NF632E Series

User Manual

NO. G03-NF632E-F

Revision: 8.0

Release date: October 1, 2019

Trademark:

Environmental Protection Announcement

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

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 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
8.0	Eighth Edition	October 1, 2019

Item Checklist

☑ Motherboard
☑ Cable(s)

Chapter 1
Introduction of the Motherboard

1-1 Feature of Motherboard

- Onboard high-performance Intel® Skylake-U series SoC CPU
- Support 2 * DDR4 2133MHz Dual Channel SO-DIMM, max up to 32GB
- Support HDMI, Display Port, LVDS, eDP Triple Independent Displays
- Support 1 * SATAIII (6Gb/s) device
- Onboard 1* full-size Mini-PCIE/M-SATA share slot device
- Onboard 1* half-size Mini-PCIE device
- Support 2 * RJ-45 LAN port
- Support 6 * internal COM port (COM1 support RS232/422/485)
- Support USB 3.0 data transport demand
- Support CPU Over-Temperature protection
- Support CPU Over-Current/Under Voltage protection
- Support CPU Smart FAN
- Compliance with ErP standard
- Support Watchdog function
- Support TPM function (optional)

1-2 Specification

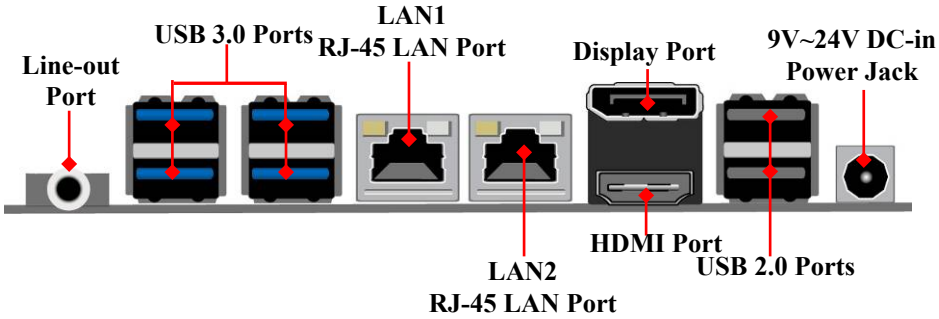
Spec	Description
Design	● 3.5” SBC Form Factor; PCB size: 148mm * 102mm
Embedded CPU	● Integrated with Intel® Skylake-U series CPU;TDP:15W ● **CPU model varies from different IPC options. Please consult your dealer for more information of onboard CPU.*
Memory Slot	● 2*DDR4 SO-DIMM slot support 2* DDR4 2133 MHz SO-DIMM up to 32GB ● Support dual channel function
Expansion Slot	● 1* Full-size Mini-PCIE/MSATA slot (***MPEST,*** *share with MSATA slot*) ● 1* Full-size Mini-PCIE slot (**MPE**)
Storage	● 1*SATAIII 6G/s port ● 1* Full-size Mini-PCIE/MSATA slot (***MPEST,*** *share with MSATA slot*)
LAN Chip	● Integrated with Intel I211AT Gigabit PCI-E LAN chip & Intel I219LM Gigabit LAN PHY chip ● Support Fast Ethernet LAN function of providing 10/100/1000Mbps Ethernet data transfer rate
Audio Chip	● Realtek ALC662VD HD Audio Codec integrated ● Audio driver and utility included
BIOS	● AMI 128MB Flash ROM
Rear I/O	● 1* 9V~24V DC-in power jack ● 2* USB 2.0 port ● 1* Display port ● 1* HDMI port ● 2* RJ-45 LAN port ● 4* USB 3.0 port ● 1* Audio line-out port
Internal I/O	● 1* 2-Pin internal 9V~24V DC-in system power connector ● 1* SATA Power-out connector ● 1* CPUFAN connector ● 1* Front panel audio header

	● 1* 3W amplifier header ● 1* Front panel header ● 2* 9-pin USB 2.0 header (Expansible to 4* USB 2.0 ports) ● 1* 4-pin USB 2.0 header (Expansible to 1* USB 2.0 port) ● 1* SMBUS header ● 1* PS/2 keyboard & mouse header ● 1* GPIO header ● 1* RS232/422/485 serial port header (***COM1***) ● 5* RS232 serial port header (***COM2/3/4/5/6***) ● 1* LAN LED activity header ● 1* 4-Lane eDP header ● 1* 24-bit dual channel LVDS header ● 1* LVDS inverter

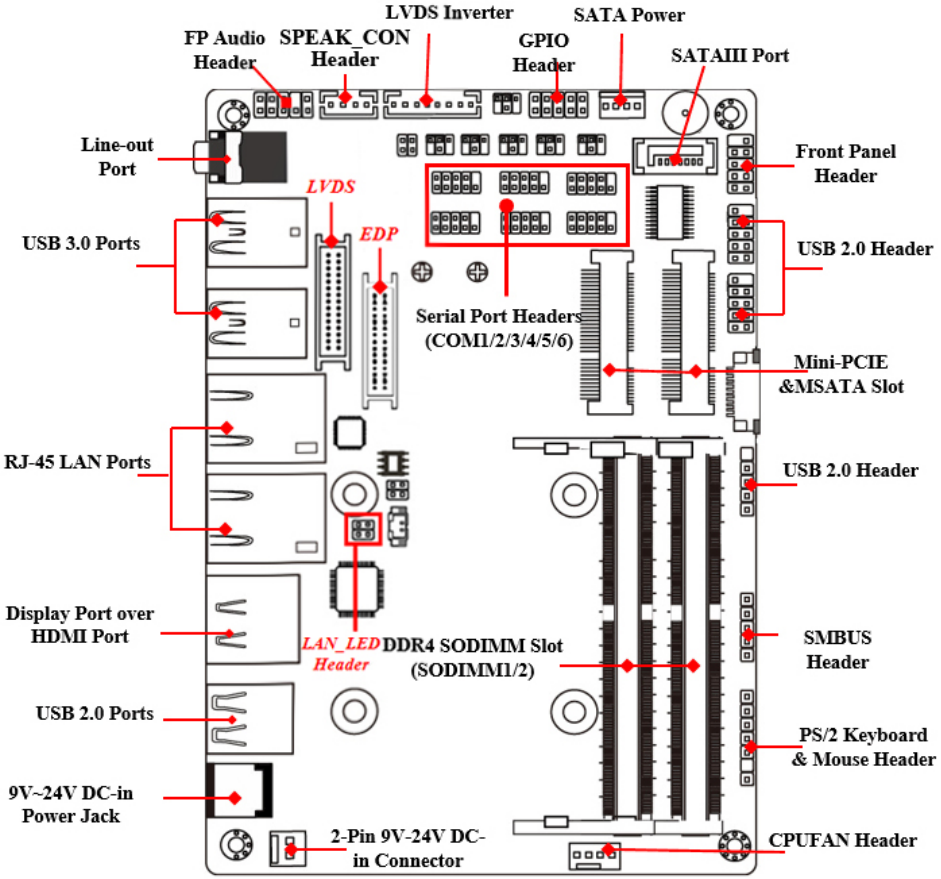
** **Note:** Many PCs now include XHCI USB controllers which allow for the support of USB 3.0 and higher USB speeds. This inclusion of XHCI controllers has lessened the need for EHCI USB controllers within platforms. However, legacy operating systems (OS) may not natively recognize XHCI controllers. You might need to pre-install XHCI driver while desiring to install a non-xHCI OS (ex.Windows* 7) on Intel platforms which do not include EHCI controllers. Please contact your representative for more details.*

