User's Manual

NO. G03-FMF833QIG-F

Manual Revision: 1.0

Release Date：December 17, 2018

TABLE OF CONTENT

 Safety Precautions

n   Operate the product according to the correct installation steps and with great care to make sure safety and comfort using experience. Please refer to the following safety instruction guide to avoid danger of electric shock or fire. Abide by the previous safety instruction guide to use and maintain the product and the hard disk to make sure of safe operating environment.

n   Please follow the instruction manual for operation guide.

n   The operation humidity for this product is 5% to 80% RH.

n   To avoid high temperature, please DO NOT overload the maximum power of the external power supply while the system is consuming high voltage. Be aware of the maximum temperature allowance of the power supply.

n   See to it that the product is not working near the water.

n   Always unplug power cable and other hardware cables from the system before cleaning.

n   Apply only dry cloth for cleansing the product.

n   Make sure that there is no heat source nearby when the product is working.

n   Make sure that the thermal louver of the product is not blocked.

n   Make sure to remove the power plug from the product when there is a thunder storm.

n   Please remove the power plug from the product when you are not going to use the product for a long time.

n   Make sure to set up or use the product on a stable surface.

n   Make sure not to drop the product or strike it by any means.

n   Make sure not to move the product when the power is on.

n   Make sure not to step on the power cables and other cables or rest anything in them..

n   Be sure to ground yourself to prevent static charge when installing any internal components. Use a grounding wrist strap and place all electronic components in any static-shielded devices. Most electronic components are sensitive to static electrical charge.

n   Disconnect the power cord from the Panel PC unit prior to 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 Panel PC unit is properly grounded. unit

n   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:

    n   Before handling a board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. This will help to discharge any static electricity on human body.
    n   When handling boards and components, wear a grounding wrist strap available from most electronic component stores.

n   Please contact qualified technician for maintenance or repair.

n   Use only accessories and parts that are made by the qualified manufacturer.

User's Notice

Item Checklist

R *User's Manual*

R *DVD*

R *Screw Pack*

R *Power Cord*

R *FSP Adapter 12V-5A-60W / LEVEL6*

R *M12 DC Cable , L=1.2M*

Environmental Protection Announcement

Do not dispose this electronic device into the trash while discarding. To minimize pollution and ensure environment protection of mother earth, please recycle.

Chapter 1

Introduction

1-1 General Descriptions

Thank you for purchasing **HBFMF833W** Series, a Fanless Embedded Box PC developed, designed and manufactured under leading technical power and consistent dedication to fine workmanship.

The system has the following features besides other basic functions:

l Intel® Skylake/Kabylake U-Processor on board

l Support 2* SO-DIMM DDR4-2133, up to 32GB memory

l Support M12 connector

l Support IP69K waterproof and dustproof level

l All-aluminum body, produced by casting process

l Flexible I/O for customized and mission-critical projects

l Stainless steel bottom cover with stainless steel screws for outdoor use without rust

1-2 Specifications

MB Model	l JNF833-7X00 / 3.5" SBC	
Part No	l HBFMF833W-7X-2L-B l HBFMF833W-7X-2C-B	
BIOS	l AMI	
CPU/Chipset	l Intel® Skylake/Kabylake U Processor (TDP 15W) *Note:* When the system runs, CPU will automatically adjust its working clock frequency according to changing workload.	
Memory	l 2 * SO-DIMM slots DDR4-2133MHz up to 32GB	
Storage	l 1 * 2.5" SATA3 6Gb/s internal drive bay l 1 * Full-size mSATA/mini-PCI Express shared slot	
Network	l 1 * Intel GbE (**HBFMF833W-7X-2C-B**) l 2 * Intel GbE (**HBFMF833W-7X-2L-B**) l 1 * Half-size mini-PCIE slot (for 802.11 b/g/n + BT 4.0 installed in WIFI model)	
Rear Panel I/O	HBFMF833W-7X-2C-B	HBFMF833W-7X-2L-B
	l 2 * USB2.0 l 1 * RJ45 l 2 * COM l 1 * HDMI l 2 * WIFI Antenna l 1 * DC-In	l 1 * USB3.0 l 1 * USB2.0 l 2 * RJ45 l 1 * COM l 1 * HDMI l 2 * WIFI Antenna l 1 * DC-In
Front Panel I/O	l 1 * Power SW l 1 * Power LED	
Power Source	l FSP Adapter / DC12V-5A-60W l AC 90~240V input	

Waterproof	l	IP69K
Environment	l	Operating Temperature: -20 ~ 60°C (under the condition of using MSATA)
	l	Operating Temperature: -20 ~ 70°C (under the condition of using 2.5" SSD)
		Note: The test environment is closed and windless
	l	Storage Temperature: -10 ~ 70 °C
	l	Humidity : 90% , non-condensing
Dimensions	l	250 (W) x 171 (D) x 54 (H) mm
OS Support	l	Windows 7, Windows 8.1, Windows 10, Linux

1-3 Product Diagram

Front:

Rear:
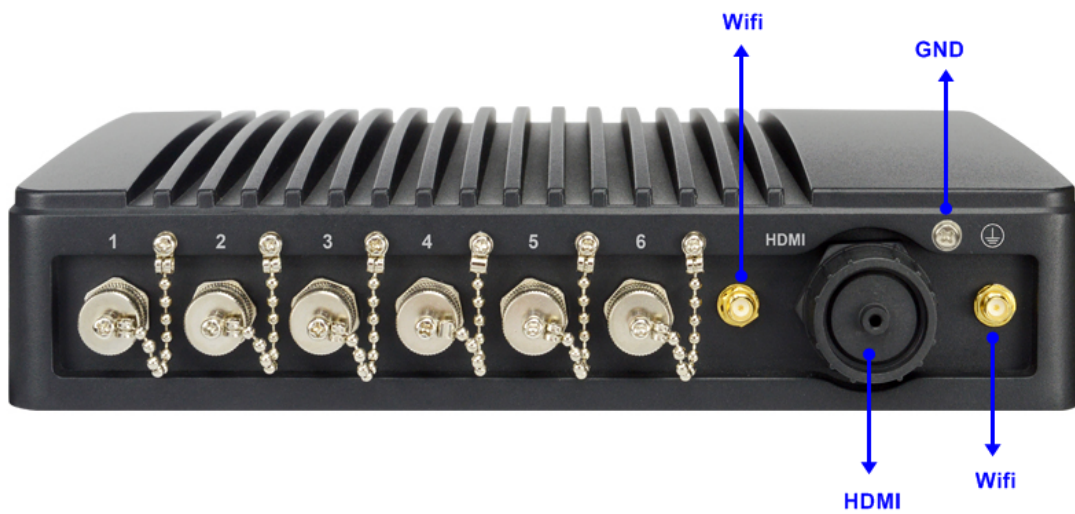
1-4 I/O Outlets

HBFM833W-7X-2L-B:

DC-IN   RJ-45 LAN   USB 2.0   USB 3.0   **COM1:** RS232/422/485

1   2   3   4   5   6

HBFM833W-7X-2C-B:

DC-IN   USB 2.0   RJ-45 LAN   USB 2.0   **COM1:** RS232/422/485   **COM2:** RS232

1   2   3   4   5   6
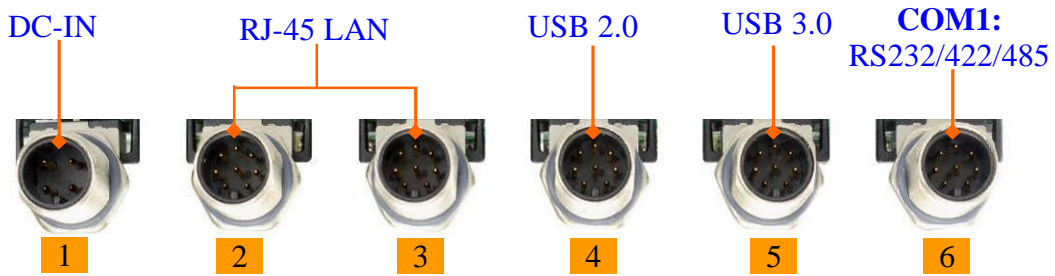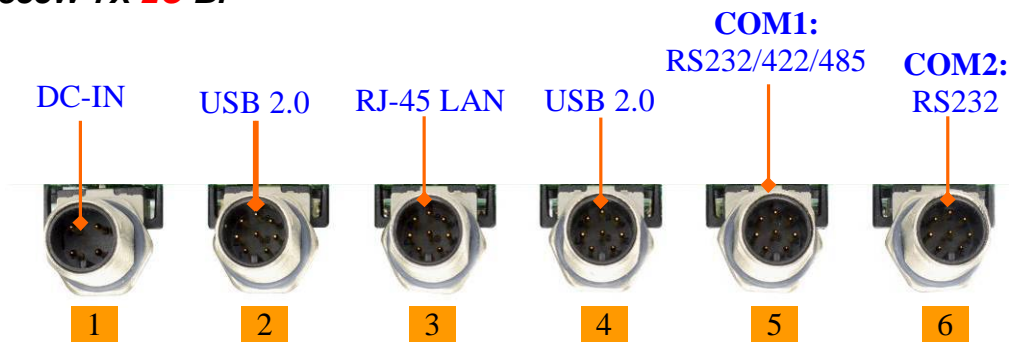
M12 NUM	MODEL	
	HBFMF833W-7X-2C-B	HBFMF833W-7X-2L-B
1	DC-IN	DC-IN
2	USB 2.0	LAN1
3	LAN	LAN2
4	USB2.0	USB2.0
5	COM1	USB3.0
6	COM2	COM1

1-5 Connector Pin Definition

(1) Connector Function

Icon	Name	Function
Power Button	**Power Button**	Press to turn on/off the system.
HDMI	**HDMI**	To connect display device that support HDMI specification.
DC	**DC-in Power Connector**	For user to connect compatible power adapter to provide power supply for the system.
USB2.0	**USB 2.0 Port Connector**	To connect USB keyboard, mouse or other devices compatible with USB 2.0 specification. *Note:* 1* USB 2.0 connector for 2* USB 2.0 expansion port.
USB3.0	**USB 3.0 Port Connector**	To connect USB keyboard, mouse or other devices compatible with USB 3.0 specification.
LAN	**RJ-45 LAN Port Connector**	This connector is standard RJ-45 LAN jack for Network connection.
COM1	**RS232/422/485 COM Port Connector**	Mainly for user to connect external MODEM or other devices that supports Serial Communications Interface.
COM2	**RS232 COM Port Connector**	Mainly for user to connect external MODEM or other devices that supports Serial Communications Interface.

