Technical Manual

Of

Intel Skylake-U Series CPU

Based IPC M/B

NO. G03-NF551-F

Revision: 2.0

Release date: October 1, 2019

Trademark:

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

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 high-performance Intel® Skylake-U series SoC CPU
- Support 2 * DDR4 2133MHz Dual Channel SO-DIMM, max up to 32GB
- Support 2 * display port
- Support 2 * SATAIII (6Gb/s) Device
- Support 1* full-size m-SATA device (***share with Mini-PCIE***)
- Support 2* full-size Mini-PCIE device *(**one share with MSATA**)*
- Support 1*external RJ-45 COM port & 1 * internal RS232/422/485 COM port
- Support 6* RJ-45 Gigabit Ethernet LAN port
- Support USB 3.0 data transport demand
- Support CPU Over-Temperature protection
- Support CPU Over-Current/Under Voltage protection
- Support CPU Smart FAN
- Compliance with ErP standard
- Support Watchdog function

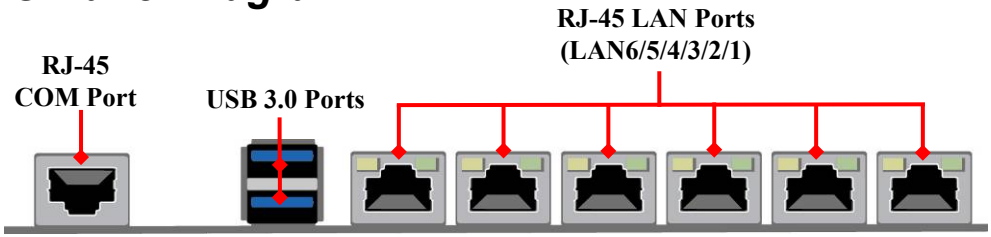
1-2 Specification

Spec	Description
Design	● 6- layer; PCB size: 13.8 x 16.6 cm
Embedded CPU	● Integrated with Intel® Skylake-U series CPU;TDP:15W **CPU model varies from different IPC options. Please consult your dealer for more information of onboard CPU.*
Memory Slot	● 2*DDR4 SO-DIMM slot support 2* DDR4 2133 MHz SO-DIMM up to 32GB ● Support dual channel function
Expansion Slot	● 1* Full-size Mini-PCIE slot (**MPE**) ● 1* Full-size Mini-PCIE/MSATA slot (***MPEST,*** *share with MSATA slot*) ● 1* SIM card slot
LAN Chip	● Integrated with 1* Intel I211AT PCI-E gigabit LAN chip, 1* Intel I219LM PHY gigabit LAN chip & 1* I350AM4 gigabit LAN chip ● Support Fast Ethernet LAN function of providing 10/100/1000Mbps Ethernet data transfer rate
Storage	● 1*SATAIII 6G/s port ● 1* 7+15 pin HDD Connector for 2.5" SATAHDD ● 1* Full-size MSATA slot (***MPST,*** *share with Mini-PCIE slot*)
BIOS	● AMI 128MB Flash ROM
Rear I/O	● 1* 12V lockable DC-in system power Jack ● 1* Reset switch button & 1* Power switch button ● 2* Display port connector ● 2* USB 2.0 port &2* USB 3.0 port ● 1* GPIO port
Front I/O	● 1* RJ-45 COM port for Console (**COM1**) ● 6* RJ-45 LAN port ● 2* USB 3.0 port
Internal I/O	● 1* 2-Pin internal 12V DC-in system power connector ● 1* Front panel header

	● 1* SMBUS header ● 1* 4-pin LAN LED activity header ● 1* 8-pin LAN LED activity header ● 1* PS/2 keyboard & mouse header ● 1* SATA Power-out connector ● 1* CPUFAN header ● 1* RS232/422/485 serial port header(***COM2***) ● 1* 9-pin USB 2.0 header (Expansible to 2* USB 2.0 ports)

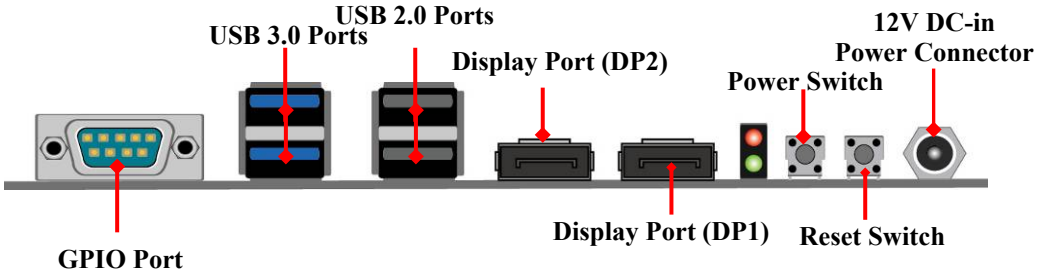
1-3 Layout Diagram

Rear IO Panel Diagram:

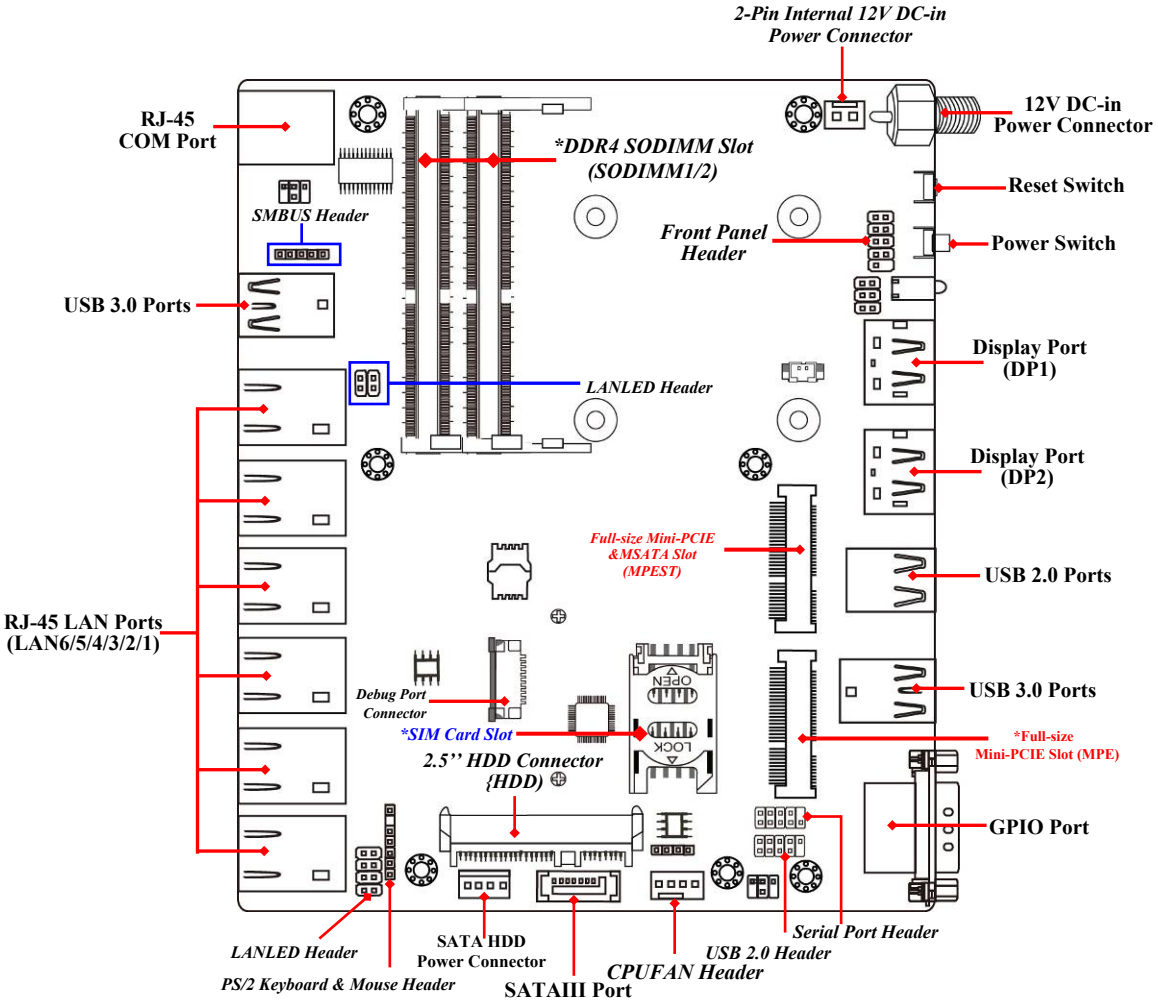


Warning!! The board has a 12V DC-in power connector (DCIN) in I/O back panel and an internal ATX12V (ATX2P) power connector. User can only connect one type of compatible power supply to one of them to power the system.

