

NF791 Series

User's Manual

G03-NF791-F

Revision: 3.0

Release date: October 1, 2019

Trademark:

- * Specifications and Information contained in this documentation are furnished for information use only, and are subject to change at any time without notice, and should not be construed as a commitment by manufacturer.

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.....	iv
USER'S NOTICE	v
MANUAL REVISION INFORMATION	v
ITEM CHECKLIST	v
CHAPTER 1 INTRODUCTION OF THE MOTHERBOARD	
1-1 FEATURE OF MOTHERBOARD.....	1
1-2 SPECIFICATION.....	2
1-3 LAYOUT DIAGRAM.....	3
CHAPTER 2 HARDWARE INSTALLATION	
2-1 JUMPER SETTING	9
2-2 CONNECTORS AND HEADERS.....	15
2-2-1 CONNECTORS	15
2-2-2 HEADERS	20
CHAPTER 3 INTRODUCING BIOS	
3-1 ENTERING SETUP	29
3-2 BIOS MENU SCREEN	30
3-3 FUNCTION KEYS	30
3-4 GETTING HELP.....	31
3-5 MEMU BARS	31
3-6 MAIN MENU	32
3-7 ADVANCED MENU.....	33
3-8 CHIPSET MENU	46
3-9 SECURITY MENU.....	49
3-10 BOOT MENU.....	50
3-11 SAVE & EXIT MENU.....	51



Environmental Safety Instruction

- Avoid the dusty, humidity and temperature extremes. Do not place the product in any area where it may become wet.
- 0 to 60 centigrade is the suitable temperature. (The figure comes from the request of the main chipset)
- Generally speaking, dramatic changes in temperature may lead to contact malfunction and crackles due to constant thermal expansion and contraction from the welding spots' that connect components and PCB. Computer should go through an adaptive phase before it boots when it is moved from a cold environment to a warmer one to avoid condensation phenomenon. These water drops attached on PCB or the surface of the components can bring about phenomena as minor as computer instability resulted from corrosion and oxidation from components and PCB or as major as short circuit that can burn the components. Suggest starting the computer until the temperature goes up.
- The increasing temperature of the capacitor may decrease the life of computer. Using the close case may decrease the life of other device because the higher temperature in the inner of the case.
- Attention to the heat sink when you over-clocking. The higher temperature may decrease the life of the device and burned the capacitor.

USER'S NOTICE

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Manual Revision Information

Reversion	Revision History	Date
3.0	Third Edition	October 1, 2019

Item Checklist

- ☒ Motherboard
- ☒ Cable(s)

Chapter 1

Introduction of the Motherboard

1-1 Feature of Motherboard

- Onboard Intel® Skylake-U/Kabylake-U series processor, TDP 15 W, never denies high performance
- Support 2* DDR-4 2133 MHz SO-DIMM, maximum capacity up to 8GB
- Integrated HD Audio CODEC
- Support 2*Realtek Gigabit LAN
- Support triple displays (HDMI, VGA, LVDS or eDP)
- Support 1 * external RS232/422/485 and 9 * internal RS232
- Support 4 * external USB 3.0 & 5 * Internal USB1.1/2.0
- Support 1* RJ-11 & PS/2 connector
- Support 1* Mini-PCIe/mSATA slot & 1 * Mini-PCIe slot
- Support 1* PCI-E x1 expansion slot
- Compliance with ErP standard
- Support Watchdog function

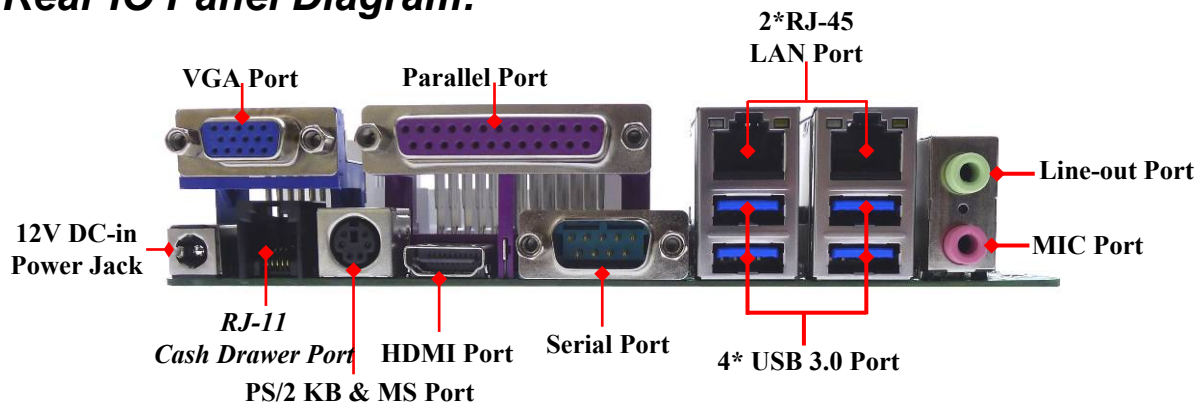
1-2 Specification

Spec	Description
Design	● 6-layers; Mini-ITX; PCB size: 17 x 17 cm
Embedded CPU	● Integrated with Intel® Skylake-U/Kabylake-U series CPU (TDP 15W) <i>*CPU model varies from different IPC options. Please consult your dealer for more information of onboard CPU.</i>
Memory Slot	● 2*DDR4 SO-DIMM slot support 2* DDR4 2133 MHz SO-DIMM up to 32GB ● Support dual channel function <i>*Memory clock supporting range is decided by specific CPU of the model. For more memory compatibility information please consults your local dealer.</i>
Expansion Slot	● 1* PCIE x1 slot ● 1* Full-size Mini-PCIE slot (MPE) ● 1* Full-size Mini-PCIE/MSATA slot (MMPE)
LAN Chip	● Integrated with 2* Realtek 8111H PCI-E Gigabit LAN chips ● 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
Storage	● 1* SATAIII 6Gb/s port ● 1* Full-size Mini-SATA slot
BIOS	● AMI Flash ROM
Rear I/O	● 1* 12V DC-in power connector ● 1* VGA port ● 1* RJ-11 cash drawer port ● 1* PS/2 keyboard & mouse combo port ● 1* HDMI port ● 1* RS 232/422/485 port (COM1) ● 1* Parallel port

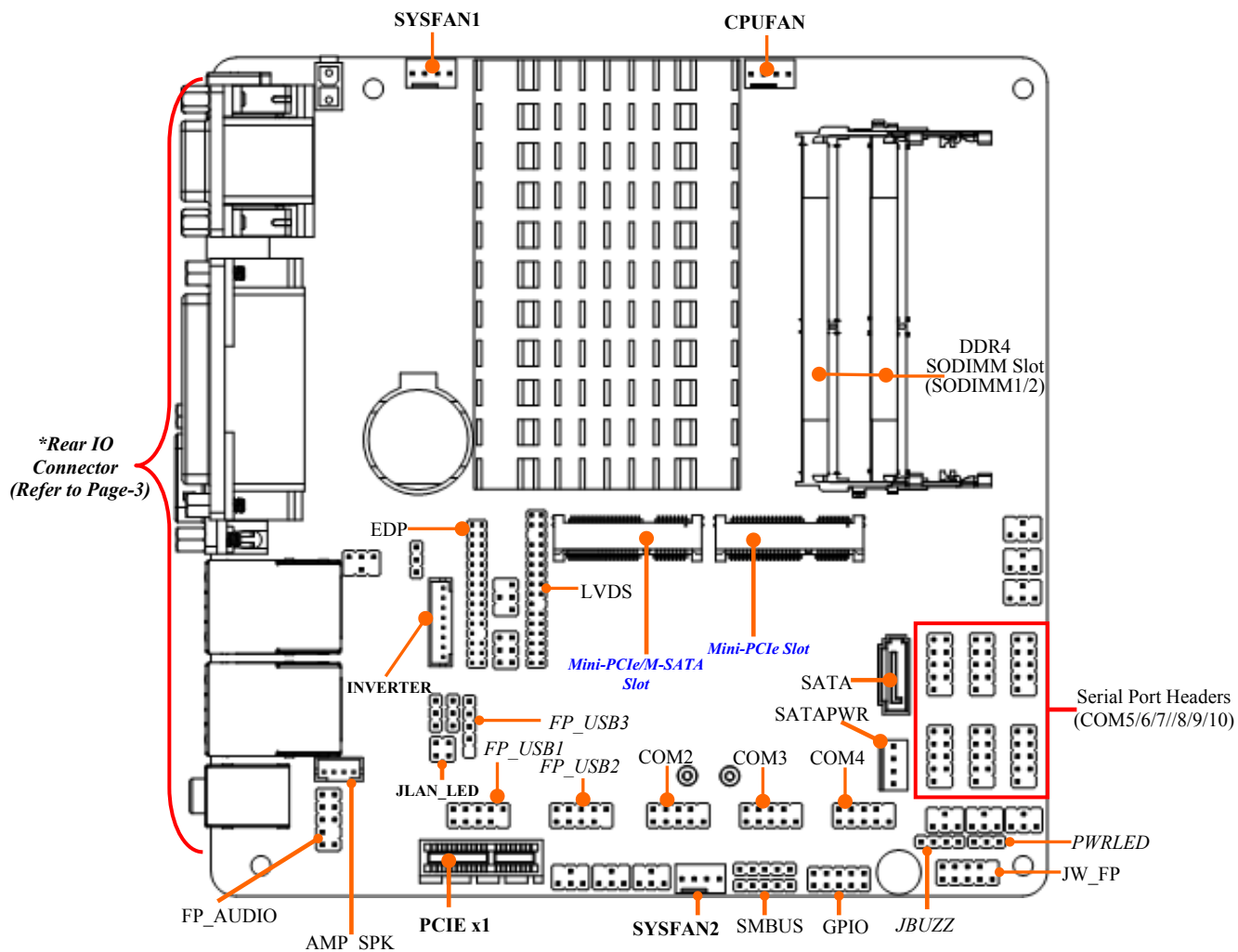
	● 2* RJ-45 LAN port ● 4* USB 3.0 port ● 1* Line-out port & 1* MIC port
Internal I/O	● 1* ATX 12V internal power connector ● 1* SATA Power-out connector ● 2* System fan connector & 1* CPU fan connector ● 1* Front panel header ● 1* Power LED header & 1* Buzzer header ● 1* Front panel audio header & 1* 3W audio amplifier header ● 1* LAN activity LED 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) ● 9* RS232 Serial port header (COM2/3/4/5/6/7/8/9/10) ● 1* GPIO header & 1* SMBUS header ● 1* LVDS header & 1* eDP Header ● 1* Inverter Header

