NMF691 Series

User Manual

G03-NMF691-F

Rev: 6.0

Release date: December 15, 2022

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.**

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.

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.

USER'S NOTICE

Manual Revision Information

Reversion	Revision History	Date
6.0	Sixth Edition	December 15, 2022

Item Checklist

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

Chapter 1
Introduction of the Motherboard

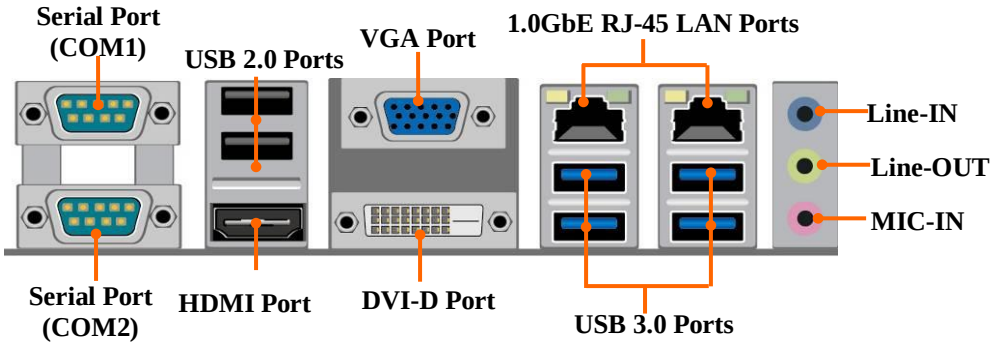
1-1 Specification

Spec	Description
Design	● m-ATX form factor; PCB size: 24.4 x24.4 cm
Chipset	● Intel® H110 Express Chipset
CPU Socket	● Supports Intel® Core™ i7, Core™ i5, Core™ i3 series, Pentium® processor in LAG1151 Package (Max. 65W) ** for detailed CPU support information please visit our website*
Memory Slots	● 2* DDR4 RAM module slot ● Supporting 2* 2133MHz DDR4 RAM Module, expandable to 32 GB (Maximum) ● Support dual-channel function
Expansion Slots	● 1* PCI-Express x16 slot ***(PCIE1)*** ● 1* PCI-Express x1 slot ***(PCIE2)*** ● 2* PCI slot ***(PCI1/2)*** ● 1* Full-size Mini-PCIE ***(MPE)***
Storage	● 3* SATAIII 6Gb/s port ***(SATA1/2/3)*** ● 1* M.2 Socket 3 connector (Socket 3, M-key, support type 2242/2260/2280/22110 SATA SSD)
LAN Chip	● Integrated with 2* Realtek RTL8111G Gigabit PCI-E LAN chip ● Support Fast Ethernet LAN function of providing 10/100/1000Mbps Ethernet data transfer rate
Audio Chip	● Realtek HD Audio Codec integrated ● Audio driver and utility included
BIOS	● AMI 64MBit Flash ROM
Multi I/O	***Rear Panel I/O:*** ● 2* Serial port connector *(**COM1_2**, COM1 supports RS232/422/485 function)* ● 2* USB 2.0 port connector ● 1* HDMI port connector ● 1* DVI-D port connector ● 1* VGA port connector ● 2* 1.0GbE RJ-45 LAN port connector ● 4* USB 3.0 port connector ● 1* 3-jack audio connector (Line-in, Line-out, MIC) ***Internal I/O Connectors & Headers:*** ● 1* 24-pin main power connector ● 1* 8-pin 12V power connector ● 1* Front panel audio header ● 1* SPDIF-out header ● 2* LAN Status indicator header(LAN1_LED/LAN2_LED) ● 8* COM port header ***(COM3/4/5/6/7/8/9/10)*** ● 1* GPIO header ● 1* Front panel header ● 1* Speaker header+ 1* POWER LED header ● 1* 4-pin front panel USB 2.0 header for 1* expansion USB 2.0 port

	● 1* 9-pin front panel USB 2.0 header for 2* expansion USB 2.0 port ● 1* PS/2 KB & MS header ● 1* SMBUS header ● 3* FAN header

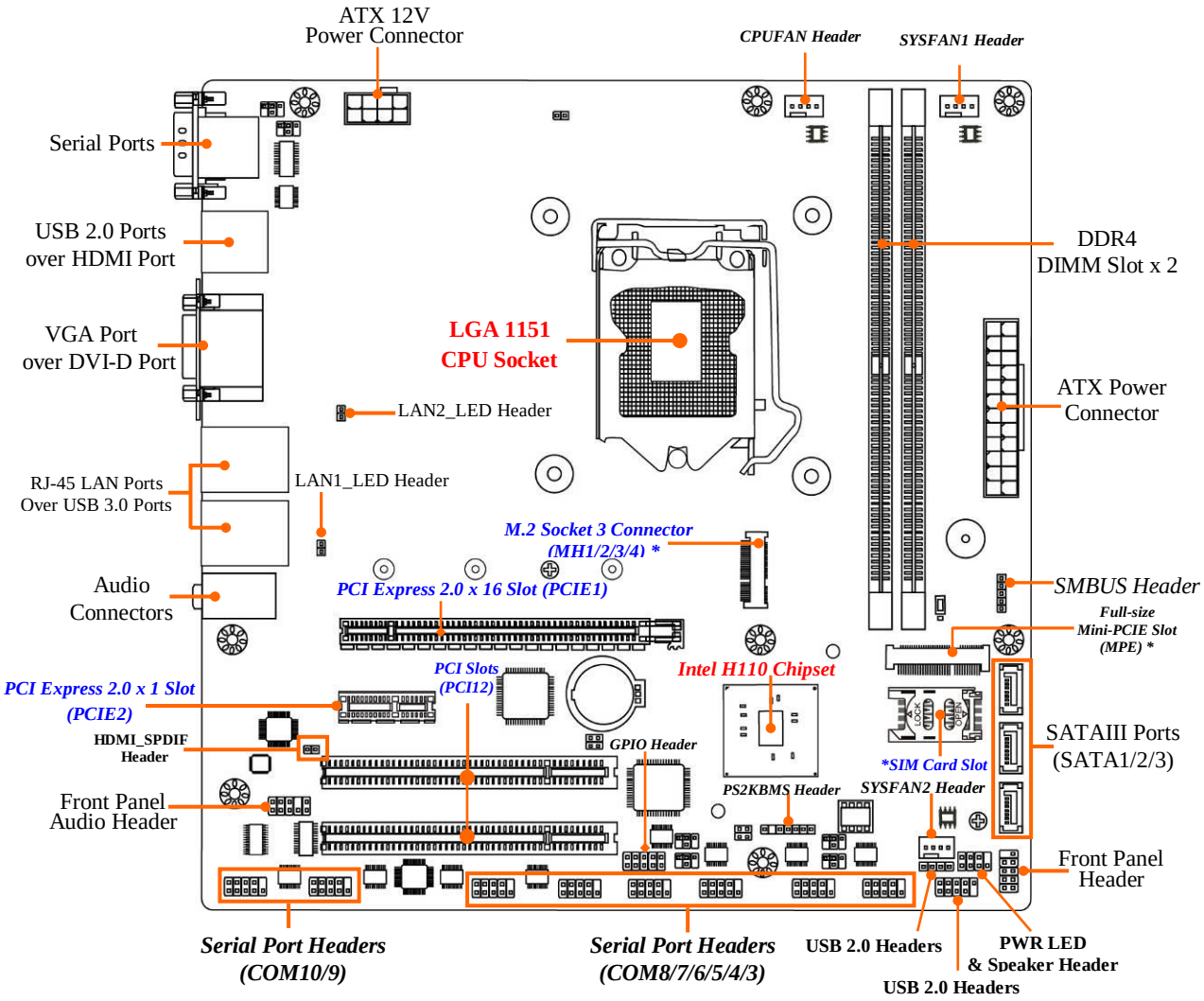
1-2 Layout Diagram

Rear IO Diagram



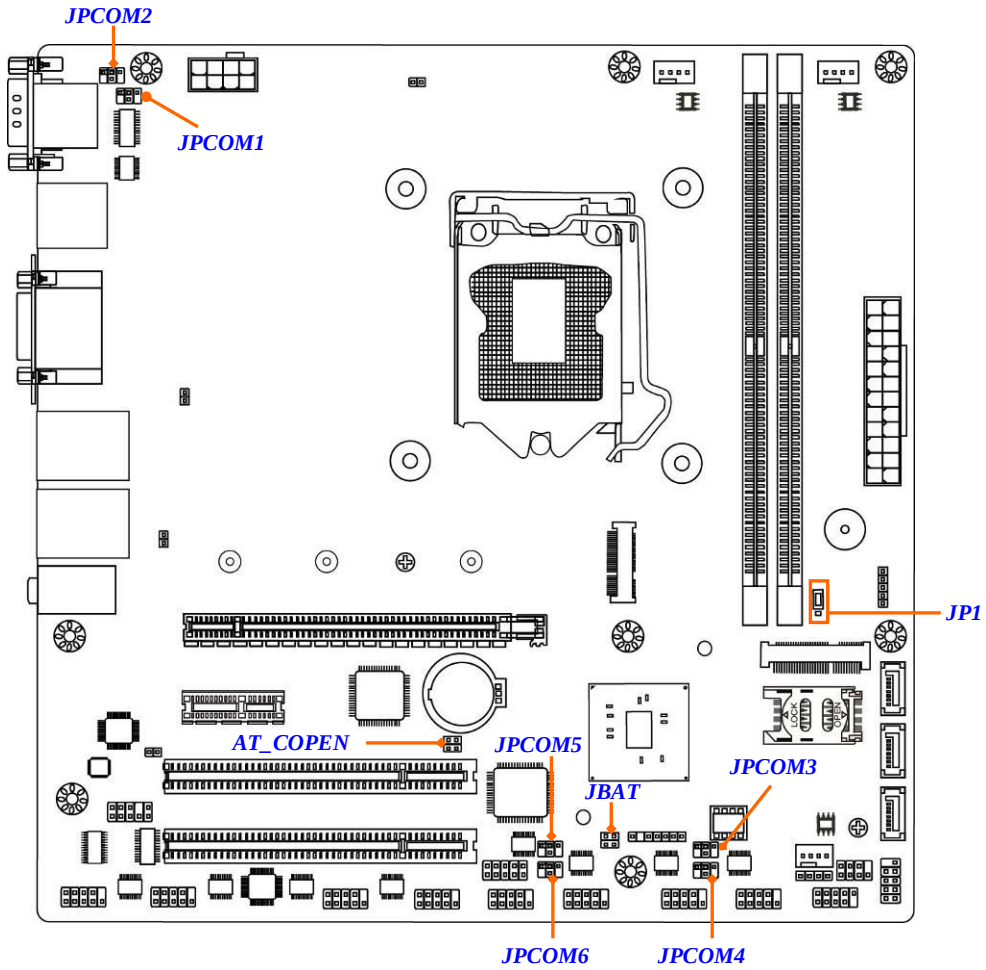
** **Note:** Many PCs now include XHCI USB controllers which allow for the support of USB 3.0 and higher USB speeds. This inclusion of XHCI controllers has lessened the need for EHCI USB controllers within platforms. However, legacy operating systems (OS) may not natively recognize XHCI controllers. 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.*

