Technical Manual

Of

Intel Braswell Series CPU

Based IPC M/B

NO.G03-NU941-F

Revision: 2.0

Release date: October 1, 2019

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.

TABLE OF CONTENT

⚠ 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

COPYRIGHT OF THIS MANUAL BELONGS TO THE MANUFACTURER. NO PART OF THIS MANUAL, INCLUDING THE PRODUCTS AND SOFTWARE DESCRIBED IN IT MAY BE REPRODUCED, TRANSMITTED OR TRANSLATED INTO ANY LANGUAGE IN ANY FORM OR BY ANY MEANS WITHOUT WRITTEN PERMISSION OF THE MANUFACTURER.

THIS MANUAL CONTAINS ALL INFORMATION REQUIRED TO USE THIS MOTHER-BOARD SERIES AND WE DO ASSURE THIS MANUAL MEETS USER'S REQUIREMENT BUT WILL CHANGE, CORRECT ANY TIME WITHOUT NOTICE. MANUFACTURER PROVIDES THIS MANUAL "AS IS" WITHOUT WARRANTY OF ANY KIND, AND WILL NOT BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTIAL OR CONSEQUENTIAL DAMAGES (INCLUDING DAMANGES FOR LOSS OF PROFIT, LOSS OF BUSINESS, LOSS OF USE OF DATA, INTERRUPTION OF BUSINESS AND THE LIKE).

PRODUCTS AND CORPORATE NAMES APPEARING IN THIS MANUAL MAY OR MAY NOT BE REGISTERED TRADEMARKS OR COPYRIGHTS OF THEIR RESPECTIVE COMPANIES, AND THEY ARE USED ONLY FOR IDENTIFICATION OR EXPLANATION AND TO THE OWNER'S BENEFIT, WITHOUT INTENT TO INFRINGE.

Manual Revision Information

Reversion	Revision History	Date
2.0	Second Edition	October 1, 2019

Item Checklist

☑ Motherboard
☑ Cable(s)

Chapter 1

Introduction of the Motherboard

1-1 Feature of Motherboard

■ Onboard Intel® Braswell series SoC Processor, with low power consumption never denies high performance

■ Support 1* DDR3L 1600MHz SO-DIMM, maximum capacity up to 8GB

■ Support onboard eMMC

■ Support 4 * RJ-45 gigabit Ethernet LAN port & 1* RJ-45 type COM port

■ Support1* HDMI port, 2*USB 3.0

■ Onboard 1* full-size Mini-PCIE slot & 1* SIM card slot

■ Onboard 1* M.2 M-key slot (type-2242 SATA interface for SSD device)

■ Support Intel AES NI and TPM 2.0 to secure customers' data

■ Compliance with ErP standard

■ Support Watchdog function

■ Solution for Firewall & IoT

1-2   Specification

Spec	Description
Design	● Non-standard form factor; PCB size: 114.6 mm x 103.6 mm
Embedded CPU	● Intel® Braswell *SoC* CPU* *CPU model varies from different IPC options. Please consult your dealer for more information of onboard CPU.*
Memory Slot	● 1 * DDR3L SO-DIMM slot ● Support 1* DDR3L 1600 MHz SO-DIMM up to 8GB
Expansion Slot	● 1* full-size USB 2.0 interface slot **(MPE)** ● 1* SIM card slot
Storage	● 1* M.2 Slot (Socket 3, M-key, support type-2242 SSD) ● 32GB onboard eMMC (default)
LAN Chip	● Integrated with 4* Intel I211AT PCI-E Gigabit LAN chips ● Support Fast Ethernet LAN function of providing 10/100/1000Mbps Ethernet data transfer rate
BIOS	● AMI Flash ROM
Front Panel I/O	● 1* HDMI port ● 2* USB 3.0 port ● 1* power button & 1* reset knob
Rear Panel I/O	● 1* 12V DC-in power jack ● 4* RJ-45 LAN port ● 1* RJ-45 COM port for console (**RJ45_COM1**)
Internal I/O	● 1* 2-pin internal 12V DC-in power connector ● 1* GPIO header ● 1* SMBUS header

** **Note:** 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 on Intel platforms which do not include EHCI controllers. Please contact your representative for more details.*

1-3   Layout Diagram

Front IO Panel Diagram:

Reset Knob

USB 3.0 Ports

HDMI Port

Power Switch/LED Button

Rear IO Panel Diagram:

RJ-45 LAN Ports (LAN1/2/3/4)

12V DC-in Power Jack

RJ-45 COM Port for Console
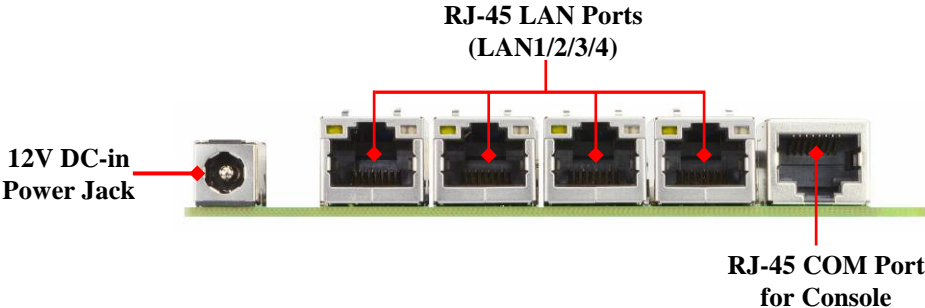
Internal Diagram-Front Side:

Internal 12V DC-In Power Connector

Full-size USB 2.0 Interface Slot (MPE)

MPE_PWR

GPIO Port Header

12V DC-in Power Jack

Power Switch/LED

M.2 SATA Slot (M2M)

HDMI Port

RJ-45 LAN Ports (LAN1/2/3/4)

SIM Card Socket

USB 3.0 Ports

RJ-45 COM Port

DDR3L SODIMM Slot

Reset Knob

JPCOM1

JP1

AT_COPEN

SMBUS Header
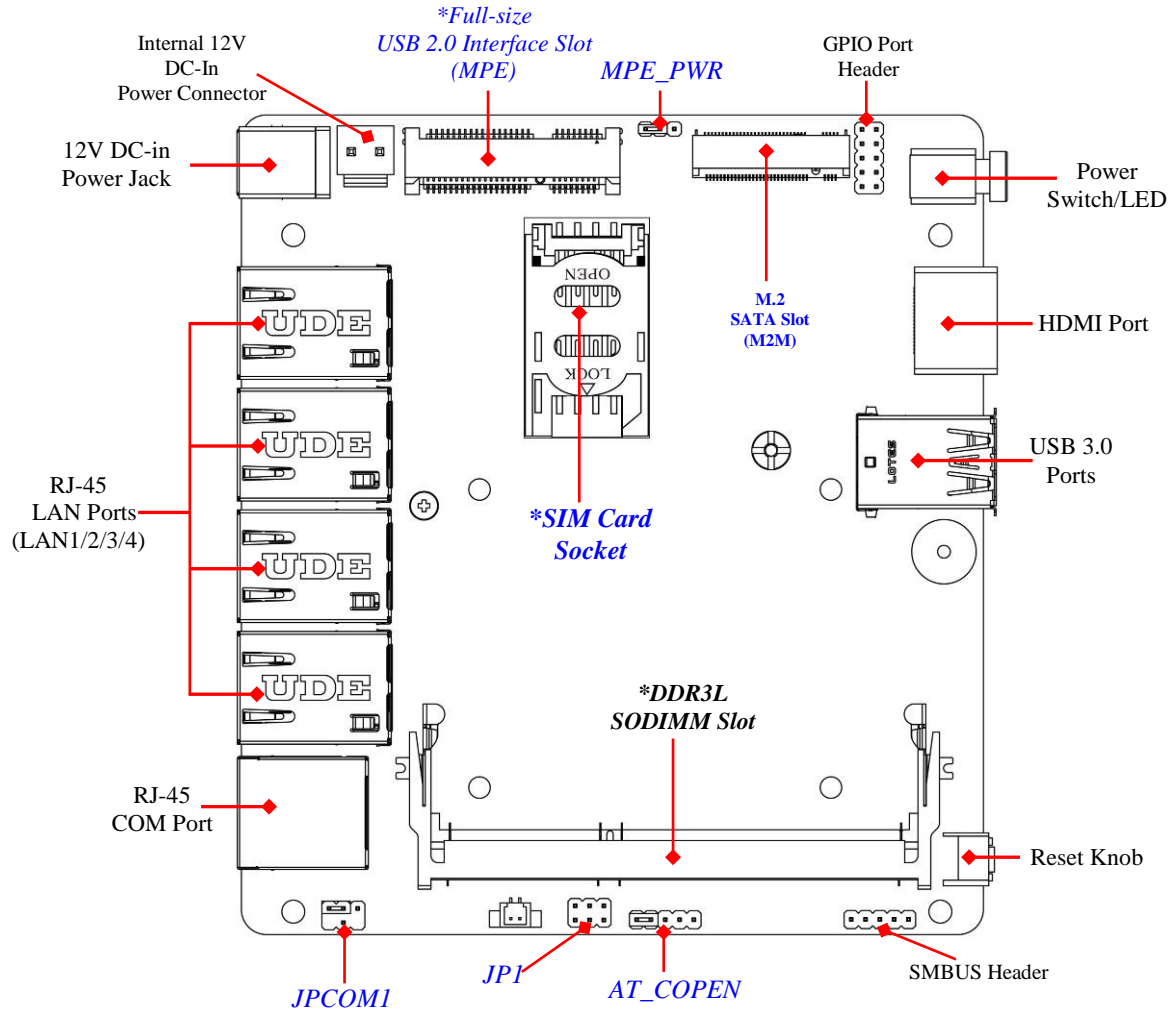
Note: 1. SODIMM module should be 1.35V DDRIII SODIMM and not exceeding 8GB total capacity.2. SIM card slot only work when compatible SIM card installed & 3G LAN card installed in full-size MPE(Support USB 2.0 specification only) slot.