(2) I/O Connectors Pin Definition

DC: DC-in Power Connector
The pin assignment for DC-in power connector is listed as follows:

Pin NO.	Definition
1	DC +9~24V
2	DC +9~24V
3	GND
4	GND

LAN: RJ-45 Ethernet Connector
The pin assignment for RJ-45 Ethernet LAN connectors are listed as follows:
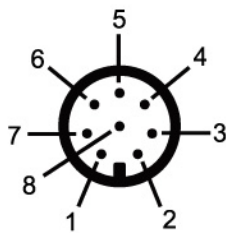
Pin NO.	Definition
1	TX_D1+
2	TX_D1-
3	RX_D2+
4	BI_D3+
5	BI_D3-
6	RX_D2-
7	BI_D4+
8	BI_D4-

USB2.0: USB 2.0 Port Connector
The pin assignment for USB 2.0 port connectors are listed as follows:
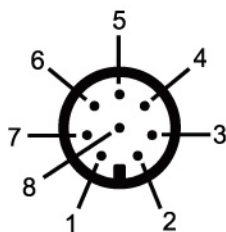
Pin NO.	Definition
1	5V
2	D1-
3	D1+
4	GND
5	5V
6	D2-
7	D2+
8	GND

Note: 1* USB 2.0 connector for 2* USB 2.0 expansion port.

USB3.0: USB 3.0 Port Connector

The pin assignment for USB 3.0 port connectors are listed as follows:
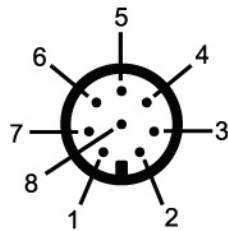
Pin NO.	Definition
1	5V
2	USB3_RX-
3	USB3_RX+
4	GND
5	USB3_TX-
6	USB3_TX-
7	D-
8	D+

COM1: RS232/422/485 COM Port Connector

The pin assignment for RS-232/ 422/ 485 is listed as follows:
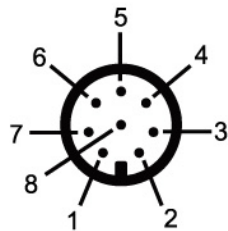
Pin NO.	RS232	*RS422 (optional)	*RS485 (optional)
1	DCD#	TX-	DATA-
2	SIN	TX+	DATA+
3	SOUT	RX+	NC
4	DTR#	RX-	NC
5	DSR#	NC	NC
6	RTS#	NC	NC
7	CTS#	NC	NC
8	RI#	NC	NC

*Note: COM1 port can function as RS232/422/485 port. In normal settings COM1 functions as RS232 port. With compatible COM cable COM1 can function as RS422 or RS 485 port. User also needs to go to BIOS to set 'Transmission Mode Select' for COM1 (refer to Page-23) at first, before using specialized cable to connect different pins of this port.

COM2: RS232COM Port Connector

The pin assignment for RS-232 is listed as follows:
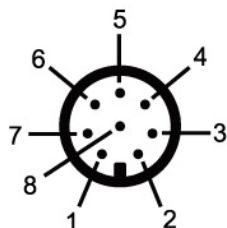
Pin NO.	RS232
1	DCD#
2	SIN
3	SOUT
4	DTR#
5	DSR#
6	RTS#
7	CTS#
8	RI#

Chapter 2
Hardware and Installation
2-1 Dimension and Outlines
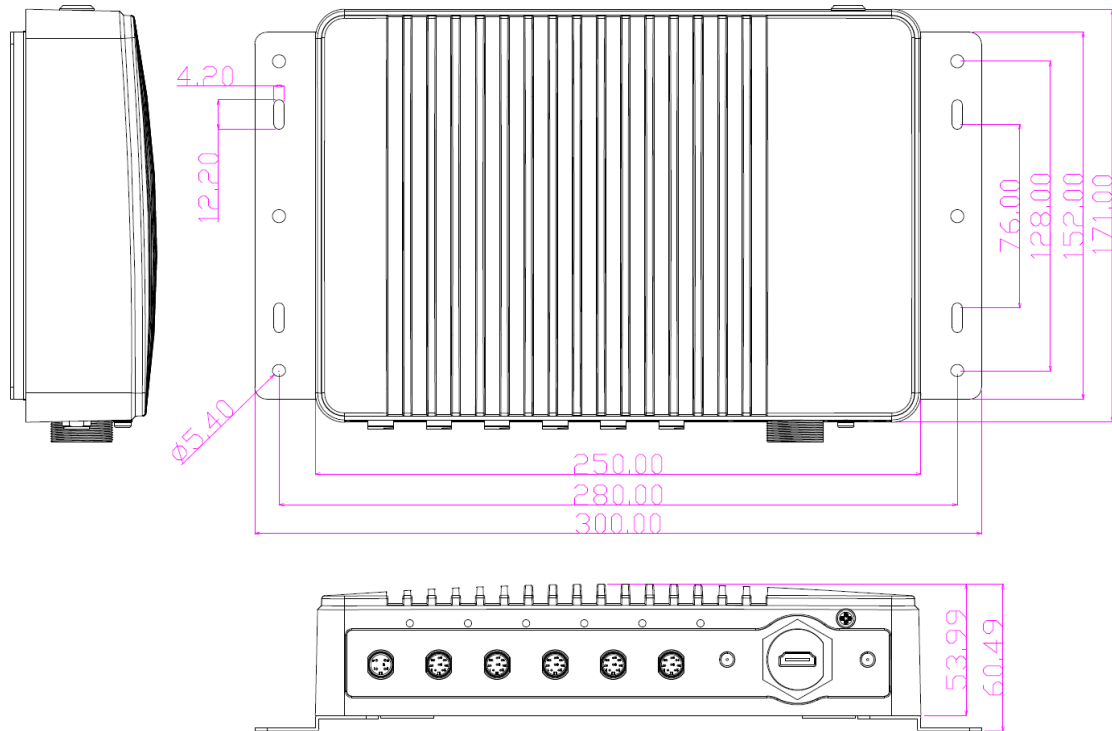
Measure Unit: mm.

2-2 To Open the Chassis

Use a screwdriver to unscrew the screws on the back cover that lock the chassis. Remove them and put the cover aside to open the chassis.

1. Place the system upon a flat operation platform with side upwards. The screws in the marked spots should be removed with a compatible Phillips screwdriver.

2. Lift up the cover to open the chassis.
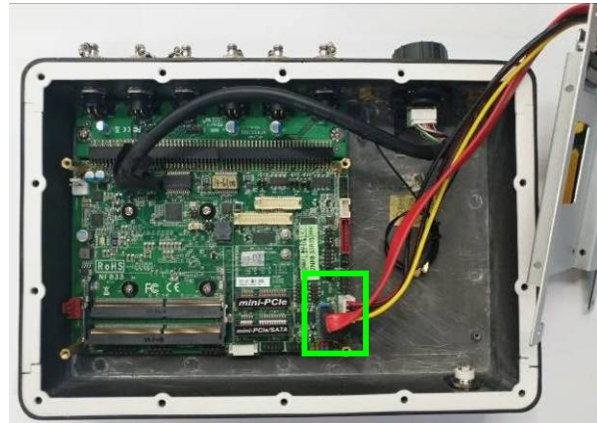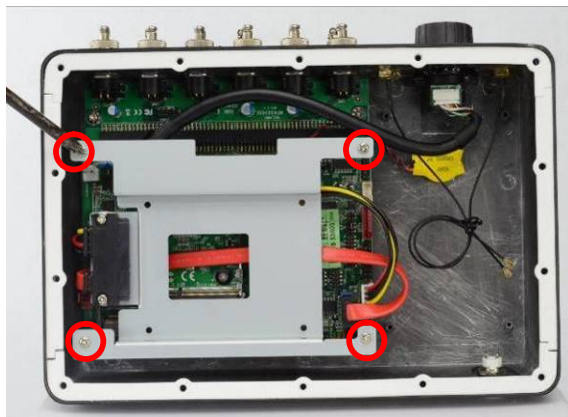
3. Remove the marked screws to dissemble the HDD tray from the system for further installation steps.