Motherboard Internal Diagram



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

Motherboard Jumper Position



Jumper

Jumper	Name	Description
JPCOM1	COM1 Port Pin9 Function Select	4-pin Block
JPCOM2	COM2 Port 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
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):*** DFDS Override	4-pin Block
JP1	Mini PCI-E Slot (MPE)VCC3.3V/3.3VSB Select	3-pin Block

Connectors

Connector	Name
ATXPWR	ATX Main Power Connector
ATX12V	ATX 12V Power Connector
COM1_2	Serial Port COM Connector X2
USB1	USB 2.0 Port Connector X2
HDMI	HDMI Port Connector
CRT_DVI	**Top:** VGA Port Connector **Bottom**: DVI-D Port Connector
UL1/UL2	**Top:** 1.0GbE RJ-45 LAN Connector X2 **Middle & Bottom**: USB 3.0 Port Connector X4
AUDIO	**Top:** Line-in Connector **Middle:** Line-out Connector **Bottom:** MIC Connector
SATA1/2/3	SATAIII Connector X3

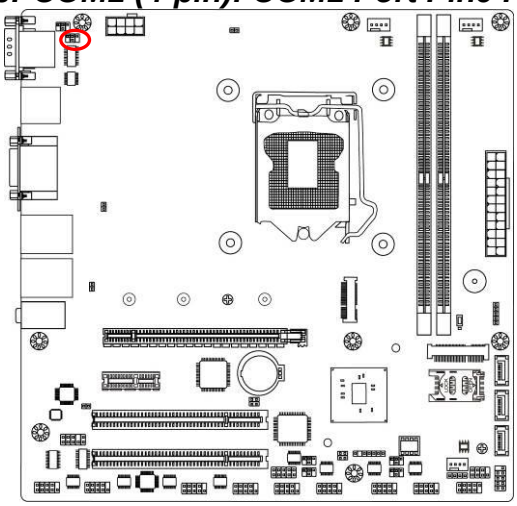
Headers

Header	Name	Description
FP_AUDIO	Front Panel Audio Header	9-pin Block
SPDIF	HDMI_SPDIF Out Header	2-pin Block
LAN1_LED/ LAN2_LED	LANLED Activity Header	2-pin Block
COM 3/4/5/6/7/8/9/10	Serial Port Header	9-pin Block
GPIO_CON	GPIO Header	10-pin Block
JW_FP	PWR LED/ HD LED/ Power Button /Reset	9-pin Block
SPK_LED	Power LED & Speaker Header	7-pin Block
FP_USB2	USB 2.0 Header	4-pin Block
FP_USB1	USB 2.0 Header	9-pin Block
PS2KBMS	PS/2 Keyboard & Mouse Header	6-pin Block
SMBUS	SMBUS Header	5-pin Block
SYSFAN1/SYSFAN2/CPUFAN	FAN Header	4-pin Block

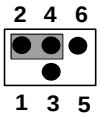
Chapter 2
Hardware Installation

2-1 Jumper Setting

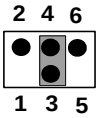
JPCOM1 (4-pin): COM1 Port Pin9 Function Select



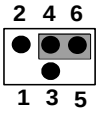
JPCOM1→COM1 Port



2-4 Closed:
RI=RS232

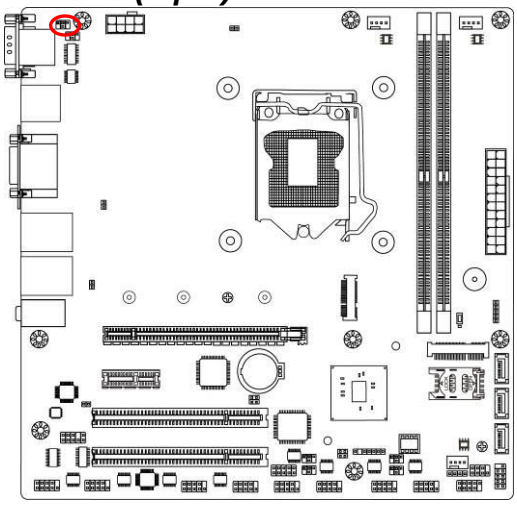


3-4 Closed:
RI= 5V;

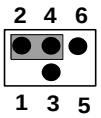


4-6 Closed:
RI= 12V;

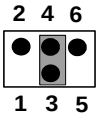
JPCOM2 (4-pin): COM2 Port Pin9 Function Select



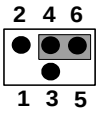
JPCOM2→COM2 Port



2-4 Closed:
RI=RS232

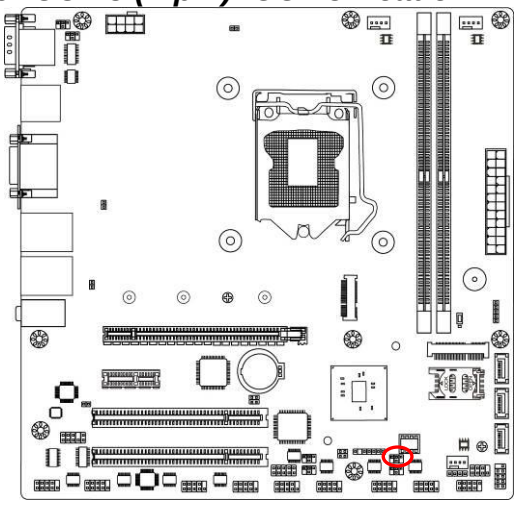


3-4 Closed:
RI= 5V;

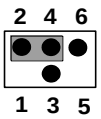


4-6 Closed:
RI= 12V;

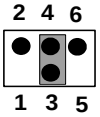
JPCOM3 (4-pin): COM3 Header Pin9 Function Select



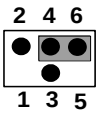
JPCOM3→COM3 Header



2-4 Closed:
RI=RS232

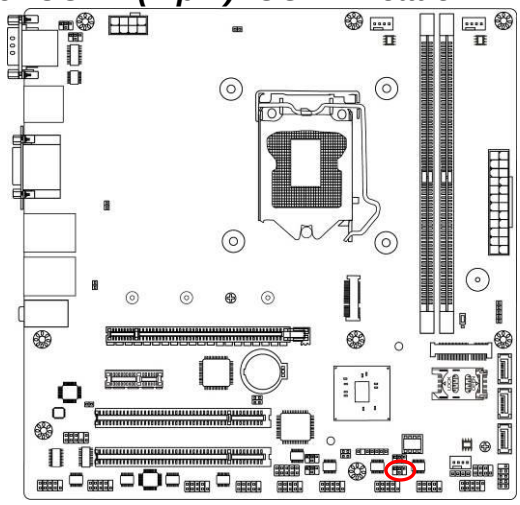


3-4 Closed:
RI= 5V;

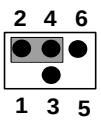


4-6 Closed:
RI= 12V;

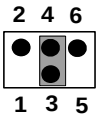
JPCOM4 (4-pin): COM4 Header Pin9 Function Select



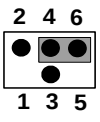
JPCOM4→COM4 Header



2-4 Closed:
RI=RS232

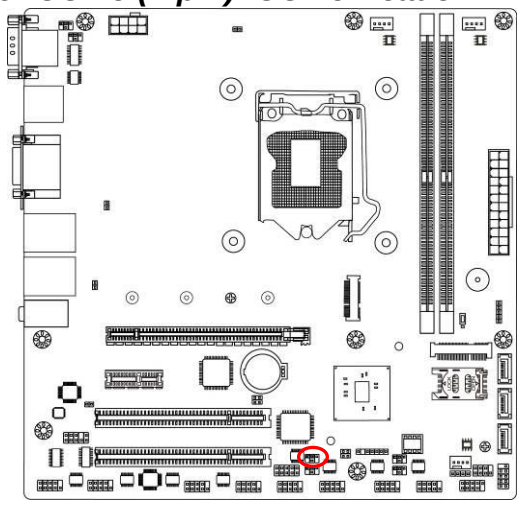


3-4 Closed:
RI= 5V;

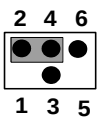


4-6 Closed:
RI= 12V;

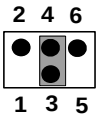
JPCOM5 (4-pin): COM5 Header Pin9 Function Select



