TECHNICAL MANUAL

Of

Intel Q170 Express Chipset

Based Mini-ITX M/B

NO. G03-NF594-F

Revision: 1.0

Release date: March 17, 2016

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.

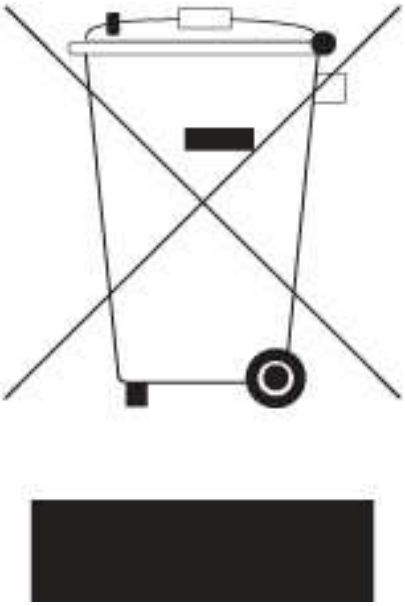


TABLE OF CONTENT

Environmental Safety Instruction

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

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

- Generally speaking, dramatic changes in temperature may lead to contact malfunction and crackles due to constant thermal expansion and contraction from the welding spots' that connect components and PCB. Computer should go through an adaptive phase before it boots when it is moved from a cold environment to a warmer one to avoid condensation phenomenon. These water drops attached on PCB or the surface of the components can bring about phenomena as minor as computer instability resulted from corrosion and oxidation from components and PCB or as major as short circuit that can burn the components. Suggest starting the computer until the temperature goes up.

- The increasing temperature of the capacitor may decrease the life of computer. Using the close case may decrease the life of other device because the higher temperature in the inner of the case.

- Attention to the heat sink when you over-clocking. The higher temperature may decrease the life of the device and burned the capacitor.

USER'S NOTICE

Manual Revision Information

Reversion	Revision History	Date
1.0	First Edition	March 17, 2016

Item Checklist

- ☑ Motherboard
- ☑ DVD for motherboard utilities
- ☑ User's Manual
- ☑ Cable(s)
- ☑ I/O Back panel shield

Chapter 1
Introduction of the Motherboard

1-1 Feature of Motherboard

- Intel® Q170 express chipset
- Support LGA 1151 CPU socket Intel® Core™ i7 processors / Intel® Core™ i5 processors / Intel® Core™ i3 processors / Intel® Pentium™ processors , Intel® Celeron™ processors
- Support 2* DDR4 2133MHz SO-DIMM up to 32GB and dual channel function
- Integrated with dual Intel Gigabit Ethernet LAN chips
- Onboard 1* PCIE 3.0 x16 slot
- Onboard 1* full-size Mini-PCIE/MSATA shared slot
- Onboard 1* half-size Mini-PCIE slot
- Support USB 3.0 data transport demand
- Support 4 * SATAIII (6Gb/s) Devices
- 1* HDMI port, 1* DVI-D port & 1* Display port, supports Triple Independent Display
- Support Smart FAN function
- Supports ACPI S3 Function
- Compliance with ErP Standard
- Support Watchdog Timer Technology

1-2 Specification

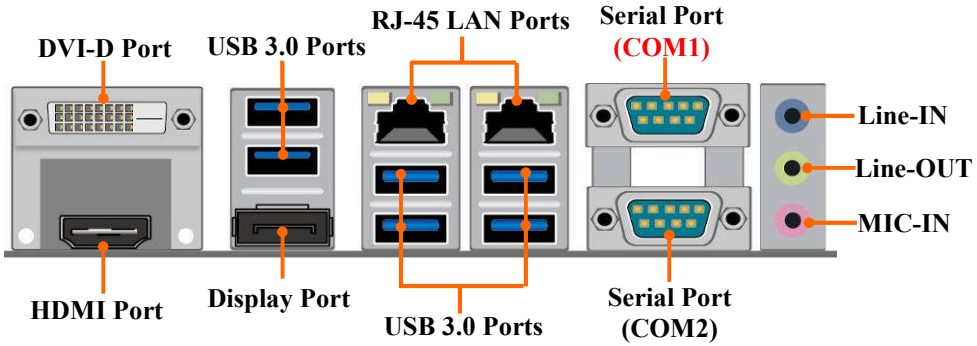
Spec	Description
Design	● Mini-ITX form factor 6 layers ; PCB size: 17.0x17.0cm
Chipset	● Intel Q170 Express Chipset
CPU Socket	● Support Intel® LGA 1151 Socket Core™ i7 processors, Intel® Core™ i5 processors, Intel® Core™ i3 processors, Intel® Pentium™ processors, Intel® Celeron™ processors ** for detailed CPU support information please visit our website*
Memory Slot	● 2*DDR4 SO-DIMM slot ● Support DDR4 2133 MHz SO-DIMM up to 32GB ● Support dual channel function
Expansion Slot	● 1* PCIE x 16 slot ● 1* Full-size Mini-PCIE/MSATA share slot (**MMPE**) ● 1* Half-size Mini-PCIE slot (**MPE**)
Storage	● 4* SATA III 6G/s connector ● 1* Full-size Mini-PCIE/MSATA share slot (**MMPE**)
Gigabit LAN Chip	● Integrated with Intel I211AT PCI-E Gigabit PCI-E LAN chip & Intel I219LM Gigabit LAN PHY chip ● Support Fast Ethernet LAN function of providing 10/100/1000Mbps Ethernet data transfer rate
Audio Chip	● Realtek ALC662-VD-GR 5.1 channel Audio Codec integrated ● Audio driver and utility included
BIOS	● 128M AMI Flash ROM
Multi I/O	***Rear Panel I/O:*** ● 1* HDMI port & 1* DVI-D port & 1* Display Port ● 6* USB 3.0 port ● 2* RJ-45 port ● 1* RS232/422/485 serial port connector (**COM1**) ● 1* RS232 serial port connector (**COM2**) ● 1*3-jack audio connector (Line-in, Line-out, MIC) ***Internal I/O Connectors & Headers:*** ● 1* 24-pin main power connector ● 1* 4-pin 12V power connector

	● 1* CPUFAN connector & 2* SYSFAN connector ● 1*Front panel audio header ● 1*HDMI_SPDIF out header ● 1* PS/2 keyboard & mouse header ● 1* RS232/422/485 serial port header **(COM3)** ● 1* RS232 serial port header **(COM4)** ● 1* GPIO Header ● 1*Front panel header ● *1* **JP7** jumper & header block* ● 1 * 9-Pin USB 2.0/1.1 header for 2* USB 2.0/1.1 ports ● 1* SMBUS header ● 1*LVDS header ● 1*LVDS inverter

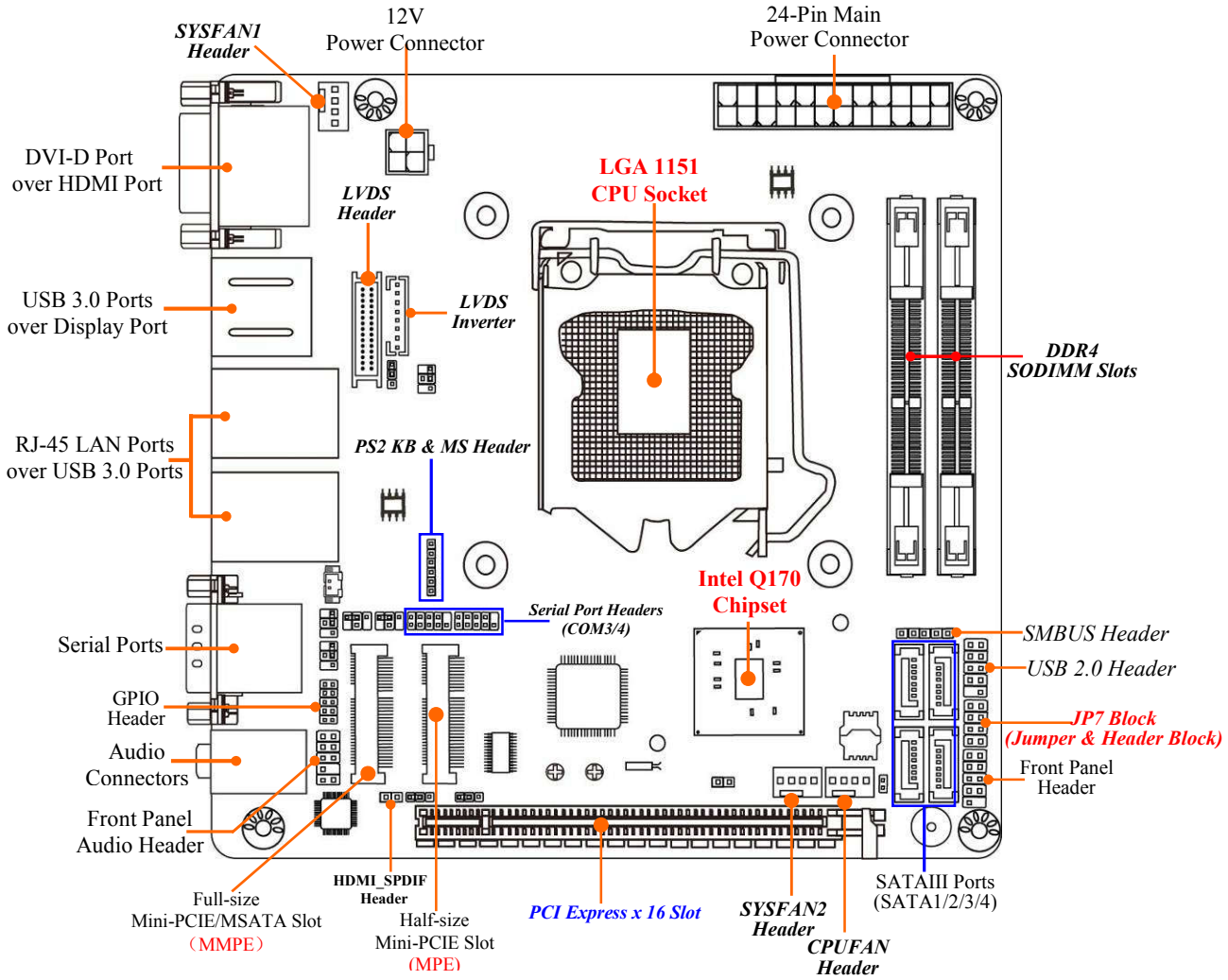
** **Note:** Many PCs now include XHCI USB controllers which allow for the support of USB 3.0 and higher USB speeds. This inclusion of XHCI controllers has lessened the need for EHCI USB controllers within platforms. However, legacy operating systems (OS) may not natively recognize XHCI controllers.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