1-3 Layout Diagram

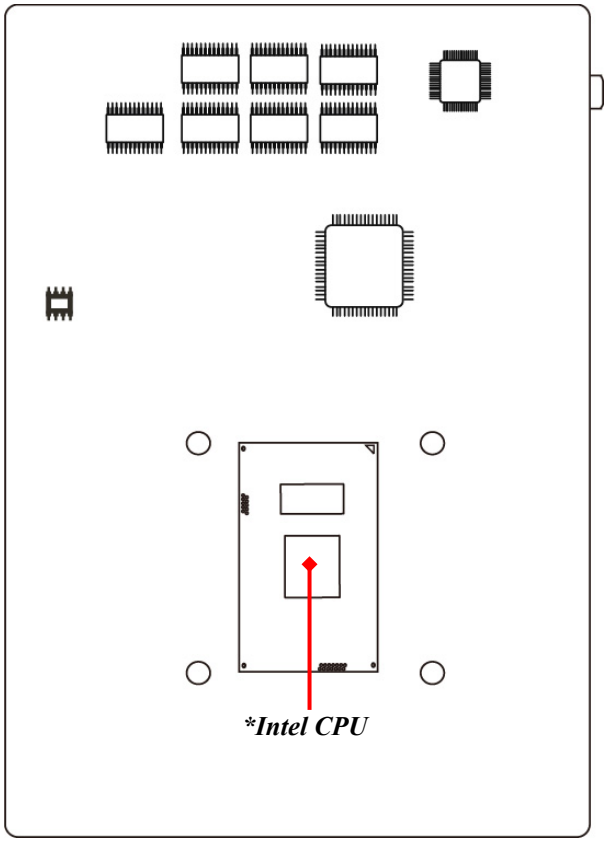
Rear IO Panel Diagram:



Motherboard Internal Diagram-Front Side

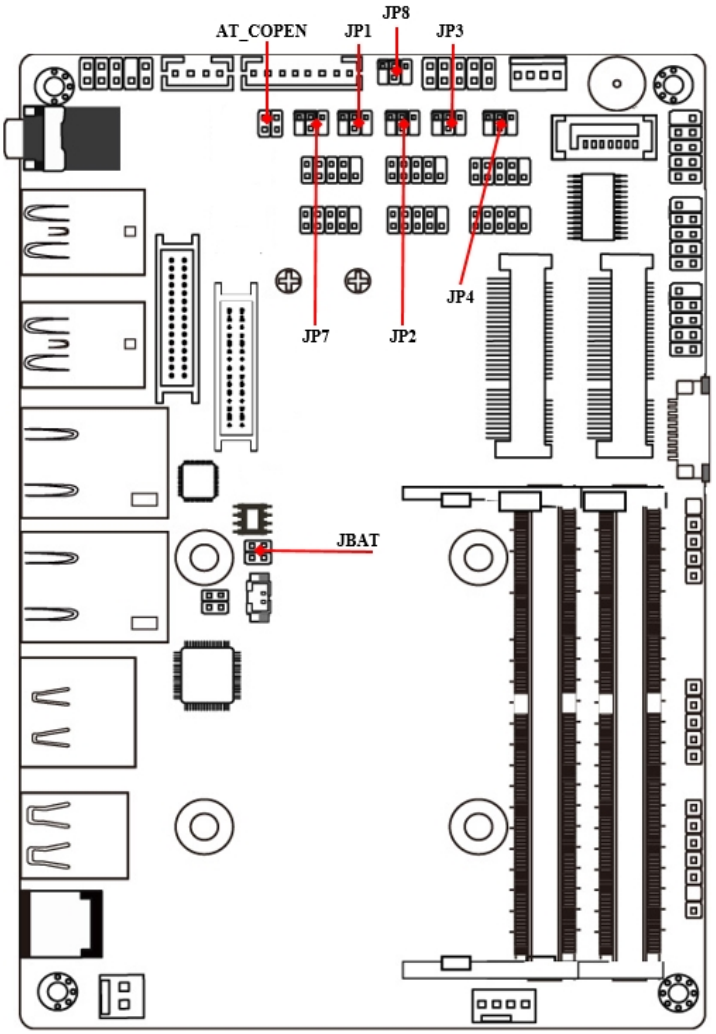


Motherboard Internal Diagram-Back Side



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

Jumper Positions:



Jumper

Jumper	Name	Description
JP1	COM1 Header Pin9 Function Select	4-pin Block
JP2	COM2 Header Pin9 Function Select	4-Pin Block
JP3	COM3 Header Pin9 Function Select	4-Pin Block
JP4	COM4 Header Pin9 Function Select	4-Pin Block
JP7	LVDS Header VCC 3.3V/5V/12V Select	4-Pin Block
JP8	LVDS INVERTER Backlight 5V/12V Select	4-Pin Block
AT_COPEN	***Pin (1&2):*** ATX Mode / AT Mode Select ***Pin(3&4):***Case Open Message Display Function	4-Pin Block
JBAT	***Pin (1&2):*** Clear CMOS RAM Function Setting ***Pin(3&4):*** Flash Descriptor Security Override	4-Pin Block

Connectors

Connector	Name
DCIN	9V~24V DC–in System Power Jack
ATX2P	Internal 9V~24V System DC–in Power Connector
USB20	USB 2.0 Port Connector x2
DP_HDMI	***Top:*** Display Port Connector ***Bottom:*** HDMI Port Connector
LAN1/LAN2	RJ-45 LAN Port Connector x2
USB30/USB31	USB 3.0 Port Connector x 4
LINE_OUT	Audio Line-Out Connector
SATA	SATAIII Connector
SATAPWR	SATA Power out Connector
CPUFAN	CPUFAN Connector

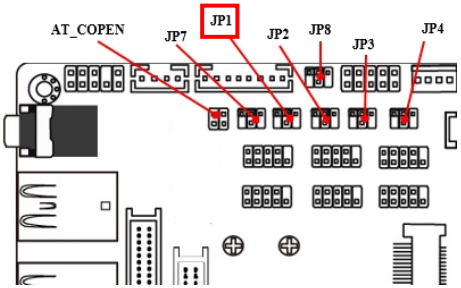
Headers

Header	Name	Description
FP_AUDIO	Front Panel Audio Header	9-pin Block
SPEAK_CON	3W Amplifier Header	4-pin Block
JW_FP	Front Panel Header(PWR LED/ HDD LED/Power Button /Reset)	9-pin Block
FP_USB20/ FP_USB21	USB 2.0 Header	9-pin Block
FP_USB	USB 2.0 Header	4-pin Block
SMBUS	SMBUS Header	5-pin Block
PS2KBMS	PS/2 Keyboard & Mouse Header	6-pin Block
GPIO	GPIO Header	10-pin Block
COM1	RS232/422/485 Serial Port Header	9-pin Block
COM2/3/4/5/6	RS232 Serial Port Header	9-pin Block
LAN_LED	LAN Activity LED Header	4-pin Block
INVERTER	LVDS Inverter Header	8-pin Block
LVDS	LVDS Header	30-pin Block
EDP	4-lane EDP Header	40-pin Block

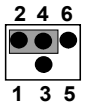
Chapter 2
Hardware Installation

2-1 Jumper Setting

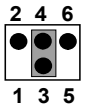
JP1 (4-pin): COM1 Header Pin9 Function Select



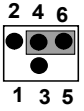
JP1→COM1 Header Pin-9



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

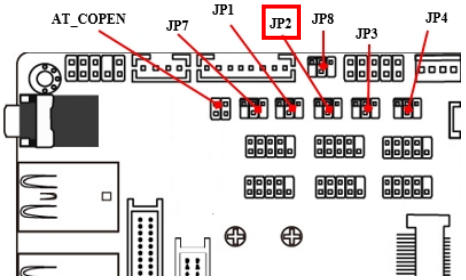


3-4 Closed: Pin9=+5V;

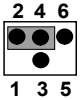


4-6 Closed: Pin9=+12V.

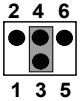
JP2 (4-pin): COM2 Header Pin9 Function Select



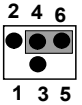
JP2→COM2 Header Pin-9



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

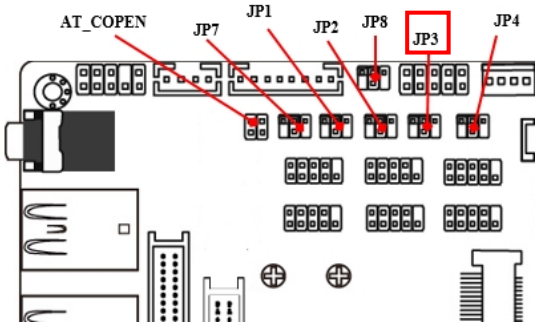


3-4 Closed: Pin9=+5V;



4-6 Closed: Pin9=+12V.

