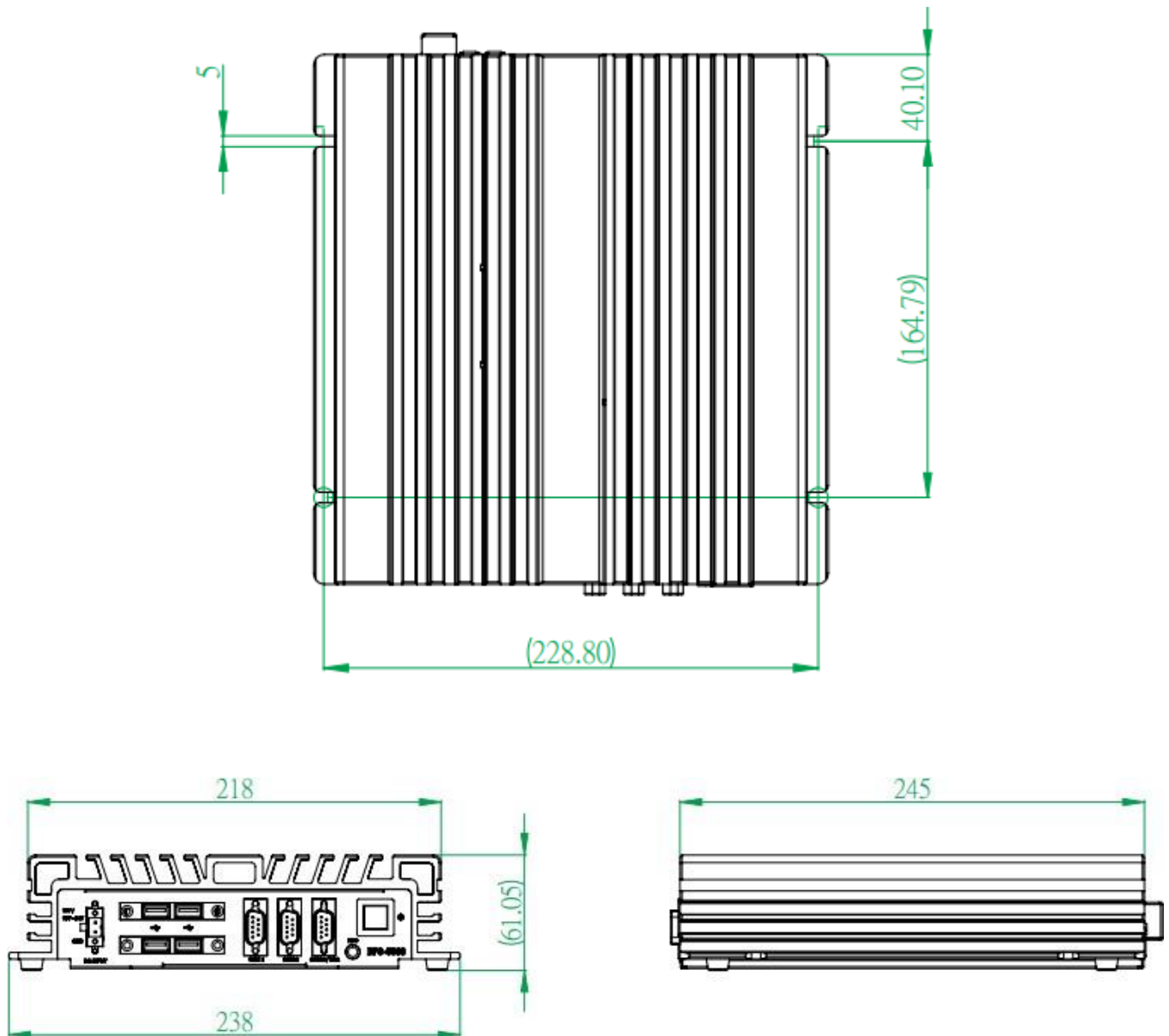
Chapter 2. System Setup

2.1 Power Installation Procedure

■ **Connect Power Cord**

This box pc can support wide-range DC input (12/19~28V). Be sure to hold the power cord by the plug end only. Please follow the steps below to connect the power cord:

1. Connect the male end (Phoenix connector) of the power cord to the DC input connector of BPC-5080 and lock it up.
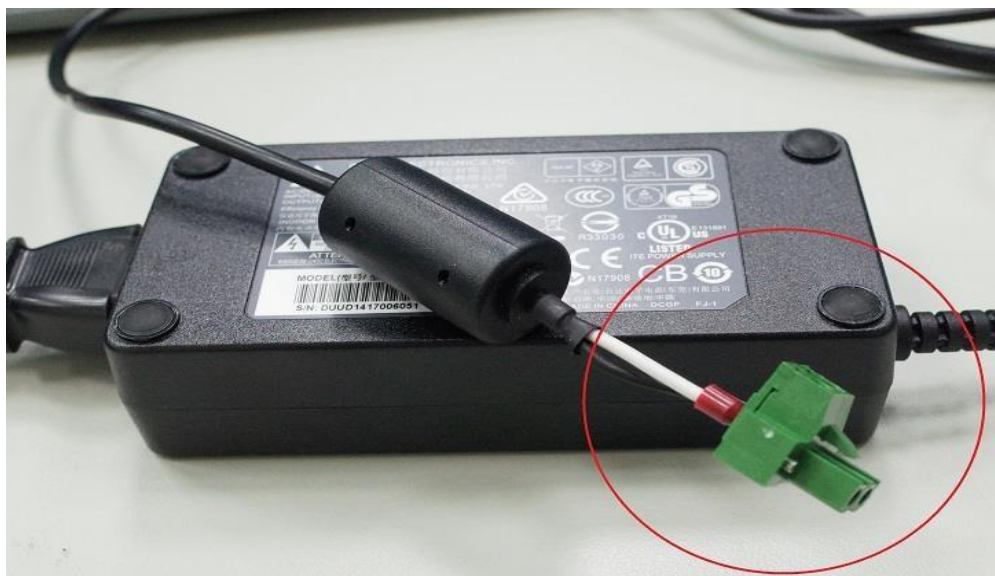
2. Connect the 3-pin male plug of the power cord to an electrical outlet.

3. Connect the Phoenix connector terminal to the system's power input connector.

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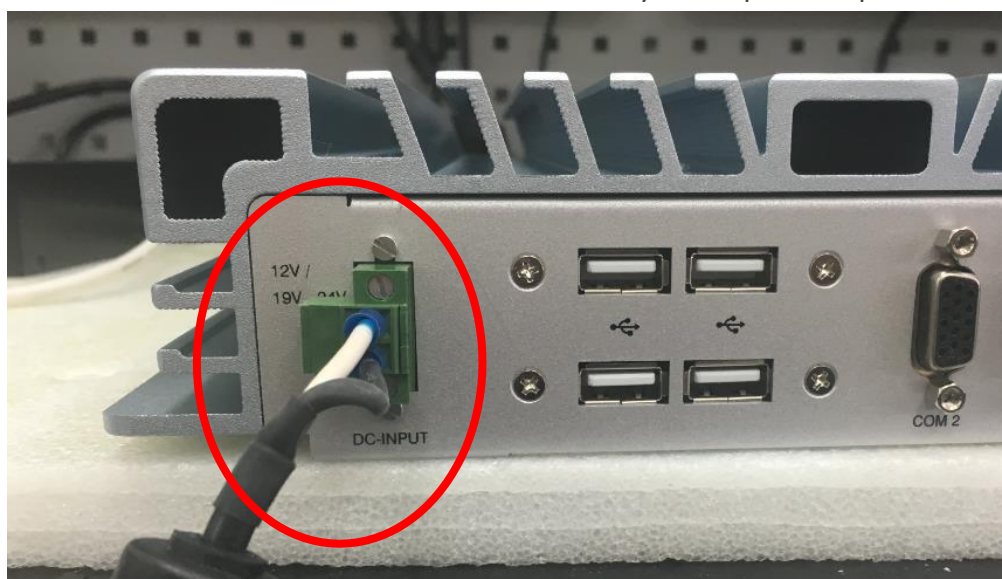
⚠️ WARNING:

1. AFTER PLUGGING IN THE PHOENIX CONNECTOR, BE SURE TO FASTEN THE TWO SCREWS TO LOCK THE CONNECTOR.
2. WHITE CABLE STANDS FOR 12V, BLACK CABLE STANDS FOR GND. MAKE SURE THE CONNECTOR IS PLUGGED IN WITH CORRECT DIRECTION.

