

Technical Manual
Of
Intel Braswell Series CPU
Based Mini-ITX M/B

NO.G03-NF596I-F

Revision: 1.0

Release date: August 31, 2021

Trademark:

* Specifications and Information contained in this documentation are furnished for information use only, and are subject to change at any time without notice, and should not be construed as a commitment by manufacturer.

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.



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Environmental Safety Instruction

- Avoid the dusty, humidity and temperature extremes. Do not place the product in any area where it may become wet.
- 0 to 60 centigrade is the suitable temperature. (The figure comes from the request of the main chipset)
- Generally speaking, dramatic changes in temperature may lead to contact malfunction and crackles due to constant thermal expansion and contraction from the 'welding spots' that connect components and PCB. Computer should go through an adaptive phase before it boots when it is moved from a cold environment to a warmer one to avoid condensation phenomenon. These water drops attached on PCB or the surface of the components can bring about phenomena as minor as computer instability resulted from corrosion and oxidation from components and PCB or as major as short circuit that can burn the components. Suggest starting the computer until the temperature goes up.
- The increasing temperature of the capacitor may decrease the life of computer. Using the close case may decrease the life of other device because the higher temperature in the inner of the case.
- Attention to the heat sink when you over-clocking. The higher temperature may decrease the life of the device and burned the capacitor.

USER'S NOTICE

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Manual Revision Information

Reversion	Revision History	Date
1.0	First Edition	August 31, 2021

Item Checklist

- Motherboard
- Cable(s)

Chapter 1

Introduction of the Motherboard

1-1 Feature of Motherboard

- Onboard Intel® Braswell N3160 2.24GHz SoC Processor, with low power consumption never denies high performance
- Support 1* DDR3L 1600 MHz SO-DIMM, up to 8GB
- Onboard 2 * Intel i211AT gigabit Ethernet LAN chip
- Support USB 3.0 data transport demand
- Support DVI-D, HDMI & LVDS multi-display
- Support 1* SATAIII device
- Onboard 1*M.2 M-key (type-2242,SATA interface) slot
- Onboard 1* full-size Mini-PCIE slot & 1* PCIE x1 slot
- Onboard 1* SIM card slot
- Support CPU Over-Temperature protection
- Support CPU Over-Current/Under Voltage protection
- Support DRAM Over-Current/Under Voltage protection
- Support Smart FAN
- Compliance with ErP standard
- Support Watchdog function

1-2 Specification

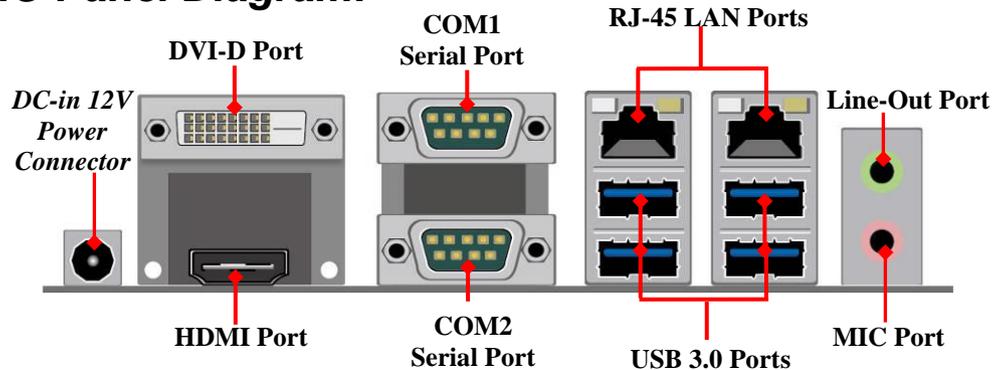
Spec	Description
Design	<ul style="list-style-type: none">● 6 layers; PCB size: 17x 17 cm
Embedded CPU	<ul style="list-style-type: none">● Intel® Braswell *SoC CPU <i>*CPU model varies from different IPC options. Please consult your dealer for more information of onboard CPU.</i>
Memory Slot	<ul style="list-style-type: none">● 1 * DDR3L SODIMM Slot for un-buffered *DDR3L 1600 MHz SDRAM, expandable to 8GB
Expansion Slot	<ul style="list-style-type: none">● 1* Full-size Mini-PCIE slot● 1* PCIE x1 slot● 1* SIM card slot
LAN Chip	<ul style="list-style-type: none">● Integrated with 2* Intel i211AT Gigabit Ethernet LAN chip● Support Fast Ethernet LAN function of providing 10/100/1000Mbps Ethernet data transfer rate
Storage	<ul style="list-style-type: none">● 1* SATAIII port (SATA1)● 1*M.2 M-key, type-2242, SATA interface slot
Audio Chip	<ul style="list-style-type: none">● C-Media HS-100B USB Audio IC
BIOS	<ul style="list-style-type: none">● AMI 64MB Flash ROM
Rear I/O	<ul style="list-style-type: none">● 1* 12V DC-in system power Jack● 1* DVI-D port● 1* HDMI port● 2* Serial port (COM1/COM2,COM1 support RS232/422/485 function)● 4* USB 3.0 port● 2* RJ-45 LAN port● 1* Line-out port● 1* MIC port
Internal I/O	<ul style="list-style-type: none">● 1* 2-Pin Internal 12V DC-in power connector● 1* SATA Power-out connector● 1* CPUFAN header & 2* SYSFAN header● 1* Front panel audio header

- 1* Front panel header
- 1* Power LED & speaker header
- 1* 9-pin USB 2.0 header (Expansable to 2* USB 2.0 ports)
- 1* PS/2 keyboard & mouse header
- 4* RS232 serial port header(**COM3/4/5/6**)
- 1* SMBUS header/I2C
- 1* GPIO_CON header
- 1* LVDS header
- 1* LVDS inverter header

*** Note:** 1. Many PCs now include XHCI USB controllers which allow for the support of USB 3.0 and higher USB speeds. This inclusion of XHCI controllers has lessened the need for EHCI USB controllers within platforms. However, legacy operating systems (OS) may not natively recognize XHCI controllers. You might need to pre-install XHCI driver while desiring to install a non-xHCI OS (ex.Windows* 7) on Intel platforms which do not include EHCI controllers. Please contact your representative for more details. 2. Braswell SOC will support memory speed at 1600 MHz and 1066 MHz only. If 1333 MHz DIMM is installed, it will run at 1066 MHz. It is not validated while installing 1066MHz DIMM with this SOC.

1-3 Layout Diagram

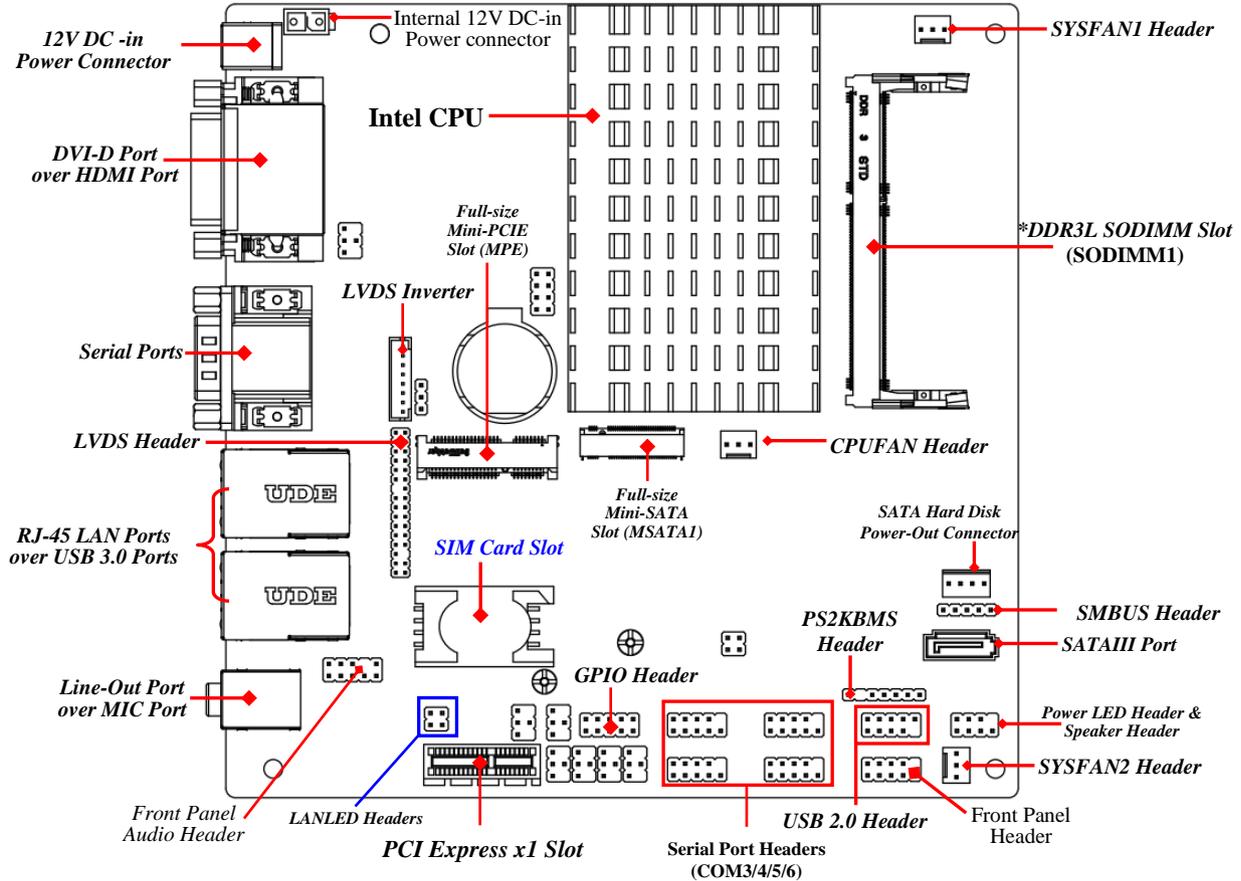
Rear IO Panel Diagram:



Warning!

