

# User Manual

## **BPC-3025**

Fanless Embedded Box PC with Intel® Apollo Lake Pentium® N4200 Processor,  
Support -20~60°C Operation Temperature

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If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU speed, Arestech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandise authorization) number from your dealer. This allows us to process your return

more quickly.

4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

# 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.
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. Never open the equipment. 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's 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 60° C (140° 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.

- 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.
- 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.

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# Chapter1.General Introduction

## 1.1 Overview:

The BPC-3025 fanless Box PC is ideal for embedded and automation applications. This embedded hardware platform is designed with the Intel® Pentium® N4200 processor. This processor runs at 2.5GHz and supports Dual Channel DDR3L 1866 MHz while maintaining low power consumption and attractive price point. The most feature of BPC-3025 is that it supports up to 4 COM ports while maintaining compact mechanical size. BPC-3025 also has a rugged case designed to protect against electromagnetic interference, extremes of cold and heat, and highlights a passive cooling design for quiet, fanless operation ideal for the Digital Signage, Medical and automation industries.

## 1.2 Key Features:

- Intel® Pentium® N4200/ Celeron® N3350 Processor
- Support 2 LAN, 2 COM, 4 USB
- Support Wide Range 9~36V DC input
- Support DIN Rail, Wall Mount

## 1.3 Hardware Specification:

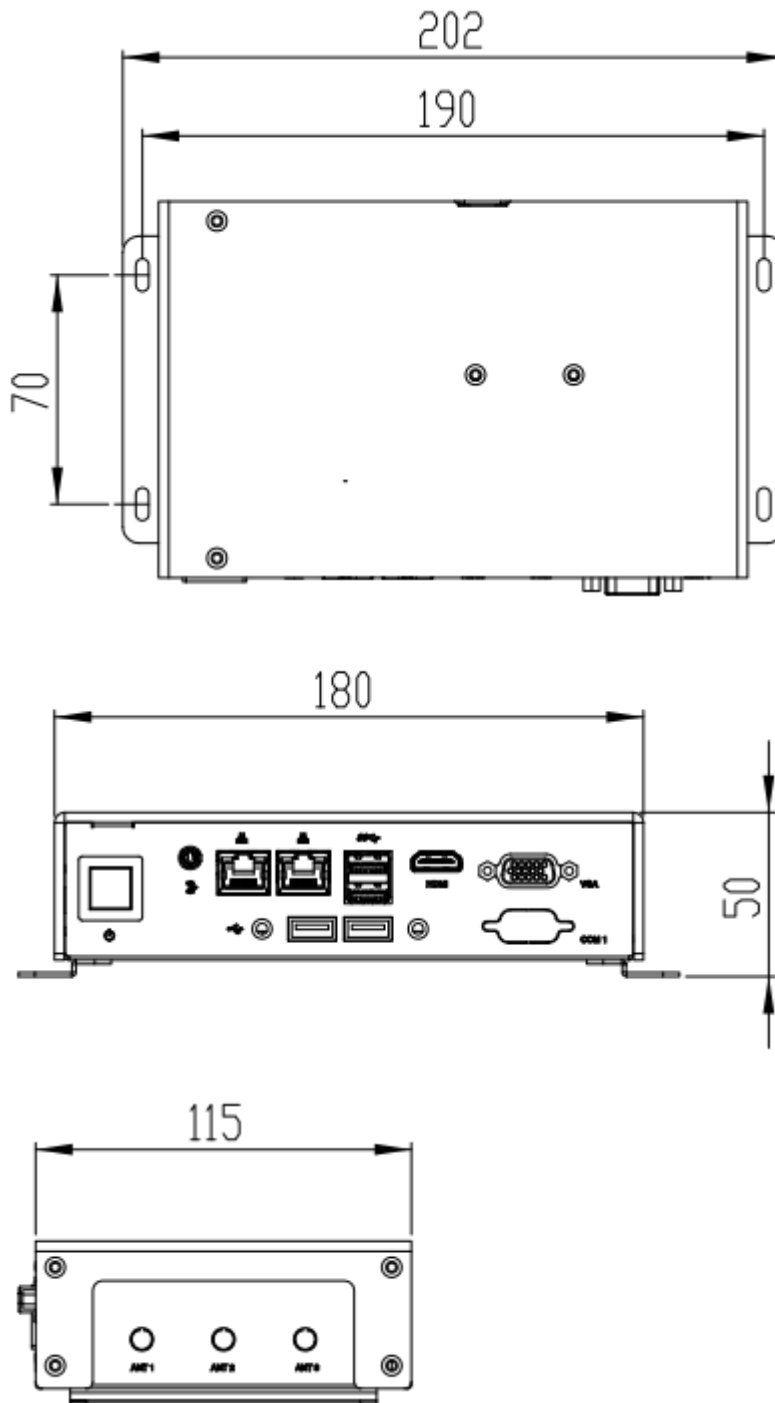
Model		BPC-3025-1A1	BPC-3025-2A1
Processor System	CPU	Intel® Pentium® N4200 Processor (Quad Core, 1.1GHz, up to 2.5GHz)	Intel® Celeron® N3350 Processor (Dual Core, 1.1GHz up to 2.4GHz)
	System Chipset	N/A	
	BIOS	UEFI	
Memory	Technology	Dual channel DDR3L 1866 MHz SDRAM	
	Max. Capacity	8 GB	
	Socket	2 204-pin SO-DIMM	
Display	Graphics Engine	Intel® HD Graphics 500	
	VGA	Max resolution, Up to 1920 x 1200 @ 60Hz	
	DVI-D	N/A	
	HDMI	HDMI 1.4b, Max Resolution Up to 3840 x 2160 @30Hz	
	Display Port	N/A	
	Multi Display	VGA + HDMI	
Front I/O Interface	USB	4, 2 USB 3.0, 2 USB 2.0	
	Serial	2, COM ports (1 RS-232/422/485, 1 RS-232)	
	GPIO	1, GPIO (8 bit)	
	Ethernet	Dual GbE, Intel® i211AT, 10/100/1000 Mbps	
	Audio	Line out	
	Others	N/A	



Rare I/O Interface	USB	N/A	
	Serial	N/A	
	GPIO	N/A	
	Ethernet	N/A	
	Audio	N/A	
	Others	N/A	
Expansion	miniPCIe/ M.2 Slot	1 miniPCIe (full-size)	
	PCI/ PCIe Slot	N/A	
Storage	HDD/SSD	N/A	
	RAID	N/A	
	mSATA/M.2	1 M.2 2242 Key B/M	
Power	Power On Model	AT/ ATX	
	Power Supply Voltage	9-36 V DC input (Phoenix Connector), 6.7-1.7 A	
	Power Consumption (Typical)	0.69A @ 12 V (8.3 W)	0.69A @ 12 V (8.3 W)
	Power Consumption (Max.)	3.18A @ 12 V (38.2W)	3.18 A @ 12 V (38.2W)
	Battery	CR2032; 3.3V	
Mounting	Type	Wall Mount, DIN Rail	
Environment	Operating Temperature	-20~60° C (-4~140° F) (Humidity: 60° C @ 80% RH Non-condensing) w/ Extended Temp. RAM & M.2 SSD	
	Storage Temperature	-40~85° C (-40~185° F) (Humidity: 60° C @ 95% RH Non-condensing)	
	Humidity	5~95% @ 40° C, non-condensing	
	Vibration	1 Grms, IEC 60068-2-64, random, 5~500 Hz, 1 Oct/min., 1hr/axis, x, y, z 3 axes	
	Shock	20 G, IEC 60068-2-27, half sine, 11 ms duration	
General	Certification	TBD	

Thermal Dissipation	Fanless System
Ingress Protection	IP40 Protection
Dimensions (W x H x D)	180 x 50 x 115 mm (7.09" x 1.97" x 4.53")
Net Weight	0.77kg ( 1.7lb)
Operating System	Windows 10 IoT 64Bit, Linux kernal 4.0.x or above