Front IO Panel Diagram:

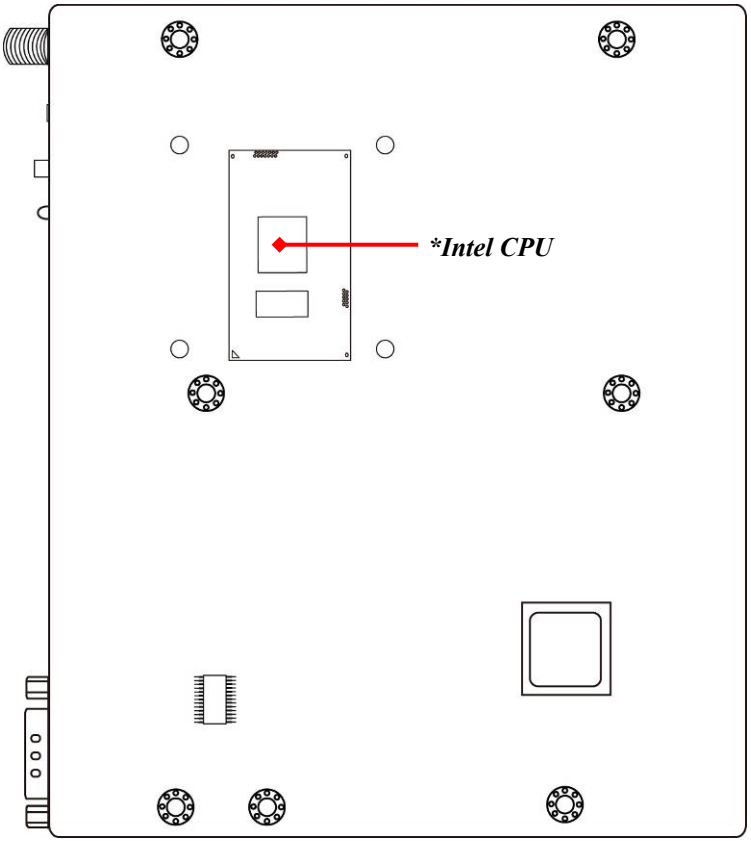


Motherboard Internal Diagram-Front Side



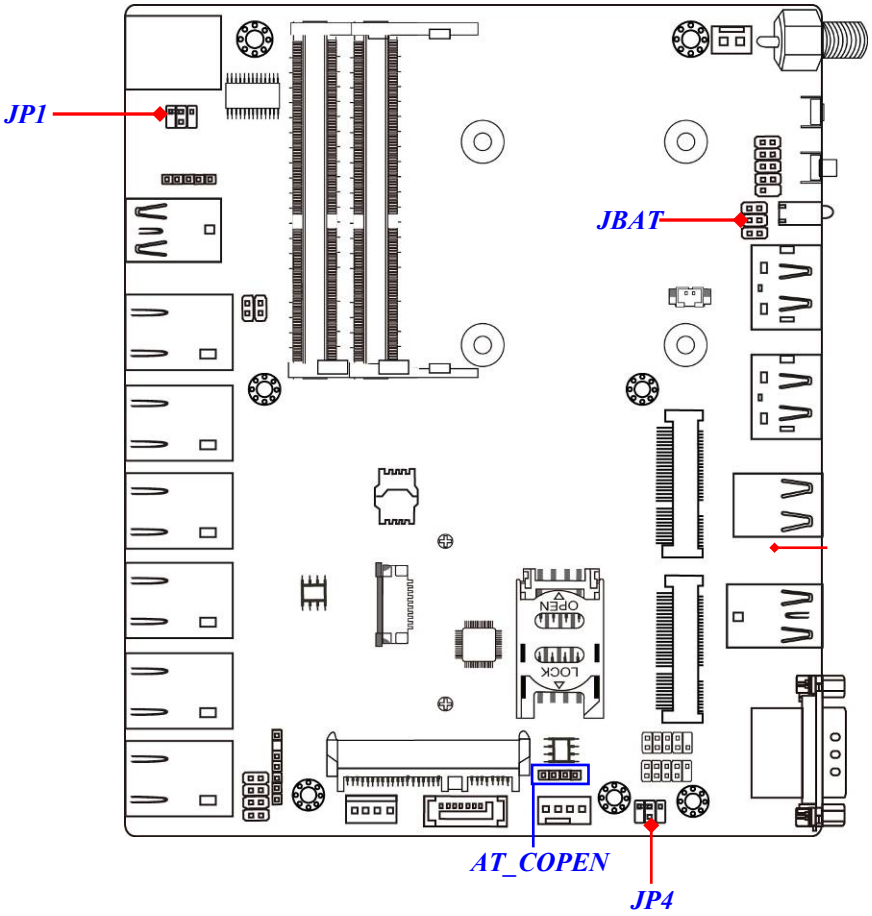
***Note: SIM card slot** only work **when** compatible SIM card installed & 3G LAN card installed in **MPE** Mini-PCIE slot.*

Motherboard Internal Diagram-Back Side



***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!*

Jumper Position:



Jumper

Jumper	Name	Description
JP1	COM1 Port Pin-5 VCC Select	4-Pin Block
JP4	COM2 Header Pin9 Function Select	4-Pin Block
JBAT	***Pin (1&2):*** Clear CMOS RAM Setting ***Pin(3&4):*** Flash Descriptor Security Override ***Pin (5&6):***POK Override	6-Pin Block
AT_COPEN	***Pin (1&2):*** ATX Mode / AT Mode Select ***Pin(3&4):*** Case Open Message Display Function	4-Pin Block

Connectors

Connector	Name
DCIN	12V System DC–in Power Jack Connector
ATX2P	Internal 12V System DC–in Power Connector
DP1/DP2	Display Port Connector x2
USB20	USB 2.0 Port Connector x2
USB30	USB 3.0 Port Connector x2
GPIO	GPIO Port Connector
COM1	Serial Port Connector
USB31	USB 3.0 Port Connector x2
LAN6/5/4/3/2/1	RJ-45 LAN Port Connector x6
HDD	7+15 pin HDD Connector for 2.5'' SATA HDD
SATAPWR	SATA Power out Connector
CPUFAN	CPUFAN Connector

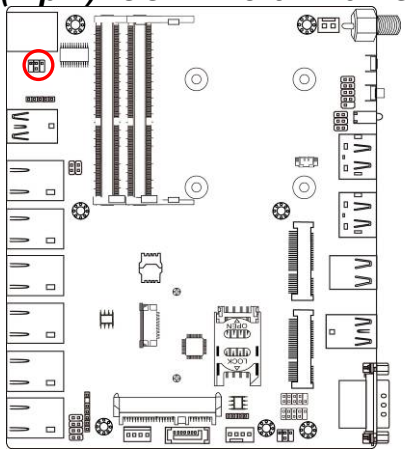
Headers

Header	Name	Description
JW_FP	Front Panel Header(PWR LED/ HDD LED/Power Button /Reset)	9-pin Block
SMBUS	SMBUS Header	5-pin Block
PS2KBMS	PS/2 Keyboard & Mouse Header	6-pin Block
JP2	LAN Activity LED Header	4-pin Block
JP3	LAN Activity LED Header	8-pin Block
FP_USB20	USB 2.0 Header	9-pin Block
FP_COM2	Serial Port Header	9-pin Block

Chapter 2
Hardware Installation

2-1 Jumper Setting

JP1 (4-pin): COM1 Port Pin5 VCC Select



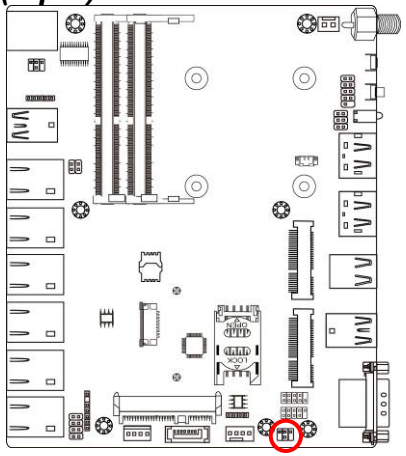
JP1→COM1 Port Pin5 VCC Select

2-4 Closed: Pin5=RING (Default);

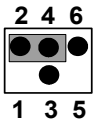
3-4 Closed: Pin5=+5V;

4-6 Closed: Pin5=+12V.