■ **Connect Keyboard and Mouse**

Connect the mouse and keyboard to the USB connectors of the box pc.

■ **Turn on Power**

The power button is located at the right side of the front cover of the box pc.

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2.2 Installing 2.5" HDD and Swappable HDD Bracket

- Step 1: Unfasten the <u>6 screws</u> on the chassis and open the bottom cover.
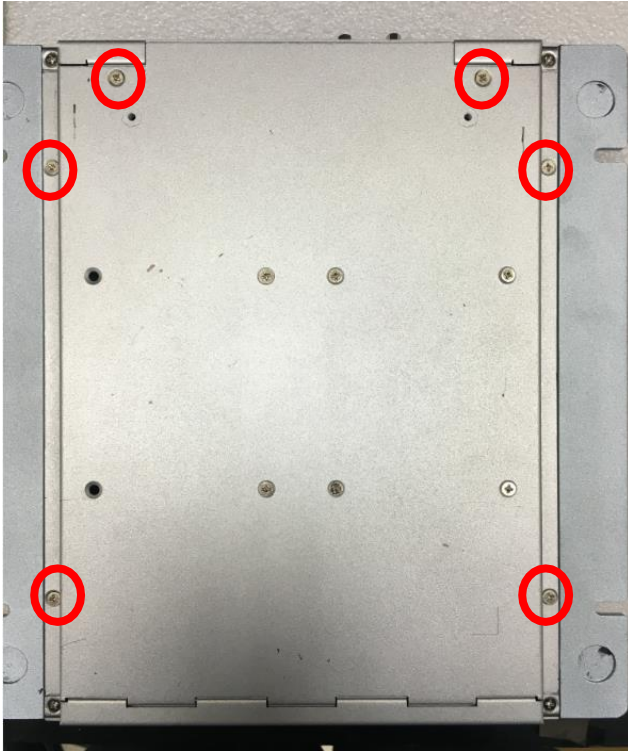
- Step 2: Unfasten the <u>SATA cable</u> and <u>SATA power cable</u> on the HDD/SSD.

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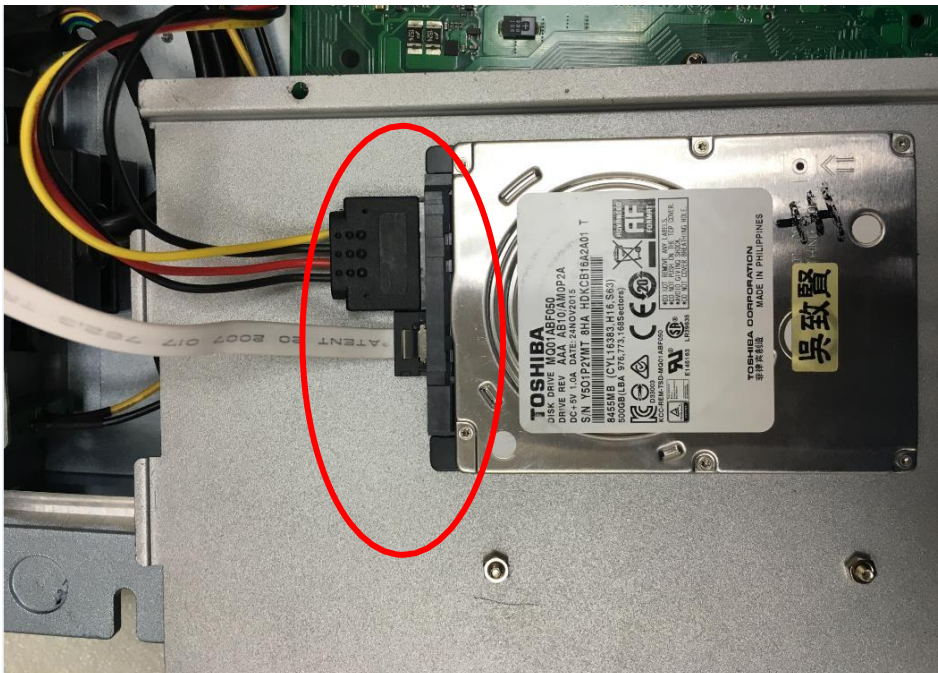
■　　Step 3: Unfasten the <u>4 screws</u> on the HDD/SSD bracket.
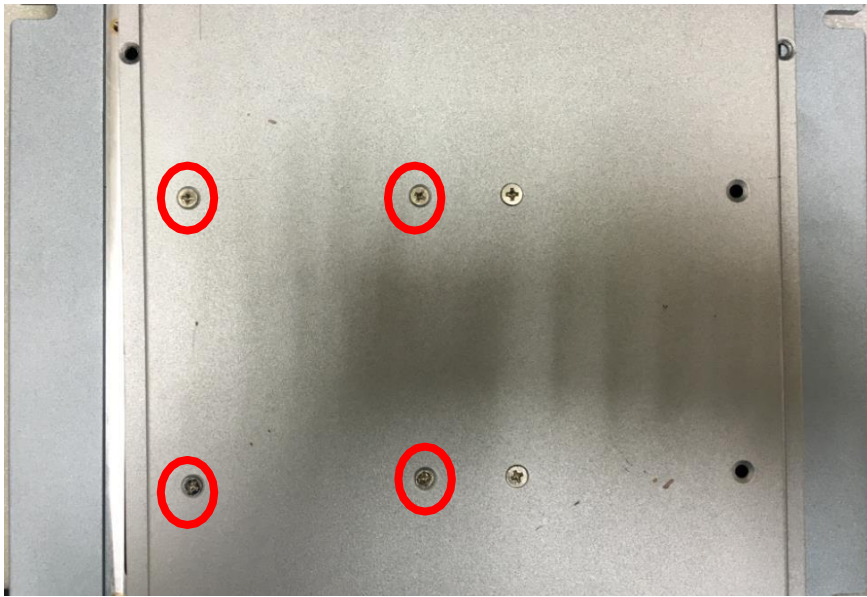
◎　NOTE: THE BRACKET ONLY SUPPORTS <u>7MM</u> HDD/SSD.

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2.3 Installing Memory and Internal Expansion Device

This box pc provides two 260-pin DDR4 (Double Data Rate 4) SO-DIMM slots, supporting dual channel DDR4 SDRAM only.