## 1.4 Mechanical Dimensions:



## 1.5 Power Requirement:

Power Input: support 9~36V DC Input

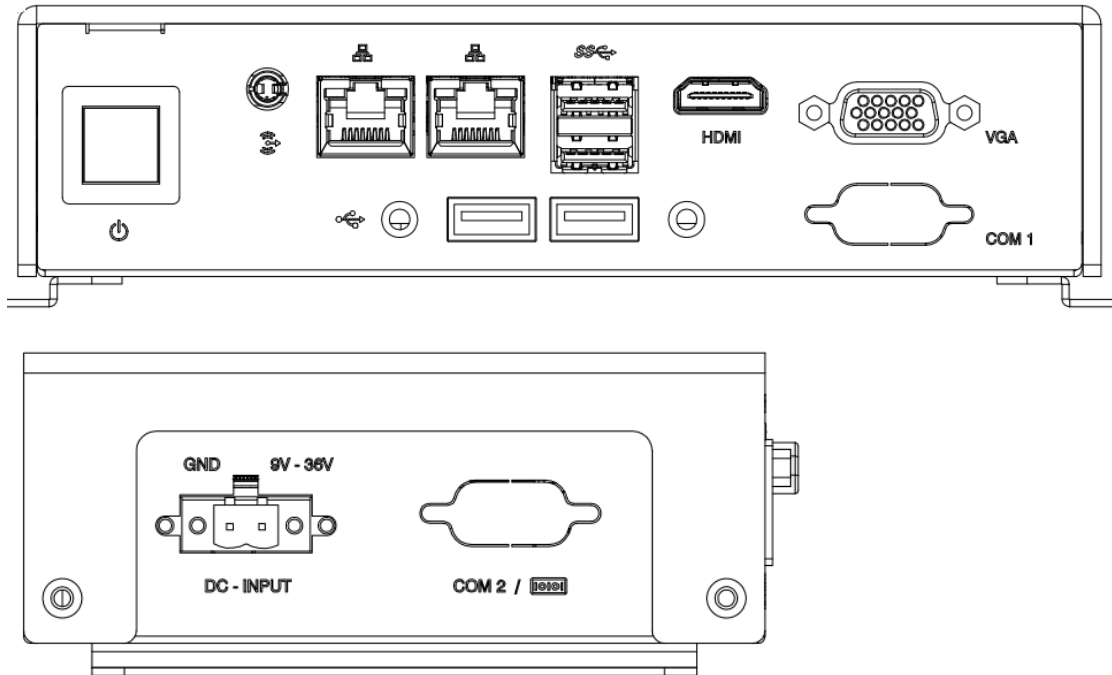
Power adaptor:12V@5A,60W

## 1.6 Environment Specification:

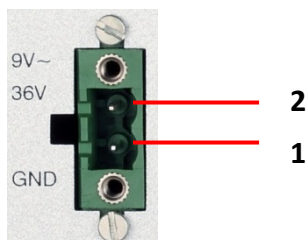
- (1) Operating Temperature: 0~60° C (32~140° F)w/ 2.5" SSD
- (2) Operational humidity: 60° C @ 95% RH Non-condensing

# Chapter 2. Connector (Pin-Definition)

## 2.1 External Interface



### 2.1.1 Power Input(9~36V DC):



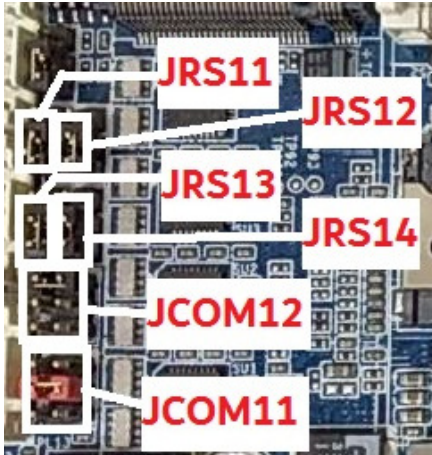
Pin	Definition
1	GND
2	Vin+ (9~36V DC)

## 2.1.2 COM Ports:

Option:RS232/422/485 for COM1

(NOTE: The parameter for COM1 can be set by Jumper setting)

RS232 for COM2 to COM4







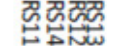
**Description**

5V/12V/RI signal select jumper for Serial port header#1 (JCOM11)

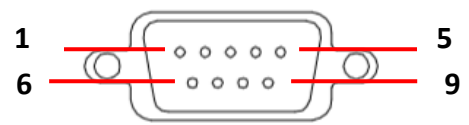
- 
1-2 Close: 5V (Power COM)
  
- 
3-4 Close: RI (Stand COM)
  
- 
5-6 Close: 12V (power COM)

Pin No.	Definition
1	VCC
2	RI1-/5V/12V
3	NRI1-
4	RI1-/5V/12V
5	+12V
6	RI1-/5V/12V

RS232/RS422/RS485 select jumper for Serial port header#1 (JCOM12/JRS13/JRS14/JRS11/JRS12)

- 
1-2 Close: RS232
  
- 
3-4 Close: RS422
  
- 
5-6 Close: RS485
  
- 
1-2 Close: RS422/RS485
  
- 
2-3Close: RS232 (Default setting)

Pin No.	Definition
1	RXD232
2	RXD1
3	RXD422
4	RXD1
5	RXD485
6	RXD1



**- COM1 Port(RS-232):**

Pin	Definition	Pin	Definition
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI/5V/12V
5	GND		

- COM1 Port(RS-422):

Pin	Definition	Pin	Definition
1	TX-	6	N/A
2	TX+	7	N/A
3	RX+	8	N/A
4	RX-	9	RI/5V/12V
5	GND		

-COM1 Port(RS-485):

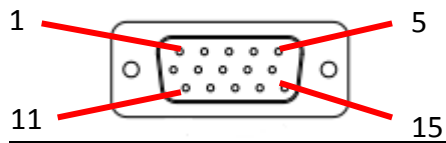
Pin	Definition	Pin	Definition
1	DATA-	6	
2	DATA+	7	
3		8	
4		9	RI/5V/12V
5	GND		

-COM2 (RS-232):

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



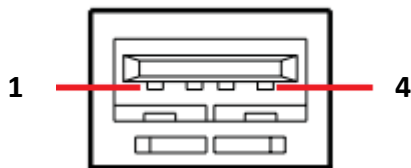
### 2.1.3 GPIO Port(DB-15 Male)



Pin	Definition	Pin	Definition
1	SOGPO_1	9	SMB_CLK
2	SOGPO_2	10	SMB_DATA
3	SOGPO_3	11	+5VS
4	SOGPO_4	12	GND
5	SOGPI_1	13	NC
6	SOGPI_2	14	NC
7	SOGPI_3	15	NC
8	SOGPI_4		

Remark: SOGPO--> output | SOGPI--> input

### 2.1.4 USB Ports(USB2.0):



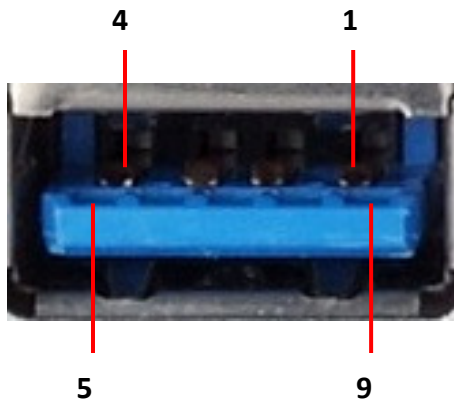
Pin	Definition
1	+5V
2	USB-
3	USB+
4	GND

## 2.1.5 Audio Ports:



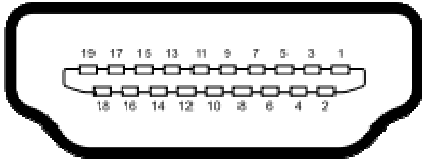
Pin	Definition
Black	Line_Out

## 2.1.6 USB Ports(USB3.0):



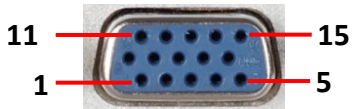
Pin	Definition
1	+5V
2	USB-
3	USB+
4	GND
5	StdA_SSRX-
6	StdA_SSRX+
7	GND_DRAIN
8	StdA_SSTX-
9	StdA_SSTX+

### 2.1.7 HDMI Ports:



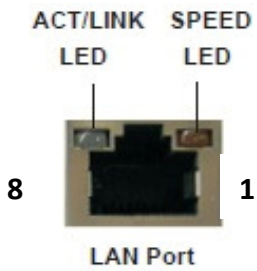
Pin	Definition	Pin	Definition
1	TMDS Data2+	2	TMDS Data2 Shield
3	TMDS Data2 -	4	TMDS Data1+
5	TMDS Data1 Shield	6	TMDS Data1-
7	TMDS Data0+	8	TMDS Data0 Shield
9	TMDS Data0-	10	TMDS Clock+
11	TMDS Clock Shield	12	TMDS Clock-
13	Reserved	14	Reserved
15	SCL	16	SDA
17	DDCGround	18	+5 V Power
19	Hot Plug Detect		