JP3 (4-pin): COM3 Header Pin9 Function Select



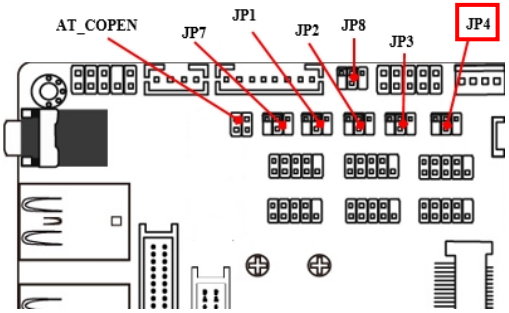
JP3→COM3 Header Pin-9

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

3-4 Closed: Pin9=+5V;

4-6 Closed: Pin9=+12V.

JP4 (4-pin): COM4 Header Pin9 Function Select



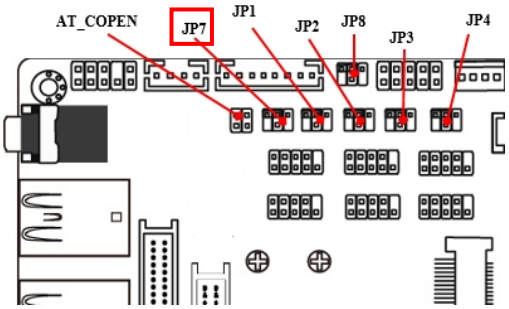
JP4→COM4 Header Pin-9

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

3-4 Closed: Pin9=+5V;

4-6 Closed: Pin9=+12V.

JP7 (4-pin): LVDS/eDP VCC 3.3V/5V/12V Select



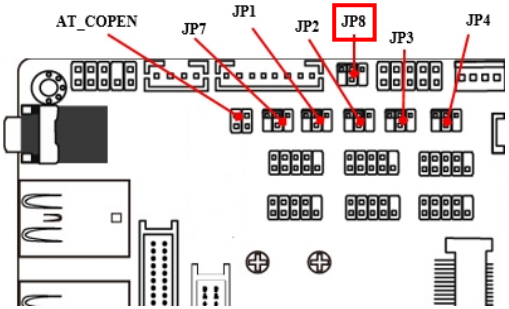
JP7→LVDS VCC

2-4 Closed:
VCC = 3.3V

3-4 Closed:
VCC = 5V;

4-6 Closed:
VCC = 12V;

JP8 (3-pin): LVDS/eDP INVERTER Backlight 5V/12V Select



JP8→LVDS Backlight

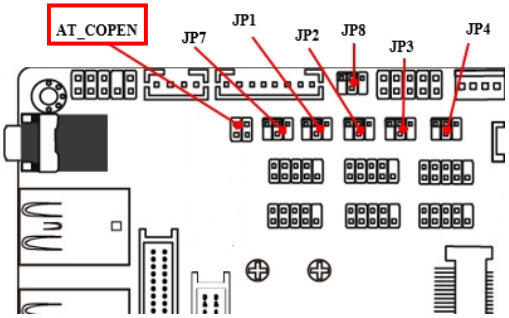
2-4 Closed:
VCC = 5V;

3-4 Closed:
VCC = 12V;

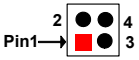
4-6 Closed:
VCC = DC-in.

***Note:** The maximum current carried is 1A.*

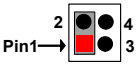
Pin(1-2) of AT_COPEN (4-pin): ATX Mode/AT Mode Select



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



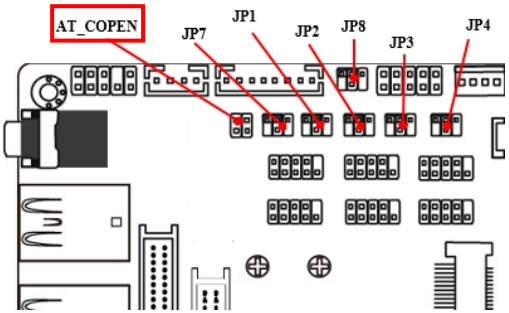
1-2 Open: ATX Mode Selected(Default);



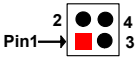
1-2 Closed: AT Mode Selected.

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

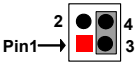
Pin(3-4) of AT_COPEN (4-pin): Case Open Message Display Function Select



Pin(3-4) of AT_COPEN→
Case Open Dectect Select



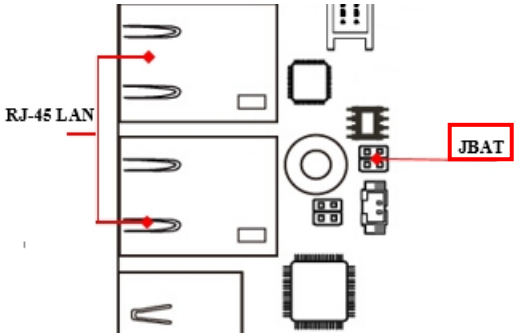
3-4 Open: Normal(Default);



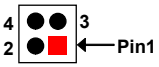
3-4 Closed: Case Open Function. Selected(One Touch).

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

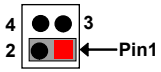
Pin (1-2) of JBAT (4-pin): Clear CMOS RAM Settings



Pin(1-2) of JBAT→ Clear CMOS

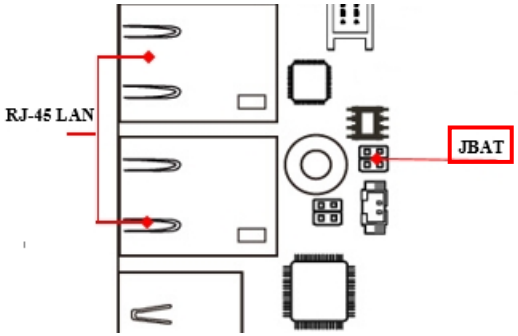


1-2 Open: Normal(Default);

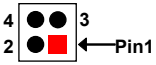


1-2 Closed: Clear CMOS(One Touch).

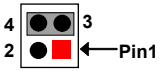
Pin(3-4)of JBAT (4-pin): Flash Descriptor Security Override



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



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

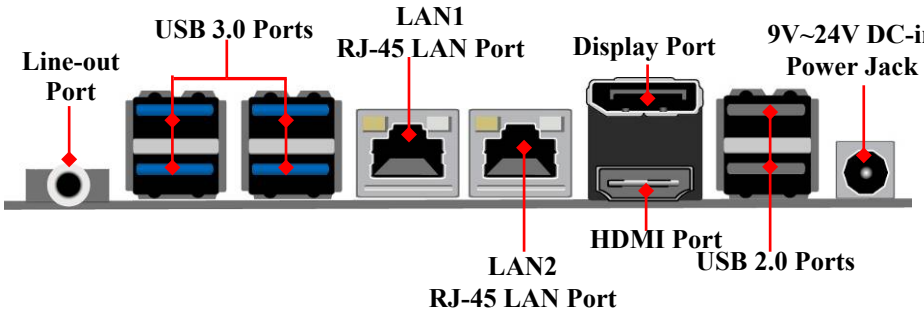


3-4 Closed: Disable Flash Descriptor security measures (override).

2-2 Connectors and Headers

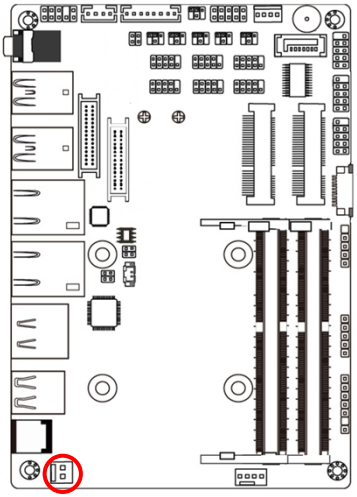
2-2-1 Connectors

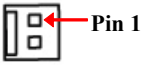
(1) Rear I/O Connectors



Icon	Name	Function
	9V~24V DC-in Power Jack	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.
	Display Port	To the system to corresponding display device with compatible DP cable.
	HDMI Port	To connect display device that support HDMI specification.
	RJ-45 LAN Port	This connector is standard RJ-45 LAN jack for Network connection.
	Line-Out Port	For user to connect external speaker, earphones, etc. to transfer system audio output.