Internal Diagram-Back Side:

32GB
eMMC

Intel CPU
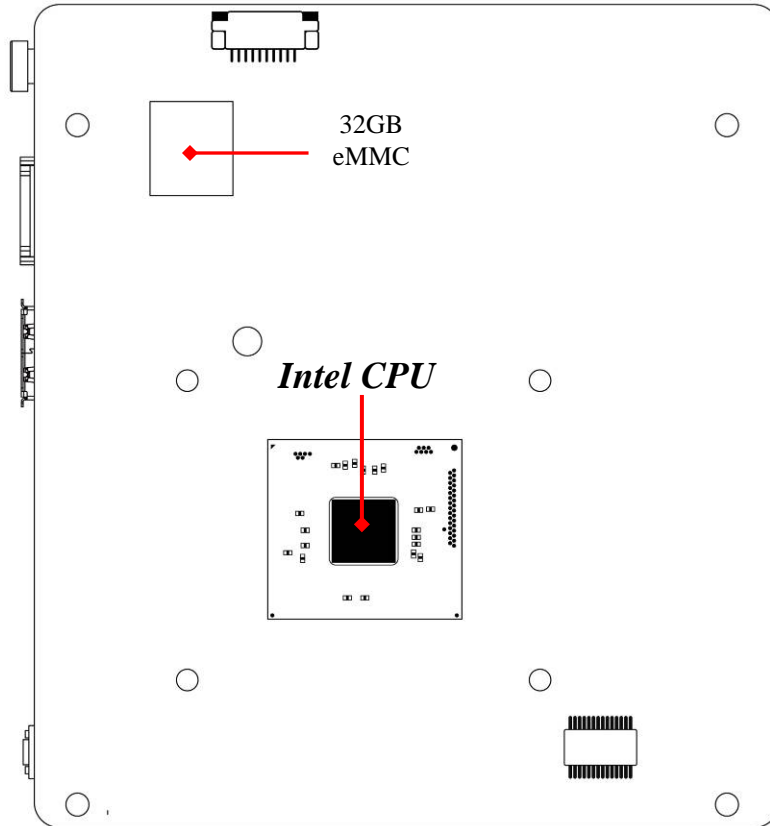
Note: *CPU is the most important part of the board and very fragile to any possible harm. Make sure that there is no damage to the CPU during any installation procedures!*

Connectors

Connector	Name
DCIN1	12V DC–in System Power Jack
LAN1/2/3/4	RJ-45 LAN Port Connector x4
RJ45_COM1	RJ-45 COM Port Connector for Console
HDMI	HDMI Port Connector
USB1	USB 3.0 Port Connector x2
DCIN2	Internal 12V DC–in System Power Connector
MPE	Full-size USB Interface Slot
M2M	M.2 SATA Slot
SIMCARD	SIM Card Socket

Headers

Header	Name	Description
GPIO	GPIO Header	10-pin Block
SMBUS	SMBUS Header	5-pin Block

Jumpers

Jumper	Name	Description
JP1	*Pin (1-2):* Clear CMOS *Pin (3-4):* RTC Reset *Pin (5-6):* Flash Override	6-Pin Block
JPCOM1	RJ45_COM1 Port Pin5 VCC Select	4-Pin Block
AT_ COPEN	*Pin(1-3):* ATX/AT Mode Select *Pin(4-5):* for Case Open Message Display	5-Pin Block
MPE_PWR	MPE Slot VCC Select	3-Pin Block

Chapter 2
Hardware Installation

2-1 Jumper Setting

Pin (1-2) of JP1 (6-pin): Clear CMOS RAM Setting
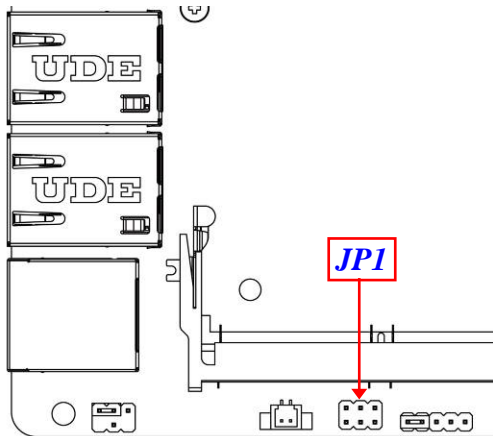
Pin 1&2 of JP1→
Clear CMOS Settings

1-2 Open: Normal;

1-2 Closed: Clear CMOS.
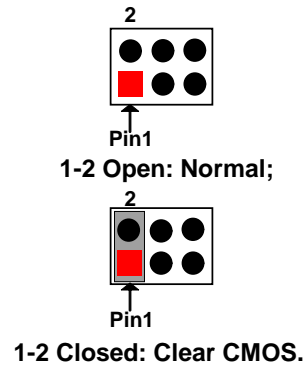
Pin (3-4) of JP1(6-pin): RTC RESET Select

