TECHNICAL MANUAL

Of

Intel Q170 Express Chipset

Based Mini-ITX M/B

NO. G03-NF795-F

Revision: 2.0

Release date: October 1, 2019

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.

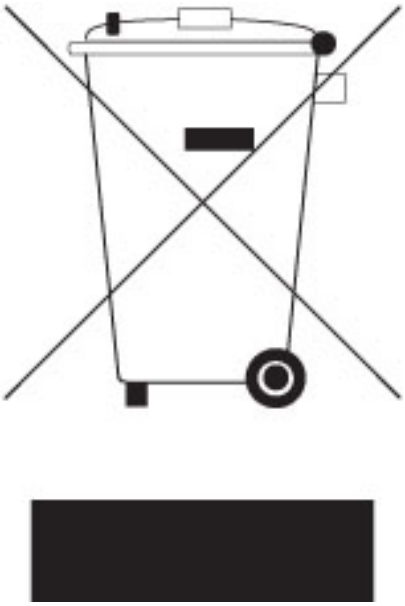


TABLE OF CONTENT

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
2.0	Second Edition	October 1, 2019

Item Checklist

- ☑ Motherboard
- ☑ Cable(s)

Chapter 1
Introduction of the Motherboard

1-1 Feature of Motherboard

- Intel® Q170 express chipset
- Support LGA 1151 CPU socket for the 6th & 7th CPU Intel® Core™ i7 / i5 i3 processors / Pentium™ & Celeron™ processors (TDP ≤65 W).
- Support 2* DDR4 2133MHz SO-DIMM up to 32GB and dual channel function
- Integrated with 3*Intel i211AT & 1* i219LM Gigabit Ethernet LAN chip
- Support USB 3.0 data transport demand
- Support 4 * SATAIII (6Gb/s) Devices & RAID 0, 1, 5, 10 mode
- Support 1 * full-size Mini-SATA slot
- Support 1* PCIE 2.0 x16 slot, 1* half-full-size Mini-PCIE slot and 1* M.2 E-key 2230 PCIe slot
- Support 3G module with SIM card slot
- 1 * HDMI port & 1 * 24-bits dual channel LVDS
- Support Smart FAN function
- Supports ACPI S3 Function
- Compliance with ErP Standard
- Support Watchdog Timer Technology
- Solution for Networking Appliance, POE & Surveillance & IoT

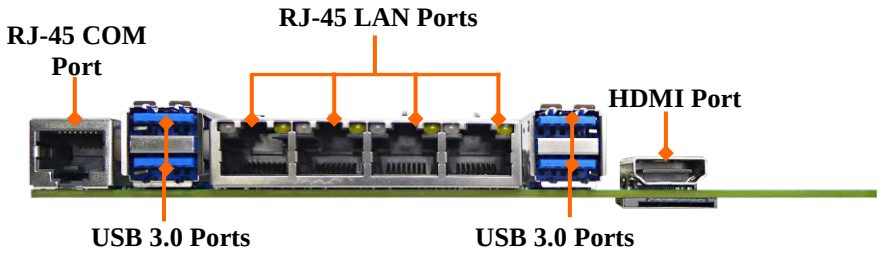
1-2 Specification

Spec	Description
Design	● Thin mini-ITX form factor; 8-layer; PCB size: 17.0x17.0cm
Chipset	● Intel Q170 Express Chipset
CPU Socket	● Intel® LGA 1151 Socket for Skylake & kabylack series processors: 6th & 7th Core™ i7/ i5/ i3, Pentium™ & 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 x16 slot (**PE1**) ● 1* half-size Mini-PCIE slot (**MPE**) ● 1* M.2 PCIE slot (**M2E**,2230 E-key PCIE interface) ● 1* SIM card slot (**BSIMCARD**)
Storage	● 4* SATAIII 6G/s ports with support for RAID 0/1/5/10 mode ● 1* full-size Mini-SATA slot (**MSATA**)
Gigabit LAN Chip	● Integrated with 3* Intel I211AT Gigabit PCI-E LAN chip & 1* Intel I219LM Gigabit PHY LAN chip ● Support Fast Ethernet LAN function of providing 10/100/1000Mbps Ethernet data transfer rate
BIOS	● AMI Flash ROM
Multi I/O	***Rear Panel I/O:*** ● 1* RJ-45 COM port ● 4* RJ-45 LAN port ● 4* USB 3.0 port ● 1* HDMI port ***Internal I/O Connectors & Headers:*** ● 1 *24-pin main power connector ● 1 *4-pin 12V power connector ● 1* CPUFAN connector & 1* SYSFAN connector