(2) ATX2P (2-pin Block): Internal 9V~24V DC-in Power Connector

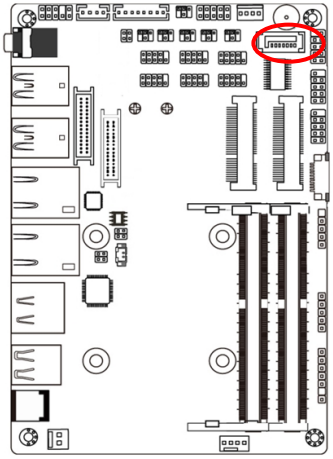




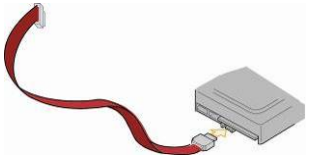
Pin.	Definition
1	+9V~+ 24V DC_IN
2	GND

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

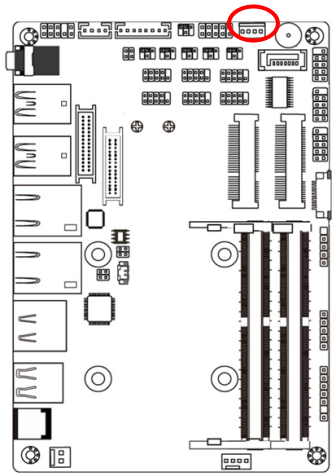
The onboard SATA port is high-speed SATAIII port that supports 6GB/s transfer rate.

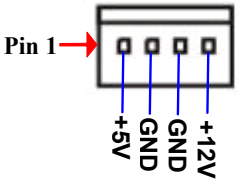


Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND



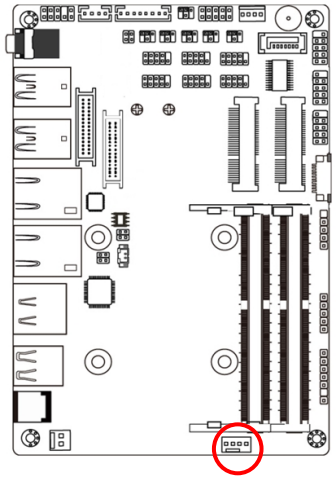
(4) SATAPWR (4-pin): SATA Power Out Connector

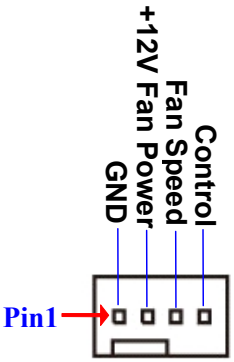




Warning: *Make sure that Pin-1 of compatible SATA Power connector is inserted into corresponding Pin-1 of SATAPW to avoid possible damage to the board and hard disk driver!*

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

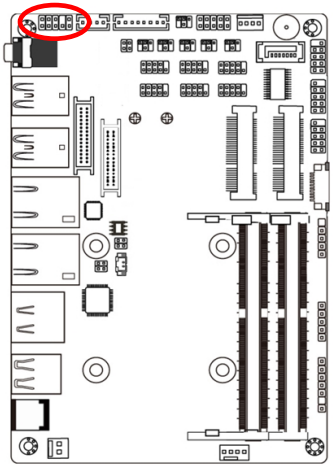


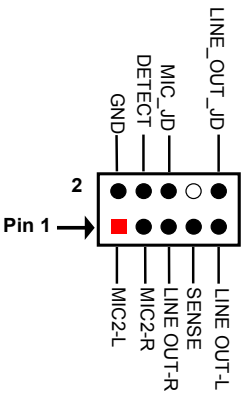


2-2-2 Headers

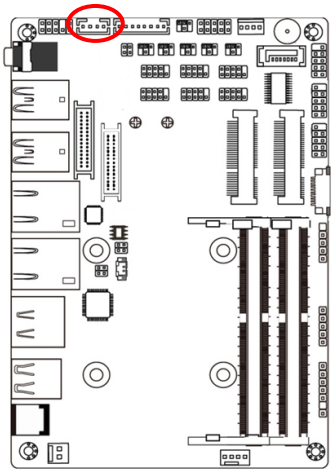
(1) FP_AUDIO (9-pin): Line-Out, MIC-In Header

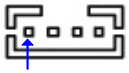
This header connects to Front Panel Line-out, MIC-In connector with cable.





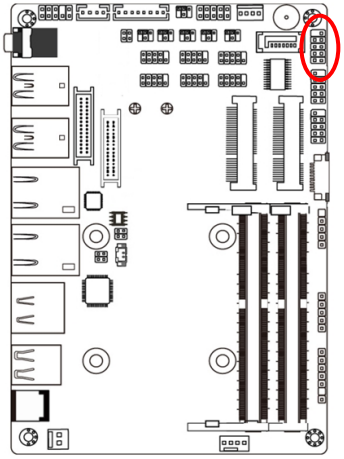
(2) SPEAK_CON (4-pin block): Speaker Header

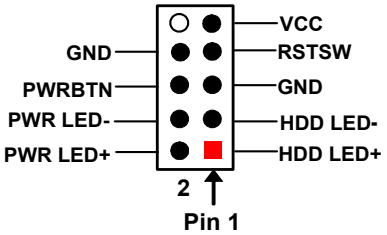




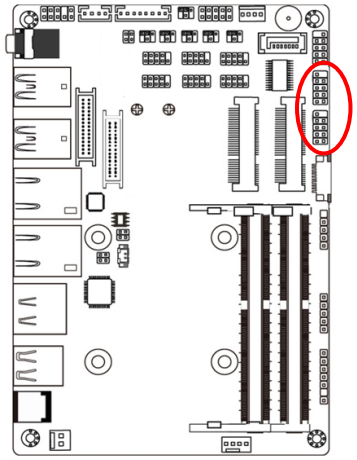
Pin No.	Definition
1	L-
2	L+
3	R+
4	R-

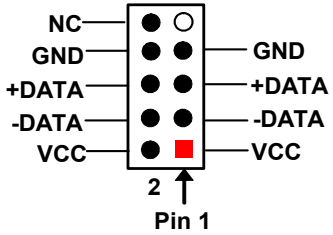
(3) JW_FP (9-pin): Front Panel Header



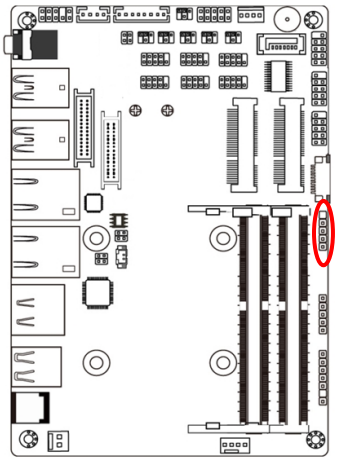


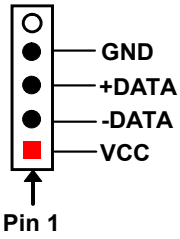
(4) FP_USB20/F_USB21 (9-pin): USB 2.0 Port Header