### 2.1.8 VGA Ports:



Pin	Definition	Pin	Definition
1	RED	9	VCC
2	GREEN	10	GND
3	BLUE	11	NC
4	NC	12	DAT
5	GND	13	HSYNC
6	GND	14	VSYNC
7	GND	15	CLK
8	GND		

## 2.1.9 LAN Ports:



### - Pin Definition:

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

1000BASE-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-

### - LAN Port LED Indications:

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

SPEED LED	
Status	Description
Off	10Mbps connection
Off	100Mbps connection
Green	1Gbps connection

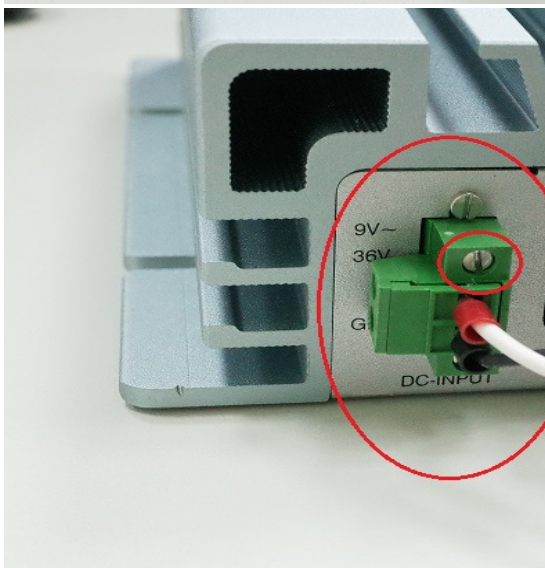
## Chapter 3. System Installation

### 3.1 Installation Procedures:

#### 1. Connecting Power Cord

The BOX-PC(BPC-3025) can support wide range DC-input (9~36V). Be sure to handle the power cord by holding the plug end only. Follow these procedures to connect the power cord:

- (1) Connect the male end(Phoenix connector) of the power cord to the DC-Input connector of BPC-3025 and lock it.
- (2) Connect the 3-pin male plug of the power cord to an electrical outlet.



## 2.Connecting Keyboard and Mouse

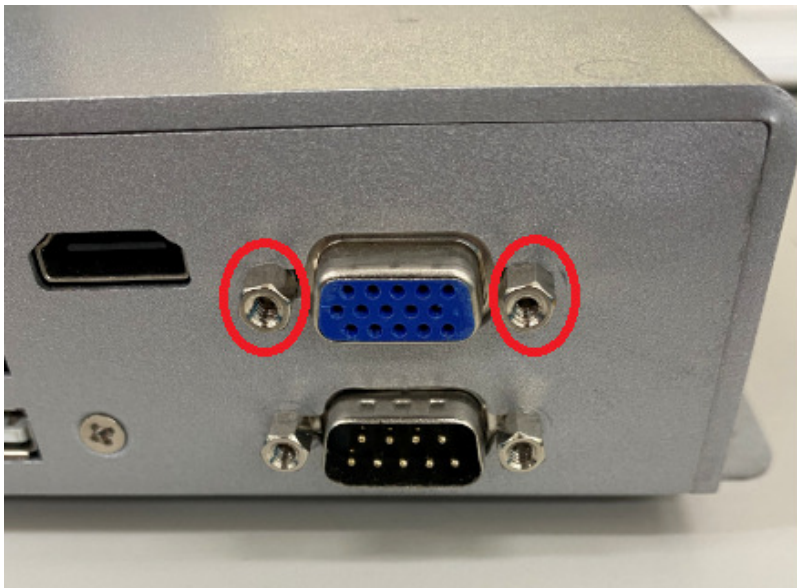
Connect the mouse and keyboard to the USB connector of BPC-3025.

## 3. Switching on Power

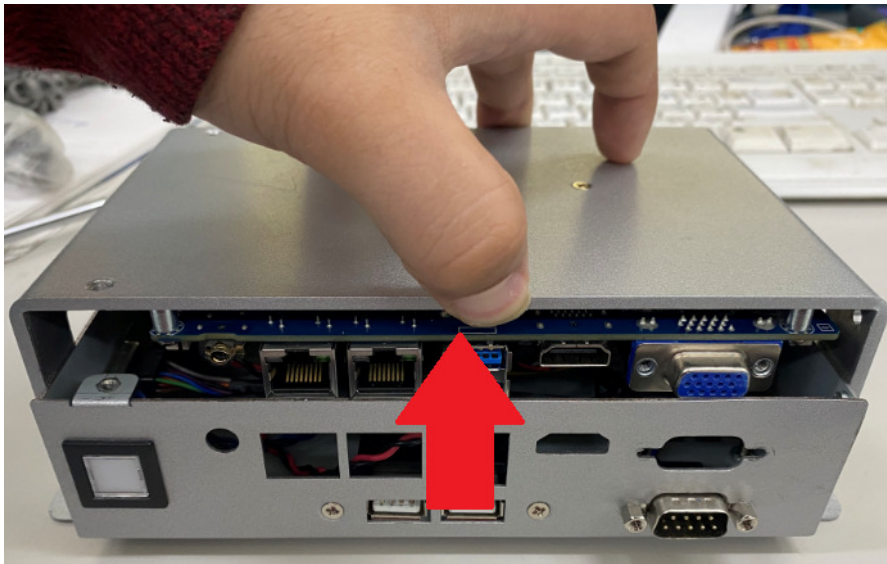
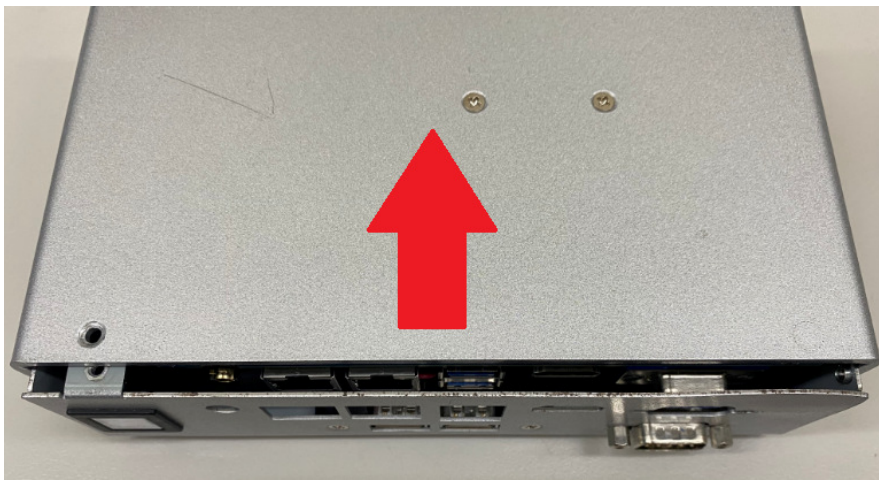
The power button is located at the right side on the front cover of BPC-3025.