Pin 3&4 of JP1→RTC RESET

3-4 Open: Normal;
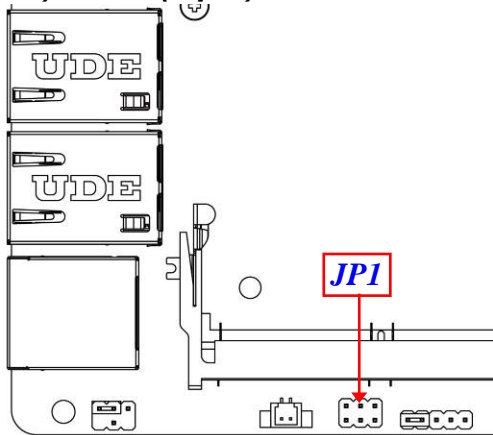
3-4 Closed: RTC RESET.
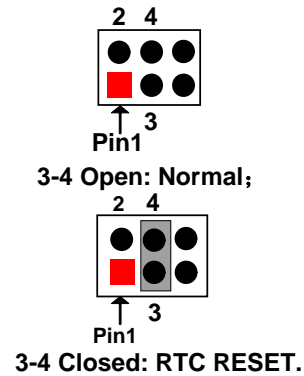
Pin (5-6) of JP1(6-pin): Flash Override Select
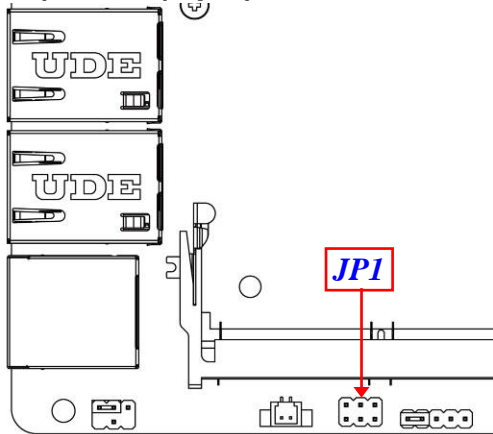
Pin 5&6 of JP1→ Flash Override
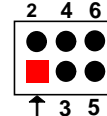
```
  2  4  6
  ●  ●  ●
  ■  ●  ●
     3  5
Pin1
```
**5-6 Open:Enable Security Measures
in the Flash Descriptor(Default);**
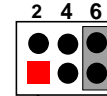
```
  2  4  6
  ●  ●  ▓
  ■  ●  ▓
     3  5
Pin1
```
**5-6 Closed: Disable Security Measures
in the Flash Descriptor(Override).**

JPCOM1 (4-pin): RJ45_COM1 Port Pin5 VCC Select

```
2  4  6
●  ●  ●
   ●
1  3  5
```
**2-4 Closed:
Pin5=NC;**

```
2  4  6
●  ●  ●
   ●
1  3  5
```
**3-4 Closed:
Pin5 = 5V;**
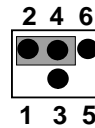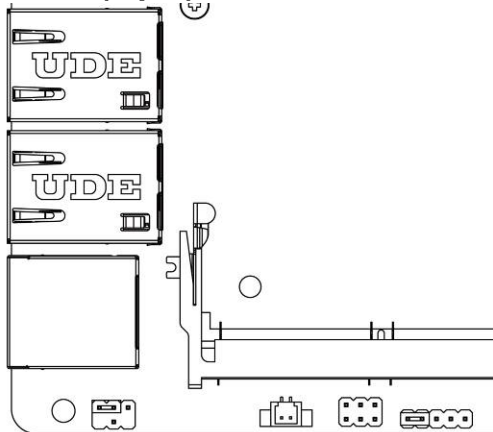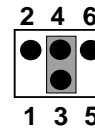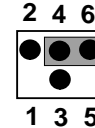
```
2  4  6
●  ●  ●
   ●
1  3  5
```
**4-6 Closed:
Pin5 = 12V.**

Pin (1-3) of AT_COPEN (5-pin): *ATX Mode & AT Mode Select*
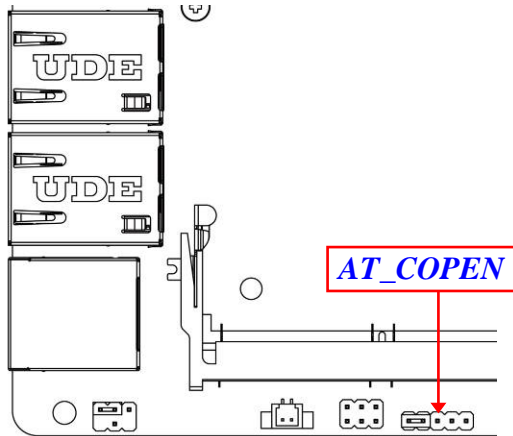
Pin(1-3) of AT_COPEN→ATX/AT Mode Select

Pin1→ ■●●●● 5

1-2 Closed: ATX Mode Selected;

Pin1→ ■●●●● 5

2-3 Closed: AT Mode Selected.

Note: ATX Mode Selected: Press power button to power on after power input ready;
   AT Mode Selected: Directly power on as power input ready.
   User needs to restart the system for the settings to take effect.

Pin (4-5) of AT_COPEN (5-pin):Case Open Message Display Function Select
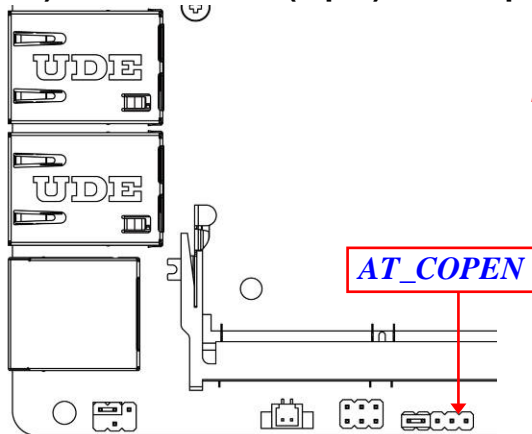
Pin(4-5) of AT_COPEN→Case Open Detection

Pin1→ ■●●●● 5

GND
CASE OPEN

Pin (4-5) short: 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.

