faytech, *nice touch.*

Technical Manual

Of

Intel Haswell/Broadwell Series CPU

Based

3.5″ SBC

NO. fay-003
Revision: 2.0
Release date: June 23, 2015

FAY0003

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.

TABLE OF CONTENTS

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	June 23, 2015

Item Checklist

- ☑ Motherboard
- ☑ User's Manual
- ☑ CD for motherboard utilities
- ☑ Cable(s)

Chapter 1
Introduction of the Motherboard

1-1   Feature of Motherboard

- Onboard Intel® Haswell/Broadwell series SoC Processor, with low power consumption never denies high performance, integrated Intel i5-5200u processor

- Support 2 * DDR3L 1333/1600 MHz SO-DIMM, up to 16GB

- Support 1 * SATAIII device

- Onboard 1* full-size mSATA/ Mini-PCIE slot

- Onboard 1* half-size Mini-PCIE slot

- Onboard 2 * RJ-45 gigabit Ethernet LAN port

- Integrated with 1 * 24-bit dual channel LVDS header

- Support 2* HDMI output

- Support USB 3.0 data transport demand

- Support CPU Smart FAN

- Compliance with ErP standard
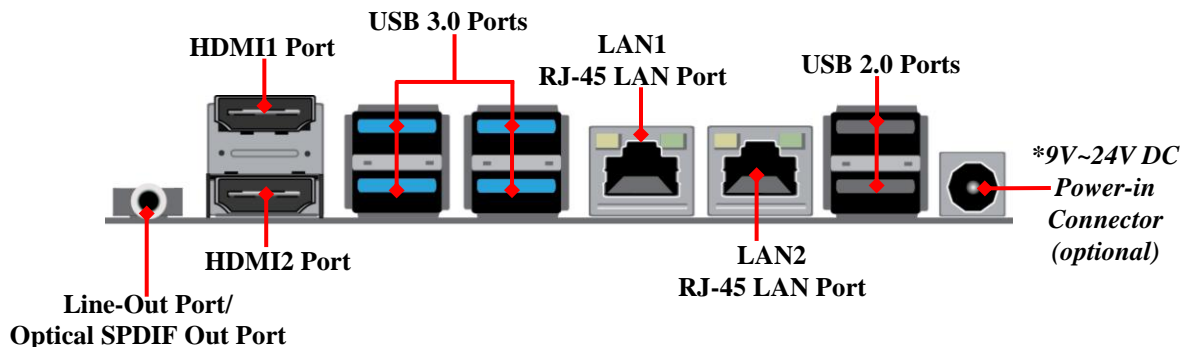
- Support Watchdog function

1-2   Specification

Spec	Description
Design	● 3.5"SBC; PCB size: 14.8x 10.2 cm
Embedded CPU	● Intel® Haswell/Boardwell ULT SoC CPU with i5-5200u processor
Memory Slot	● 2 * DDRIIIL SODIMM Slot for un-buffered DDRIIIL 1333/1600 MHz SDRAM, expandable to 16GB ● Dual-channel function supported
Expansion Slot	● 1* Full-size Mini-PCIE/mSATA slot (MMPE) ● 1* Half-size Mini-PCIE slot (MPE)
Storage	● 1* SATAIII 6G/s Connector (SATA1) *SATA1 port & M-SATA connector (MMPE) supports RAID0/1 function.*
LAN Chip	● Integrated with Intel I211AT PCI-E Gigabit PCI-E LAN chip & Intel I218LM Gigabit LAN PHY chip ● Support Fast Ethernet LAN function of providing 10/100/1000Mbps Ethernet data transfer rate
Audio Chip	● Realtek ALC662 HD Audio Codec integrated ● Audio driver and utility included
BIOS	● AMI 128MB Flash ROM
Multi I/O	***Rear Panel I/O:*** ● 1* DC 9V~24V power-in connector (***Optional for fay-003 Series***) ● 2* USB 2.0 port ● 4* USB 3.0 port ● 2* RJ-45 LAN port ● 2* HDMI port ● 1* Audio Line out/Optical SPDIF out port ***Internal I/O Connectors& Headers:*** ● 1* 2-pin 9V~24V DC-in internal power connector ● 1* SATAIII 6Gb/s port ● 1* SATA Power connector

	• 1* CPU FAN connector
	• 1* Front panel audio header • 1* SPK_OUT header (for 3W / 8 OHM amplifier) • 4* Serial port header (COM1 supports RS422/RS485 function) • 1* 9-pin USB 2.0 header (Expansible to 2* USB 2.0 ports) • 1* 4-pin USB 2.0 header (Expansible to 1* USB 2.0 ports) • 1* GPIO header • 1* SMBUS header • 1* PS2KBMS header • 1* Front panel header • **JP8:** 1* LAN LED activity header • 1* LVDS inverter • 1* LVDS header

1-3   Layout Diagram

Rear IO Panel Diagram
For fay-003 Series:

HDMI1 Port

USB 3.0 Ports

LAN1
RJ-45 LAN Port

USB 2.0 Ports

9V~24V DC
Power-in
Connector
(optional)

HDMI2 Port

LAN2
RJ-45 LAN Port

Line-Out Port/
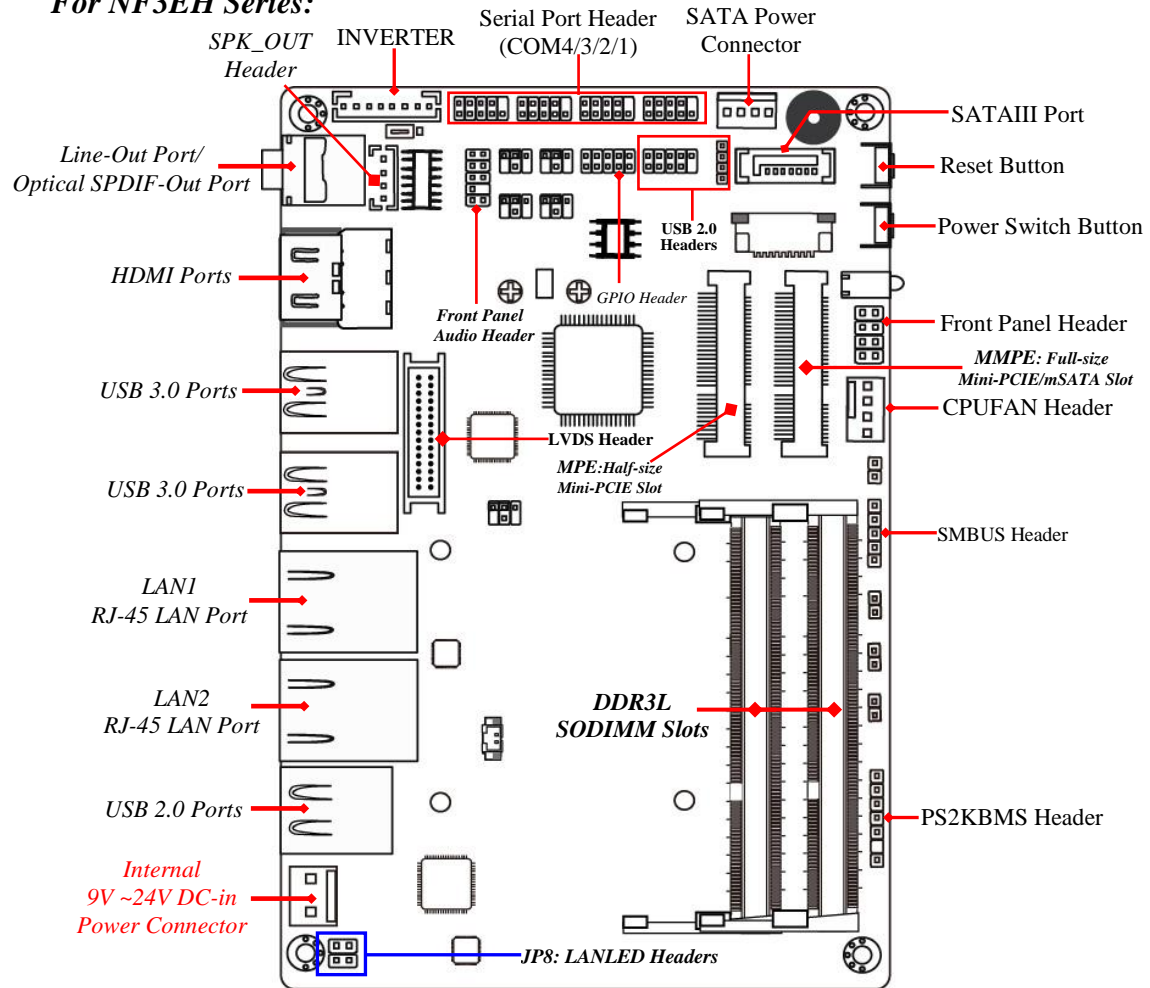**Optical SPDIF Out Port**

***Notice:** Please connect compatible power supply to the power connector. The voltage of power connector should not be lower than 9V or higher than 24V, otherwise it may do harm to the board & other devices!*

Internal Diagram-Front Side:
For NF3EH Series:

SPK_OUT Header

INVERTER

Serial Port Header (COM4/3/2/1)

SATA Power Connector

SATAIII Port

Line-Out Port/ Optical SPDIF-Out Port

Reset Button

Power Switch Button

HDMI Ports

Front Panel Audio Header

GPIO Header

USB 2.0 Headers

Front Panel Header

MMPE: Full-size Mini-PCIE/mSATA Slot

USB 3.0 Ports

LVDS Header

CPUFAN Header

MPE:Half-size Mini-PCIE Slot

USB 3.0 Ports

SMBUS Header

LAN1 RJ-45 LAN Port

LAN2 RJ-45 LAN Port

DDR3L SODIMM Slots

USB 2.0 Ports

PS2KBMS Header

Internal 9V ~24V DC-in Power Connector

JP8: LANLED Headers

*Note: In the case that user wish to install two different cards to **MPE & MMPE** slot, make sure that there is no interference between the cards installed.