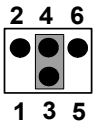
JP4 (4-pin): COM2 Header Pin9 Function Select



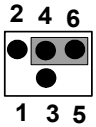
JP4→COM2 Header Pin-9



2-4 Closed: Pin9= RING (Default);

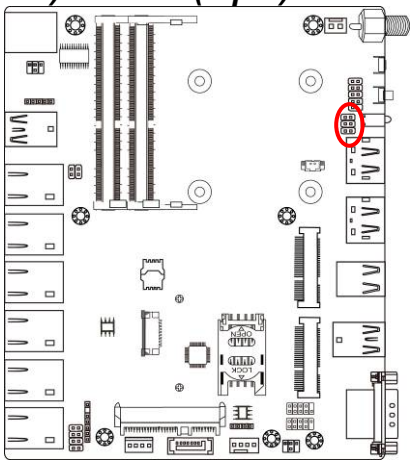


3-4 Closed: Pin9=+5V;

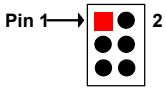


4-6 Closed: Pin9=+12V.

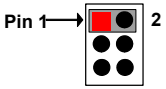
Pin(1&2)of JBAT (6-pin): Clear CMOS RAM Setting



Pin (1&2) of JBAT→ Clear CMOS

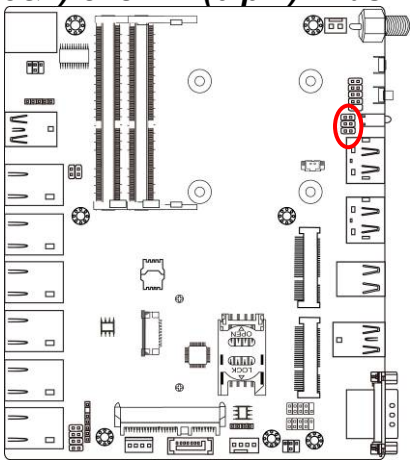


1-2 Open: Normal(Default);

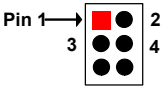


1-2 Closed: Clear CMOS(One Touch).

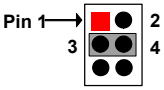
Pin (3&4) of JBAT(6-pin): Flash Descriptor Security Override



Pin (3&4) of JBAT→ Flash Descriptor Security Override

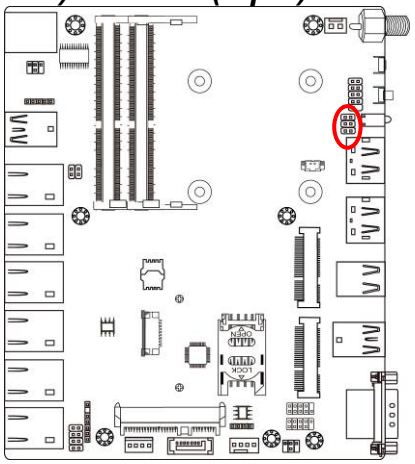


3-4 Open: Enable security measures defined in the Flash Descriptor (Default);

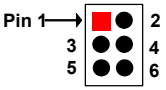


3-4 Closed: Disable Flash Descriptor security measures (override).

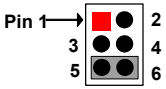
Pin (5&6) of JBAT (6-pin): POK Override Function Select



Pin (5&6) of JBAT→ POK Override

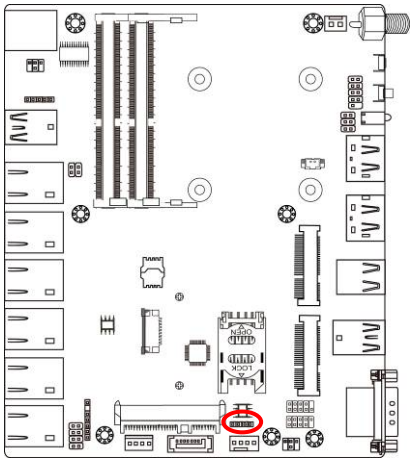


5-6 Open: Normal (Default);

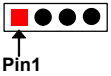


5-6 Closed: POK Override Selected.

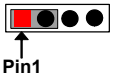
Pin (1&2) of AT_COPEN (4-pin): ATX Mode/AT Mode Select



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



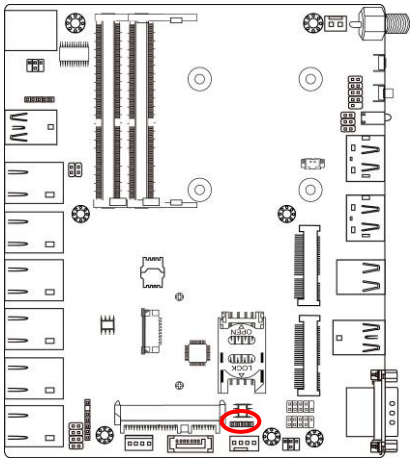
1-2 Open: ATX Mode Selected(Default);



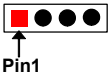
1-2 Closed: AT Mode Selected.

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

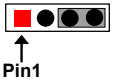
Pin (3&4)of AT_COPEN(6pin):Case Open Message Display Function Select



Pin (3&4) of AT_COPEN→ Case Open Function Select



3-4 Open: Normal (Default);



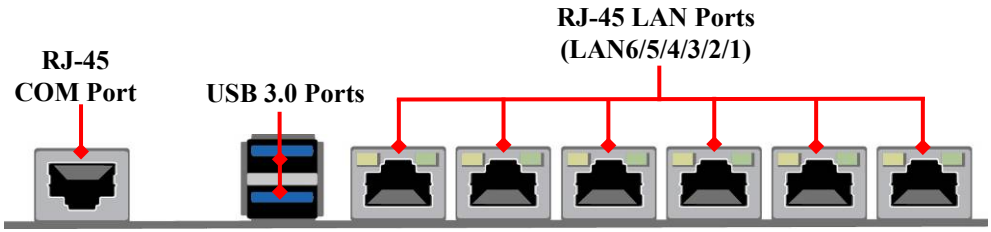
3-4 Closed: Case Open Function. Selected(One Touch).

