TECHNICAL MANUAL

Of

Intel Q170 Express Chipset

Based Mini-ITX M/B

NO. G03-NF592-F

Revision: 3.0

Release date: December 13, 2022

Environmental Protection Announcement

Do not dispose this electronic device into the trash while discarding. To minimize pollution and ensure environment protection of mother earth, please recycle.

TABLE OF CONTENT

Environmental Safety Instruction

- Avoid the dusty, humidity and temperature extremes. Do not place the product in any area where it may become wet.

- 0 to 40 centigrade is the suitable temperature. (The temperature comes from the request of the chassis and thermal solution)

- 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
3.0	Third Edition	December 13, 2022

Item Checklist

- ☑ Motherboard
- ☑ Cable(s)
- ☑ I/O Back panel shield

Chapter 1

Introduction of the Motherboard

1-1   Feature of Motherboard

- Intel® Q170 express chipset

- Support LGA 1151 CPU socket Intel® Core™ i7 processors / Intel® Core™ i5 processors / Intel® Core™ i3 processors / Intel® Pentium™ processors , Intel® Celeron™ processors (TDP $\leqslant 65$ W).

- Support 2* DDR3L 1600MHz SO-DIMM up to 16GB and dual channel function

- Integrated with 7*Intel i211AT & 1* i219LM Gigabit Ethernet LAN chip

- Support USB 3.0 data transport demand

- Support 6 * SATAIII (6Gb/s) Devices & RAID 0, 1, 5, 10 mode

- Support 1* side PCIE 2.0 x4 slot and 1* full-size Mini-PCIE slot

- Support 3G module with SIM card slot

- 1 * internal HDMI port

- Support Smart FAN function

- Supports ACPI S3 Function

- Compliance with ErP Standard
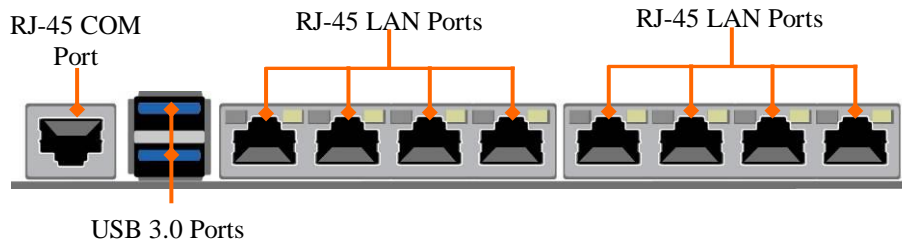
- Support Watchdog Timer Technology

1-2 Specification

Spec	Description
Design	● Thin mini-ITX form factor 6 layers ; PCB size: 17.0x17.0cm
Chipset	● Intel Q170 Express Chipset
CPU Socket	● Support Intel® LGA 1151 Socket Core™ i7 processors, Intel® Core™ i5 processors, Intel® Core™ i3 processors, Intel® Pentium™ processors, Intel® Celeron™ processors ** for detailed CPU support information please visit our website*
Memory Slot	● 2*DDR3L SO-DIMM slot ● Support DDR3L 1600 MHz SO-DIMM up to 16GB ● Support dual channel function
Expansion Slot	● 1* Full-size Mini-PCIE slot (**MPE**) ● 1* PCIE x4 slot by sideway(**PCIE1**)
Storage	● 6* SATAIII 6G/s ports with support for RAID 0/1/5/10 mode
Gigabit LAN Chip	● Integrated with 7* Intel I211AT Gigabit PCI-E LAN chip & 1* Intel I219LM Gigabit PHY LAN chip ● Support Fast Ethernet LAN function of providing 10/100/1000Mbps Ethernet data transfer rate
BIOS	● 128M AMI Flash ROM
Multi I/O	***Rear Panel I/O:*** ● 1* RJ-45 COM port ● 2* USB 3.0 port ● 8* RJ-45 port ***Internal I/O Connectors& Headers:*** ● 1 *24-pin main power connector ● 1 *4-pin 12V power connector ● 1* Front panel header ● 1* Speaker header & POWER LED header ● 2 * 9-Pin USB 2.0/1.1 header for 4* USB 2.0/1.1 ports ● 1 * PS2 Keyboard & Mouse header

	● 1* GPIO header
	● 2* LAN Status LED header
	● 1* HDMI header
	● 1* CPUFAN header & 2* SYSFAN header

1-3 Layout Diagram

Rear IO Diagram

RJ-45 COM Port

USB 3.0 Ports

RJ-45 LAN Ports

RJ-45 LAN Ports

Motherboard Internal Diagram-Front

SYS FAN1 Header

CPUFAN Header

ATX Main Power Connector

RJ-45 COM Port

ATX 12V Power Connector

USB 3.0 Ports

RJ-45 LAN Ports (LAN2)

LGA 1151 CPU Socket

DDR3L SODIMM Slots (SODIMM1/SODIMM2)

SIM Card Slot

BATCON

HDMI Header

Intel Q170 Chipset

RJ-45 LAN Ports (LAN1)

Full-size Mini-PCIE Slot

SATAIII Ports (SATA1/2/3/4/5/6)