Internal Diagram-Back Side:

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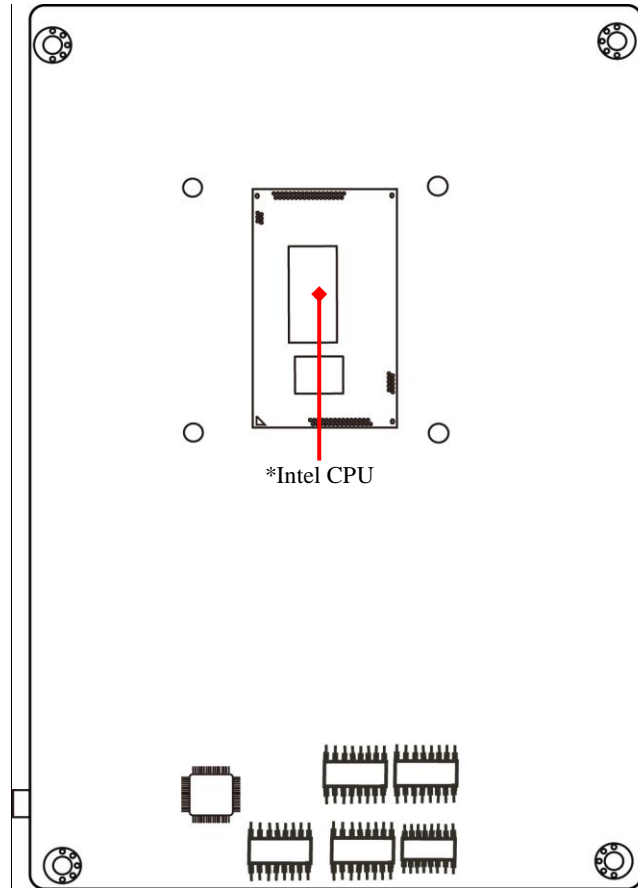
Note: CPU is the most important part of the board and very fragile to any possible harm. Make sure that there is no damage to the CPU during any installation procedures!

Jumper Position:
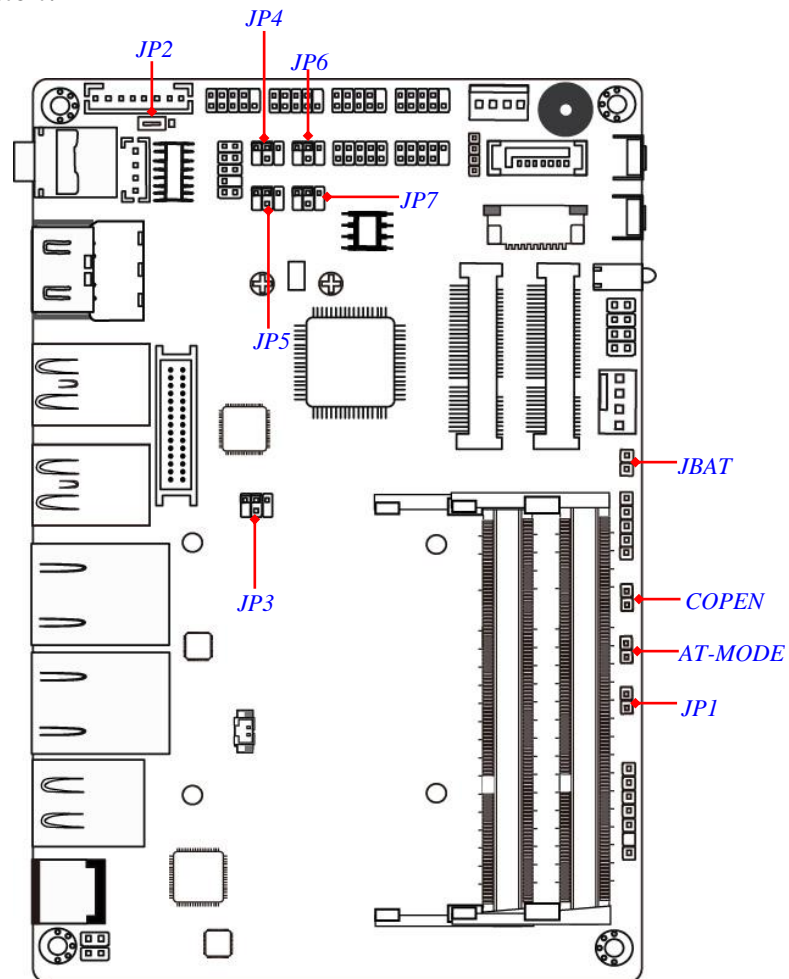
Jumper

Jumper	Name	Description
JP3	LVDS PVCC 5V/3.3V /12V Select	4-Pin Block
JP2	INVERTER VCC 5V/12V Select	3-Pin Block
JP7	COM4 Header Pin9 Function Select	4-Pin Block
JP5	COM3 Header Pin9 Function Select	4-Pin Block
JP6	COM2 Header Pin9 Function Select	4-Pin Block
JP4	COM1 Header Pin9 Function Select	4-Pin Block
JBAT	CMOS RAM Clear Function Setting	2-Pin Block
COPEN	Case Open Message Display Function	2-Pin Block
AT_MODE	AT Mode Function Select	2-Pin Block
JP1	Security Measure Function Select	2-Pin Block

Connectors

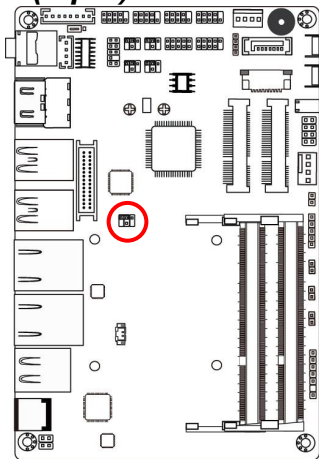| Connector	Name
DCIN1	*fay-003 Series:* 9V~24V DC-in Power Jack Connector / *Internal 2-Pin 9V~24V DC-in Power Connector*
SATA1	SATAIII Port Connector
PWOUT	SATA Power out Connector
CPUFAN	CPUFAN Connector
USB1/USB3	USB 3.0 Port Connector X4
USB5	USB 2.0 Port Connectors X2
LAN1/LAN2	RJ-45 LAN Port Connector X2
HDMI	DVI-I Port Connector X2
LOUT	Audio Line Out Connector
MMPE	Full-size Mini-PCIE/MSATA Connector
MPE	Half-size Mini-PCIE Connector

Headers

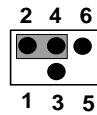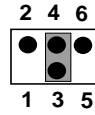| Header	Name	Description
FP_AUDIO	Front Panel Audio Header	9-pin Block
SPK_CON	Speaker Header	4-pin Block
COM4/3/2/1	Serial Port Header X4	9-pin Block
USB4	USB 2.0 Header	9-pin Block
USB6	USB 2.0 Header	4-pin Block
FP	Front Panel Header(PWR LED/ HDD LED/Power Button /Reset)	8-pin Block
GPIO	GPIO Header	10-pin Block
SMBUS	SMBUS Header	5-pin Block
PS2KBMS	PS2KBMS Header	6-pin Block
JP8	LAN Activity LED Header	4-pin Block
LVDS	24-bit LVDS Header	30-pin Block
INVERTER	LVDS Inverter Connector	8-pin Block

Chapter 2
Hardware Installation

2-1 Jumper Setting

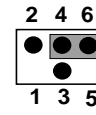### JP3 (4-pin): LVDS PVCC 3.3V/5V/12V Function Select

JP3→LVDS

```
2  4  6          2  4  6          2  4  6
● ● ●            ● ● ●            ● ● ●
   ●                ●                ●
1  3  5          1  3  5          1  3  5
```
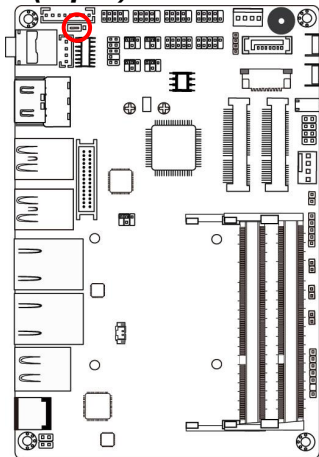
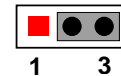**2-4 Closed: LVDS VCC= 3.3V;**　　**3-4 Closed: LVDS VCC= 5V;**　　**4-6 Closed: LVDS VCC= 12V.**

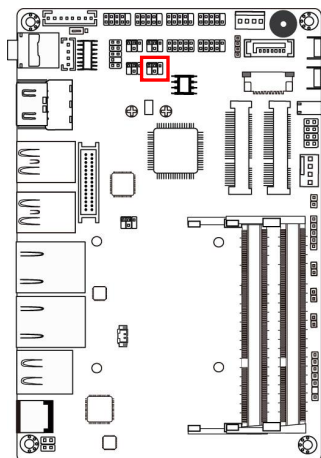### JP2 (3-pin): INVERTER VCC 5V/12V Select

JP2→I N V E R T E R

```
■ ● ●
1     3
```

1-2 Closed: Inverter VCC = 5V;

```
■ ● ●
1     3
```
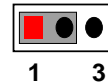
2-3 Closed: Inverter VCC = 12V.