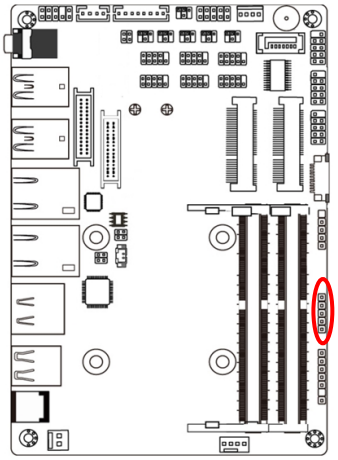


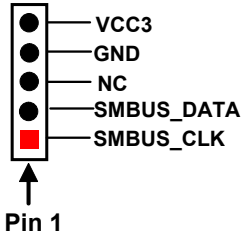
(5) FP_ USB(4-pin): USB 2.0 Port Header



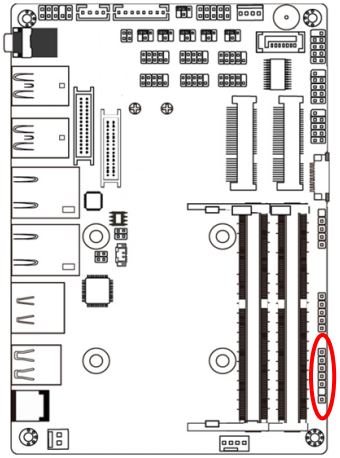


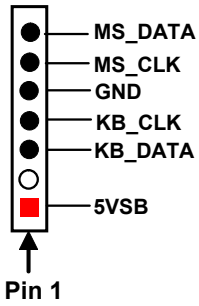
(6) SMBUS (5-Pin): SM BUS Header



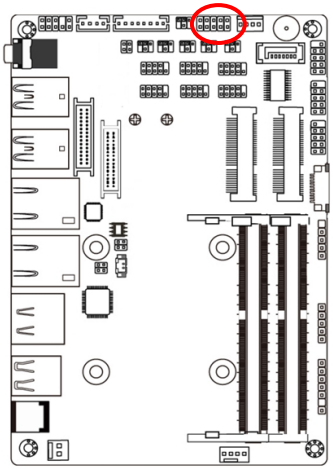


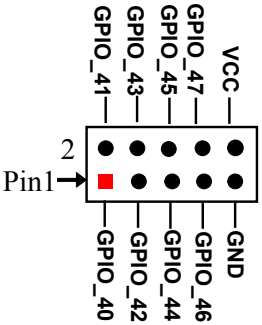
(7) PS2KBMS (6-pin): PS2 Keyboard & Mouse Header





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

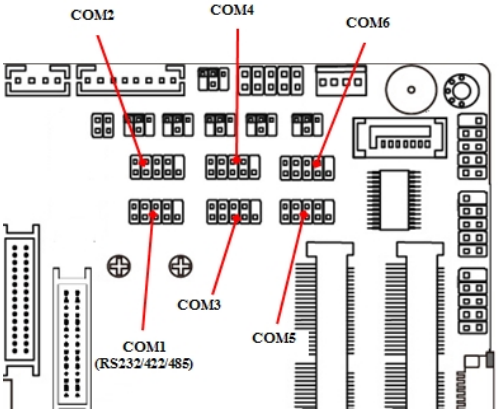


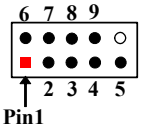


(9) COM1/2/3/4/5/6 (9-pin): Serial Port Header

COM1 (9-pin): RS232/422/485 Serial Port Header

COM2/3/4/5/6 (9-pin): RS232 Serial Port Header

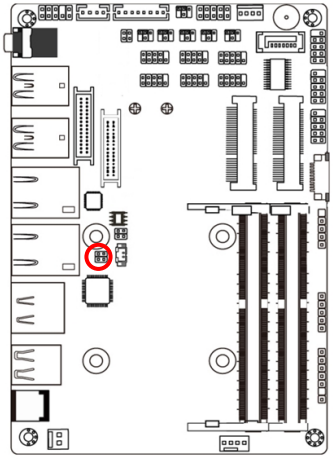


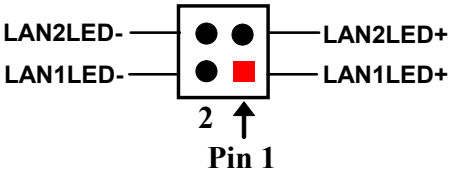


Pin NO.	RS232	*RS422 (COM1)	*RS485 (COM1)
Pin 1	DCD	TX-	DATA-
Pin 2	RXD	TX+	DATA+
Pin 3	TXD	RX+	NC
Pin 4	DTR	RX-	NC
Pin 5	GND	GND	GND
Pin 6	DSR	NC	NC
Pin 7	RTS	NC	NC
Pin 8	CTS	NC	NC
Pin 9	RI	NC	NC

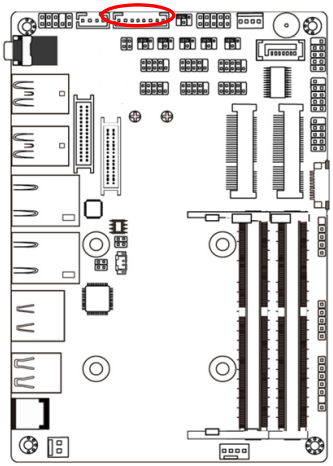
***Notice: COM1** header can function as RS232/422/485 port. In normal settings COM1 functions as RS232 port. With compatible COM cable **COM1** can function as RS422 or RS 485 port. User also needs to go to BIOS to set '**Transmission Mode Select**' for COM1 as [RS422] or [RS485] for boards that support RS422/485 function before connecting compatible COM cable to COM1 header.*

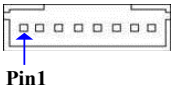
(10) LAN_LED (4-pin): LAN Activity LED Header





(11) INVERTER (8-pin): LVDS/eDP Inverter Header

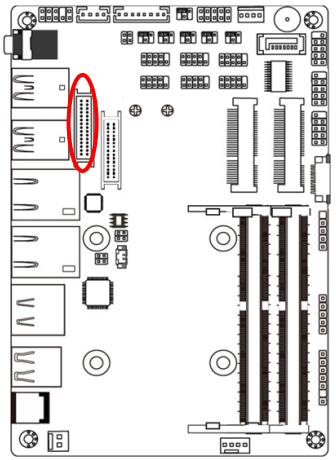


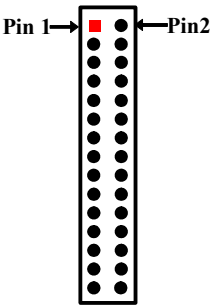


Pin No.	Definition
1	Backlight Enable
2	Backlight PWM
3	Backlight VCC
4	Backlight VCC
5	GND
6	GND
7	Backlight Brightness Up SW
8	Backlight Brightness Down SW

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

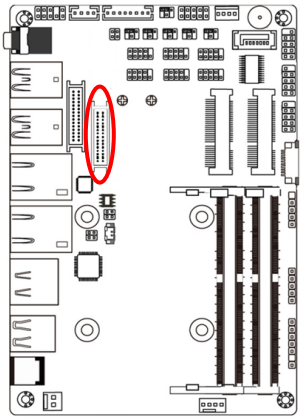
(12) LVDS (30-pin): 24-bit Dual Channel LVDS Header

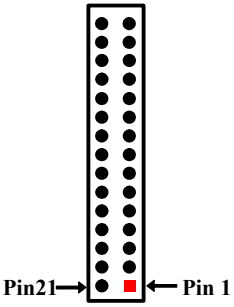




Pin NO.	Pin Define	Pin NO.	Pin Define
Pin 1	LVDSB_DATAN3	Pin 2	LVDSB_DATAP3
Pin 3	LVDS_CLKBN	Pin 4	LVDS_CLKBP
Pin 5	LVDSB_DATAN2	Pin 6	LVDSB_DATAP2
Pin 7	LVDSB_DATAN1	Pin 8	LVDSB_DATAP1
Pin 9	LVDSB_DATAN0	Pin 10	LVDSB_DATAP0
Pin 11	NC/DDC_DATA	Pin 12	NC/DDC_CLK
Pin 13	GND	Pin 14	GND
Pin 15	GND	Pin 16	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	VLCD	Pin 28	VLCD
Pin 29	VLCD	Pin 30	VLCD

(13) EDP (40-pin): 4-lane eDP Header





Pin NO.	Pin Define	Pin NO.	Pin Define
Pin 1	NC	Pin 21	NC
Pin 2	GND	Pin 22	NC
Pin 3	Lane3_N	Pin 23	GND
Pin 4	Lane3_P	Pin 24	GND
Pin 5	GND	Pin 25	GND
Pin 6	Lane2_N	Pin 26	GND
Pin 7	Lane2_P	Pin 27	HPD
Pin 8	GND	Pin 28	GND
Pin 9	Lane1_N	Pin 29	GND
Pin 10	Lane1_P	Pin 30	GND
Pin 11	GND	Pin 31	GND
Pin 12	Lane0_N	Pin 32	BL_ENABLE
Pin 13	Lane0_P	Pin 33	BL_PWM_DIM
Pin 14	GND	Pin 34	NC
Pin 15	AUX_CH_P	Pin 35	NC
Pin 16	AUX_CH_N	Pin 36	BL_PWR
Pin 17	GND	Pin 37	BL_PWR
Pin 18	LCD_VCC	Pin 38	BL_PWR
Pin 19	LCD_VCC	Pin 39	BL_PWR
Pin 20	LCD_VCC	Pin 40	NC