4. For user to have a clear view, we remove the SATA HDD cable & SATA power-out cable from the system for further installation steps.

Notice: It is very important for the cables connected to their original places for normal functioning.

2-3 Jumper Settings

Jumper is a small component consisting of jumper clip and jumper pins. Install jumper clip on 2 jumper pins to close the pins. And remove jumper clip from 2 jumper pins to open the pins. Diagram 2-1 illustrates how to set up a jumper.
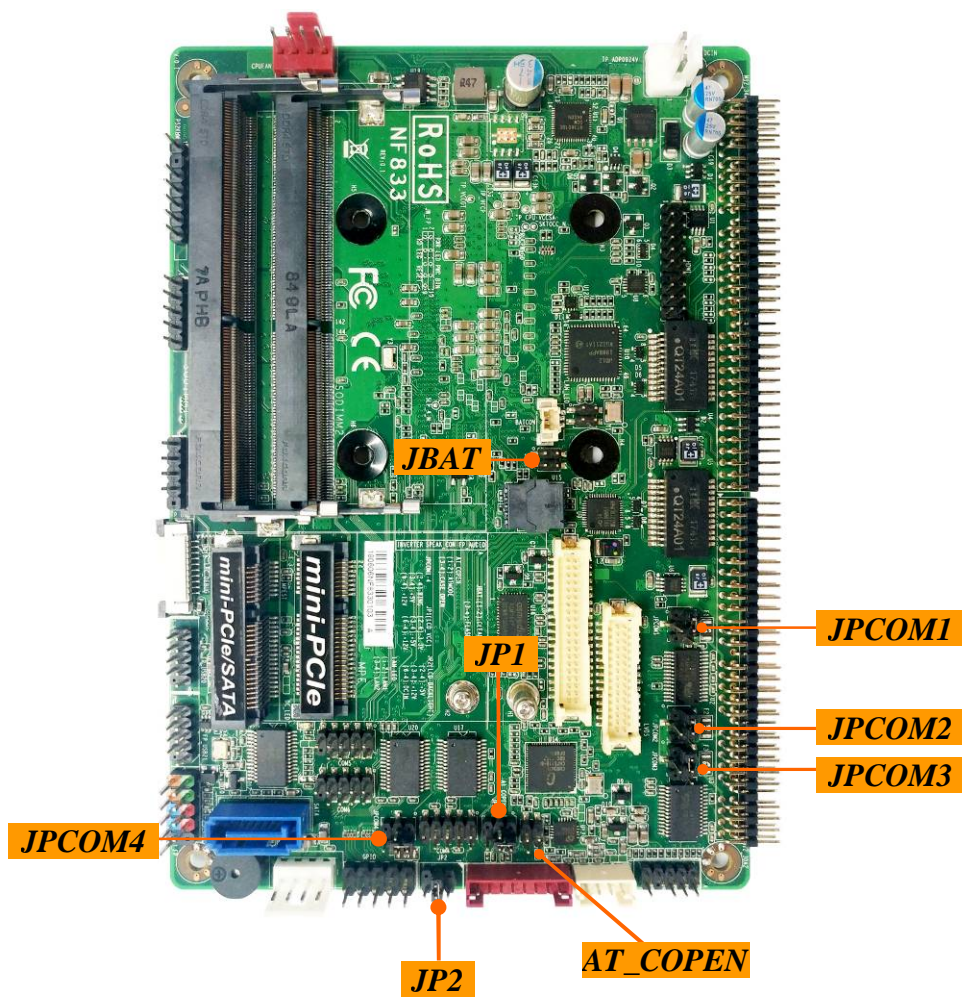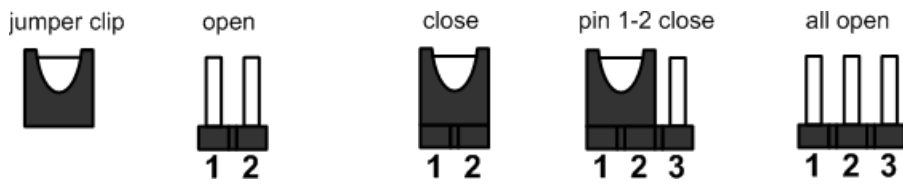
AT_COPEN (4-pin): AT Mode & Case Open Detection Select
Pin(1-2): AT Mode Select
Pin(3-4):Case Open Detection Select

Pin 1&2 of AT_COPEN
→ AT Mode Select

```
3  ● ■  ← Pin1
4  ● ●  2
```
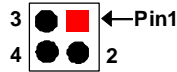
1-2 Open: ATX Mode Selected(Default);

```
3  ● ■  ← Pin1
4  ● ●  2
```
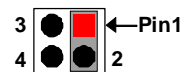
1-2 Closed: AT Mode Selected.

Pin 3&4 of AT_COPEN
→ Case Open Detection

CASE OPEN

```
3  ● ■  ← Pin1
4  ● ●  2
```

GND
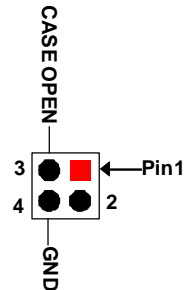
ATX Mode Selected: Press power button to power on after power input ready;
AT Mode Selected: Directly power on as power input ready.

Pin (3&4) Closed: *When Case open function pin short to GND, the Case open function was detected. When used, needs to enter BIOS and enable 'Case Open Detect' function. In this case if your case is removed, next time when you restart your computer, a message will be displayed on screen to inform you of this.*

JBAT (4-pin): Clear CMOS RAM Setting & Flash Override

Pin(1-2): Clear CMOS Settings;
Pin(3-4): Flash Override.

Pin 1&2 of JBAT→Clear CMOS

```
Pin1 →  ■ ●  2
        ● ●
```
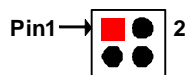
1-2 Open: Normal(Default);

```
Pin1 →  ■ ●  2
        ● ●
```
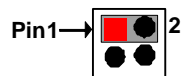
1-2 Closed: Clear CMOS(One Touch).

Pin 3&4 of JBAT→
Flash Descriptor Override

```
Pin1 →  ■ ●  2
     3  ● ●  4
```
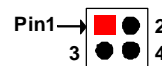
3-4 Open: Normal(Default);

```
Pin1 →  ■ ●  2
     3  ● ●  4
```
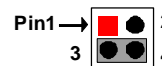
3-4 Closed: Disable Flash Descriptor Security (override).

JPCOM1 (4-pin): COM1 Port Pin9 Function Select
JPCOM2 (4-pin): COM2 Port Pin9 Function Select
JPCOM3 (4-pin): COM3 Port Pin9 Function Select
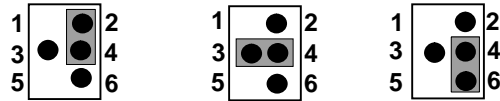
2-4 Closed:
Pin9=RING(Default);

3-4 Closed:
Pin9 = 5V;

6-4 Closed:
Pin9 = 12V.

JPCOM4 (4-pin): COM4 Port Pin9 Function Select
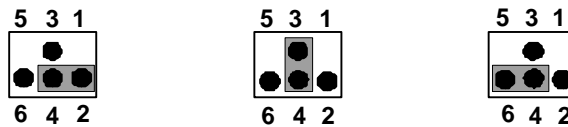
2-4 Closed:
Pin9=RING(Default);

3-4 Closed:
Pin9 = 5V;

6-4 Closed:
Pin9 = 12V.

JP1 (4-pin): LCD VCC Select
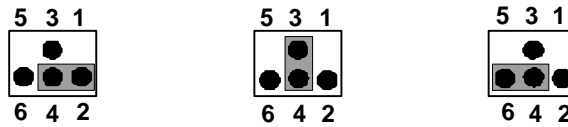
2-4 Closed:
LVDS VCC= 3.3V;

3-4 Closed:
LVDS VCC=5V;

4-6 Closed:
LVDS VCC=12V.

JP2 (4-pin): LCD Backlight VCC Select
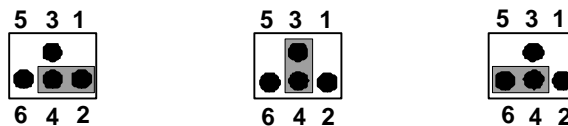
2-4 Closed:
Backlight=5V;

3-4 Closed:
Backlight=12V;

4-6 Closed:
Backlight=DCIN.

2-4 Hardware Installation

Remove the screws that lock the back cover to the system from the back side before hardware installation procedures (refer to **2-2**).