JP7 (4-pin): COM4 Header Pin9 Function Select

JP7→COM4

```
  2  4  6          2  4  6          2  4  6
  ●  ●  ●          ●  ●  ●          ●  ●  ●
     ●                ●                ●
  1  3  5          1  3  5          1  3  5
```
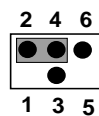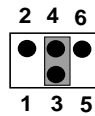
| 2-4 Closed:
RI=RS232; | 3-4 Closed:
RI= 5V; | 4-6 Closed:
RI= 12V. |

JP5 (4-pin): COM3 Header Pin9 Function Select

JP5→COM3

```
  2  4  6          2  4  6          2  4  6
  ●  ●  ●          ●  ●  ●          ●  ●  ●
     ●                ●                ●
  1  3  5          1  3  5          1  3  5
```
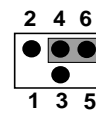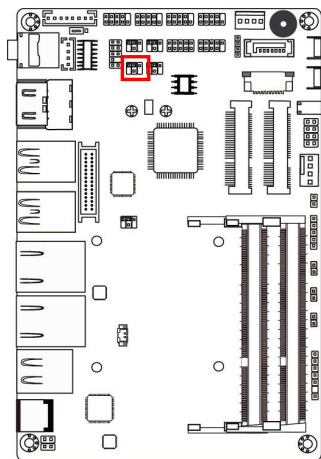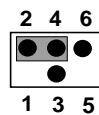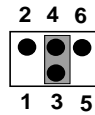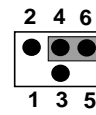
| 2-4 Closed:
RI=RS232; | 3-4 Closed:
RI= 5V; | 4-6 Closed:
RI= 12V. |

JP6 (4-pin): COM2 Header Pin9 Function Select

JP6→COM2
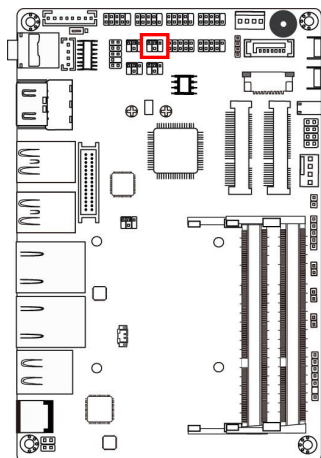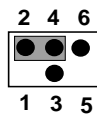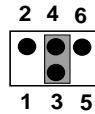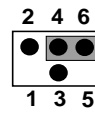
2 4 6	2 4 6	2 4 6
1 3 5	1 3 5	1 3 5
2-4 Closed: **RI=RS232;**	**3-4 Closed:** **RI= 5V;**	**4-6 Closed:** **RI= 12V.**

JP4 (4-pin): COM1 Header Pin9 Function Select

JP4→COM1
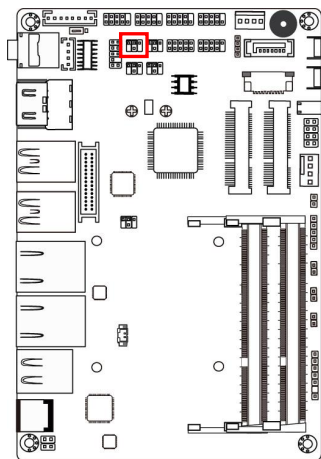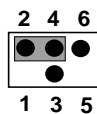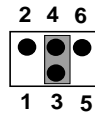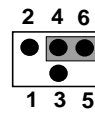
2 4 6	2 4 6	2 4 6
1 3 5	1 3 5	1 3 5
2-4 Closed: **RI=RS232;**	**3-4 Closed:** **RI= 5V;**	**4-6 Closed:** **RI= 12V.**

JBAT (2-pin): Clear CMOS

JBAT

1
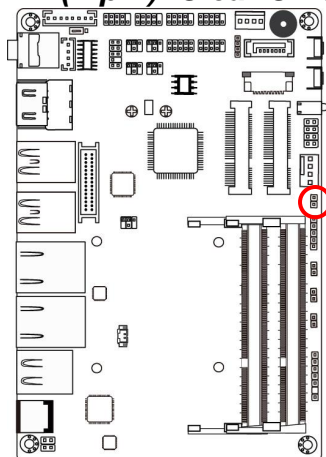
1-2 Open Normal   1-2 Closed Clear CMOS

CMOS Clear Setting

COPEN (2-pin): Case Open Message Display Function Select

COPEN

GND
1   Case open func
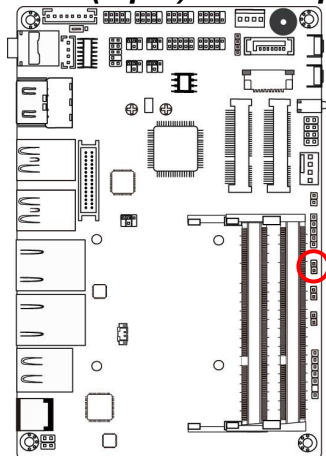
Pin 1-2 Closed: *When Case open function pin short to GND, the Case open function was detected. When Used, needs to enter BIOS and enable 'Case Open Detect' function. In this case if your case is removed, next time when you restart your computer, a message will be displayed on screen to inform you of this.*

AT_MODE (2-pin): AT Mode Function Select

Pin 1-2 closed: AT_MODE function is enabled. In this case your computer will automatically turns on after a sudden power failure when power supply resumes.

AT-MODE

2 ●
1 ■

1-2 Open Normal

2 ●
1 ■
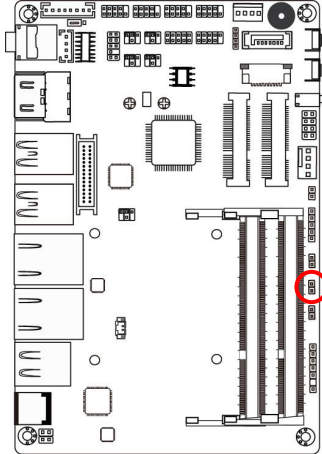
1-2 Closed AT Mode Selected

JP1 (2-pin): Security Measure Function Select

JP7

1 ■
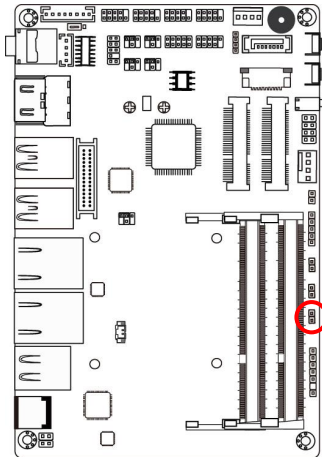
1-2 Open: Enable Security Measures
in the Flash Descriptor(Default);

1 ■

1-2 Closed: Disable Security Measures
in the Flash Descriptor(Override).

2-2 Connectors and Headers
2-2-1 Connectors
(1) Rear I/O Connectors
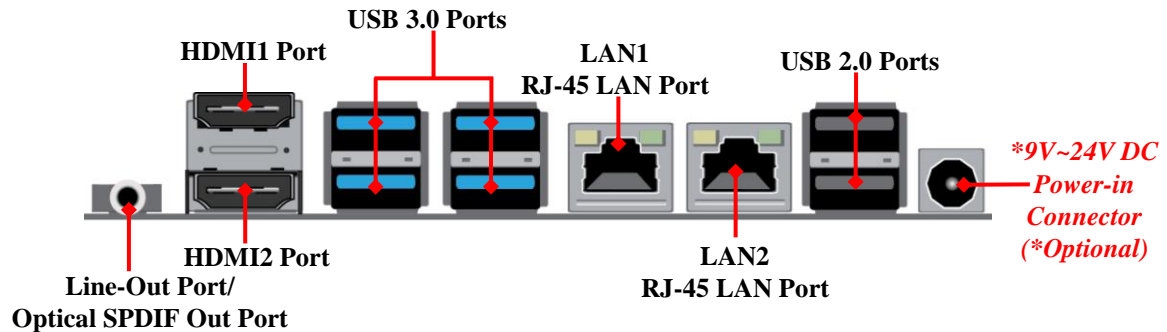
Icon	Name	Function
(*Optional)	DC 9V~24V Power-in Connector	For user to connect compatible power adapter to provide power supply for the system.
	USB 2.0 Port	To connect USB keyboard, mouse or other devices compatible with USB specification.
	USB 3.0 Port	To connect USB keyboard, mouse or other devices compatible with USB specification. USB 3.0 ports supports up to 5Gbps data transfer rate.
	RJ-45 LAN Port	This connector is standard RJ-45 LAN jack for Network connection.
	HDMI Port	To connect display device that support HDMI specification.
	Line-Out Connector /Optical SPDIF-Out	For user to connect external speaker, earphones, etc to transfer system audio

	Connector	output.
		This connector can function as optical SPDIF-Out jack with compatible cables & devices.