1-3 Layout Diagram

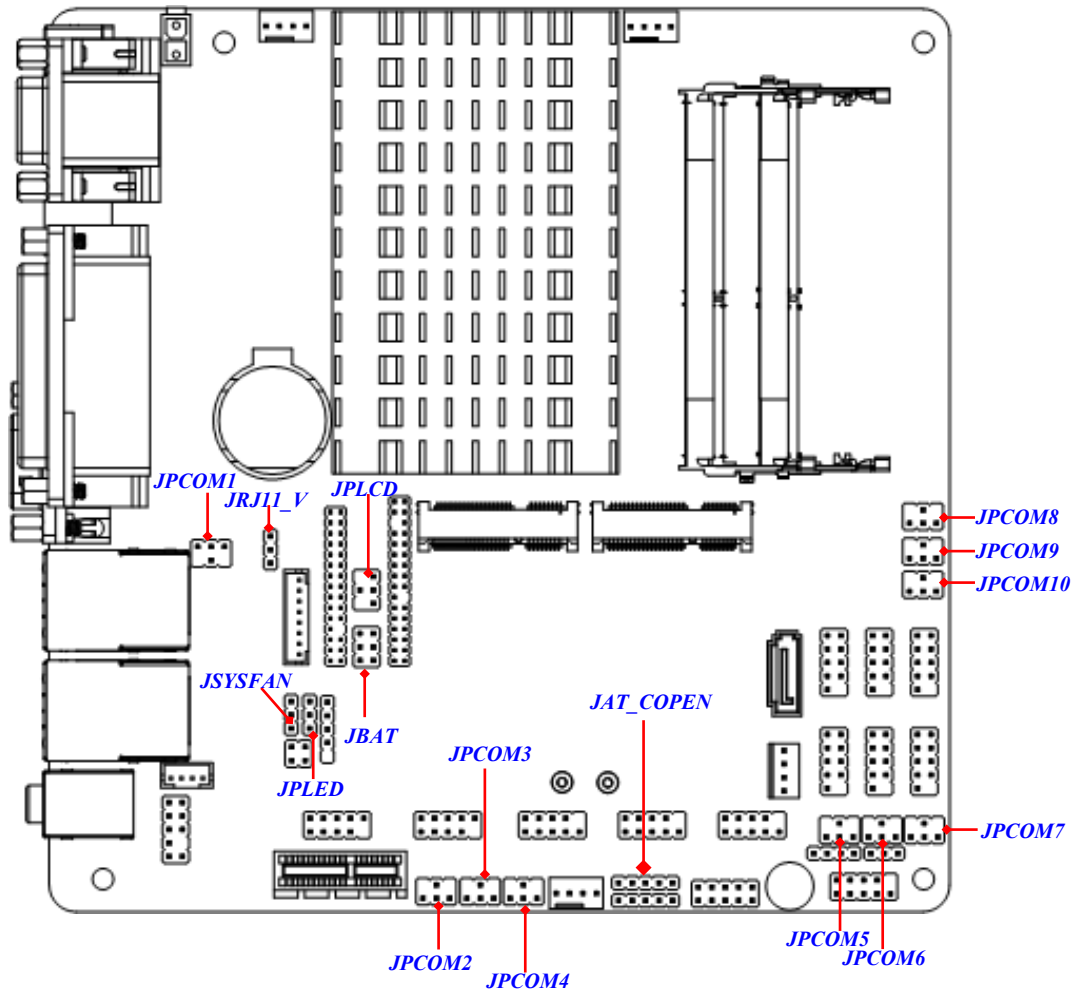
Rear IO Panel Diagram:



Motherboard Internal Diagram



Jumper Positions:



Jumper	Name	Description
JPCOM1	COM1 Port Pin9 Function Select	4-pin Block
JPCOM2	COM2 Header Pin9 Function Select	4-pin Block
JPCOM3	COM3 Header Pin9 Function Select	4-pin Block
JPCOM4	COM4 Header Pin9 Function Select	4-pin Block
JPCOM5	COM5 Header Pin9 Function Select	4-pin Block
JPCOM6	COM6 Header Pin9 Function Select	4-pin Block
JPCOM7	COM7 Header Pin9 Function Select	4-pin Block
JPCOM8	COM8 Header Pin9 Function Select	4-pin Block
JPCOM9	COM9 Header Pin9 Function Select	4-pin Block
JPCOM10	COM10 Header Pin9 Function Select	4-pin Block
JAT_COPEN	Pin1&2&3: ATX/AT Mode Select Pin 4&5: Case Open Message Display Function Select	5-pin Block
JBAT	Pin 1&2: Clear CMOS RAM Pin 3&4: Flash Override Pin 5&6: POK Override	6-pin Block
JPLCD	LVDS/eDP VCC 3.3V/5V/12V Select	4-pin Block
JPLED	LVDS INVERTER/EDP Pane Backlight 5V/12V Select	3-pin Block
JRJ11_V	RJ-11 Cash Drawer Port VCC 12 V/24V Select	3-pin Block
JSYSFAN	SYSFAN1/SYSFAN2 Fan Speed Detect	3-pin Block

Connectors

Connector	Name
DC_IN1	12V DC-in Power Jack Connector
VGA	CRT VGA Port Connector
RJ11	RJ-11 Port Connector
PS2	PS/2 Keyboard & Mouse Connector
HDMI	High-Definition Multimedia Interface Connector
LPT	Parallel Port Connector
COM1	Serial Port Connector
USB1_LAN1/ USB2_LAN2	Top: RJ-45 LAN Port Connector x2 Middle: USB 3.0 Port Connector x2 Bottom: USB 3.0 Port Connector x2
AUDIO	Top: Audio Line Out Port Connector Bottom: Audio MIC In Connector
ATXPWR	Internal 12V DC-in Power Connector
SATA	SATAIII Port Connector
STATPWR	SATA Power out Connector
CPUFAN	CPU Fan Connector
SYSFAN1/SYSFAN2	System Fan Connector X 2

Headers

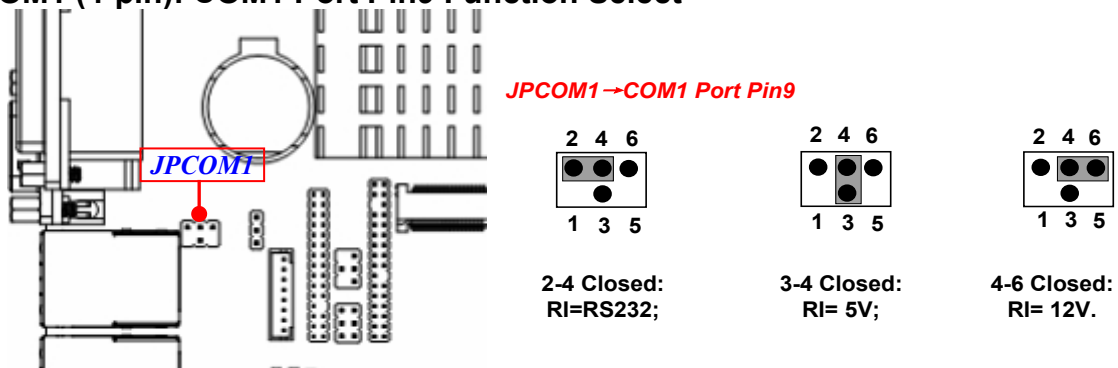
Header	Name	Description
JW_FP	Front Panel Header (PWR LED/ HDD LED/ Power Button /Reset)	9-pin Block
PWRLED	Power LED Header	3-pin Block
JBUZZ	Buzzer Header	4-pin Block
FP_AUDIO	Front Panel Audio Header	9-pin Block
AMP_SPK	3W Amplifier Header	4-pin Block
J_LAN_LED	LAN Activity LED Header	4-pin Block
F_USB1/ F_USB2	USB 2.0 Header	9-pin Block
F_USB3	USB 2.0 Header	4-pin Block
COM2/3/4/5/6/7/8/9/10	Serial Port Header X9	9-pin Block
GPIO	GPIO Header	10-pin Block
SMBUS	SMBUS Header	5-pin Block
INVERTER	LVDS INVERTER Header	8-pin Block
LVDS	LVDS Header	30-pin Block
eDP	eDP Header	29-pin Block

Chapter 2

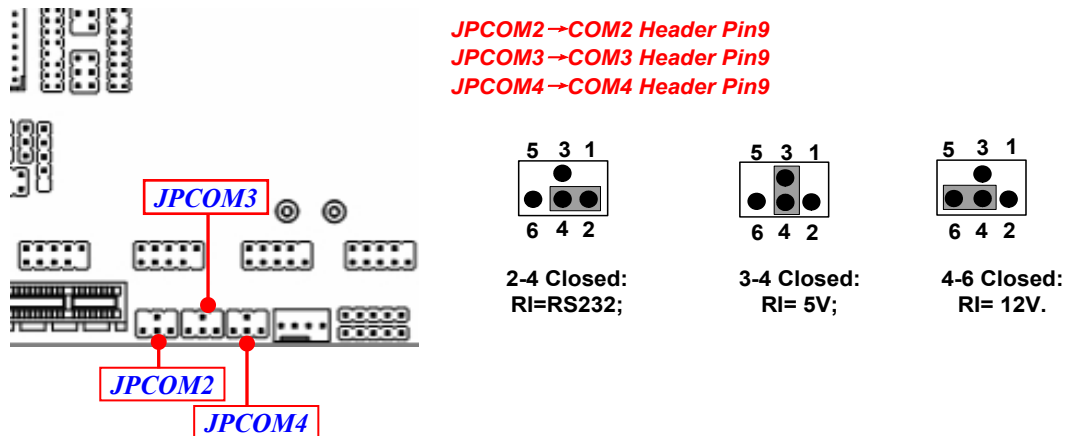
Hardware Installation

2-1 Jumper Setting

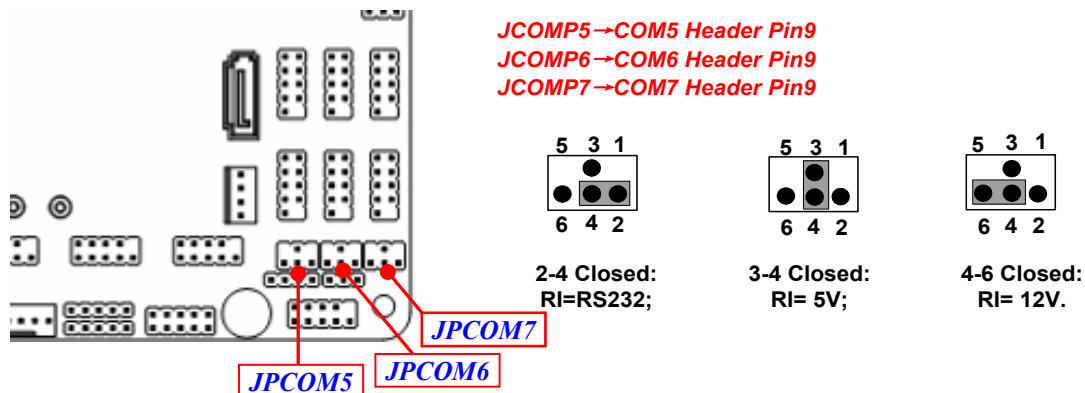
JPCOM1 (4-pin): COM1 Port Pin9 Function Select



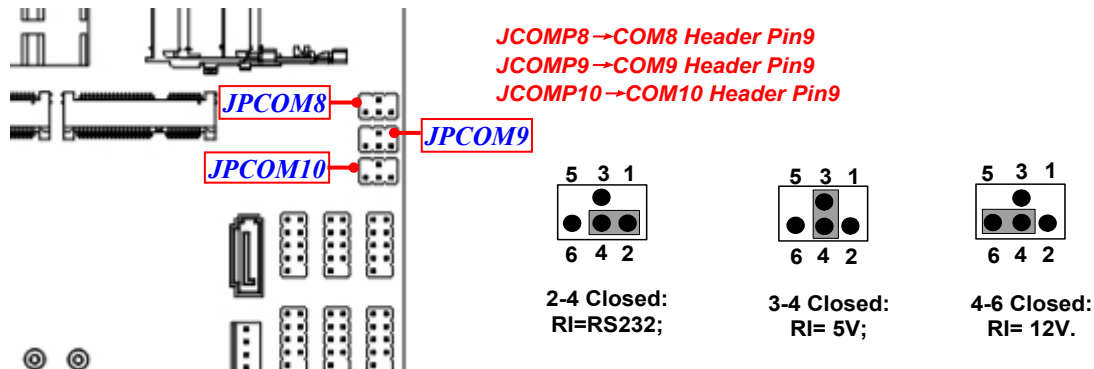
JPCOM2/3/4(4-pin): COM2/3/4 Header Pin9 Function Select