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

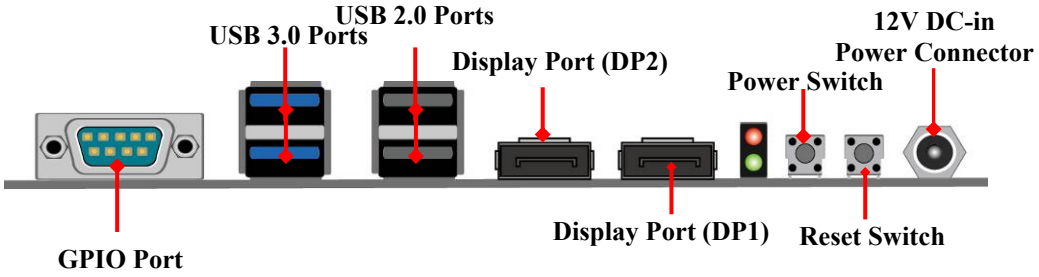
2-2 Connectors and Headers

2-2-1 Connectors

(1) Rear I/O Connectors:

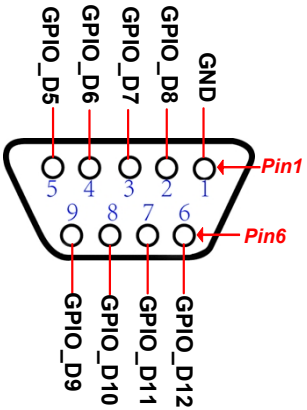


(2) Front IO Panel Diagram:

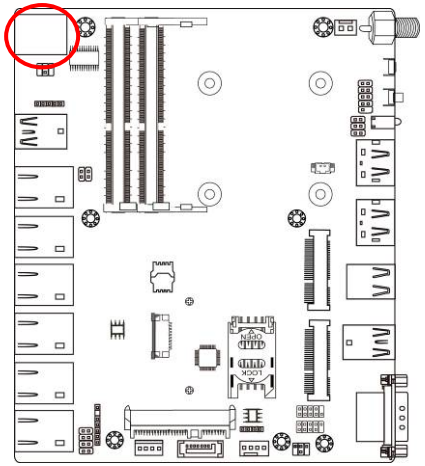


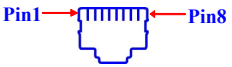
Icon	Name	Function
	**12V DC-in Power Connector**	For user to connect compatible power adapter to provide power supply for the system.
	**Display Port**	To the system to corresponding display device with compatible display port cable.
	**USB 2.0 Port**	To connect USB keyboard, mouse or other devices compatible with USB 2.0 specification.
	**USB 3.0 Port**	To connect USB keyboard, mouse or other devices compatible with USB 3.0 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.
	**RJ-45 COM Port**	This connector is a RJ-45 COM port for console function.
	**GPIO Port**	General Purpose Input Output port.

(3) GPIO (9-pin Block): GPIO Port



(4) COM1(8-pin block): RJ-45 COM Port Connector for Console

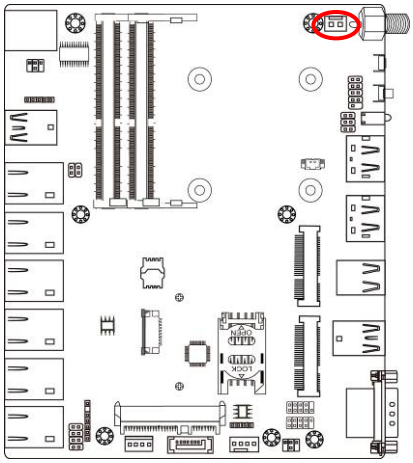




Pin No.	Definition
1	RTS
2	DTR
3	TXD
4	GND
5	RING/+5V/+12V
6	RXD
7	DSR
8	CTS

Note: *Please set* ***Pin (2-4)*** *of Jumper* ***JP1*** *as closed, when apply Console cable to COM1 port (refer to page-9).*

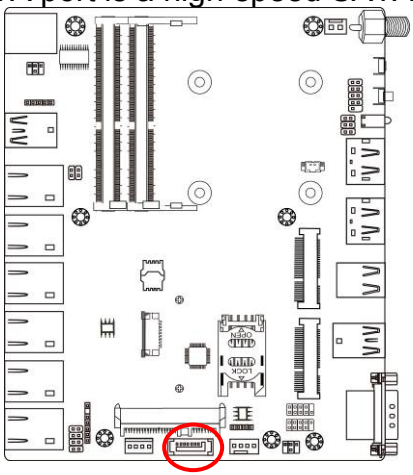
(5) ATX2P (2-pin Block): Internal 12V DC-in Power Connector



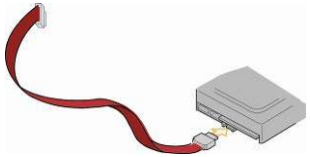
Pin.	Definition
1	+12V DC_IN
2	GND

(6) SATA (7-pin Block): SATAIII Port connector

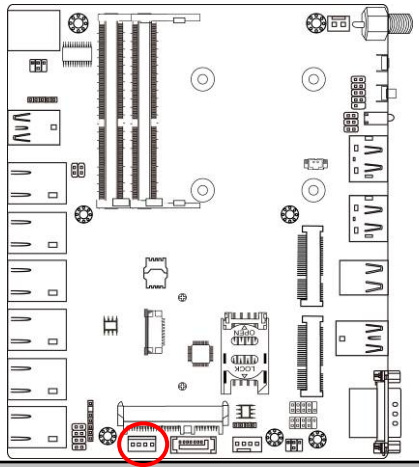
SATA port is a high-speed SATAIII port that supports 6GB/s transfer rate.

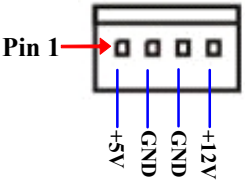


Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND



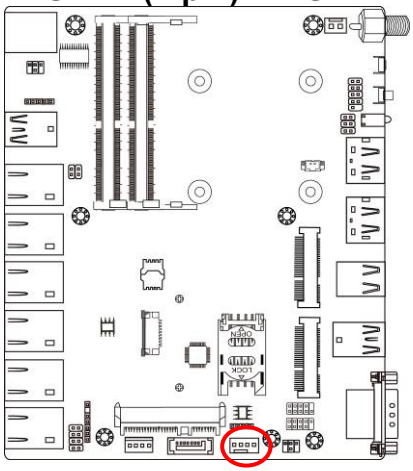
(7) SATAPW (4-pin): SATA Power Out Connector

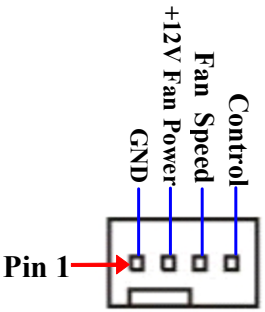




Warning: *Make sure that Pin-1 of compatible SATA Power connector is inserted into corresponding Pin-1 of SATAPW to avoid possible damage to the board and hard disk driver!*