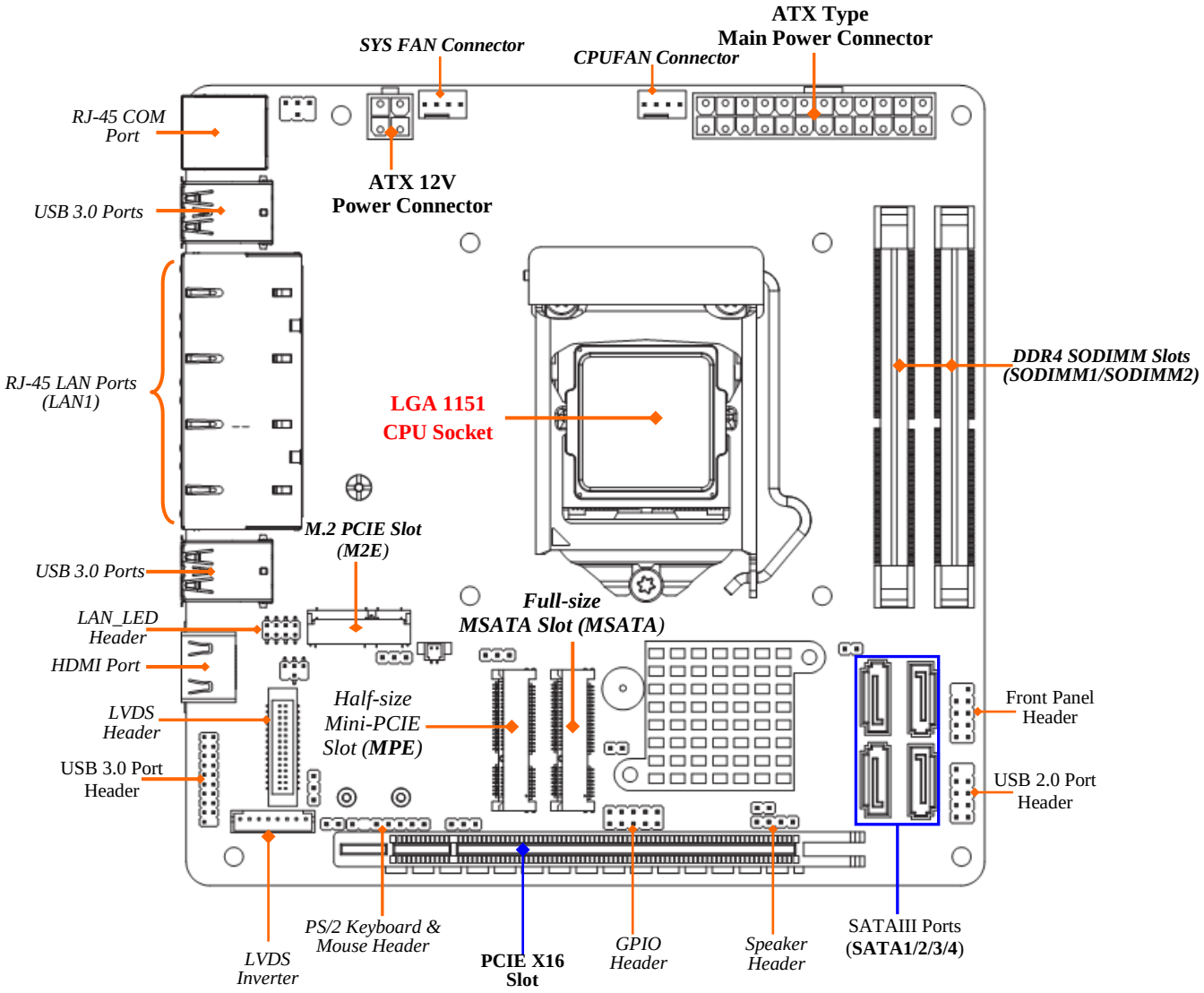
	● 1* Front panel header ● 1* 9-Pin USB 2.0 header for 2* USB 2.0 ports ● 1* 19-Pin USB 3.0 header for 2* USB3.0 ports ● 1 * PS2 Keyboard & Mouse header ● 1* LAN Status LED header ● 1* GPIO header ● 1*LVDS header ● 1*Inverter header ● 1*Speaker header