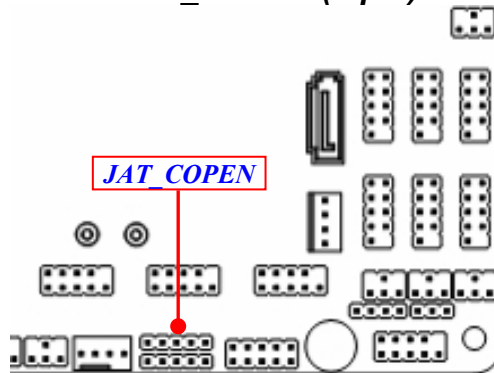
JPCOM5/6/7(4-pin): COM5/6/7 Header Pin9 Function Select



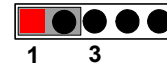
JPCOM8/9/10(4-pin): COM8/9/10 Header Pin9 Function Select



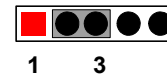
Pin 1&2&3 of JAT_COPEN (5-pin): ATX/AT Mode Select



***Pin 1&2&3 of JAT_COPEN
→ ATX/AT Mode Select***



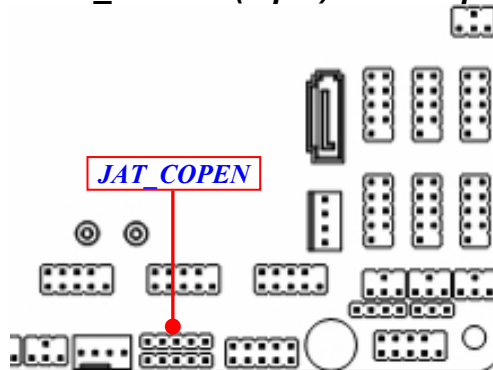
1-2 Close: ATX Mode Selected(default);



2-3 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 4 & 5 of JAT_COPEN (5-pin): Case Open Message Display Function Select



***Pin 4&5 of JAT_COPEN
→ Case Open Function Select***

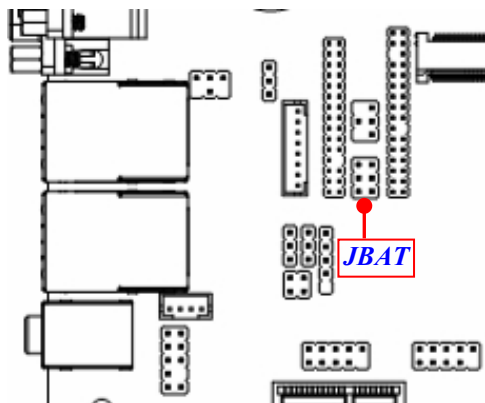


4-5 Open:Normal (Default);

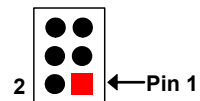


***4-5 Close: Case Open
Function Selected (One Touch).***

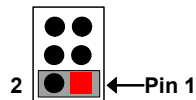
Pin 1&2 of JBAT (6-pin): Clear CMOS RAM Setting



Pin 1&2 of JBAT → Clear CMOS Setting

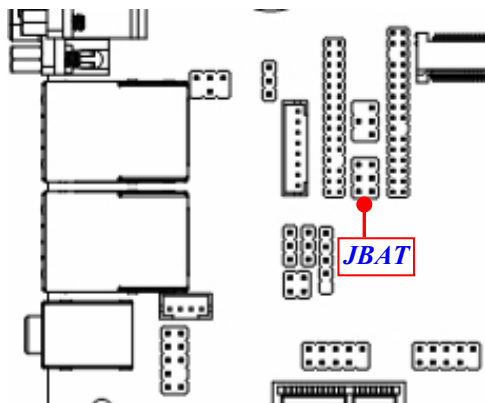


1-2 Open: Normal;

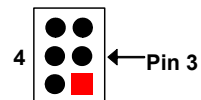


1-2 Closed: Clear CMOS.

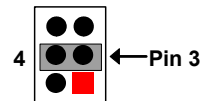
Pin 3&4 of JBAT (6-pin): Flash Override Function Slect



Pin 3&4 of JBAT → Flash Override

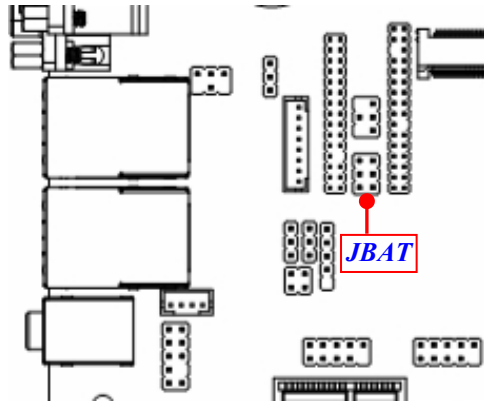


3-4 Open: Enable Security Measures
in the Flash Descriptor(Default);

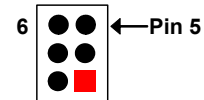


3-4 Closed: Disable Security Measures
in the Flash Descriptor(Override).

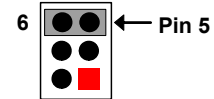
Pin 5&6 of JBAT (6-pin): POK Override Function Slect



Pin 5&6 of JBAT → POK Override

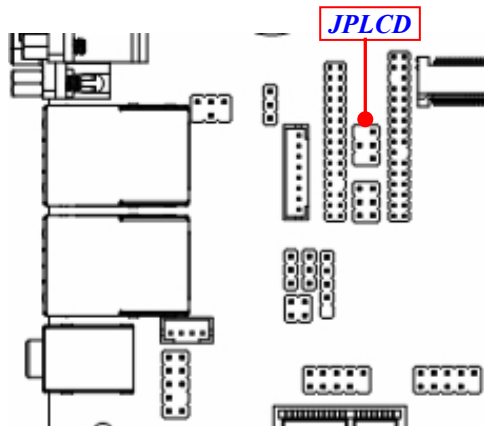


5-6 Open: Normal;

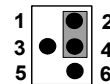


5-6 Closed: POK Override.

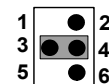
JPLCD (4-pin): LVDS/eDP LCD VCC 3.3V/5V/12V Select



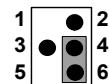
JPLCD → LVDS/eDP LCD VCC



2-4 Closed:
VCC=3.3V
(Default);

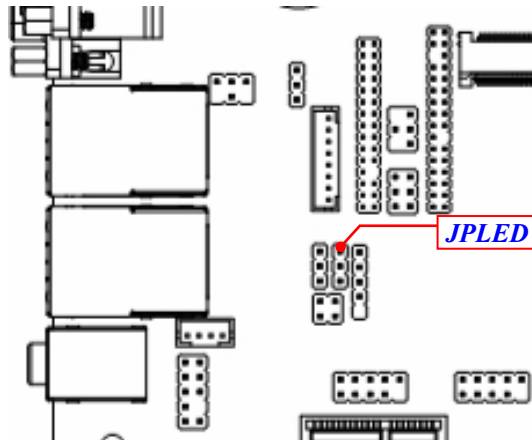


3-4 Closed:
VCC= 5V;



4-6 Closed:
VCC= 12V.

JPLED (3-pin): LVDS INVERTER/EDP Panel Backlight VCC Select



JPLED → LVDS INVERTER/EDP Panel Backlight VCC

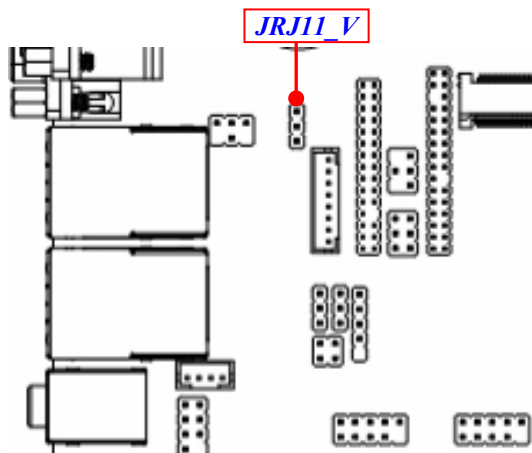


1-2 Close: LVDS INVERTER/EDP Panel Backlight 5V Selected(Default);



2-3 Close: LVDS INVERTER/EDP Panel Backlight 12V Selected.

JRJ11_V (3-pin): RJ-11 Cash Drawer Port VCC 12V/24V Select



JRJ11_V → RJ-11 Cash Drawer Port VCC

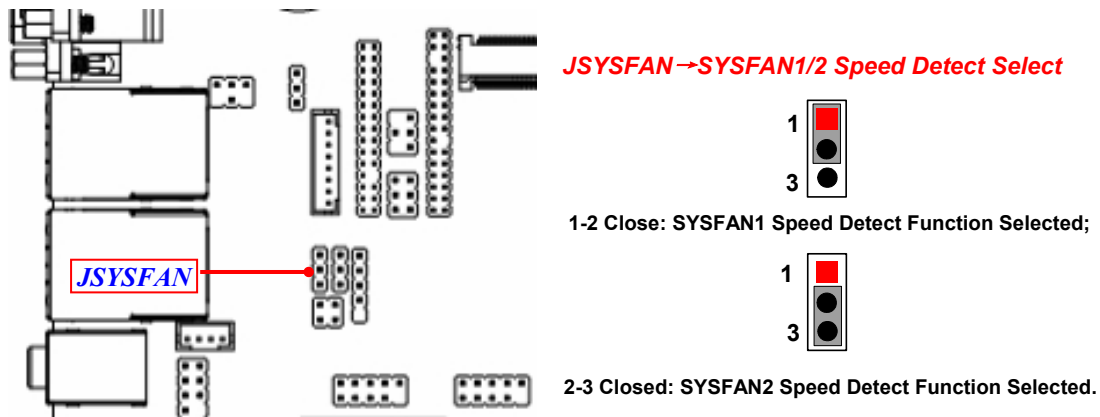


1-2 Close: RJ-11 Cash Drawer Port Voltage=12V(Default);



2-3 Close: RJ-11 Cash Drawer Port Voltage=24V.