MPE_PWR(3-pin): MPE Slot VCC Select
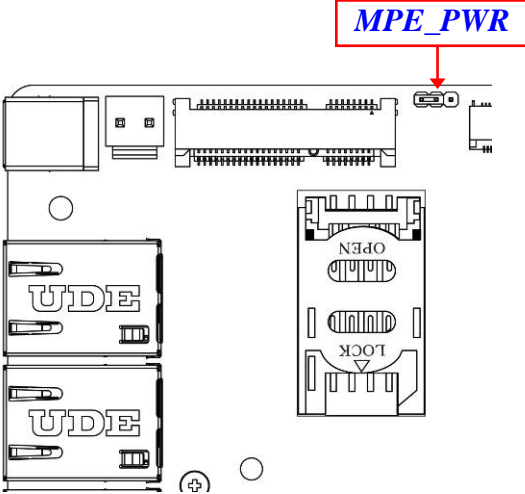
MPE_PWR

MPE_PWR→MPE Slot VCC

1   3
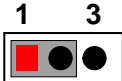
1-2 Closed:MPE Slot VCC= 3.3V;

1   3
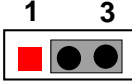
2-3 Closed: MPE Slot VCC = 3.3VSB.

2-2 Connectors and Headers

2-2-1 Connectors

(1) External I/O:

Refer to Page-3.

Icon	*Name*	*Function*
	Power Connector	12V DC–in system power connector For user to connect compatible power adapter to provide power supply for the system.
	RJ-45 LAN Port	This connector is standard RJ-45 LAN jack for Network connection.
	RJ-45 COM Port	This connector is a RJ-45 COM port for console function.
	HDMI Port	To connect display device that support HDMI specification.
	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.
	Power Button/LED	For user to power on/off the system, also function as power status LED.
	Reset knob	For user to reset the system.

(2) RJ45_COM1(8-pin block): RJ-45 COM Port Connector for Console

RJ45_COM1

Pin8 →
Pin1 →
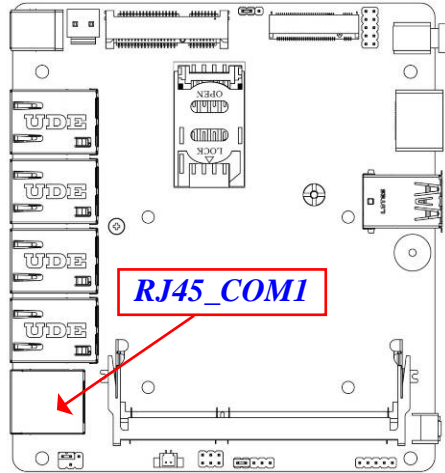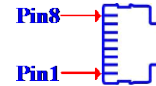
Pin No.	Definition
1	RTS
2	DTR
3	TXD
4	GND
5	GND/VCC/+12V
6	RXD
7	DSR
8	CTS

*Note: Please set **Pin (2-4)** of Jumper **JPCOM1** as closed, when apply Console cable to RJ45-COM1 port (refer to page-8).*

(3) DCIN2 (2-pin): Internal 12V DC-in power connector
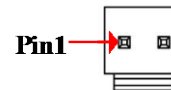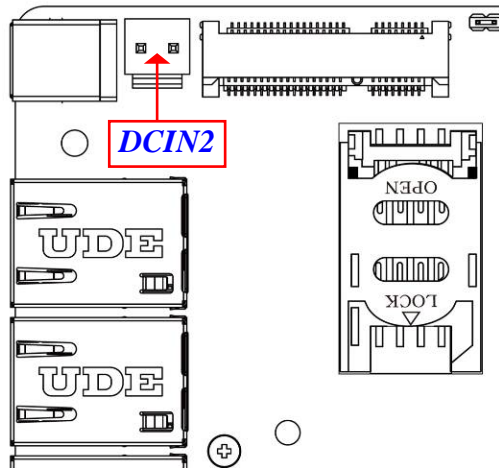
DCIN2