1-3 Layout Diagram

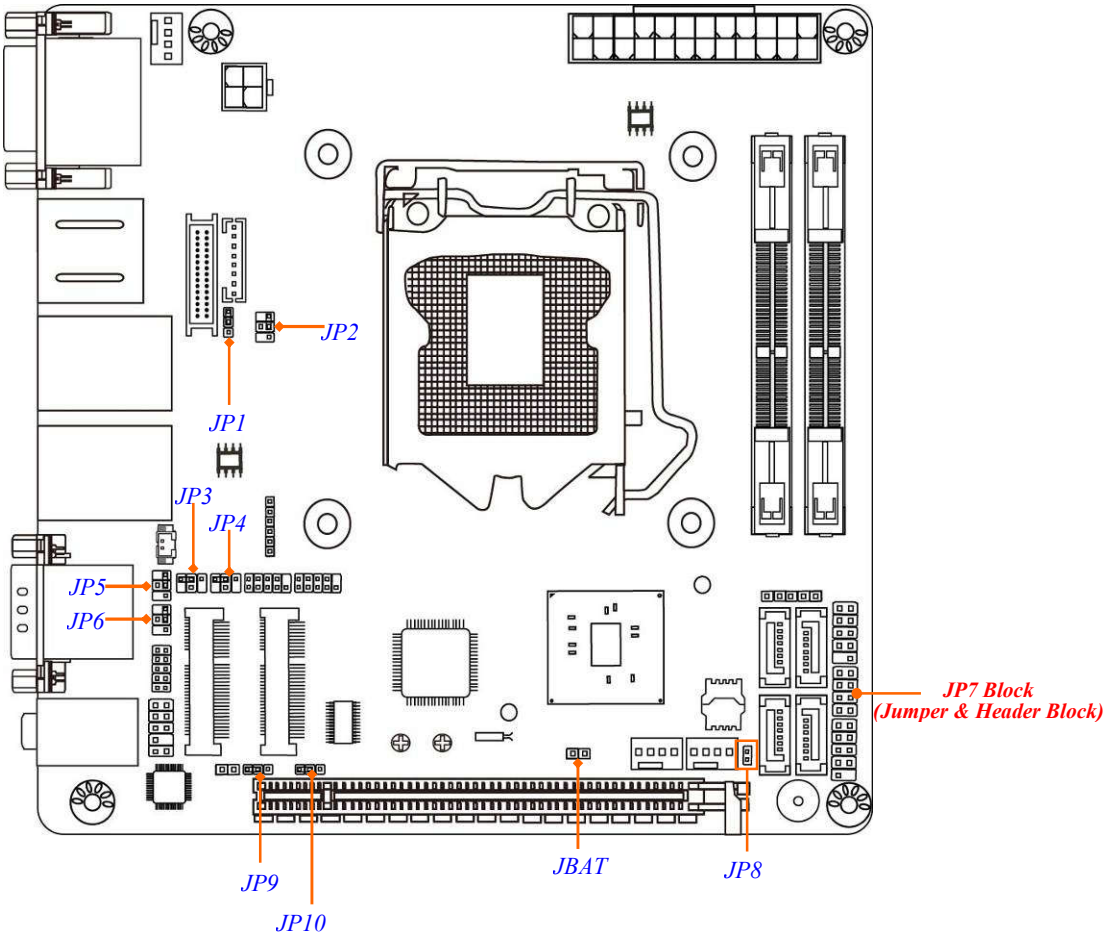
Rear IO Diagram



Motherboard Internal Diagram-Front



Motherboard Jumper Position



Jumper

Jumper	Name	Description
JP6	COM1 Port Pin9 Function Select	4-pin Block
JP5	COM2 Port Pin9 Function Select	4-pin Block
JP3	COM3 Header Pin9 Function Select	4-pin Block
JP4	COM4 Header Pin9 Function Select	4-pin Block
JP1	Inverter Backlight VCC 5V/12V Select	3-pin Block
JP2	LCD Panel VCC 3.3V /5V/12V Select	4-pin Block
JP9	MMPE Slot PWR VCC3.3V/3.3VSB Select	3-pin Block
JP10	MPE Slot PWR VCC3.3V/3.3VSB Select	3-pin Block
JP7	***Pin(1-2):*** Case Open Message Display Function ***Pin(3-4):*** ATX Mode / AT Mode Select	8-pin Block
JBAT	Clear CMOS RAM Setting	2-pin Block
JP8	ME Features Select	2-pin Block

Connectors

Connector	Name
ATXPWR	24-Pin Main Power Connector
ATX12V	4-Pin 12V Power Connector
HDMI	High-Definition Multimedia Interface
DVI	DVI-D Port Connector
DP	Display Port Connector
USB1	USB 3.0 Connector X2
UL1/UL2	**Top:**RJ-45 LAN Connector X2 **Middle & Bottom**: USB 3.0 Port Connector X 4
COM1_2	Serial Port COM Connector X2
AUDIO	**Top:** Line-in Connector **Middle:** Line-out Connector **Bottom:** MIC Connector
SATA1/2/3/4	SATAIII Connector X4
CPUFAN/SYSFAN1/2	FAN Connector X3

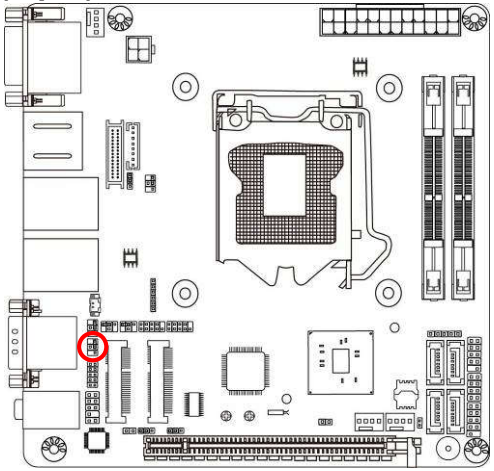
Headers

Header	Name	Description
FP_AUDIO	Front Panel Audio Header	9-pin Block
SPDIFOUT	HDMI_SPDIF Out Header	2-pin Block
PS2KBMS	PS/2 Keyboard & Mouse Header	6-pin Block
COM3/COM4	Serial Port Header	9-pin Block
GPIO	GPIO Header	10-pin Block
FP	Front Panel Header(PWR LED/ HD LED/Power Button /Reset)	9-pin Block
JP7	***Pin(5-6)***：LAN1 Activity LED Header ***Pin(7-8)***：LAN2 Activity LED Header	8-pin Block
USB4	USB 2.0 Port Header	9-pin Block
SMBUS	SMBUS Header	5-pin Block
INVERTER	LVDS Inverter Header	8-pin Block
LVDS	LVDS Header	30-pin Block

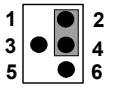
Chapter 2
Hardware Installation

2-1 Jumper Setting

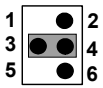
JP6 (4-pin): COM1 Port Pin9 Function Select



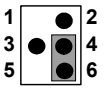
JP6→COM1 Port Pin-9



2-4 Closed:
Pin9=RING;

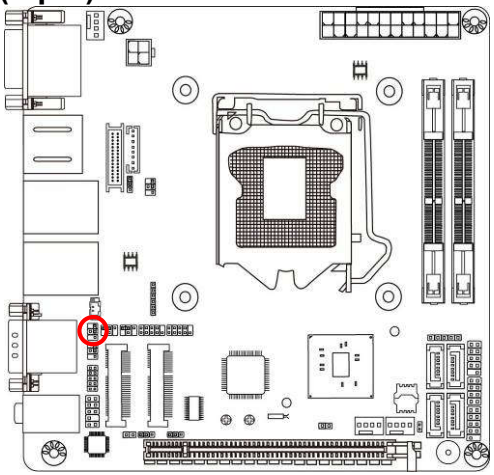


3-4 Closed:
Pin9=5V;

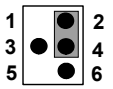


4-6 Closed:
Pin9=12V.