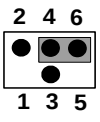
JPCOM5→COM5 Header



2-4 Closed:
RI=RS232

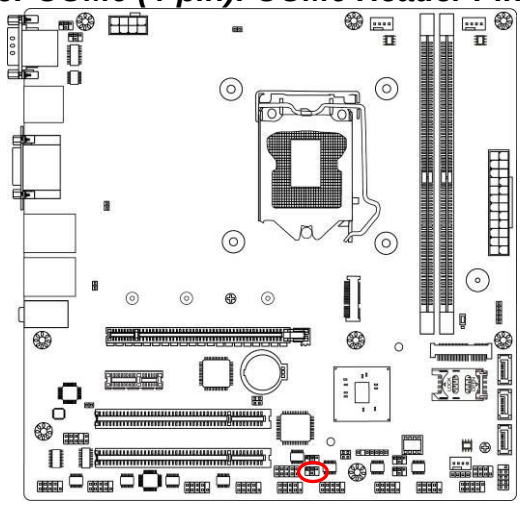


3-4 Closed:
RI= 5V;

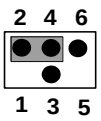


4-6 Closed:
RI= 12V;

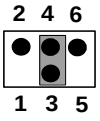
JPCOM6 (4-pin): COM6 Header Pin9 Function Select



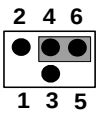
JPCOM6→COM6 Header



2-4 Closed:
RI=RS232

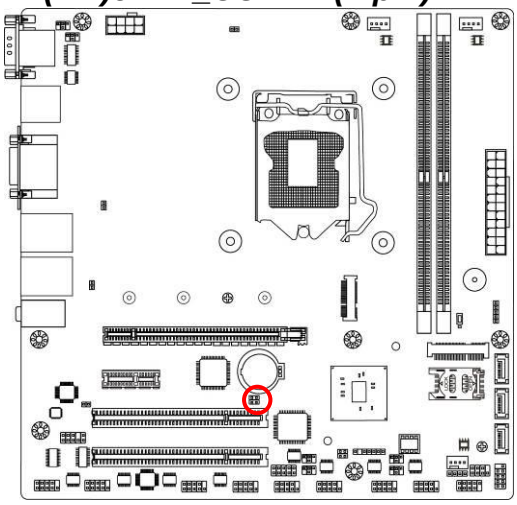


3-4 Closed:
RI= 5V;

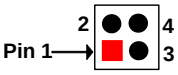


4-6 Closed:
RI= 12V;

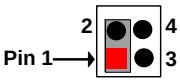
Pin(1-2)of AT_COPEN (4-pin): ATX Mode/AT Mode Select



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



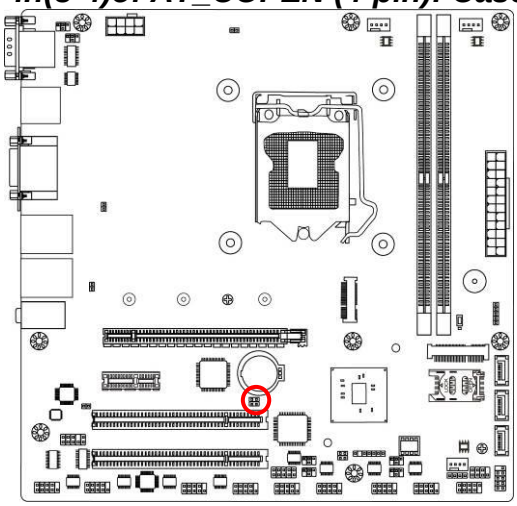
1-2 Open: ATX Mode Selected(Default);



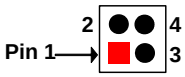
1-2Closed: AT Mode Selected.

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

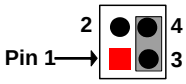
Pin(3-4)of AT_COPEN (4-pin): Case Open Message Display Select



Pin(3-4) of AT_COPEN→Case Open



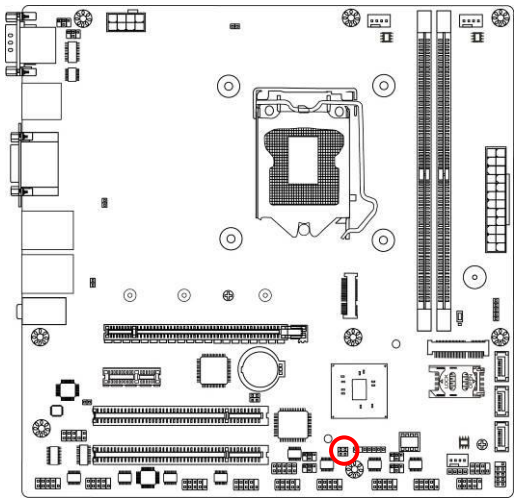
3-4 Open: Normal (Default);



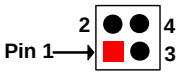
3-4 Closed: Case Open Funcion Selected.

Use needs to enter BIOS and enable 'Case Open Detect' function. In this case if you case is removed, next time when you restart your computer a message will be displayed onscreen to inform you of this.

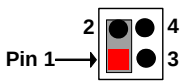
Pin(1-2)of JBAT (4-pin): Clear CMOS RAM Function Settings



Pin(1-2) of JBAT→Clear CMOS

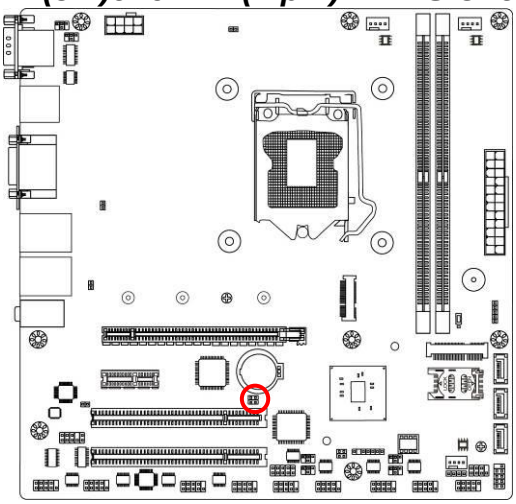


1-2 Open: Normal(Default);

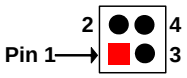


1-2 Closed: Clear CMOS RAM Settings.

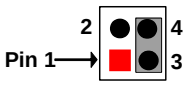
Pin(3-4)of JBAT (4-pin): DFDS Override



Pin(3-4) of JBAT→DFDS Override

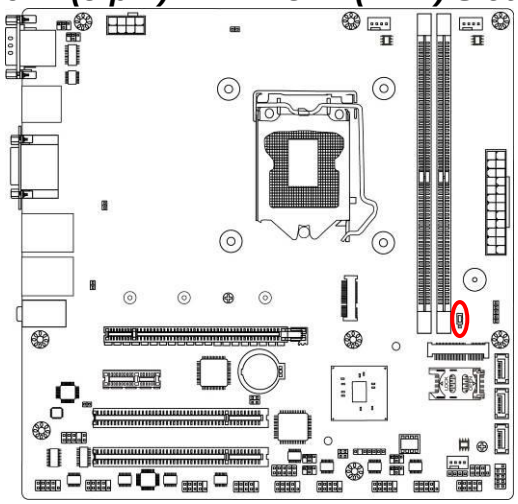


3-4 Open: Normal (Default);

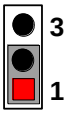


3-4 Closed: DFDS Override.

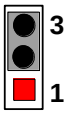
JP1 (3-pin): Mini PCI-E (MPE) Slot VCC 3.3V/3.3 VSB Select



JP1→ Mini-PCIE Slot VCC Select



1-2 Closed: MINI PCI-E Slot VCC= 3.3V;



2-3 Closed: MINI PCI-E Slot VCC = 3.3VSB.

2-2 Connectors and Headers

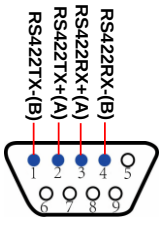
2-2-1 Rear I/O Back Panel Connectors

Refer to Page-2.

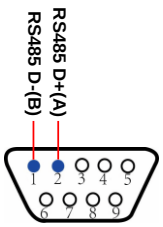
Icon	*Name*	*Function*
	**Serial Port**	Mainly for user to connect external MODEM or other devices that supports Serial Communications Interface. ***Note:** COM1 supports RS232/422/485 function.*
	**HDMI Port**	To connect display device that support HDMI specification.
	**DVI-D Port**	To connect display device that support DVI specification.
	**VGA Port**	VGA connector is the 15-pin D-subminiature female connector; it is for the display devices, such as the CRT monitor, LCD monitor and so on.
	**USB 2.0 Port**	To connect USB keyboard, mouse or other devices compatible with USB 2.0 specification.
	**USB 3.0 Port**	To connect USB keyboard, mouse or other devices compatible with USB 3.0 specification. USB 3.0 ports supports up to 5Gbps data transfer rate.
	**1.0GbE RJ-45 LAN Port**	This connector is standard 1.0Gbps RJ-45 LAN jack for Network connection.
	**Audio Connectors**	**BLUE:** Line-in Connector **GREEN:**Line-out Connector **PINK :** MIC Connector

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 at first, before using specialized cable to connect different pins of this port.



For RS422 Mode



For RS485 Mode

2-2-2 Motherboard Internal Connectors

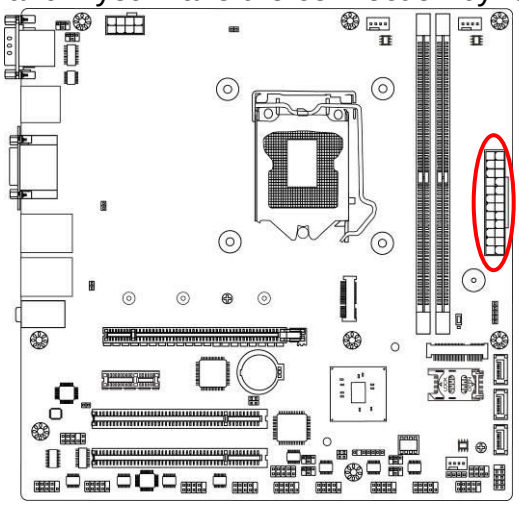
(1) ATXPWR (24-pin block): Main Power Connector

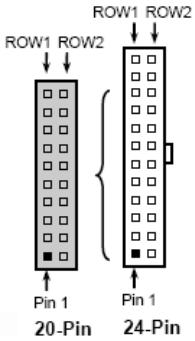
ATX Power Supply connector: This is a new defined 24-pins connector that usually comes with ATX case. The ATX Power Supply allows using soft power on momentary switch that connect from the front panel switch to 2-pins Power On jumper pole on the motherboard. When the power switch on the back of the ATX power supply turned on, the full power will not come into the system board until the front panel switch is momentarily pressed. Press this switch again will turn off the power to the system board.