Pin1 →

Pin No.	Definition
1	+12V DC_IN
2	GND

2-2-2 Headers

GPIO_CON (10-pin): GPIO Port Header

VCC	GND
GPIO_57	GPIO_56
GPIO_55	GPIO_54
GPIO_53	GPIO_52
GPIO_51	GPIO_50

2

Pin1

SMBUS (5-Pin): SMBUS Header

SMBUS_CLK
SMBUS_DATA
NC
GND
3VSB

Pin1 →
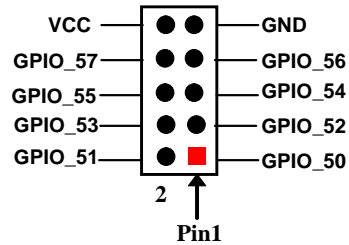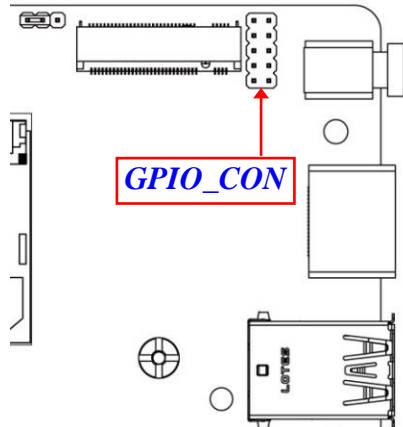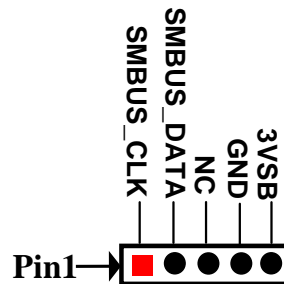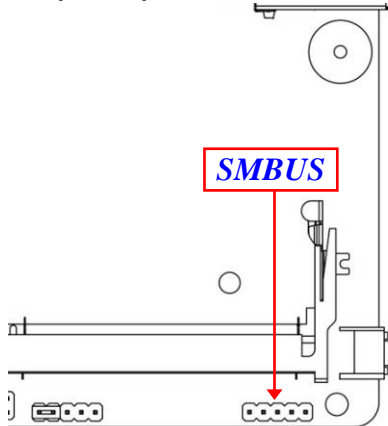
Chapter 3
Introducing BIOS

Notice!	The BIOS options in this manual are for reference only. Due to constant update/upgrade, the BIOS screens in the manual (usually first version) may be different from the actual available version. 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:

Menu Bar

```
        Aptio Setup Utility - Copyright (C) 2019 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             5.11
  Filename                 BAU9IA01
  Build Date and Time      06/11/2019 16:33:53
  Access Level             Administrator

  TXE Information
  TXE FW Version           02.00.05.3117

  System Date              [Tue 01/01/2019]
  System Time              [00:07:49]
                                                         ++: Select Screen
                                                         ↑↓: 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) 2019 American Megatrends, Inc.
```

General Help Items

Current Setting Value

Function Keys

Menu Items

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) 2019 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                    5.11
    Filename                        BAU9IA01
    Build Date and Time             06/11/2019 16:33:53
    Access Level                    Administrator

    TXE Information
    TXE FW Version                  02.00.05.3117

    System Date                     [Tue 01/01/2019]
    System Time                     [00:07:49]

                                                               →←: Select Screen
                                                               ↑↓: 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) 2019 American Megatrends, Inc.
```

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) 2019 American Megatrends, Inc.
  Main  Advanced  Chipset  Security  Boot  Save & Exit

 ▶ Trusted Computing                               Trusted Computing Settings
 ▶ ACPI Settings
 ▶ Super IO Configuration
 ▶ Serial Port Console Redirection
 ▶ PC Health Status
 ▶ CPU Configuration
 ▶ SATA Configuration
 ▶ Network Stack Configuration
 ▶ CSM Configuration
 ▶ Wake-up Function Settings
 ▶ USB Configuration
 ▶ IntelRMT Configuration

 ▶ Intel(R) I211 Gigabit  Network Connection -    →←: Select Screen
   00:30:18:28:21:09                               ↑↓: Select Item
 ▶ Intel(R) I211 Gigabit  Network Connection -     Enter: Select
   00:30:18:28:21:0A                               +/-: Change Opt.
 ▶ Intel(R) I211 Gigabit  Network Connection -     F1: General Help
   00:30:18:28:21:0B                               F2: Previous Values
 ▶ Intel(R) I211 Gigabit  Network Connection -     F3: Optimized Defaults
   00:30:18:28:21:0C                               F4: Save & Exit
                                                   ESC: Exit

            Version 2.17.1254. Copyright (C) 2019 American Megatrends, Inc.
```

▶ **Trusted Computing**
Press [Enter] to enable or disable Security Device Support.
Configuration

Security Device Support
Use this item to enable or disable BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available. The optional settings: [Disabled]; [Enabled].
Note: in the case that the model is onboard with optional TPM function, the following items will show up for user to make further settings:
Active PCR Banks
The optional setting is: [SHA-1].
Available PCR Banks
The optional setting is: [SHA-1,SHA256].

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].

TPM2.0 UEFI Spec Version
Use this item to select the TCG2 spec. version supported.
The optional settings: [1.0]; [1.x].
[1.0]: compatible mode for Win8/Win10.
[1.x]: for TCG2 newer spec. compatible mode for Win10.

▸ **ACPI Settings**
Press [Enter] to make settings for the following sub-item:
<u>*ACPI Settings*</u>

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 IO Configuration**
Press [Enter] to make settings for the following sub-items:
<u>*Super IO Configuration*</u>

▸ **Serial Port 1 Configuration**
Press [Enter] to make settings for the following items:
<u>*Serial Port 1 Configuration*</u>

Serial Port
Use this item to enable or disable serial port (COM).
The optional settings: [Disabled]; [Enabled].
*When set as [Enabled], user can make further settings in the following items:
Change Settings

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

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

ERP Support

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

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 **Pin (4-5)** of AT_COPEN has been short or not (refer to Page 9); if these two pins short, system will show Case Open Message during POST.

WatchDog Reset Timer

Use this item to enable or disable WatchDog Timer 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 [10] to [255] when '**WatchDog Reset Timer Unit**' is set as [Sec.], or [1] to [255] when '**WatchDog Reset Timer Unit**' is set as [Min.].