Chapter 3
Introducing BIOS

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

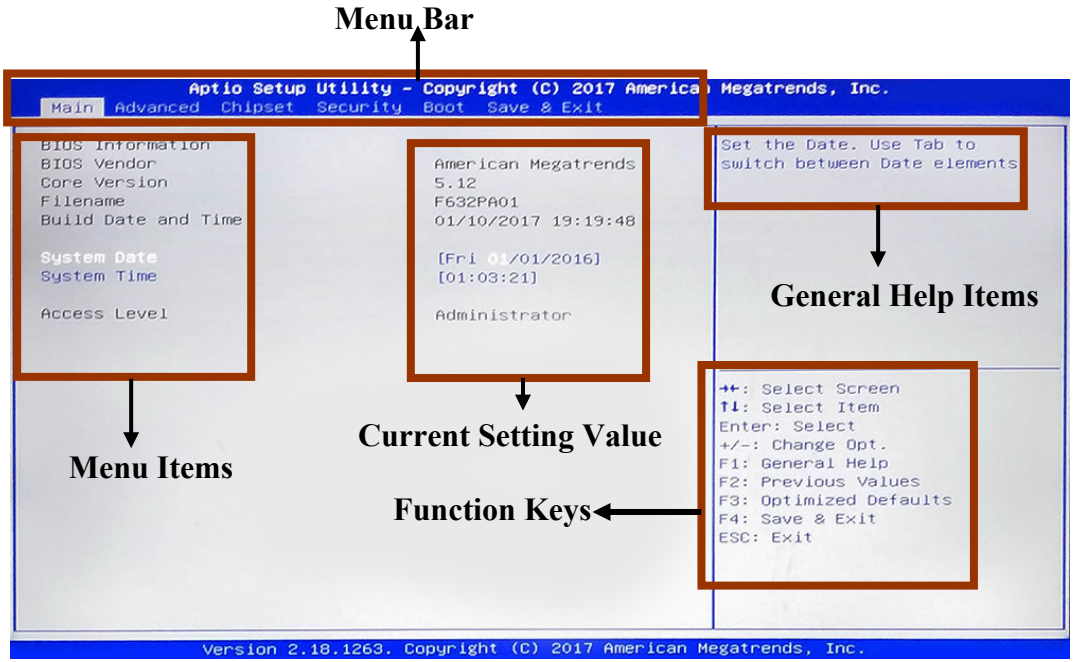
The BIOS is a program located on a Flash Memory on the motherboard. This program is a bridge between motherboard and operating system. When you start the computer, the BIOS program will gain control. The BIOS first operates an auto-diagnostic test called POST (power on self test) for all the necessary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

3-1 Entering Setup

Power on the computer and by pressing <Del> immediately allows you to enter Setup. If the message disappears before your respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the “RESET” button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt> and <Delete> keys. If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to Press **<Del>** to enter Setup; press < **F7**> to enter pop-up Boot menu.

3-2 BIOS Menu Screen

The following diagram show a general BIOS menu screen:



3-3 Function Keys

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

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

- Press **<+>/<–>** keys when you want to modify the BIOS parameters for the active option.
- **[F1]:** General help.
- **[F2]:** Previous value.
- **[F3]:** Optimized defaults.
- **[F4]:** Save & Exit.
- Press **<Esc>** to quit the BIOS Setup.

3-4 Getting Help

Main Menu

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

Status Page Setup Menu/Option Page Setup Menu

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

3-5 Menu Bars

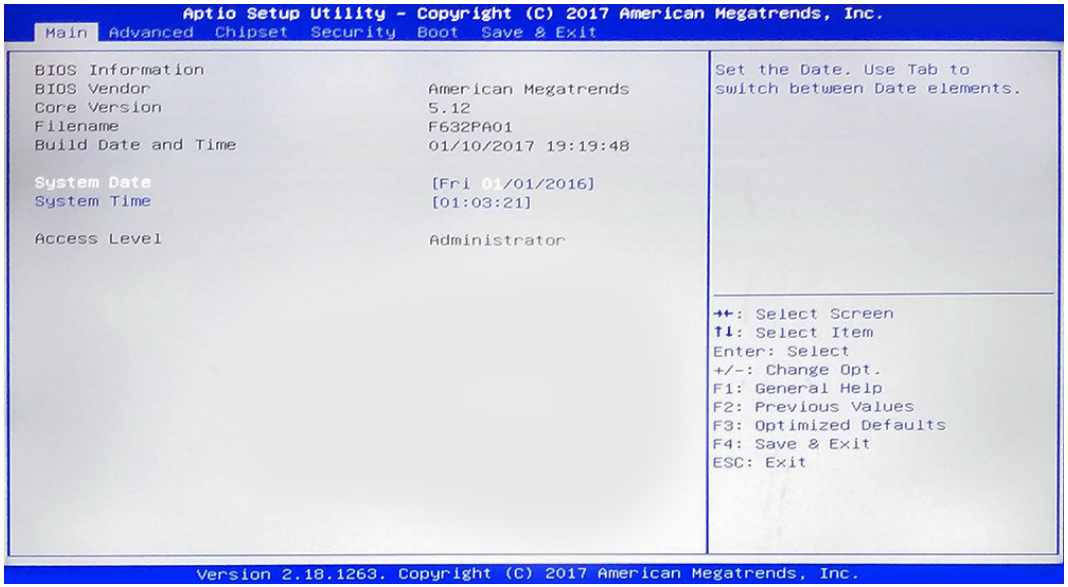
There are six menu bars on top of BIOS screen:

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

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

3-6 Main Menu

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



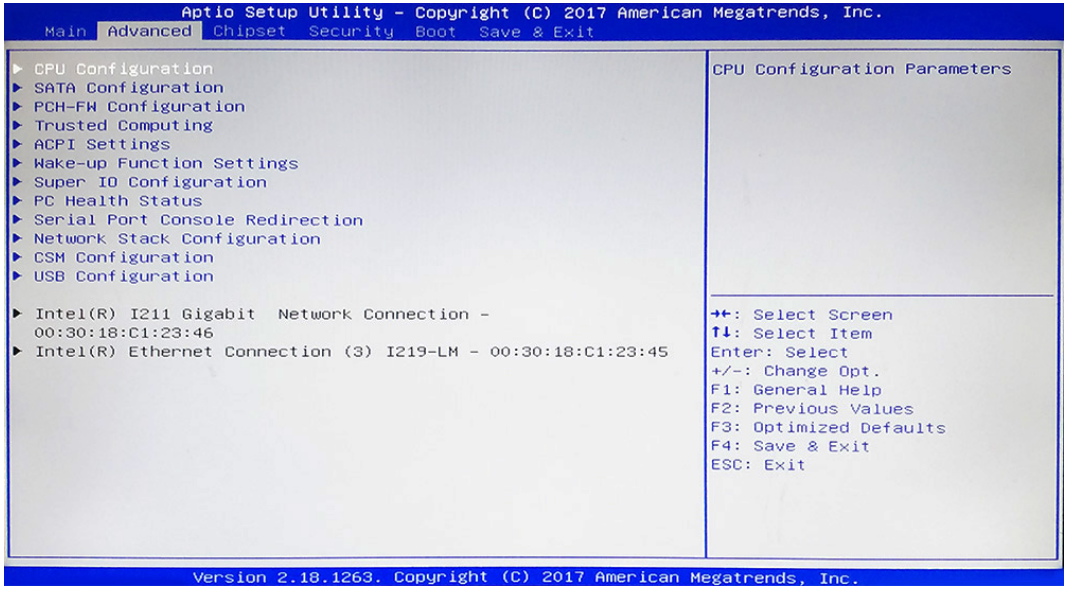
System Date

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

System Time

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

3-7 Advanced Menu



► **CPU Configuration**

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

Hyper-Threading

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

When set as [Disabled] only one thread per enabled core is enabled.