## 3.2 Installing M.2 Storage/mPCIe module/Dimm RAM

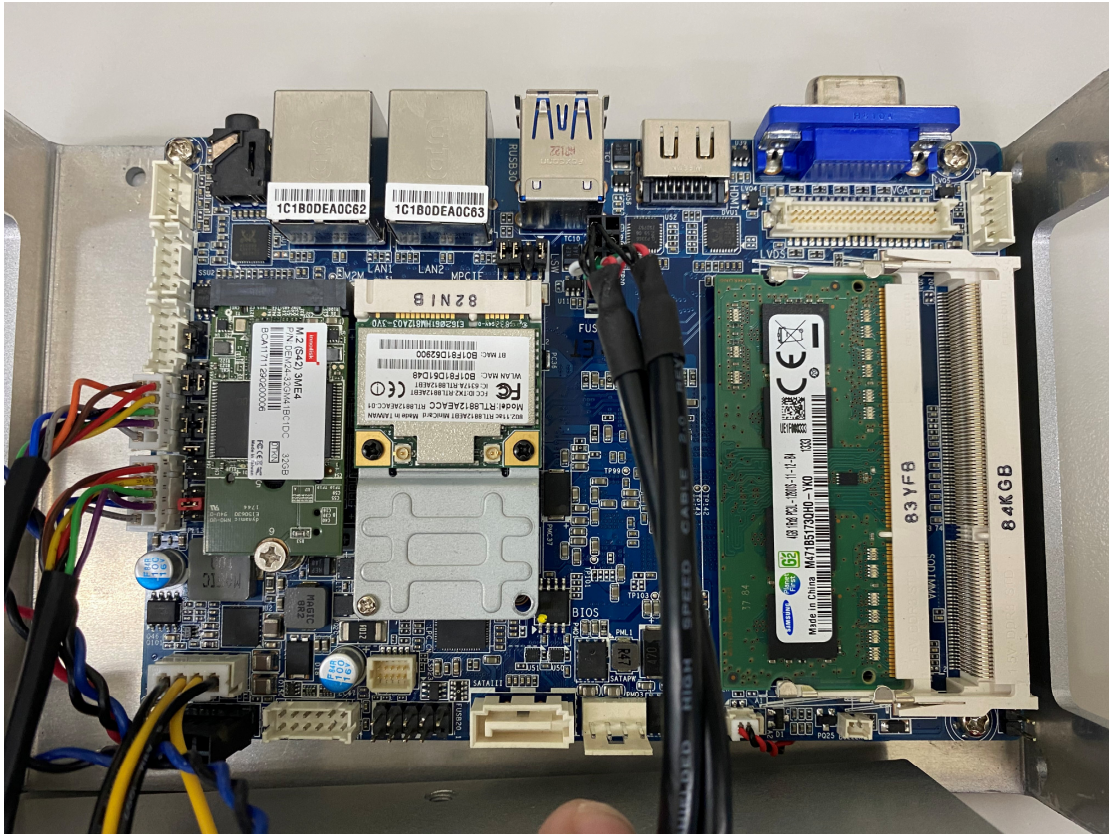
1.Unfasten the screws on the chassis and open the bottom cover.







## 2. Install another m.2/mPCIe/SO-DIMM





## Chapter 4. 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
- **Chipset** To set up the chipset features
- **Security** To set up the security features
- **Boot** To set up the default system device to locate and load the  
Operating System
- **Save & Exit** To exit the current screen or the UEFI SETUP UTILITY

Use ←key or → key to choose among the selections on the menu bar.

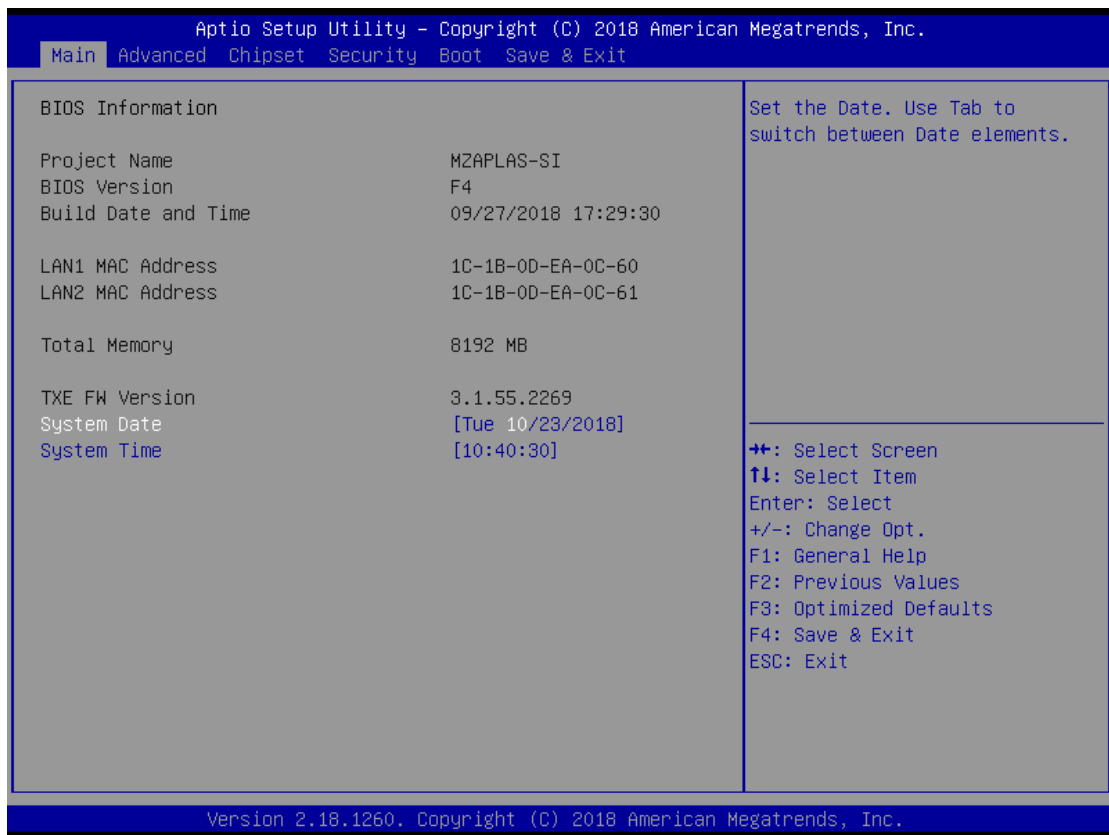
Use<Enter>key to get into the sub screen or an item.

Use ↓ key or ↑ key to move cursor down or up to select items.

Use <Esc> key to exit current screen.

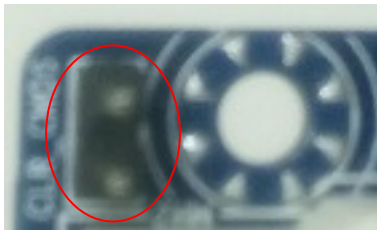
## 4.1 Main

This section (Main screen) displays the system overview.



### Note: Clear CMOS

As shown, short two PINs can clear CMOS



## 4.2 Advanced

This section allows users to set the configurations for the following items:

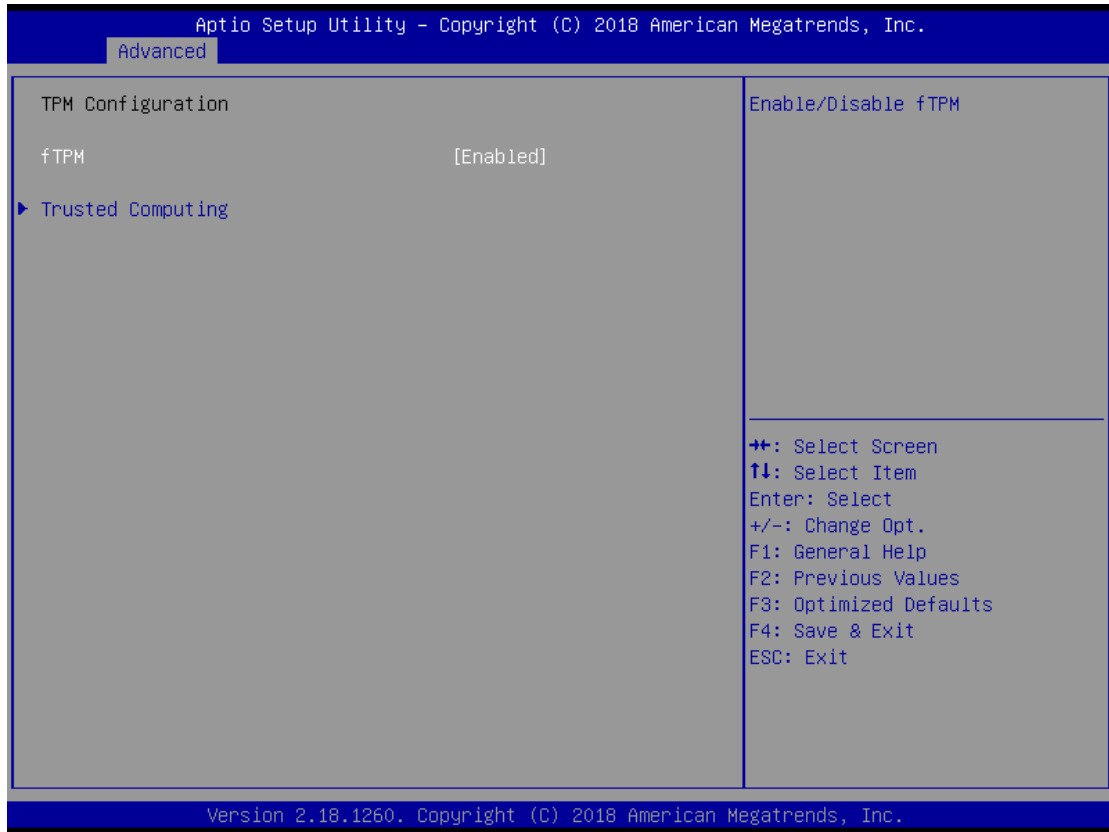
- **TPM Configuration.**
- **IT8786 Super IO Configuration.**
- **Hardware Monitor Configuration.**
- **S5 RTC Wake Setting.**
- **CPU Configuration.**
- **SATA Configuration**
- **OS Selection**



### NOTE:

Setting wrong values in this section may cause the system to malfunction.