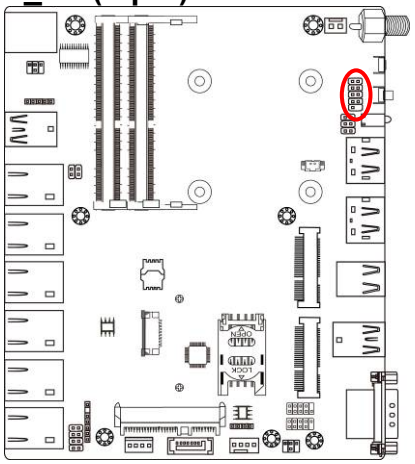
(8) CPUFAN (4-pin): CPUFAN Connector

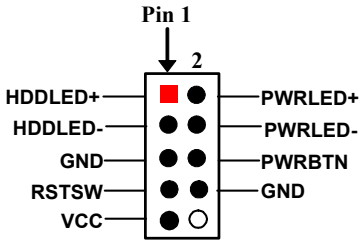




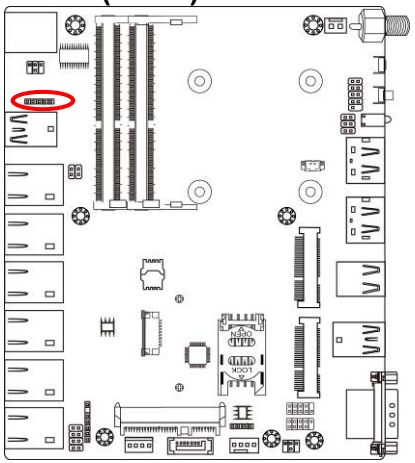
2-2-2 Headers

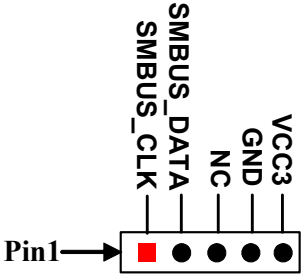
(1) JW_FP (8-pin): Front Panel Header



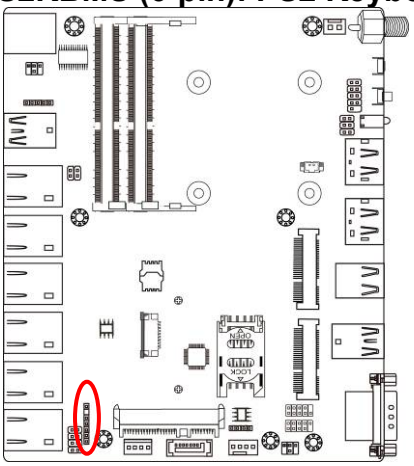


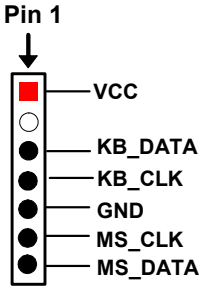
(2) SMBUS (5-Pin): SM BUS Header



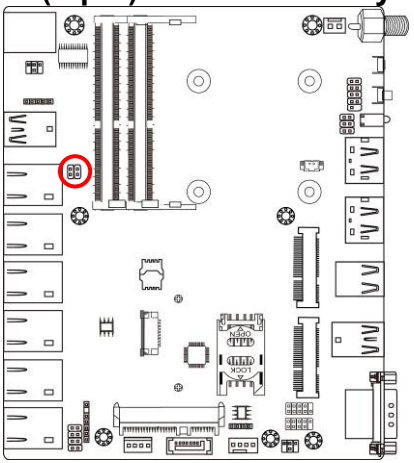


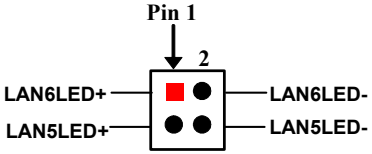
(3) PS2KBMS (6-pin): PS2 Keyboard & Mouse Header



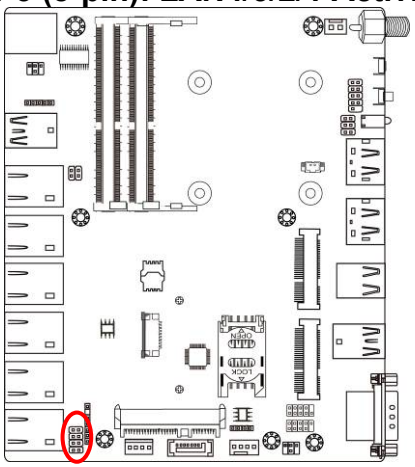


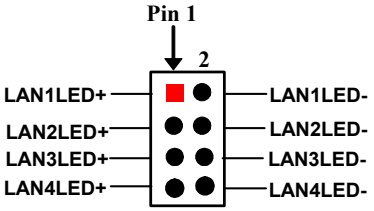
(4) JP2 (4-pin): LAN6/5 Activity LED Header



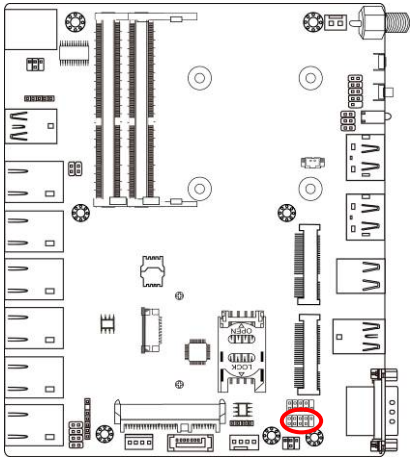


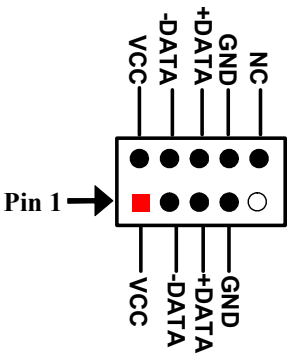
(5) JP3 (8-pin): LAN4/3/2/1 Activity LED Header



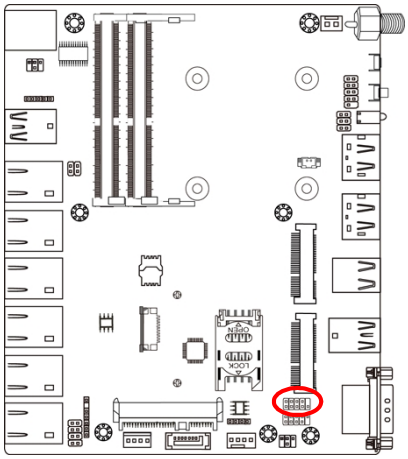


(6) FP_USB2 (9-pin): USB 2.0 Port Header





(7) FP_COM2 (9-pin): RS232/422/485 Serial Port Header



Pin NO.	RS232	RS422	RS485
Pin 1	DCD	TX-	DATA-
Pin 2	RXD	TX+	DATA+
Pin 3	TXD	RX+	NC
Pin 4	DTR	RX-	NC
Pin 5	GND	GND	GND
Pin 6	DSR	NC	NC
Pin 7	RTS	NC	NC
Pin 8	CTS	NC	NC
Pin 9	RI	NC	NC

Notice: **FP_COM2** port can function as RS232/422/485 serial port. In normal settings **FP_COM2** 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 **FP_COM2** (***refer to Page 28***) at first, before using specialized cable to connect different pins of this port.

Chapter 3
Introducing BIOS

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

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

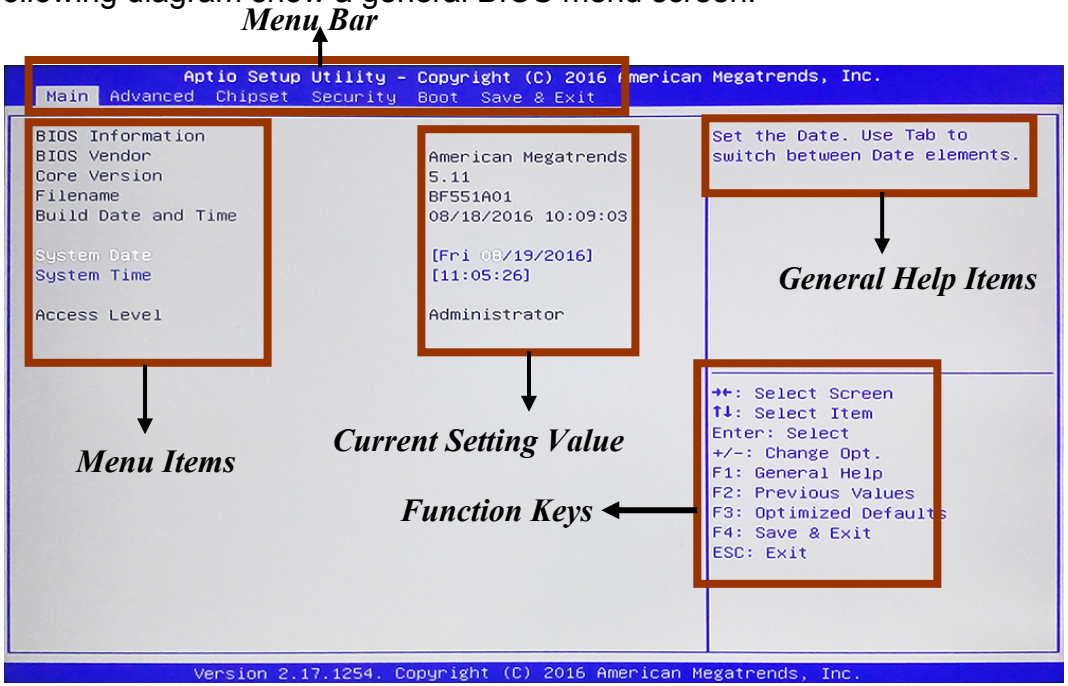
3-1 Entering Setup

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

Press **<Del>** to enter Setup; press < **F7**> to enter pop-up Boot menu.