WatchDog Reset Timer Unit

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

WatchDog Wake-up Timer

This item support WDT wake-up while ERP function is set as [Enabled].

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

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

WatchDog Wake-up Timer Value

The setting range is [10] ~ [4095] seconds, or [1] ~ [4095] minutes.

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 *Page 9*, **Pin (1-3) of AT_COPEN** for ATX Mode & AT Mode Select).

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

▸ **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: [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: [9600]; [19200]; [38400]; [57600]; [115200].
Data Bits
The optional settings: [7]; [8].
Parity

A parity bit can be sent with the data bits to detect some transmission errors.
The optional settings: [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: [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: [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: [Disabled]; [Enabled].

Recorder Mode
With this mode enable only text will be sent. This is to capture Terminal data.
The optional settings: [Disabled]; [Enabled].

Resolution 100x31
Use this item to enable or disable extended terminal resolution.
The optional settings: [Disabled]; [Enabled].

Legacy OS Redirection Resolution
On Legacy OS, the Number of Rows and Columns supported redirection.
The optional settings: [80x24]; [80x25].

Putty KeyPad
Use this item to select Functionn Key and Key Pad on Putty.

The optional settings: [VT100]; [LINUX]; [XTERMR6]; [SCO]; [ESCN]; [VT400].
Redirection After BIOS POST
The optional settings are: [Always Enable]; [BootLoader].
Whet Bootloader is selected, then Lagacy Console Redirection is disabled before booting to legacy OS. When Always Enable is selected, then Legacy Console is enabled for legacy OS. Default setting for this option is set to Always Enable.

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

Console Redirection
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.
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
Microsoft Windows Emergency Management Services (EMS) allows for remote management of a Windows Server OS through a serial port.
The default setting is: [COM1].
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 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 set shutdown temperature or view current hardware health status.

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°C/185°F]; [90°C/194°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

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

Use this item to enable or disable Intel SpeedStep.

When set as [Enabled], user can make further settings in 'Turbo Mode':

Turbo Mode

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

Use this item to enable or disable Intel Turbo Mode.

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

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].

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
The optional settings are: [Enabled]; [Disabled].
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 boot optional will not be created.
Ipv6 PXE Support
The optional settings are: [Disabled]; [Enabled].
Use this item to enable Ipv6 PXE Boot Support. When set as [Disabled], Ipv6 boot optional will not be created.
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.
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 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], system will wake on the current time + increased minute(s).The settings range is from [1] ~ [60] minute(s).
USB Wake-up from S3-S4
Use this item to enable or disable USB Wake-up from S3-S4 state.
The optional settings: [Disabled]; [Enabled].
*Note: This item is only supported when **'ERP Support'** is set as [Disabled]. Please disable ERP before activating this function in S4 state.*

▶ **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.
The optional settings: [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.
‣ **IntelRMT Configuration**
Press [Enter] to make settings for the following sub-item:
IntelRMT Configuration
Intel RMT Support
The optional settings are: [Enabled]; [Disabled].
Intel RMT(Ready Mode Technology) SSDT table will be loaded if it is set as [Enabled].
*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(R) I211 Gigabit Network Connection -XX:XX:XX:XX:XX:XX/ Intel(R) I211 Gigabit Network Connection -XX:XX:XX:XX:XX:XX/ Intel(R) I211 Gigabit Network Connection -XX:XX:XX:XX:XX:XX/ Intel(R) I211 Gigabit**

Network Connection -XX:XX:XX:XX:XX:XX

This item gives Intel gigabit ethernet controller basic driver information.

3-8 Chipset Menu

```
            Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
    Main   Advanced   Chipset   Security   Boot   Save & Exit

  ▶ North Bridge                                          North Bridge Parameters
  ▶ South Bridge




                                                       ←→: Select Screen
                                                       ↑↓: 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) 2019 American Megatrends, Inc.
```
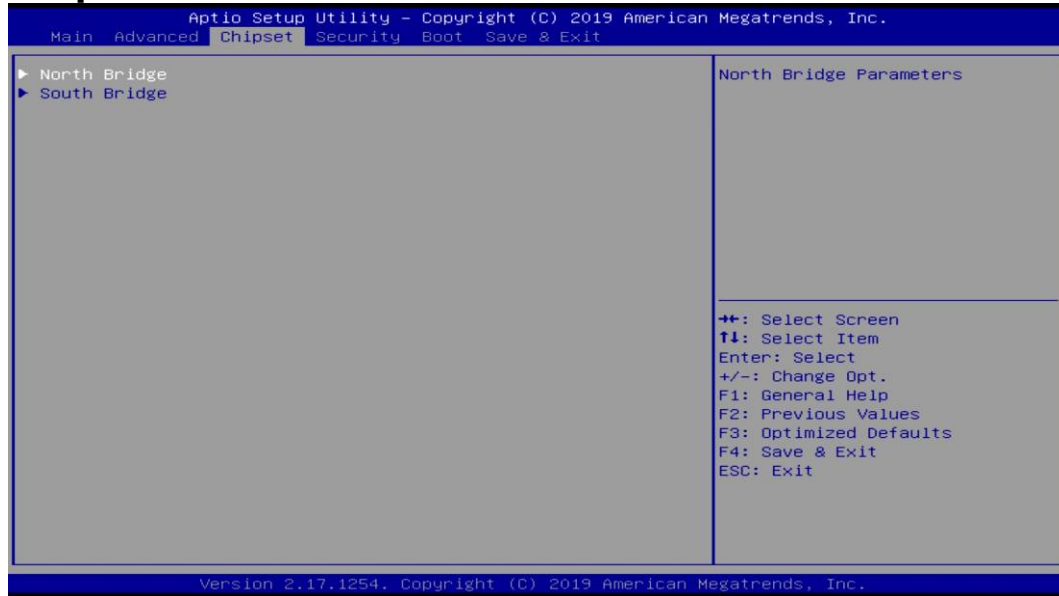
▶ **North Bridge**

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: [128MB]; [256MB]; [MAX].