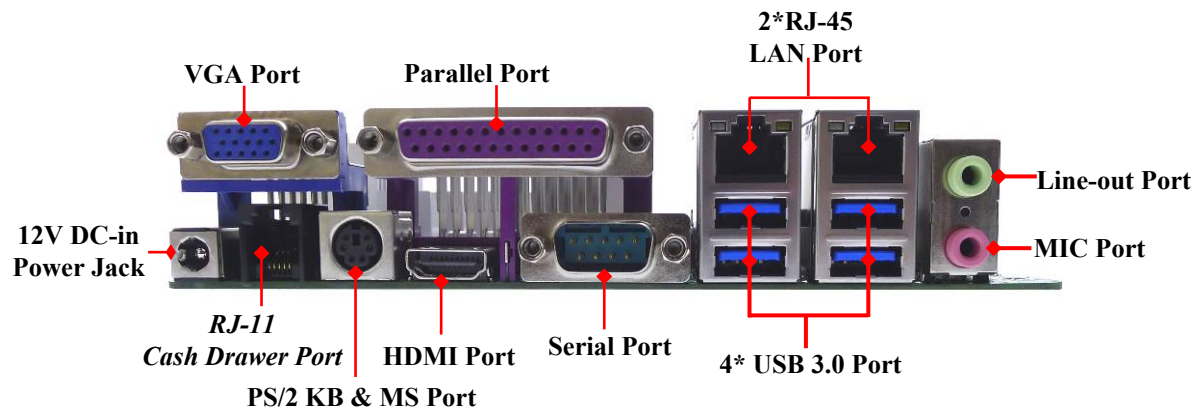
JSYSFAN (3-pin): SYSFAN1/SYSFAN2 Speed Detect Select

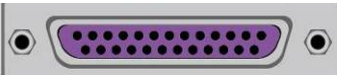


2-2 Connectors and Headers

2-2-1 Connectors

(1) Rear I/O Connectors



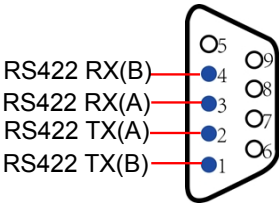
Icon	Name	Function
	DC 12V Power-out Connector	For user to connect compatible power adapter to provide power supply out.
	VGA Port	To connect display device that support VGA specification.
	Parallel Port	Also called LPT connector. Mostly for user to connect printer or scanner with parallel interface.
	RJ-11 Port	RJ-11for cash drawer I/F by GPIO control.
	PS/2 Keyboard & Mouse Connector	This combo port is for user to connect PS/2 mouse or keyboard device to the board.
	HDMI Port	To connect display device that support HDMI specification.
	Serial Port	Mainly for user to connect external MODEM or other devices that supports Serial Communications Interface.
	USB 3.0 Port	To connect USB keyboard, mouse or other devices compatible with USB specification. USB 3.0 ports supports up to 5Gbps data transfer rate.
	RJ-45 LAN Port	This connector is standard RJ-45 LAN jack for Network connection.
	Line-Out Connector	For user to connect external speaker, earphones, etc to transfer system audio output.

	MIC Connector	For user to connect microphone.
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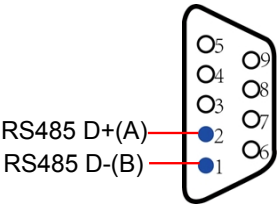
(2) COM1 (9-pin Block): RS232/422/485 Port

COM1 port 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 (*refer to Page 30*) at first, before using specialized cable to connect different pins of this port.

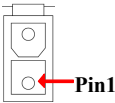
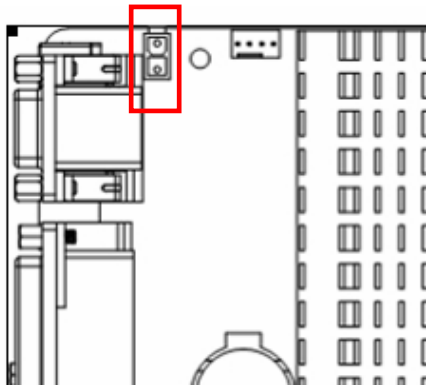


For RS422 Mode



For RS485 Mode

(3) ATXPWR(2-pin Block): Internal 12V DC-in Power Connector

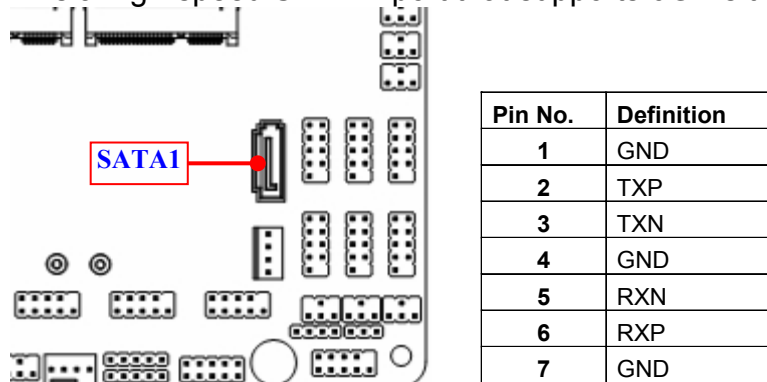


Pin.	Definition
2	+12V DC_IN
1	GND

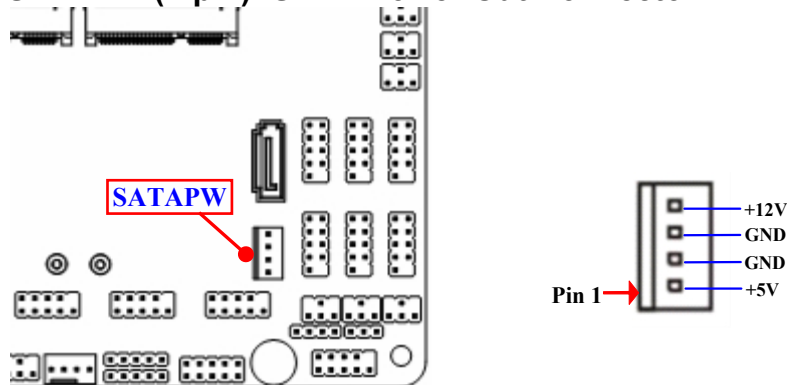
Warning!! The board has a 12V DC-in power connector (DC_IN) in I/O back panel and an internal ATX12V (ATXPWR) power connector. User can only connect one type of compatible power supply to one of them to power the system.

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

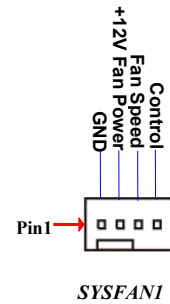
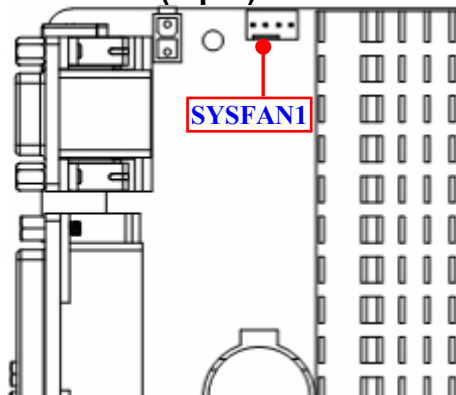
SATA is a high-speed SATAIII port that supports 6GB/s transfer rate.



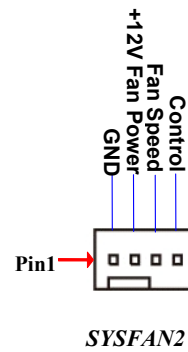
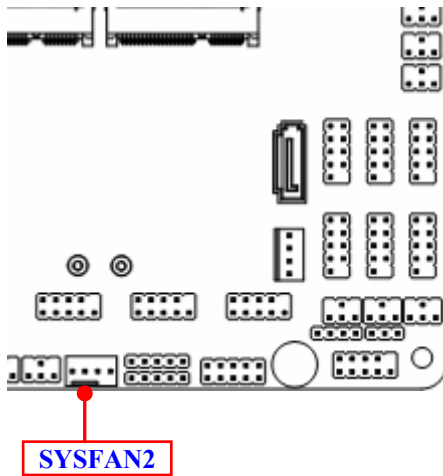
(5) SATAPW (4-pin): SATA Power Out Connector