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.
- **[F7]:** To enter pop-up boot menu to select boot device.
- 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

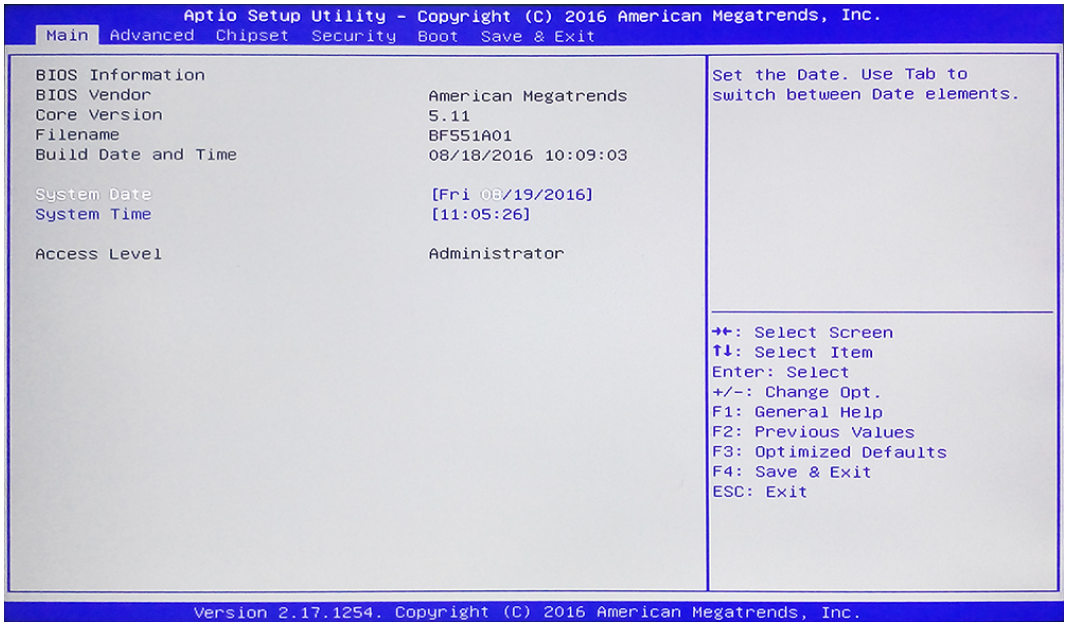
There are six menu bars on top of BIOS screen:

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.



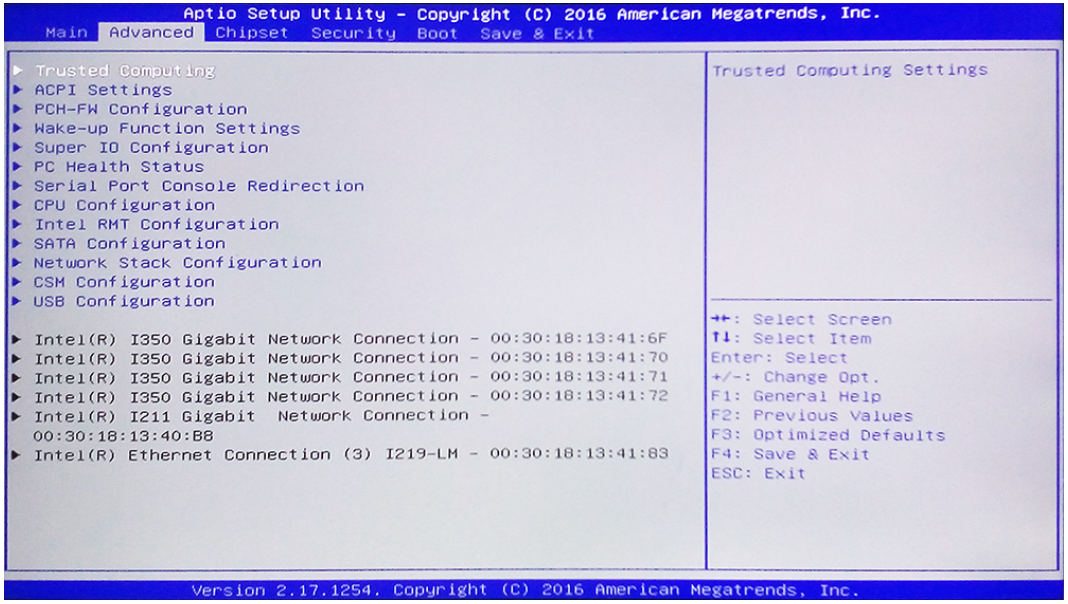
System Date

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:*

  TPM State

  Use this item to enable or disable security device. Your computer will reboot during restart to change state of device.

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

  Pending Operation

Use this item to schedule an operation for the security device. Your computer will reboot during restart to change state of device.
The optional settings: [None]; [TPM Clear].

- **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)].

- **PCH-FW Configuration**

Press [Enter] to view ME information and make settings for '**Firmware Update Configuration'**.

- **Firmware Update Configuration**

Press [Enter] to make settings for 'ME FW Image RE-Flash'.
ME FW Image RE-Flash
Use this item to enable or disable ME FW Image Re-Flash function.
The optional settings: [Disabled]; [Enabled].

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

- **Wake-up Function Settings**

Press [Enter] to make settings for the following sub-items:
Wake-up System with Fixed Time
Use this item to enable or disable system wake on alarm event. 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).

PS2 KB/MS Wake-up

Use this item to enable or disable PS2 KB/MS wake-up from S3/S4/S5. This function is only supported when 'ERP Support' is set as [Disabled].

USB S3/S4 Wake-up

Use this item to enable or disable USB S3/S4 wake-up. This function is only supported when 'ERP Support' is set as [Disabled].

USB S5 Power

Use this item to enable or disable USB power after system shutdown. This function is only supported when 'ERP Support' is set as [Disabled].

Super IO Configuration

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

Super IO Configuration

ERP Support

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

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

- **Serial Port 1 Configuration**

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

Serial Port

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

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

Change Settings

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

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

- **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.

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].

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].

WatchDog Reset Timer Unit

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

WatchDog Wake-up Timer in ERP

This item support WDT wake-up while 'ERP Support 'is set as [Auto].
The optional settings: [Disabled]; [Enabled].
When set as [Enabled], the following sub-items shall appear:

WatchDog Wake-up Timer Value in ERP

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

WatchDog Wake-up Timer Unit in ERP

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 'ATX/AT Mode' on MB jumper at first (refer to ***Page 11***, **Pin (1&2) ofAT_COPEN** for ATX Mode /AT Mode Select).

Case Open Detect
This item controls detect case open function.
The optional settings: [Disabled]; [Enabled].

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

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

CPUFAN Smart Mode
The optional settings: [Disabled]; [Enabled].
When set as [Enabled], the following sub-items shall appear:
CPUFAN Full-Speed Temperature
Use this item to set CPUFAN full speed temperature. Fan will run at full speed when above the preset temperature.
CPUFAN Full-Speed Duty
Use this item to set CPUFAN full speed duty. Fan will run at full speed when above the pre-set duty.
CPUFAN Idle-Speed Temperature
Use this item to set CPUFAN idle speed temperature. Fan will run at idle speed when below the pre-set temperature.
CPUFAN Idle-Speed Duty
Use this item to set CPUFAN 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]; [70°C/156°F]; [75°C/164°F]; [80°C/172°F]; [85°C/180°F]; [90°C/188°F].

- **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].

Bits per second

The optional settings are: [9600]; [19200]; [38400]; [57600]; [115200].

Data Bits

The optional settings are: [7]; [8].

Parity

The optional settings are: [None]; [Even]; [Odd];[Mark]; [Space].