## 4.2.1 TPM Configuration



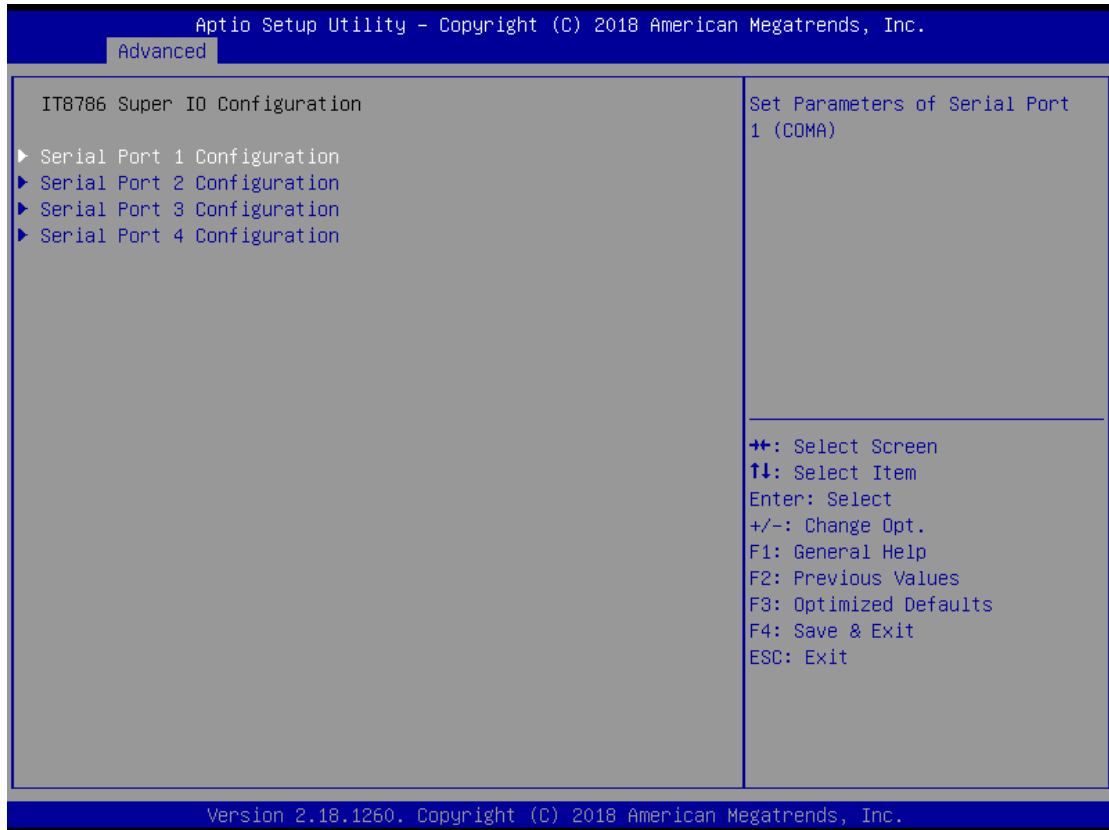
### 4.2.1.1 fTPM

This item allows users to enable or disable the fTPM.

#### 4.2.1.1-1 Trusted Computing

This item allows users to enable or disable the Security Device Support.

## 4.2.2 IT8786 Super IO Configuration



### 4.2.2.1 COM1 Configuration

This item allows users to enable or disable COM1.

### 4.2.2.2 COM2 Configuration

This item allows users to enable or disable COM2.

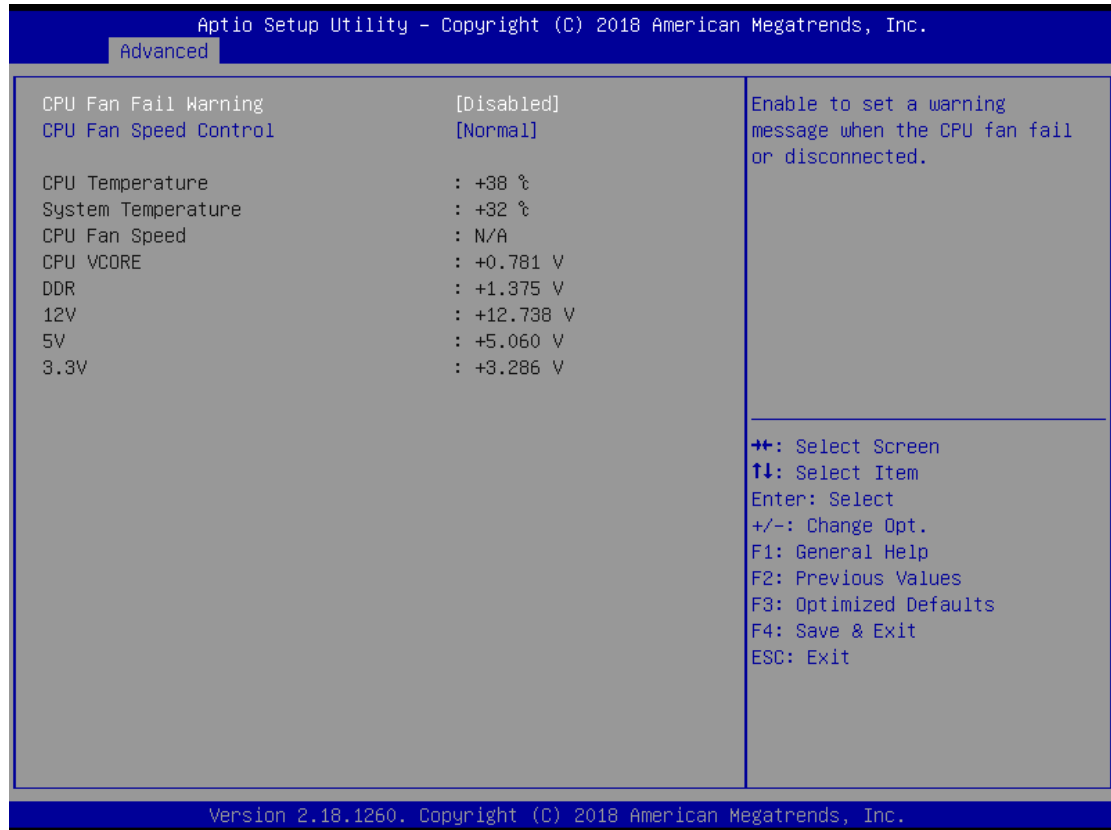
### 4.2.2.3 COM3 Configuration

This item allows users to enable or disable COM3.

### 4.2.2.4 COM4 Configuration

This item allows users to enable or disable COM4.