LAN_LED2 Header

LAN_LED1 Header

SYS FAN2 Header

Front Panel Header

GPIO Header

USB 2.0 Port Headers

PWR LED & Speaker Header

PS/2 Keyboard & Mouse Header

PCIE1: Sideway PCI Express x4 Slot

Motherboard Jumper Position
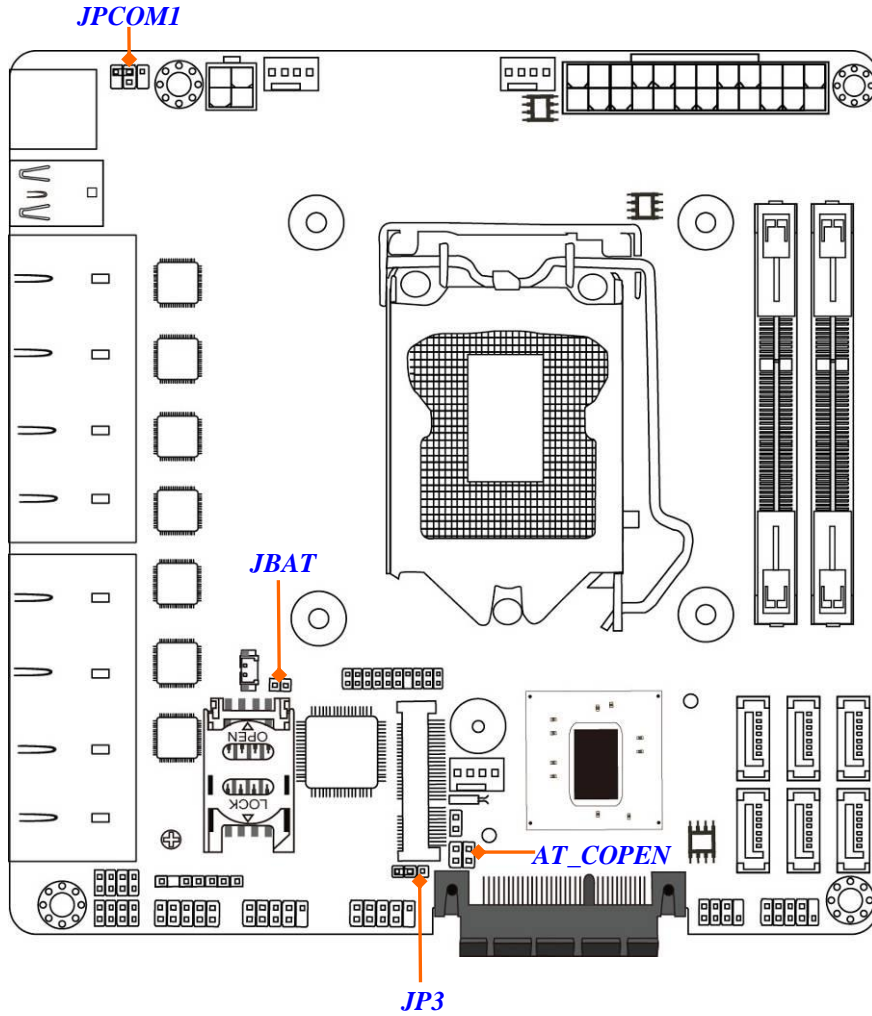
Connectors

Connector	Name
ATXPWR	Main Power Connector
ATX12V	Internal 12V Power Connector
SATA1/2/3/4/5/6	SATAIII Connector
RJ45_COM1	RJ-45 COM Port Connector for Console
USB1	USB 3.0 Port Connector X2
LAN1/LAN2	RJ-45 LAN Connector
MPE	Full-size Mini-PCIE Connector

Headers

| Header	Name	Description
JW_FP	Front Panel Header(PWR LED/ HD LED/Power Button /Reset)	9-pin Block
SPEAK	Power LED &Speaker Header	7-pin Block
FP_USB1/FP_USB2	USB Header X2	9-pin Block
PS2KBMS	PS2 Keyboard & Mouse Header	6-pin Block
GPIO_CON	GPIO Header	10-pin Block
LAN_LED1/LAN_LED2	LAN Status LED Header	8-pin Block
HDMI	HDMI Port Header	19-pin Block
CPUFAN/SYSFAN1/SYSFAN2	Fan Header X3	4-pin Block

Jumper

Jumper	Name	Description
JCOMP1	RJ45_COM1 Port Pin 5 VCC Select	4-pin Block
JBAT	Clear ME Function Setting	2-pin Block
JP3	Mini PCI-E Slot (MPE)VCC3.3V/3.3VSB Select	3-pin Block
AT_COEPN	*Pin (1-2):* ATX Mode / AT Mode Select *Pin (3-4):* Case Open Message Display Function	4-pin Block

Chapter 2
Hardware Installation

2-1 Jumper Setting

JPCOM1 (4-pin): RJ45_COM1 Port Pin5 VCC Select
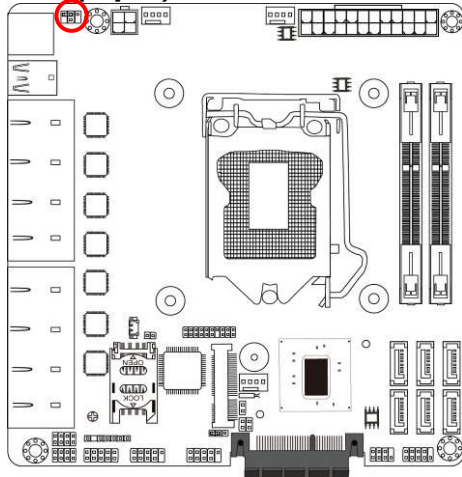
JCOMP1→RJ45_COM1 Pin5 VCC Select
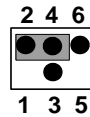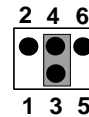
2 4 6	2 4 6	2 4 6
1 3 5	1 3 5	1 3 5
2-4 Closed: Pin5=NC;	3-4 Closed: Pin5=+5V;	4-6 Closed: Pin5=+12V.
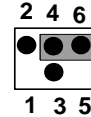
JBAT (2-pin): Clear CMOS Function Settings
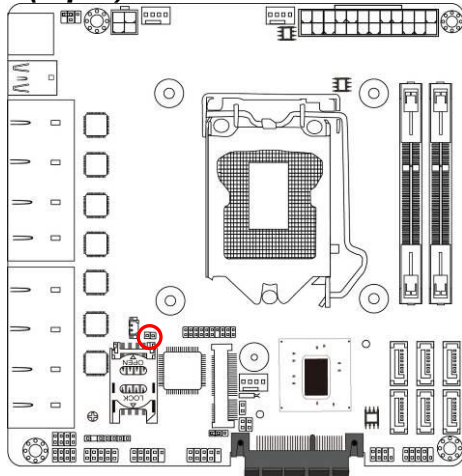
JBAT→Clear CMOS

Pin1

1-2 Open: Normal；

Pin1

1-2 Closed: Clear CMOS.