Stop Bits

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

Flow Control

The optional settings are: [None]; [Hardware RTS/CTS].

VT-UTF8 Combo Key Support

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

Recorder Mode

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

Resolution 100x31

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

Legacy OS Redirection Resolution

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

Putty Keypad

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

Redirection After BIOS POST

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

Terminal Type

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

Bits per second

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

Flow Control

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.*

- **CPU Configuration**

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

Hyper-Threading
The optional settings: [Disabled]; [Enabled].
When set as [Disabled] only one thread per enabled core is enabled.
[Enabled]: for Windows XP and Linux (OS optimized for Hyper-Threading Technology).
[Disabled]: for other OS (OS optimized not for Hyper-Threading Technology).
Intel Virtualization Technology
The optional settings: [Enabled]; [Disabled].
When set as [Enabled], a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.
Hardware Prefetcher
The optional settings are: [Disabled]; [Enabled].
Use this item to turn on/off the Mid Level Cache (L2) streamer prefetcher.
Adjacent Cache Line Prefetch
The optional settings are: [Disabled]; [Enabled].
Use this item to turn on/off prefetching of adjacent cache lines.
Intel(R) SpeedStep(tm)
The optional settings: [Disabled]; [Enabled].
When set as [Enable], it allows more than two frequency ranges to be supported.
CPU C States
Use this item to enable or disable CPU C states.
The optional settings are: [Disabled]; [Enabled].
Package C State Limit
The optional settings: [C0/C1]; [C2]; [C3]; [C6]; [C7]; [C7s]; [C8]; [C9]; [C10]; [AUTO].

- **Intel RMT Configuration**
  Press [Enter] to make settings in '**Intel Ready Mode Technology**':
  Intel Ready Mode Technology
  Use this item to enable or disable Ready Mode support based on Windows away-mode. Only on DT/AIO.
  The optional settings: [Disabled]; [Enabled].
  When set as [Enabled], user can make further settings in '**Intel RMT State**'.
  Intel RMT State
  The optional settings are: [Enabled]; [Disabled].
  Use this item to set Intel RMT enabling status in BIOS.
- **SATA Configuration**
  Press [Enter] to make settings for the following sub-items:
  SATA Configuration
  SATA Controller(s)
  The optional settings are: [Enabled]; [Disabled].
  When set as [Enabled], the following items shall appear:
  SATA Mode
  The optional settings are: [AHCI]; [RAID].
  m-SATA
  Port
  The optional settings are: [Enabled]; [Disabled].
  SATA/SATA2
  Port
  The optional settings are: [Enabled]; [Disabled].
  Hot Plug
  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.

- **CSM Configuration**

Press [Enter] to make settings for the following sub-items:
Option ROM execution
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: [UEFI]; [Legacy].

- **USB Configuration**

Press [Enter] to make settings for the following sub-items:
USB Configuration
Legacy USB Support
The optional settings are: [Enabled]; [Disabled]; [Auto].
[Enabled]: To enable legacy USB support.

[Disabled]: To keep USB devices available only for EFI specification,
[Auto]: To disable legacy support if no USB devices are connected.

XHCI Hand-off

This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
The optional settings are: [Enabled]; [Disabled].

USB Mass Storage Driver Support

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

USB Hardware Delays and Time-outs:

USB Transfer Time-out

Use this item to set the time-out value for control, bulk, and interrupt transfers.
The optional settings are: [1 sec]; [5 sec]; [10 sec]; [20 sec].

Device Reset Time-out

Use this item to set USB mass storage device start unit command time-out.
The optional settings are: [10 sec]; [20 sec]; [30 sec]; [40 sec].

Device Power-up Delay

Use this item to set maximum time the device will take before it properly reports itself to the host controller.
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'.**

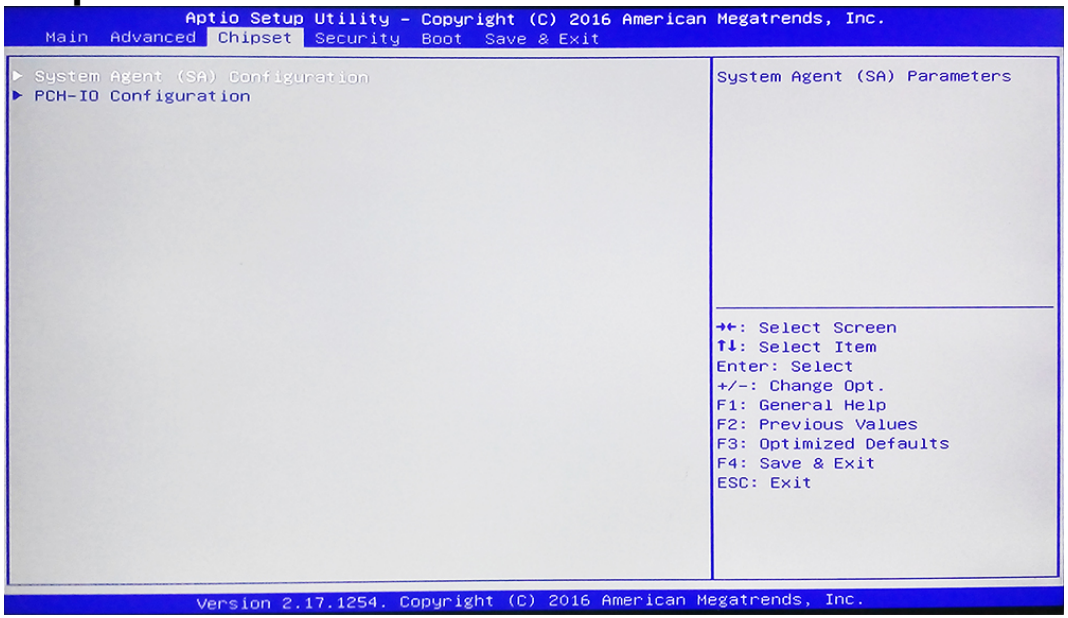
Device Power-up Delay in Seconds

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

- **Intel(R) I350 Gigabit Network Connection- XX:XX:XX:XX:XX:XX/…/Intel(R) I211 Gigabit Network Connection- XX:XX:XX:XX:XX:XX/Intel(R) Ethernet Connection(3) I219-LM - XX:XX:XX:XX:XX:XX**

These items show current networks' information.

3-8 Chipset Menu



- **System Agent (SA) Configuration**

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

VT-d

Use this item to enable or disable VT-d capability.

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

** This item might not be available depending on configuration.*

- **Graphics Configuration**

Press [Enter] to for user to view IGFX basic information or make further settings for graphics configuration.

Graphics Configuration

GTT Size

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

Aperture Size

The optional settings are: [128MB]; [256MB]; [512MB]; [1024MB].

DVMT Pre-Allocated

Use this item to select DVMT 5.0 pre-allocated (fixed) graphics memory size used by the internal graphics device.

The optional settings are: [32M]; [64M]; [96M]; [128M]; [160M]; [192M]; [224M]; [256M]; [288M]; [320M]; [352M]; [384M]; [416M]; [448M]; [480M]; [512M]; [1024MB]; [1538MB]; [2048MB]; [4M]; [8M]; [12M]; [16M]; [20M]; [24M]; [28M]; [32M/F7]; [36M]; [40M]; [44M]; [48M]; [52M]; [56M]; [60M].

DVMT Total Gfx Mem

Use this item to select DVMT 5.0 total graphics memory size used by the internal graphics device.

The optional settings are: [128M]; [256M]; [MAX].

Primary IGFX Boot Display

The optional settings are: [VBIOS Default]; [DP1]; [DP2].

When set as **[DP1] or **[DP2]**, user can make further settings in the following items:*

Secondary IGFX Boot Display

The optional settings are: [Disabled]; [DP1]; [DP2].

- **Memory Configuration**

Press [Enter] to view current memory configuration.

- **PCH-IO Configuration**

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

USB Controller

Use this item to enable or disable USB port.