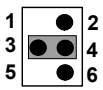
JP5 (4-pin): COM2 Port Pin9 Function Select



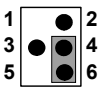
JP5→COM2 Port Pin-9



2-4 Closed:
Pin9=RING;

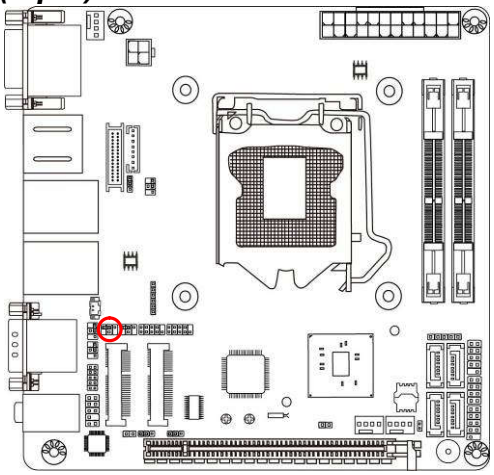


3-4 Closed:
Pin9=5V;

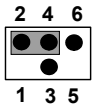


4-6 Closed:
Pin9=12V.

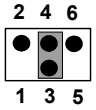
JP3 (4-pin): COM3 Header Pin9 Function Select



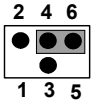
JP3→COM3 Header Pin-9



2-4 Closed:
Pin9=RING;

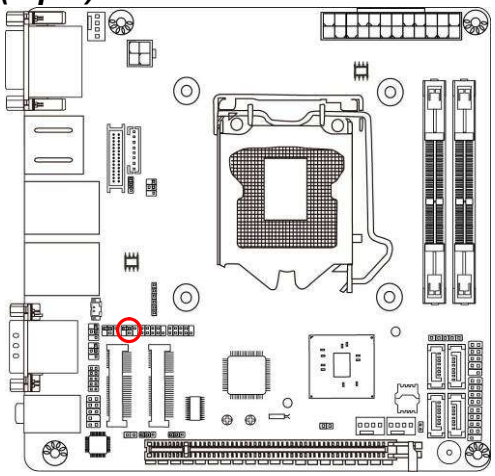


3-4 Closed:
Pin9= 5V;

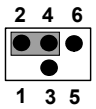


4-6 Closed:
Pin9= 12V.

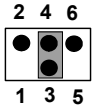
JP4 (4-pin): COM4 Header Pin9 Function Select



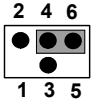
JP4→COM4 Header Pin-9



2-4 Closed:
Pin9=RING;

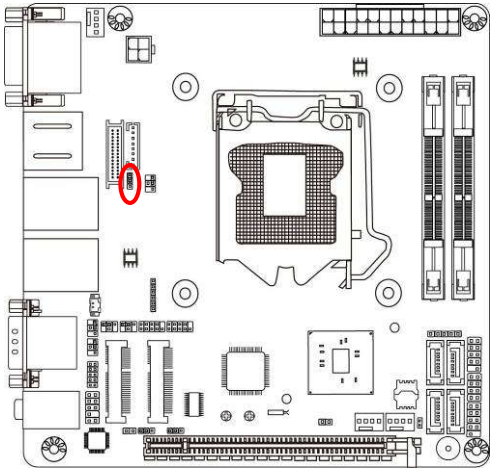


3-4 Closed:
Pin9= 5V;

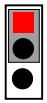


4-6 Closed:
Pin9= 12V.

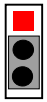
JP1 (3-pin): INVERTER Backlight VCC 5V/12V Select



JP1→INVERTER Backlight VCC

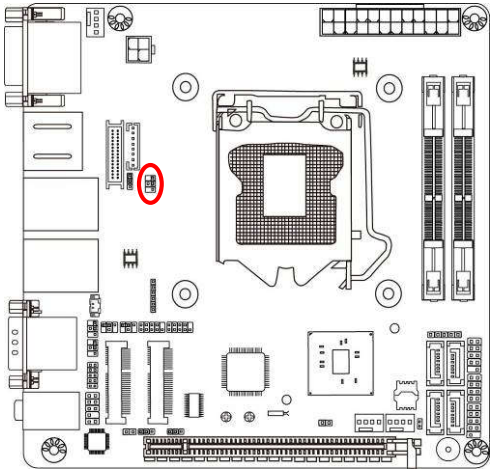


1-2 Closed: Inverter backlight VCC= 5V;

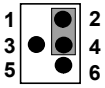


2-3 Closed: Inverter backlight VCC=12V.

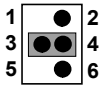
JP2 (4-pin): LCD Panel VCC 3.3V/5V/12V Select



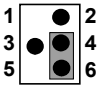
JP2→LCD Panel VCC



2-4 Closed: LCD VCC= 3.3V;

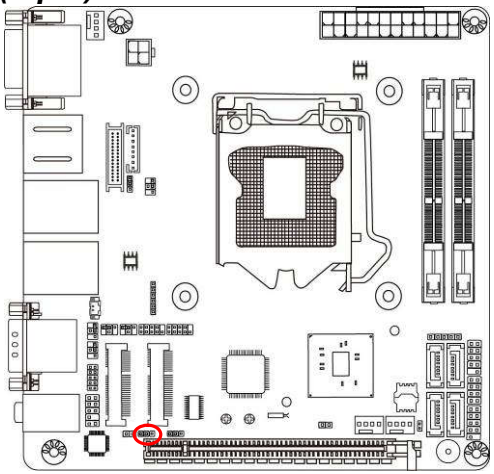


3-4 Closed: LCD VCC= 5V;

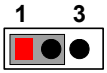


4-6 Closed: LCD VCC= 12V.

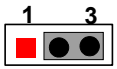
JP9 (3-pin): MMPE Slot PWR VCC 3.3V/3.3 VSB Select



JP9→MMPE Slot PWR VCC

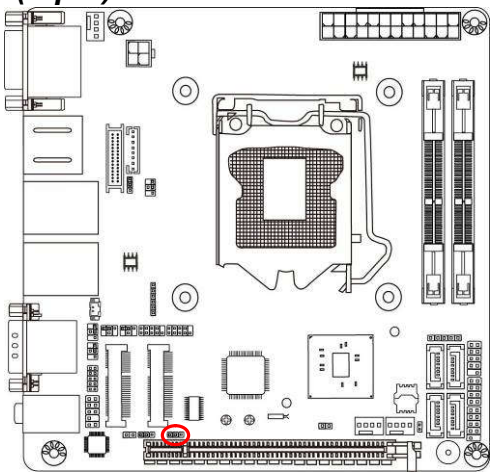


1-2 Closed：MMPE Slot PWR VCC= 3.3V(Default);

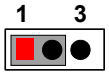


2-3 Closed：MMPE Slot PWR VCC= 3.3VSB.

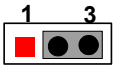
JP10 (3-pin): MPE Slot PWR VCC 3.3V/3.3 VSB Select



JP10→MPE Slot PWR VCC

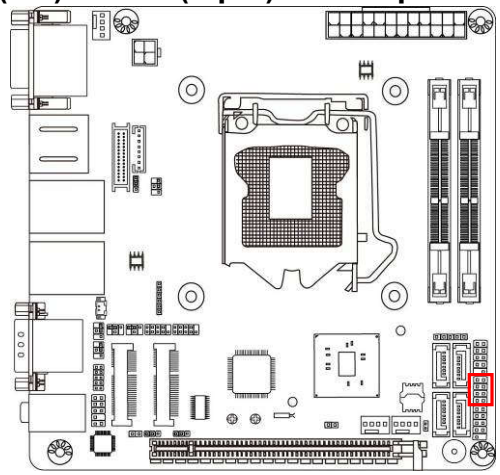


1-2 Closed：MPE Slot PWR VCC= 3.3V(Default);

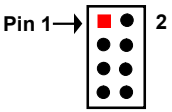


2-3 Closed：MPE Slot PWR VCC= 3.3VSB.

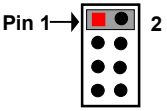
Pin (1-2) of JP7 (8-pin):Case Open Message Display Function Select



Pin(1-2) of JP7→Case Open Detection



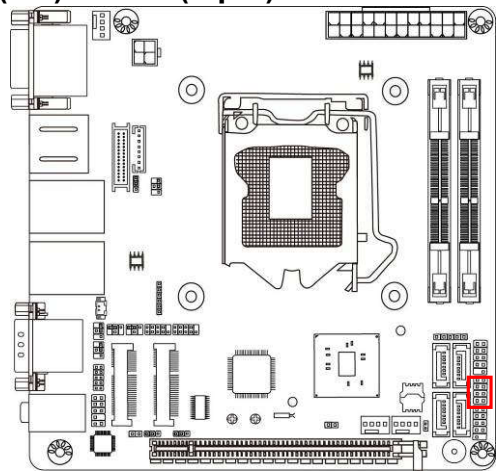
1-2 Open: Normal (Default);



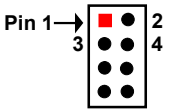
1-2 Close: Case Open Function Selected (One Touch).