Aperture Size

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

GTT Size

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

Memory Information

System will show total memory capacity on the screen,

Max TOLUD

Use this select maximum value of TOLUD.

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

▸ **South Bridge**

Press [Enter] to make further settings in thefollowing configuration.

Onboard PCIE LAN1

The default setting is:[Enabled].

Onboard PCIE LAN2/ Onboard PCIE LAN3/ Onboard PCIE LAN4

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

    Azalia HDMI Codec

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

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

SCC eMMC Support

Use this item to enable or disable eMMC support.

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

System State after Power Failure

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

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

```
                Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
        Main  Advanced  Chipset  Security  Boot  Save & Exit

        Password Description                            Set Administrator Password

        If ONLY the Administrator's password is set,
        then this only limits access to Setup and is
        only asked for when entering Setup.
        If ONLY the User's password is set, then this
        is a power on password and must be entered to
        boot or enter Setup. In Setup the User will
        have Administrator rights.
        The password length must be
        in the following range:
        Minimum length              3
        Maximum length              20
                                                        →←: Select Screen
        Administrator Password                          ↑↓: Select Item
        User Password                                   Enter: Select
                                                        +/-: Change Opt.
                                                        F1: General Help
                                                        F2: Previous Values
                                                        F3: Optimized Defaults
                                                        F4: Save & Exit
                                                        ESC: Exit


                Version 2.17.1254. Copyright (C) 2019 American Megatrends, Inc.
```

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

```
           Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
     Main  Advanced  Chipset  Security  Boot  Save & Exit

     Setup Prompt Timeout            1                    Number of seconds to wait for
     Bootup NumLock State            [On]                 setup activation key.
     Quiet Boot                      [Disabled]           65535(0xFFFF) means indefinite
                                                          waiting.
     Boot Option Priorities
     Boot Option #1                  [MMC - BJTD4R]
     Boot Option #2                  [UEFI: Built-in EFI
                                     Shell]

     New Boot Option Policy          [Place First]

     Hard Drive BBS Priorities
                                                          →←: Select Screen
                                                          ↑↓: 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) 2019 American Megatrends, Inc.
```

Boot Configuration

Setup Prompt Timeout
Use this item to set number of seconds to wait for setup activation key.
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.
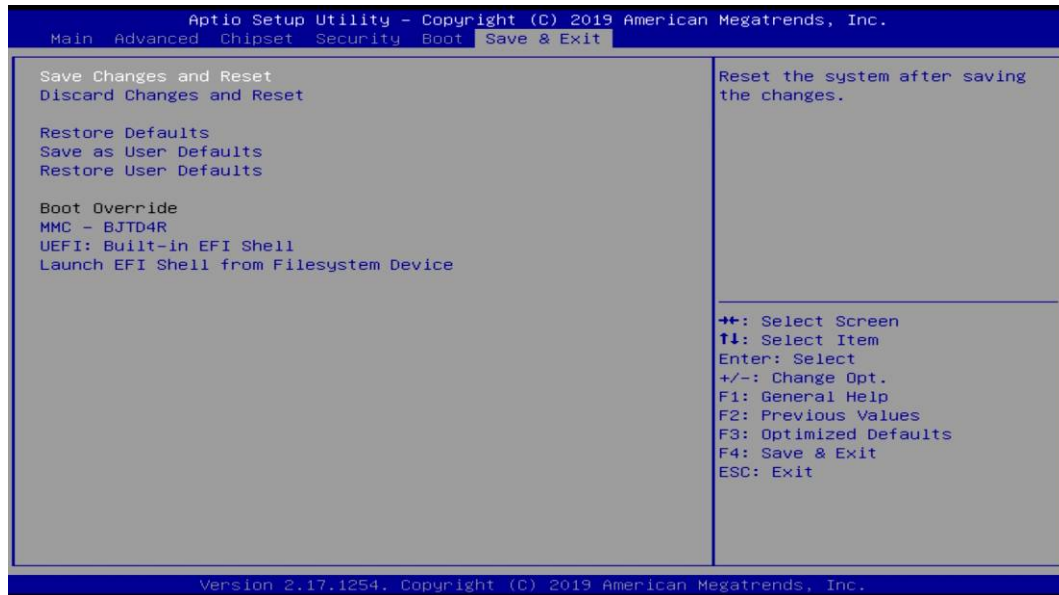**New Boot Option Policy**
This item controls the placement of newly detected UEFI boot options.

The optional settings are: [Default]; [Place First]; [Place Last].
Hard Drive BBS Priorities
Use this item to set the order of the legacy devices in this group.

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

UEFI:xx/…
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.