2-4-1 To Install SO-DIMM
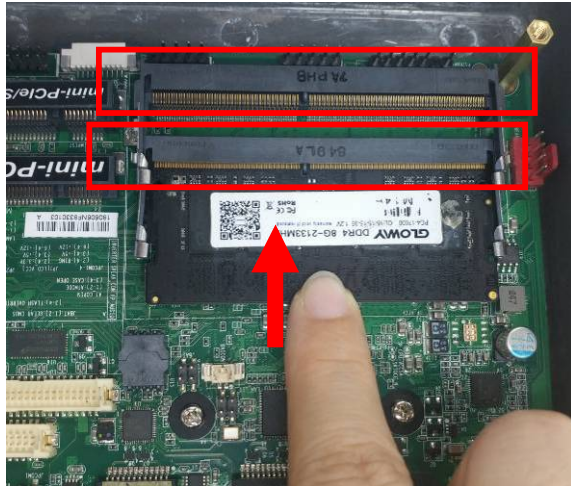
1. Locate the SO-DIMM memory slots on the board. Insert the gold-figure side of the compatible SO-DIMM into the slot at a 30 degree and press down.
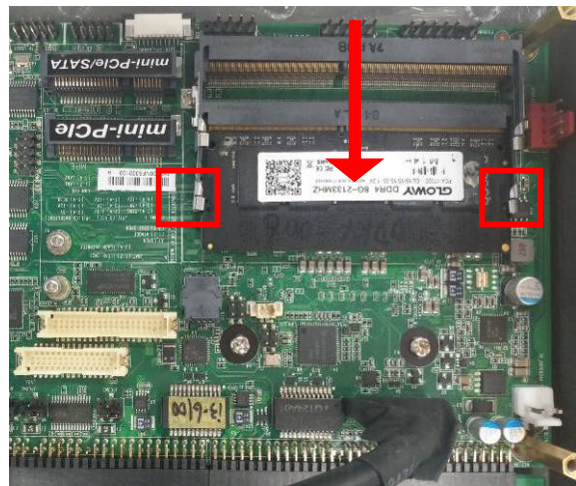
2. See to it that the notch of the module fit into the break of the slot; the two plastic clips will automatically close if the memory module is fitted in a proper way.

2-4-2 To Install Mini-PCIE Card

Note: The following photos are for illustration only. If you wish to install compatible full-size card, please install it in Mini-PCIE/MSATA shared slot.
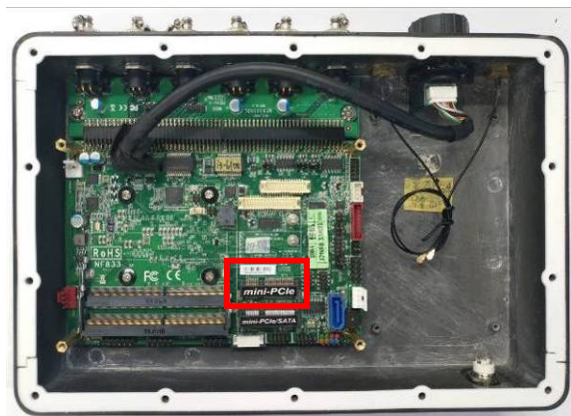
1. Locate the half-size Mini-PCIE card slot on the board.
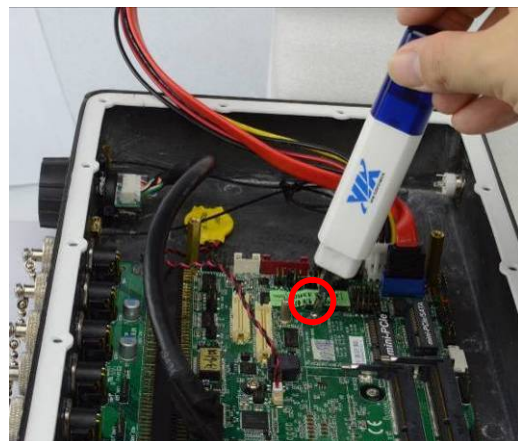
2. Remove the marked screw and use it to lock half-size Mini-PCIE card to the slot in later installation.
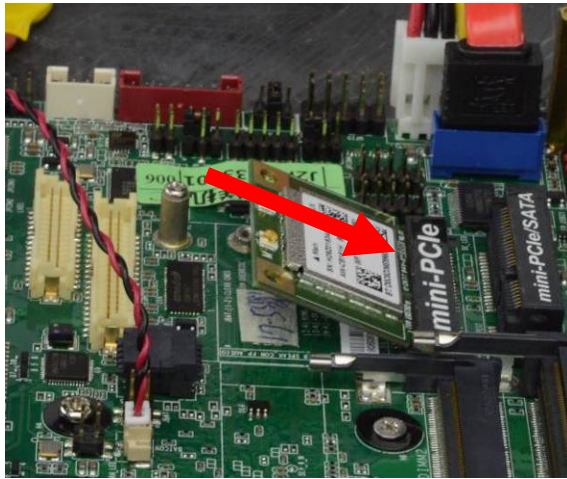
3. Insert the gold-figure side of the compatible card into the slot and press down.
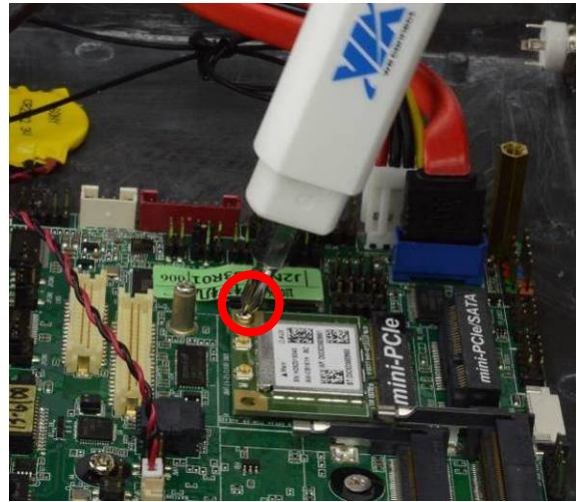
4. Lock the card to the board by tightening up the screw to the marked spot.

5. Locate the antenna slots on the card.
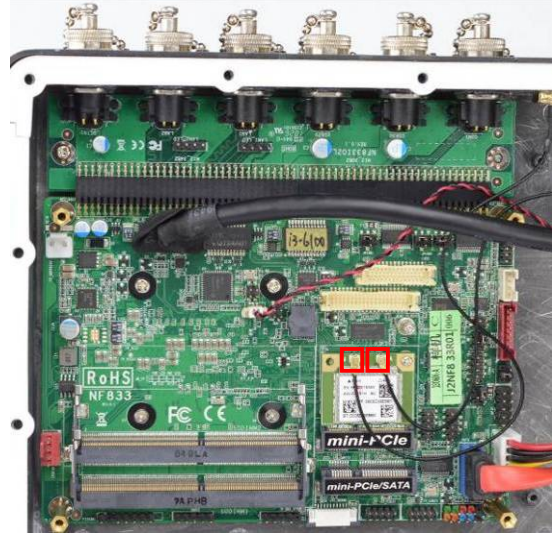
6. Press the metal hat on the end of the antenna string to the antenna slot on the card as shown (If you install two antenna, press the left metal hat of the left antenna to the left slot, the right metal hat to the right slot).

7. Locate the Wi-Fi antenna connectors in the rear panel.

8. Connect the external Wi-Fi receiver antenna to the antenna connector on the rear panel.

2-4-3 To Install MSATA Card
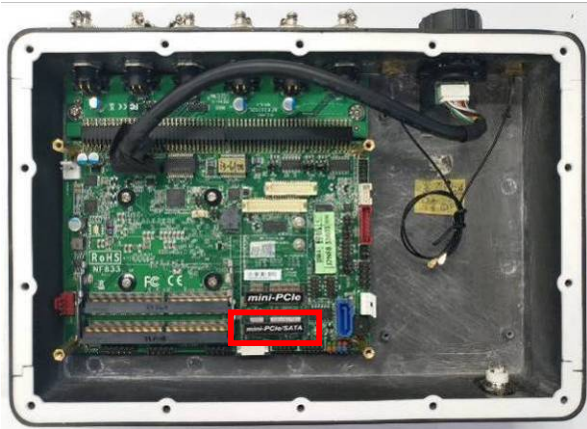
1. Locate the full-size Mini-PCIE/MSATA card slot on the board.
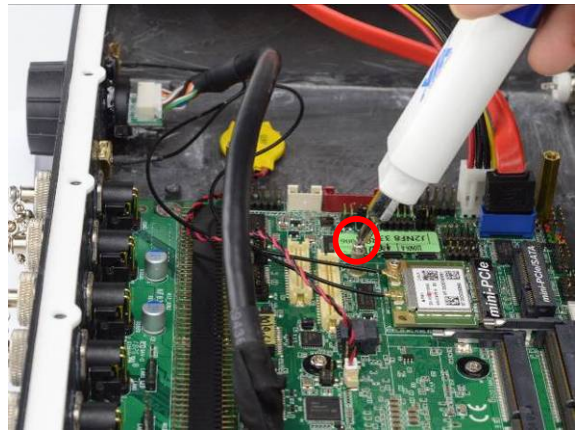
2. Remove the marked screw and use it to lock MSATA card to the slot in later installation.
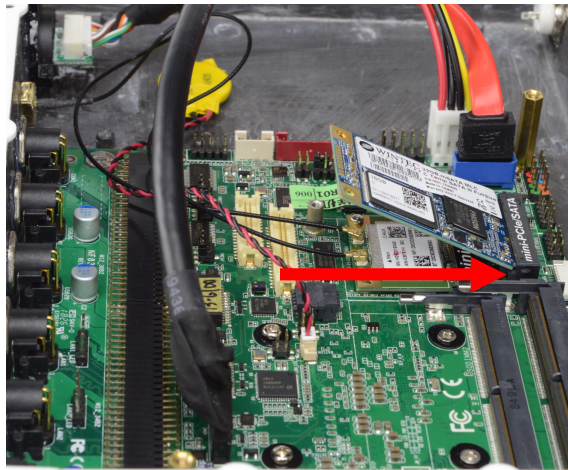
3. Insert the gold-figure side of the compatible card into the slot and press down.