1-3 Layout Diagram

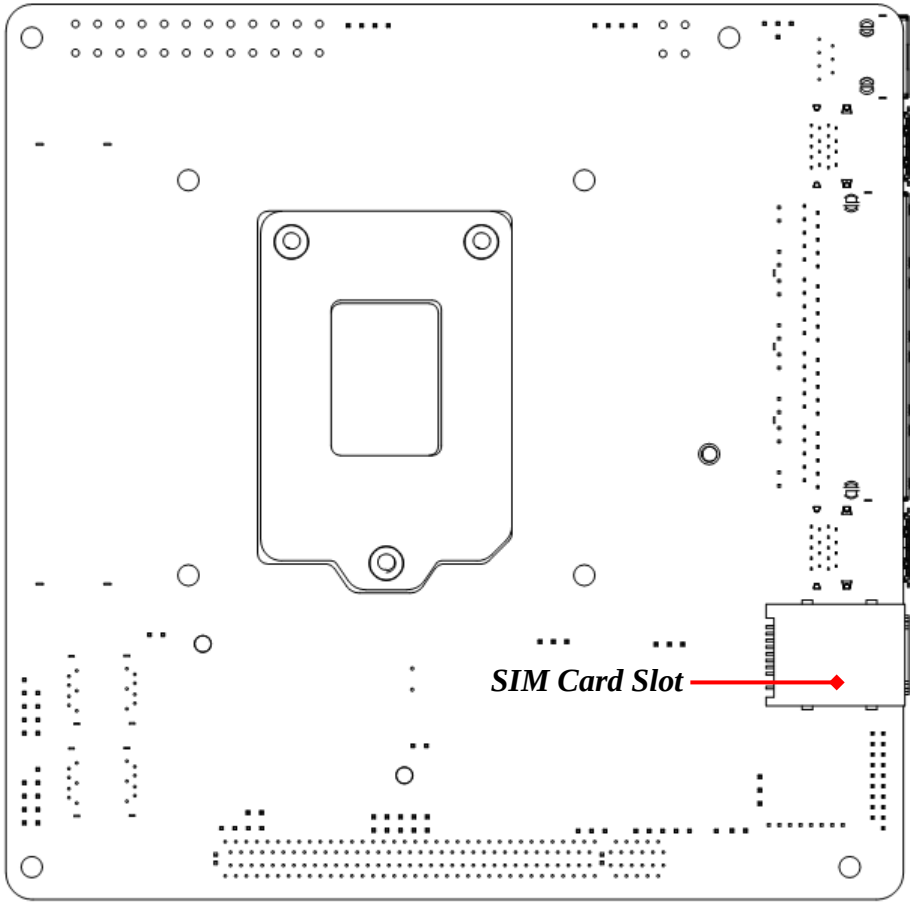
Rear IO Diagram



Motherboard Internal Diagram-Front

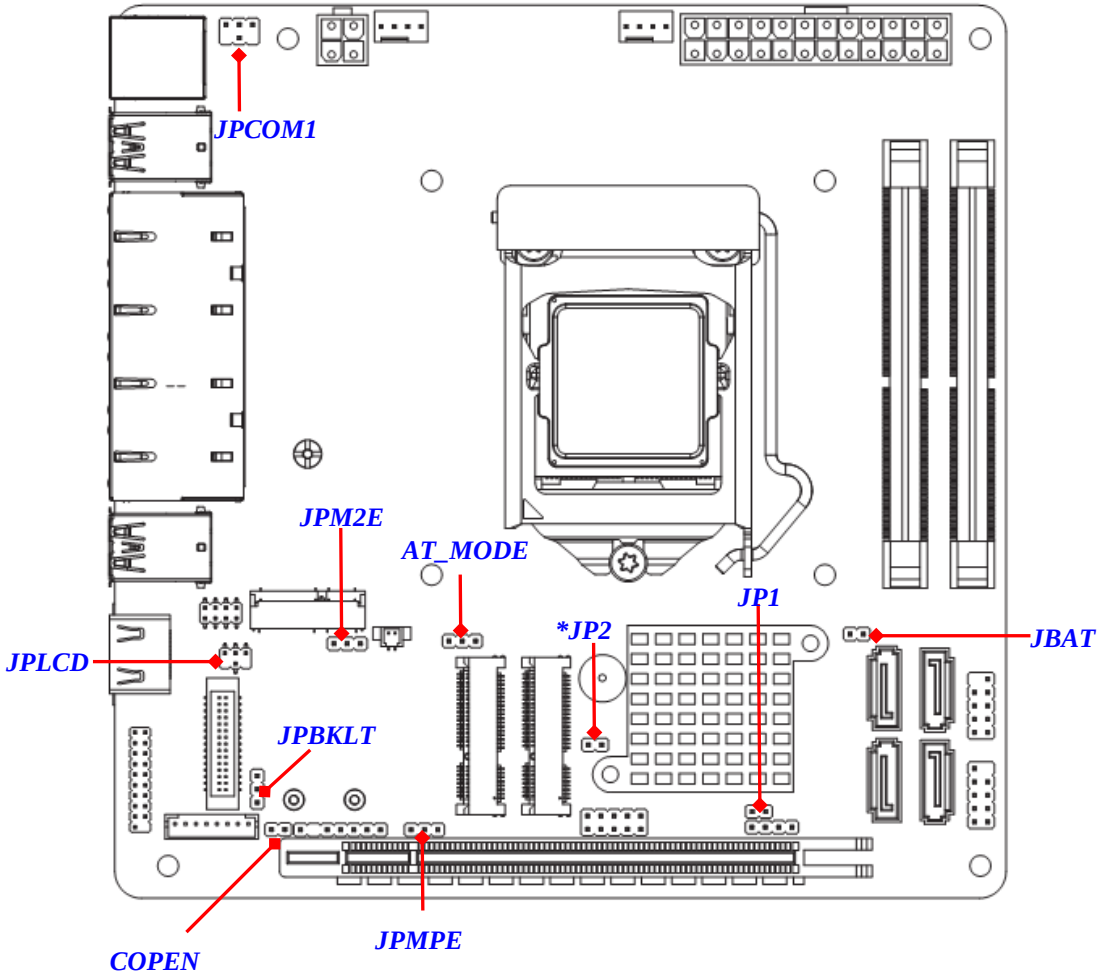


Internal Diagram-Back Side:



***Note:** **1.SIM card slot (BSIMCARD)** only works **when** compatible SIM card installed & USB 3G expansion card installed in the full-size MSATA slot (**MSATA**); **2.** USB 3G card and MSATA card is optional, i.e., user can only choose one to installed in the full-size MSATA at the same time.*

Motherboard Jumper Position



***Note:** JP2 is for RMA test only.*

Connectors

P/N	Name
RJ45_COM1	RJ-45 COM Port Connector for Console
USB1/USB2	USB 3.0 Port Connector X4
LAN1	RJ-45 LAN Connector X4
HDMI	HDMI Port Connector
ATXPWR	Main Power Connector
ATX12V	Internal 12V Power Connector
SATA1/2/3/4	SATAIII Connector
CPUFAN	CPUFAN Connector
SYSFAN	SYFFAN Connector