## 4.2.3 Hardware Monitor



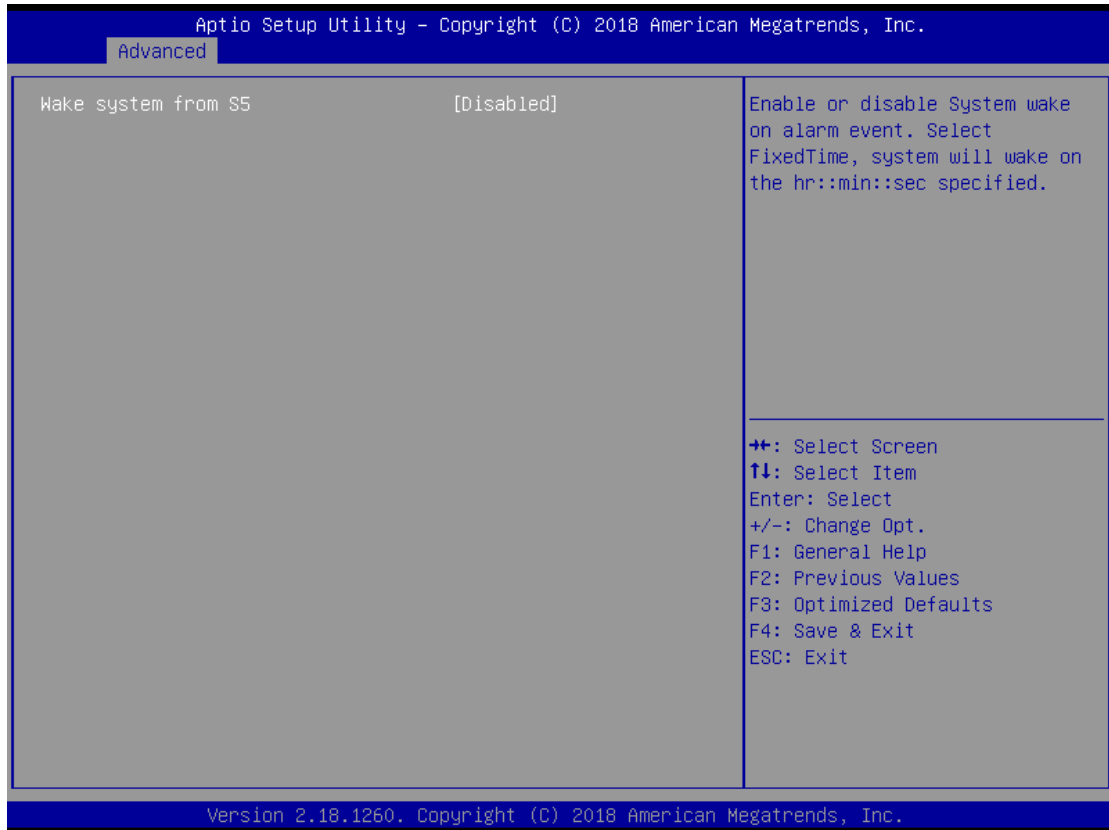
### 4.2.3.1 CPU Fan Fail Warning

This item allows users to enable or disable the CPU Fan Fail Warning.

### 4.2.3.2 CPU Fan Speed Control

This item allows users to select CPU Fan Speed "Normal" or "Full Speed".

## 4.2.4 S5 RTC Wake Configuration



### 4.2.4.1 Wake system from S5

This item allows users to FixedTime or disable System wake on alarm event. SelectTime System will wake on the hr:: min::sec:: specified.

## 4.2.5 CPU Configuration



### 4.2.5.1 Intel Virtualization Technology

This item allows users to enable or disable Intel Virtualization Technology. select [Enabled] can utilize the additional hardware capabilities provided by Vanderpool Technology.

### 4.2.5.2 Turbo mode

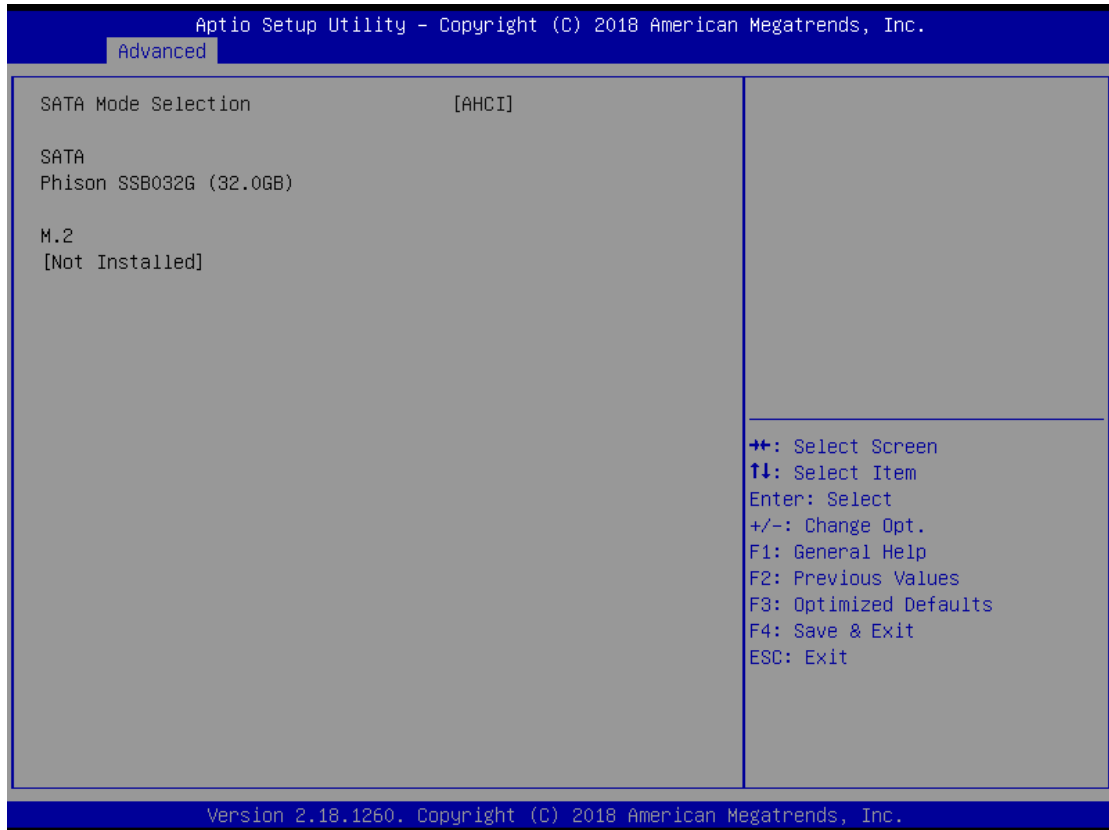
This item allows users to enable or disable Turbo mode.

### 4.2.5.3 C-States

This item allows users to enable or disable C-States.



## 4.2.6 SATA Configuration



### 4.2.6.1 SATA Mode Selection

The new M/B only supports AHCI mode

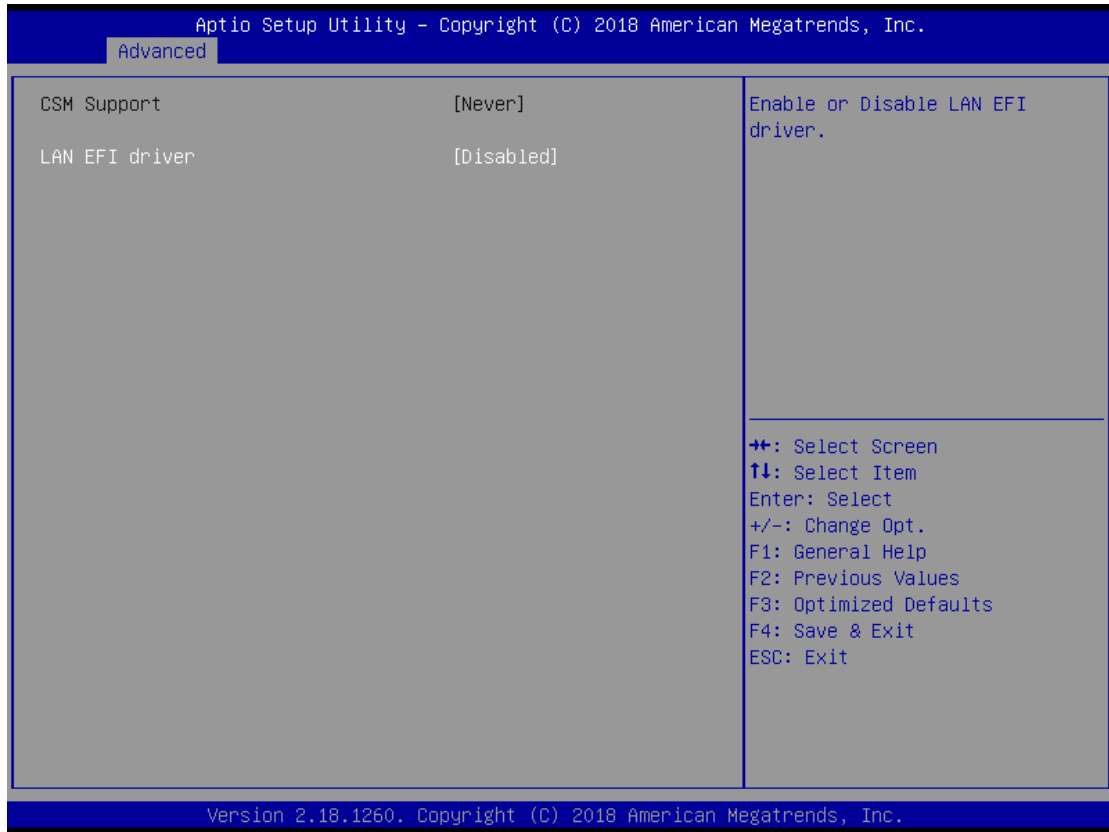
### 4.2.6.2 SATA

Can confirm the hard disk model and capacity.