4. Lock the card to the board by tightening up the screw to the marked spot.

2-4-4 To Install 2.5'' HDD
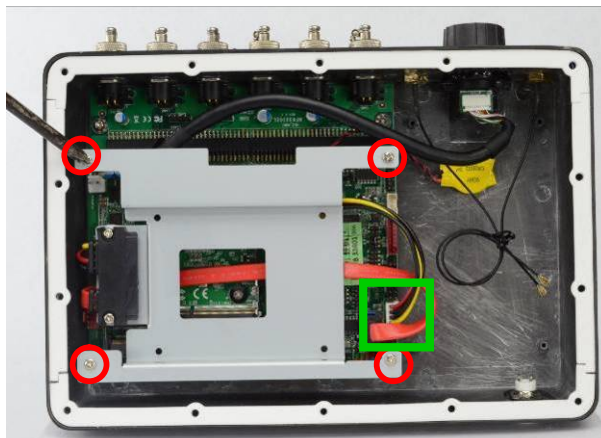
1. Remove the marked screws to dissemble the HDD tray from the system & unplug the pre-installed SATA HDD cable for further installation steps.
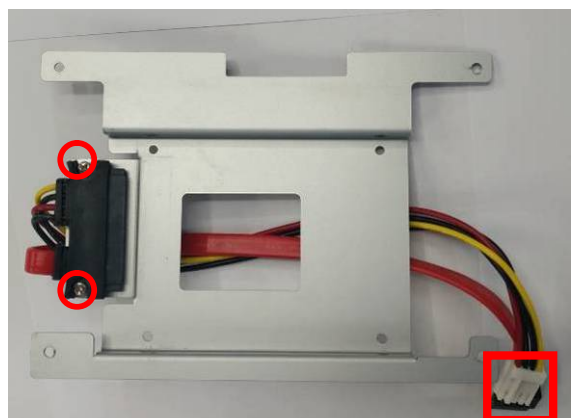
2. The HDD tray with HDD cable locked to it with 2*screws.

3. Place compatible SATA HDD upon HDD tray as showed above. Plug this side of the cable to SATA power-in connector and SATA connector of the hard disk.

4. Turn over the HDD tray and fix 2.5'' HDD upon HDD tray by tightening 4* screws marked in corresponding spots.
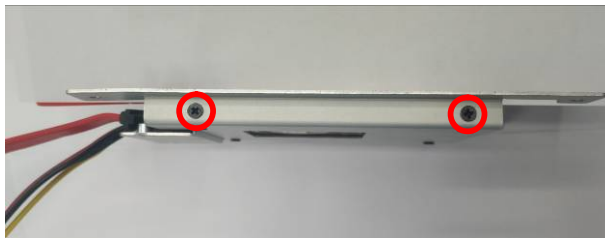
5. Fix 2.5'' HDD upon HDD tray by tightening 2* screws marked in corresponding spots.
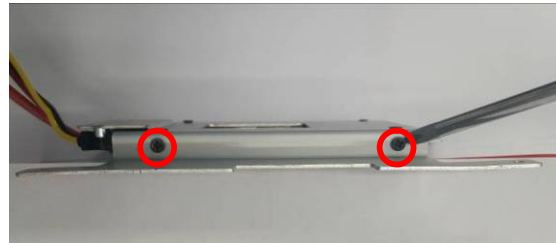
6. Tightening the other 2* screws on the other side of the HDD tray.
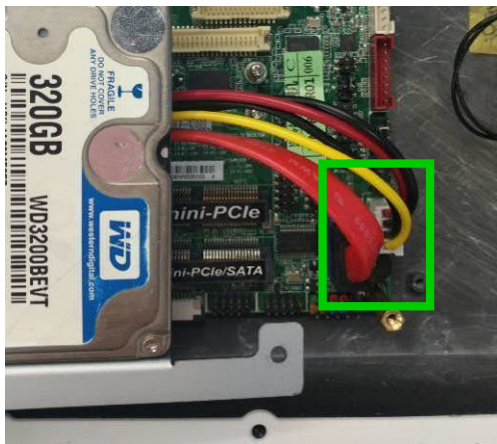
7. Plug SATA power connector and SATA port connector into corresponding connecters onboard.

8. Adjust the installed tray as showed above. Fix HDD tray into the system by tightening up 4* screws marked.

2-4-4 To Wall Mount the System

1. Find a pair of racks for wall-mount from the accessories package. The screw holes in the marked spots should be aligned to the screw holes of the chassis cover.

2. Place the system upon a flat operation platform with side upwards. The screw holes in the marked spots are reserved for wall mount rack installation.

3. Install the wall mount rack to the system by tightening up with compatible screws with a Phillips screwdriver.

4. Install the other rack in the same way. The above is a system with wall mount racks locked to it.

Chapter 3
Introducing BIOS

Notice!	The BIOS options in this manual are for reference only. Different configurations may lead to difference in BIOS screen and BIOS screens in manuals are usually the first BIOS version when the board is released and may be different from your purchased motherboard. Users are welcome to download the latest BIOS version form our official website.

The BIOS is a program located on a Flash Memory on the motherboard. This program is a bridge between motherboard and operating system. When you start the computer, the BIOS program will gain control. The BIOS first operates an auto-diagnostic test called POST (power on self test) for all the necessary hardware, it detects the entire hardware device and configures the parameters of the hardware synchronization. Only when these tasks are completed done it gives up control of the computer to operating system (OS). Since the BIOS is the only channel for hardware and software to communicate, it is the key factor for system stability, and in ensuring that your system performance as its best.

3-1   Entering Setup

Power on the computer and by pressing <Del> immediately allows you to enter Setup. If the message disappears before your respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt> and <Delete> keys.   If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to

Press   **<Del>** to enter Setup

3-2   BIOS Menu Screen

The following diagram show a general BIOS menu screen:
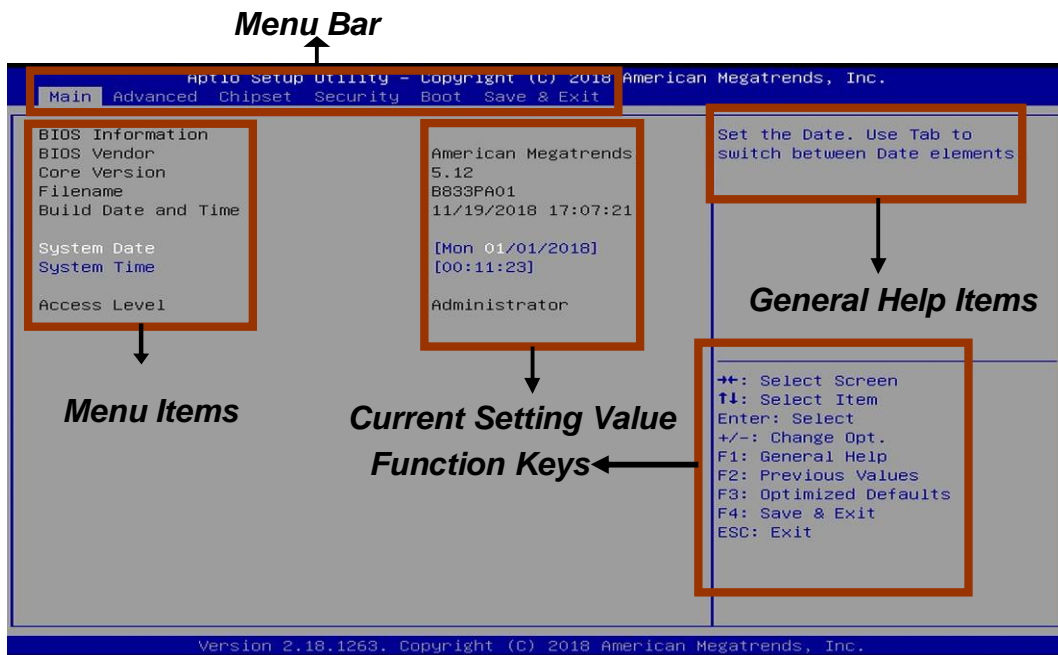
BIOS Menu Screen

3-3   Function Keys

In the above BIOS Setup main menu of, you can see several options. We will explain these options step by step in the following pages of this chapter, but let us first see a short description of the function keys you may use here:

l   Press ¬ ® (left, right) to select screen;

l   Press - ¯ (up, down) to choose, in the main menu, the option you want to confirm or to modify.

l   Press <Enter> to select.

l   Press <+>/<−> keys when you want to modify the BIOS parameters for the active option.

l   [F1]: General help.

l   [F2]: Previous values.

l   [F3]: Optimized defaults.

l   [F4]: Save & Exit.

l   Press <Esc> to exit from BIOS Setup.

3-4   Getting Help

Main Menu

The on-line description of the highlighted setup function is displayed at the top right corner the screen.

Status Page Setup Menu/Option Page Setup Menu

Press [**F1**] to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window, press <**Esc**>.