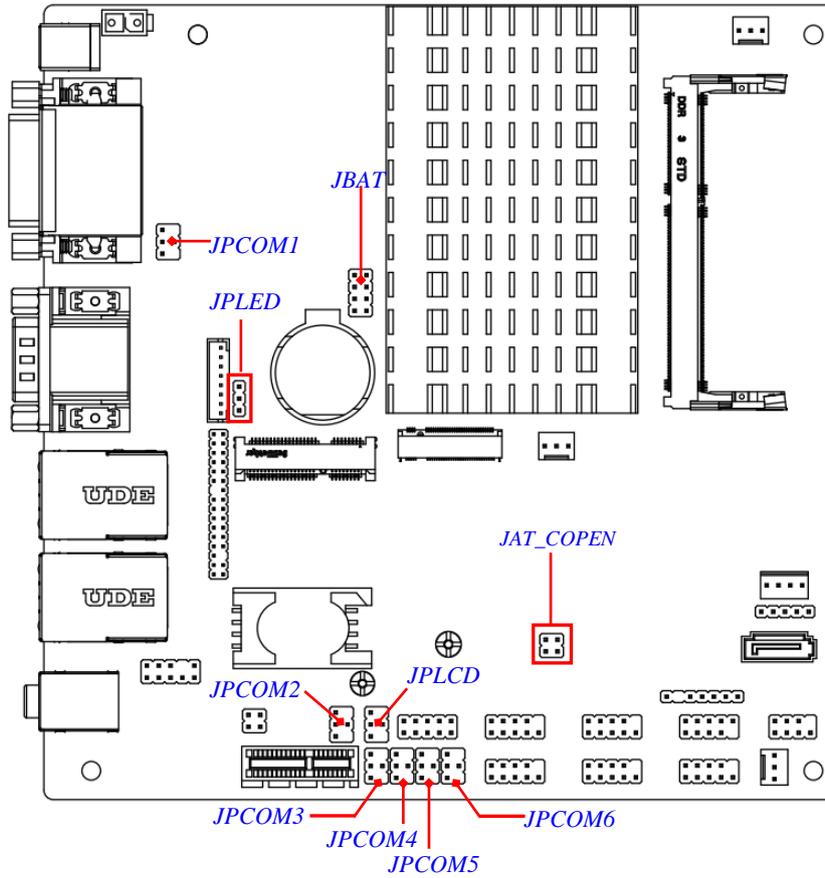
The board has a DC 12V power connector (DCIN) in I/O back panel and an internal ATX12V (ATX2P) power connector. User can only connect one type of compatible power supply to one of them to power the system.

Motherboard Internal Diagram



Note: SODIMM module should be 1.35V DDRIII SODIMM and **not exceeding 8GB total capacity.**

Jumper Position:



Jumper

Jumper	Name	Description
JPCOM1	COM1 Port Pin9 Function Select	4-Pin Block
JPCOM2	COM2 Port Pin9 Function Select	4-Pin Block
JPCOM3	COM3 Header Pin9 Function Select	4-Pin Block
JPCOM4	COM4 Header Pin9 Function Select	4-Pin Block
JPCOM5	COM5 Header Pin9 Function Select	4-Pin Block
JPCOM6	COM6 Header Pin9 Function Select	4-Pin Block
JPLCD	LVDS Panel VCC 3.3V /5V/12V Select	4-Pin Block
JPLED	INVERTER Back Light 5V/12V Select	3-Pin Block
JAT_COPEN	Pin (1&2): ATX Mode / AT Mode Select Pin (3&4): Case Open Message Display Function	4-Pin Block
JBAT	Pin (1&2): Flash Descriptor Security Override Pin (3&4): Clear CMOS RAM Function Setting Pin (5&6): ODD Present Setting Pin (7&8): Clear ME Function Setting	8-Pin Block

Connectors

Connector	Name
DCIN	DC 12V System Power-in Connector
ATX2P	Internal DC 12V System Power-in Connector
HDMI	HDMI Port Connector
DVI	DVI-D Port Connector
COM1	RS232/422/485 Serial Port Connector
COM2	RS232 Serial Port Connector
UL1/UL2	Top: RJ-45 LAN Port Connector X2 Middle & Bottom: USB 3.0 Port Connector X4
SATA1	SATAIII Port Connector

SATAPW	SATA Power out Connector
CPUFAN/SYSFAN1/SYSFAN2	FAN Connector X3

Headers

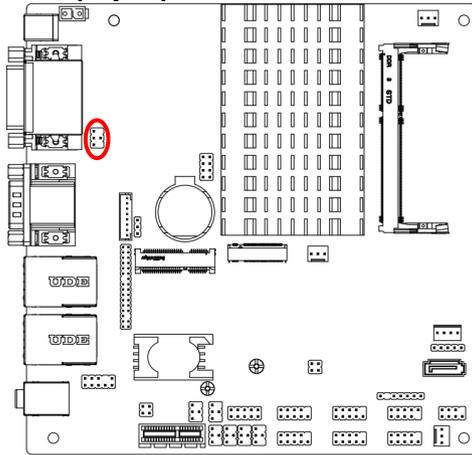
Header	Name	Description
FP_AUDIO	Front Panel Audio Header	9-pin Block
JLAN_LED	LAN Activity LED Header	4-pin Block
JW_FP	Front Panel Header(PWR LED/ HDD LED/Power Button /Reset)	9-pin Block
SPK-LED	Power LED & Speaker Header	7-pin Block
FP_USB20	USB 2.0 Header	9-pin Block
PS2KBMS	PS/2 Keyboard & Mouse Header	6-pin Block
COM3/4/5/6	Serial Port Header X4	9-pin Block
SMBUS	SMBUS Header	5-pin Block
GPIO_CON	GPIO Header	10-pin Block
INVERTER	LVDS Inverter	8-pin Block
LVDS	LVDS Header	30-pin Block

Chapter 2

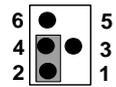
Hardware Installation

2-1 Jumper Setting

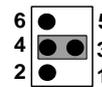
JPCOM1 (4-pin): COM1 Port Pin9 Function Select (2.54 pitch)



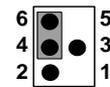
JPCOM1 → COM1 Port Pin-9



2-4 Closed:
RI=RS232;

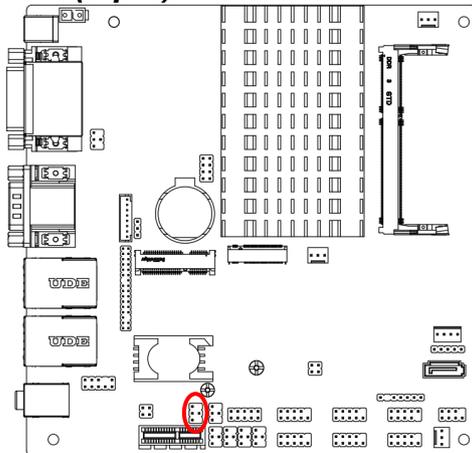


3-4 Closed:
RI= +5V;

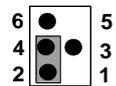


4-6 Closed:
RI= +12V.

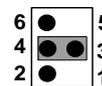
JPCOM2 (4-pin): COM2 Header Pin9 Function Select (2.54 pitch)



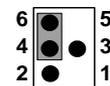
JPCOM2 → COM2 Header Pin9



2-4 Closed:
RI=RS232;

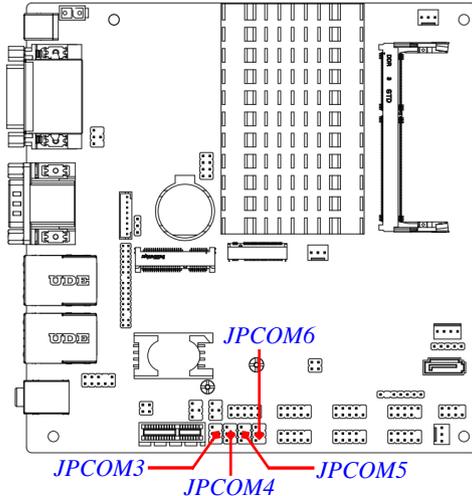


3-4 Closed:
RI= +5V;

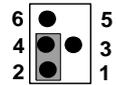


4-6 Closed:
RI= +12V.

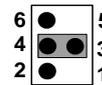
JPCOM3/JPCOM4/JPCOM5/JPCOM6 (4-pin): COM3/4/5/6 Header Pin9 Function Select (2.54 pitch)



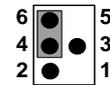
JPCOM3→COM3 Header Pin9
JPCOM4→COM4 Header Pin9
JPCOM5→COM5 Header Pin9
JPCOM6→COM6 Header Pin9



2-4 Closed:
RI=RS232;

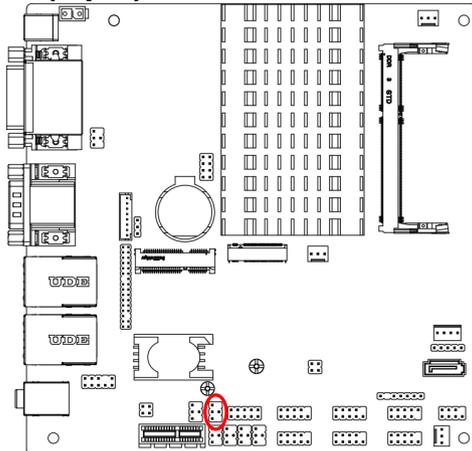


3-4 Closed:
RI= +5V;

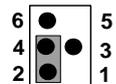


4-6 Closed:
RI= +12V.