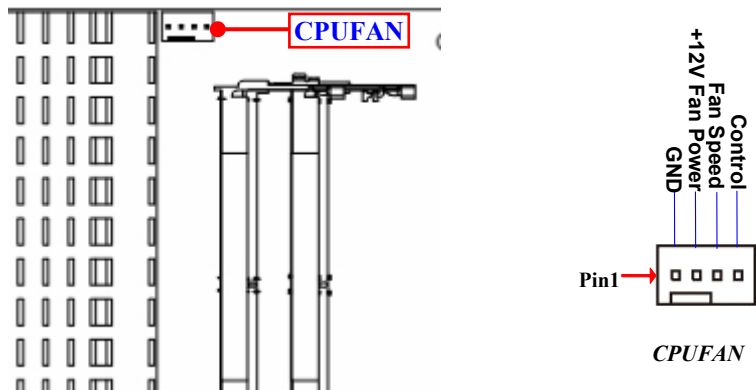
(6) SYSFAN1 (4-pin): SYSFAN1 Connector



(7) SYSFAN2 (4-pin): SYSFAN2 Connector

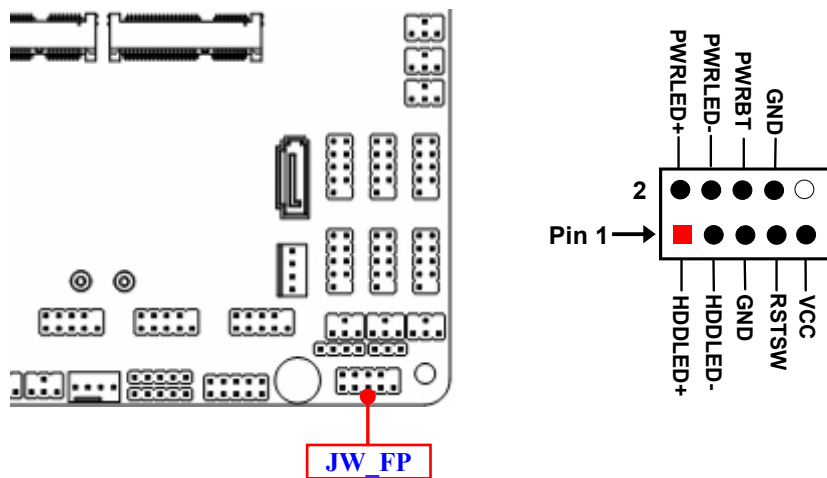


(8) CPUFAN (4-pin): CPUFAN Connector

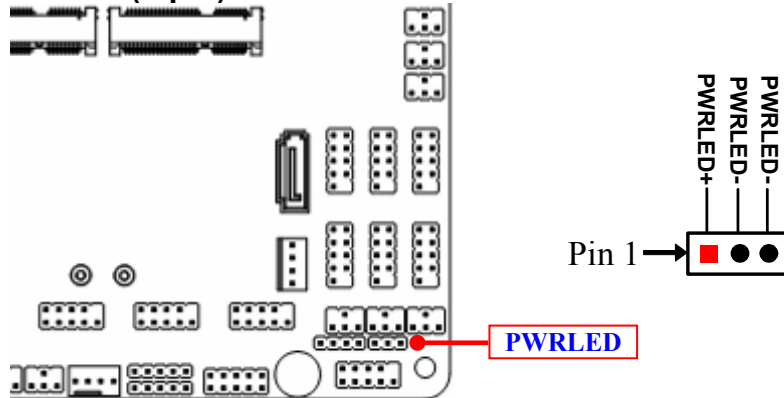


2-2-2 Headers

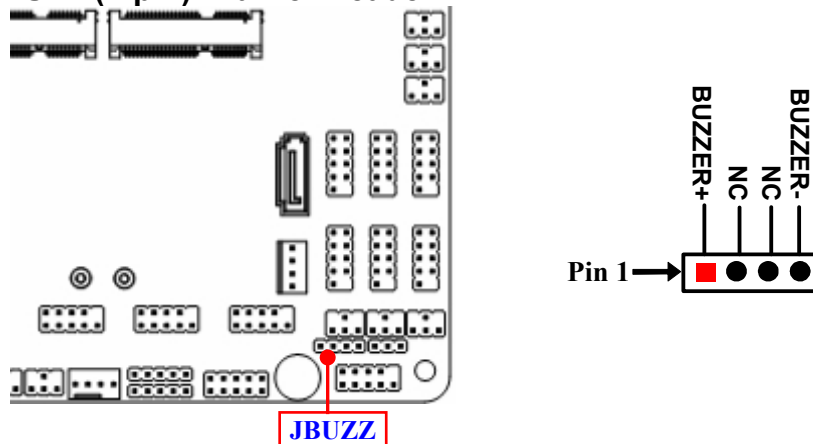
(1) JW_FP (9-pin): Front Panel Header



(2) PWRLED (3-pin): Power LED Header

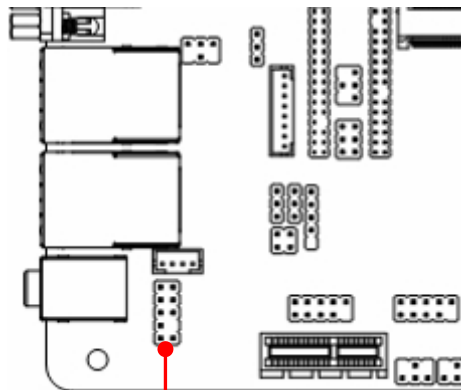


(3) JBUZZ (4-pin): Buzzer Header

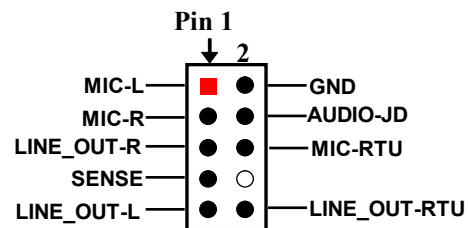


(4) FP_AUDIO (9-pin): Line-Out, MIC-In Header

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

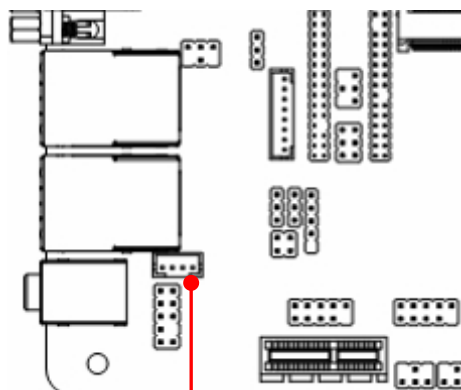


FP_AUDIO



Line-Out, MIC Header

(5) AMP_SPK (4-pin): 3W Amplifier Header

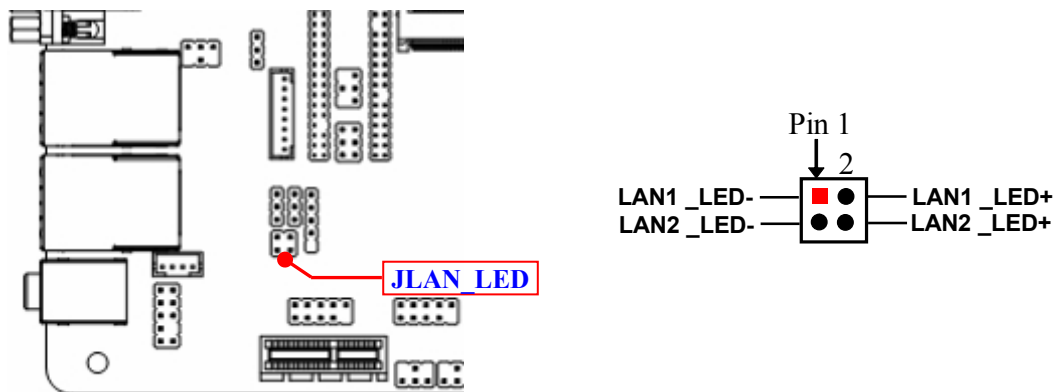


AMP_SPK

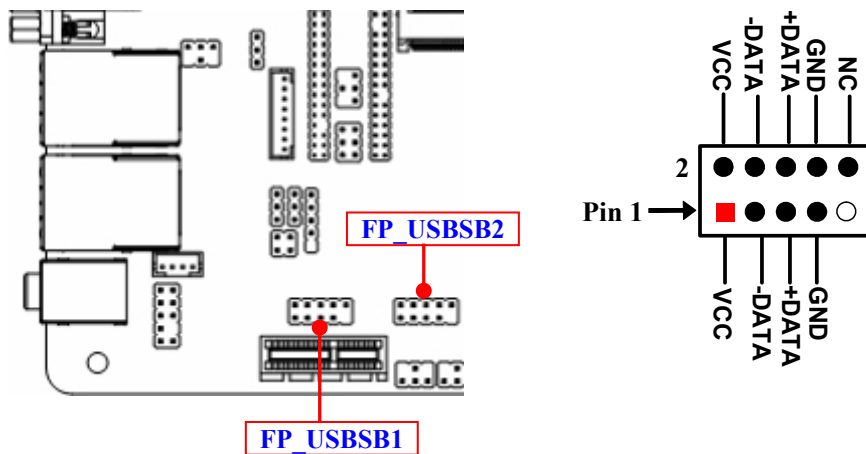


Pin No.	Definition
1	L-
2	L+
3	R+
4	R-

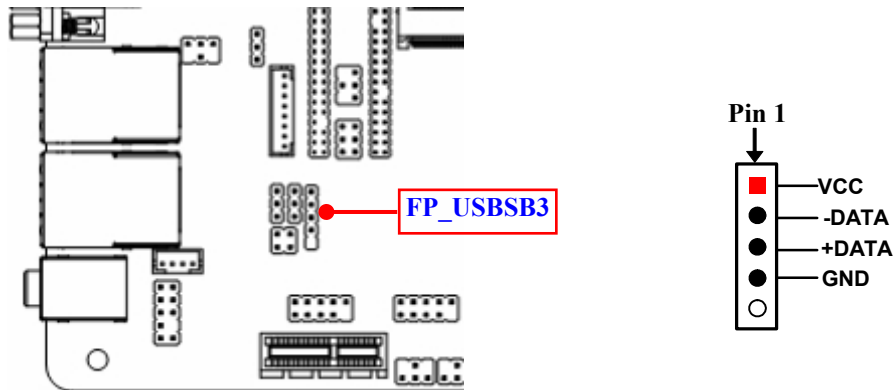
(6) JLAN_LED (4-pin): LAN2 RJ-45 LAN Header



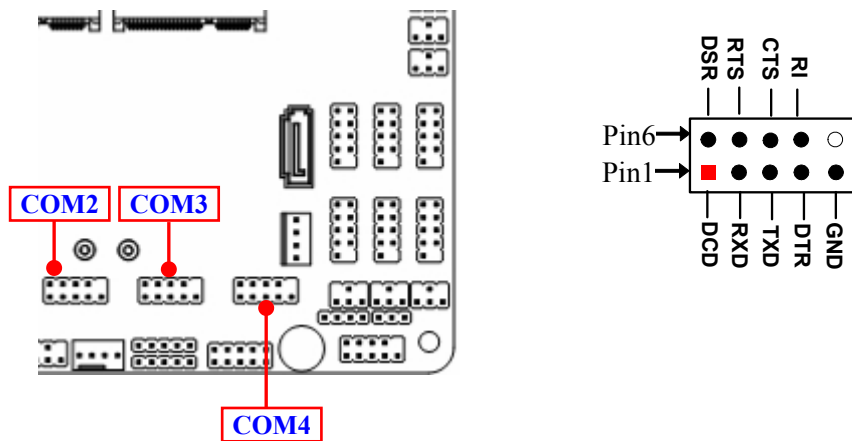
(7) FP_USB1/ FP_USB1 (9-pin): USB 2.0 Port Header



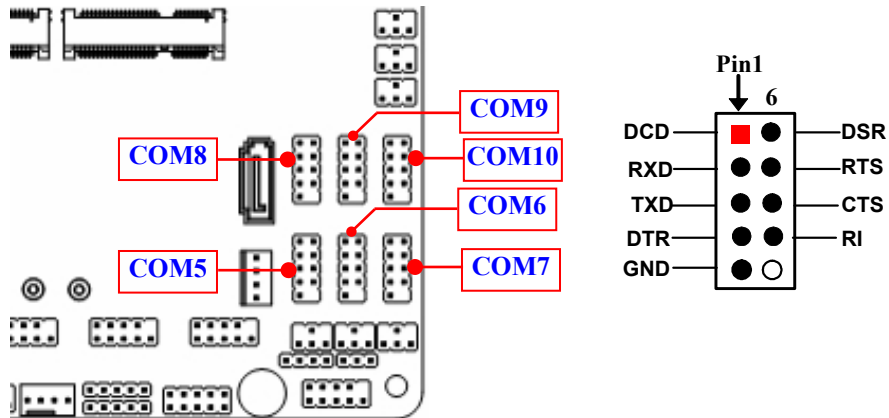
(8) FP_USB3 (4-pin): USB 2.0 Port Header



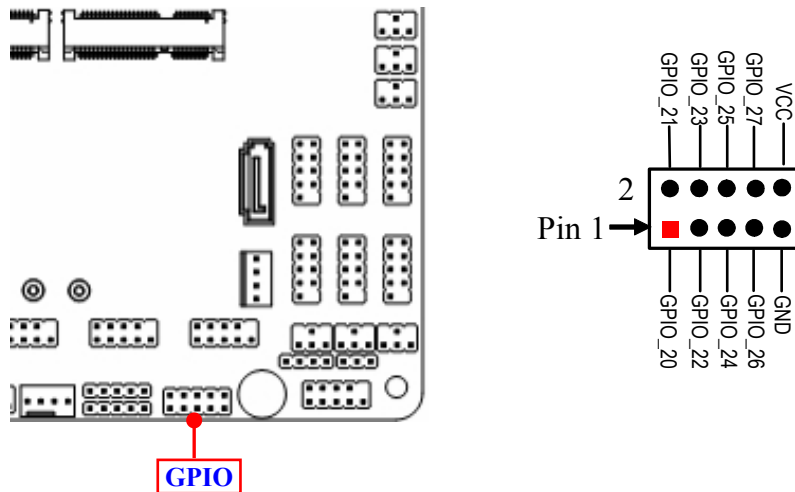
(9) COM2/3/4 (9-pin): Serial Port Headers



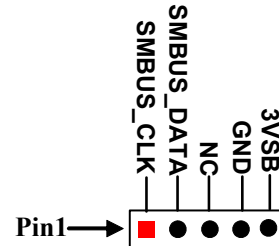
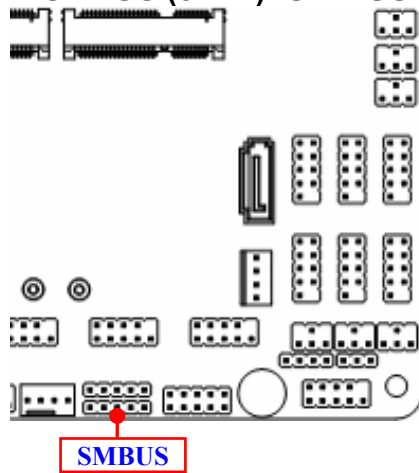
(10) COM5/6/7/8/9/10 (9-pin): Serial Port Headers