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

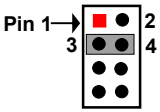
Pin (3-4) of JP7 (8-pin): ATX Mode/ AT Mode Select



Pin(3-4) of JP7→ATX/AT Mode Select



3-4 Open: ATX Mode Selected (Default);

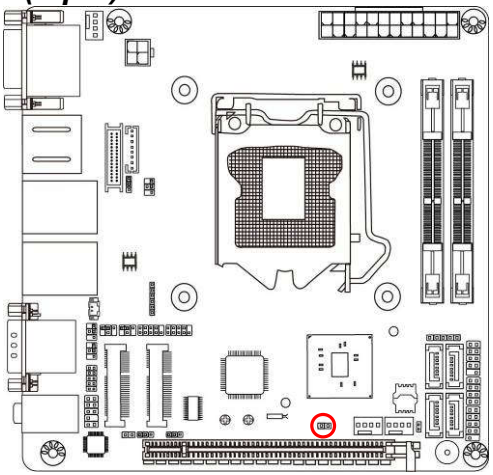


3-4 Close : AT Mode Selected.

***ATX Mode Selected**: Press power button to power on after power input ready;*

AT Mode Selected: *Directly power on as power input ready.*

JBAT (2-pin): Clear CMOS RAM Settings

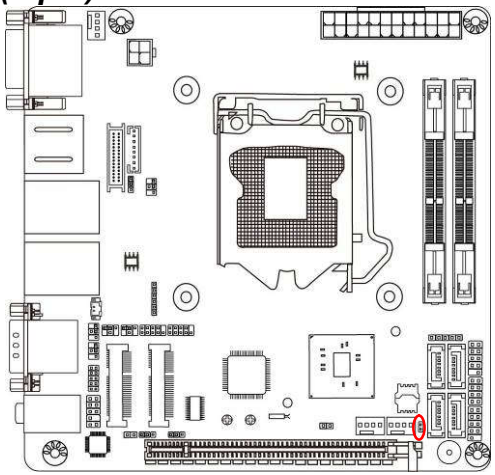


JBAT→Clear CMOS

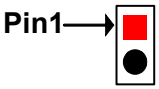
1-2 Open: Normal (Default);

1-2 Closed:Clear CMOS Settings.

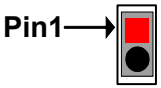
JP8 (2-pin): ME Features Select



JP8→ME Features



1-2 Open: Enable ME Features；



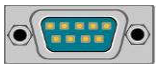
1-2 Closed: Disable ME Features.

2-2 Connectors and Headers

2-2-1 Connectors

(1) Rear Panel Connectors

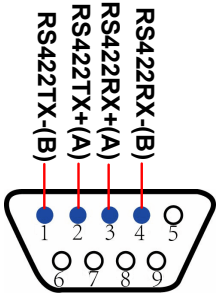
Refer to Page-3.

Icon	*Name*	*Function*
	**DVI-D Port**	To connect display device that support DVI-D specification (Max. resolution Support: 1920*1080).
	**HDMI Port**	To connect display device that support HDMI specification. (Max. resolution Support : 4096*2160 @ 60Hz)
	**Display Port**	To the system to corresponding display device with compatible DP cable. (Max. resolution Support : 4096*2304 @ 60Hz)
	**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.
	**Serial Port**	Mainly for user to connect external MODEM or other devices that supports Serial Communications Interface. ***COM1: RS232/422/485 Serial Port;*** ***COM2: RS232 Seial Port.***
	**Audio Connectors**	**BLUE:** Line-in Connector **GREEN:**Line-out Connector **PINK :** MIC Connector

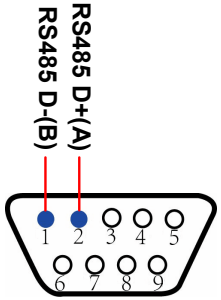
(2) COM1 (9-pin Block): RS232/422/485 Serial Port

COM1 port can function as RS232/422/485 port. In normal settings COM1 functions as RS232 port. With compatible COM cable they 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 31) at first, before using specialized cable to connect different pins of this port.

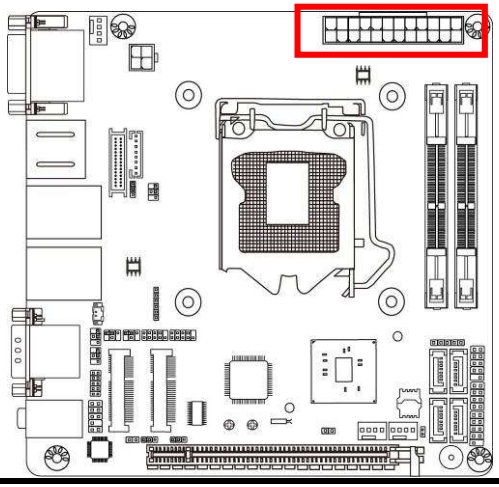


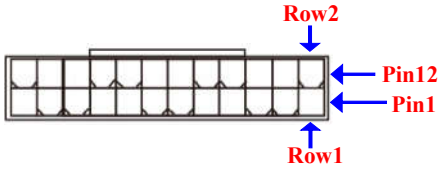
For RS422 Mode



For RS485 Mode

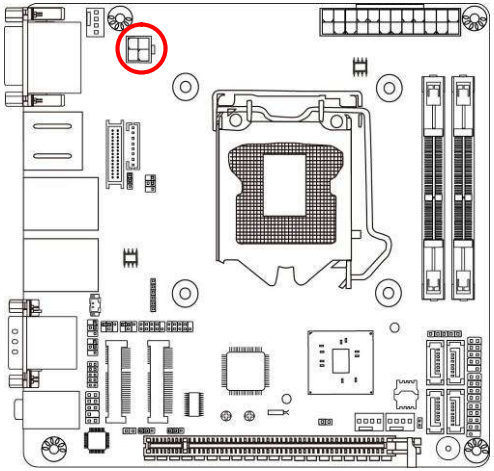
(3) ATXPWR (24-pin block): Power Connector

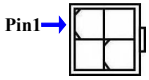




PIN	ROW1	ROW2
1	+3.3V	+3.3V
2	+3.3V	-12V
3	GND	GND
4	+5V	Soft Power on
5	GND	GND
6	+5V	GND
7	GND	GND
8	Power OK	-5V
9	+5V Stand by	+5V
10	+12V	+5V
11	+12V	+5V
12	+3.3V	GND

(4) ATX12V (4-pin block): ATX12V Type Power Connector

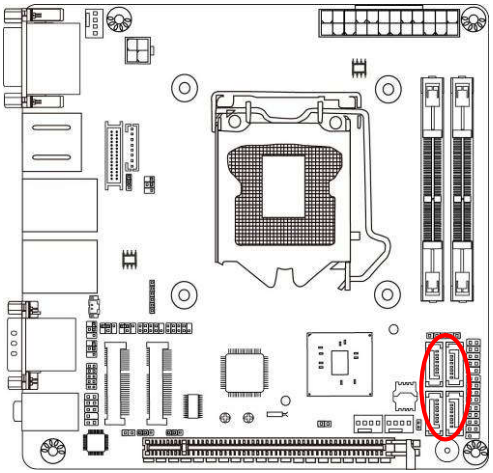




Pin No.	Definition
1	GND
2	GND
3	+12V
4	+12V

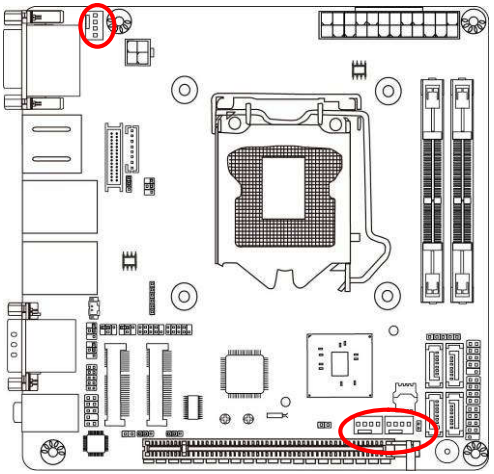
(5) SATA1/2/3/4 (7-pin): SATA III Port connector

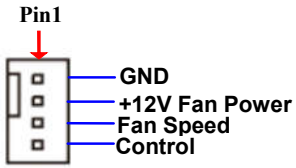
SATA1/2/3/4 port is a high-speed SATAIII port that supports 6 GB/s transfer rate.