JP3 (3-pin): Mini PCI-E (MPE) Slot VCC 3.3V/3.3 VSB Select
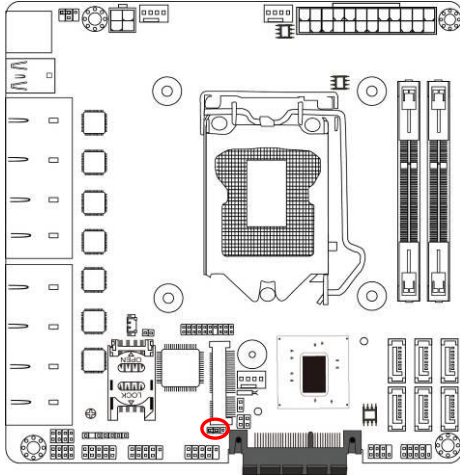
JP3→MPE Slot
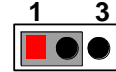
1-2 Closed：MINI PCI-E VCC= 3.3V;
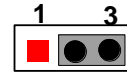
2-3 Closed：MINI PCI-E VCC= 3.3VSB.

Pin 1 & 2 of AT_COPEN (4-pin): AT Mode Function Select
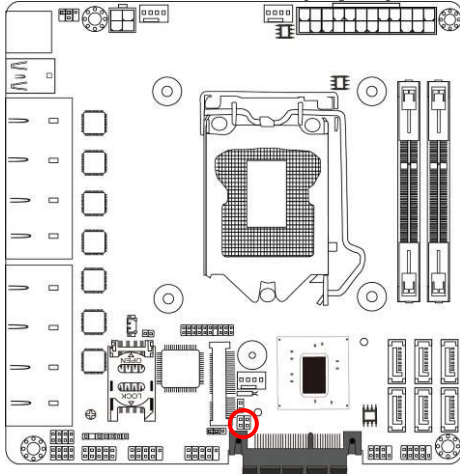
AT_COPEN(Pin 1&2)→AT Mode Select
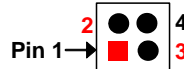
1-2 Open: ATX Mode Selected(Default);
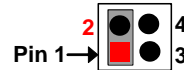
1-2 Close: AT Mode Selected.

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 (4-pin): Case Open Message Display Function Select
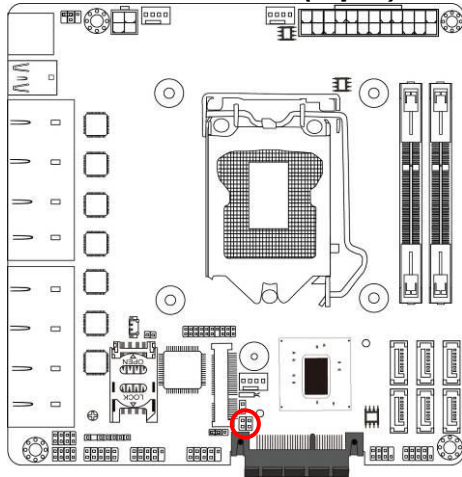
AT_COPEN(Pin 3&4)→Case Open Function Select

2 ●● **4**
1 ■● ← **Pin3**
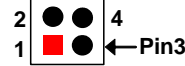
3-4 Open: Normal(Default);

2 ●● **4**
1 ■● ← **Pin3**
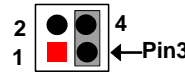
3-4 Close: Case Open Function Selected (One Touch).

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

2-2　Connectors and Headers
2-2-1 Connectors
(1) RJ45_COM1(8-pin block): RJ-45 COM Port Connector for Console
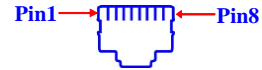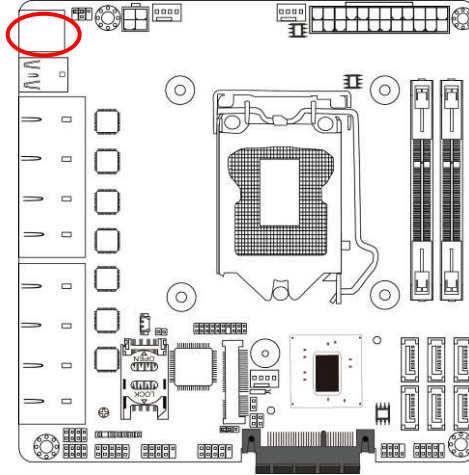
RJ45_COM1

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

(2) ATXPWR(24-pin block): Main Power Connector
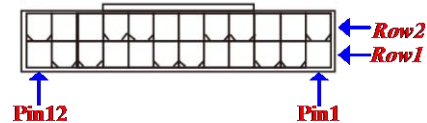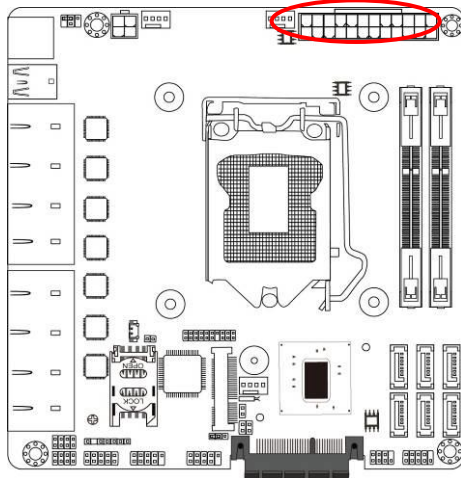
PIN	ROW1	ROW2
1	+3.3V	+3.3V
2	+3.3V	-12V
3	GND	GND
4	+5V	Soft Power on
5	GND	GND
6	+5V	GND
7	GND	GND
8	Power OK	-5V
9	+5V Stand by	+5V
10	+12V	+5V
11	+12V	+5V
12	+3.3V	GND