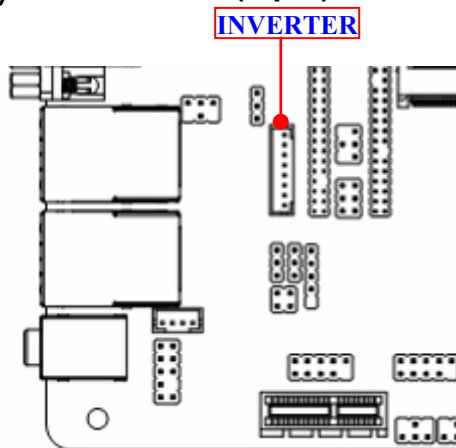
(11) GPIO (10-pin): GPIO Header



(12) **SMBUS (5-Pin): SM BUS Header**

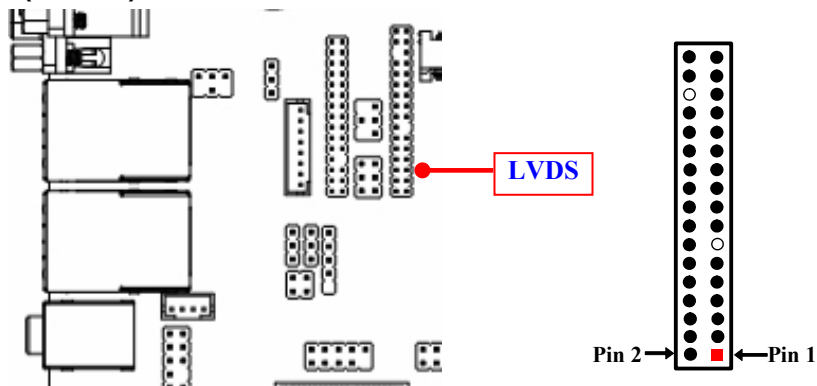


(13) **INVERTER (8-pin): LVDS Inverter Header**



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

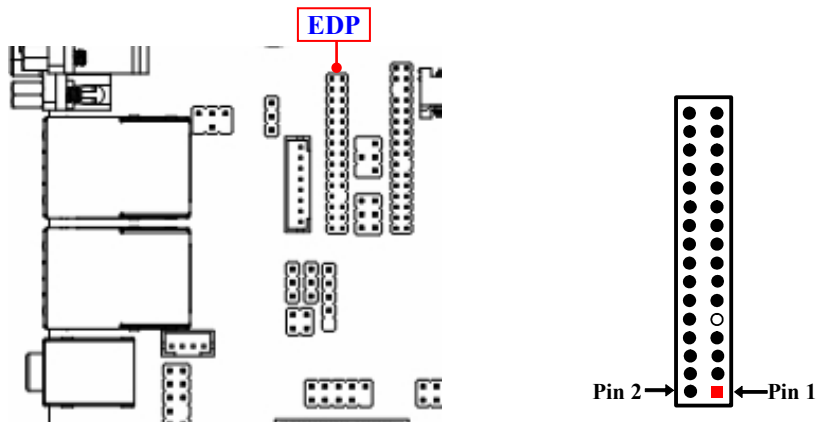
(14) LVDS (30-Pin): 24-bit dual channel LVDS Header



Pin Define	Pin NO.	Pin NO.	Pin Define
GND	Pin 32	Pin 31	GND
LCD_VCC	Pin 30	Pin 29	LCD_VCC
XX	Pin 28	Pin 27	LCD_VCC
LVDSA_DATAN0	Pin 26	Pin 25	LVDSA_DATAP0
LVDSA_DATAN1	Pin 24	Pin 23	LVDSA_DATAP1
LVDSA_DATAN2	Pin 22	Pin 21	LVDSA_DATAP2
LVDS_CLKAN	Pin 20	Pin 19	LVDS_CLKAP
LVDSA_DATAN3	Pin 18	Pin 17	LVDSA_DATAP3
GND	Pin 16	Pin 15	GND
GND	Pin 14	Pin 13	XX
NC	Pin 12	Pin 11	NC
LVDSB_DATAP0	Pin 10	Pin 9	LVDSB_DATAN0
LVDSB_DATAP1	Pin 8	Pin 7	LVDSB_DATAN1
LVDSB_DATAP2	Pin 6	Pin 5	LVDSB_DATAN2
LVDS_CLKBP	Pin 4	Pin 3	LVDS_CLKBN
LVDSB_DATAP3	Pin 2	Pin 1	LVDSB_DATAN3

Note: EDP header shares function with LVDS header; i.e. only one can function at a time.

(15) EDP (29-Pin): EDP Header



Pin Define	Pin NO.	Pin NO.	Pin Define
EDP_LANE-0	Pin 30	Pin 29	EDP_LANE+0
EDP_LANE-1	Pin 28	Pin 27	EDP_LANE+1
GND	Pin 26	Pin 25	GND
EDP_LANE-2	Pin 24	Pin 23	EDP_LANE+2
EDP_LANE-3	Pin 22	Pin 21	EDP_LANE+3
GND	Pin 20	Pin 19	GND
EDP_AUXNC	Pin 18	Pin 17	EDP_HPD
EDP_AUXP_C	Pin 16	Pin 15	EDP Backlight Enable
GND	Pin 14	Pin 13	GND
EDP Backlight PWM	Pin 12	Pin 11	EDP_VDD
NC	Pin 10	Pin 9	EDP_VDD
NC	Pin 8	Pin 7	XX
NC	Pin 6	Pin 5	GND
GND	Pin 4	Pin 3	BKLT_PW
BKLT_PW	Pin 2	Pin 1	BKLT_PW

Note: EDP header shares function with LVDS header; i.e. only one can function at a time.

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 from 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.

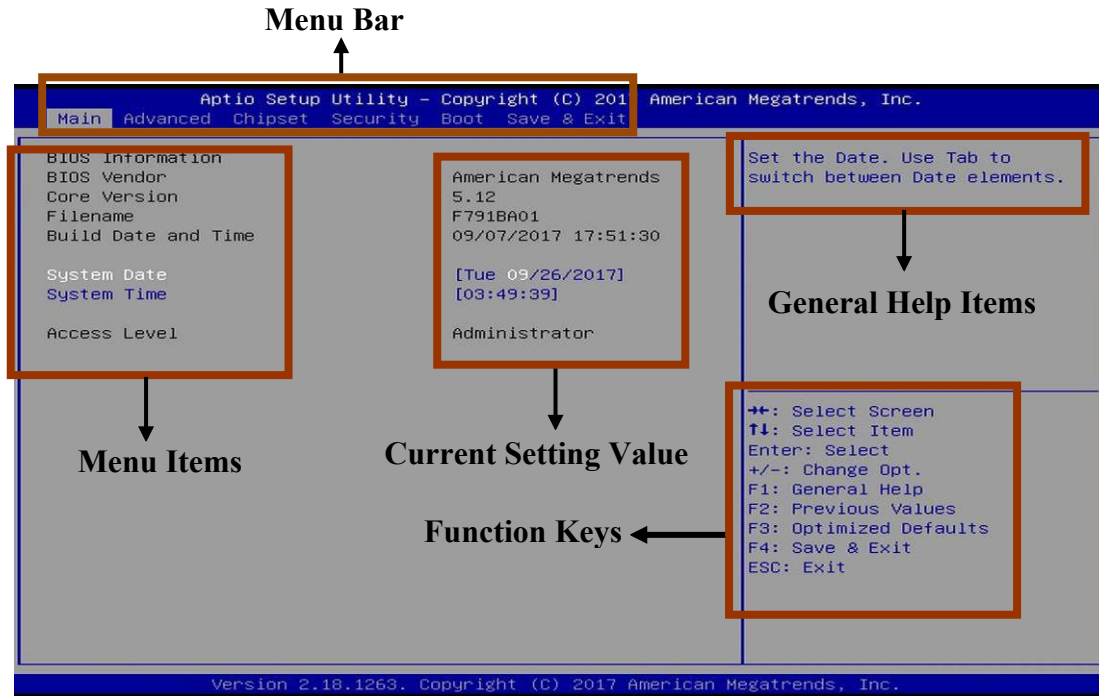
3-1 Entering Setup

Power on the computer and by pressing 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 **** to enter Setup; press **< F7>** for Pop Menu.

3-2 BIOS Menu Screen

The following diagram show a general BIOS menu screen:



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 exit from 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

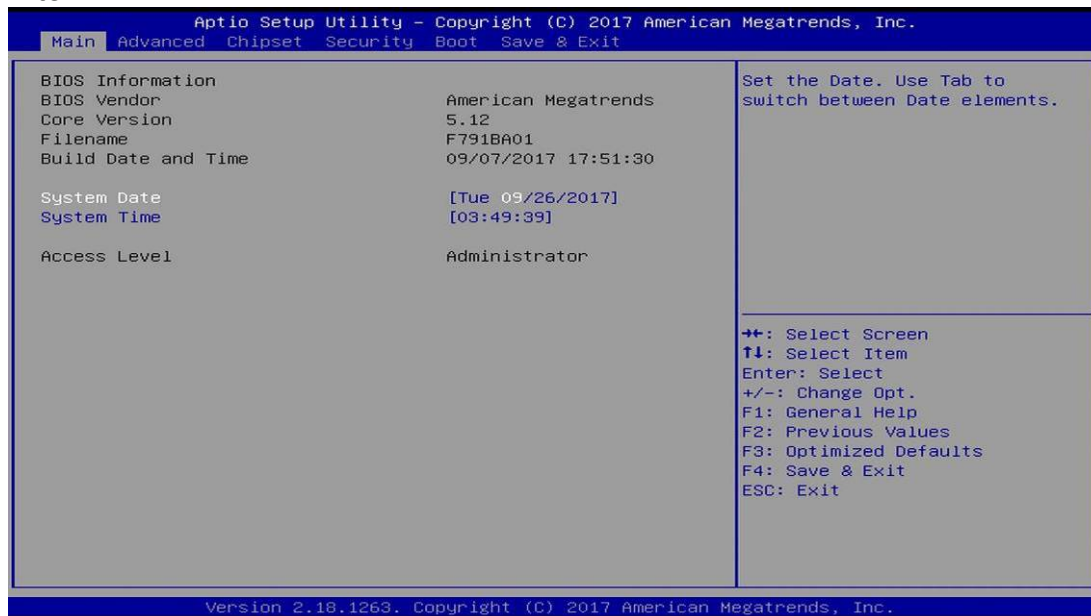
There are six menu bars on top of BIOS screen:

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.



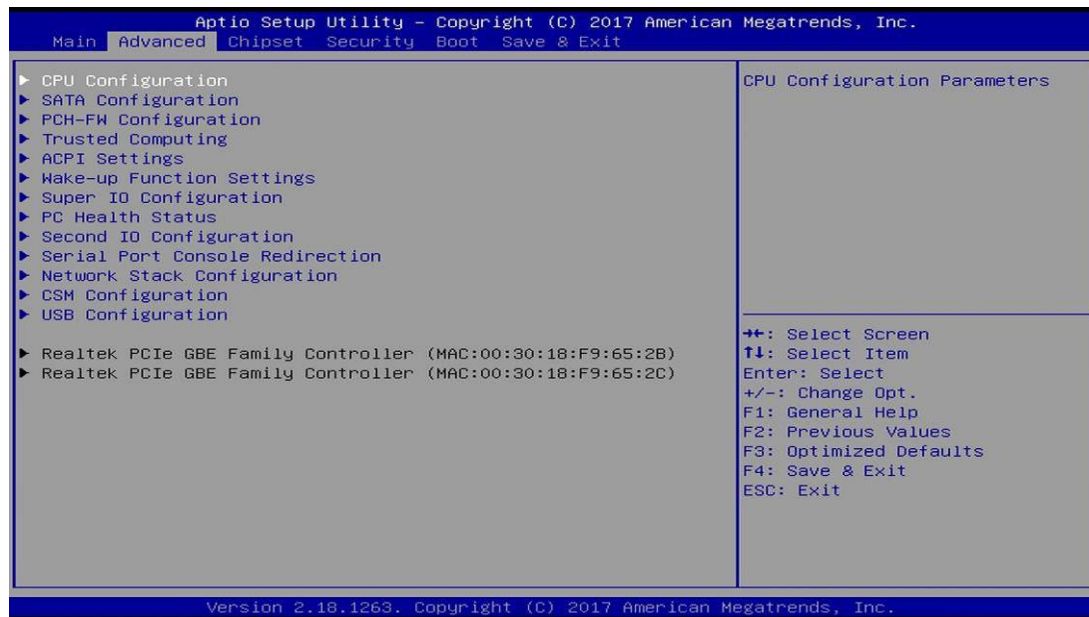
System Date

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:

Intel Virtualization Technology

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

When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

Hardware Prefetcher

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

Use this item to enable the Mid Level Cache (L2) streamer prefetcher.