3-5 Menu Bars

There are six menu bars on top of BIOS screen:

Main	To change system basic configuration
Advanced	To change system advanced configuration
Chipset	To change chipset configuration
Security	Password settings
Boot	To change boot settings
Save & Exit	Save setting, loading and exit options.

User can press the right or left arrow key on the keyboard to switch from menu bar. The selected one is highlighted.

3-6   Main Menu

Main menu screen includes some basic system information. Highlight the item and then use the <+> or <-> and numerical keyboard keys to select the value you want in each item.

```
         Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
 Main   Advanced  Chipset  Security  Boot  Save & Exit

 BIOS Information                                          Set the Date. Use Tab to
 BIOS Vendor                  American Megatrends          switch between Date elements.
 Core Version                 5.12
 Filename                     B833PA01
 Build Date and Time          11/19/2018 17:07:21

 System Date                  [Mon 01/01/2018]
 System Time                  [00:11:23]

 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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```

System Date
Set the date. Please use [Tab] to switch between date elements.
System Time
Set the time. Please use [Tab] to switch between time elements.

3-7 Advanced Menu

```
            Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
     Main  Advanced  Chipset  Security  Boot  Save & Exit

  ► CPU Configuration                                    CPU Configuration Parameters
  ► SATA Configuration
  ► PCH-FW Configuration
  ► AMT Configuration
  ► Trusted Computing
  ► ACPI Settings
  ► Wake-up Function Settings
  ► Super IO Configuration
  ► PC Health Status
  ► Serial Port Console Redirection
  ► Network Stack Configuration
  ► CSM Configuration
  ► USB Configuration

  ► Intel(R) I211 Gigabit  Network Connection -          →←: Select Screen
    00:30:18:11:60:3C                                    ↑↓: Select Item
  ► Intel(R) Ethernet Connection (3) I219-LM - 00:30:18:11:60:3B   Enter: Select
                                                         +/-: Change Opt.
                                                         F1: General Help
                                                         F2: Previous Values
                                                         F3: Optimized Defaults
                                                         F4: Save & Exit
                                                         ESC: Exit



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```

► **CPU Configuration**

Press [Enter] to view current CPU configuration and make settings for the following sub-items:

Hyper-Threading

The optional settings: [Disabled]; [Enabled].

[Enabled]: for Windows and Linux(OS optimized for Hyper-Threading Technology).

[Disabled]: for other OS (OS not optimized for Hyper-Threading Technology).

Intel Virtualization Technology

The optional settings: [Enabled]; [Disabled].

When set as [Enabled], a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

Hardware Prefetcher

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

The optional settings: [Disabled]; [Enabled].

Adjacent Cache Line Prefetch

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

The optional settings: [Disabled]; [Enabled].

Intel(R) SpeedStep(tm)

This item allows more than two frequency ranges to be supported.

The optional settings: [Disabled]; [Enabled].

CPU C Status

Use this item to enable or disable CPU power management.

The optional settings: [Disabled]; [Enabled].

When set as [Enabled], it allows CPU to go to C states when it is not 100% utilized.

Package C State Limit

Use this item to select maximum Package C State Limit settings.

The optional settings are: [C0/C1]; [C2]; [C3]; [C6]; [C7]; [C7s]; [C8]; ; [C9]; [C10]; [Cpu Default]; [Auto].

[Cpu Default]: Leaves to factory default value.

[Auto]: Initializes to deepest available Package C State Limit.

▶ **SATA Configuration**
Press [Enter] to make settings for the following sub-items:
SATA Controller(s)
The optional settings: [Disabled]; [Enabled].
When set as [Enabled], user can make further settings in the following items:
SATA Mode Selection
The optional setting is: [AHCI].
SATA
Port
Use this item to enable or disable device connected respective port.
The optional settings: [Disabled]; [Enabled].
Hot Plug
Use this item to designate this port as Hot Pluggable.
The optional settings: [Disabled]; [Enabled].
mSATA
Port
Use this item to enable or disable device connected to MSATA port.
The optional settings: [Disabled]; [Enabled].

▶ **PCH-FW Configuration**
Press [Enter] to view ME information and make settings in the following sub-items:
TPM Device Selection
Use this item to select TPM device.
The optional settings: [dTPM]; [PPT].
Warning!! *PTT/dTPM will be disabled and all data saved on it will be lost.*
▶ **Firmware Update Configuration**
Use this item to configure Management Engine Technology parameters.
Press [Enter] to make settings for '**ME FW Image RE-Flash**'.
ME FW Image Re-Flash
Use this item to enable or disable ME FW Image Re-Flash function.
The optional settings: [Disabled]; [Enabled].

** In the case that user needs to update ME firmware, user should set '**ME FW Image Re-Flash**' as [**Enabled**], save the settings and exit. The system will turn off and reboot after 4 seconds. If the user goes to BIOS screen again will find this item is set again as [**Disabled**], but user can still re-flash to update firmware next time.*

▶ **AMT Configuration**
Press [Enter] to configure Intel (R) Active Management Technology parameters.
Intel AMT
The optional settings: [Disabled]; [Enabled].
When set as [Disabled] AMT BIOS features are no longer supported and user is no longer able to access MEBx setup. This option does not disable Manageability Features in FW.
When set as [Enabled], user can make further settings in the following items that show up:
Hide Un-Configure ME Confirmation Prompt
Use this item to hide un-configure ME confirmation prompt when attempting ME un-configuration.

The optional settings: [Disabled]; [Enabled].

MEBx Debug Message Output

Use this item to enable MEBx debug message output.

The optional settings: [Disabled]; [Enabled].

Un-Configure ME

Use this item to unconfigure ME with resetting MEBx password to default.

The optional settings: [Disabled]; [Enabled].

ASF

Use this item to enable or disable Alert Standard Format support.

The optional settings: [Disabled]; [Enabled].

Activate Remote Assistance Process

This item is for user to trigger CIRA boot. Network Access must be activated first from MEBx setup.

The optional settings: [Disabled]; [Enabled].

USB Configure

Use this item to enable or disable AMT USB provisioning.

The optional settings: [Disabled]; [Enabled].

PET Prgress

Use this item to enable or disable PET Events Progress to receive PET Events.

The optional settings: [Disabled]; [Enabled].

AMT CIRA Timeout

The default setting is [0].

WatchDog

Use this item to enable or disable WatchDog Timer. When set as [Enabled], the following sub-items shall appear:

OS Timer

Use this item to set OS Watchdog Timer.

BIOS Timer

Use this item to set BIOS Watchdog Timer.

► **Trusted Computing**

Press [Enter] to enable or disable '**Security Device Support**'.

Security Device Support

Use this item to enable or disable BIOS support for security device.

The optional settings: [Disabled]; [Enabled].

► **ACPI Settings**

Press [Enter] to make settings for the following sub-items:

ACPI Settings

ACPI Sleep State

Use this item to select the highest ACPI sleep state the system will enter when the suspend button is pressed.

The optional settings are: [Suspend Disabled]; [S3 (Suspend to RAM)].

► **Wake-up Function Settings**

Press [Enter] to make settings for the following sub-items:

Wake-up System with Fixed Time

Use this item to enable or disable system wake on alarm event.

The optional settings: [Disabled]; [Enabled].

When set as [Enabled], system will wake on the hour/min/sec specified.

Wake-up System with Dynamic Time

Use this item to enable or disable system wake on alarm event.

System will wake on the current time + Increase minutes.

The optional settings: [Disabled]; [Enabled].

When set as [Enabled], system will wake on the current time + increased minute(s).

PS2 KB/MS Wake-up

The optional settings: [Enabled]; [Disabled].

Use this item to enable or disable PS2 KB/MS wake-up from S3/S4/S5.

**Note: *This function is supported when 'ERP Support' is set as [Disabled].*

USB S3/S4 Wake-up

Use this item to enable or disable USB S3/S4 wakeup. This function is only supported when ERP function is disabled.

**Note: *This function is supported when 'ERP Support' is set as [Disabled].*

USB S5 Power

Use this item to enable or disable USB power after power shutdown.

**Note: *This function is supported when 'ERP Support' is set as [Disabled].*

Internal USB Port S5 Power

Use this item to enable or disable USB power after power shutdown.

**Note: *This function is supported when 'ERP Support' is set as [Disabled].*

► **Super I/O Configuration**

Press [Enter] to make settings for the following sub-items:

Super IO Configuration

ERP Support

The optional settings: [Disabled]; [Auto].

This item should be set as [**Disabled**] if you wish to have all active wake-up functions.

► **Serial Port 1 Configuration**

Press [Enter] to make settings for the following items:

Serial Port

Use this item to enable or disable serial port (COM).

Change Settings

Use this item to select an optimal setting for super IO device. Changing setting may conflict with system resources.

Transmission Mode Select

The optional settings are: [RS422]; [RS232]; [RS485].

Mode Speed Select

The optional settings are: [RS232/RS422/RS485=250kbps]; [RS232 =1Mbps, RS422/RS485=10Mbps].

Serial Port FIF0 Mode

The optional settings are: [16-Byte FIF0]; [32-Byte FIF0]; [64-Byte FIF0]; [128-Byte FIF0].

► **Serial Port 2 Configuration/ Serial Port 3 Configuration/ Serial Port 4 Configuration/ Serial Port 5 Configuration/ Serial Port 6 Configuration**

Press [Enter] to make settings for the following items:

Serial Port

Use this item to enable or disable serial port (COM).