(2) DCIN1(2-pin) : 9V~24V DC- in Internal Power Connector
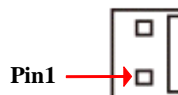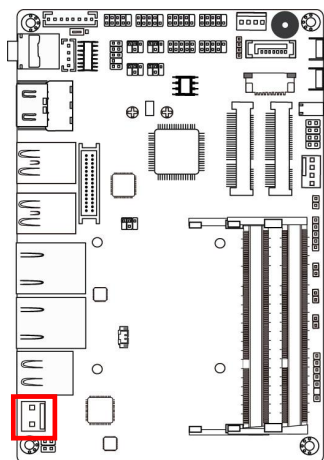
Pin1 →

Pin No.	Definition
1	+9V~+24V
2	GND

*Warning: Find Pin-1 position before connecting power cable to this 2-pin power connector. **WRONG INSTALLATION DIRECTION WILL DAMAGE THE BOARD!!***

(3) SATA1(7-pin): SATAIII Port connector

SATA1 port is a high-speed SATAIII port that supports 6GB/s transfer rate.
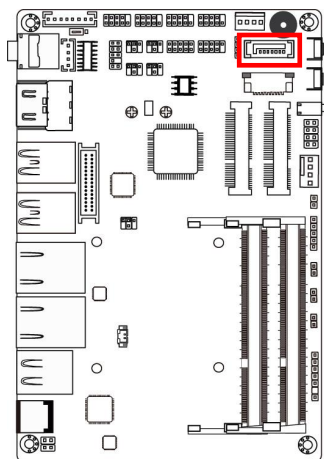
Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

(4) PWROUT(4-pin): SATA Hard Disk Power-out Connector

Pin 1 →

+5V GND GND +12V
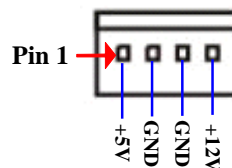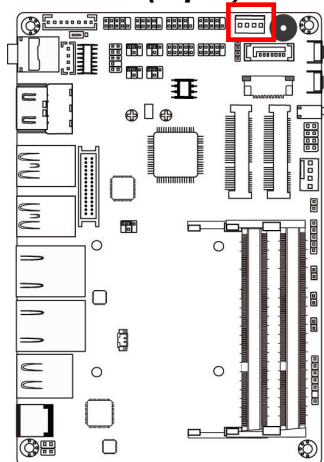
Warning: Make sure that Pin-1 of compatible SATA Power connector is inserted into corresponding Pin-1 of PWOUT to avoid possible damage to the board and hard disk driver!

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

P i n

G N D
+ 1 2 V　F a n　P
F a n　S p e
C o n t r o l
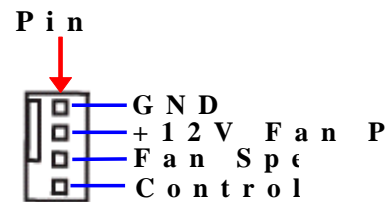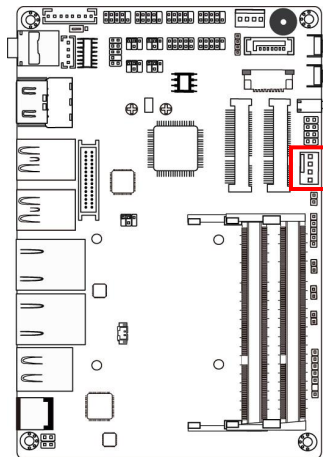
2-2-2 Headers

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

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


```
              Pin
               ↓ 2
MIC-L ──      ■  ●      ── GND
MIC-R ──      ●  ●      ── NC
Line-R ──     ●  ●      ── NC
NC ──         ●  ○
Line-L ──     ●  ●      ── NC
```
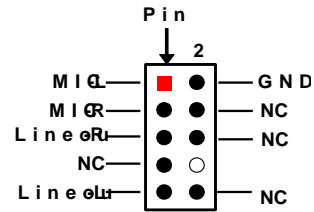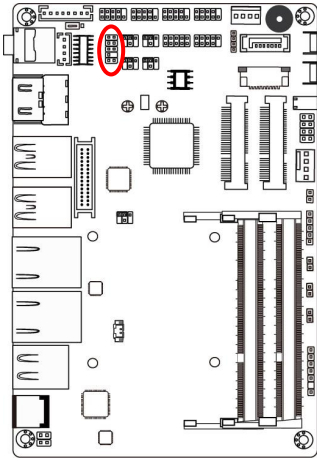
Line-Out, MIC Header

(2) SPK_OUT (4-pin): Speaker Header


```
     ┌─┐
     │■│── R-
     │■│── R+
     │■│── L+
     │■│── L-
     └─┘
     Pin1
```
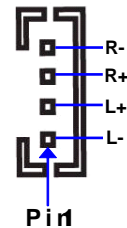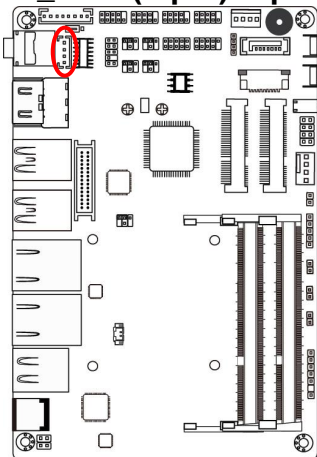
(3)COM4/3/2/1(9-Pin): Serial Port Headers
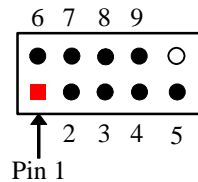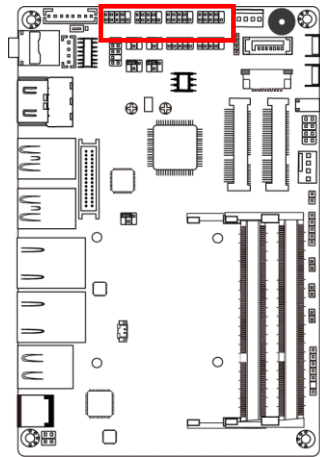
Pin NO.	RS232	*RS422 (for COM1)	*RS485 (for COM1)
Pin 1	DCD	TX-	DATA-
Pin 2	RXD	TX+	DATA+
Pin 3	TXD	RX+	NC
Pin 4	DTR	RX-	NC
Pin 5	GND	GND	GND
Pin 6	DSR	NC	NC
Pin 7	RTS	NC	NC
Pin 8	CTS	NC	NC
Pin 9	RI	NC	NC

*Notice: RS422, RS485 function is supported by COM1 header only, with compatible COM cable for RS422 or RS 485 function. User also needs to go to BIOS to set 'Transmission Mode Select' for COM1 (refer to Page 33).

(4) USB4 (9-pin): USB 2.0 Port Header
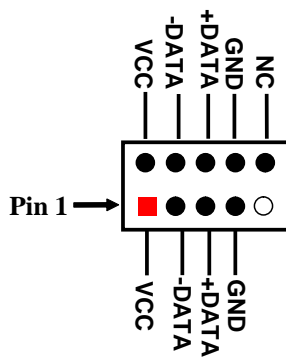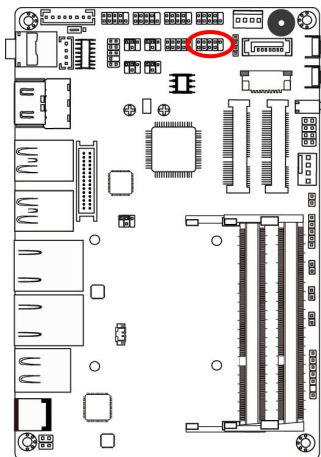
(5) USB6 (4-pin): USB 2.0 Port Header

GND
+DATA
-DATA
VCC

Pin
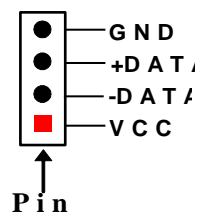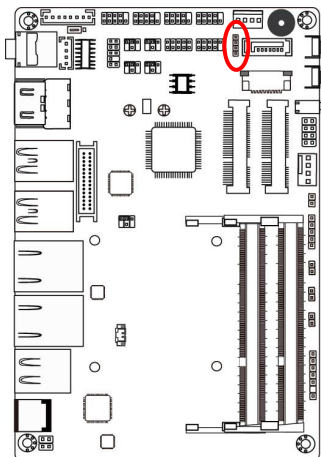
(6) FP (8-pin): Front Panel Header