10

(3) ATX12V (4-pin block): 12V Internal Power Connector
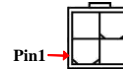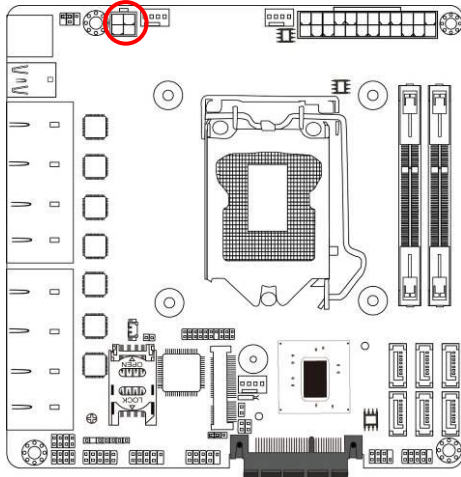
Pin No.	Definition
1	GND
2	GND
3	+12V
4	+12V

(4) SATA1/2/3/4/5/6 (7-pin): SATA III Port connector
These are high-speed SATAIII port that supports 6 GB/s transfer rate.
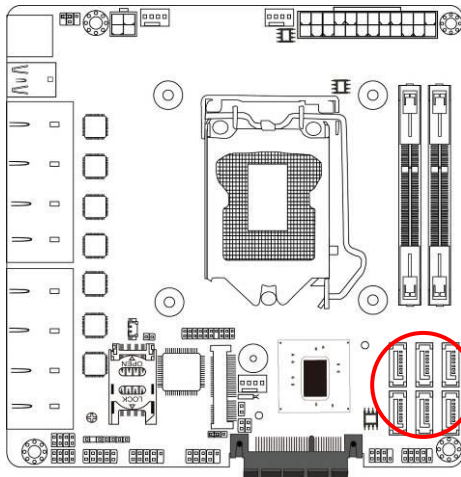
Pin No.	Defnition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

(5) BATCON (2-pin): Battery Connector
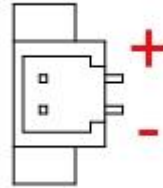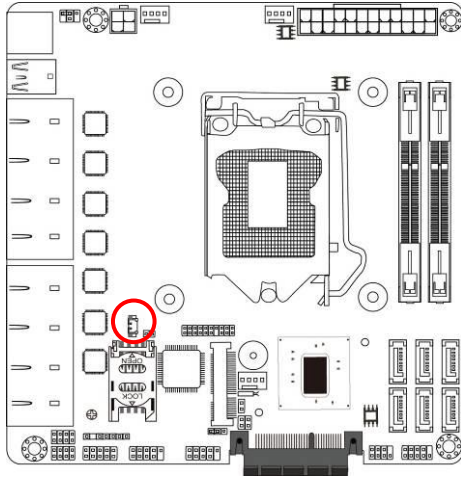
2-2-2 Headers
(1) JW-FP (9-pin): Front Panel Header
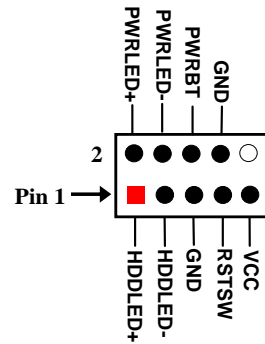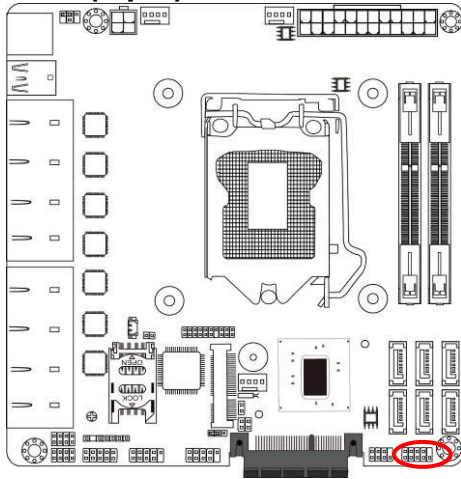
(2) SPEAK (7-pin): PWR LED Header & Speaker Header

PWRLED-
PWRLED-
PWRLED+

Pin 1 →

SPEAK+
NC
NC
SPEAK-
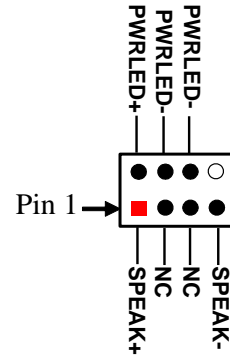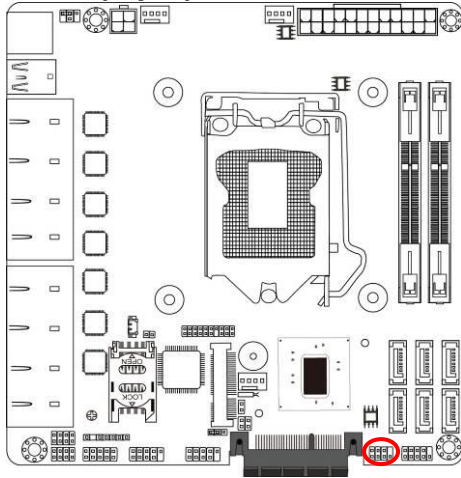
(3) FP_USB1/FP_USB2 (9-pin): USB 2.0 Port Headers

-DATA
+DATA
GND
VCC
NC

Pin 1 →

VCC
-DATA
+DATA
GND
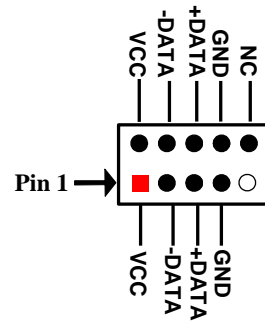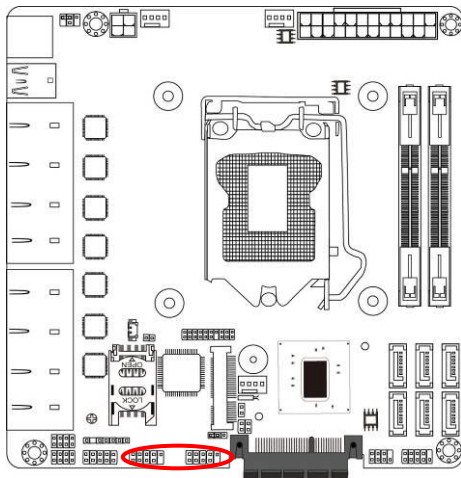
(4) PS2KBMS (6-pin): PS/2 Keyboard & Mouse Header