Change Settings
Use this item to select an optimal setting for super IO device. Changing setting may conflict with system resources.
Serial Port FIF0 Mode
The optional settings are: [16-Byte FIF0]; [32-Byte FIF0]; [64-Byte FIF0]; [128-Byte FIF0].
WatchDog Reset Timer
Use this item to enable or disable WDT reset function. When set as [Enabled], the following sub-items shall appear:
WatchDog Reset Timer Value
User can set a value in the range of [4] to [255].
WatchDog Reset Timer Unit
The optional settings are: [Sec.]; [Min.].
ATX Power Emulate AT Power
This item support Emulate AT power function, MB power On/Off control by power supply. Use needs to select 'AT or ATX Mode' on MB jumper at first (refer to *Page 10*, **Pin(1-2) of AT_ COPEN** for AT Mode Select).
Case Open Detect
Use this item to detect case has already open or not, show message in POST.
The optional settings: [Disabled]; [Enabled].
When set as [Enabled], system will detect if COPEN has been short or not (refer to **Page-10**, **Pin (3-4)** of **AT_COPEN** jumper for Case Open Detection); if **Pin (3-4)** of **COPEN** is short, system will show Case Open Message during POST.

► **PC Health Status**
Press [Enter] to view current hardware health status, make further settings in '**SmartFAN Configuration**' and set value in '**Shutdown Temperature**'.

► **SmartFAN Configuration**
Press [Enter] to make settings for SmartFan Configuration:
SmartFAN Configuration

CPUFAN Smart Mode
The optional settings are: [Disabled]; [Enabled].
When set as [Enabled], the following sub-items shall appear:
CPUFAN Full-Speed Temperature
Use this item to set CPUFAN full speed temperature. Fan will run at full speed when above this pre-set temperature.
CPUFAN Full-Speed Duty
Use this item to set CPUFAN full-speed duty. Fan will run at full speed when above this pre-set duty.
CPUFAN Idle-Speed Temperature
Use this item to set CPUFAN idle speed temperature. Fan will run at idle speed when below this pre-set temperature.
CPUFAN Idle-Speed Duty
Use this item to set CPUFAN idle speed duty. Fan will run at idle speed when below this pre-set duty.
Shutdown Temperature
Use this item to select system shutdown temperature.
The optional settings are: [Disabled]; [70°C/158°F]; [75°C/167°F]; [80°C/176°F];

$[85^{o}C/185^{o}F]$; $[90^{o}C/194^{o}F]$.

4 Serial Port Console Redirection
COM1
Console Redirection
The optional settings are: [Disabled]; [Enabled]. When set as [Enabled], the following sub-items shall appear:

4 Console Redirection Settings
The settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.
Press [Enter] to make settings for the following items:
COM1
Console Redirection Settings
Terminal Type
The optional settings are: [VT100]; [VT100+]; [VT-UTF8]; [ANSI].
Emulation: [ANSI]: Extended ASCII char set; [VT100]: ASCII char set; [VT100+]: Extends VT100 to support color,function keys, etc.; [VT-UTF8]: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.
Bits per second
Use this item to select serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.
The optional settings are: [9600]; [19200]; [38400]; [57600]; [115200].
Data Bits
The optional settings are: [7]; [8].
Parity
A parity bit can be sent with the data bits to detect some transmission errors.
The optional settings are: [None]; [Even]; [Odd]; [Mark]; [Space].
[Even]: parity bit is 0 if the num of 1's in the data bits is even; [Odd]: parity bit is 0 if num of 1's in the data bits is odd; [Mark]: parity bit is always 1; [Space]: Parity bit is always 0; [Mark] and [Space] Parity do not allow for error detection.
Stop Bits
Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit.
The optional settings are: [1]; [2].
Flow Control
Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a "stop" signal can be sent to stop the data flow. Once the buffers are empty, a "start" signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.
The optional settings are: [None]; [Hardware RTS/CTS].
VT-UTF8 Combo Key Support
Use this item to enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals.
The optional settings are: [Disabled]; [Enabled].
Recorder Mode
With this mode enable only text will be sent. This is to capture Terminal data.
The optional settings are: [Disabled]; [Enabled].

Resolution 100x31

Use this item to enable or disable extended terminal resolution.

The optional settings: [Disabled]; [Enabled].

Legacy OS Redirection Resolution

Use this item to enable or disable extended terminal resolution.

The optional settings: [80x24]; [80x25].

Putty KeyPad

Use this item to select the number of Rows and Columns supported redirection on Legacy OS.

The optional settings are: [VT100]; [Linux]; [XTERMR6]; [SCO]; [ESCN]; [VT400].

Redirection After BIOS POST

The optional settings are: [Always Enable]; [Bootloader].

When [**Bootloader**] is selected, then Legacy Console Redirection is disabled before booting to legacy OS. When [**Always Enabled**] is selected, then Legacy Console Redirection is enabled for legacy OS. Default setting for this option is set to [**Always Enabled**].

Serial Port for Out-of-Band Management/

Windows Emergency Management Services (EMS)

Console Redirection

The optional settings: [Disabled]; [Enabled]. When set as [Enabled], the following sub-items shall appear:

❹ Console Redirection Settings

The settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.

Press [Enter] to make settings for the following items:

Out-of-Band Mgmt Port

Microsoft Windows Emergency Management Services (EMS) allows for remote management of a Windows Server OS through a serial port.

The optional settings: [COM1]; [COM1(Pci Bus0, Dev0, Func0)(Disabled)].

Terminal Type

The optional settings: [VT100]; [VT100+]; [VT-UTF8]; [ANSI].

[VT-UTF8] is the preferred terminal type for out-of-band management. The next best choice is [VT100+] and them [VT100]. See above, in Console Redirection Settings page, for more help with Terminal Type/Emulation.

Bits per second

Use this item to select serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.

The optional settings: [9600]; [19200]; [57600]; [115200].

Flow Control

Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a "stop" signal can be sent to stop the data flow. Once the buffers are empty, a "start" signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.

The optional settings: [None]; [Hardware RTS/CTS]; [Software Xon/Xoff].

Data Bits

The default setting is: [8].

This item may or may not show up, depending on different configuration.
Parity
The default setting is: [None].
This item may or may not show up, depending on different configuration.
Stop Bits
The default setting is: [1].
This item may or may not show up, depending on different configuration.

► **Network Stack Configuration**
Press [Enter] to go to '**Network Stack**' screen to make further settings.
Network Stack
Use this item to enable or disable UEFI Network Stack.
The optional settings: [Disabled]; [Enabled].
When set as [Enabled], the following sub-items shall appear:
Ipv4 PXE Support
The optional settings are: [Disabled]; [Enabled].
Use this item to enable Ipv4 PXE Boot Support. When set as [Disabled], IPv4 PXE boot support will not be created.
Ipv4 HTTP Support
The optional settings are: [Disabled]; [Enabled].
Use this item to enable Ipv4 HTTP Boot Support. When set as [Disabled], Ipv4 HTTP boot support will not be available.
Ipv6 PXE Support
The optional settings are: [Disabled]; [Enabled].
Use this item to enable IPv6 PXE Boot Support. When set as [Disabled], IPv6 PXE boot support will not be available.
Ipv6 HTTP Support
The optional settings are: [Disabled]; [Enabled].
Use this item to enable Ipv6 HTTP Boot Support. When set as [Disabled], Ipv6 HTTP boot support will not be available.
PXE boot wait time
Use this item to set wait time to press [ESC] key to abort the PXE boot.
Media Detect Count
Use this item to set number of times presence of media will be checked.

► **CSM Configuration**
Press [Enter] to make settings for the following sub-items:
Option ROM execution
Network
This option controls the execution of UEFI and Legacy PXE OpROM.
The optional settings are: [Do not launch]; [Legacy].
Storage
This option controls the execution of UEFI and Legacy Storage OpROM.
The optional settings are: [Do not launch]; [UEFI]; [Legacy].
Other PCI devices
This item is for user to determine OpROM execution policy for devices other than Network, storage or video.
The optional settings are: [Do not launch]; [UEFI]; [Legacy].

► **USB Configuration**
Press [Enter] to make settings for the following sub-items:

USB Configuration
Legacy USB Support

The optional settings are: [Enabled]; [Disabled]; [Auto].

[**Enabled**]: To enable legacy USB support.

[**Disabled]**: to keep USB devices available only for EFI specification,

[**Auto**]: To disable legacy support if no USB devices are connected.

XHCI Hand-off

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

The optional settings are: [Enabled]; [Disabled].

USB Mass Storage Driver Support

The optional settings are: [Disabled]; [Enabled].

USB hardware delays and time-outs

USB Transfer time-out

Use this item to set the time-out value for control, bulk, and interrupt transfers.

The optional settings are: [1 sec]; [5 sec]; [10 sec]; [20 sec].

Device reset time-out

Use this item to set USB mass storage device start unit command time-out.

The optional settings are: [10 sec]; [20 sec]; [30 sec]; [40 sec].

Device power-up delay

Use this item to set maximum time the device will take before it properly reports itself to the host controller. 'Auto' uses default value: for a root port it is 100 ms, for a hub port the delay is taken from hub descriptor. The optional settings: [Auto]; [Manual].Select [Manual] you can set value for the following sub-item: '**Device Power-up delay in seconds**'**,** the delay range in from 1 to 40 seconds, in one second increments.