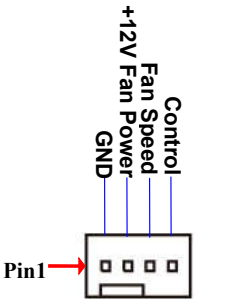
Pin No.	Defnition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

(6) CPUFAN/SYSFAN1/SYSFAN2 (4-pin): Fan Connector





SYSFAN2

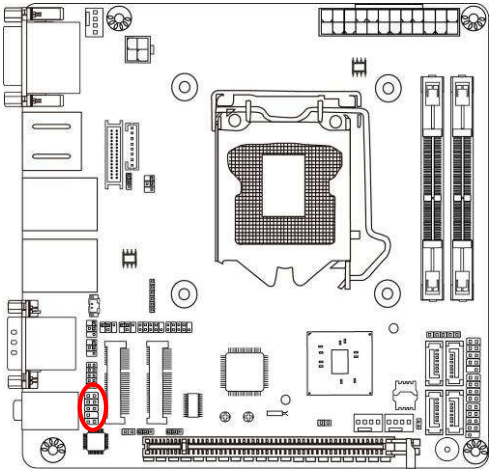


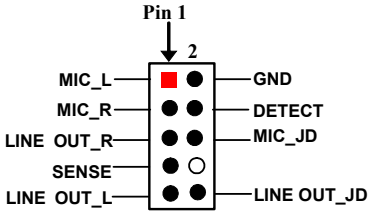
SYSFAN2/CPUFAN

2-2-2 Headers

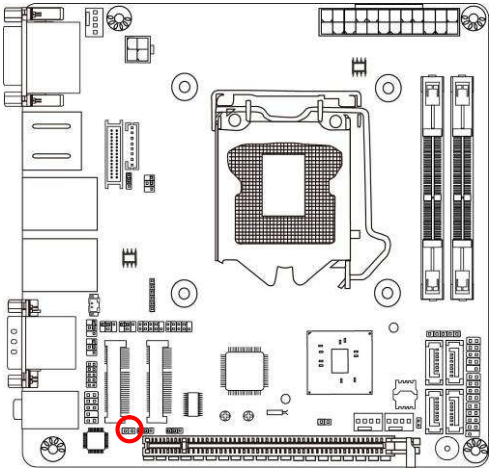
(1) FP_AUDIO (9-pin): Line-Out, MIC-In Header

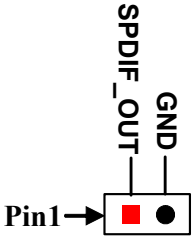
This header connects to Front Panel Line-out, MIC-In connector with cable.



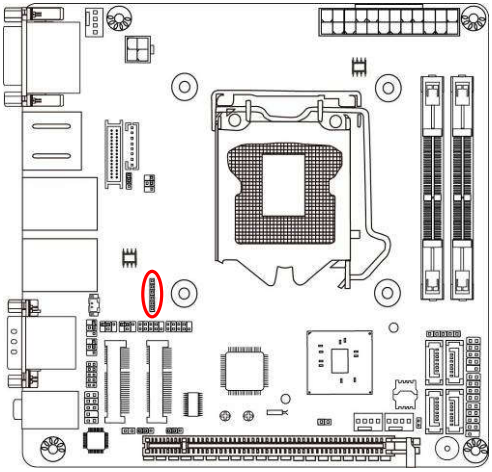


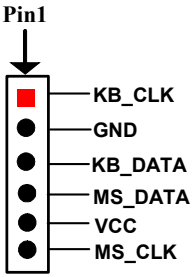
(2) SPDIFOUT(2-Pin): HDMI SPDIF_Out Header





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

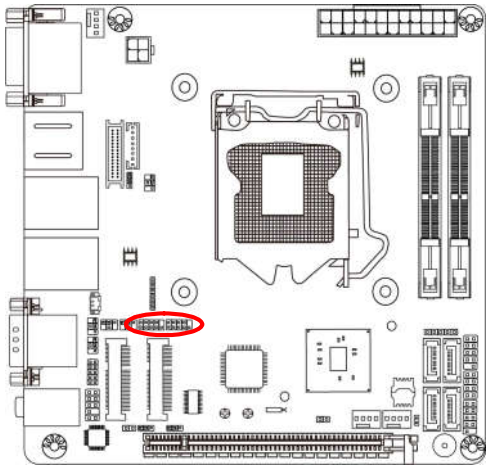




(4) COM3/COM4 (9-pin): Serial Port Header

COM3: RS232/422/485 Serial Port Header

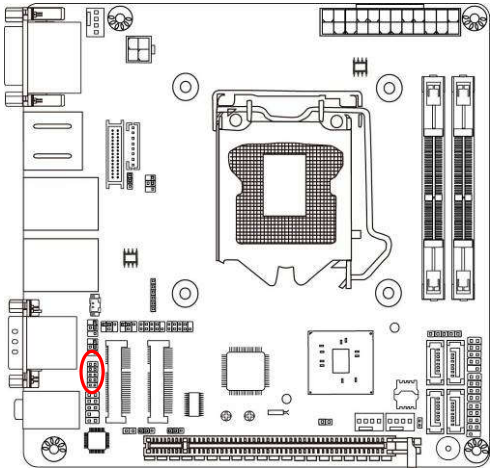
COM4: RS232 Serial Port Header

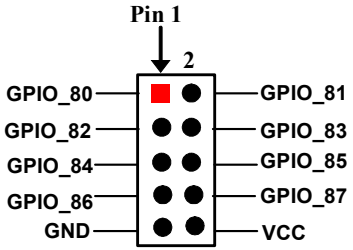


Pin NO.	RS232	*RS422 (COM3)	*RS485 (COM3)
Pin 1	DCD	TX-	DATA-
Pin 2	RXD	TX+	DATA+
Pin 3	TXD	RX+	NC
Pin 4	DTR	RX-	NC
Pin 5	GND	GND	GND
Pin 6	DSR	NC	NC
Pin 7	RTS	NC	NC
Pin 8	CTS	NC	NC
Pin 9	RI	NC	NC

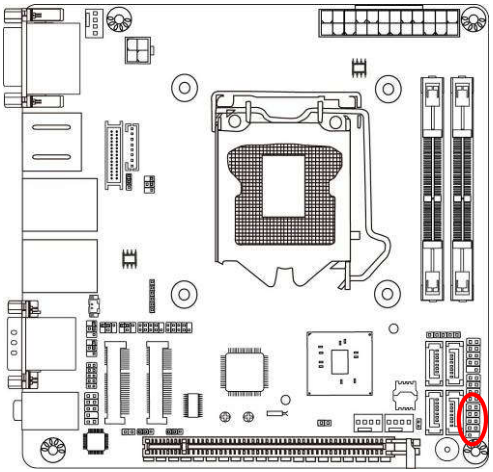
Notice: COM3 servers as RS232 serial port header in most cases.RS422 & RS485 function is only optional to customized models. *User also needs to go to BIOS to set '**Transmission Mode Select**' for COM1 as [RS422] or [RS485] for boards that support RS422/485 function before connecting compatible COM cable to **COM3** header.*

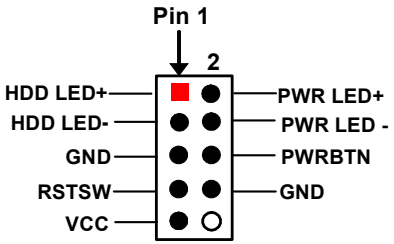
(5) GPIO(10-pin): GPIO Header



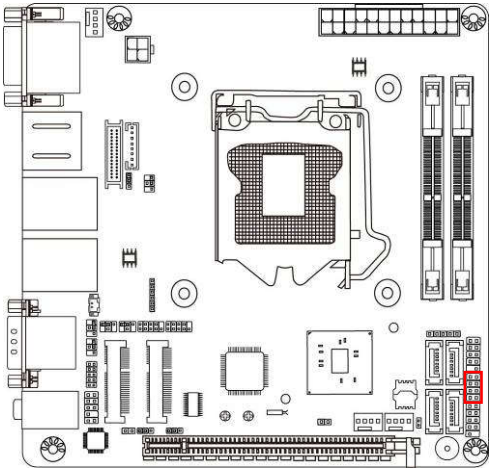


(6) FP (9-pin): Front Panel Header

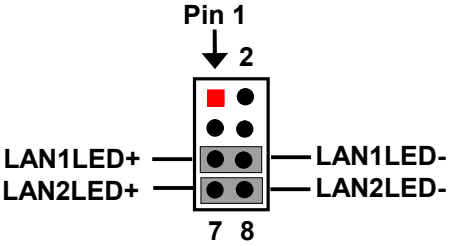




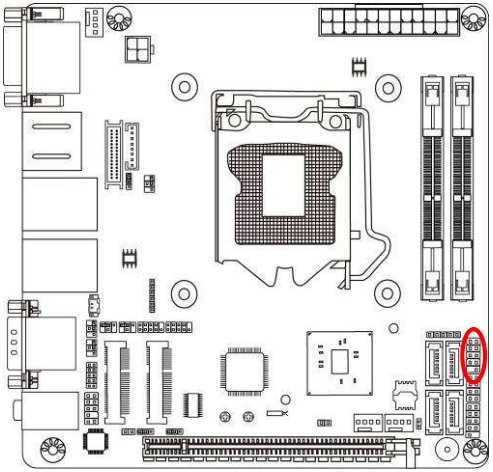
(7) Pin (5-6) & Pin(7-8) of JP7 (8-pin): LAN Activity LED Headers