Pin1 → VCC, KB_DATA, KB_CLK, GND, MS_CLK, MS_DATA
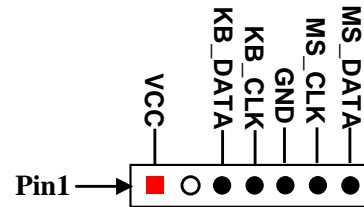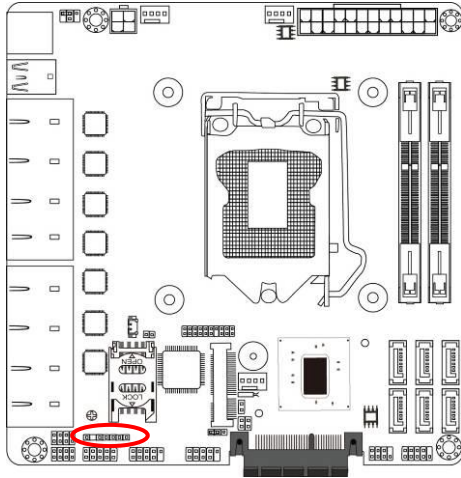
(5) GPIO_CON (10-pin): GPIO Header

GPIO31, GPIO33, GPIO35, GPIO37, VCC
Pin1 → GPIO30, GPIO32, GPIO34, GPIO36, GND
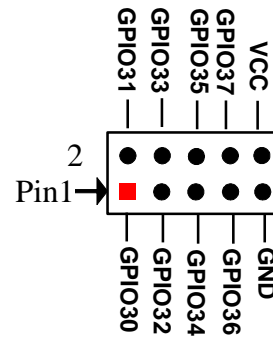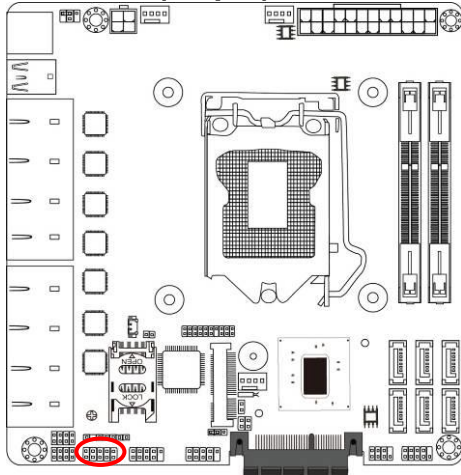
(6) LAN_LED1/LAN_LED2 (8-pin): LANLED Header
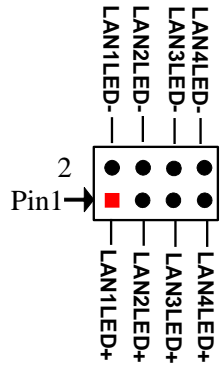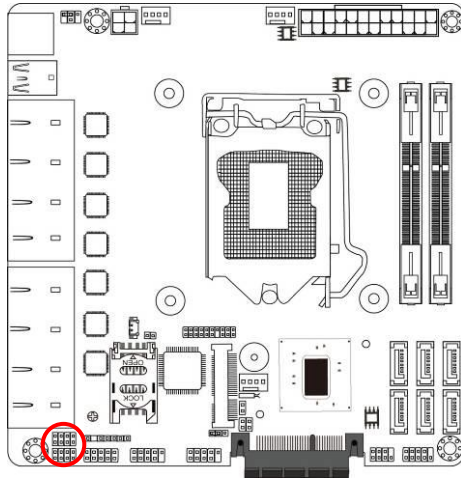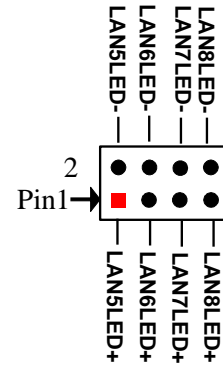
LAN_LED1 Header   *LAN_LED2 Header*

(7) HDMI (19-pin): HDMI Port Header
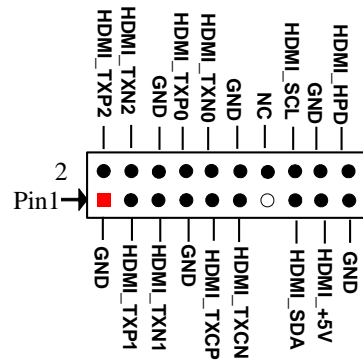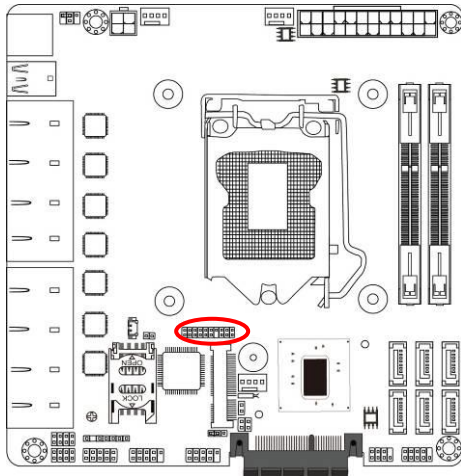
(8) SYSFAN1/CPUFAN/SYSFAN2 (4-pin): FAN Headers

Control
Fan Detect
+12V Fan Power
GND

Pin1
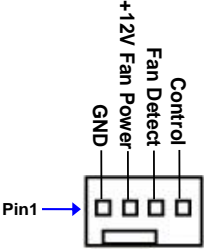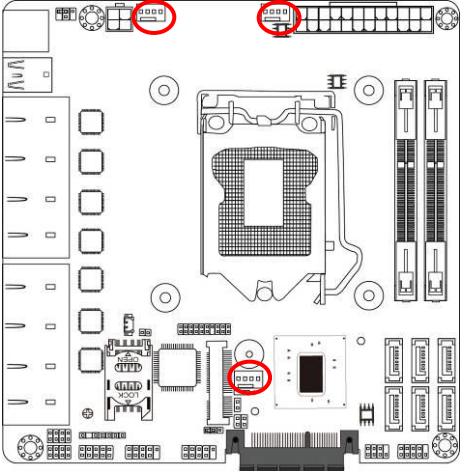
Chapter 3
Introducing BIOS

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

3-2 BIOS Menu Screen

The following diagram show a general BIOS menu screen:

Menu Bar

Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.