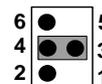
JPLCD (4-pin): LVDS Panel VCC 3.3V/5V/12V Select (2.54 pitch)



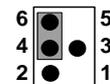
JPLCD→LVDS Panel VCC



2-4 Closed:
VCC=3.3V;
(Default);

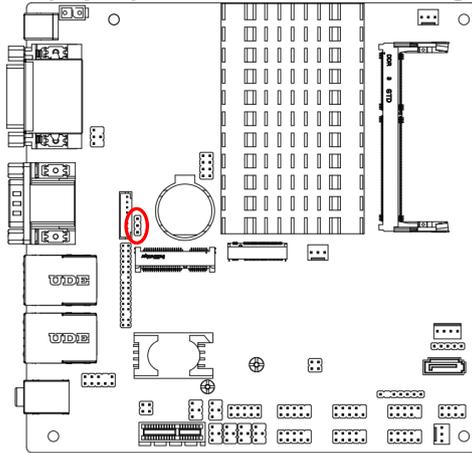


3-4 Closed:
VCC= 5V



4-6 Closed:
VCC= 12V.

JPLED (3-pin): INVERTER Back Light VCC 5V/12V Select (2.54 pitch)



JPLED→INVERTER Back Light VCC

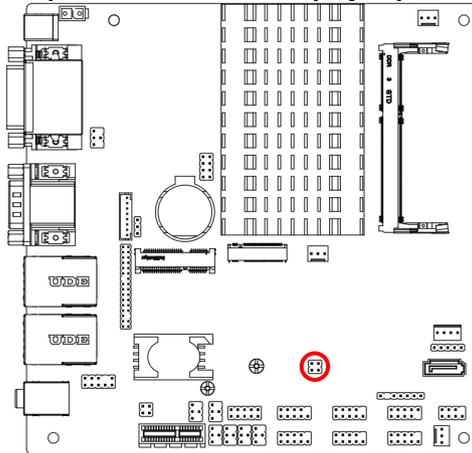


1-2 Close: INVERTER Back Light 5V Selected(Default);

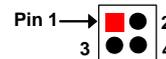


2-3 Close: INVERTER Back Light 12V Selected.

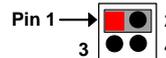
Pin (1-2) of JAT_COPEN (4-pin): ATX Mode/AT Mode Select (2.54 pitch)



Pin (1&2) of JAT_COPEN→ ATX/AT Mode Select



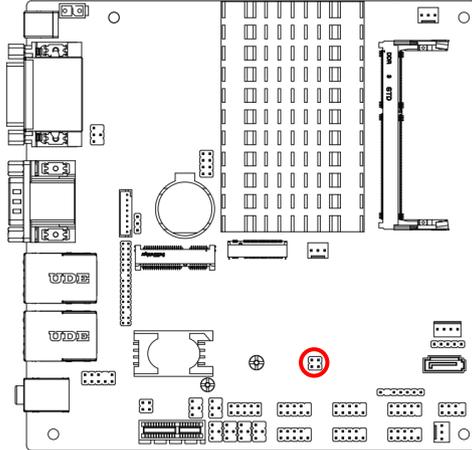
1-2 Open: ATX Mode Selected(Default);



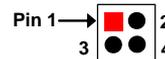
1-2 Closed: AT Mode Selected.

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

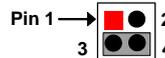
Pin (3-4) of JAT_COPEN (4-pin): Case Open Message Display Function Select



Pin (1&2) of JAT_COPEN → Case Open



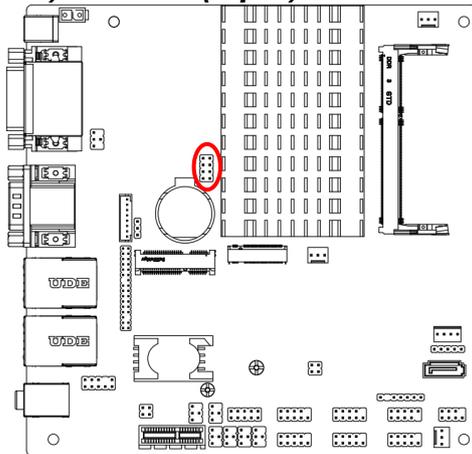
3-4 Open: Normal (Default);



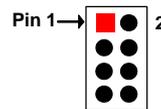
3-4 Closed: Case Open Function Selected (One Touch).

Pin 1-2 Close: 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.

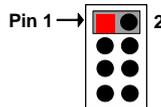
Pin (1-2) of JBAT (8-pin): Flash Descriptor Security Override (2.54 pitch)



Pin 1-2 of JBAT → Flash Descriptor Security Override

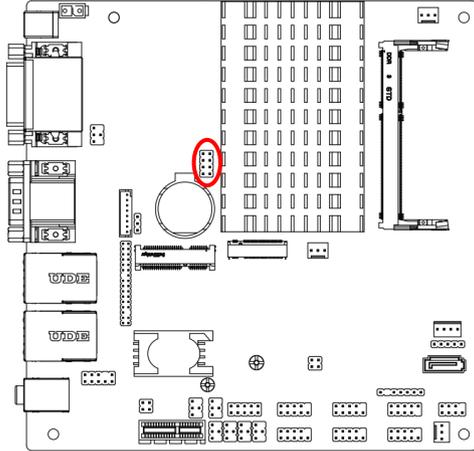


1-2 Open: Normal (Default);

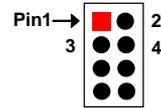


1-2 Closed: Flash Descriptor Security Override.

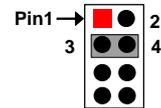
Pin (3-4) of JBAT (8-pin): Clear CMOS Setting



Pin 3-4 of JBAT → Clear CMOS

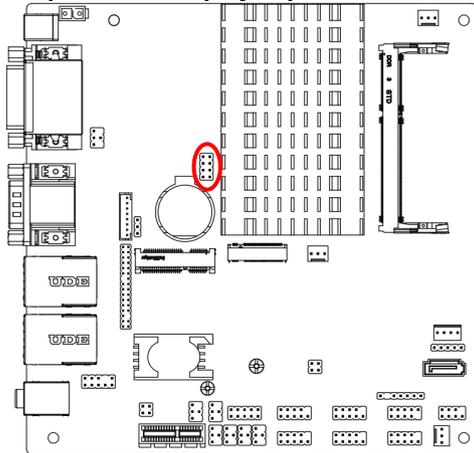


3-4 Open: Normal(Default);

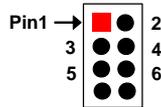


3-4 Closed: Clear CMOS(One Touch).

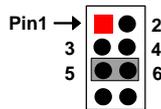
Pin (5-6) of JBAT (8-pin): ODD Present Select



Pin 5-6 of JBAT → ODD Present Select

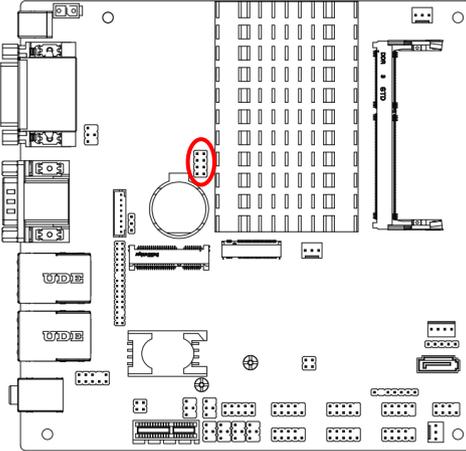


5-6 Open: Normal (Default);

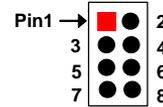


5-6 Closed: ODD Present.

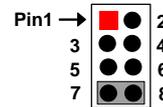
Pin (7-8) of JBAT (8-pin): Clear ME Function Setting



Pin 7-8 of JBAT → Clear ME



7-8 Open: Normal (Default);



7-8 Closed: Clear ME.

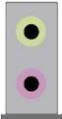
2-2 Connectors and Headers

2-2-1 Connectors

(1) Rear I/O Connectors

* Refer to Page 3.

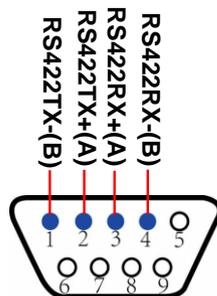
Icon	Name	Function
	12V DC-in Power Connector	For user to connect compatible power adapter to provide power supply for the system.
	DVI-D Port	To connect display device that support DVI specification.
	HDMI Port	To connect display device that support HDMI specification.

	Serial Port	Mainly for user to connect external MODEM or other devices that supports Serial Communications Interface.
	USB 3.0 Port	To connect USB keyboard, mouse or other devices compatible with USB specification. USB 3.0 ports supports up to 5Gbps data transfer rate.
	RJ-45 LAN Port	This connector is standard RJ-45 LAN jack for Network connection.
	Audio Connectors	GREEN: Line-out Connector PINK : MIC Connector

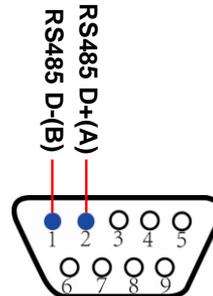
(2) COM1 (9-pin Block): RS232/422/485 Port

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 30*) at first, before using specialized cable to connect different pins of this port.