■   Step 1: The notch on the SO-DIMM should be lined up with the slot key.
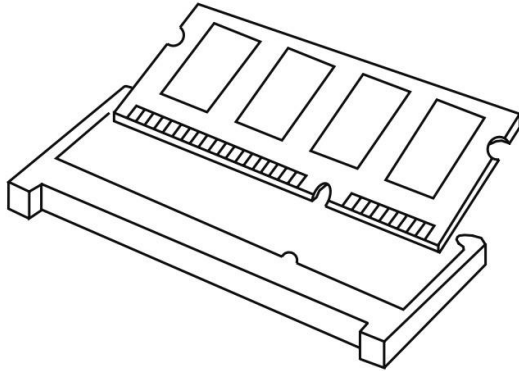
■   Step 2: Firmly insert the SO-DIMM into the slot until the retaining clips at both ends fully snap back, and the SO-DIMM is properly hold in place.

2.4 Installing mini-PCIe Card and M.2 Device

There are 1x mini-PCIe slot, 1x M.2 E key 2230 slot, and 1x M key 2280 slot on the motherboard.

- ■ **mPCIe Placement**
  1 x full/half mini-PCIe with PCIe x1 and USB 2.0
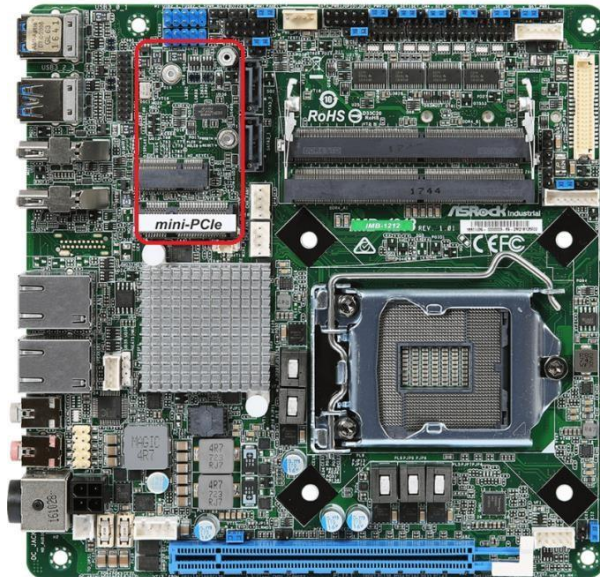
- ■ **M.2 E key 2230 Placement**
  1x M.2 (Key E, 2230) with PCIe x1, CNVI and USB 2.0 for Wi-Fi modules.

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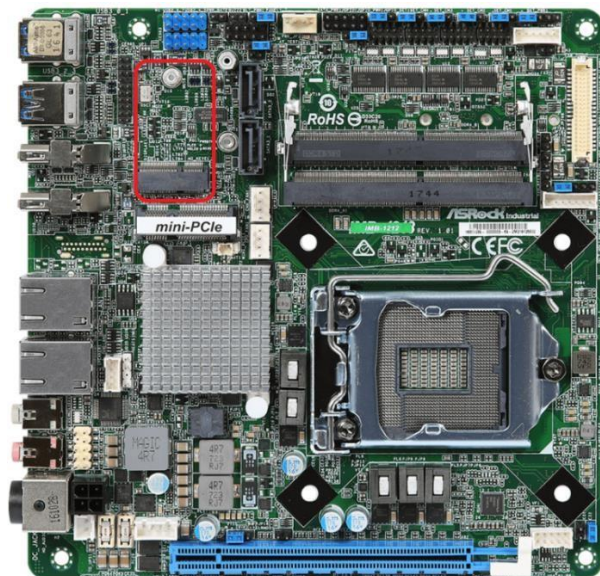
■ **M.2 M key 2280 Placement**

1x M.2 (Key M, 2242/2260/2280) with SATA3 for SSD (Bottom)
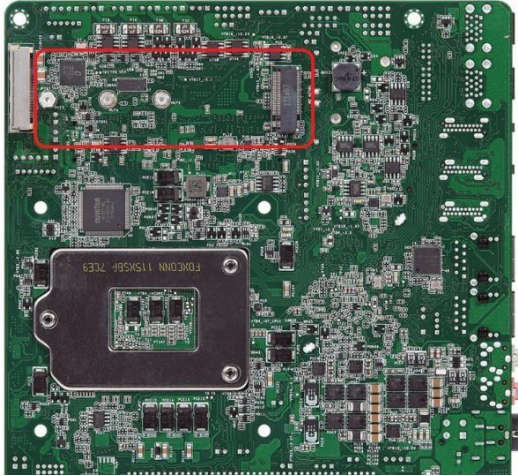
■ Installing An Expansion Card

1. Before installing the expansion card, please make sure that the power supply is switched off or the power cord is unplugged. Please read the documentation of the expansion card and make necessary hardware settings for the card before you start the installation.

2. Remove the system unit cover.

3. Align the card connector with the slot and press firmly until the card is completely hold in place.

4. Fasten the card to the chassis with screws.

5. Put the system cover back on.

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Chapter 3. BIOS Setting

The BIOS (Basic Input/Output System) installed in your computer system's ROM supports Intel processors. The BIOS provides critical low-level support for a standard device such as disk drives, serial ports, and parallel ports. It also adds virus and password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system. The BIOS provides a setup utility program for specifying the system configurations and settings. The BIOS ROM of the system stores the setup utility.

When you turn on the computer, the BIOS is immediately activated. Pressing the <Del> key immediately allows you to enter the setup utility. When you enter the BIOS setup utility, the top of the screen has a menu bar with the following selections:

- **Main: To set up the system time/date information**

- **Advanced: To set up the advanced UEFI features**

- **H/W Monitor: To display current hardware status**

- **Security: To set up the security features**

- **Boot: To set up the default system device to locate and load the operating system**

- **Exit : To exit the current screen or the UEFI setup utility**

  Use $\leftarrow$ key or $\rightarrow$ key to choose the selections on the menu bar.

  Use <Enter> key to get into the sub screen or an item.

  Use $\downarrow$ key or $\uparrow$ key to move the cursor down or up to select items.

  Use <Exit> key to exit the current screen.