GND — GND
PWRBTN — RSTSW
PWRLED - — HDDLED-
PWRLED+ — HDDLED+

2

Pin 1

(7) GPIO (10-pin): GPIO Header

GPIO_81
GPIO_83
GPIO_85
GPIO_87
VCC

2

Pin 1

GPIO_80
GPIO_82
GPIO_84
GPIO_86
GND
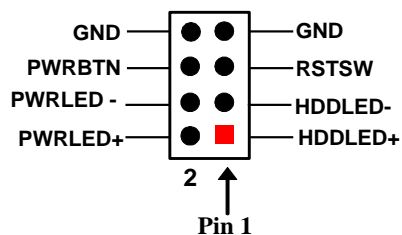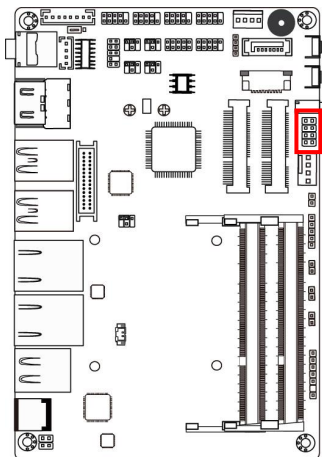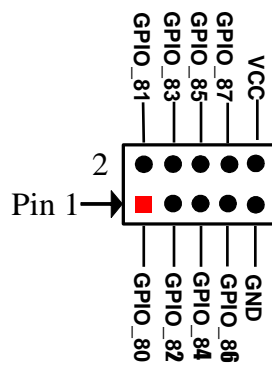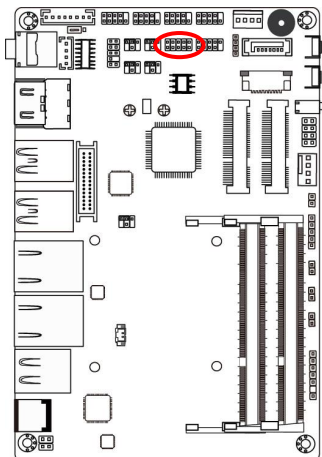
(8) SMBUS (5-Pin): SM BUS Header

VCC3.3
GND
SMBUS_AŁ
SMBUS_DA
Pin → SMBUS_
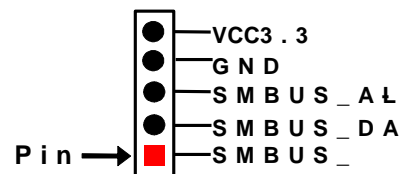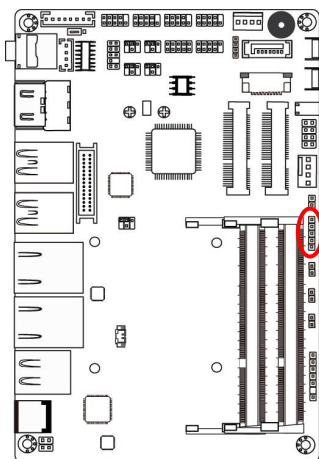
(9) PS2KBMS (6-pin): PS/2 Keyboard & Mouse Header

MS_DATA
MS_CLK
GND
KB_CLK
KB_DAT
Pin → VCC
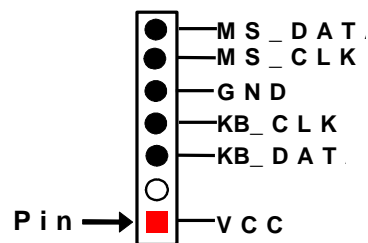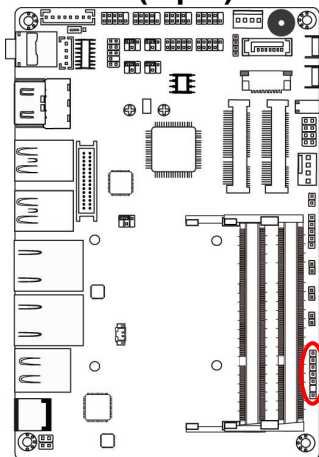
(10)JP8 (4-pin): LAN1 &LAN2 Activity LED Headers
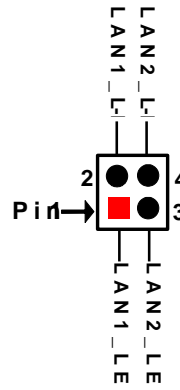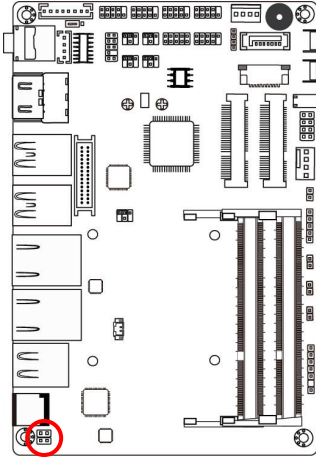
(11) INVERTER (8-pin): LVDS Inverter Connector
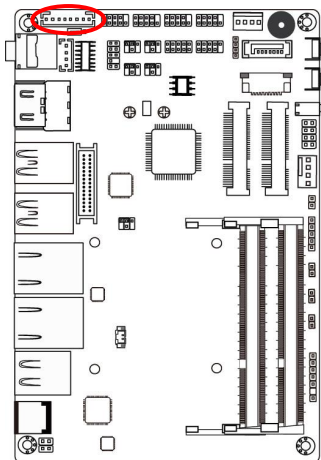
Pin No.	Definition
1	Backlight Enable
2	Backlight PWM
3	PVCC
4	PVCC
5	GND
6	GND
7	Backlight Up SW
8	Backlight Down SW

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

(12) LVDS (30-pin): 24-bit Dual Channel LVDS Header
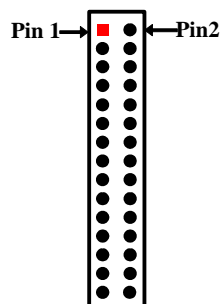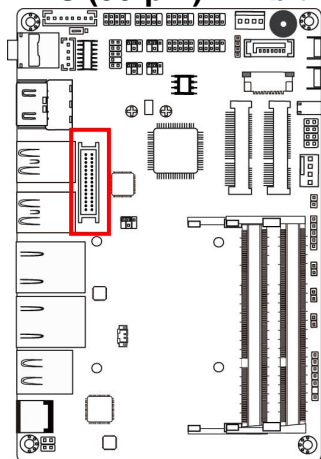
Pin 1→ ■ ←Pin2

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

Chapter 3
Introducing BIOS

Notice!	1.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. 2. Customized model may have minor customized settings. This manual serves as common reference purpose only. For any difference please refer to actual product your purchased!!

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**> for Popup Menu.

3-2   BIOS Menu Screen

The following diagram show a general BIOS menu screen:

Menu Bar

BIOS Menu Screen
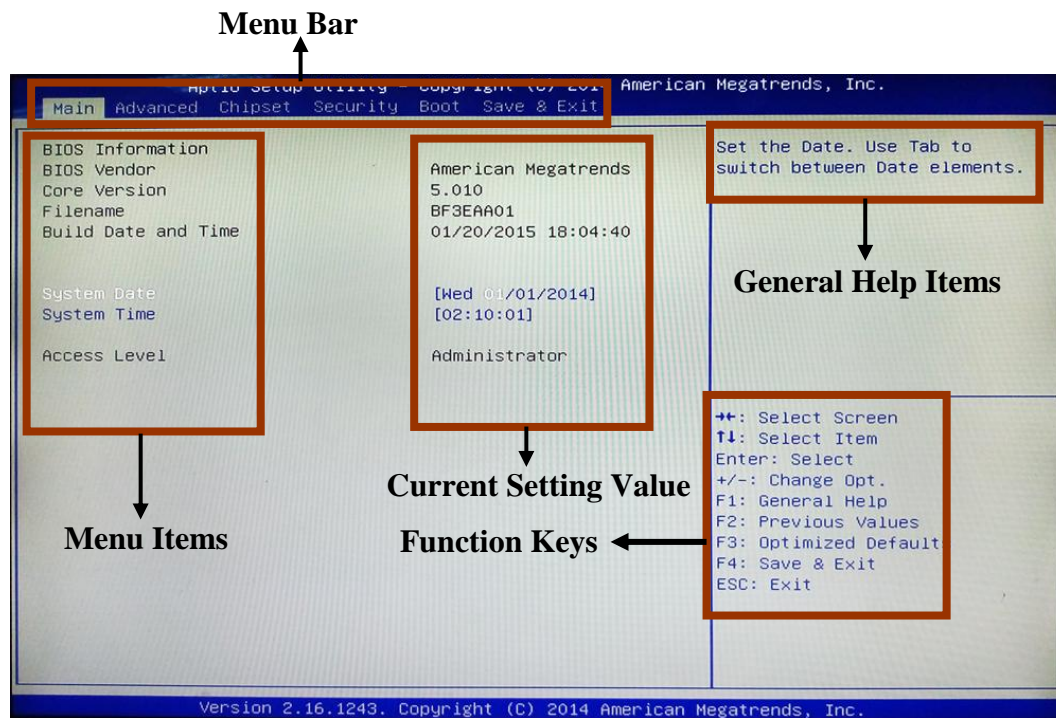
3-3   Function Keys

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

● Press←→ (left, right) to select screen;
● Press ↑↓ (up, down) to choose, in the main menu, the option you want to confirm or to modify.
● Press **<Enter>** to select.
● Press **<+>/<−>** keys when you want to modify the BIOS parameters for the active option.
● **[F1]:** General help.
● **[F2]:** Previous value.
● **[F3]:** Optimized defaults
● **[F4]:** Save & Exit
● Press **<Esc>** to quit the BIOS Setup.