Headers

P/N	Name	Description
JW_FP	Front Panel Header(PWR LED/ HD LED/Power Button /Reset)	9-pin Block
SPEAKER	Speaker Header	4-pin Block
FP_USB1	USB 2.0 Port Header	9-pin Block
FP_USB31	USB 3.0 Port Header	19-pin Block
PS2KBMS	PS2 Keyboard & Mouse Header	6-pin Block
LAN_LED	LAN Status LED Header	8-pin Block
GPIO_CON	GPIO Header	10-pin Block
LVDS2	LVDS Header	30-pin Block
INVERTER2	LVDS Inverter Header	8-pin Block

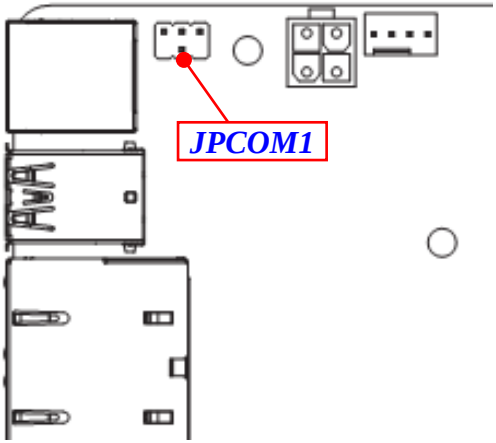
Jumper

P/N	Name	Description
JPCOM1	RJ45_COM1 Port VCC 5V/12V Select	4-pin Block
JBAT	Clear CMOS Setting	2-pin Block
COPEN	Case Open Message Display Function Select	2-pin Block
AT_MODE	AT/ATX Mode Select	3-Pin Block
JPLCD	LVDS Panel VCC 3.3V/5V/12V Select	4-pin Block
JPBKLT	LVDS Backlight VCC 5V/12V Select	3-pin Block
JPMPE	**MPE** Slot VCC 3VSB/VCC3 Select	3-Pin Block
JPM2E	**M2E** Slot VCC 3VSB/VCC3 Select	3-Pin Block
JP1	DFDS Override Select	2-pin Block

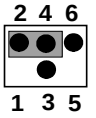
Chapter 2
Hardware Installation

2-1 Jumper Setting

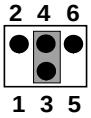
JPCOM1 (4-pin): RJ45_COM1 Port Pin5 VCC Select



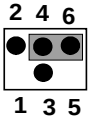
JPCOM1→RJ45_COM1 Pin5 VCC Select



2-4 Closed:
Pin5=NC;

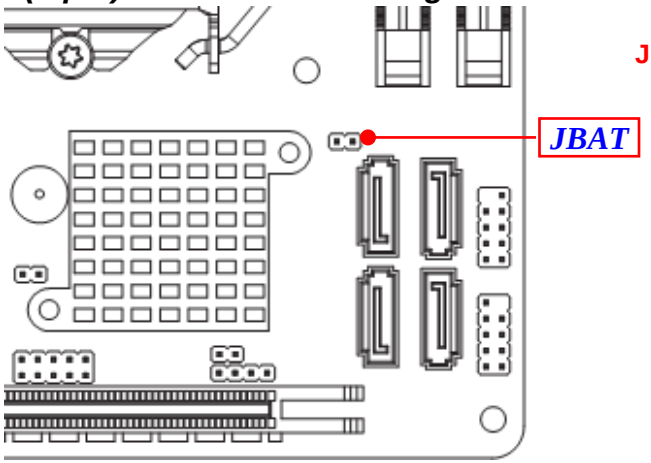


3-4 Closed:
Pin5=+5V;

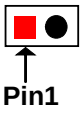


4-6 Closed:
Pin5=+12V.