3.1 Main

This section (Main screen) displays the system overview.

```
          Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
 Main  Advanced  H/W Monitor  Security  Boot  Exit

 System Date                     [Thu 05/03/2018]        Set the Date. Use Tab to
 System Time                     [00:59:15]              switch between Date elements.
                                                         Default Ranges:
 UEFI Version    : IMB-1213 L0.28                        Year: 2005-2099
 Processor Type  : Intel(R) Core(TM) i5-8600 CPU @ 3.10GHz  Months: 1-12
 Processor Speed : 3100MHz                               Days: dependent on month
 Cache Size      : 9MB

 Total Memory    : 8GB with 512MB Shared Memory
                   Single-Channel Memory Mode

 DDR4_A1         : None
 DDR4_B1         : Kingston 8GB (DDR4-2400)
                                                         →←: Select Screen
 LVDS Rom Version: Default                               ↑↓: Select Item
                                                         Enter: Select
                                                         +/-: Change Option
                                                         F1: General Help
                                                         F7: Discard Changes
                                                         F9: Load UEFI Defaults
                                                         F10: Save and Exit
                                                         ESC: Exit




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```

3.2 Advanced

In this section, you may set the configurations for the following items: CPU Configuration, Chipset Configuration, Storage Configuration, Super IO Configuration, AMT Configuration, ACPI Configuration, USB Configuration, and Trusted Computing.
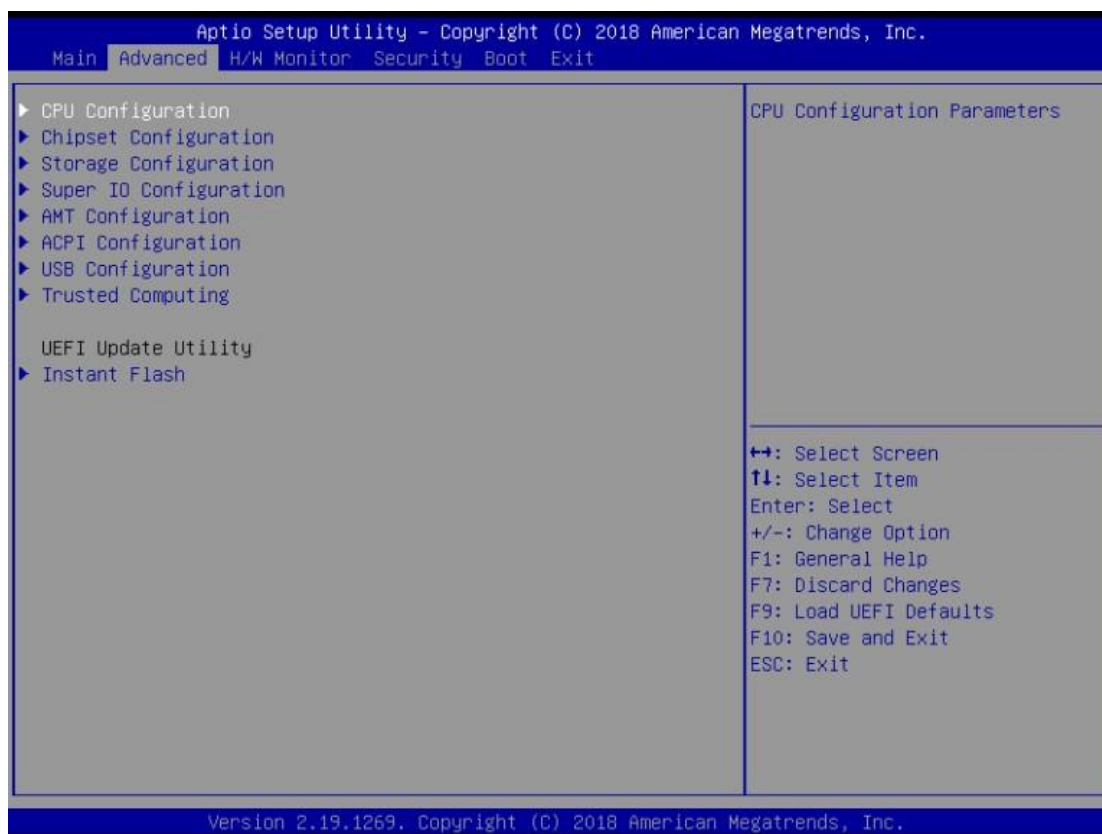
- ■ **Instant Flash**

    Instant Flash is a UEFI flash utility embedded in flash ROM. This convenient UEFI update tool allows you to update system UEFI without the need to enter operating systems like MS-DOS or Windows® first. Just launch this tool and save the new UEFI file to your USB flash drive, floppy disk, or hard drive, and then you can update your UEFI in a few clicks without additional floppy disk or other complicated flash utility. Please note that the USB flash drive or hard drive must use FAT32/16/12 file system. If you execute Instant Flash utility, the utility will show the UEFI files and their respective information. Select the proper UEFI file to update your UEFI, and reboot your system after UEFI update process is completed.

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3.2.1 CPU Configuration

```
           Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
    Advanced

   Intel(R) Core(TM) i5-8600 CPU @ 3.10GHz          Select the number of cores to
   Microcode Revision              906EA 84         enable in each processor
   Max CPU Speed                   3100 MHz         package.
   Min CPU Speed                   800 MHz
   Processor Cores                 6

   Active Processor Cores          [All]
   CPU C States Support            [Disabled]

   Intel Virtualization Technology [Enabled]
   Intel SpeedStep Technology      [Enabled]
   Intel Turbo Boost Technology    [Enabled]

   CPU Thermal Throttling          [Enabled]        ←→: Select Screen
   Hardware Prefetcher             [Enabled]        ↑↓: Select Item
   Adjacent Cache Line Prefetch    [Enabled]        Enter: Select
                                                    +/-: Change Option
                                                    F1: General Help
                                                    F7: Discard Changes
                                                    F9: Load UEFI Defaults
                                                    F10: Save and Exit
                                                    ESC: Exit



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```

■   **Intel Hyper Threading Technology**

Intel Hyper Threading Technology allows multiple threads to run on each core so that the overall performance on threaded software is improved.

■   **Active Processor Cores**

Select the number of cores to enable in each processor package.

■   **CPU C States Support**

Enable CPU C States Support for power saving. It is recommended to keep C3, C6 and C7 all enabled for better power saving.

■   **Intel Virtualization Technology**

When this option is set to [Enabled], a VMM (Virtual Machine Architecture) can utilize the additional hardware capabilities provided by Vanderpool Technology. This option will be hidden if the installed CPU does not support Intel Virtualization Technology.

■   **Intel SpeedStep Technology**

Intel SpeedStep technology is Intel's new power saving technology. Processors can switch between multiple frequencies and voltage points to enable power saving. The default value is [Enabled]. Configuration options: [Enabled] and [Disabled]. If you install Windows® OS and

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want to enable this function, please set this item to [Enabled]. This item will be hidden if the current CPU does not support Intel SpeedStep technology.

◎ NOTE: PLEASE NOTE THAT ENABLING THIS FUNCTION MAY REDUCE CPU VOLTAGE AND LEAD TO SYSTEM STABILITY OR COMPATIBILITY ISSUES WITH SOME POWER SUPPLIES. PLEASE SET IT TO [DISABLED] IF ABOVE ISSUES OCCUR.

■ **CPU Thermal Throttling**

You may select [Enabled] to enable CPU internal thermal control mechanism to keep the CPU from overheating.

■ **Hardware Prefetcher**

Use this item to turn on/off the MLC streamer prefetcher.

■ **Adjacent Cache Line Prefetch**

Use this item to turn on/off prefetching of adjacent cache lines.