### 4.2.6.3 M.2

Can confirm the M.2 SSD model and capacity.

## 4.2.7 OS Selection



### 4.2.7.1 CSM Support

Never support CSM

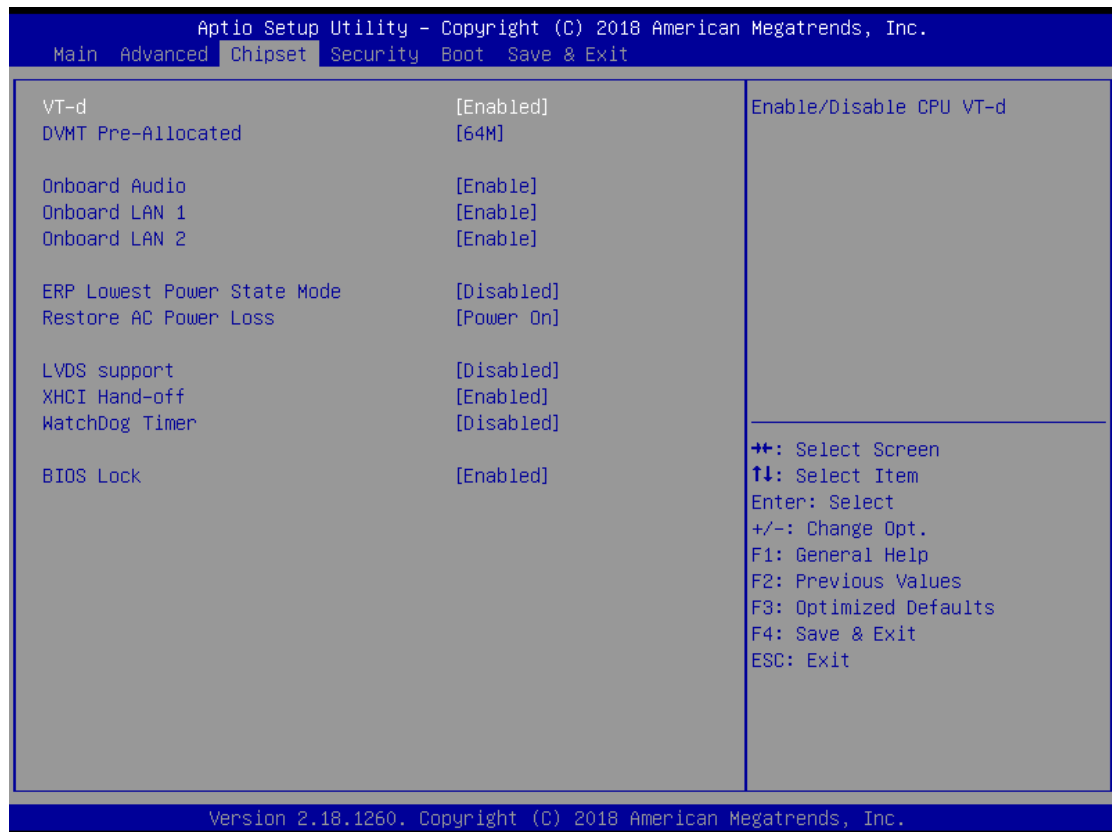
### 4.2.7.2 LAN EFI driver

This item allows users to enable or disable the LAN EFI Driver.

### 4.3 Chipset

This section allows users to set the configurations for the following items:

- (1)VT-d
- (2)DVMT Pre-Allocated
- (3)Onboard Audio
- (4)Onboard LAN 1
- (5)Onboard LAN 2
- (6)ERP Lowest Power State mode
- (7)Restore AC Power Loss
- (8)LVDS support
- (9)XHCI Hand-off
- (10)WatchDog Timer
- (11)BIOS Lock



#### 4.3.1 VT-d

This item allows users to enabled or disabled the VT-d

This default value is [Enabled]

#### **4.3.2 DVMT Pre-Allocated**

This item allows users to set DVMT [64M],[128M],[256M]or[512M]

The default value is [64M].

#### **4.3.3 Onboard Audio**

This item allows users to enable or disable the Onboard Audio.

The default value is [Enabled].

#### **4.3.4 Onboard LAN 1**

This item allows users to enable or disable the Onboard LAN 1.

The default value is [Enabled].

#### **4.3.5 Onboard LAN 2**

This item allows users to enable or disable the Onboard LAN 2.

The default value is [Enabled].

#### **4.3.6 ERP Lowest Power State Mode**

This item allows users to enable or disable the ERP Lowest Power State Mode.

The default value is [Disabled].

#### **4.3.7 Restore AC Power Loss(AT/ATX Power setting)**

This item allows users to set Restore AC Power Loss [Power On],[Power Off]or [Last State].

The default value is [Power On].

#### **4.3.8 LVDS support**

This item allows users to enable or disabled the LVDS support

The default value is [disabled].

#### **4.3.9 XHCI Hand-off**

This item allows users to enable or disabled the XHCI Hand-off.

The default value is [Enabled].

#### **4.3.10 WatchDog Timer**

This item allows users to set WatchDog Timer [15S],[30S],[45S],[60S] or [Disable]

The default value is [Disabled].

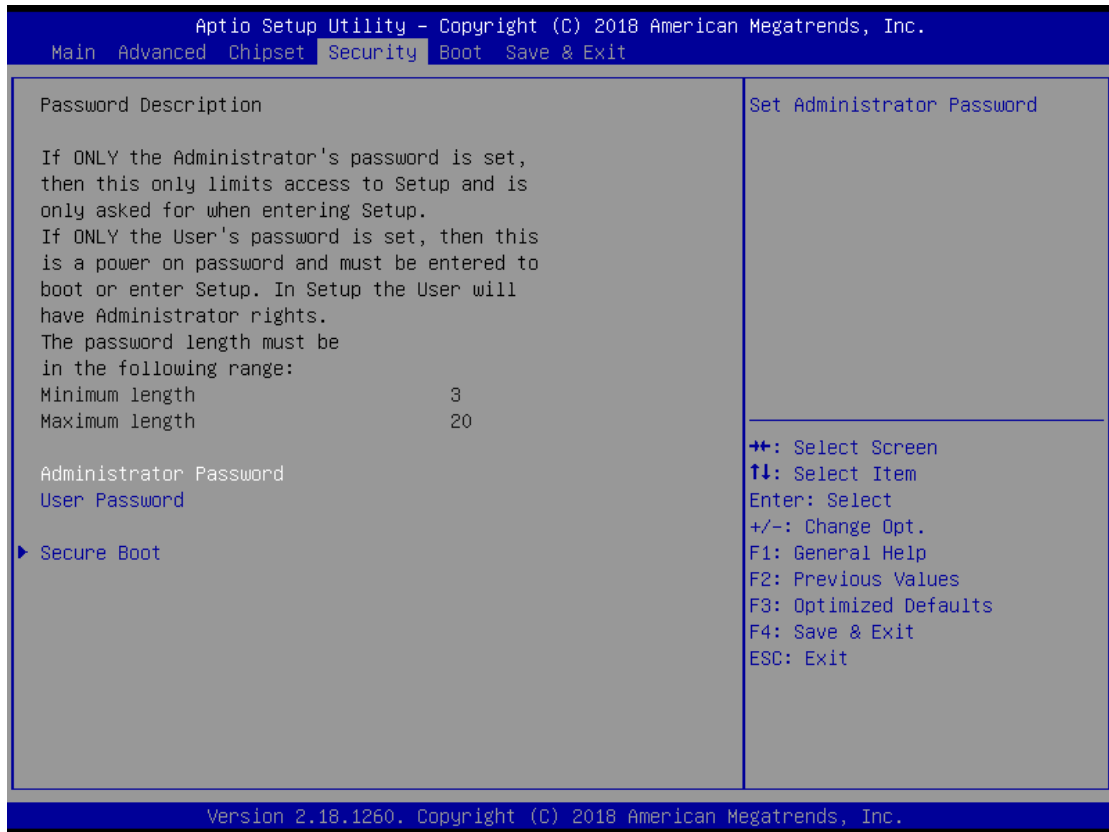
#### **4.3.11 BIOS Lock**

This item allows users to enable or disabled the BIOS Lock.