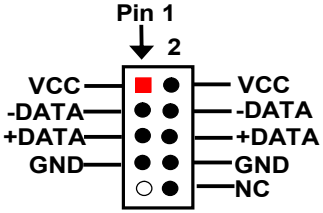


J7: Pin (5&6) →LAN1 Activity LED
J7: Pin (7&8) →LAN2 Activity LED

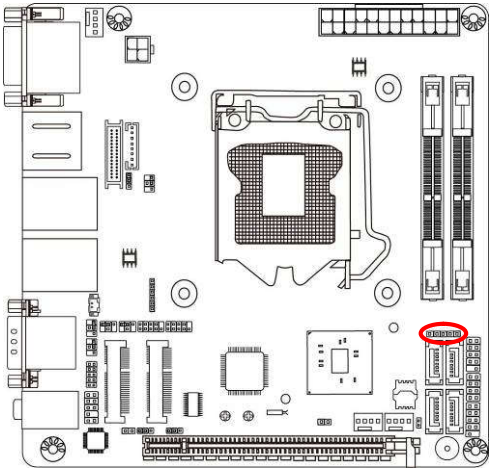


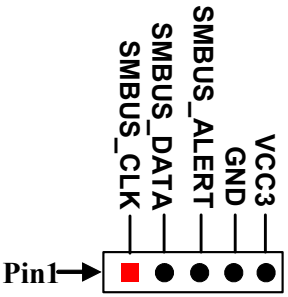
(8) USB4 (9-pin): USB 2.0 Port Header



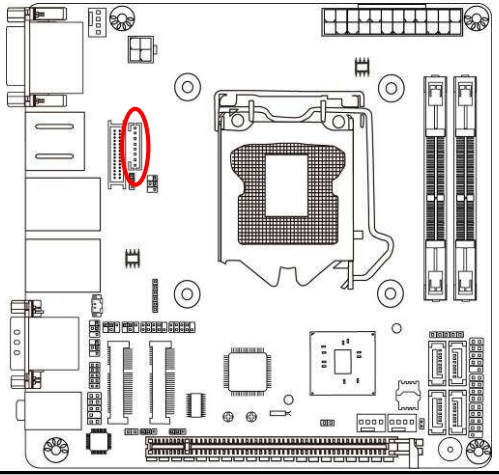


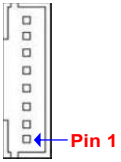
(9) SMBUS (4-Pin): SMBUS Header





(10) INVERTER (8-pin): LVDS Inverter Connector

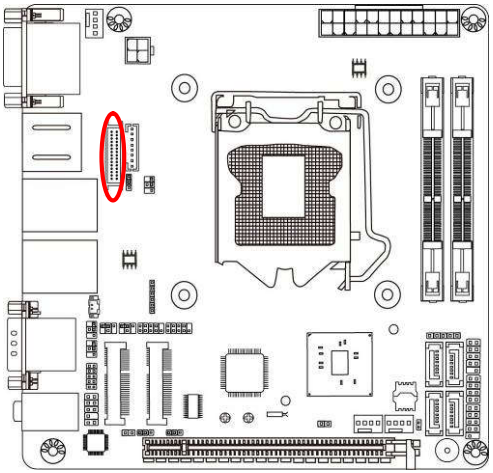


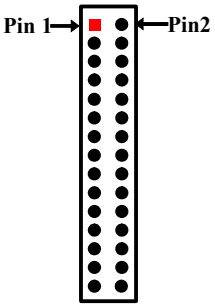


Pin No.	Definition
1	Backlight Enable
2	Backlight Duty
3	PVCC
4	PVCC
5	GND
6	GND
7	Brightness up
8	Brightness down

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

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





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

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.

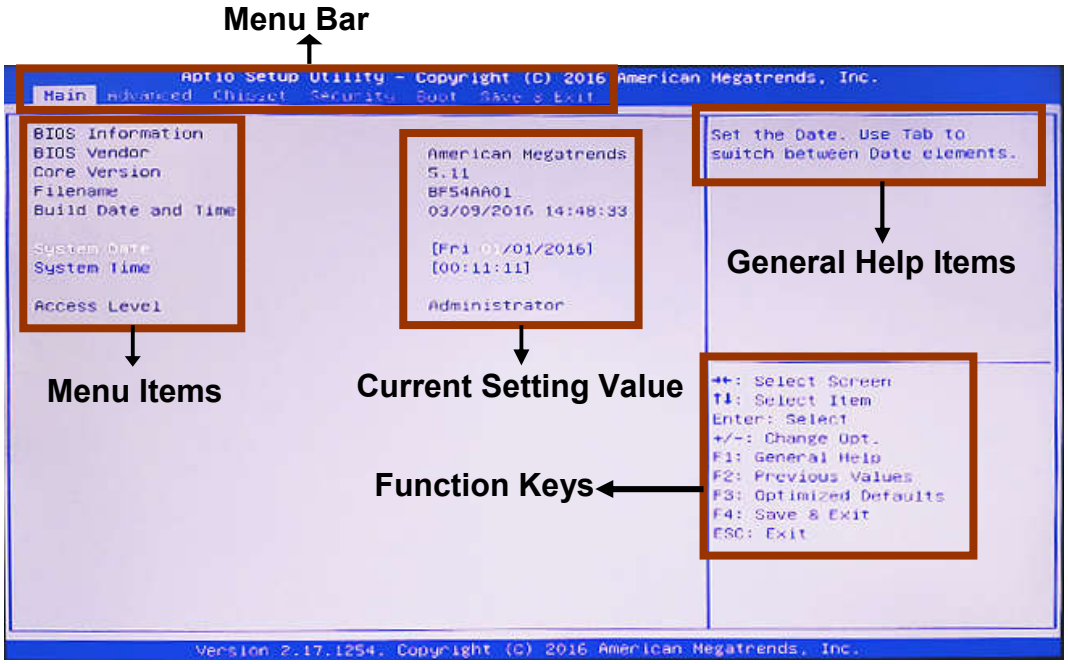
3-1 Entering Setup

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:



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

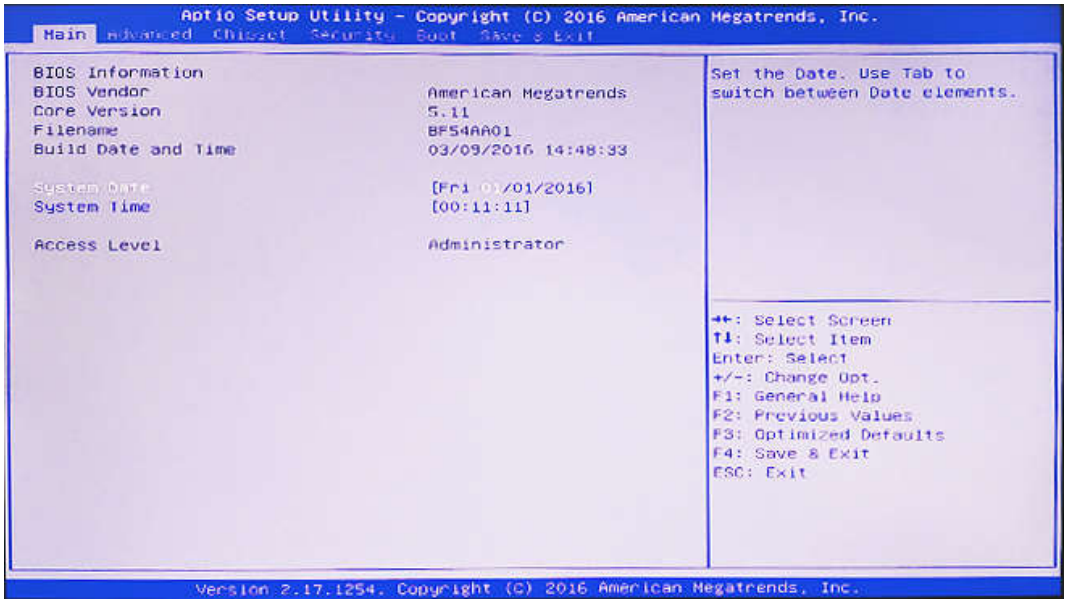
There are six menu bars on top of BIOS screen:

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.



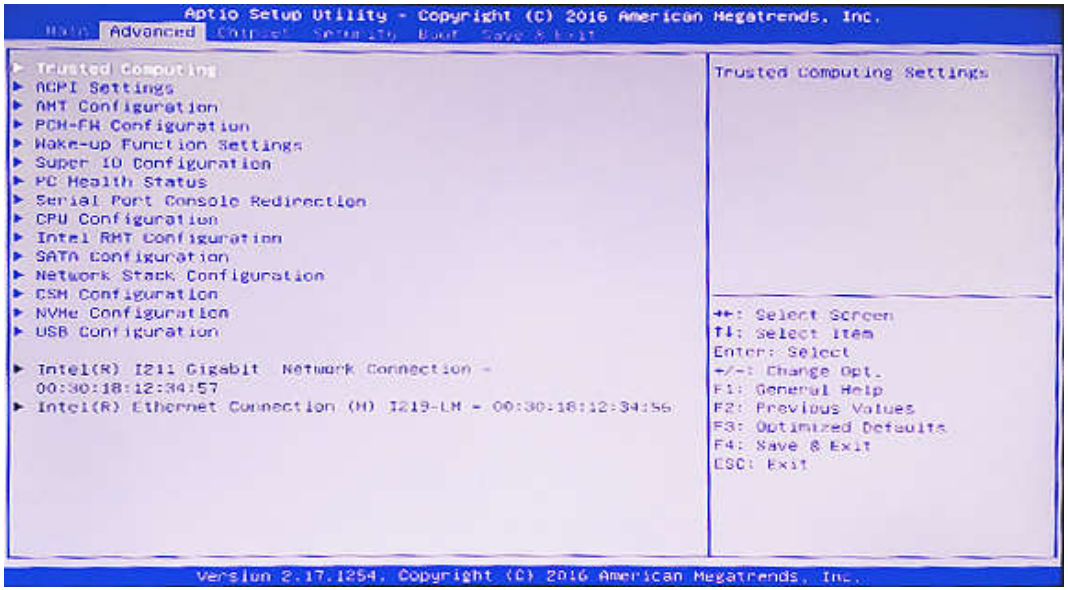
System Date

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. O.S. will not show security device. TGG EFI protocol and INT1A interface will not be available.