3.2.2 Chipset Configuration

```
            Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
      Advanced

   ME Firmware Version            12.0.0.1068            Select a primary VGA.
   VT-d Capability                Supported

   Primary Graphics Adapter       [PCI Express]
   Above 4G Decoding              [Disabled]
   VT-d                           [Enabled]

   PCIE1 Link Speed               [Auto]
   PCIE1 Bandwidth Mode           [x16 Mode]

   Share Memory                   [Auto]
   IGPU Multi-Monitor             [Disabled]
   Active LVDS                    [Disabled]
                                                         ↔: Select Screen
   Onboard LAN1                   [Enabled]              ↑↓: Select Item
   Onboard LAN2                   [Enabled]              Enter: Select
                                                         +/-: Change Option
   Onboard HD Audio               [Auto]                 F1: General Help
     Front Panel                  [HD]                   F7: Discard Changes
   Onboard Digital Audio          [Enabled]              F9: Load UEFI Defaults
                                                         F10: Save and Exit
   Deep Sleep                     [Disabled]             ESC: Exit




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```

- ■ **Primary Graphics Adapter**
  This allows you to select [Onboard] or [PCI Express] as the boot graphic adapter priority. The default value is [PCI Express].

- ■ **Above 4G Decoding**
  Enable or disable 64bit capable devices to be decoded in Above 4G Address Space (only if the system supports 64 bit PCI decoding).

- ■ **VT-d**
  Use this to enable or disable Intel® VT-d technology (Intel® Virtualization Technology for Directed I/O). The default value of this feature is [Disabled].

- ■ **PCIE1 Link Speed**
  Select the link speed for PCIE1.

- ■ **PCIE1 Bandwidth Mode**
  Select the bandwidth mode for PCIE1.

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■ **Share Memory**

Configure the size of memory that is allocated to the integrated graphics processor when the system boots up.

■ **IGPU Multi-Monitor**

Select disable to disable the integrated graphics when an external graphics card is installed. Select enable to keep the integrated graphics enabled at all times.

■ **Active LVDS**

Use this to enable or disable the LVDS. The default value is [Disabled]. Set the item to [Enable]. Then press <F10> to save the setting and restart the system. Now the default value of Active LVDS is changed to [Enable] (F9 load default is also set to [Enable]).

Change the setting from [Enable] to [Disabled], and then press <F10> to save the setting and restart the system. Likewise, the default value of Active LVDS is changed to [Disabled] (F9 load default is also set to [Disabled]).

■ **Panel Type Selection**

Use this to select panel type. This item appears when you enable Active LVDS.

■ **Onboard LAN 1**

This allows you to enable or disable the Onboard LAN 1 feature.

■ **Onboard LAN 2**

This allows you to enable or disable the Onboard LAN 2 feature.

■ **Onboard HD Audio**

Select [Auto], [Enabled], or [Disabled] for the onboard HD Audio feature. If you select [Auto], the onboard HD Audio will be disabled when PCI Sound Card is plugged in.

■ **Front Panel**

Select [Auto] or [AC 97] for the onboard HD Audio Front Panel.

■ **Deep Sleep**

Mobile platforms support Deep S4/S5 in DC only and desktop platforms support Deep S4/S5 in AC only. The default value is [Disabled].

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3.2.3 Storage Configuration


```
              Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
        Advanced

    SATA Controller(s)               [Enabled]              Enable/disable the SATA
    SATA Mode Selection              [AHCI]                 controllers.
    SATA Aggressive Link Power       [Disabled]
    Management
    Hard Disk S.M.A.R.T              [Enabled]

  ▶ SATA3_1: Not Detected
  ▶ SATA3_2: Not Detected
  ▶ M2_2: Not Detected

                                                           ↔: Select Screen
                                                           ↑↓: Select Item
                                                           Enter: Select
                                                           +/-: Change Option
                                                           F1: General Help
                                                           F7: Discard Changes
                                                           F9: Load UEFI Defaults
                                                           F10: Save and Exit
                                                           ESC: Exit



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```

■ **SATA Controller(s)**

Use this item to enable or disable the SATA Controller feature.

■ **SATA Mode Selection**

Use this to select SATA mode. Configuration options: [IDE Mode] and [AHCI Mode]. The default value is [AHCI Mode].

◎ NOTE: AHCI (ADVANCED HOST CONTROLLER INTERFACE) SUPPORTS NCQ AND OTHER NEW FEATURES THAT WILL IMPROVE SATA DISK PERFORMANCE BUT IDE MODE DOES NOT HAVE THESE ADVANTAGES.

■ **SATA Aggressive Link Power Management**

Use this item to configure SATA Aggressive Link Power Management.

■ **Hard Disk S.M.A.R.T.**

Use this item to enable or disable the S.M.A.R.T. (Self-Monitoring, Analysis, and Reporting Technology) features. Configuration options: [Disabled] and [Enabled].

3.2.4 Super IO Configuration

```
              Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
         Advanced
   Super IO Configuration                                    Set Parameters of COM1

 ▶ COM1 Configuration
 ▶ COM2 Configuration
 ▶ COM3 Configuration
 ▶ COM4 Configuration
 ▶ WatchDog Configuration


                                                        ←→: Select Screen
                                                        ↑↓: Select Item
                                                        Enter: Select
                                                        +/-: Change Option
                                                        F1: General Help
                                                        F7: Discard Changes
                                                        F9: Load UEFI Defaults
                                                        F10: Save and Exit
                                                        ESC: Exit



              Version 2.15.1234. Copyright (C) 2012 American Megatrends, Inc.
```

- **COM1 Configuration**
  Use this to set parameters of COM1.

- **COM2 Configuration**
  Use this to set parameters of COM2.

- **COM3 Configuration**
  Use this to set parameters of COM3. Select COM3 port type:[RS232], [RS422] or [RS485].

- **COM4 Configuration**
  Use this to set parameters of COM4. Select COM3 port type:[RS232], [RS422] or [RS485].

- **WDT Timeout Reset**
  This allows users to enable/disable the Watch Dog Timer timeout to reset system. The default value is [Disabled].

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3.2.5 AMT Configuration

```
              Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
        Advanced

    AMT BIOS Features                [Enabled]         When disabled AMT BIOS
    ASF support                      [Enabled]         Features are no longer
                                                       supported and user is no
    USB Provisioning of AMT          [Disabled]        longer able to access MEBx
  ▶ CIRA Configuration                                 Setup.
  ▶ ASF Configuration                                  Note:
  ▶ Secure Erase Configuration                         This option does not disable
  ▶ OEM Flags Settings                                 Manageability Features in FW.
  ▶ MEBx Resolution Settings


                                                       ↔: Select Screen
                                                       ↑↓: Select Item
                                                       Enter: Select
                                                       +/-: Change Option
                                                       F1: General Help
                                                       F7: Discard Changes
                                                       F9: Load UEFI Defaults
                                                       F10: Save and Exit
                                                       ESC: Exit



              Version 2.19.1269. Copyright (C) 2018 American Megatrends, Inc.
```

- **AMT BIOS Features**

  Use this to enable or disable Intel® Active Management Technology BIOS Extension. The default is [Enabled].

- **ASF Support**

  Use this to enable or disable Alert Specification Format. The default is [Enabled].

- **USB Provisioning of AMT**

  Use this to enable or disable AMT USB Provisioning. The default is [Disabled].

- **Secure Erase Mode**

  Change Secure Erase module behavior: Simulated: Performs SE flow without erasing SSD. Real: Erase SSD.

- **Force Secure Erase**

  Use this to enable or disable Force Secure Erase on next boot. The default is [Disabled].

- **MEBx Hotkey Pressed**

  Use this to enable or disable MEBx hotkey press. The default is [Disabled].

- **MEBx Selection Screen**

  Use this to enable or disable MEBx Selection Screen. The default is [Disabled].

- **Un-configure ME Confirmation Prompt**

  Hide Un-Configure ME without password confirmation prompt. The default is [Disabled].

- **MEBx OEM Debug Menu Enable**

  Use this to enable or disable MEBx OEM Debug Menu. The default is [Disabled].

- **Un-Configure ME**

  Un-Configure ME without password. The default is [Disabled]

- **WatchDog**

  Use this to enable or disable AMT WatchDog Timer. The default is [Disabled].

- **Activate Remote Assistance Process**

  Trigger CIRA boot. The default is [Disabled].

- **PET Progress**

  User can enable or disable PET Events progress to receive PET events or not. The default is [Enabled].

- **ASF Sensors Table**

  Use this to enable or disable ASF Sensor Table. The default is [Disabled].

- **Non-UI Mode**

  Resolution Use this to set resolution for non-UI text mode.

- **UI Mode Resolution**

  Use this to set resolution for UI text mode.

- **Graphics Mode Resolution**

  Use this to set resolution for graphics mode.