** We recommend that you use an ATX 12V Specification 2.0-compliant power supply unit (PSU) with a minimum of 350W power rating. This type has 24-pin and 4-pin power plugs.

** If you intend to use a PSU with 20-pin and 4-pin power plugs, make sure that the 20-pin power plug can provide at least 15A on +12V and the power supply unit has a minimum power rating of 350W. The system may become unstable or may not boot up if the power is inadequate.

** If you are using a 20-pin power plug, please refer to Figure1 for power supply connection. Power plug form power supply and power connectors from motherboard both adopt key design to avoid mistake installation. You can insert the power plug into the connector with ease only in the right direction. If the direction is wrong it is hard to fit in and if you make the connection by force if is possible.





PIN	ROW1	ROW2
1	+3.3V	+3.3V
2	+3.3V	-12V
3	GND	GND
4	+5V	Soft Power on
5	GND	GND
6	+5V	GND
7	GND	GND
8	Power OK	-5V
9	+5V Stand by	+5V
10	+12V	+5V
11	+12V	+5V
12	+3.3V	GND

24-pin Main Power Connector

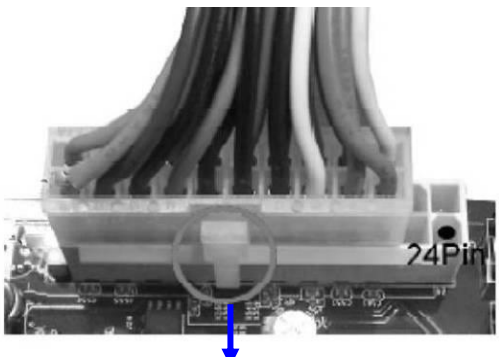


Figure1：20-pin power plug

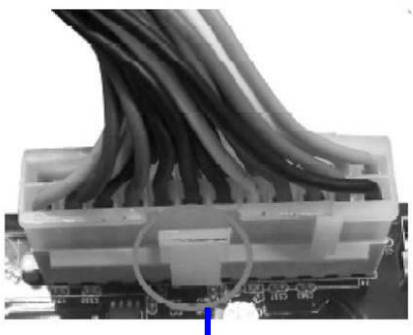
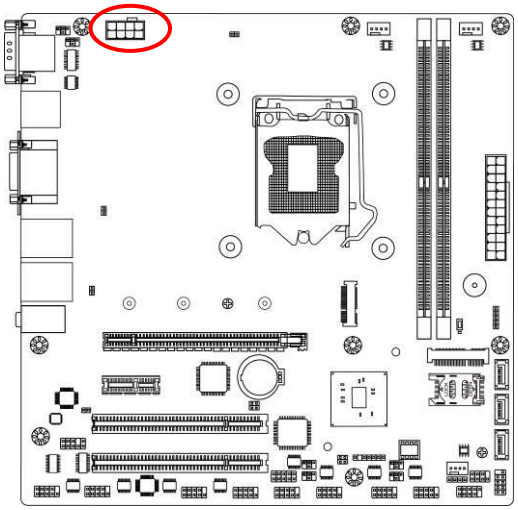
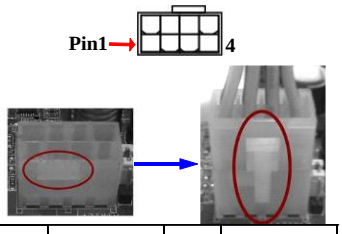


Figure 2：24-pin power plug

(2) ATX12V (8-pin block): 12V Power Connector

This is a new defined 8-pin connector that usually comes with ATX Power Supply that supports extra 12V voltage to maintain system power consumption. Without this connector might cause system unstable because the power supply can not provide sufficient current for system.

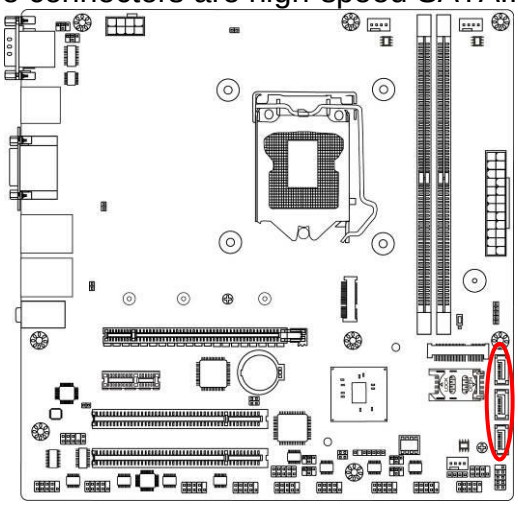


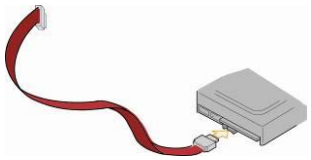


Pin	Definition	No.	Definition
1	GND	5	+12V
2	GND	6	+12V
3	GND	7	+12V
4	GND	8	+12V

(3) SATA1/2/3: SATAIII Port Connector

These connectors are high-speed SATAIII ports that support 6 GB/s transfer rate.

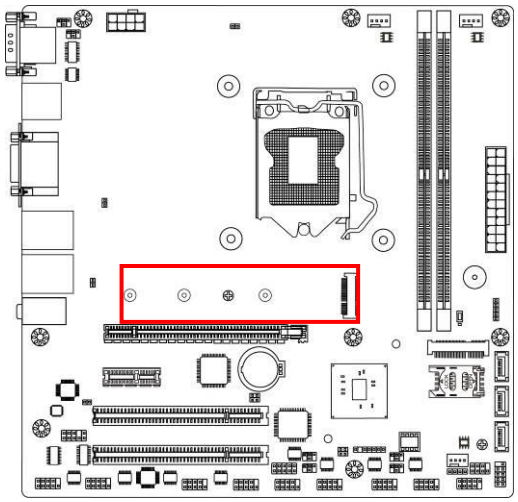


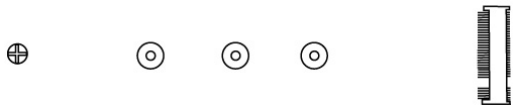


Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

(4) M2: M.2 Socket 3 Connector

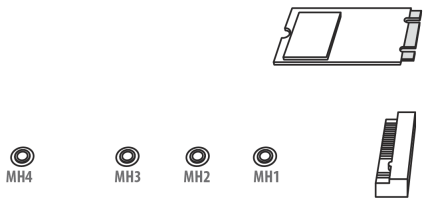
This M.2 Socket 3 connector support compatible type 2242/2260/2280/22110 SATA SSD module.



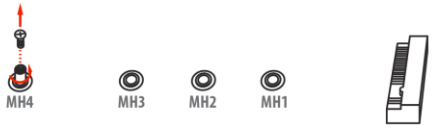


M.2 Socket 3 Connector

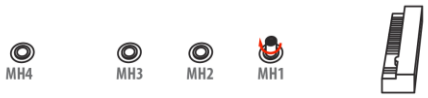
M.2 Module Installation Guide



1. Prepare compatible M.2 SATA or M.2 SSD card. Deferent type of cards has different length. Find corresponding nut location for further installation.

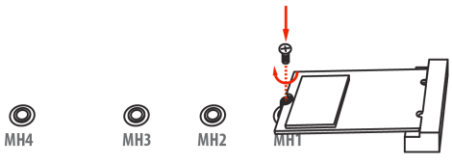


2. Remove the screw post and nut fixed at location **MH4** by default (Skip step 2 & 3 and go straight to Step 4 if you are going to use the default nut).



3. Lock the screw post into the location corresponding to the length of the module.

4. Align and insert corresponding M.2 module, as the photo shows.

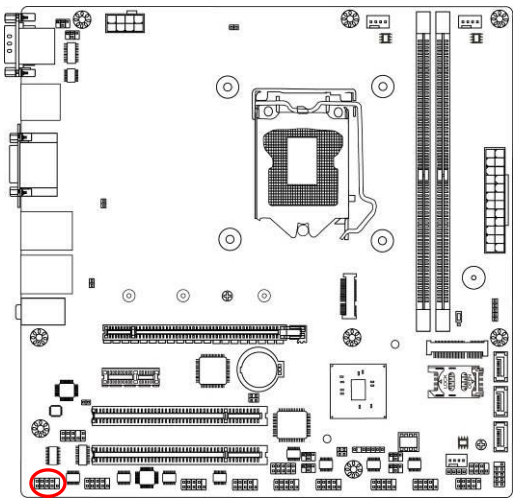


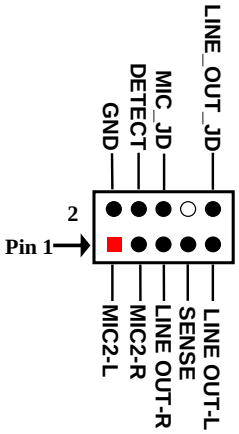
5. Tighten up the screw to secure the module into the M.2 connector. Mare sure not overtighten the screw to avoid possible damage to the module.