The default value is [Enabled].

## 4.4 Security

In this section, you may set, change or clear the Administrator/user password for the system.



### 4.4.1 Administrator Password

Set or change the password for the administrator account. Only the administrator has authority to change the settings in the UEFI Setup Utility.

Leave it blank and press enter to remove the password.

### 4.4.2 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.

### 4.4.3 Secure Boot

#### 4.4.3.1 Secure Boot Control

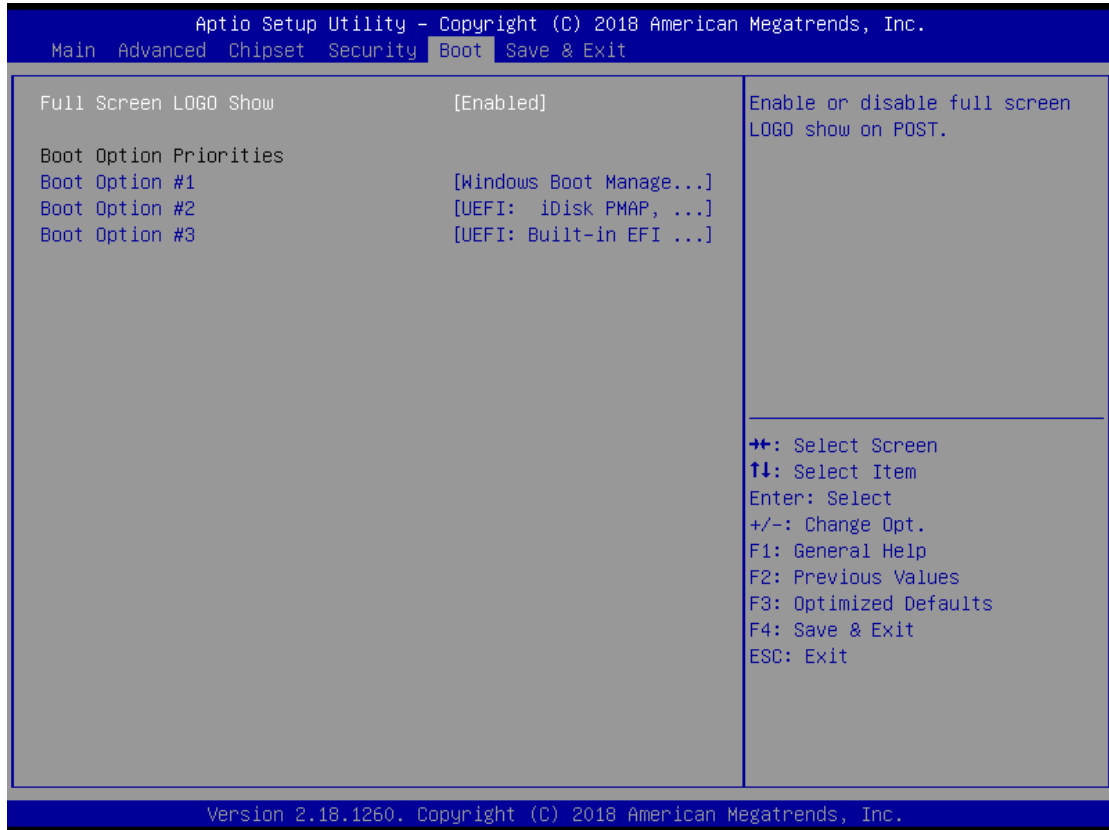
This item allows users to enable or disabled the Secure Boot Control  
The default value is [Enabled].

#### 4.4.3.2 Secure Boot Mode

This item allows users to [Standard] or [Custom] the Secure Boot Mode  
The default value is [Standard]

## 4.5 Boot

In this section, it will display the available devices on your system for you to configure the boot settings and the boot priority.



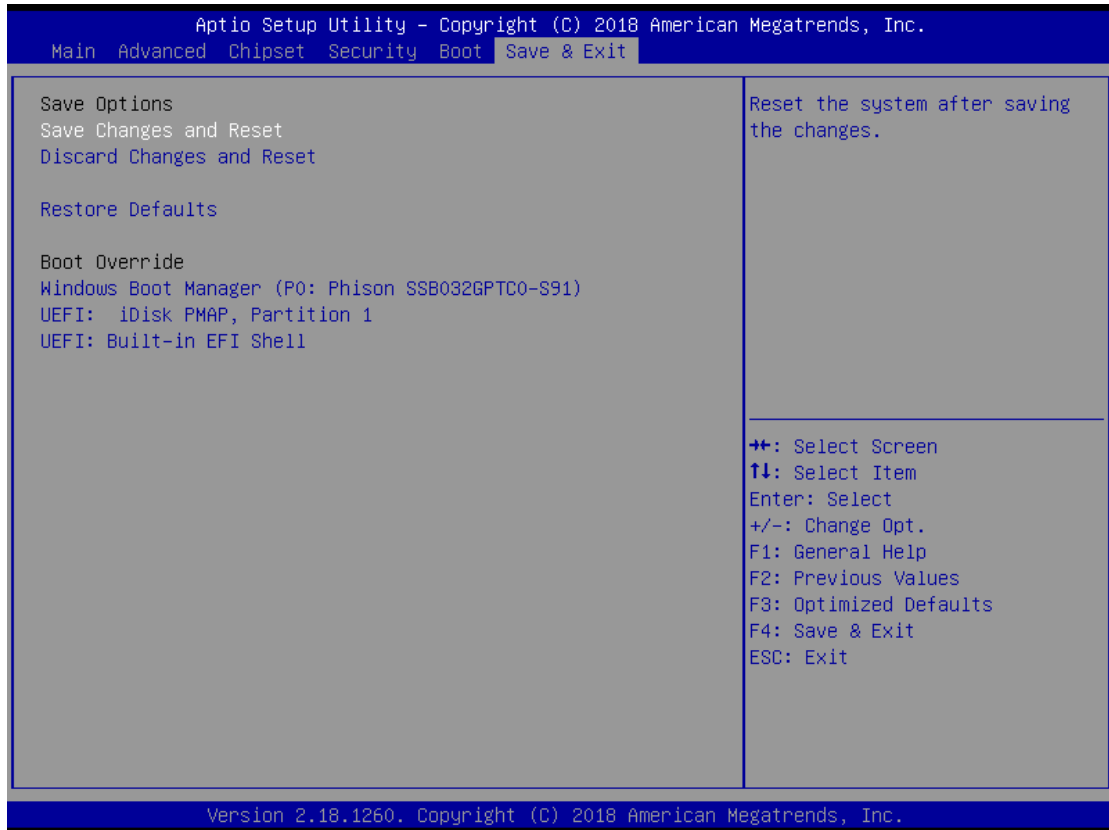
### 4.5.1 Full Screen LOGO Show

This item allows users to enable or disabled the Full Screen LOGO Show. The default value is [disabled].

### 4.5.2 Boot Option #1

This item allows users to set the system boot order.

## 4.6 Exit



### 4.6.1 Save Changes and Reset

When you select this option, it will pop-out the following message, “Save configuration changes and reset?”

Select [OK] to save the changes and exit the UEFI SETUP UTILITY.

### 4.6.2 Discard Changes and Reset

When you select this option, it will pop-out the following message, “Reset without saving?”

Select [OK] to exit the UEFI SETUP UTILITY without saving any changes.

### 4.6.3 Restore Defaults

Restore/Load default values for all setup options.

### 4.6.4 Boot override

Let the user select the boot device.

## About Arestech

Arestech, founded in 2011, employs a highly talented R&D team with over a decade of product development experience in intelligent embedded computing.

With our dynamic expertise in the embedded market, Arestech offers a full range of intelligent systems, including embedded Box PCs, industrial multi-touch displays and multi-touch Panel PCs.

Arestech's dedication to product development is matched by its commitment to world class customer support with a minimum 5-year product lifecycle plan, product longevity, and added value for our partners.

Additionally, Arestech strategically aligns itself with key industry software and system integration partners to deliver top-notch design services and turnkey solutions, enabling our partners to better build and grow their businesses.

## Arestech Headquarters

**7F., No.94, Xiwei St., Sanchong Dist., New Taipei City  
241, Taiwan (R.O.C.)  
Tel : 886-2-8287-9168  
Fax : 886-2-8287-2577  
[www.arestech.com.tw](http://www.arestech.com.tw)**