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

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

**Note: 'Hyper-Threading' item may or may not show up, depending on different CPU.*

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 States

Use this item to enable or disable CPU power management. This item allows CPU to go to C states when it's not 100% utilized.

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

Package C State Limit

Use this item to select the maximum Package C State limit setting.

The optional settings are: [C0/C1]; [C2]; [C3]; [C6]; [C7]; [C7s]; [C8]; [C9]; [C10]; [CPU default]; [AUTO].

[CPU Default]: Leaves to factory default value.

[AUTO]: Initializes to deepest available Package C State Limit.

- **SATA Configuration**

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

SATA Configuration(s)

SATA Controller

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

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

SATA Mode Selection

The default setting is: [AHCI].

The optional settings are: [AHCI].

SATA

Port
The optional settings: [Disabled]; [Enabled].
Use this item to enable or disable each SATA port.
Hot Plug
The optional settings: [Disabled]; [Enabled].
mSATA
Port
The optional settings: [Disabled]; [Enabled].
Use this item to enable or disable device connected to MSATA slot.

- **PCH-FW Configuration**

Press [Enter] to view ME information and make settings in the following sub-items:
TPM Device Selection
Use this item to select TPM device.
The optional settings: [dTPM]; [PTT].
The default setting is: [dTPM].
[PTT]: Enable PTT in SkuMgr.
[dTPM]: Disable PTT in SkuMgr.
Warnning!! PTT/dTPM will be disabled and all data saved on it will be lost!

- **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.

  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.

  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.

- **Trusted Computing**

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

Configuration

Security Device Support

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

The optional settings: [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)].

- **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 KB/MS Wake-up

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

Use this item to enable or disable PS2 KB/MS wake-up from S3/S4/S5.

** **Note**: This function is supported when 'ERP Support' is set as [Disabled].*

USB S3/S4 Wake-up

Use this item to enable or disable USB S3/S4 wakeup.

** **Note**: 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].*

Internal USB Port S5 Power

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

Use this item to enable or disable USB power after System shutdown.

** **Note**: This function is supported 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 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.

Transmission Mode Select

The optional settings are: [RS422]; [RS232]; [RS485].

Mode Speed Select

The optional settings are: [RS232/RS422/RS485=250kbps]; [RS232=1Mbps, RS422/RS485=10Mbps].

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

► **Serial Port 2 Configuration/ Serial Port 3 Configuration/Serial Port 4 Configuration/ Serial Port 5 Configuration/ Serial Port 6 Configuration**
Press [Enter] to make settings for the following sub-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 Reset Timer
Use this item to enable or disable WDT reset function.
The optional settings: [Disabled]; [Enabled].
When set as [Enabled], the following sub-items shall appear:

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

WatchDog Reset 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 (refer to ***Page 11***, Pin(1-2) of AT_COPEN 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.

- **PC Health Status**
  Press [Enter] to view current hardware health status, set shutdown temperature, or

make further settings in '**SmartFAN Configuration**'.

- **SmartFAN Configuration**

Press [Enter] to make settings for SmartFAN Configuration:

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

Shutdown Temperature Configuration
Use this item to select system shutdown temperature.
The optional settings are: [Disabled]; [70°C/156°F]; [75°C/164°F]; [80°C/172°F]; [85°C/180°F]; [90°C/188°F].

- **Serial Port Console Redirection**

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.*

- **Network Stack Configuration**

  Press [Enter] to go to '**Network Stack**' screen to make further settings.

  Network Stack

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

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

  Ipv4 PXE Support

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

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

  Ipv4 HTTP Support

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

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

  Ipv6 PXE Support

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

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

  Ipv6 HTTP Support

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

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

  PXE boot wait time

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

  Media Detect Count

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

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

- **CSM Configuration**

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

  Option ROM execution

  Network

This item controls the execution of UEFI and legacy PXE OpROM.
The optional settings are: [Do not launch]; [Legacy].

Storage

This item controls the execution of UEFI and Legacy Storage OpROM.
The optional settings are: [Do not launch]; [UEFI]; [Legacy].

Other PCI devices

This item determines OpROM execution policy for devices other than Network, storage or video.
The optional settings are: [Do not launch]; [UEFI]; [Legacy].

- **USB Configuration**

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

USB Configuration

Legacy USB Support

The optional settings are: [Enabled]; [Disabled]; [Auto].
[Enabled]: To enable legacy USB support.
[Disabled]: To keep USB devices available only for EFI specification,
[Auto]: To disable legacy support if no USB devices are connected.

XHCI Hand-off

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

USB Mass Storage Driver Support

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

USB Hardware Delays and Time-outs:

USB Transfer Time-out

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

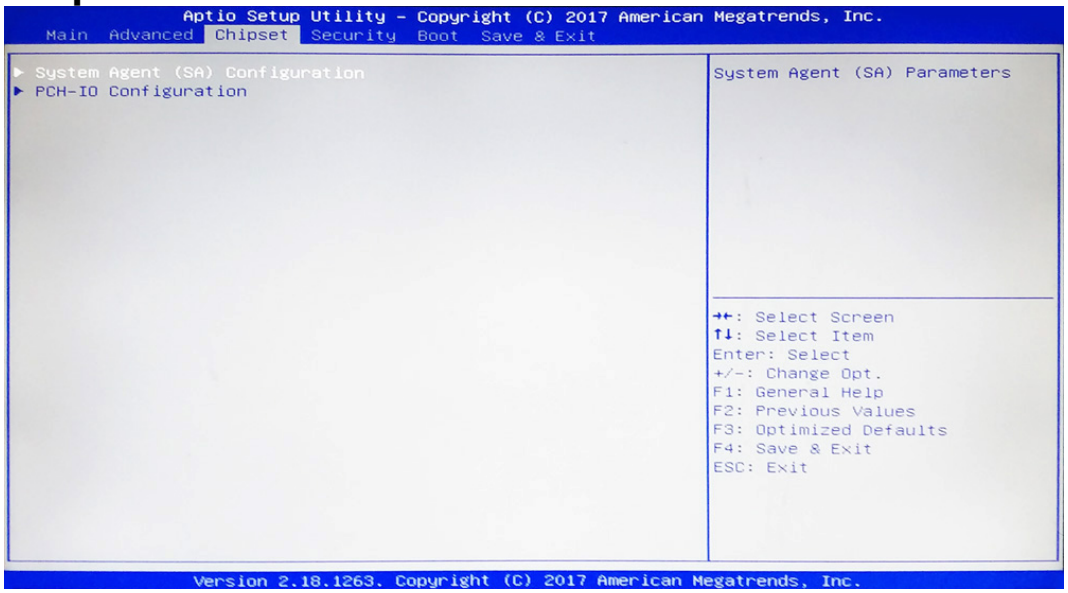
Device Reset Time-out

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

Device Power-up Delay
Use this item to set maximum time the device will take before it properly reports itself to the host controller.
The optional settings: [Auto]; [Manual].
'Auto' uses default value: for a root port it is 100 ms, for a hub port the delay is taken from hub descriptor.
Select [Manual] you can set value for the following sub-item: '**Device Power-up Delay in Seconds'.**
Device Power-up Delay in Seconds
The delay range is from [1] to [40] seconds, in one second increments.

- **Intel(R) I211 Gigabit Network Connection -XX:XX:XX:XX:XX:XX/ Intel(R) Ethernet Connection (3) I219-LM -XX:XX:XX:XX:XX:XX**
  This item gives Intel gigabit ethernet controller basic MAC address information.

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].

- **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].

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.

The optional settings are: [VBIOS Default]; [DP]; [HDMI]; [eDP/LVDS].

Active LVDS

The optional settings are: [LVDS]; [eDP].

When set as [LVDS], user can make further settings in screen:

Backlight Control

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

Panel Type

Use this item to manually select LCD panel type used by internal graphics device by selecting the appropriate setup item.

The optional setting are: [800x 480 18bit Single]; [800x 60018bit Single]; [800x 600 24bit Single]; [1024 x 60018bit 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].

LVDS FW Write Protect
This item supports LVDS FW update & protection.
The optional settings are: [Enabled]; [Disabled].