3-4   Getting Help
Main Menu
The on-line description of the highlighted setup function is displayed at the top right corner the screen.

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

3-5 Menu Bars

There are six menu bars on top of BIOS screen:

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

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

3-6   Main Menu

Main menu screen includes some basic system information. Highlight the item and then use the <+> or <-> and numerical keyboard keys to select the value you want in each item.
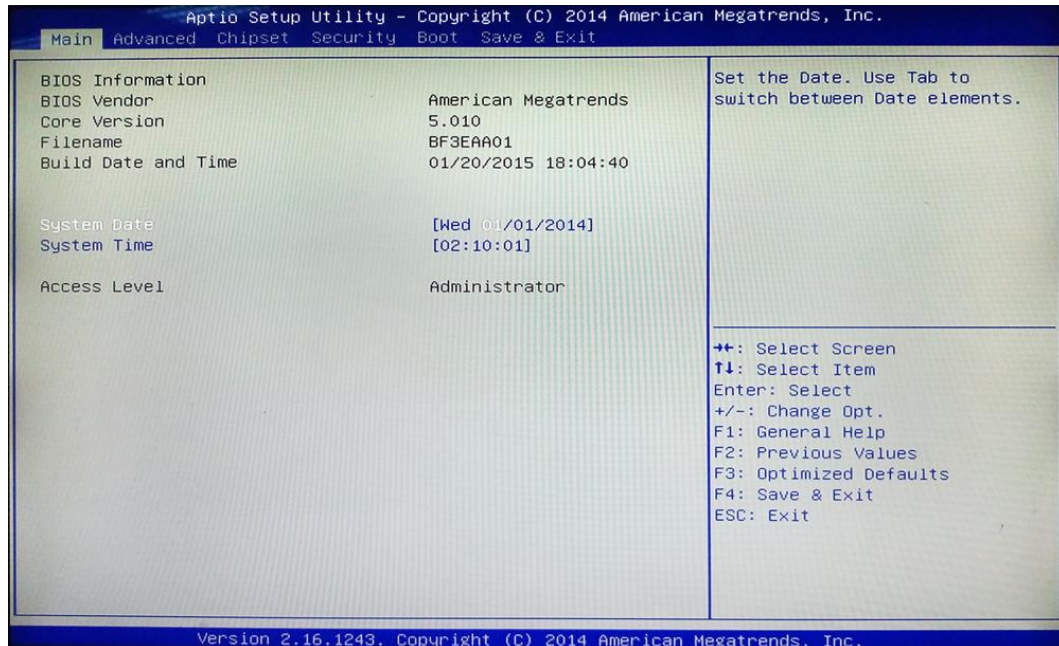
System Date
Set the date. Please use [Tab] to switch between date elements.
System Time
Set the time. Please use [Tab] to switch between time elements.

3-7 Advanced Menu
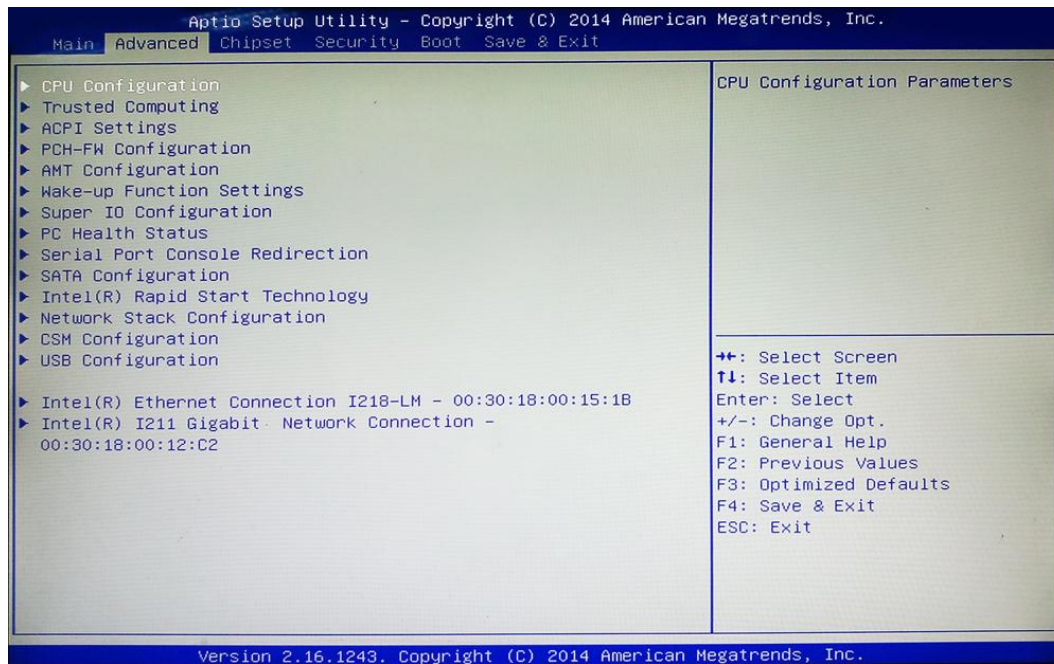
▶ **CPU Configuration**

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

Hyper-Threading

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

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

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

Limit CPUID Maximum

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

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

Execute Disable Bit

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

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.

EIST

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

CPU C states

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

*When set as [Enabled], user can make further settings in '**Package C state demotion'**.*

Package C state demotion

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

‣ **Trusted Computing**

Press [Enter] to make settings to make further settings in '**Security Device Support'**.

**Configuration**

Security Device Support

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

‣ **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.*

▸ **AMT Configuration**
Use this item to configure Active Management Technology parameters.
Press [Enter] to make settings for the following sub-items:
Intel AMT
Use this item to enable or disable Intel Active Management Technology BIOS extension.
The optional settings: [Disabled]; [Enabled].
BIOS Hotkey Pressed
Use this function to enable or disable BIOS Hotkey Press function.
MEBx Selection Screen
Use this function to enable or disable MEBx Selection Screen function.
Hide Un-Configure ME Confirmation
Use this function to enable or disable Hide Un-Configure ME without password Configuration Prompt function.
MEBx Debug Message Output
Use this function to enable or disable MEBx Debug Message Output function.
Un-Configure ME
Use this function to enable or disable Un-Configure ME without password function.

Amt Wait Timer

Use this item to set time to wait before sending ASF_GET_BOOT_OPTIONS.

Disable ME

Use this item to set ME to soft Temporary Disabled function.

ASF

Use this item to enable or disable Alert Specification Format.

Active Remote Assistance Process

Use this item to enable or disable Trigger CIRA boot function.

USB Configure

Use this item to enable or disable USB configure function.

PET Progress

Use this item to enable or disable PET events progress to receive PET event or not.

WatchDog

Use this item to enable or disable WatchDog Timer.

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

OS Timer

Use this item to set OS watch dog timer.

BIOS Timer

Use this item to set BIOS watch dog timer.

▸ **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.

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

Wake-up System with Dynamic Time

Use this item to enable or disable system wake on alarm event. When set as [Enabled], system will wake on the current time + increase minute(s).

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

PS2 KB/MS Wakeup
The optional settings: [Disabled]; [Enabled].
Use this item to enable or disable PS2 KB/MS wakeup from S3/S4/S5 state.
This item will only show when 'ERP Support' is set as [Disabled].

USB S3/S4 Wakeup
The optional settings: [Disabled]; [Enabled].
Use this item to enable or disable USB S3/S4 wakeup.
This item will only show when 'ERP Support' is set as [Disabled].

▸ **Super I/O Configuration**
Press [Enter] to make settings for the following sub-items:
Super IO Configuration

ERP Function
The optional settings: [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 1 Configuration

Serial Port
Use this item to enable or disable serial port (COM).
Change Settings
Use this item to select an optimal setting for super IO device.
Transmission Mode Select
The optional settings are: [RS422]; [RS232]; [RS485].
Mode Speed Select
The optional settings are: [RS232/RS422/RS485=250kbps]; [RS232=1Mbps, RS422/RS485=10Mbps].
Serial Port FIF0 Mode
The optional settings are: [16-Byte FIF0]; [32-Byte FIF0]; [64-Byte FIF0]; [128-Byte

FIF0].

▸ **Serial Port 2 Configuration/ Serial Port 3 Configuration/ Serial Port 4 Configuration**

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

Serial Port 2 Configuration/ Serial Port 3 Configuration/ Serial Port 3 Configuration

Serial Port
Use this item to enable or disable serial port (COM).
Change Settings
Use this item to select an optimal setting for super IO device.
Serial Port FIF0 Mode
The optional settings are: [16-Byte FIF0]; [32-Byte FIF0]; [64-Byte FIF0]; [128-Byte FIF0].
OS Select for Serial Port
The optional settings: [Windows]; [Linux].

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

WatchDog Timer Value
User can set a value in the range of [4] to [255].