3.2.6 ACPI Configuration
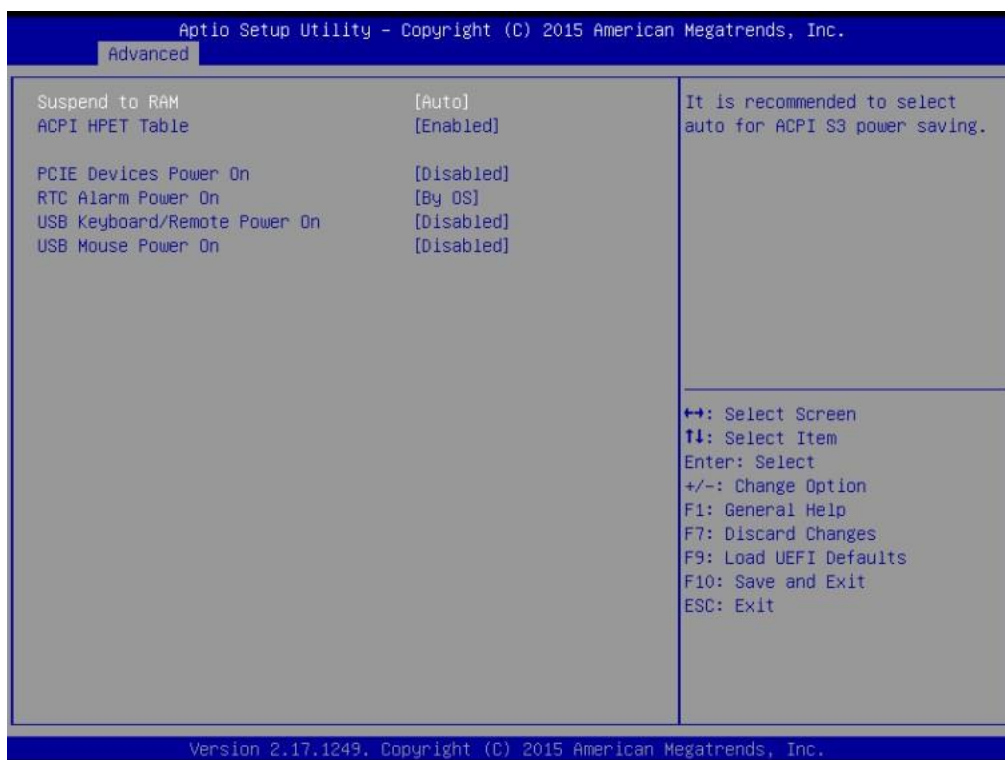
- ■ **Suspend to RAM**

    Use this item to select whether to auto-detect or disable the Suspend-to-RAM feature. Select [Auto] will enable this feature if the OS supports it.

- ■ **ACPI HPET Table**

    Use this item to enable or disable ACPI HPET Table. The default value is [Enabled].Please set this option to [Enabled] if you plan to use this motherboard to submit Windows® certification.

- ■ **PCIE Devices Power On**

    Use this item to enable or disable PCIE devices to turn on the system from the power-soft-off mode.

- ■ **RTC Alarm Power On**

    Use this item to enable or disable RTC (Real Time Clock) to power on the system.
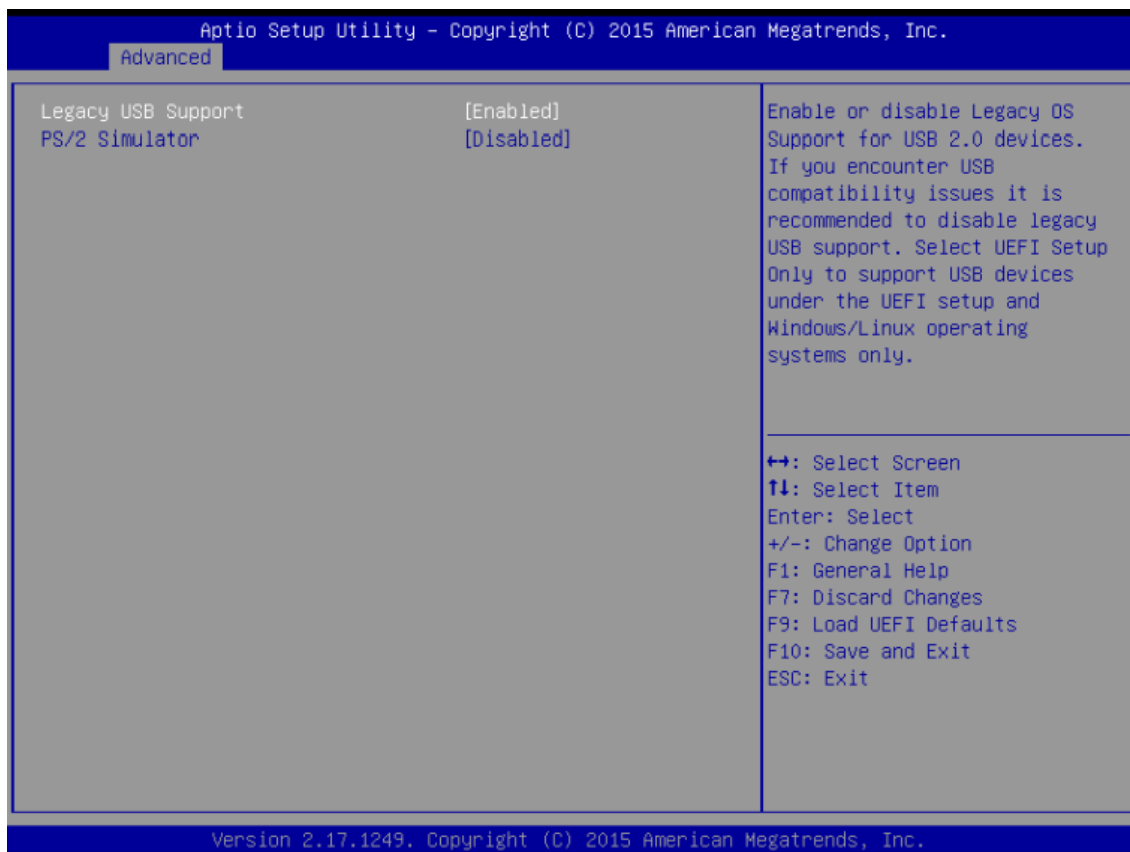
- ■ **USB Keyboard/Remote Power On**

    Use this item to enable or disable USB Keyboard/Remote to power on the system.

- ■ **USB Mouse Power On**

    Use this item to enable or disable USB Mouse to power on the system.

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3.2.7 USB Configuration

```
        Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
      Advanced

  Legacy USB Support              [Enabled]          Enable or disable Legacy OS
  PS/2 Simulator                  [Disabled]         Support for USB 2.0 devices.
                                                     If you encounter USB
                                                     compatibility issues it is
                                                     recommended to disable legacy
                                                     USB support. Select UEFI Setup
                                                     Only to support USB devices
                                                     under the UEFI setup and
                                                     Windows/Linux operating
                                                     systems only.


                                                     ↔: Select Screen
                                                     ↑↓: Select Item
                                                     Enter: Select
                                                     +/-: Change Option
                                                     F1: General Help
                                                     F7: Discard Changes
                                                     F9: Load UEFI Defaults
                                                     F10: Save and Exit
                                                     ESC: Exit



        Version 2.17.1249. Copyright (C) 2015 American Megatrends, Inc.
```

■ **Legacy USB Support**

Use this option to select legacy support for USB devices. There are four configuration options: [Enabled], [Auto] and [UEFI Setup Only]. The default value is [Auto]. Please refer to below descriptions for the details of these four options:

[Enabled] - Enables support for legacy USB.
[Disabled] - Disables support for legacy USB.