Main Advanced Chipset Security Boot Save & Exit

BIOS Information
BIOS Vendor
Core Version
Filename
Build Date and Time

System Date
System Time

Access Level

American Megatrends
5.11
BF52AA01
02/02/2016 09:44:47

[Sat 01/03/2015]
[01:01:56]

Administrator

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

General Help Items

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

Menu Items

Current Setting Value

Function Keys

Version 2.17.1254. Copyright (C) 2016 American Megatrends, Inc.

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 values.
- [F3]: Optimized defaults.
- [F4]: Save & Exit.
- Press <Esc> to exit from BIOS Setup.

3-4   Getting Help

Main Menu

The on-line description of the highlighted setup function is displayed at the top right corner the screen.

Status Page Setup Menu/Option Page Setup Menu

Press 【F1】to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window, press <**Esc**>.

3-5 Menu Bars

There are six menu bars on top of BIOS screen:

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

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

3-6　Main Menu

Main menu screen includes some basic system information. Highlight the item and then use the <+> or <-> and numerical keyboard keys to select the value you want in each item.

```
           Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
    Main  Advanced  Chipset  Security  Boot  Save & Exit

    BIOS Information                                          Set the Date. Use Tab to
    BIOS Vendor                   American Megatrends         switch between Date elements.
    Core Version                  5.11
    Filename                      BF52AA01
    Build Date and Time           02/02/2016 09:44:47

    System Date                   [Sat 01/03/2015]
    System Time                   [01:01:56]

    Access Level                  Administrator


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



           Version 2.17.1254. Copyright (C) 2016 American Megatrends, Inc.
```

System Date
Set the date. Please use [Tab] to switch between data elements.
System Time
Set the time. Please use [Tab] to switch between time elements.

3-7 Advanced Menu
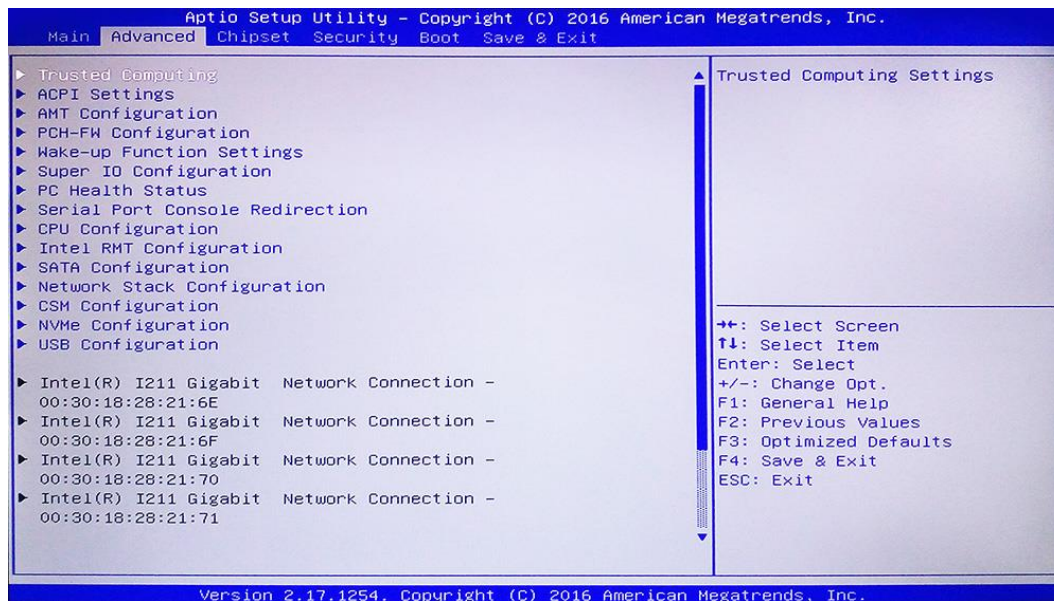
► **Trusted Computing**

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

   Security Device Support

   Use this item to enable or disable BIOS support for security device. O.S. will not show security device. TGG 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-items:
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)].

► **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.
Hide Un-Configure ME Confirmation Prompt
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.
ASF
Use this item to enable or disable Alert Specification Format.
Activate 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 events 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.

► **PCH-FW Configuration**

Press [Enter] to view ME information and make settings in the following sub-items:

  ► **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.

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

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

Wake-up System with Dynamic Time

Use this item to enable or disable system wake on alarm event.

System will wake on the current time + Increase minutes.

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

When set as [Enabled], system will wake on the current time + increased minute(s).

PS2 (S3~S5)/USB(S3~S4) Wake-up

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

Use this item to enable or disable PS2 KB/MS wake-up from S3/S4/S5 or USB from S3/S4 state.
This function is supported when 'ERP Support' is set as [Disabled].
USB S5 Power
Use this item to enable or disable USB power after power shutdown.
This function is 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: [Disabled]; [Auto].
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).
Change Settings
Use this item to select an optimal setting for super IO device.
Serial Port FIFO Mode
The optional settings are: [16-Byte FIFO]; [32-Byte FIFO]; [64-Byte FIFO]; [128-Byte FIFO].

WatchDog Timer
Use this item to enable or disable WDT reset function. 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 Support**' is set as [Auto].

The optional settings: [Disabled]; [Enabled].
When set as [Enabled], the following sub-items shall appear:

WatchDog Timer Value in ERP
User can select a value in the range of [10] to [4095] seconds when '**WatchDog Reset Timer Unit in ERP**' set as [Sec]; or in the range of [1] to [4095] minutes when '**WatchDog Reset Timer Unit in ERP**' set as [Min].
WatchDog Timer Unit in ERP
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 (refer to *Page 8*, AT_MODE jumper for ATX Mode & AT Mode Select).
Case Open Detect
Use this item to detect case has already open or not, show message in POST.
PS2 KB/MS Connect
Use this item to select PS2 connect primary device.
The optional settings are: [Keyboard First]; [Mouse First].