► **Intel(R) I211 Gigabit Network Connection:XX:XX:XX:XX:XX:XX/ Intel(R) Ethernet Connection(2) I219-LM:XX:XX:XX:XX:XX:XX**

These items show current network brief information.

3-8 Chipset Menu

```
                Aptio Setup Utility – Copyright (C) 2018 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**
Press [Enter] to make settings for the following sub-items:
VT-d
The optional settings are: [Enabled]; [Disabled]. This item might not be available depending on configuration.

  ► **Graphics Configuration**
Press [Enter] to make further settings for Graphics Configuration.
Graphics Configuration

GTT Size
Use this item to select the GTT size.
The optional settings are: [2MB]; [4MB]; [8MB].
Aperture Size
Use this item to select the Aperture size.
The optional settings are: [128MB]; [256MB]; [512MB]; [1024MB].
DVMT Pre-Allocated
Use this item to select DVMT 5.0 pre-allocated (fixed) graphics memory size used by the internal graphics device.
The optional settings are: [32M]; [64M]; [96M]; [128M]; [160M]; [192M]; [224M]; [256M]; [288M]; [320M]; [352M]; [384M]; [416M]; [448M]; [480M]; [512M]; [1024M] ; [1536M] ; [2048M] ; [4M] ; [8M] ; [12M] ; [16M] ; [20M]; [24M] ; [28M] ; [32M/F7] ;[36M]; [40M]; [44M]; [48M]; [52M]; [56M]; [60M].
DVMT Total Gfx Mem
Use this item to select DVMT 5.0 total graphics memory size used by the internal graphics device.
The optional settings are: [128M]; [256M]; [MAX].
Primary IGFX Boot Display
Use this item to select the video device which will be activated during POST. This has no effect if external graphics present. Secondary boot display selection will appear based on your selection.
The optional settings are: [VBIOS Default]; [HDMI]; [eDP/LVDS].
* Note: When set as [HDMI] or [eDP/LVDS], user can make further settings in 'Second IGFX Boot Display'.
Second IGFX Boot Display
Use this item to select second display device.
The optional settings are: [Disabled]; [HDMI].
Active LFP
Use this item to select the active LFP configuration.
The optional settings are: [eDP]; [LVDS].
*Note: When 'Active LFP' is set as [LVDS], user can make further settings in the following items related to LVDS options:
Backlight Control
Use this item to select backlight control settings.
The optional settings are: [PWM Inverted]; [PWM Normal].
Panel Type
Use this item to select LVDS panel resolution type.
The optional settings are: [800 x 480 18bit Single]; [800 x 600 18bit Single]; [800 x 600 24bit Single]; [1024 x 600 18bit Single]; [1024 x 768 18bit Single]; [1024 x 768 24bit Single]; [1280 x 768 24bit Single]; [1280 x 800 18bit Single]; [1280 x 800

24bit Single]; [1366 x 768 18bit Single]; [1366 x 768 24bit Single]; [1440 x 900 18bit Dual]; ; [1440 x 900 24bit Dual]; [1280 x 1024 24bit Dual]; [1680 x 1050 24bit Dual]; [1920 x 1080 24bit Dual].

LVDS FW Write Protect

Use this item to enable or disable LVDS FW Update/Protect.

The optional settings are: [Disabled]; [Enabled].

► **Memory Configuration**

Press [Enter] to view brief information for the working memory module.

► **PCH-IO Configuration**

Press [Enter] to make settings for the following sub-items:

USB Controller

Use this item to enable or disable this USB physical connector (physical port). Once disabled, any USB devices plugged into the connector will be detected by BIOS or OS.

The optional settings are: [Disabled]; [Enabled].

HD Audio

This item controls detection of the HD-Audio device.

The optional settings are: [Disabled]; [Enabled].

[**Disabled**]: HDA will be unconditionally disabled.

[**Enabled**]: HAD will be unconditionally enabled.

[**Auto**]: HAD will be enabled if present, disabled otherwise.

Onboard Lan1 Controller

Use this item to enable or disable LAN1 device or controller.

Wake on LAN

Use this item to enable or disable integrated LAN to wake the system.

The optional settings are: [Disabled]; [Enabled].

Onboard Lan2 Controller

Use this item to enable or disable LAN2 device or controller.

MPEST Slot

Use this item to control the MPEST device or controller.

The optional settings are: [Enabled]; [Disabled].

Speed

Use this item to configure Mini-PCIE device speed.

The optional settings are: [Auto]; [Gen1] ; [Gen2]; [Gen3].

MPE Slot

Use this item to control the MPE device or controller.

The optional settings are: [Enabled]; [Disabled].

Speed

Use this item to configure Mini-PCIE device speed.

The optional settings are: [Auto]; [Gen1] ; [Gen2]; [Gen3].

System State after Power Failure

Use this item to specify what state to go to when power re-applied after a power failure (G3 state).

The optional settings are: [Always On]; [[Always Off]; Former State].

3-9 Security Menu

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



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Security menu allow users to change administrator password and user password settings.

Administrator Password

Press [Enter] to create new administrator password. Press again to confirm the new administrator password.

User Password

Press [Enter] to create new user password. Press again to confirm the new user password.

3-10 Boot Menu

```
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      Main  Advanced  Chipset  Security  Boot  Save & Exit

   Boot Configuration                                   Number of seconds to wait for
   Setup Prompt Timeout          2                      setup activation key.
   Bootup NumLock State          [Off]                  65535(0xFFFF) means indefinite
   Quiet Boot                    [Disabled]             waiting.

   Boot Option Priorities
   Boot Option #1                [UEFI: Built-in EFI
                                 Shell]

   UEFI Boot                     [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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Boot Configuration

Setup Prompt Timeout

Use this item to set number of seconds to wait for setup activation key.

User can select a value in the range of [1] to [65535] seconds

Bootup Numlock State

Use this item to select keyboard numlock state.
The optional settings are: [On]; [Off].
Quiet Boot
The optional settings are: [Disabled]; [Enabled].
Boot Option Priorities
Boot Option #1/ Boot Option #2…
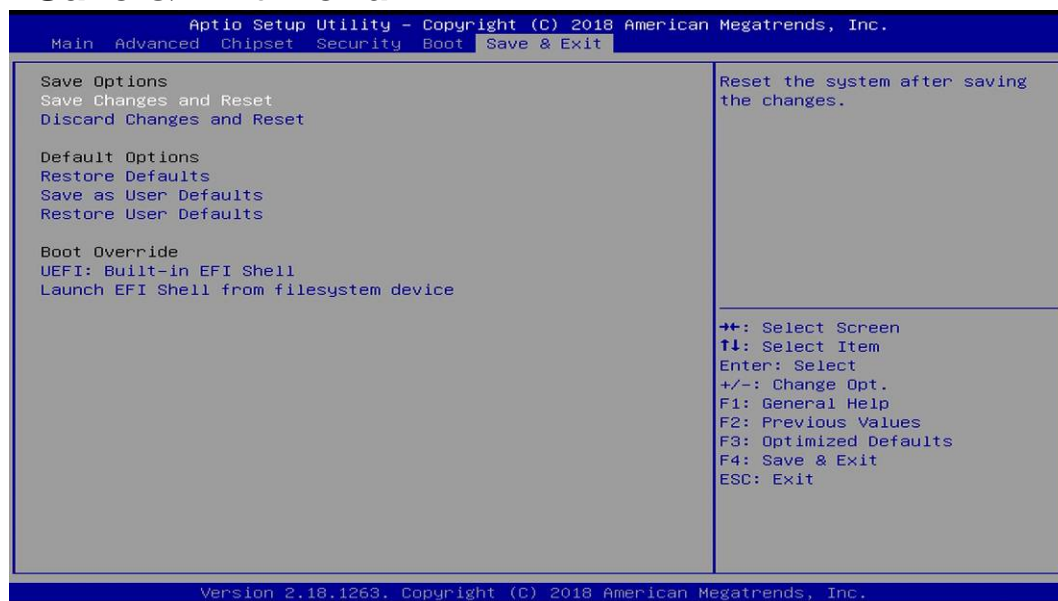Use this item to decide system boot order from available options.
UEFI Boot
The optional settings are: [Disabled]; [Enabled].
[Enabled]: To enable all UEFI boot options.
[Disabled]: To disabled all UEFI boot options.

3-11 Save & Exit Menu

```
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  Main  Advanced  Chipset  Security  Boot  Save & Exit

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

 Default Options
 Restore Defaults
 Save as User Defaults
 Restore User Defaults

 Boot Override
 UEFI: Built-in EFI Shell
 Launch EFI Shell from filesystem device
                                                  →←: 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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Save Options:

Save Changes and Reset
This item allows user to reset the system after saving the changes.
Discard Changes and Reset
This item allows user to reset the system without saving any changes.
Default Options:

Restore Defaults
Use this item to restore /load default values for all the setup options.
Save as User Defaults
Use this item to save the changes done so far as user defaults.
Restore User Defaults
Use this item to restore defaults to all the setup options.
Boot Override

UEFI: Built-in EFI Shell /…
Press this item to select the device as boot disk after save configuration and reset
Launch EFI Shell from filesystem device
Press this item to launch EFI Shell application (Shell.efi) from one of the available file system device.