2-2-3 Header Pin Definition

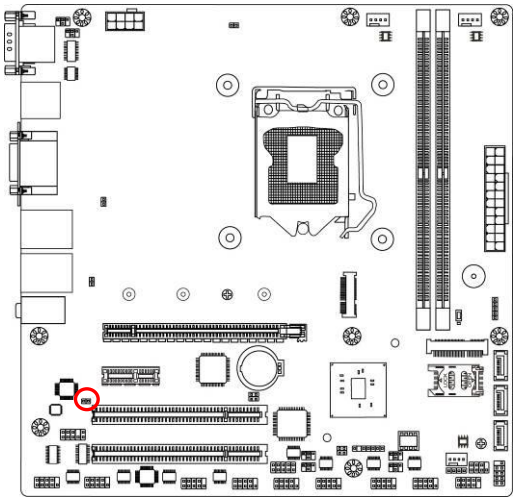
FP_AUDIO (9-pin): Line-Out, MIC-In Header

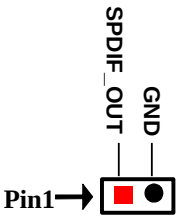
This header is connected to Front Panel Line-out, MIC connector with cable.



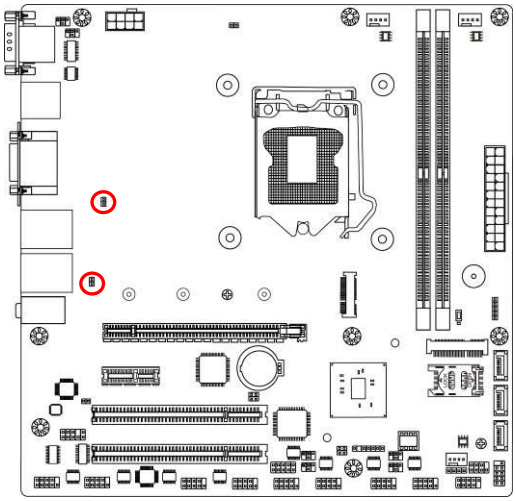


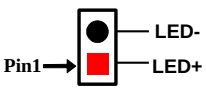
SPDIF (2-pin): HDMI-SPDIF Out header



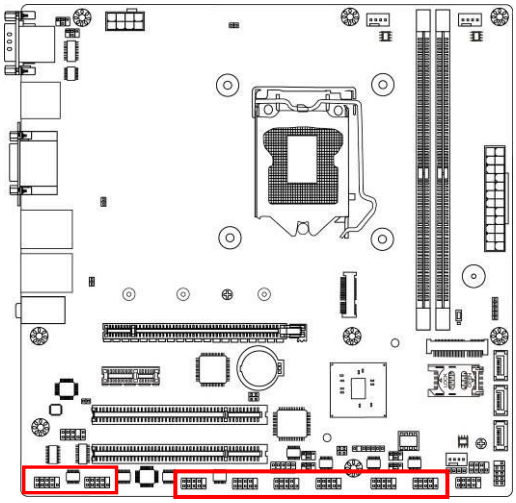


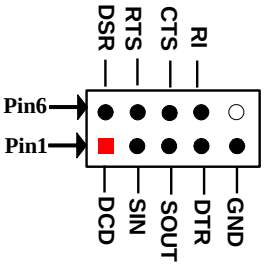
LAN1_LED/ LAN2_LED (2-pin): LANLED Header



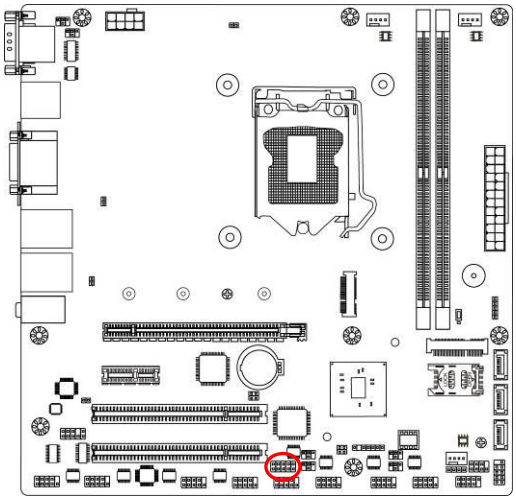


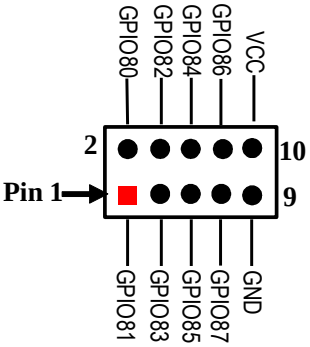
COM10/9/8/76/5/4/3 (9-pin): Serial Port Header



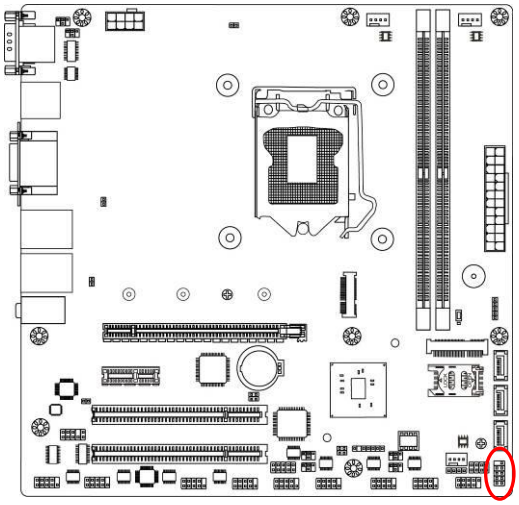


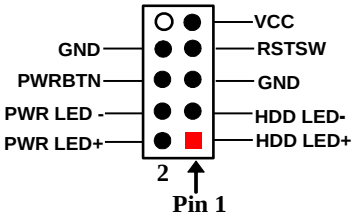
GPIO_CON (10-pin): GPIO Header



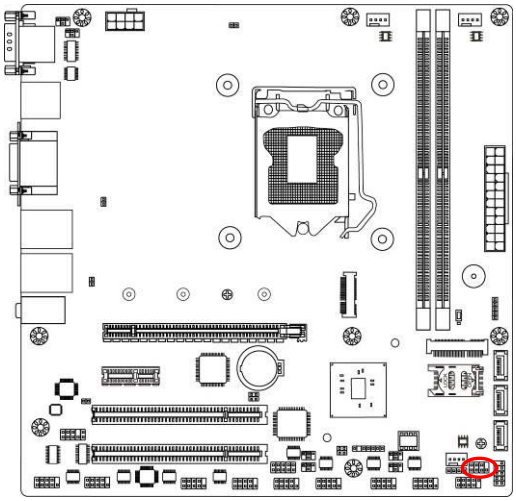


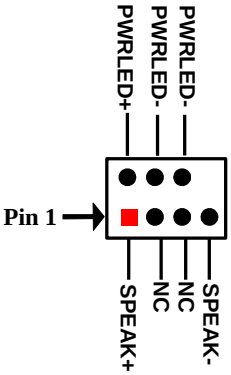
JW_FP (9-pin): Front Panel Header



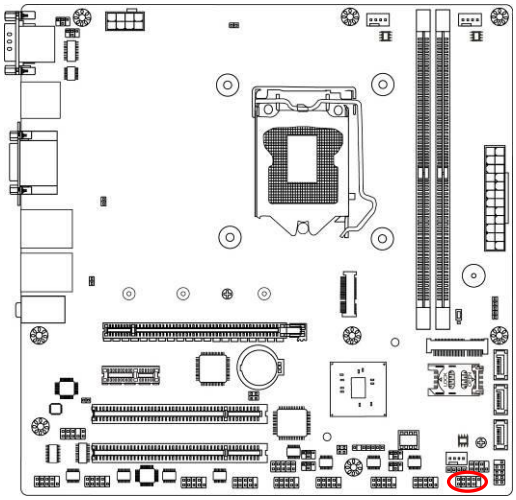


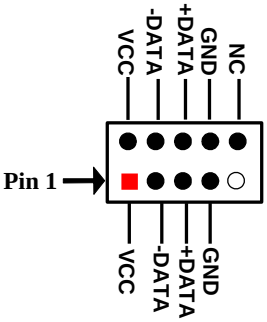
SPK_LED (7-pin): PWR LED Header & Speaker Header