Adjacent Cache Line Prefetch

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

Use this item to enable Mid Level Cache (L2) prefetching of adjacent cache lines.

Intel(R) SpeedStep(tm)

Use this item to enable or disable Intel SpeedStep. When set as [Enabled], it 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. When set as [Enabled], it 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 maximum package C State Limit setting.

The optional settings: [C0/C1]; [C2]; [C3]; [C6]; [C7]; [C7S]; [C8]; [C9]; [C10]; [Cpu Default]; [Auto].

▶ **SATA Configuration**

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

SATA Controller(s)

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

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

SATA Mode Selection

This item determines how SATA controller(s) operate.

The default setting is: [AHCI].

mSATA

Port

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

SATA

Port

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

Hot Plug

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

▶ **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 are: [dTPM]; [PTT].

► 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.*

► 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.

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

► ACPI Settings

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

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: [Enabled]; [Disabled].

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. This function is only supported when ERP function is disabled.

* **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].*

► **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.

The optional settings are: [IO=3F8h; IRQ=4]; [IO=3F8h; IRQ=3,4,5,6,7,

9,10,11,12]; [IO=2F8h; IRQ=3,4,5,6,7, 9,10,11,12]; [IO=3E8h; IRQ=3,4,5,6,7, 9,10,11,12]; [IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12].

Transmission Mode Select

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

Mode Speed Select

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

Serial Port FIF0 Mode

The optional settings are: [16-Byte FIF0]; [32-Byte FIF0]; [64-Byte FIF0]; [128-Byte FIF0].

► **Serial Port 2 Configuration/ Serial Port 3 Configuration/Serial Port 4 Configuration/ 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.

The optional settings are: [IO=2F8h; IRQ=3]; [IO=3F8h; IRQ=3,4,5,6,7, 9,10,11,12]; [IO=2F8h; IRQ=3,4,5,6,7, 9,10,11,12]; [IO=3E8h; IRQ=3,4,5,6,7, 9,10,11,12]; [IO=2E8h; IRQ=3,4,5,6,7, 9,10,11,12] for '**Serial Port 2 Configuration**'.

The optional settings are: [IO=3E8h; IRQ=10]; [IO=3F8h; IRQ=3,4,5,6,7, 9,10,11,12]; [IO=2F8h; IRQ=3,4,5,6,7, 9,10,11,12]; [IO=3E8h; IRQ=3,4,5,6,7, 9,10,11,12]; [IO=2E8h; IRQ=3,4,5,6,7, 9,10,11,12] ; [IO=3E0h; IRQ=3,4,5,6,7, 9,10,11,12]; [IO=2E0h; IRQ=3,4,5,6,7, 9,10,11,12] for '**Serial Port 3 Configuration**'.

The optional settings are: [IO=2E8h; IRQ=10]; [IO=3F8h; IRQ=3,4,5,6,7, 9,10,11,12]; [IO=2F8h; IRQ=3,4,5,6,7, 9,10,11,12]; [IO=3E8h; IRQ=3,4,5,6,7, 9,10,11,12]; [IO=2E8h; IRQ=3,4,5,6,7, 9,10,11,12] ; [IO=3E0h; IRQ=3,4,5,6,7, 9,10,11,12]; [IO=2E0h; IRQ=3,4,5,6,7, 9,10,11,12] for '**Serial Port 4 Configuration**'.

The optional settings are: [IO=3E0h; IRQ=10]; [IO=3F8h; IRQ=3,4,5,6,7, 9,10,11,12]; [IO=2F8h; IRQ=3,4,5,6,7, 9,10,11,12]; [IO=3E8h; IRQ=3,4,5,6,7, 9,10,11,12]; [IO=2E8h; IRQ=3,4,5,6,7, 9,10,11,12] ; [IO=3E0h; IRQ=3,4,5,6,7, 9,10,11,12]; [IO=2E0h; IRQ=3,4,5,6,7, 9,10,11,12] for '**Serial Port 5 Configuration**'.

The optional settings are: [IO=2E0h; IRQ=10]; [IO=3F8h; IRQ=3,4,5,6,7, 9,10,11,12]; [IO=2F8h; IRQ=3,4,5,6,7, 9,10,11,12]; [IO=3E8h; IRQ=3,4,5,6,7, 9,10,11,12]; [IO=2E8h; IRQ=3,4,5,6,7, 9,10,11,12] ; [IO=3E0h; IRQ=3,4,5,6,7, 9,10,11,12]; [IO=2E0h; IRQ=3,4,5,6,7, 9,10,11,12] for '**Serial Port 6 Configuration**'.

► **Parallel Port Configuration**

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

Parallel Port Configuration

Parallel Port

Use this item to enable or disable serial port (LPT/LPTE).

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

Change Settings

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

The optional settings are: [Auto]; [IO=378h; IRQ=7];
[IO=378h; IRQ=5,6,7,9,10,11,12]; [IO=278h; IRQ=5,6,7,9,10,11,12];
[IO=3BCh; IRQ=5,6,7,9,10,11,12];[IO=378h];[IO=278h]; [IO=3BCh].

Device Mode

The optional settings are: [STD Printer Mode]; [SPP Mode]; [EPP-1.9 and SPP Mode]; [EPP-1.7 and SPP Mode]; [ECP Mode]; [ECP and EPP 1.9 Mode]; [ECP and EPP 1.7 Mode].

WatchDog Reset Timer

Use this item to enable or disable WDT reset function. When set as [Enabled], the following sub-items shall appear:

WatchDog Reset Timer Value

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

WatchDog Reset Timer Unit

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

WatchDog Wake-up Timer in ERP

This item support WDT wake-up while ‘**ERP Support**’ is set as [Auto].

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

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

WatchDog Wake-up Timer Value in ERP

User can select a value in the range of [10] to [4095] seconds when ‘**WatchDog Reset Timer Unit**’ set as [Sec]; or in the range of [1] to [4095] minutes when ‘**WatchDog Reset Timer Unit**’ set as [Min].

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&3 of JAT_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.

PS2 KB/MS Connect

The optional settings are: [Keyboard First]; [Mouse First].

► **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/SYSFAN1 Smart Mode

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

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

CPUFAN/SYSFAN1 Full-Speed Temperature

Use this item to set CPUFAN full speed temperature. Fan will run at full speed when above the pre-set temperature.

CPUFAN/SYSFAN1 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/SYSFAN1 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/SYSFAN1 Idle-Speed Duty

Use this item to set CPUFAN idle speed duty. Fan will run at idle speed when below the pre-set duty.

SYSFAN1 Type

The optional settings are: [4-Pin]; [3-Pin].

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].

► **Second IO Configuration**

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

Second IO Configuration

► **Serial Port 7 Configuration/ Serial Port 8 Configuration/Serial Port 9 Configuration/ Serial Port 10 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.

The optional settings are: [IO=240h; IRQ=11]; [IO=240h; IRQ=5, 10,11]; ; [IO=248h; IRQ=5, 10,11]; [IO=250h; IRQ=5, 10,11]; ; [IO=258h; IRQ=5, 10,11] for 'Serial Port 7 Configuration'.

The optional settings are: [IO=248h; IRQ=11]; [IO=240h; IRQ=5, 10,11]; ;
[IO=248h; IRQ=5, 10,11]; [IO=250h; IRQ=5, 10,11]; ; [IO=258h; IRQ=5, 10,11] for
'**Serial Port 8 Configuration**'.

The optional settings are: [IO=250h; IRQ=11]; [IO=240h; IRQ=5, 10,11]; ;
[IO=248h; IRQ=5, 10,11]; ; [IO=250h; IRQ=5, 10,11]; ; [IO=258h; IRQ=5, 10,11] for
'**Serial Port 9 Configuration**'.

The optional settings are: [IO=258h; IRQ=11]; [IO=240h; IRQ=5, 10,11]; ;
[IO=248h; IRQ=5, 10,11]; ; [IO=250h; IRQ=5, 10,11]; ; [IO=258h; IRQ=5, 10,11] for
'**Serial Port 10 Configuration**'.

► **Serial Port Console Redirection**

Press [Enter] to make settings for serial port redirection settings:

COM1

Console Redirection

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

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

► **Console Redirection Settings**

The settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.

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

Terminal Type

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

Bits per second

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

Data Bits

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

Parity

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

Stop Bits

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

Flow Control

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

VT-UTF8 Combo Key Support

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

Recorder Mode

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

Resolution 100x31

Use this item to disable or enable extended terminal resolution.

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 are: [Enabled]; [Disabled].

When set as [Enabled], user can make further settings in 'Console Redirection Settings':

► **Console Redirection Settings**

The settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.

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

Out-of-Band Mgmt Port

The optional settings are: [COM1]; [COM1(Pci Bu0, Dev0, Func0) (Disabled)].

**This item may or may not show up, depending on different configuration.*

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 enable or disable UEFI Network Stack.

Network Stack

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

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

Ipv4 PXE Support

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

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

Ipv4 HTTP Support

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

Use this item to enable Ipv4 HTTP 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 PXE Boot Support. When set as [Disabled], Ipv6 boot optional will not be created.

Ipv6 HTTP Support

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

Use this item to enable Ipv6 HTTP 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 only].

Storage

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

The optional settings are: [Do Not Launch]; [UEFI only]; [Legacy only].

Other PCI Devices

This item determines OpROM execution policy for devices other than Network, storage or video.

The optional settings are: [Do Not Launch]; [UEFI only]; [Legacy only].

▶ **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-outs:

USB Transfer time-out

Use this item to set the time-out value for control, bulk, and interrupt transfers.

The optional settings are: [1 sec]; [5 sec]; [10 sec]; [20 sec].

Device reset time-out

Use this item to set USB mass storage device start unit command time-out.

The optional settings are: [10 sec]; [20 sec]; [30 sec]; [40 sec].

Device power-up delay

Use this item to set maximum time the device will take before it properly reports itself to the host controller. 'Auto' uses default value: for a root port it is 100 ms, for a hub port the delay is taken from hub descriptor.

The optional settings: [Auto]; [Manual].

Select [Manual] you can set value for the following sub-item: '**Device Power-up Delay in Seconds**'.