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

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

TPM State

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

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

Pending Operation

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

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

► **ACPI Settings**

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

ACPI Settings

ACPI Sleep State

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

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

► **AMT Configuration**

Use this item to configure Active Management Technology parameters.

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

Intel AMT

Use this item to enable or disable Intel Active Management Technology BIOS extension.

Hide Un-Configure ME Confirmation Prompt

Use this function to enable or disable Hide Un-Configure ME without password Configuration Prompt function.

MEBx Debug Message Output

Use this function to enable or disable MEBx Debug Message Output function.

Un-Configure ME

Use this function to enable or disable Un-Configure ME without password function.

Amt Wait Timer

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

ASF

Use this item to enable or disable Alert Specification Format.

Activate Remote Assistance Process

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

USB Configure

Use this item to enable or disable USB configure function.

PET Progress

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

WatchDog
Use this item to enable or disable WatchDog Timer.
**When set as [Enabled], the following sub-items shall appear:*
OS Timer
Use this item to set OS watch dog timer.
BIOS Timer
Use this item to set BIOS watch dog timer.

- **PCH-FW Configuration**
  Press [Enter] to view ME information and make settings in the following sub-items:
  - **Firmware Update Configuration**

  Press [Enter] to make settings for '**ME FW Image RE-Flash**'.
  ME FW Image Re-Flash
  Use this item to enable or disable ME FW Image Re-Flash function.
  The optional settings: [Disabled]; [Enabled].

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

- **Wake-up Function Settings**
  Press [Enter] to make settings for the following sub-items:
  Wake-up System with Fixed Time
  Use this item to enable or disable system wake on alarm event.
  The optional settings: [Disabled]; [Enabled].
  When set as [Enabled], system will wake on the hour/min/sec specified.
  Wake-up System with Dynamic Time
  Use this item to enable or disable system wake on alarm event.
  System will wake on the current time + Increase minutes.
  The optional settings: [Disabled]; [Enabled].
  When set as [Enabled], system will wake on the current time + increased minute(s).

PS2 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 state.
**This function is supported when 'ERP Support' is set as [Disabled].*

USB S3/S4 Wake-up
The optional settings: [Enabled]; [Disabled].
Use this item to enable or disable USB wake-up from S3/S4 state.
**This function is supported when 'ERP Support' is set as [Disabled].*

USB S5 Power
Use this item to enable or disable USB power after power shutdown.
**This function is supported when 'ERP Support' is set as [Disabled].*

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

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

ERP Support
The optional settings: [Disabled]; [Auto].
This item should be set as [**Disabled**] if you wish to have all active wake-up functions.

► **Serial Port 1 Configuration/ Serial Port 3 Configuration**
Press [Enter] to make settings for the following items:

Serial Port
Use this item to enable or disable serial port (COM).

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

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

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

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

► **Serial Port 2 Configuration/ Serial Port 4 Configuration**
Press [Enter] to make settings for the following sub-items:
Serial Port
Use this item to enable or disable serial port (COM).
Change Settings
Use this item to select an optimal setting for super IO device.
Serial Port FIFO Mode
The optional settings are: [16-Byte FIFO]; [32-Byte FIFO]; [64-Byte FIFO]; [128-Byte FIFO].

WatchDog Reset Timer
Use this item to enable or disable WDT reset function. 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 Reset 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***

12, Pin (3-4) of JP7 block for ATX Mode & AT Mode Select).

Case Open Detect

Use this item to detect case has already open or not, show message in POST.

PS2 KB/MS Connect

Use this item to select PS2 connect primary device.

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

► **PC Health Status**

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

► **SmartFAN Configuration**

Press [Enter] to make settings for SmartFan Configuration:

SmartFAN Configuration

CPUFAN / SYSFAN1/ SYSFAN2 Smart Mode

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

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

CPUFAN / SYSFAN1/ SYSFAN2 Full-Speed Temperature

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

CPUFAN / SYSFAN1/ SYSFAN2 Full-Speed Duty

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

CPUFAN / SYSFAN1/ SYSFAN2 Idle-Speed Temperature

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

CPUFAN / SYSFAN1/ SYSFAN2 Idle-Speed Duty

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

Shutdown Temperature

Use this item to select system shutdown temperature.

The optional settings are: [Disabled]; [70°C/156°F]; [75°C/164°F]; [80°C/172°F]; [85°C/180°F]; [90°C/188°F].

► **Serial Port Console Redirection**

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

COM1

Console Redirection

Use this item to enable or disable COM1 Console Redirection.

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

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

▸ **Console Redirection Settings**

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

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

Terminal Type

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

Bits per second

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

Data Bits

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

Parity

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

Stop Bits

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

Flow Control

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

VT-UTF8 Combo Key Support

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

Recorder Mode

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

Resolution 100x31

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

Legacy OS Redirection Resolution

The optional settings are: [80x24]; [80x25].

Putty Keypad

The optional settings are: [VT100]; [LINUX]; [XTERMR6]; [SCO]; [ESCN]; [VT400].

Redirection After BIOS POST

The optional settings are: [Always Enable]; [BootLoader].

Serial Port for Out-of-Band Management/ Windows Emergency Management Services (EMS)

Console Redirection

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

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

- **Console Redirection Settings**

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

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

Out-of-Band Mgmt Port

The optional settings are: [COM1]; [COM1(Pci Bus0, Dev0, Func0) (Disabled)].

Terminal Type

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

Bits per second

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

Flow Control

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

Data Bits

The default setting is: [8].

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

Parity

The default setting is: [None].

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

Stop Bits

The default setting is: [1].
**This item may or may not show up, depending on different configuration.*

► **CPU Configuration**

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

Hyper-Threading

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

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

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

**This item might not be available depending different CPU configuration.*

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)
Use this item to enable or disable SATA device.
The optional settings: [Disabled]; [Enabled].
SATA Mode Selection
The optional settings are: [AHCI]; [RAID].
SATA1/2/3/4
Port
The optional settings: [Disabled]; [Enabled].
Use this item to enable or disable each SATA port respectively.
Hot Plug
The optional settings: [Disabled]; [Enabled].
mSATA
Port
The optional settings: [Disabled]; [Enabled].
Use this item to enable or disable mSATA device.

► **Network Stack Configuration**
Press [Enter] to go to '**Network Stack**' screen to make further settings.
Network Stack
Use this item to enable or disable UEFI Network Stack.
The optional settings: [Disabled]; [Enabled].
When set as [Enabled], the following sub-items shall appear:
Ipv4 PXE Support
The optional settings are: [Disabled]; [Enabled].

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

Ipv6 PXE Support

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

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

PXE boot wait time

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

Media Detect Count

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

► **CSM Configuration**

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

Option ROM execution

Network

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

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

Storage

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

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

Other PCI devices

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

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

► **NVMe Configuration**

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

► **USB Configuration**

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

USB Configuration

Legacy USB Support

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

[**Enabled**]: To enable legacy USB support.

[**Disabled]**: to keep USB devices available only for EFI specification,
[**Auto**]: To disable legacy support if no USB devices are connected.

XHCI Hand-off

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

USB Mass Storage Driver Support

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

USB hardware delay and time-out

USB Transfer time-out

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

Device reset time-out

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

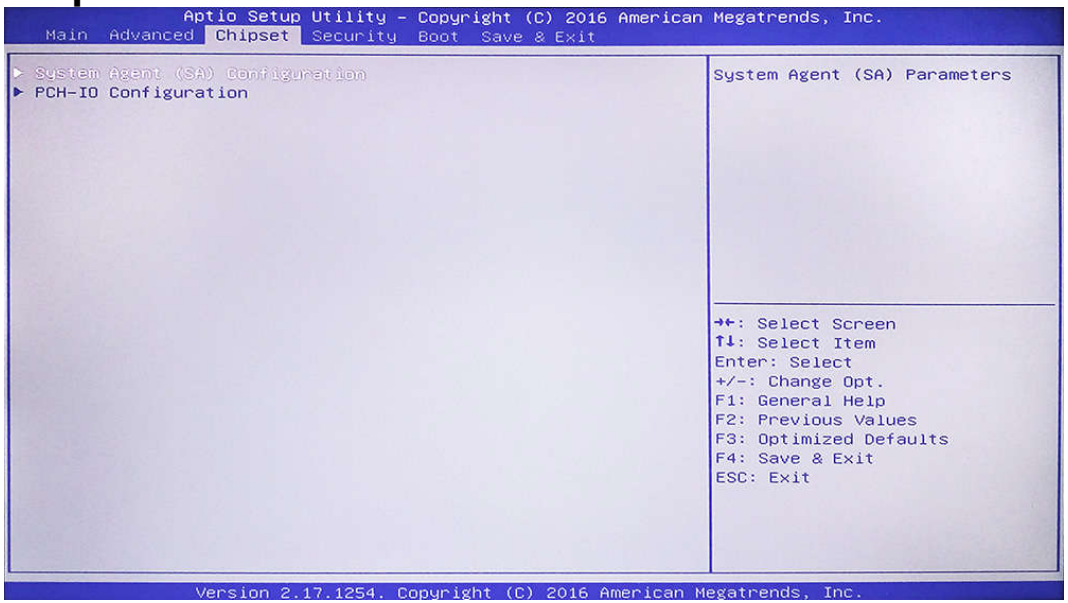
Device power-up delay

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

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

This item shows current network brief information.