WatchDog Timer Unit
The optional settings are: [Sec.]; [Min.].

WatchDog Wake-up Timer in ERP
This item support WDT wake-up while ERP function is set as [Auto].
The optional settings are: [Enabled]; [Disabled].
When set as [Enabled], the following sub-items shall appear:

WatchDog Timer Value in ERP
User can set a value in the range of [10] to [4095].

WatchDog Timer Unit
The optional settings are: [Sec.]; [Min.].

ATX Power Emulate AT Power
This item support Emulate AT power function, MB power On/Off control by power supply. Use needs to select 'AT or ATX Mode' on MB jumper at first (ATX Mode & AT Mode Select).

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

▸ **PC Health Status**
Press [Enter] to view current hardware health status & make further settings in '**Smart Configuration**' & '**Shutdown Temperature**'.

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

CPUFAN Smart Mode
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 pre-set 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 Consol Redirection**
Press [Enter] to make settings for serial port redirection settings:
COM1
Console Redirection
The optional settings are: [Enabled]; [Disabled].
When set as [Enabled], user can make further settings in:

▸ **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 Mgnagement/
Windows Emergency Management Services (EMS)

Console Redirection
The optional settings are: [Enabled]; [Disabled].
When set as [Enabled], user can make further settings in:
▸ **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].
Flow Control
The optional settings are: [None]; [Hardware RTS/CTS]; [Software Xon/Xoff]
▸ **SATA Configuration**
Press [Enter] to make settings for the following sub-items:
SATA Controller(s)
The optional settings: [Disabled]; [Enabled].
SATA Mode Selection

The optional settings are: [AHCI]; [RAID].
SATA Controller Speed
The item is for user to set the maximum speed the SATA controller can support.
The optional settings are:[Default]; [Gen1]; [Gen2];[Gen3].
SATA1
The optional settings are: [Enabled]; [Disabled].
mSATA
The optional settings are: [Enabled]; [Disabled].

▸ **Intel(R) Rapid Start Technology**
Press [Enter] to go to '**Intel(R) Rapid Start Technology**' screen to make further settings.
Intel(R) Rapid Start Technology
The optional settings: [Disabled]; [Enabled].

▸ **Network Stack Configuration**
Press [Enter] to go to '**Network Stack**' screen to make further settings.
Network Stack
Use this item to enable or disable UEFI Network Stack.
The optional settings are: [Enabled]; [Disabled].
When set as [Enabled], the following sub-items shall appear:
Ipv4 PXE Support
The optional settings are: [Disabled]; [Enabled].
Use this item to enable Ipv4 PXE Boot Support. When set as [Disabled], Ipv4 boot option 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], Ipv4 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 only]; [Legacy only].
Storage
This item controls the execution of UEFI and Legacy Storage OpROM.
The optional settings are: [Do not launch]; [UEFI only]; [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 only]; [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].
EHCI Hand-off
This is a workaround for OSes without EHCI hand-off support. The EHCI ownership change should be claimed by EHCI driver.
The optional settings are: [Disabled]; [Enabled].
USB Mass Storage Driver Support
The optional settings are: [Disabled]; [Enabled].

USB hardware delay and time-outs:
USB Transfer time-out
Use this item to set the time-out value for control, bulk, and interrupt transfers.
The optional settings are: [1 sec]; [5 sec]; [10 sec]; [20 sec].
Device reset time-out
Use this item to set USB mass storage device start unit command time-out.
The optional settings are: [10 sec]; [20 sec]; [30 sec]; [40 sec].
Device power-up delay
Use this item to set maximum time the device will take before it properly reports itself to the host controller. 'Auto' uses default value: for a root port it is 100 ms, for a hub port the delay is taken from hub descriptor.
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) Ethernet Connection I218-LM-XX:XX:XX:XX:XX:XX/ Intel(R) I211 Gigabit Network Connection- XX:XX:XX:XX:XX:XX**
Press [Enter] to view current network information and make further settings in '**NIC Configuration**'

  ▸ **NIC Configuration**
Press [Enter] to configure the network device port.
Link Speed
Use this item to specify the port speed used for the selected boot protocol.
The optional settings are: [Auto Negotiated]; [10 Mbps Half]; [10 Mbps Full]; [10 0Mbps Half]; [100 Mbps Full].
Wake On LAN
Use this item to enable the server to be powered on using an in-hand magic packet.
Blink LEDs
Use this item to identify the physical network port by blinking the associated LED.

3-8 Chipset Menu
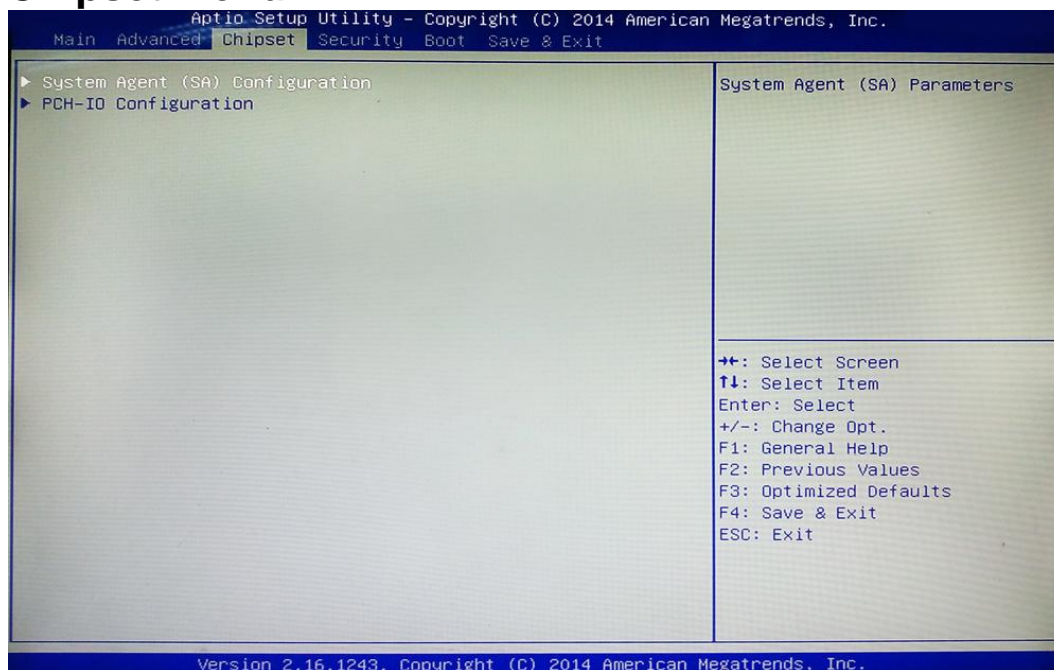
▶ **System Agent (SA) Configuration**
Press [Enter] to make settings for the following sub-items:
VT-d
The optional settings are: [Enabled]; [Disabled].
* This item might not be available depending on configuration.
Azalia Internal HDMI Codec
Use this item to enable or disable internal HDMI codec for Azalia.
The optional settings are: [Disabled]; [Enabled].
  ▶ **Graphics Configuration**
Press [Enter] to make further settings for Graphics Configuration.

Graphics Configuration

Aperture Size
The optional settings are: [128MB]; [256MB]; [512MB].
DVMT Pre-Allocated
Use this item to select DVMT 5.0 pre-allocated (fixed) graphics memory size used by the internal graphics device.
The optional settings are: [32M]; [64M]; [96M]; [128M]; [160M]; [192M]; [224M]; [256M]; [288M]; [320M]; [352M]; [384M]; [416M]; [448M]; [480M]; [512M].
DVMT Total Gfx Mem
Use this item to select DVMT 5.0 total graphics memory size used by the internal graphics device.
The optional settings are: [128M]; [256M]; [MAX].
LCD Control
Primary IGFX Boot Display
Use this item to select the video device which will be activated during POST. This has no effect if external graphics present. Secondary boot display selection will appear based on your selection. VGA modes will be supported only on primary display.
The optional settings are: [VBIOS Default]; [HDMI1]; [HDMI2]; [LVDS].

When set as [HDMI1];[HDMI2] or [LVDS], the following sub-item shall appear:
Secondary IGFX Boot Display
The optional settings are: [Disabled]; [HDMI1]; [HDMI2]; [LVDS].
Active LVDS
The optional settings are: [Disabled]; [Enabled].
[Disable]: VBIOS disable LVDS.
[Enable]: VBIOS enable LVDS.
* **Note**: *When set as [Enabled], user can make further settings in '**LVDS Panel Type**'.*
LVDS Panel Type
Use this item to manually select LVDS panel type.
The optional setting are: [800x 480 18bit Single]; [800x 600 18bit Single]; [800x 600 24bit Single]; [1024 x 600 18bit Single]; [1024 x 768 18bit Single]; [1024 x 768

24bit Single]; [1280 x 768 24bit Single]; [1280 x 800 18bit Single]; [1280 x 800 24bit Single]; [1366 x 768 18bit Single]; [1366 x 768 24bit Single]; [1440 x 900 18bit Dual]; [1440 x 900 24bit Dual]; [1280 x 1024 24bit Dual]; [1680 x 1050 24bit Dual]; [1920 x 1080 24bit Dual].