► **PC Health Status**
Press [Enter] to view current hardware health status, make further settings in '**SmartFAN Configuration**' and set value in '**Shutdown Temperature**'.

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

CPUFAN / SYSFAN1/ SYSFAN2 Smart Mode
The optional settings are: [Disabled]; [Enabled].
When set as [Enabled], the following sub-items shall appear:
CPUFAN / SYSFAN1/ SYSFAN2 Full-Speed Temperature
Use this item to set CPUFAN (/SYSFAN1/SYSFAN2) full speed temperature. Fan will run at full speed when above this pre-set temperature.
CPUFAN / SYSFAN1/ SYSFAN2 Full-Speed Duty
Use this item to set CPUFAN (/SYSFAN1/SYSFAN2) full-speed duty. Fan will run

at full speed when above this pre-set duty.

CPUFAN / SYSFAN1/ SYSFAN2 Idle-Speed Temperature

Use this item to set CPUFAN (/SYSFAN1/SYSFAN2) idle speed temperature. Fan will run at idle speed when below this pre-set temperature.

CPUFAN / SYSFAN1/ SYSFAN2 Idle-Speed Duty

Use this item to set CPUFAN (/SYSFAN1/SYSFAN2) idle speed duty. Fan will run at idle speed when below this pre-set duty.

Shutdown Temperature

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**' 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.
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:

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

Use this item to turn on/off the MLC streamer prefecher.

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

Adjacent Cache Line Prefetch

Use this item to turn on/off prefeching of adjacent cache lines.

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

Intel(R) SpeedStep(tm)

This item allows more than two frequency ranges to be supported.

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

CPU C Status

Use this item to enable or disable CPU C status.

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

Package C State Limit

The optional settings are: [C0/C1]; [C2]; [C3]; [C6]; [C7]; [C7s]; [C8]; [AUTO].

► **Intel RMT Configuration**
Press [Enter] to go to next screen to enable or disable '**Intel Ready Mode Technology'.**
Intel Ready Mode Technology
The optional settings: [Disabled]; [Enabled].

*When set as [**Enabled**], user can also make further settings in the following items that appear:*
Intel RMT State
Use this item to enable or disable Intel RMT enabling status in BIOS.

► **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].
S ATA 1/ 2/ 3 /4/ 5/ 6
Port
The optional settings: [Disabled]; [Enabled].
Use this item to enable or disable each SATA port.
Hot Plug
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: [Disabled]; [Enabled].
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], 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 option controls the execution of UEFI and Legacy PXE OpROM.

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

Storage

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

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

Other PCI devices

This item is for PCI devices other than Network, Mass storage or video defines which OpROM to launch.

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

► **NVMe Configuration**

Press [Enter] to check NVMe controller and driver information.

► **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 delay and time-out

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. The optional settings: [Auto]; [Manual].Select [Manual] you can set value for the following sub-item: **Device Power-up delay in seconds,** the delay range in from 1 to 40 seconds, in one second increments.

► **Intel(R) I211 Gigabit Network Connection- XX:XX:XX:XX:XX:XX / Intel(R) Ethernet Connection (H) I219-LM- XX:XX:XX:XX:XX:XX**

This item shows current network brief information.

Note: *Use should slide down to the bottom of the screen to view information for 'Intel(R) Ethernet Connection (H) I219-LM- XX:XX:XX:XX:XX:XX'*

3-8 Chipset Menu

Aptio Setup Utility – Copyright (C) 2016 American Megatrends, Inc.
Main   Advanced   Chipset   Security   Boot   Save & Exit

▶ System Agent (SA) Configuration   System Agent (SA) Parameters
▶ PCH-IO Configuration

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

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► **System Agent (SA) Configuration**
Press [Enter] to make settings for the following sub-items:
VT-d
The optional settings are: [Enabled]; [Disabled].

► **Graphics Configuration**
Press [Enter] to 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]; [1024M] ; [1536M] ; [2048M] ; [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].

► **Memory Configuration**
Press [Enter] to view brief information for the working memory module.

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

USB Controller
The optional settings are: [Disabled]; [Enabled].
Onboard Lan1 Controller
Use this item to enable or disable onboard NIC
Wake on LAN
Use this item to enable or disable integrated LAN to wake the system. The Wake on LAN can not be disabled if ME is on at Sx state.
Onboard Lan2 Controller/ Onboard Lan3 Controller/ Onboard Lan4 Controller/Onboard Lan5 Controller/Onboard Lan6 Controller/Onboard Lan7Controller/ Onboard Lan8 Controller
Use this item to enable or disable onboard device or controller.
MPE Slot
Use this item to enable or disable the PCI Express root port.
The optional settings are: [Disabled]; [Enabled].
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 re-applied after a power failure (G3 state).
The optional settings are: [Always On]; [Always Off]; [Former State].