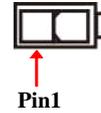
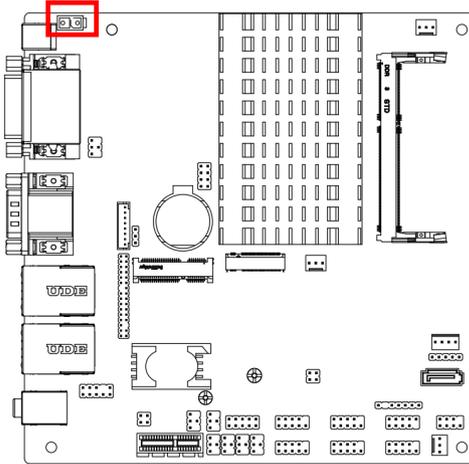


For RS422 Mode



For RS485 Mode

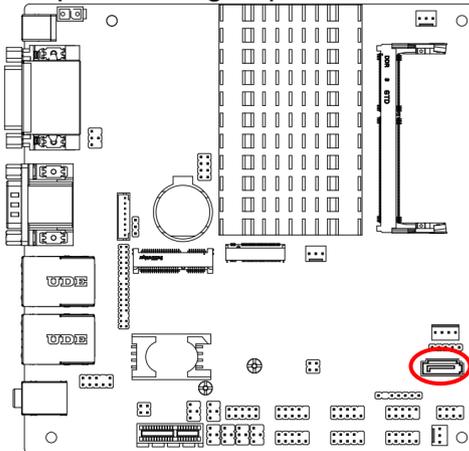
(3) ATX2P (2-pin Block): Internal 12V DC-in Power Connector



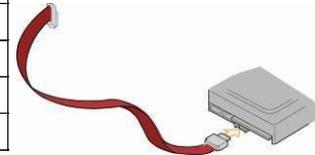
Pin.	Definition
1	GND
2	+12V DC_IN

(4) SATA1 (7-pin Block): SATAIII Port connector

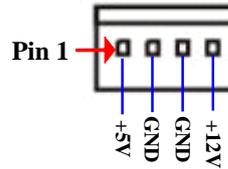
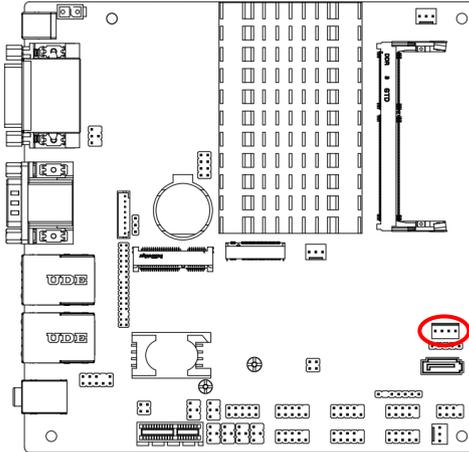
SATA1 port is a high-speed SATAIII port that supports 6GB/s transfer rate.



Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

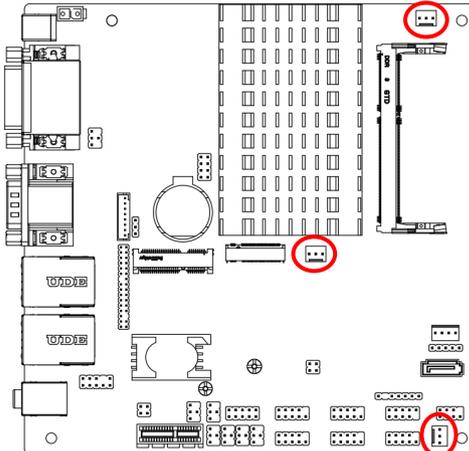


(5) SATAPW (4-pin): SATA Power Out Connector (2.54 pitch)



Warning: Make sure that Pin-1 of compatible SATA Power connector is inserted into corresponding Pin-1 of **SATAPW** to avoid possible damage to the board and hard disk driver!

(6) CPUFAN1/SYSFAN1/SYSFAN2 Connector (3-pin): FAN Connectors (2.54 pitch)



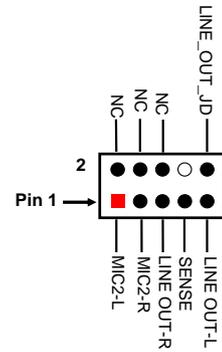
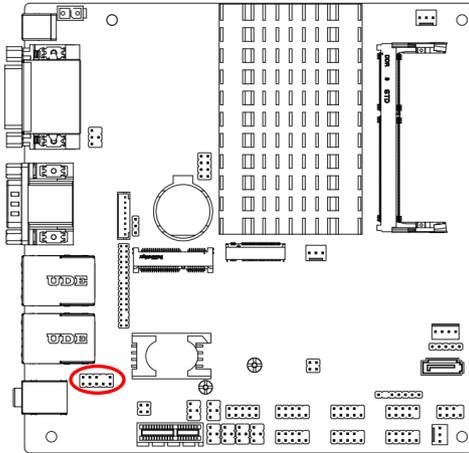
Pin No.	Definition
1	GND
2	+12V Fan Power
3	Fan Speed

***Note:** CPUFAN & SYSFAYN1 support SmartFan function (refer to Page36).

2-2-2 Headers

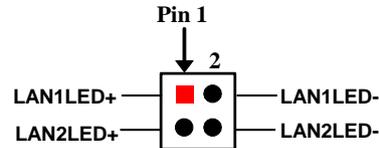
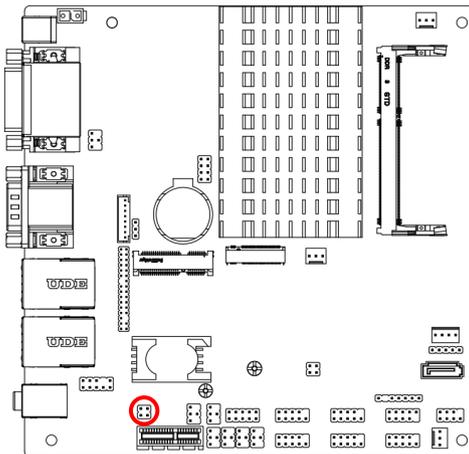
(1) FP_AUDIO (9-pin): Line-Out, MIC-In Header

This header connects to Front Panel Line-out, MIC-In connector with cable. (2.54 pitch)

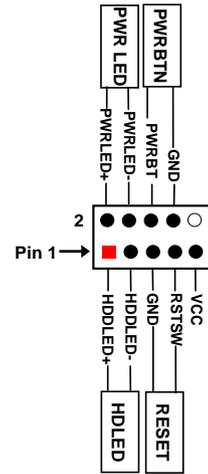
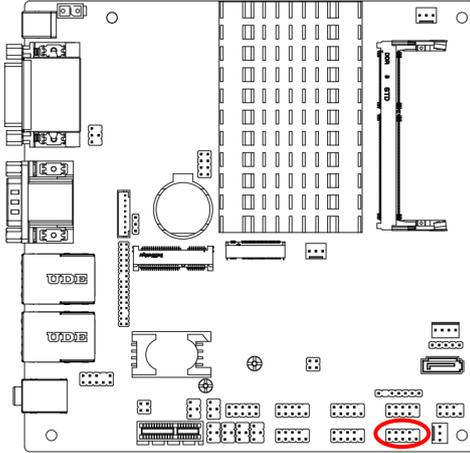


Line-Out, MIC Header

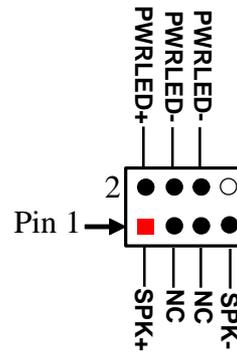
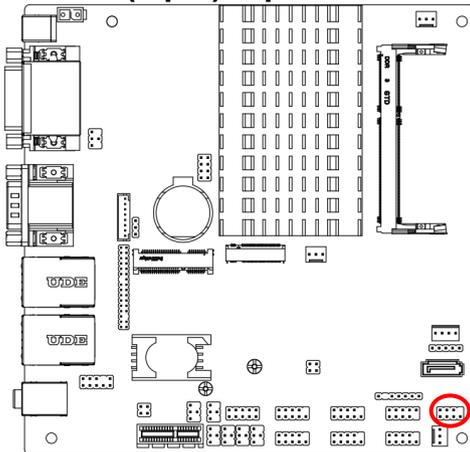
(2) JLAN_LED (4-pin): LAN Activity LED Header (2.54 pitch)



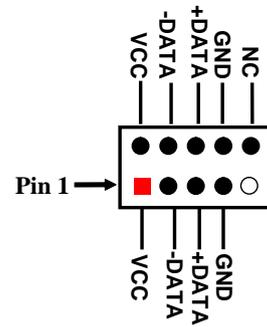
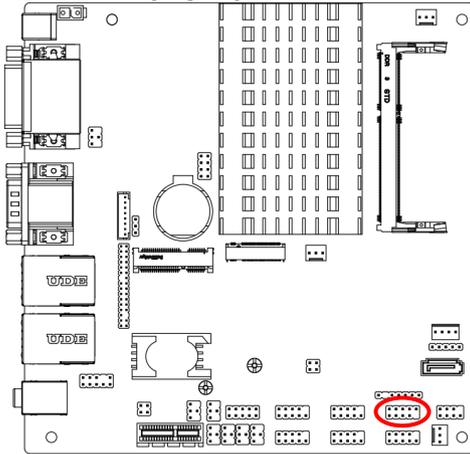
(3) JW_FP (9-pin): Front Panel Header (2.54 pitch)