[Auto] - Enables legacy support if USB devices are connected.

[UEFI Setup Only] - USB devices are allowed to use only under UEFI setup and Windows / Linux OS.

■ **XHCI Hand-off**

This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.

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3.2.8 Trusted Computing

```
          Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
  Advanced

 TPM20 Device Found                              Enables or Disables BIOS
 Firmware Version:          7.62                 support for security device.
 Vendor:                    IFX                  O.S. will not show Security
                                                 Device. TCG EFI protocol and
 Security Device Support    [Enable]             INT1A interface will not be
 Active PCR banks           SHA-1,SHA256         available.
 Available PCR banks        SHA-1,SHA256

 SHA-1 PCR Bank             [Enabled]
 SHA256 PCR Bank            [Enabled]

 Pending operation          [None]
 Platform Hierarchy         [Enabled]
 Storage Hierarchy          [Enabled]
 Endorsement Hierarchy      [Enabled]            →←: Select Screen
 TPM2.0 UEFI Spec Version   [TCG_2]              ↑↓: Select Item
 Physical Presence Spec Version  [1.3]           Enter: Select
 TPM 20 InterfaceType       [TIS]                +/-: Change Option
 Device Select              [Auto]               F1: General Help
                                                 F7: Discard Changes
 Onboard TPM                [Enabled]            F9: Load UEFI Defaults
                                                 F10: Save and Exit
                                                 ESC: Exit

          Version 2.19.1269. Copyright (C) 2018 American Megatrends, Inc.
```
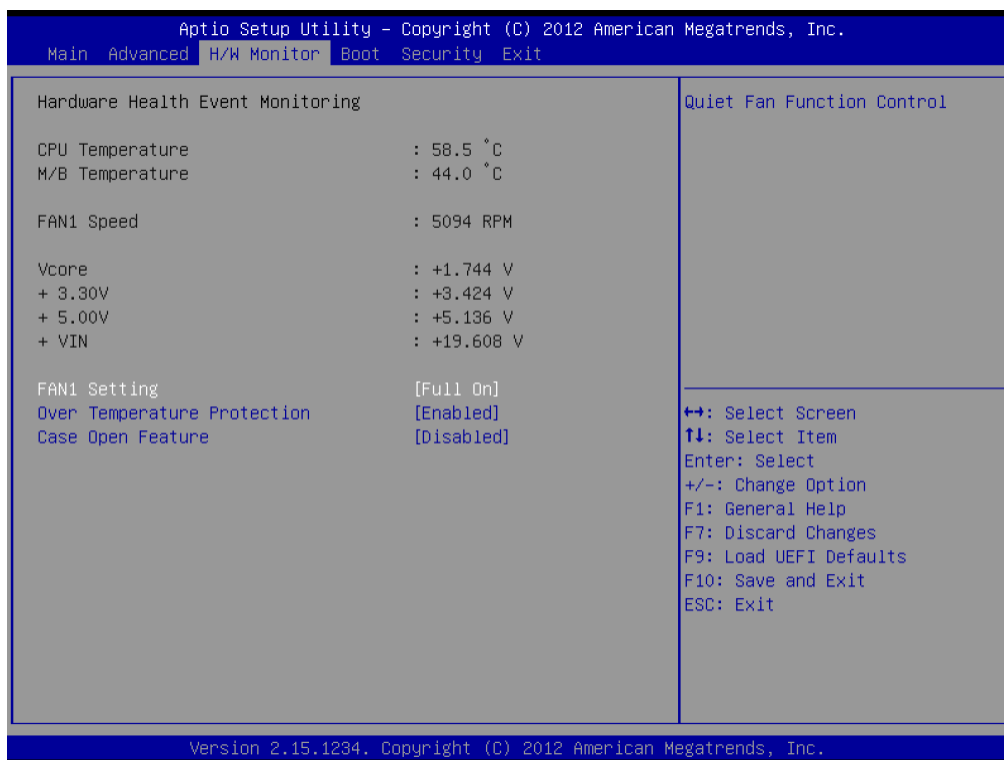
■ **Security Device Support**
 Enable or disable BIOS support for security device.

■ **Onboard TPM**
 Use this to enable or disable onboard TPM. The default is [Enabled].

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3.3 Hardware Health Event Monitoring Screen

This section allows you to monitor the status of the hardware on your system, including the parameters of the CPU temperature, motherboard temperature, CPU, fan speed, chassis fan speed, and the critical voltage.

```
              Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
        Main  Advanced  H/W Monitor  Boot  Security  Exit

   Hardware Health Event Monitoring                        Quiet Fan Function Control

   CPU Temperature                  : 58.5 °C
   M/B Temperature                  : 44.0 °C

   FAN1 Speed                       : 5094 RPM

   Vcore                            : +1.744 V
   + 3.30V                          : +3.424 V
   + 5.00V                          : +5.136 V
   + VIN                            : +19.608 V

   FAN1 Setting                     [Full On]
   Over Temperature Protection      [Enabled]      ↔: Select Screen
   Case Open Feature                [Disabled]     ↑↓: Select Item
                                                   Enter: Select
                                                   +/-: Change Option
                                                   F1: General Help
                                                   F7: Discard Changes
                                                   F9: Load UEFI Defaults
                                                   F10: Save and Exit
                                                   ESC: Exit

              Version 2.15.1234. Copyright (C) 2012 American Megatrends, Inc.
```

- ■ **FAN1 Setting**

  This allows you to set fan 1's speed. Configuration options: [Full On] and [Automatic Mode]. The default value is [Full On].

- ■ **Over Temperature Protection**

  Use this to enable or disable Over Temperature Protection. The default value is [Enabled].

- ■ **Case Open Feature**

  This allows you to enable or disable case open detection feature. The default value is [Disabled].

- ■ **Clear Status**

 This option appears only when the case open has been detected. Use this option to keep or clear the record of previous chassis intrusion status.

- ■ **Over Temperature Protection**

  Use this to enable or disable Over Temperature Protection. The default value is [Enabled].