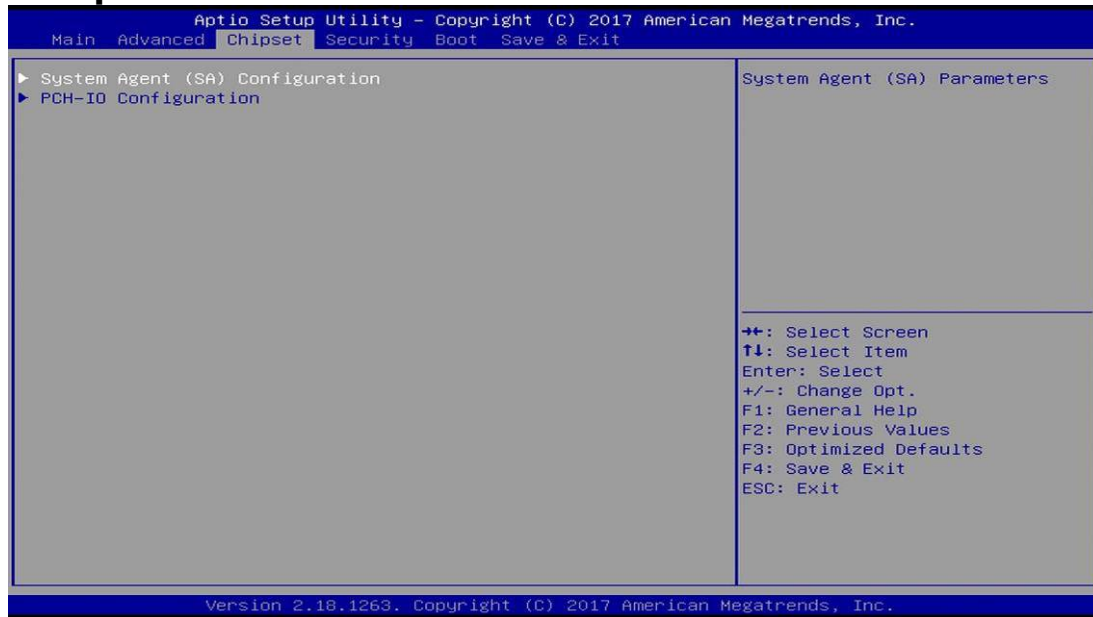
Device Power-up Delay in Seconds

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

- ▶ **Realtek PCIe GBE Family Controller (MAC:XX:XX:XX:XX:XX:XX)/ Realtek PCIe GBE Family Controller (MAC:XX:XX:XX:XX:XX:XX)**

This item gives Intel gigabit ethernet controller basic driver 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: [Disabled]; [Enabled].

▶ **Graphics Configuration**

Press [Enter] to make further settings for 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 Video Device which will be activated during POST. This has no effect if external graphics present. Secondary boot display selection will appear based on selection. BGA modes will be supported only on primary display.

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

** Note: When set as [HDMI], [CRT], or [eDP/LVDS], user can make further settings in ‘**Second IGFX Boot Display**’.*

Second IGFX Boot Display

Use this item to select second IGFX boot device..

The optional settings are: [Disabled]; [HDMI]; [CRT].

Active LFP

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

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

Backlight Control

Use this item to select Back Light Control setting.

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

Panel Type

Use this item to select Panel Type.

The optional settings are: [800x480 18bit Single]; [800x600 18bit Single]; [800x600 24bit Single]; [1024x600 18bit Single]; [1024x768 18bit Single]; [1024x768 24bit Single]; [1280x768 24bit Single]; [1280x800 18bit Single]; [1280x800 24bit Single]; [1366x768 18bit Single]; [1366x768 24bit Single]; [1440x900 18bit Dual]; [1440x900 24bit Dual]; [1280x1024 24bit Dual];

[1680x1050 24bit Dual]; [1920x1080 24bit Dual].

LVDS FW Write Protect

Use this item to select LVDS FW Update/Protect.

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

► **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

Use this item to enable or disable this USB physical connector (physical port). Once disabled, any USB devices plugged into this connector will not be detected by BIOS or OS.

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

HD Audio

Use this item to control the detection of the HD Audio device.

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

[Disabled]: HDA will be unconditionally disabled;

[Enabled]: HDA will be unconditionally enabled;

[Auto]: HAD will be enabled if present, or disabled otherwise.

Onboard Lan1 Controller/ Onboard Lan2 Controller

Use this item to enable or disable device or controller.

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

PCI-E Slot

Use this item to enable or disable device or controller.

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

Speed

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

MPE Slot

Use this item to enable or disable device or controller.

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

Speed

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

MMPE Slot

Use this item to enable or disable device or controller.

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

Speed

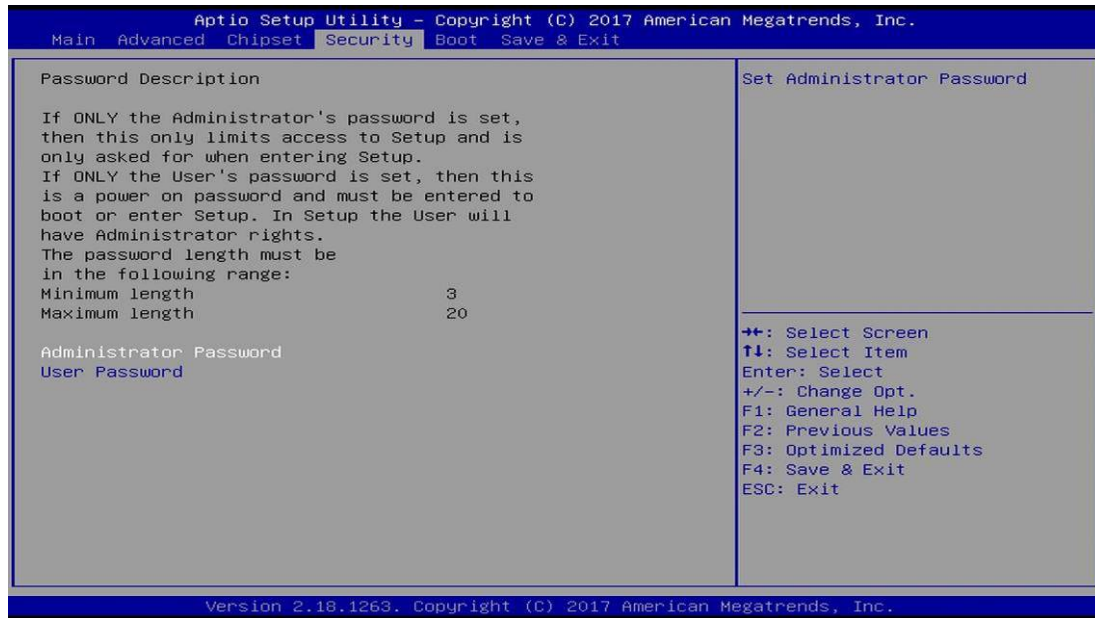
The optional settings are: [Auto]; [Gen1]; [Gen2]; [Gen3].

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.

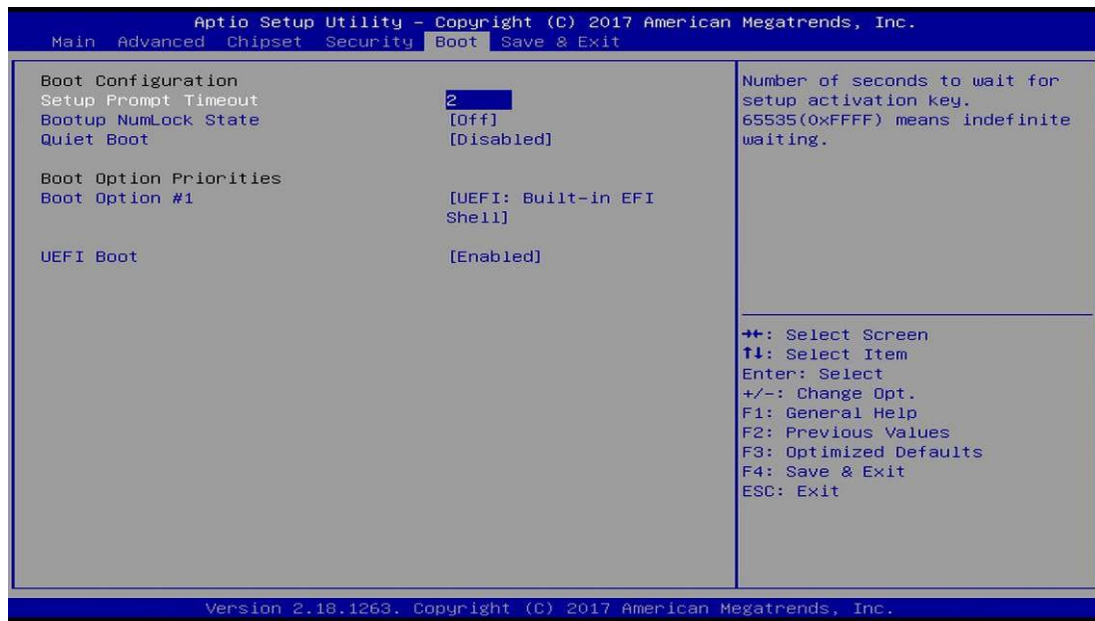
Administrator Password

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/...

The optional settings are: [UEFI: Built-in EFI Shell]; [Disabled].

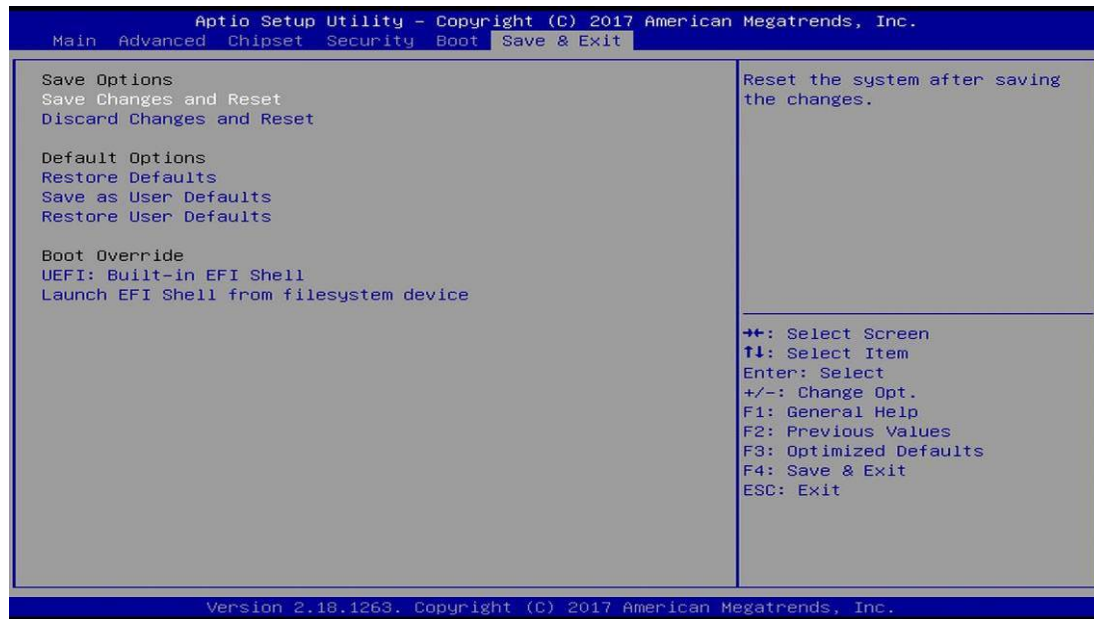
UEFI Boot

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

[Enabled]: To enable all UEFI boot options.

[Disabled]: To disabled all UEFI boot options.

3-11 Save & Exit Menu



Save Options

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.

Default Options

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

UEFT: Built-in EFI Shell

Launch Internal EFI shell application (shell.efi).

Lauch EFI Shell from filesystem device

Use this item to launch EFI shell application (shell.efi) from one of the available filesystem device.