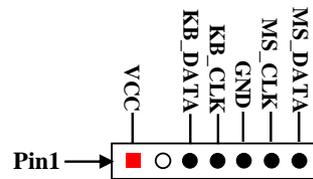
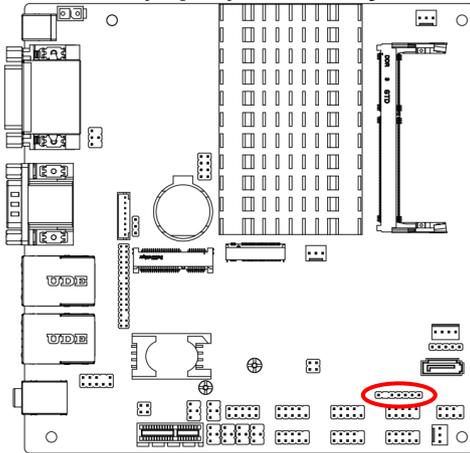
(4) SPK-LED (7-pin): Speaker Header & PWR LED Header (2.54 pitch)



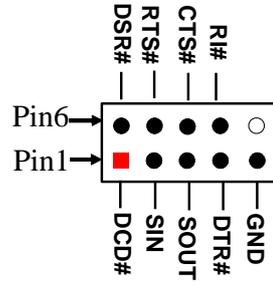
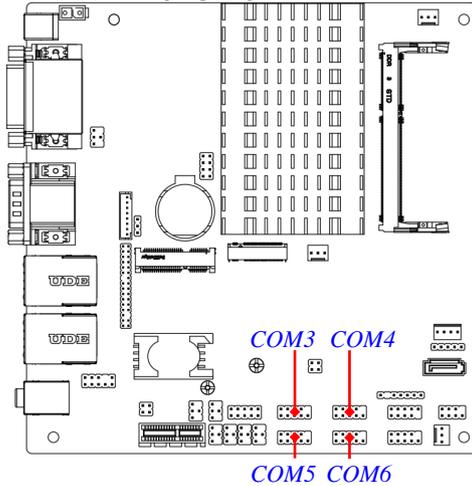
(5) FP_USB20 (9-pin): USB 2.0 Port Header (2.54 pitch)



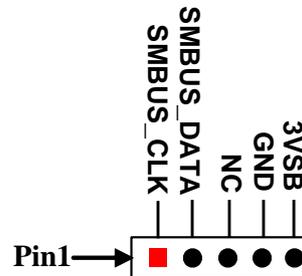
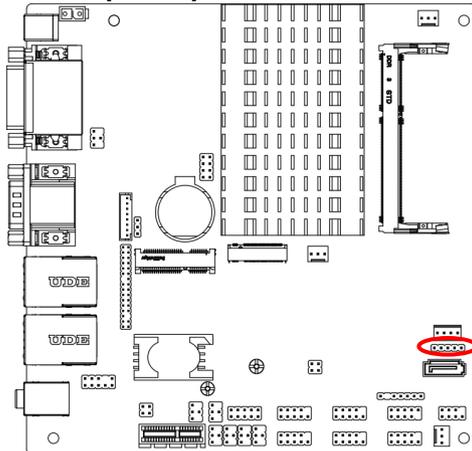
(6) PS2KBMS (6-pin): PS2 Keyboard & Mouse Header (2.54 pitch)



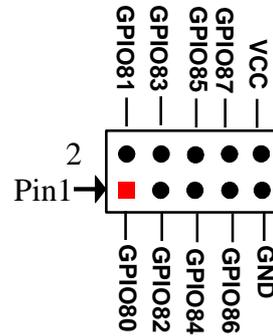
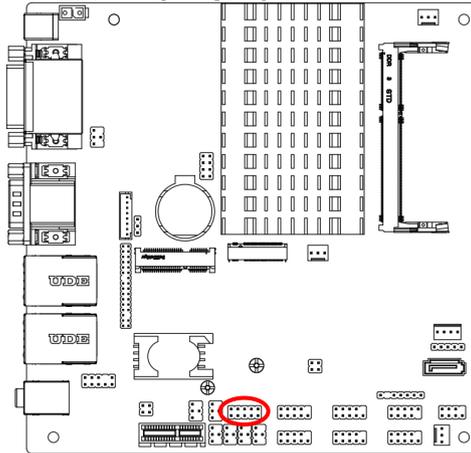
(7) COM3/4/5/6 (9-pin): Serial Port Header (2.54 pitch)



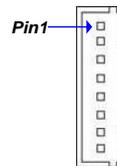
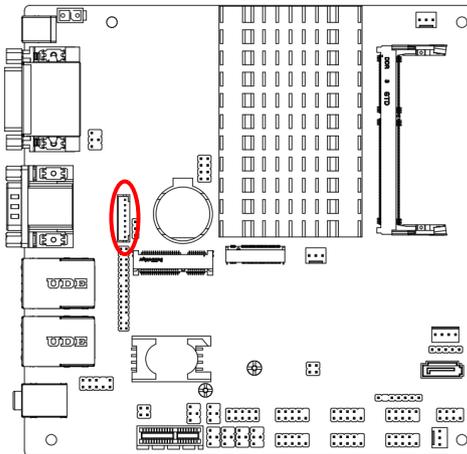
(8) SMBUS (5-Pin): SM BUS Header (2.54 pitch)



(9) GPIO_CON (10-pin): GPIO Header (2.54 pitch)



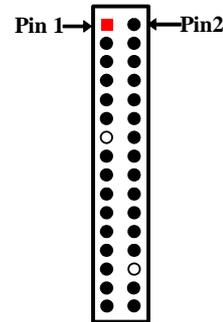
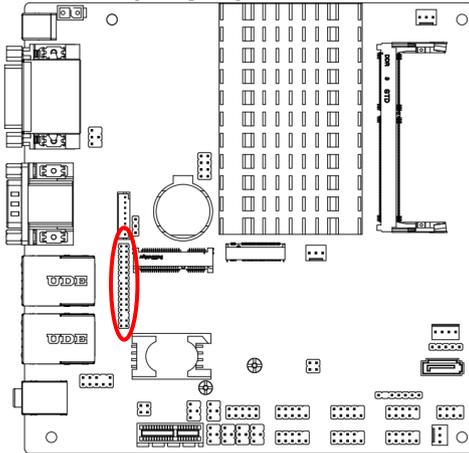
(10) INVERTER (8-pin): LVDS Inverter Connector (2.0 pitch)



Pin No.	Definition
1	Backlight Enable
2	Backlight PWM
3	Backlight VCC
4	Backlight VCC
5	GND
6	GND
7	Backlight Brightness Up SW
8	Backlight Brightness Down SW

Warning! Find Pin-1 location of the inverter and make sure that the installation direction is correct! Otherwise serious harm will occur to the board/display panel!!

(11) LVDS (30-pin): 24-bit Dual Channel LVDS Header (2.0 pitch)



Pin NO.	Pin Define	Pin NO.	Pin Define
Pin 1	LVDSB_DATAN3	Pin 2	LVDSB_DATAP3
Pin 3	LVDS_CLKBN	Pin 4	LVDS_CLKBP
Pin 5	LVDSB_DATAN2	Pin 6	LVDSB_DATAP2
Pin 7	LVDSB_DATAN1	Pin 8	LVDSB_DATAP1
Pin 9	LVDSB_DATAN0	Pin 10	LVDSB_DATAP0
Pin 11	LVDS_DDC_DAT	Pin 12	LVDS_DDC_CLK
Pin 13	N/A	Pin 14	GND
Pin 15	GND	Pin 16	GND
Pin 17	LVDSA_DATAP3	Pin 18	LVDSA_DATAN3
Pin 19	LVDS_CLKAP	Pin 20	LVDS_CLKAN
Pin 21	LVDSA_DATAP2	Pin 22	LVDSA_DATAN2
Pin 23	LVDSA_DATAP1	Pin 24	LVDSA_DATAN1
Pin 25	LVDSA_DATAP0	Pin 26	LVDSA_DATAN0
Pin 27	PVDD	Pin 28	N/A
Pin 29	PVDD	Pin 30	PVDD
Pin 31	GND	Pin 32	GND

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.

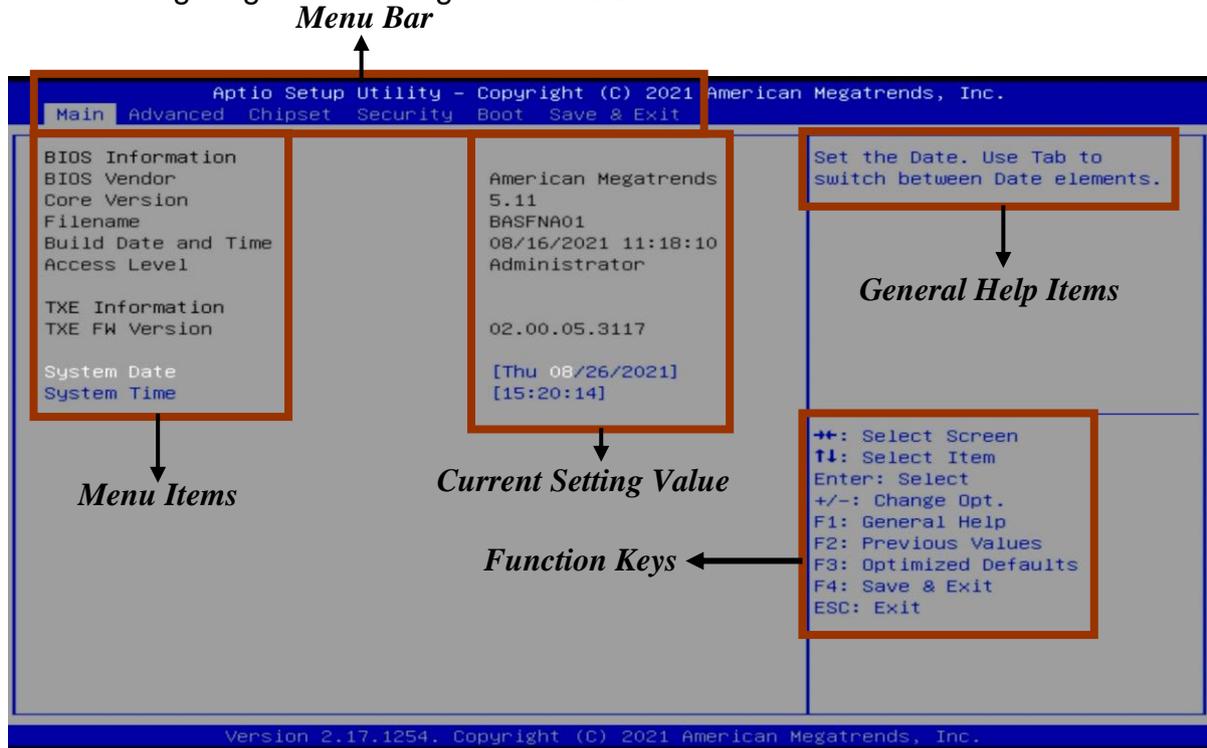
3-1 Entering Setup

Power on the computer and by pressing 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 to enter Setup.