► **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].
HD Audio
The optional settings are: [Disabled]; [Enabled]; [Auto].
Onboard Lan1 Controller
Use this item to enable or disable LAN1 NIC.
When set as [Enabled], user can make further settings in '**Wake on LAN**' item:

Wake on LAN
Use this item to enable or disable integrated LAN to wake the system.
The optional settings are: [Enabled]; [Disabled].

Onboard Lan2 Controller
Use this item to enable or disable LAN2 device or controller.
MPEST Slot
Use this item to enable or disable device or controller installed on MPEST slot.
The optional settings are: [Disabled]; [Enabled].

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

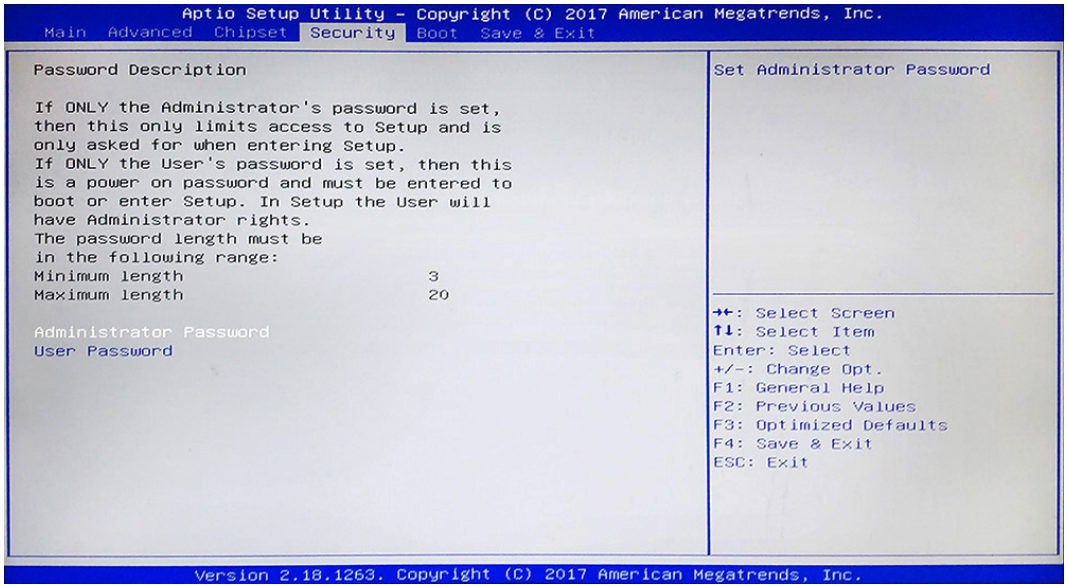
MPE Slot
Use this item to enable or disable device or controller installed on MPE slot.
The optional settings are: [Disabled]; [Enabled].

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

System State after Power Failure

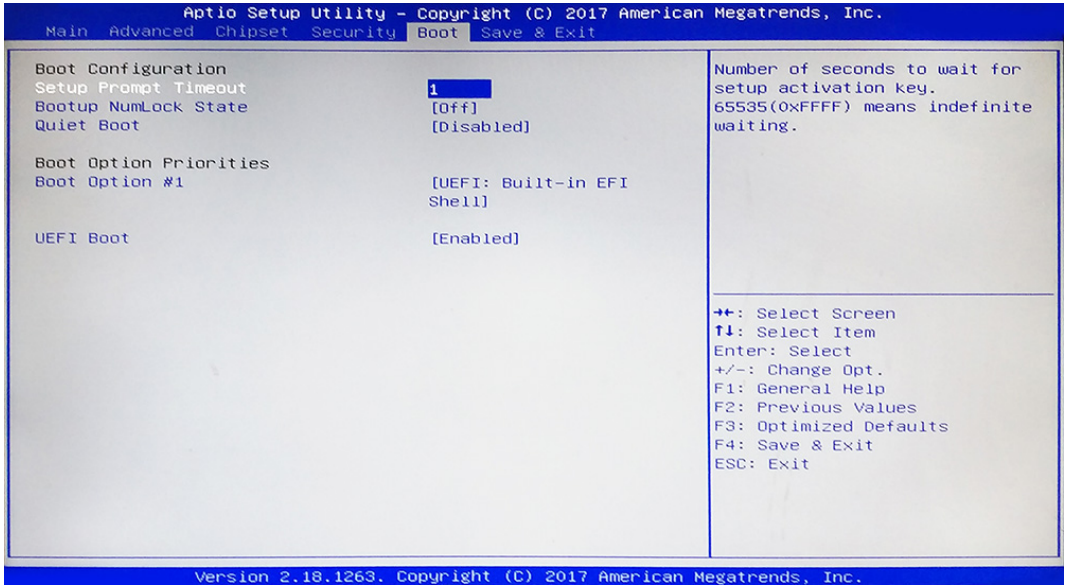
Use this item to specify what state to go to when power re-applied after a power failure (G3 state).
The optional settings are: [Always Off]; [Always On]; [Former State].

3-9 Security Menu



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

3-10 Boot Menu



Boot Configuration

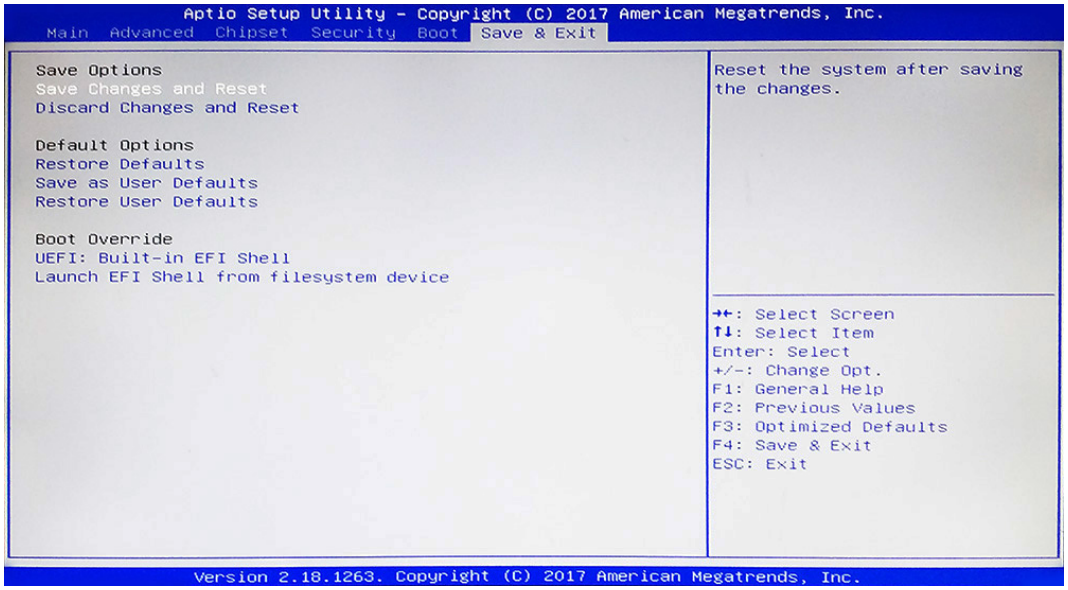
Setup Prompt Timeout
Use this item to set number of seconds to wait for setup activation key.
Bootup Numlock State
Use this item to select keyboard numlock state.
The optional settings are: [On]; [Off].
Quiet Boot
The optional settings are: [Disabled]; [Enabled].

Boot Option Priorities

Boot Option #1/ Boot Option #2…
Use this item to decide system boot order from available options.

UEFI Boot
The optional settings are: [Disabled]; [Enabled].
[Disabled]: Disable all UEFI boot options.
[Enabled]: Enable all UEFI boot options.

3-11 Save & Exit Menu



Save Changes and Reset
This item allows user to reset the system after saving the changes.
Discard Changes and Reset
This item allows user to reset the system without saving any changes.
Restore Defaults
Use this item to restore /load default values for all the setup options.
Save as User Defaults
Use this item to save the changes done so far as user defaults.

Restore User Defaults
Use this item to restore the user defaults to all the setup options.

Boot Override

UEFI: Built-in EFI Shell
Press this item to select the device as boot disk after save configuration and reset.

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