3-9 Security Menu
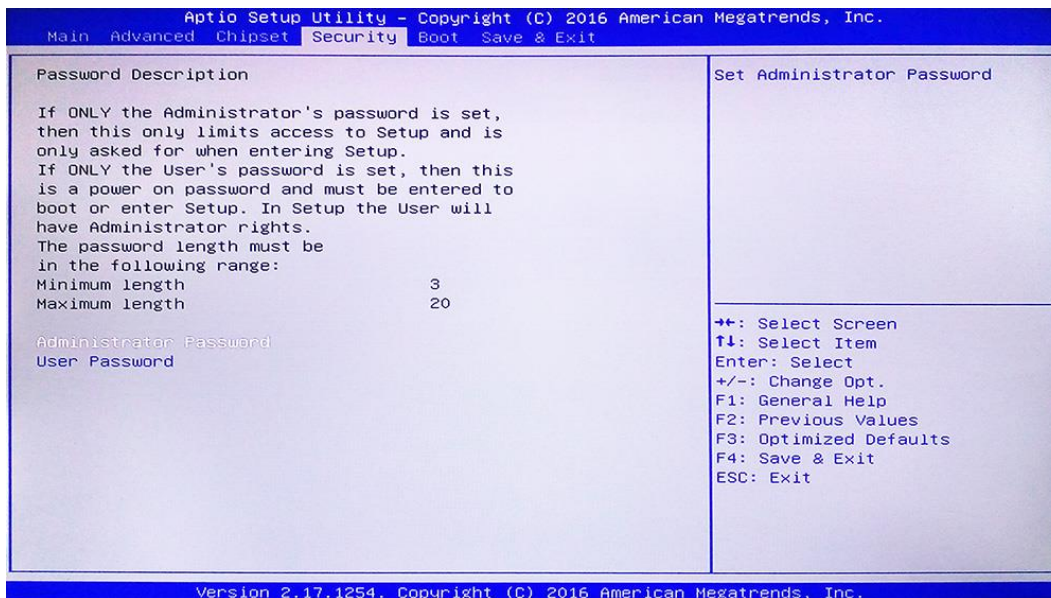
Security menu allow users to change administrator password and user password settings.

Administrator Password

Press [Enter] to create new administrator password. Press again to confirm the new administrator password.

User Password

Press [Enter] to create new user password. Press again to confirm the new user password.

3-10 Boot Menu
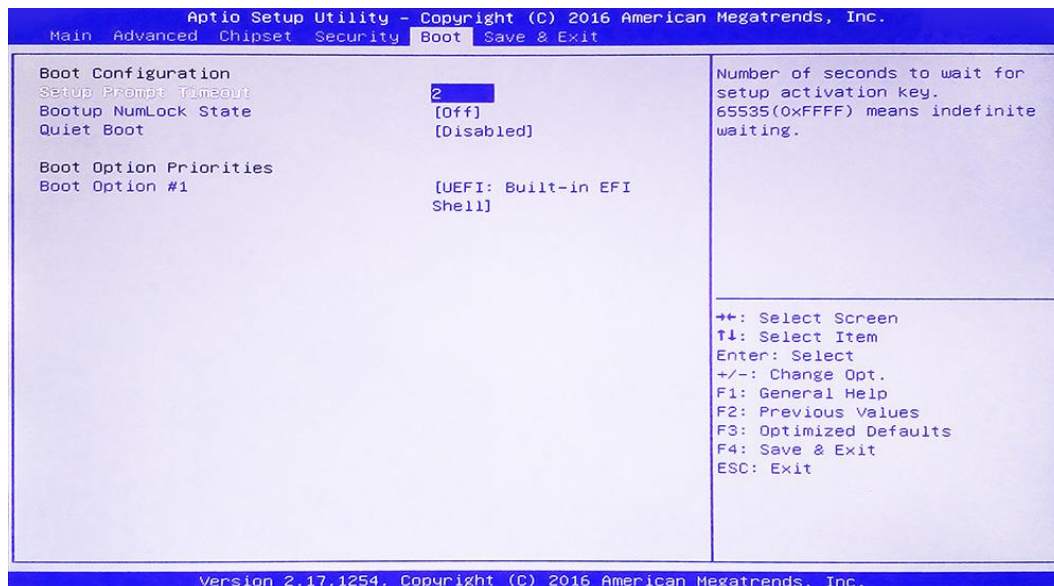
Boot Configuration

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.

3-11 Save & Exit Menu

```
                    Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
      Main  Advanced  Chipset  Security  Boot  Save & Exit

   Save Options                                              Reset the system after saving
   Save Changes and Reset                                    the changes.
   Discard Changes and Reset

   Default Options
   Restore Defaults
   Save as User Defaults
   Restore User Defaults

   Boot Override
   UEFI: Built-in EFI Shell
   Launch EFI Shell from filesystem device
                                                             ──────────────────────────────
                                                             →←: Select Screen
                                                             ↑↓: Select Item
                                                             Enter: Select
                                                             +/-: Change Opt.
                                                             F1: General Help
                                                             F2: Previous Values
                                                             F3: Optimized Defaults
                                                             F4: Save & Exit
                                                             ESC: Exit


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```
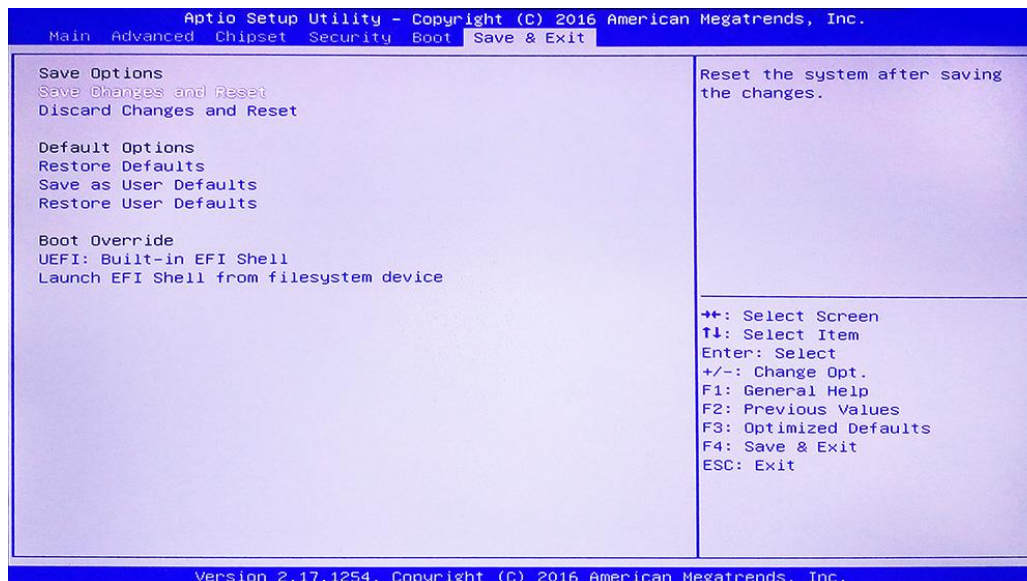
Save Changes and Reset

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 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.