3-2 BIOS Menu Screen

The following diagram show a general 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:

- Press ←→ (left, right) to select screen;
- Press ↑↓ (up, down) to choose, in the main menu, the option you want to confirm or to modify.

-
-
- Press <Enter> to select.
 - Press <+>/<-> keys when you want to modify the BIOS parameters for the active option.
 - [F1]: General help.
 - [F2]: Previous value.
 - [F3]: Optimized defaults.
 - [F4]: Save & Exit.
 - Press <Esc> to quit the 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) 2021 American Megatrends, Inc.
Main Advanced Chipset Security Boot Save & Exit

BIOS Information
BIOS Vendor          American Megatrends
Core Version         5.11
Filename            BASFNA01
Build Date and Time  08/16/2021 11:18:10
Access Level         Administrator

TXE Information
TXE FW Version       02.00.05.3117

System Date          [Thu 08/26/2021]
System Time          [15:20:14]

Set the Date. Use Tab to
switch between Date elements.

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

Version 2.17.1254. Copyright (C) 2021 American Megatrends, Inc.
```

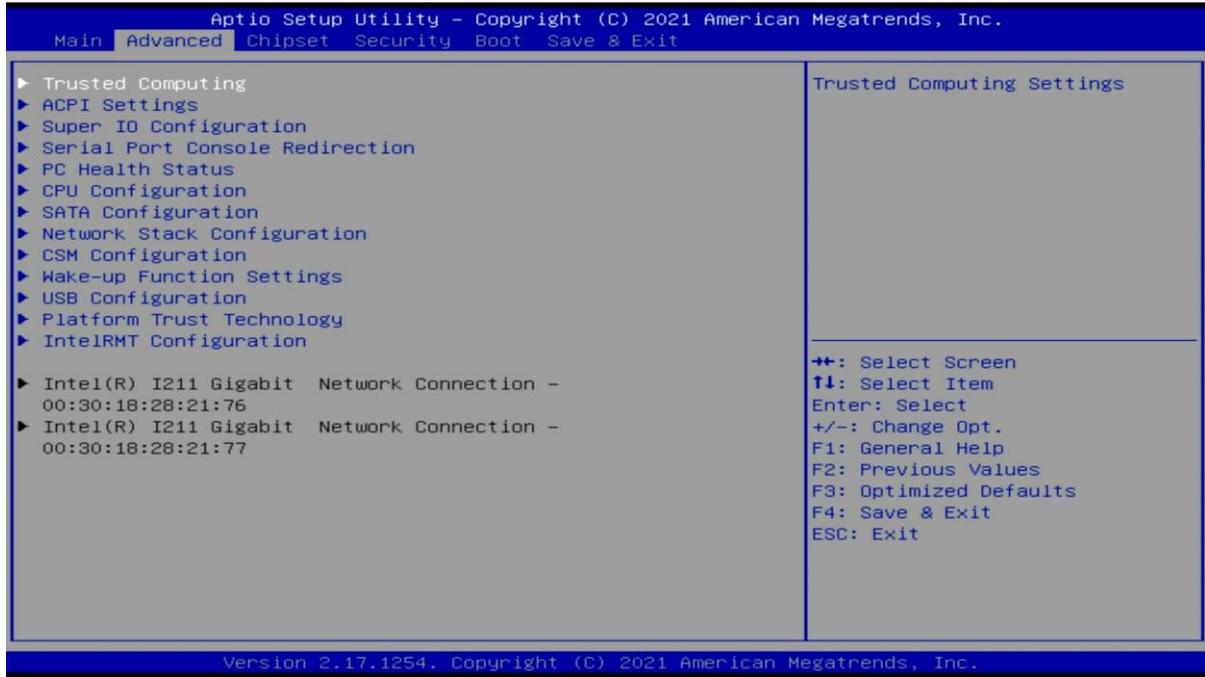
System Date

Set the date. Please use [Tab] to switch between data elements.

System Time

Set the time. Please use [Tab] to switch between time elements.

3-7 Advanced Menu



▶ **Trusted Computing**

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

TPM20 Device Found

Security Device Support

Use this item to enable or disable BIOS support for security device. TCG EFI protocol and INT1A interface will not be available.

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

When set as **[Enabled]**, user can make further settings in the following items:

SHA-1 PCR Bank

Use this item to enable or disable SHA-1 PCR Bank

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

SHA256 PCR Bank

Use this item to enable or disable SHA256 PCR Bank

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

Pending Operation

Use this item to schedule an Operation for the Security Device.

***Note:** *Your Computer will reboot during restart in order to change State of Security Device.*

The optional settings: [None]; [TPM Clear].

TPM2.0 UEFI Spec Version

Use this item to select the TCG2 spec version support. When set as [1.0]: the compatible mode for Win8/Win10. When set as [1.x]: For TCG2 newer spec for Win10.

The optional settings: [1.0]; [1.x].

▶ **ACPI Settings**

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

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)].

▶ **Super I/O Configuration**

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

Super IO Configuration

▶ **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).

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

Change Settings

Use this item to select an optimal setting for super IO device.

The optional settings: [Auto]; [IO=3F8h; IRQ=4;]; [IO=2F8h; IRQ=3;]; [IO=3E8h; IRQ=4;]; [IO=2E8h; IRQ=3;].

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 FIFO Mode

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

▶ Serial Port 2 Configuration

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

Serial Port

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

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

Change Settings

Use this item to select an optimal setting for super IO device.

The optional settings: [Auto]; [IO=3F8h; IRQ=4;]; [IO=2F8h; IRQ=3;]; [IO=3E8h; IRQ=4;]; [IO=2E8h; IRQ=3;].

Serial Port FIFO Mode

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

▶ Serial Port 3 Configuration

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

Serial Port

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

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

Change Settings

Use this item to select an optimal setting for super IO device.

The optional settings: [Auto]; [IO=3F8h; IRQ=10;]; [IO=2F8h; IRQ=10;]; [IO=3E8h; IRQ=10;]; [IO=2E8h; IRQ=10;]; [IO=2F0h; IRQ=10;]; [IO=2E0h; IRQ=10;].

Serial Port FIFO Mode

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

▶ **Serial Port 4 Configuration**

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

Serial Port

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

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

Change Settings

Use this item to select an optimal setting for super IO device.

The optional settings: [Auto]; [IO=3F8h; IRQ=10;]; [IO=2F8h; IRQ=10;]; [IO=3E8h; IRQ=10;]; [IO=2E8h; IRQ=10;]; [IO=2F0h; IRQ=10;]; [IO=2E0h; IRQ=10;].

Serial Port FIFO Mode

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

▶ **Serial Port 5 Configuration**

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

Serial Port

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

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

Change Settings

Use this item to select an optimal setting for super IO device.

The optional settings: [Auto]; [IO=3F8h; IRQ=11;]; [IO=2F8h; IRQ=11;]; [IO=3E8h; IRQ=11;]; [IO=2E8h; IRQ=11;]; [IO=2F0h; IRQ=11;]; [IO=2E0h; IRQ=11;].

Serial Port FIFO Mode

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

▶ **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).

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

Change Settings

Use this item to select an optimal setting for super IO device.

The optional settings: [Auto]; [IO=3F8h; IRQ=11;]; [IO=2F8h; IRQ=11;]; [IO=3E8h; IRQ=11;]; [IO=2E8h; IRQ=11;]; [IO=2F0h; IRQ=11;]; [IO=2E0h; IRQ=11;].

Serial Port FIFO Mode

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

OS Select for Serial Port

Use this item to select serial port.

The optional settings: [Windows]; [LINUX].

ERP Support

Use this item to select Energy-Related Products function.

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

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

Case Open Detect

This item will detect if case have ever been opened, it will show message in POST.

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

When set as **[Enable]**; system will detect if COPEN has been short or not (refer to **JAT_COPEN** jumper setting for Case Open Detection); if Pin 3&4 of **Case Open** are short, system will show Case Open Message during POST.

PS2 KB/MS Connect

Use this item to select PS2 connect primary device.
The optional settings: [Keyboard First]; [Mouse First].

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 select a value in the range of [10] to [255] seconds when 'WatchDog Reset Timer Unit' set as [Sec]; or in the range of [1] to [255] minutes when 'WatchDog Reset Timer Unit' set as [Min].

WatchDog Reset Timer Unit

The optional settings are: [Sec.]; [Min.].

WatchDog Wake-up Timer

Use this item to enable or disable WDT wake-up function.
The optional settings: [Disabled]; [Enabled].
When set as **[Enabled]**, the following sub-items shall appear:

WatchDog Wake-up Timer Value