▶ **Memory Configuration**
Press [Enter] to view current memory configuration.

▶ **PCH-IO Configuration**
Press [Enter] to make settings for the following sub-items:

▶ **USB Devices Configuration**
Press [Enter] to further setting USB device configuration.
USB Devices Configuration

XHCI Mode
Use this item to control the USB XHCI controller.
The optional settings are: [Smart Auto]; [Auto]; [Enabled]; [Disabled].
** **Note**: When set as [Disabled], user can make further settings in '**EHCI**'.*
EHCI1
Use this item to control the USB EHCI (USB 2.0) functions.
One EHCI controller must always be enabled.
The optional settings are: [Disabled]; [Enabled].

Azalia
The optional settings are: [Disabled]; [Enabled].
Onboard Lan1 Controller
Use this item to enable or disable onboard NIC.
The optional settings are: [Enabled]; [Disabled].

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].
Onboard Lan2 Controller
Use this item to enable or disable onboard LAN2 controller.

The optional settings are: [Enabled]; [Disabled].
MMPE Controller
The optional settings are: [Enabled]; [Disabled].
MMPE Slot Speed
The optional settings are: [Auto]; [Gen1]; [Gen2].
MPE Controller
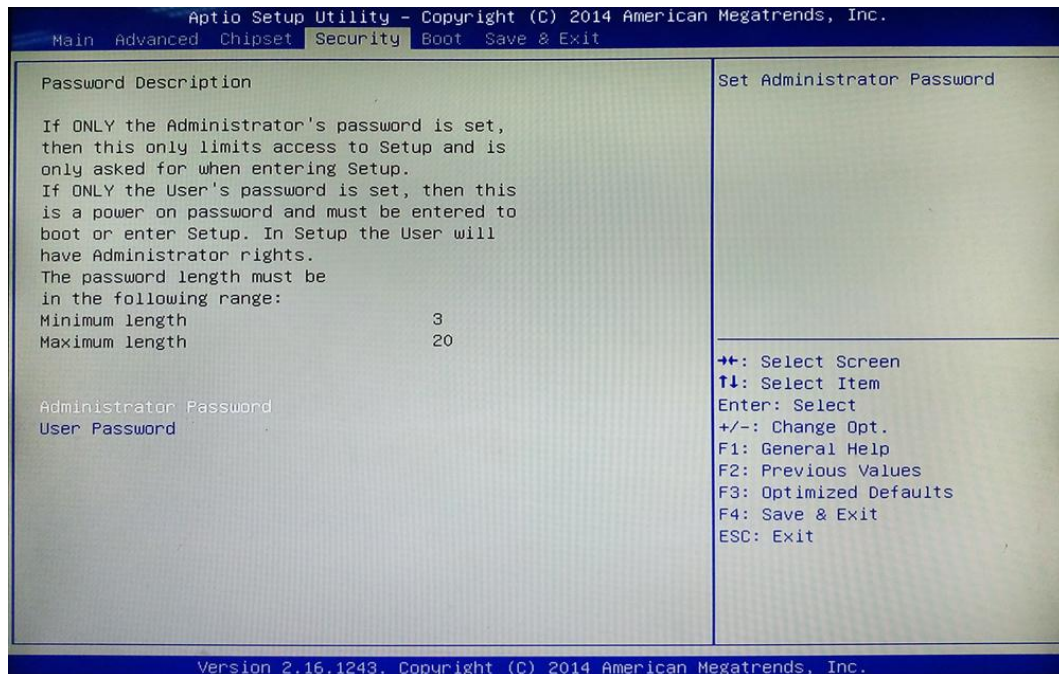The optional settings are: [Enabled]; [Disabled].
MPE Slot Speed
The optional settings are: [Auto]; [Gen1]; [Gen2].
**System State after Power Failure**
The optional settings are: [Always off]; [Always on]; [Former State].

3-9 Security Menu

```
          Aptio Setup Utility - Copyright (C) 2014 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
                                                    ↑↓: Select Item
                                                    Enter: Select
  Administrator Password                             +/-: Change Opt.
  User Password                                      F1: General Help
                                                    F2: Previous Values
                                                    F3: Optimized Defaults
                                                    F4: Save & Exit
                                                    ESC: Exit


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```

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

3-10 Boot Menu
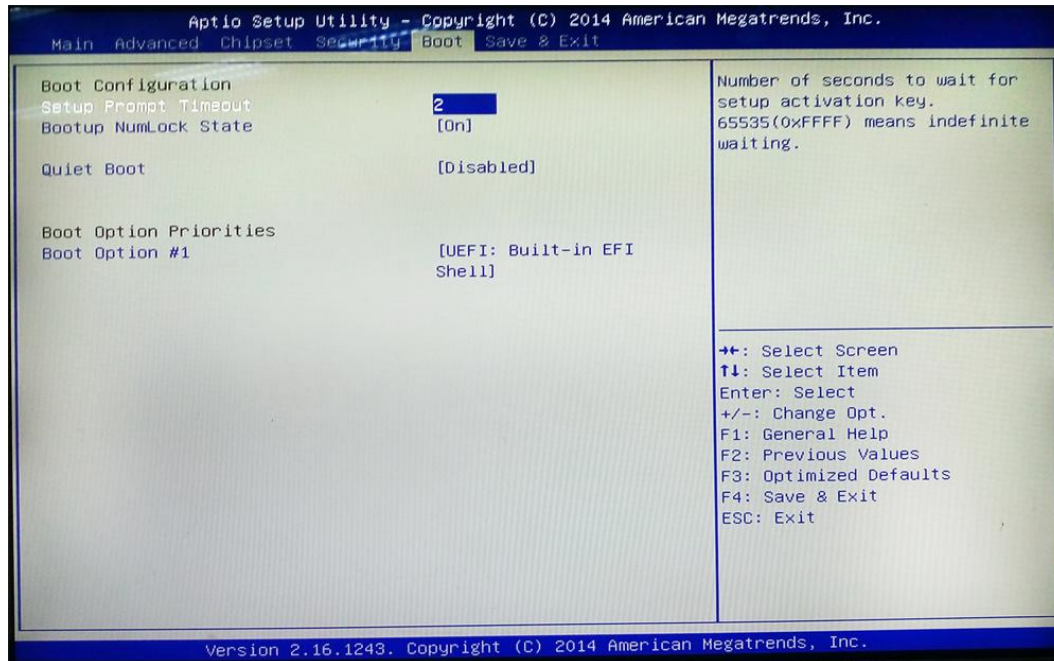
<u>*Boot Configuration*</u>

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.
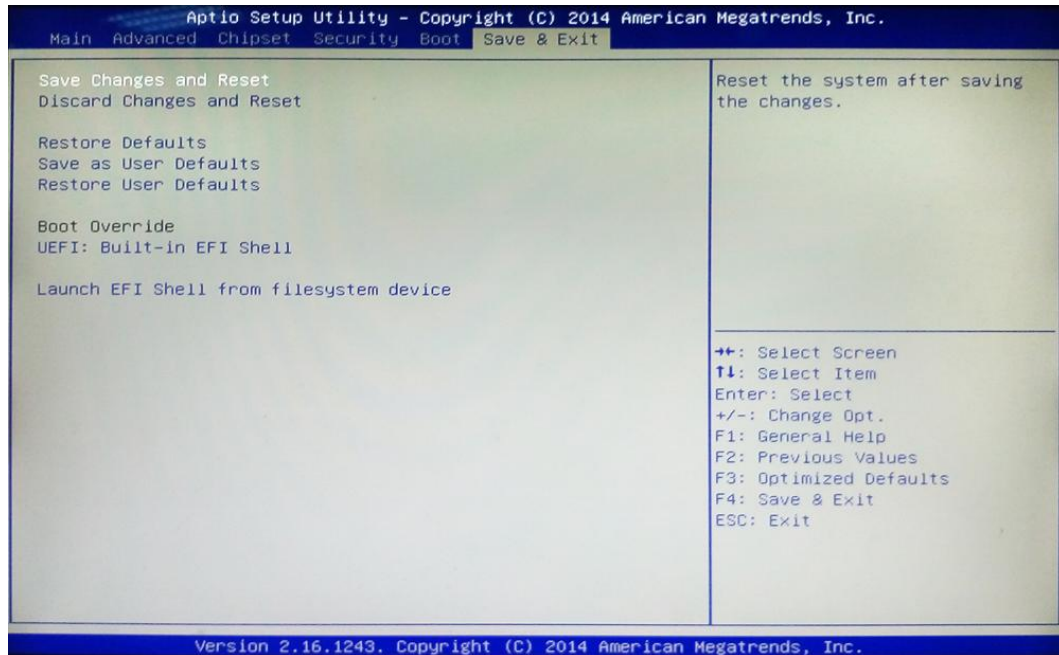The optional settings are: [On]; [Off].
Quiet Boot
The optional settings are: [Disabled]; [Enabled].
<u>*Boot Option Priorities*</u>

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

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 defaults to all the setup options.
Boot Oerride

UEFI: Built-in EFI Shell
Press this item and a dialogue box shall appear to ask if user wish to save configuration and reset.
Lauch EFI Shell from filesystem device
Use this item to launch EFI shell application (shell.efi) from one of the available filesystem device.