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

HD Audio

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

[Disabled]: HD Audio will be unconditionally disabled;

[Enabled]: HD Audio will be unconditionally enabled.

[Auto]: HD Audio will be enabled if present, disabled otherwise.

Onboard Lan1/2/3/4 Controller
Use this item to enable or disable Lan1/2/3/4 device or controller.
The optional settings are: [Enabled]; [Disabled].
Onboard Lan5 Controller
Use this item to enable or disable Lan5 device or controller.
The optional settings are: [Enabled]; [Disabled].
Onboard Lan6 Controller
Use this item to enable or disable Lan6 onboard NIC.
The optional settings are: [Enabled]; [Disabled].
When '**Onboard Lan6 Controller**' set as [Enabled], the following sub-items shall appear:

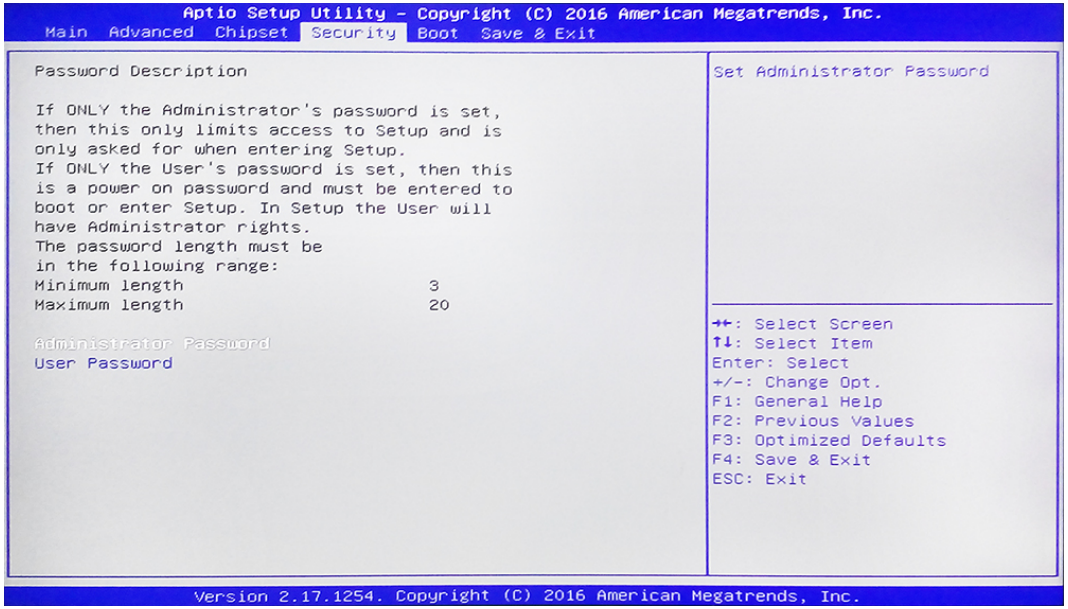
Wake on LAN
Use this item to enable or disable integrated LAN to wake the system (The Wake On LAN cannot be disabled if ME is on at Sx state).
The optional settings are: [Enabled]; [Disabled].

MPEST Slot/MPE Slot
The optional settings are: [Enabled]; [Disabled].

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

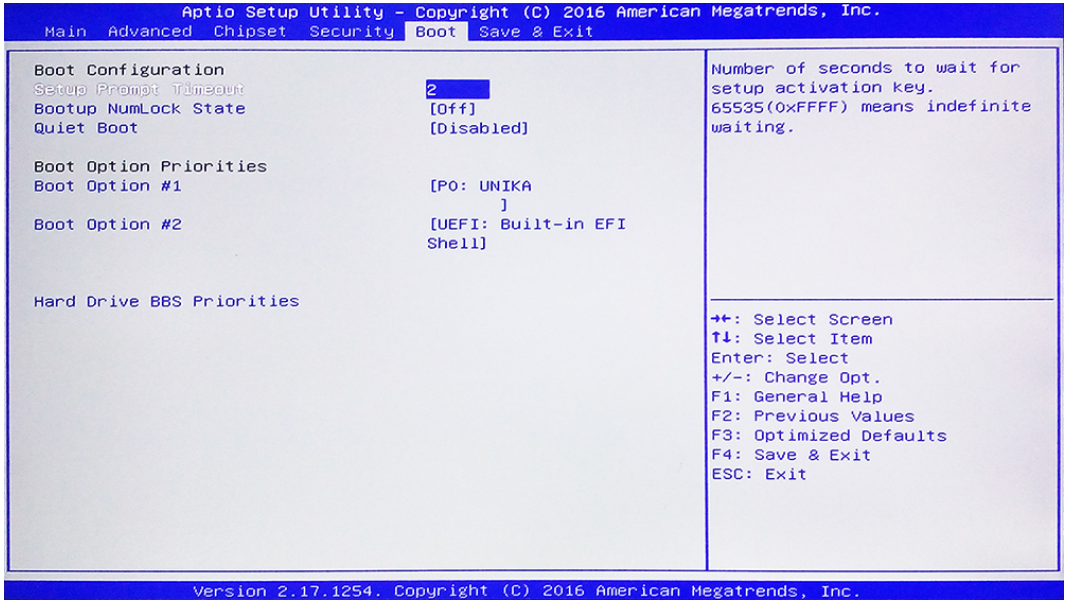
System State After Power Failure
Use this item to specify what state to go to when power is re-applied after a power loss (G3 State).
The optional settings are: [Always Off]; [Always On]; [Former State].
** The option [Always On] and [Former State] are affected by ERP function. Please disable '**ERP Support**' to support [Always On] and [Former State] function.*

3-9 Security Menu



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

3-10 Boot Menu



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

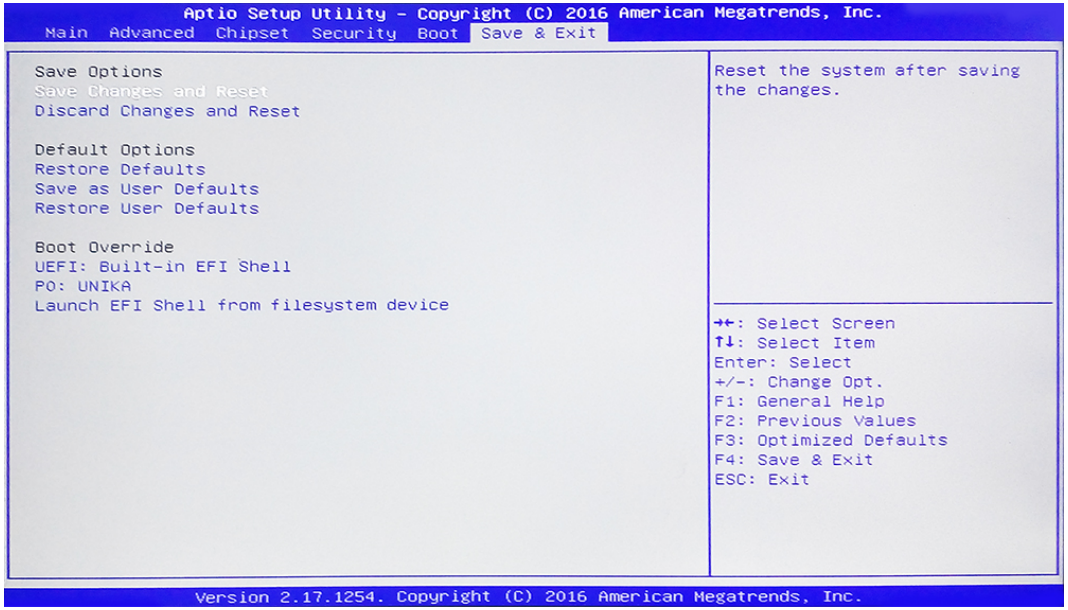
Boot Option #1/ Boot Option #2…

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

Hard Drive BBS Priorities

Use this item to set the system boot order of the legacy device in the 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

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

Press this item to launch EFI Shell application (Shell.efi) from one of the available file system device.