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. VGA modes will be supported only on primary display.

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

Secondary IGFX Boot Display

Use this item to select secondary IGFX boot display.

The optional settings are: [Disabled]; [HDMI]; [DP]; [DVI].

Active LFP

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

**** Note**: When set as 'Enabled', user can make further settings in '**Panel Type**'.*

Panel Type

Use this item to manually select LCD panel type.

The optional setting are: [800x 480 18bit Single]; [800x 600 18bit Single]; [800x 600 24bit Single]; [1024 x 600 18bit Single]; [1024 x 768 18bit Single]; [1024 x 768 24bit Single]; [1280 x 768 24bit Single]; [1280 x 800 18bit Single]; [1280 x 800 24bit Single]; [1366 x 768 18bit Single]; [1366 x 768 24bit Single]; [1440 x 900 18bit Dual]; [1440 x 900 24bit Dual]; [1280 x 1024 24bit Dual]; [1680 x 1050 24bit Dual]; [1920 x 1080 24-bit Dual].

► **PEG Port Configuration**

Press [Enter] to make further settings for PEG port Configuration.

PEG Port Configuration

PEG (PCIE1 Slot)

This will show the current PCIE1 slot connected, if any available.

Max Link Speed

Use this item to configure maximum speed for available working card connected to PCIE1 slot.

The optional settings are: [Auto]; [Gen1]; [Gen1]; [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

Use this item to enable or disable onboard NIC

Wake on LAN

Use this item to enable or disable integrated LAN to wake the system.The Wake on LAN can not be disabled if ME is on at Sx state.

Onboard Lan2 Controller

Use this item to enable or disable onboard device or controller.

MPE Slot

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

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

Speed

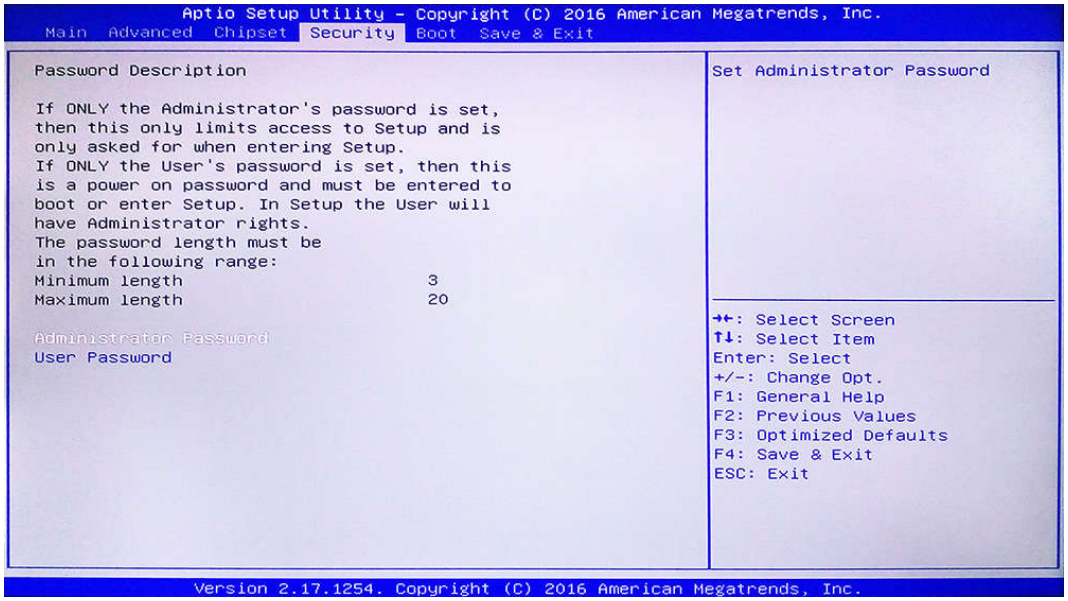
The optional settings are: [Auto]; [Gen1]; [Gen2]; [Gen3].

System State after Power Failure

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

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

3-9 Security Menu



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

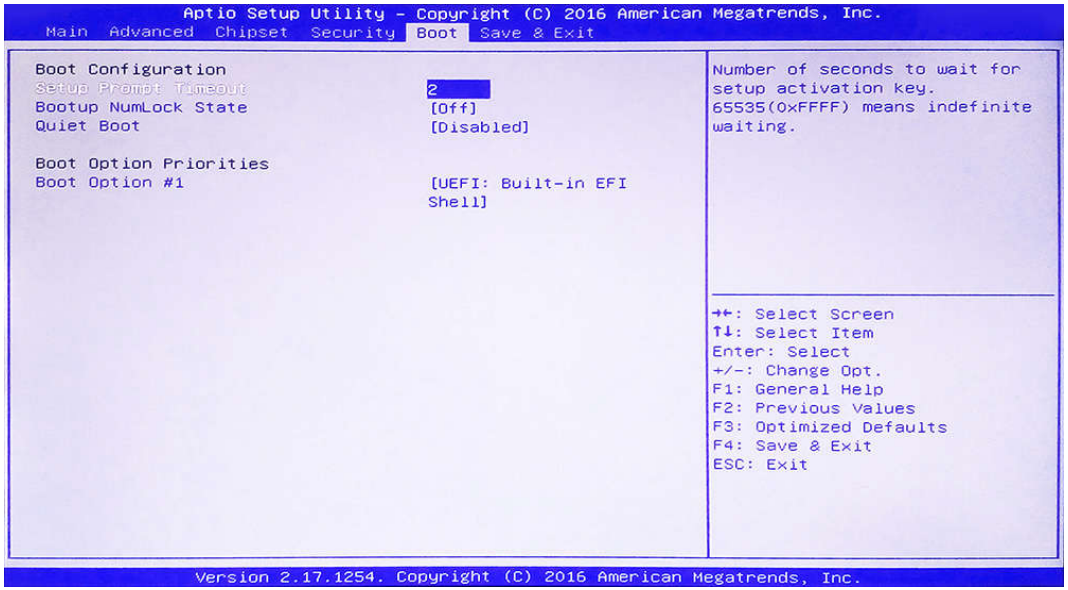
Administrator Password

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

User Password

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

3-10 Boot Menu



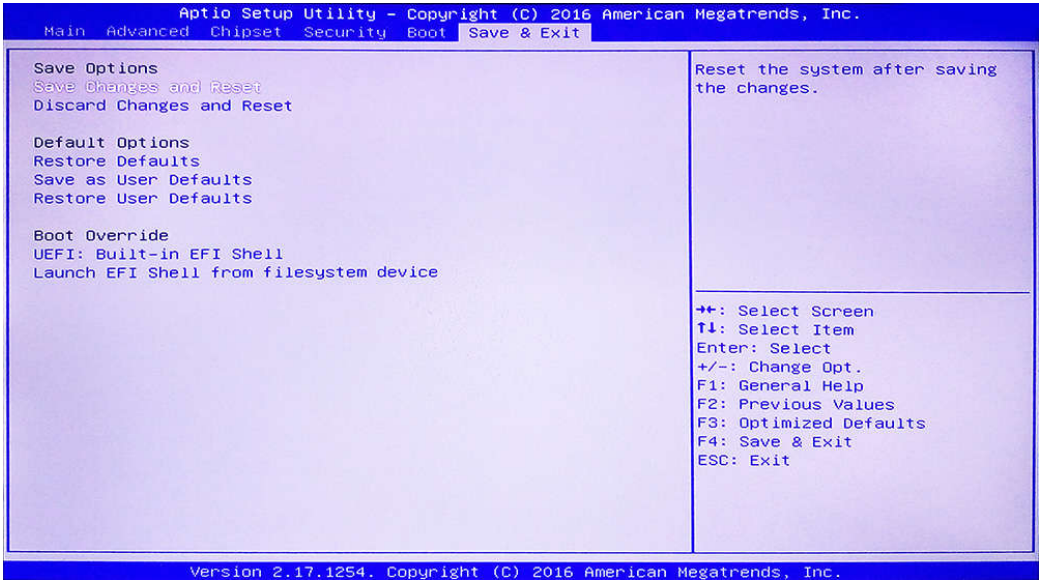
Boot Configuration

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

Boot Option Priorities

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

3-11 Save & Exit Menu



Save Changes and Reset

This item allows user to reset the system after saving the changes.

Discard Changes and Reset

This item allows user to reset the system without saving any changes.

Restore Defaults

Use this item to restore /load default values for all the setup options.

Save as User Defaults

Use this item to save the changes done so far as user defaults.

Restore User Defaults

Use this item to restore defaults to all the setup options.

Boot Override

UEFI:xx/…

Press this item to select the device as boot disk after save configuration and reset

Launch EFI Shell from filesystem device

Press this item to launch EFI Shell application (Shell.efi) from one of the available file system device.