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3.4 Security Screen

In this section, you may set, change, or clear the supervisor/user password for the system.
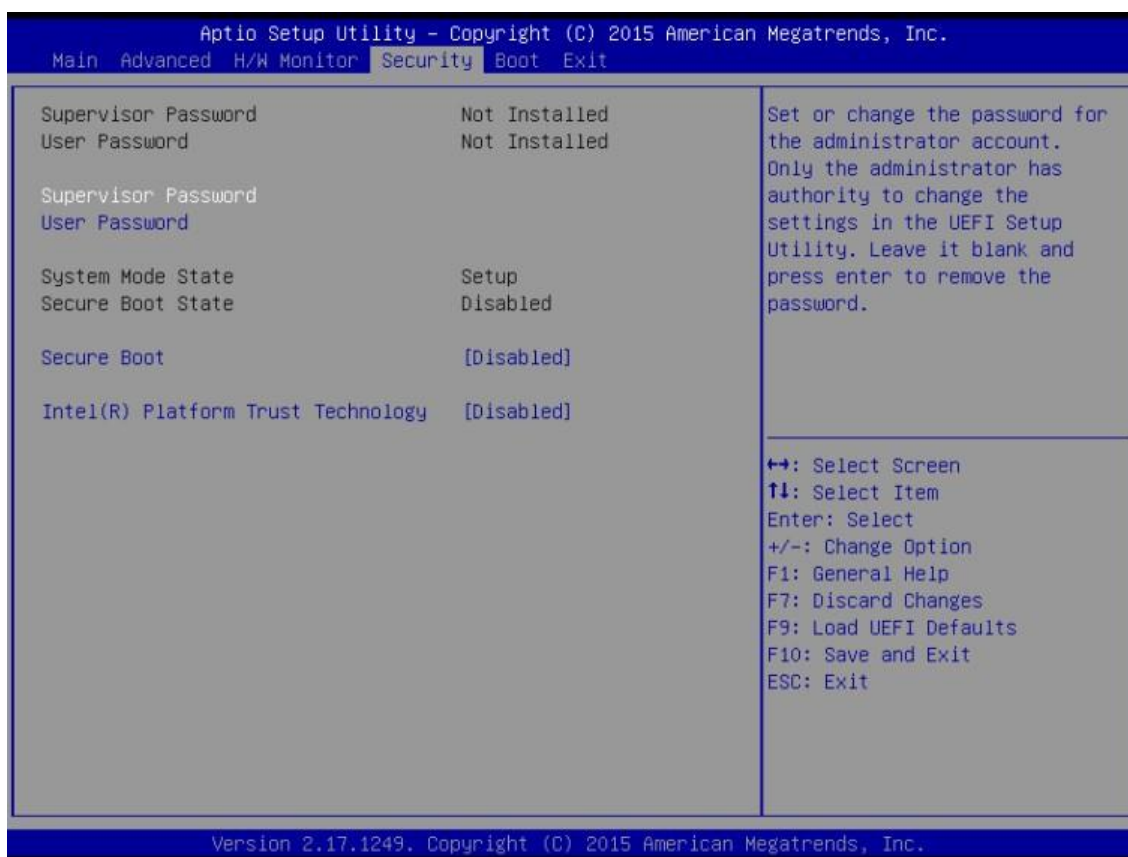
■ **Supervisor Password**

Set or change the password for the administrator account. Only the administrator has the authority to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.

■ **User Password**

Set or change the password for the user account .Users are unable to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.

■ **Secure Boot**

Enable to support Windows 8 Secure Boot.

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3.5 Boot Screen

This section displays the available devices on your system for you to configure the boot settings and the boot priority.

- **Boot From Onboard LAN**

  Use this item to enable or disable the Boot From Onboard LAN feature.

- **Setup Prompt Timeout**

  This shows the number of seconds to wait for setup activation key. 65535(0XFFFF) means indefinite waiting.

- **Bootup Num-Lock**

  If this item is set to [On], it will automatically activate the Numeric Lock function after boot-up.

- **Boot Beep**

  Select whether the Boot Beep should be turned on or off when the system boots up. Please note that a buzzer is needed.

- **Full Screen Logo**

  Use this item to enable or disable OEM Logo. The default value is [Disabled].

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3.5.1 CSM (Compatibility Support Module)
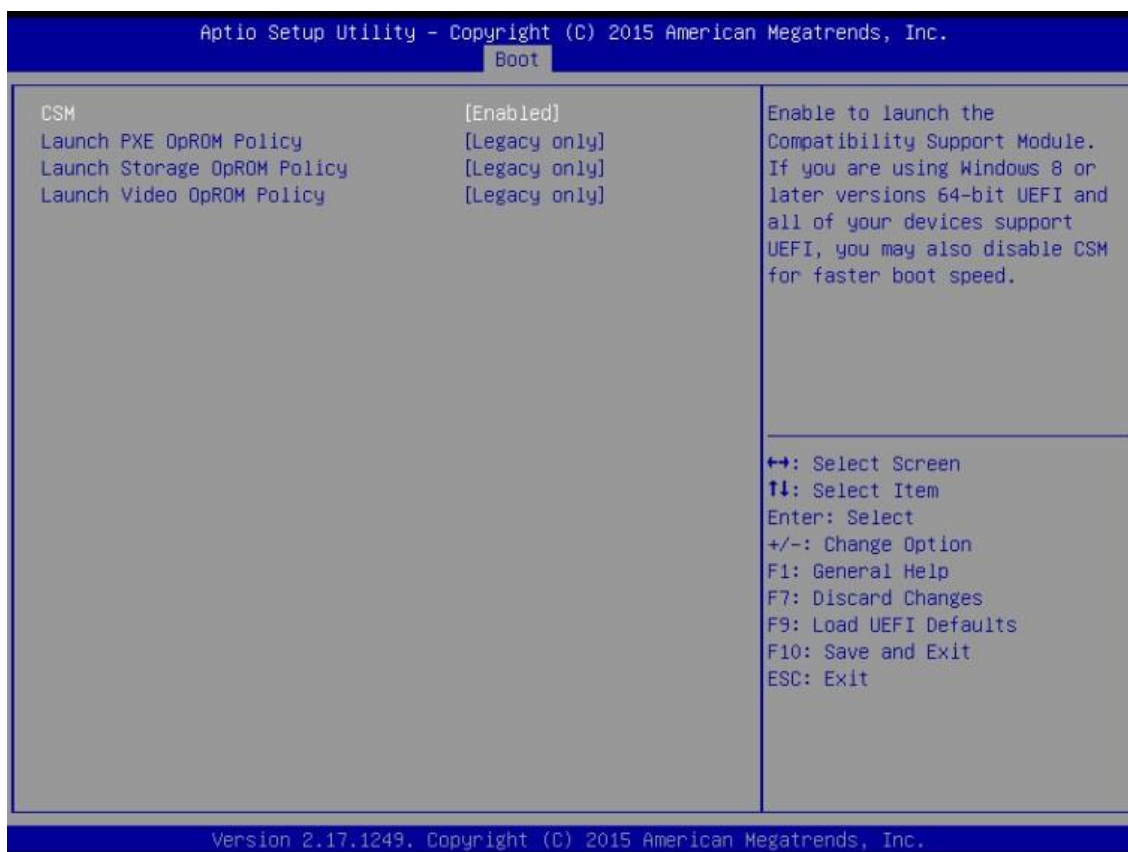
- ■ **CSM**

  Enable to launch the Compatibility Support Module. Please do not disable it unless you're running a WHCK test. If you are using Windows® 8 64-bit and all your devices support UEFI, you may also disable CSM for faster **boot speed.**

- ■ **Launch PXE OpROM Policy**

  Select [UEFI only] to run those that support UEFI option ROM only. Select [Legacy only] to run those that support legacy option ROM only. Select [Do not launch] to not execute both legacy and UEFI option ROM.

- ■ **Launch Storage OpROM Policy**

  Select [UEFI only] to run those that support UEFI option ROM only. Select [Legacy only] to run those that support legacy option ROM only. Select [Do not launch] to not execute both legacy and UEFI option ROM.

- ■ **Launch Video OpROM Policy**

  Select [UEFI only] to run those that support UEFI option ROM only. Select [Legacy only] to run those that support legacy option ROM only. Select [Do not launch] to not execute both legacy and UEFI option ROM.

3.6 Exit Screen

■ **Save Changes and Exit**

When you select this option, following message will pop out: "Save configuration changes and exit setup?" Select [OK] to save the changes and exit the UEFI Setup Utility.

■ **Discard Changes and Exit**

When you select this option, following message will pop out: "Discard changes and exit setup?" Select [OK] to exit the UEFI Setup Utility without saving any changes.

■ **Discard Changes**

When you select this option, following message will pop out: "Discard changes?" Select [OK] to discard all changes.

■ **Load UEFI Defaults**

Load UEFI default values for all setup questions. F9 key can be used for this operation.

■ **Launch EFI Shell from Filesystem Device**

Attempt to Launch EFI Shell application (Shell64.efi) from one of the available filesystem devices.