User can select a value in the range of [10] to [4095] seconds when 'WatchDog Reset Timer Unit' set as [Sec]; or in the range of [1] to [4095] minutes when 'WatchDog Reset Timer Unit' set as [Min].

WatchDog Wake-up Timer Unit

The optional settings are: [Sec.]; [Min.].

ATX Power Emulate AT Power

This item displays current Emulate AT Power Status, motherboard power On/Off control by power supply. User needs to select 'AT or ATX Mode' on MB jumper at first (refer to **Pin (1&2) of JAT_COPEN** for ATX Mode & AT Mode Select).

▶ Serial Port Console Redirection

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

COM1

Console Redirection

Use this item to enable or disable COM1 Console Redirection.

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

*When set as [Enabled], user can make further settings in the '**Console Redirection Settings**' screen:*

▶ **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 sub-items.

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 are: [Disabled]; [Enabled].

Legacy OS Redirection Resolution

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

Putty Keypad

Use this item to select FunctionKey and KeyPad on Putty.

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

Redirection After BIOS POST

Use this item to set specify if BootLoader is selected then Legacy console redirection is disabled before booting to Legacy OS.

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

Serial Port for Out-of-Band Management/ Windows Emergency Management Services (EMS)

Console Redirection

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

When set as [Enabled], user can make further settings in ‘Console Redirection Settings’:

▶ 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 sub-items.

Out-of-Band Mgmt Port

The default setting is: [COM1].

Terminal Type

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

[VT-UTF8] is the preferred terminal type for out-of-band management. The next best choice is [VT100+] and then [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 are: [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 are: [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.*

▶ **PC Health Status**

Press [Enter] to view current hardware health status, set shutdown temperature, or make further settings in '**SmartFAN Configuration**'.

▶ **SmartFAN Configuration**

Press [Enter] to make settings for SmartFAN Configuration:

CPUFAN / SYSFAN1 Smart Mode

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

When set as [Enabled], the following sub-items shall appear:

CPUFAN / SYSFAN1 Full-Speed Temperature

Use this item to set CPUFAN/SYSFAN1 full speed temperature. Fan will run at full speed when above the preset temperature.

CPUFAN / SYSFAN1 Full-Speed Duty

Use this item to set CPUFAN/SYSFAN1 full speed duty. Fan will run at full speed when above the pre-set duty.

CPUFAN / SYSFAN1 Idle-Speed Temperature

Use this item to set CPUFAN/SYSFAN1 idle speed temperature. Fan will run at idle speed when below the pre-set temperature.

CPUFAN / SYSFAN1 Idle-Speed Duty

Use this item to set CPUFAN/SYSFAN1 idle speed duty.. Fan will run at idle speed when below the pre-set duty.

Shutdown Temperature Configuration

Use this item to select system shutdown temperature.

The optional settings are: [Disabled]; [65°C/149°F]; [70°C/158°F]; [75°C/167°F]; [80°C/176°F]; [85°C/185°F].

▶ **CPU Configuration**

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

Limit CPUID Maximum

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

This item should be set as [Disabled] for Windows XP.

EIST

Use this item to enable or disable Intel SpeedStep.

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

Turbo Mode

Use this item to enable or disable processor Turbo Mode.

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

CPU C State Report

Use this item to enable or disable CPU C state report to OS.

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

When set as [Enabled], the following item shall appear:

Max CPU C State

This item controls Max C state that the processor will support.

The optional settings: [C7]; [C6]; [C1].

▶ **SATA Configuration**

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

SATA Configuration

SATA Controller

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

When set as [Enabled], the following items shall appear:

SATA Mode Selection

This item determines how SATA controller operate.

The default setting is: [AHCI].

SATA Interface Speed

The item is for user to set the maximum speed the SATA controller can support.

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

SATA Port

Port

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

M.2 SATA

Port

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

▶ **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 are: [Enabled]; [Disabled].

When set as [Enabled], the following sub-items shall appear:

Ipv4 PXE Support

Use this item to enable Ipv4 PXE Boot Support. When set as [Disabled], Ipv4 boot optional will not be created.

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

Ipv6 PXE Support

Use this item to enable Ipv6 PXE Boot Support. When set as [Disabled], Ipv6 boot optional will not be created.

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

PXE boot wait time

Use this item to set wait time to press [ESC] key to abort the PXE boot.

Use either [+] / [-] or numeric keys to set the value.

The optional settings range from [1] to [5].

Media Detect Count

Use this item to set number of times presence of media will be checked.

Use either [+] / [-] or numeric keys to set the value.

The optional settings range from [1] to [50].

▶ **CSM Configuration**

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

Compatibility Support Module Configuration

Boot Option Filter

This item controls Legacy/UEFI ROMs priority.

The optional settings are: [UEFI and Legacy]; [Legacy only]; [UEFI only].

Network

This item controls the execution of UEFI and legacy PXE OpROM.

The optional settings are: [Do not launch]; [UEFI]; [Legacy].

Storage

This item controls the execution of UEFI and Legacy Storage OpROM.

The optional settings are: [Do not launch]; [UEFI]; [Legacy].

Other PCI devices

This item determines OpROM execution policy for devices other than Network, storage or video.

The optional settings are: [Do not launch]; [UEFI]; [Legacy].

▶ **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-up by RTC alarm.

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

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

Wake-up Hour

Use this item to select 0-23. For example enter 3 for 3am and 15 for 3pm.

Wake-up Minute

Use this item to select 0-59.

Wake-up Second

Use this item to select 0-59

Wake-up System with Dynamic Time

Use this item to enable or disable system wake-up by RTC alarm.

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

When set as **[Enabled]**, the following items shall appear:

Wake-up Time Increase

Use this item to select 1-60 minute(s).

USB KB/MS Wake-up from S3-S4

Use this item to enable or disable USB Wake-up from S3-S4 state.

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

**This item is only supported when 'ERP Support' is set as [Disabled]. Please disable ERP before activating this function in S4 state.*

PS2 KB/MS Wake-up from S3-S5

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

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

**This item is only supported when 'ERP Support' is set as [Disabled]. Please disable ERP before activating this function in S4 or S5 state.*

▶ **USB Configuration**

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

USB Configuration

Legacy USB Support

Use this item to enable or disable 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

Use this item to enable or disable 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.

The optional settings are: [Auto]; [Manual].

'Auto' uses default value: for a root port it is 100 ms, for a hub port the delay is taken from hub descriptor.

Select [Manual] you can set value for the following sub-item: '**Device Power-up Delay in Seconds**'.

Device Power-up Delay in Seconds

The delay range is from [1] to [40] seconds, in one second increments.

▶ **Platform Trust Technology**

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

TPM Configuration

fTPM

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

▶ **IntelRMT Configuration**

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

IntelRMT Configuration

Intel RMT Support

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

*When set as **[Enabled]**, user can make further settings in the following item:*

HW Notification

This item is for user to select hardware notification enabling status.

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

-
-
- ▶ **Intel® I211 Gigabit Network Connection- (MAC:XX:XX:XX:XX:XX:XX)**
This item gives basic driver information and Intel ethernet controller configuration parameter.
 - ▶ **Intel® I211 Gigabit Network Connection- (MAC:XX:XX:XX:XX:XX:XX)**
This item gives basic driver information and Intel ethernet controller configuration parameter.

3-8 Chipset Menu



▶ **North Bridge**

Press [Enter] to view memory configurations or make settings for the following sub-items:

PAVC

Use this item to enable or disable protected audio video control.

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

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].

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].

Aperture Size

The optional settings are: [128MB]; [256MB]; [512MB].

GTT Size

The optional settings are: [2MB]; [4MB]; [8MB].

Primary IGFX Boot Display

Use this item to select the Video Device which will be activated during POST.

The optional settings are: [Auto]; [DVI]; [HDMI].

** **Note:** This has no effect if external graphics present. Secondary boot display selection will appear based on your selection. VGA modes will be supported only on primary display.*

Secondary IGFX Boot Display

The optional settings are: [Disabled]; [DVI]; [HDMI].

Active LFP

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

** **Note:** When set as 'Enabled', user can make further settings in 'LCD Panel Type'.*

LCD Panel Type

Use this item to manually select LVDS panel type.

The optional setting are: [800x 480 1ch 18-bit]; [800x 600 1ch 18-bit]; [800x 600 1ch 24-bit]; [1024 x 600 1ch 18-bit]; [1024 x 768 1ch 18-bit]; [1024 x 768 1ch 24-bit]; [1280 x 768 1ch 24-bit]; [1280 x 800 1ch 18-bit]; [1280 x 800 1ch 24-bit]; [1366 x 768 1ch 18-bit]; [1366 x 768 1ch 24-bit]; [1440 x 900 2ch 18-bit]; [1440 x 900 2ch 24-bit]; [1280 x 1024 2ch 24-bit]; [1680 x 1050 2ch 24-bit]; [1920 x 1080 2ch 24-bit].

Backlight Control

The optional setting are: [PWM Inverted]; [PWM Normal].

LVDS FW Protect

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

Max TOLUD

The optional settings are: [2GB]; [2.25GB]; [2.5GB]; [2.75GB]; [3GB].

▶ **South Bridge**

Press [Enter] to further setting USB device configuration.

PCIE Slot (x1)

The default setting is: [Enabled].

PCIE Slot (x1) Speed

The optional settings are: [Auto]; [Gen 2]; [Gen 1].

Mini PCIE

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

Mini PCIE Speed

The optional settings are: [Auto]; [Gen 2]; [Gen 1].

Onboard PCIE LAN1

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

Onboard PCIE LAN2

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

Audio Controller

Use this item to control detection of the Azalia device.

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

[Disabled]: Azalia will be unconditionally disabled;

[Enabled]: Azalia will be unconditionally enabled.

Azalia HDMI Codec

Use this item to enable or disable internal HDMI codec for Azalia.

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

USB 3.0 (XHCI) Support

Use this item to enable or disable mode of operation of XHCI controller.

The default setting is: [Enable].

System Status after Power Failure

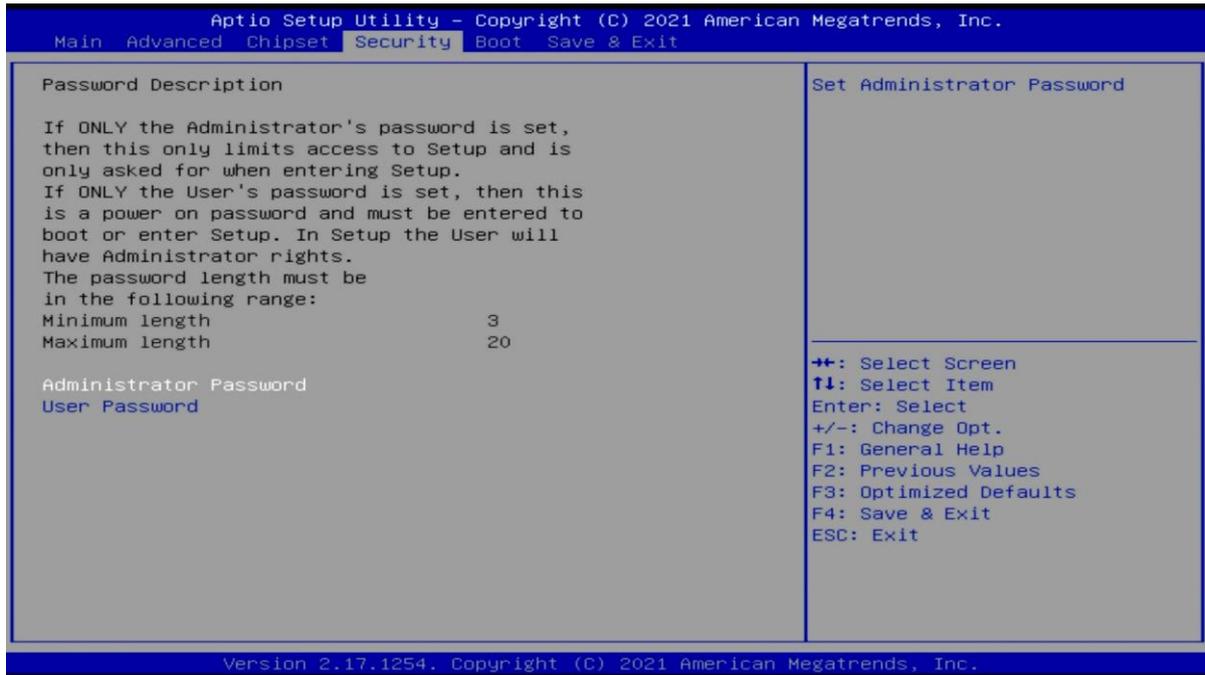
Use this item to select AC power state when power is re-applied after a power failure.

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

**Note: The option [Always On] and [Former State] are affected by ERP function.*

Please disable ERP to support [Always On] and [Former State] function.

3-9 Security Menu



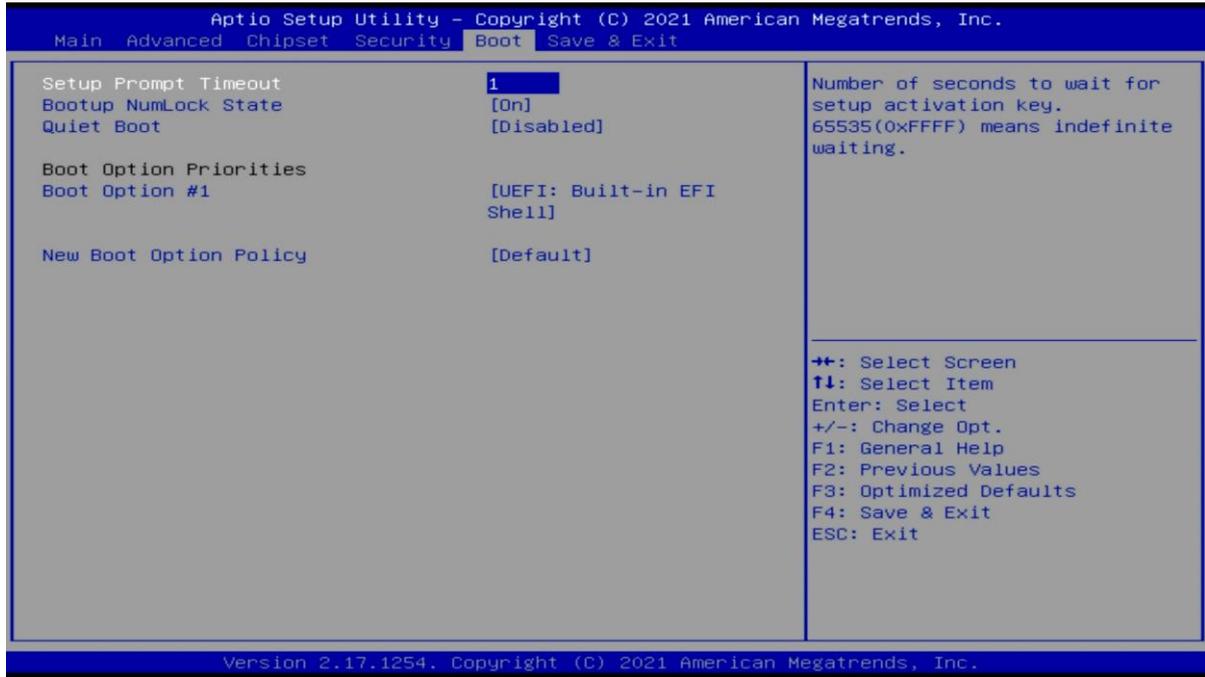
Security menu allow users to change administrator password and user password settings.

Administrator Password

User Password

If there is no password present on system, please press [Enter] to create new administrator password. If password is present on system, please press [Enter] to verify old password then to clear/change password. Press again to confirm the new administrator password.

3-10 Boot Menu



Boot Configuration

Setup Prompt Timeout

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

Bootup Numlock State

Use this item to select keyboard numlock state.

The optional settings are: [On]; [Off].

Quiet Boot

Use this item to enables or disable Quiet Boot option.

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

Boot Option Priorities

Boot Option #1

Use this item to decide system boot order from available options.

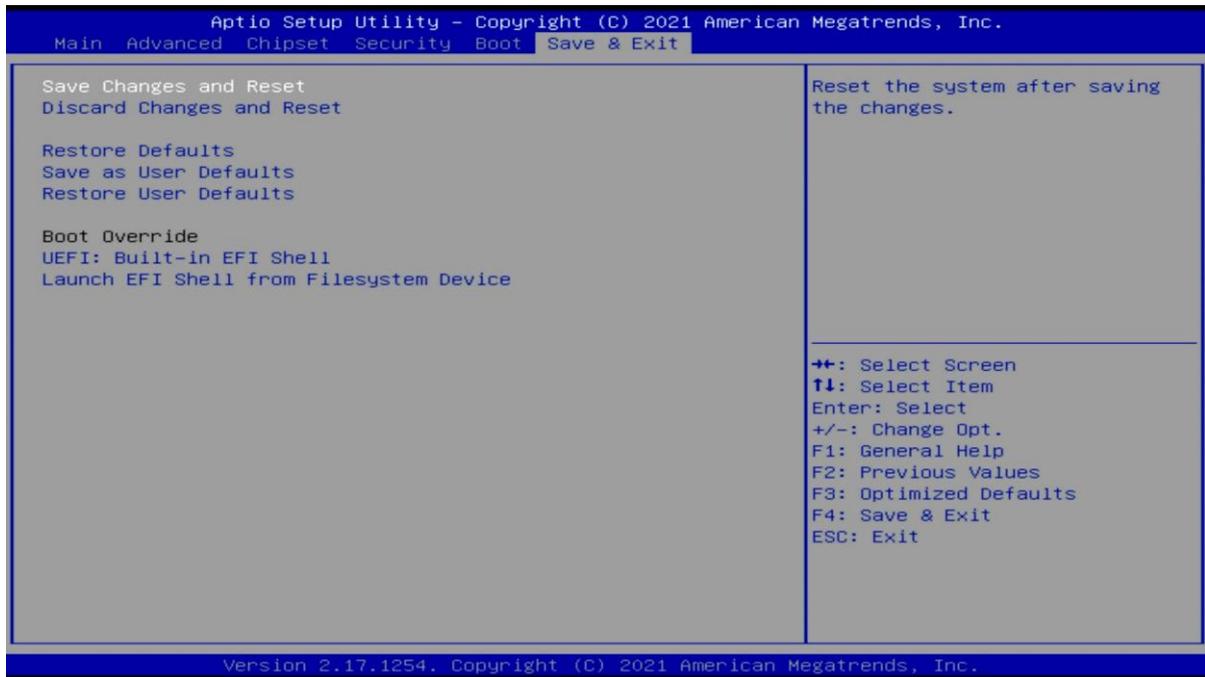
The optional settings: [UEFI: Built-in EFI Shell]; [Disabled].

New Boot Option Policy

This item controls the placement of newly detected UEFI boot options.

The optional settings are: [Default]; [Place First]; [Place Last].

3-11 Save & Exit Menu



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.

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 the user defaults to all the setup options.

Boot Override

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

This item is used for attempts to launch EFI shell application from one of the available file system devices.