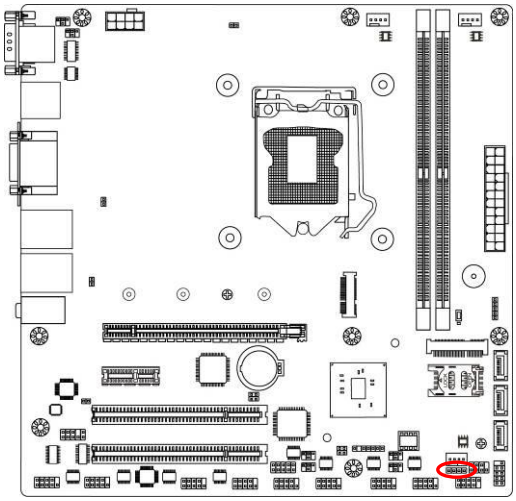


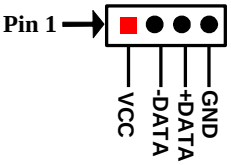
FP_USB1 (9-pin): USB 2.0 Port Headers



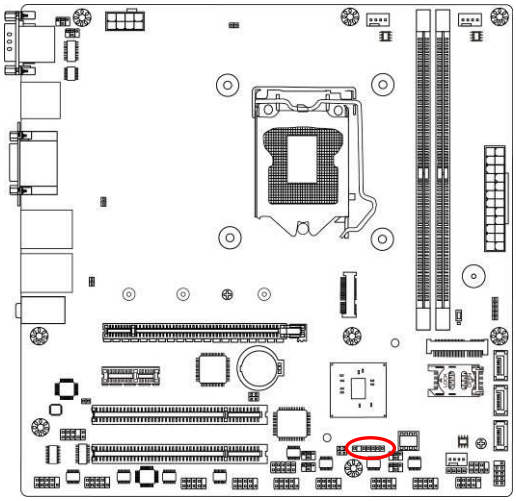


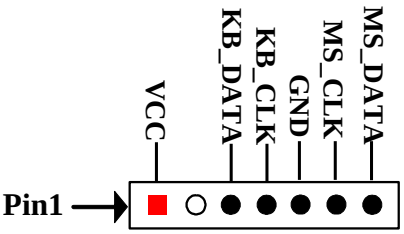
FP_USB2 (4-pin): USB 2.0 Port Header



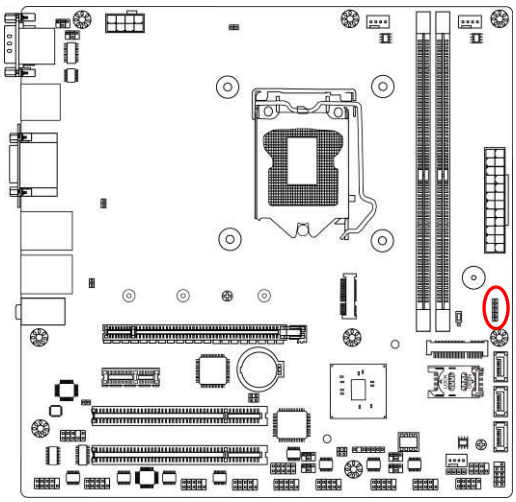


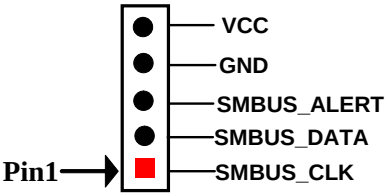
PS2KBMS (6-pin): PS/2 Keyboard & Mouse Header



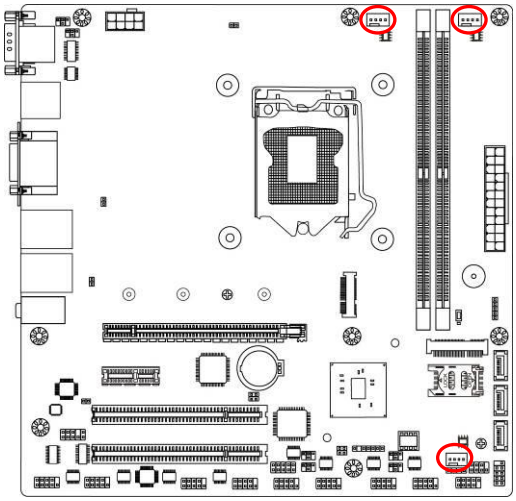


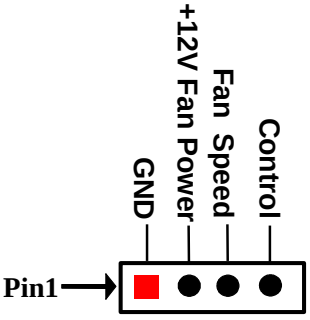
SMBUS (5-pin): SM BUS Header



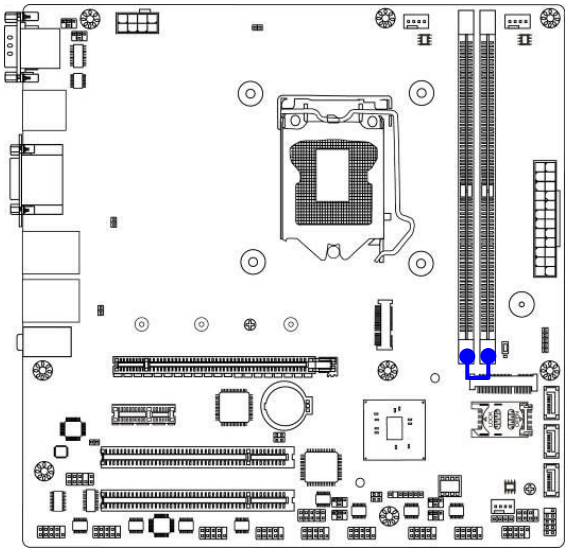


SYSFAN1/CPUFAN/SYSFAN2 (4-pin): FAN Headers





Dual Channel Memory Installation



config	Slot 1	Slot 2
1	install	--
2	--	install
3	install	install

Notice!

- For dual channel installation, you need to install the same brand, speed, size and type memory module.
- It is unable to activate dual channel feature if you install only one memory module. Slot order can be from left-to-right or right-to-left, and it must be installed in pairs.
- If you install memory modules in wrong direction, it will damage the motherboard and memory module.

Chapter 3
Introducing BIOS

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

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

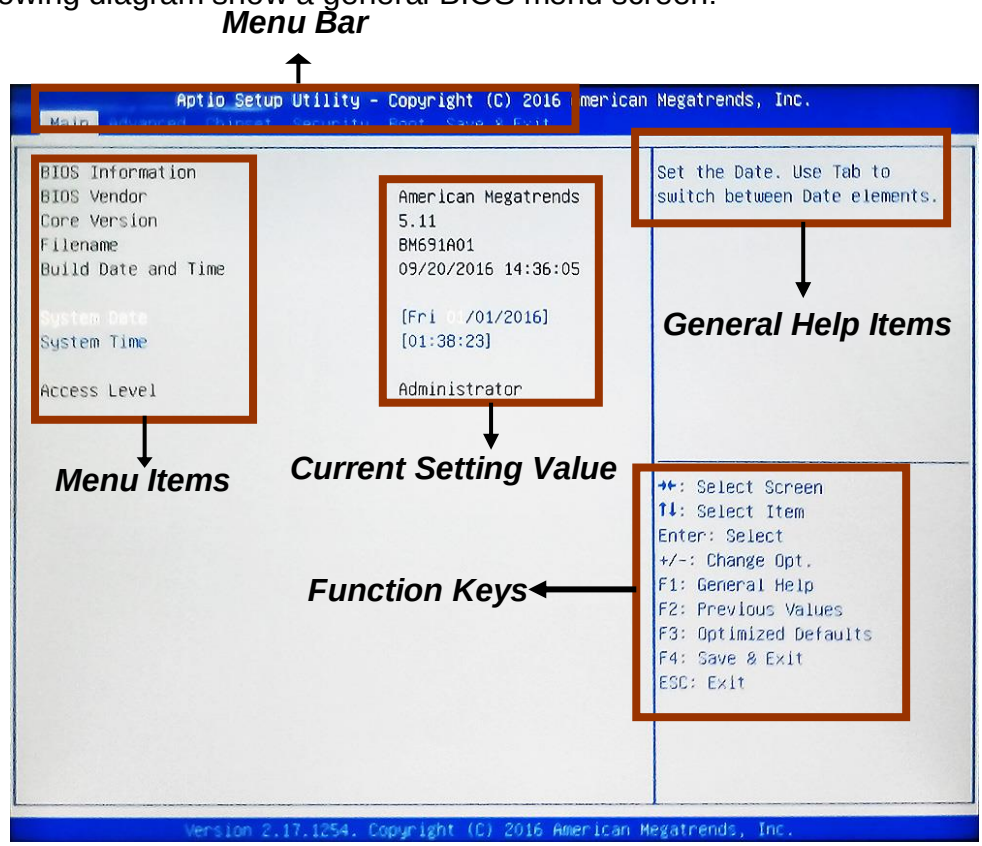
3-1 Entering Setup

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

Press **<Del>** to enter Setup

3-2 BIOS Menu Screen

The following diagram show a general BIOS menu screen:



BIOS Menu Screen

3-3 Function Keys

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

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

3-4 Getting Help

Main Menu

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

Status Page Setup Menu/Option Page Setup Menu

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

3-5 Menu Bars

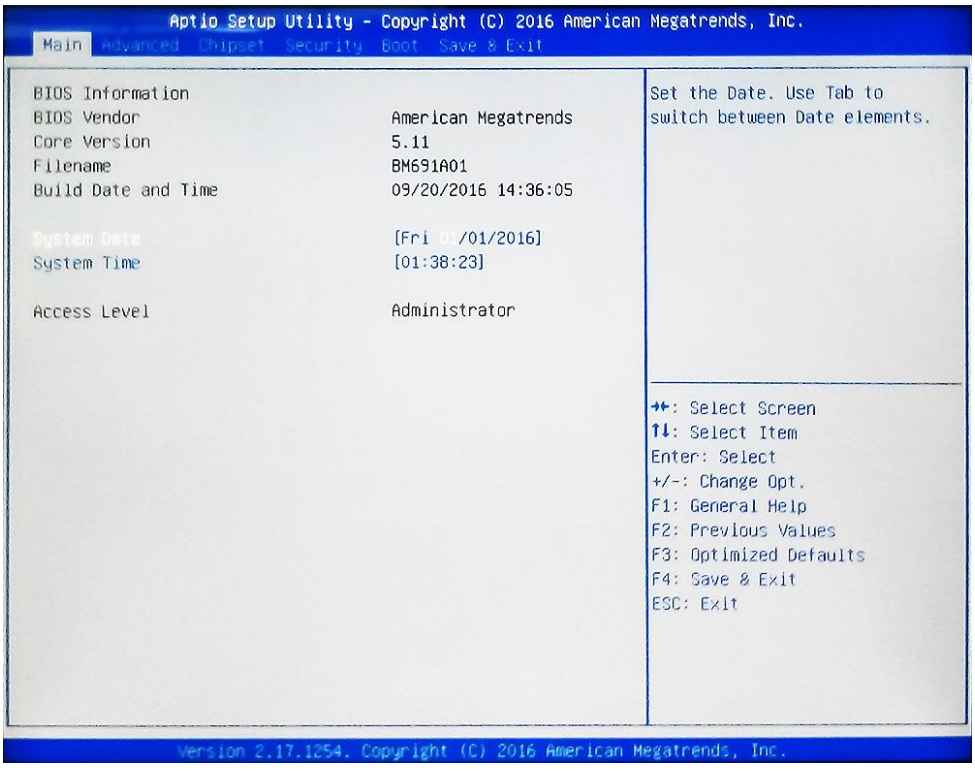
There are six menu bars on top of BIOS screen:

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

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

3-6 Main Menu

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



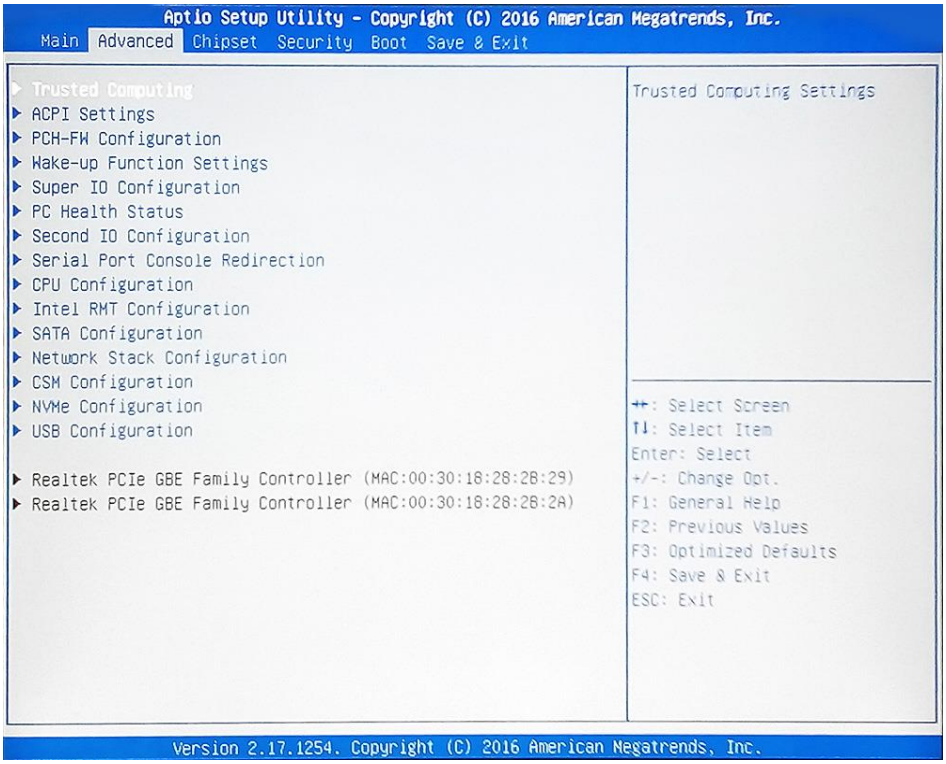
System Date

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

System Time

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

3-7 Advanced Menu



► **Trusted Computing**

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

Security Device Support

Use this item to enable or disable BIOS support for security device.

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

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

TPM State

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

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

Pending Operation

Use this item to schedule an operation for the security device. Your computer will reboot during restart to change state of device.

The optional settings: [None]; [TPM Clear].

► **ACPI Settings**

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

ACPI Settings

ACPI Sleep State

Use this item to select the highest ACPI sleep state the system will enter when the suspend button is pressed.

The optional settings are: [Suspend Disabled]; [S3 (Suspend to RAM)].

► **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 default setting is: [PTT].
[PTT]: Enable PTT in SkuMgr.

► **Firmware Update Configuration**

Press [Enter] to make settings for '**ME FW Image RE-Flash**'.

ME FW Image Re-Flash

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

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

► **Wake-up Function Settings**

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

Wake-up System with Fixed Time

Use this item to enable or disable system wake on alarm event.
The optional settings: [Disabled]; [Enabled].
When set as [Enabled], system will wake on the hour/min/sec specified.

Wake-up System with Dynamic Time

Use this item to enable or disable system wake on alarm event.
System will wake on the current time + Increase minutes.
The optional settings: [Disabled]; [Enabled].
When set as [Enabled], system will wake on the current time + increased minute(s).

PS2 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].*

Ring Wake-up

The optional settings: [Enabled]; [Disabled].
Use this item to enable or disable ring wake-up.
** **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 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.

Serial Port FIF0 Mode

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

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 8***, 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.

PS2 KB/MS Connect
The optional settings are: [Keyboard First]; [Mouse First].

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

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

CPUFAN / SYSFAN1/ SYSFAN2 Smart Mode
The optional settings are: [Disabled]; [Enabled].
When set as [Enabled], the following sub-items shall appear:
CPUFAN / SYSFAN1/ SYSFAN2 Full-Speed Temperature
Use this item to set CPUFAN /SYSFAN1/SYSFAN2 full speed temperature. Fan will run at full speed when above this pre-set temperature.
CPUFAN / SYSFAN1/ SYSFAN2 Full-Speed Duty
Use this item to set CPUFAN /SYSFAN1/SYSFAN2 full-speed duty. Fan will run at full speed when above this pre-set duty.
CPUFAN / SYSFAN1/ SYSFAN2 Idle-Speed Temperature
Use this item to set CPUFAN /SYSFAN1/SYSFAN2 idle speed temperature. Fan will run at idle speed when below this pre-set temperature.
CPUFAN / SYSFAN1/ SYSFAN2 Idle-Speed Duty
Use this item to set CPUFAN /SYSFAN1/SYSFAN2 idle speed duty. Fan will run at idle speed when below this pre-set duty.
Shutdown Temperature
Use this item to select system shutdown temperature.
The optional settings are: [Disabled]; [70°C/156°F]; [75°C/164°F]; [80°C/172°F]; [85°C/180°F]; [90°C/188°F].

▸ **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.

▸ **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.*

► **CPU Configuration**
Press [Enter] to view current CPU configuration and make settings for the following sub-items:
Hyper-Threading
The optional settings: [Disabled]; [Enabled].
When set as [Disabled] only one thread per enabled core is enabled.
[Enabled]: for Windows XP and Linux (OS optimized for Hyper-Threading Technology).
[Disabled]: for other OS (OS optimized not for Hyper-Threading Technology).
*****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 Status
Use this item to enable or disable CPU C status.
The optional settings: [Disabled]; [Enabled].
Package C State Limit
The optional settings are: [C0/C1]; [C2]; [C3]; [C6]; [C7]; [C7s]; [C8]; [AUTO].

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

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

► **SATA Configuration**

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

SATA Controller(s)

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

SATA Mode Selection

The default setting is: [AHCI].

SATA1/ SATA2/SATA3

Port

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

Use this item to enable or disable each SATA port.

Hot Plug

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

M.2

Port

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

Use this item to enable or disable device connected to M.2 SATA slot.

► **Network Stack Configuration**

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

Network Stack

Use this item to enable or disable UEFI Network Stack.

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

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

Ipv4 PXE Support

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

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

Ipv6 PXE Support

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

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

PXE boot wait time

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

Media Detect Count

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

► **CSM Configuration**

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

Option ROM execution

Network

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

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

Storage

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

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

Other PCI devices

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

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

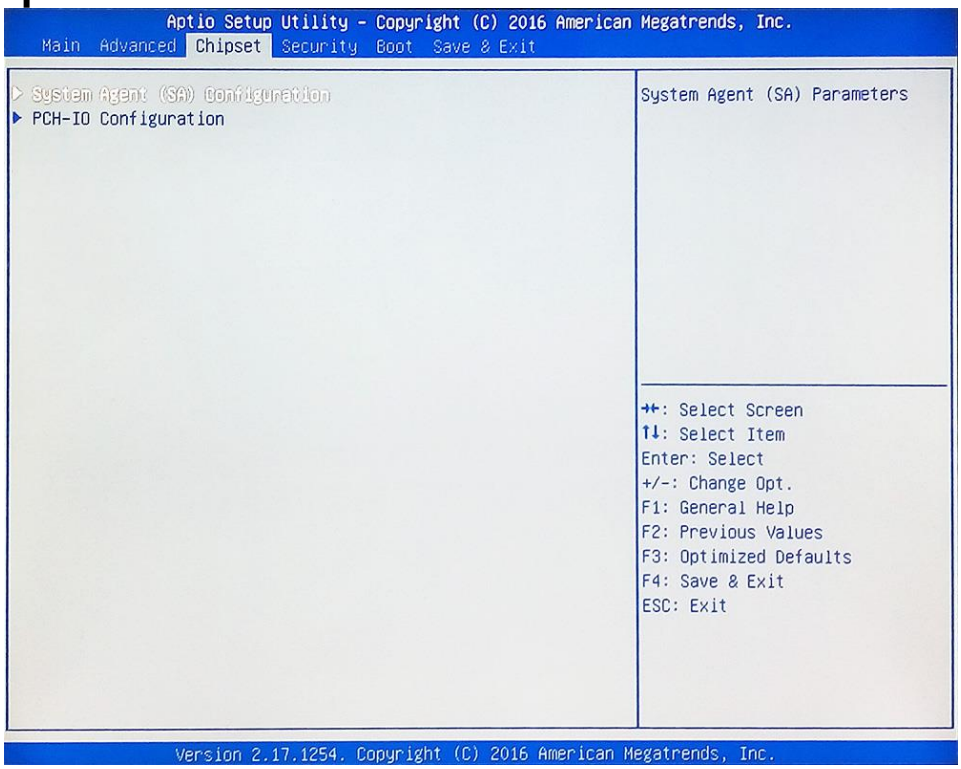
► **NVMe Configuration**
Press [Enter] to check NVMe controller and driver information.

► **USB Configuration**
Press [Enter] to make settings for the following sub-items:
USB Configuration
Legacy USB Support
The optional settings are: [Enabled]; [Disabled]; [Auto].
[**Enabled**]: To enable legacy USB support.
[**Disabled]**: to keep USB devices available only for EFI specification,
[**Auto**]: To disable legacy support if no USB devices are connected.
XHCI Hand-off
This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
The optional settings are: [Enabled]; [Disabled].
USB Mass Storage Driver Support
The optional settings are: [Disabled]; [Enabled].
USB hardware delay and time-out

USB Transfer time-out
Use this item to set the time-out value for control, bulk, and interrupt transfers.
The optional settings are: [1 sec]; [5 sec]; [10 sec]; [20 sec].
Device reset time-out
Use this item to set USB mass storage device start unit command time-out.
The optional settings are: [10 sec]; [20 sec]; [30 sec]; [40 sec].
Device power-up delay
Use this item to set maximum time the device will take before it properly reports itself to the host controller. 'Auto' uses default value: for a root port it is 100 ms, for a hub port the delay is taken from hub descriptor. The optional settings: [Auto]; [Manual].Select [Manual] you can set value for the following sub-item: '**Device Power-up delay in seconds**'**,** the delay range in from 1 to 40 seconds, in one second increments.

► **Realtek PCIe GBE Family Controller(MAC:XX:XX:XX:XX:XX:XX)/ Realtek PCIe GBE Family Controller(MAC:XX:XX:XX:XX:XX:XX)**
These items show current network brief 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

Primary Display

Use this item to select which of graphics device should be primary display.

The optional settings are: [Auto]; [IGFX]; [PEG].

Internal Graphics

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

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]; [HDMI]; [DVI]; [CRT].

**** Note**: When set as [HDMI], [DVI] or [CRT], 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]; [DVI]; [CRT].

► **PEG Port Configuration**

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

PEG Port Configuration

PEG(PCIE1 Slot)

This will show current device connected to PCIE1 slot.

Max Link Speed

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

► **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/ Onboard Lan2 Controller

Use this item to enable or disable LAN1/LAN2 device or controller.

PCIE2 Slot

Use this item to enable or disable the PCI Express Root Port.

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

Speed

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

MPE Slot

Use this item to enable or disable the PCI Express root port.

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

Speed

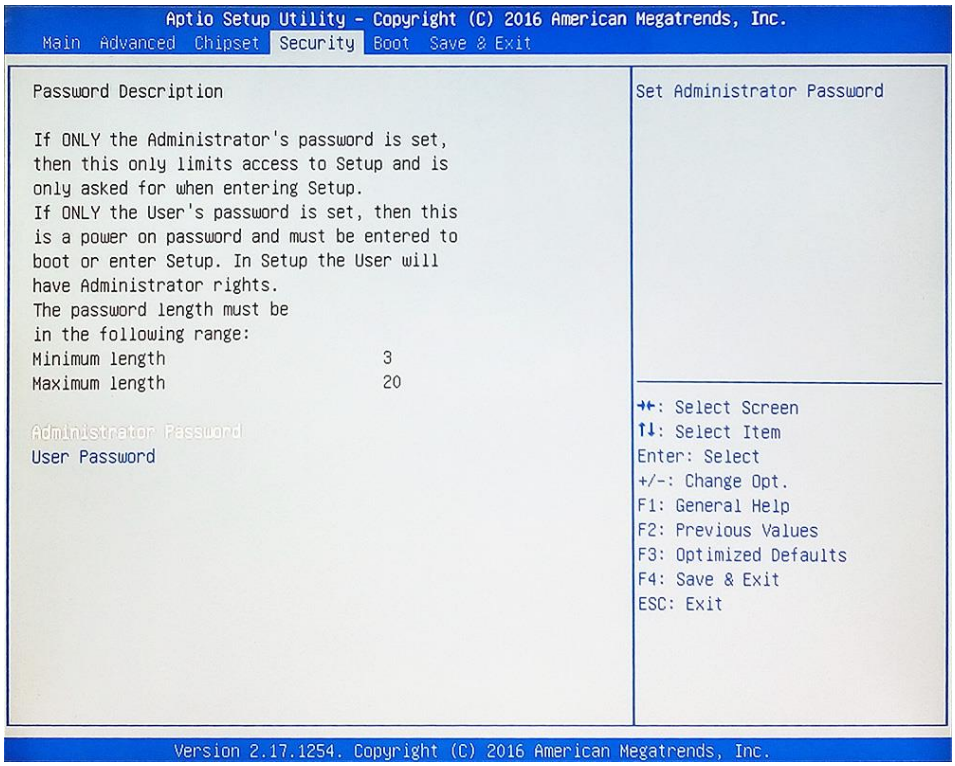
The optional settings are: [Auto]; [Gen1]; [Gen2]; [Gen3].

System State after Power Failure

Use this item to specify what state to go to when power re-applied after a power failure (G3 state).

The optional settings are: [Always Off]; [Always On]; [Former State].

3-9 Security Menu



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

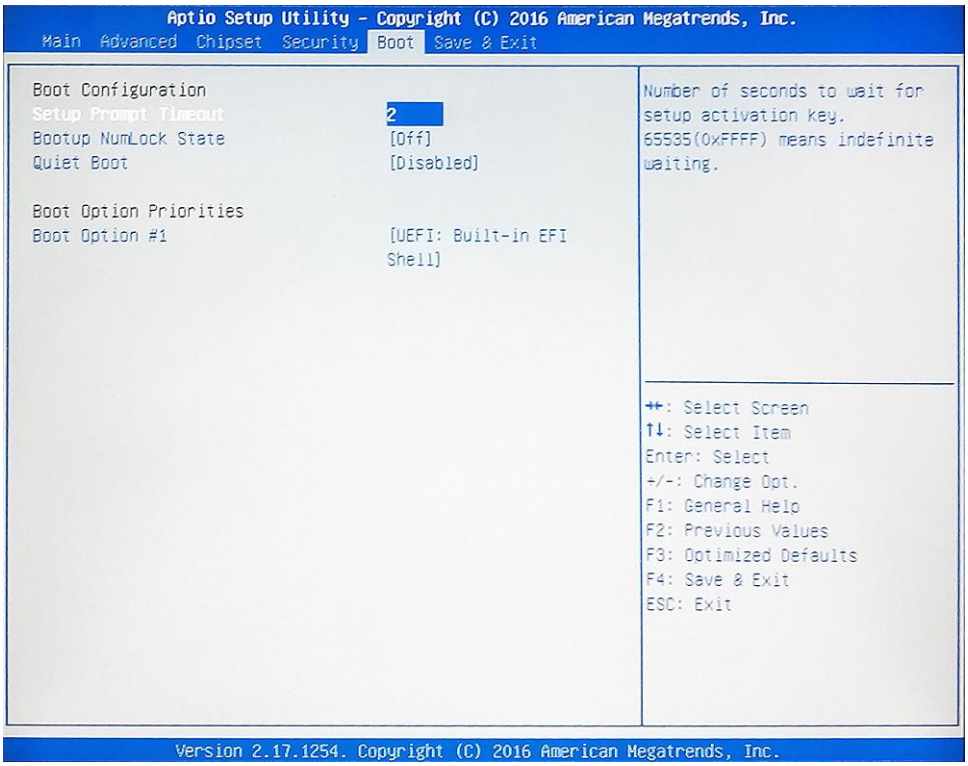
Administrator Password

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

User Password

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

3-10 Boot Menu



Boot Configuration

Setup Prompt Timeout

Use this item to set number of seconds to wait for setup activation key.

Bootup Numlock State

Use this item to select keyboard numlock state.

The optional settings are: [On]; [Off].

Quiet Boot

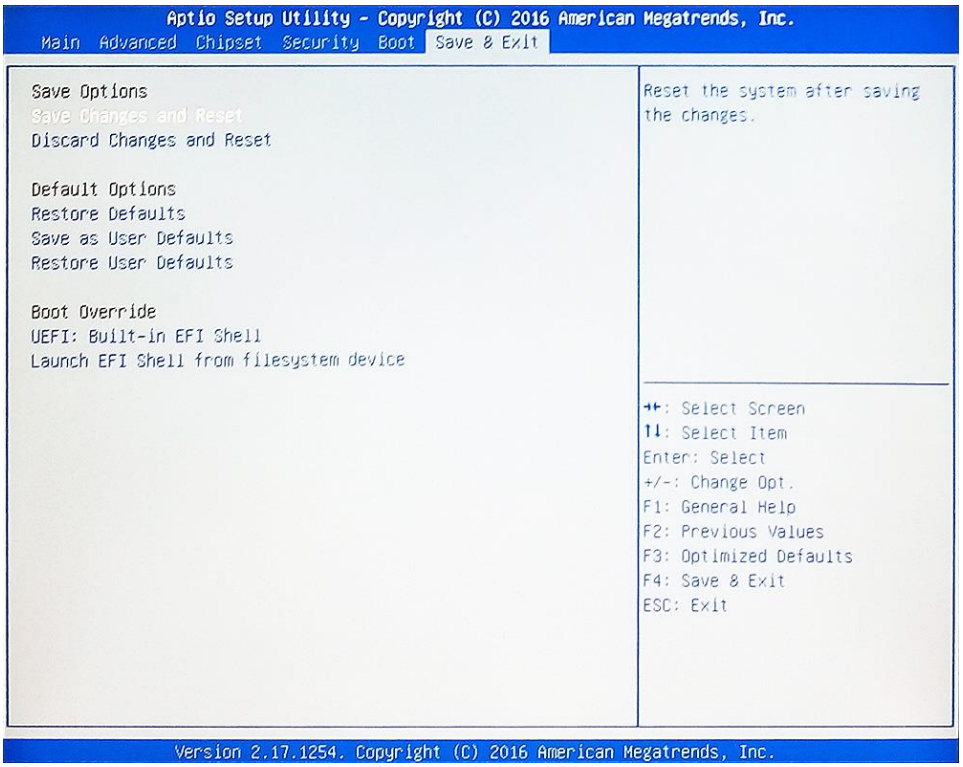
The optional settings are: [Disabled]; [Enabled].

Boot Option Priorities

Boot Option #1/ Boot Option #2…

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

3-11 Save & Exit Menu



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

UEFI:xx/…
Press this item to select the device as boot disk after save configuration and reset
Launch EFI Shell from filesystem device
Press this item to launch EFI Shell application (Shell.efi) from one of the available file system device.