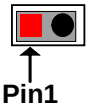
JBAT (2-pin): Clear CMOS Settings



JBAT→*Clear CMOS*

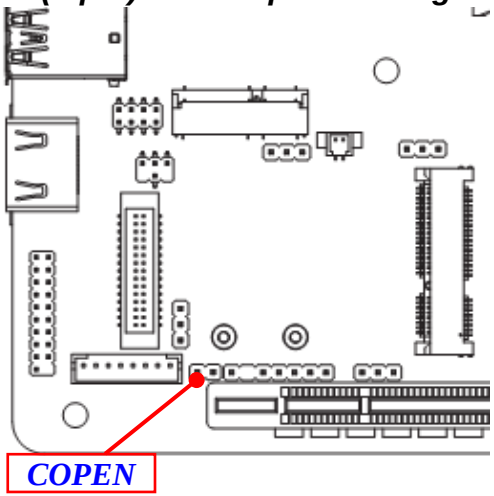


1-2 Open: Normal;



1-2 Closed: Clear CMOS.

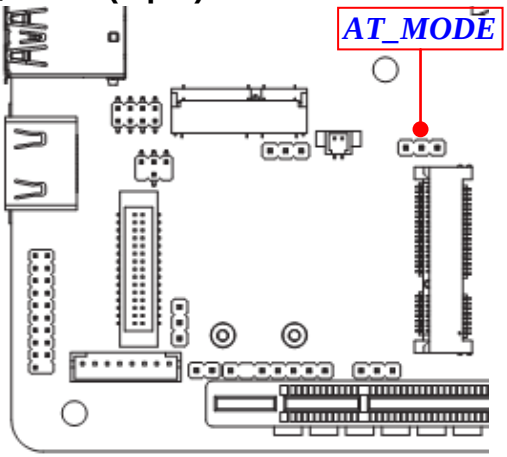
COPEN (2-pin): Case Open Message Display Function Select



COPEN→*Case Open Detection*

Pin 1-2 Short: *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.*

AT_MODE (3-pin): AT Mode /ATX Mode Select



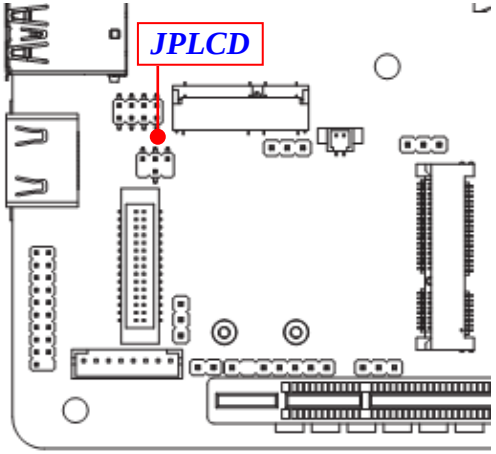
AT_MODE→ATX/AT Mode Select

1-2 Closed: ATX Mode Selected;

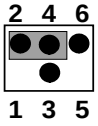
2-3 Closed: AT Mode Selected.

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

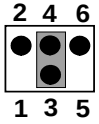
JPLCD (4-pin): LVDS VCC 3.3V/5V/12V Select



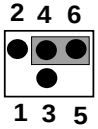
JPLCD→LVDS Panel VCC



2-4 Closed: VCC=3.3V;

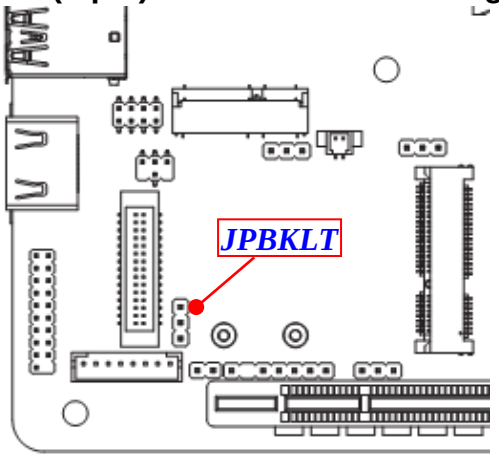


3-4 Closed: VCC=5V;

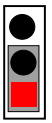


4-6 Closed: VCC=12V.

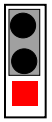
JPBKLT (3-pin): LVDS Inverter Backlight VCC Select



JPBKLT→Inverter Backlight VCC Select

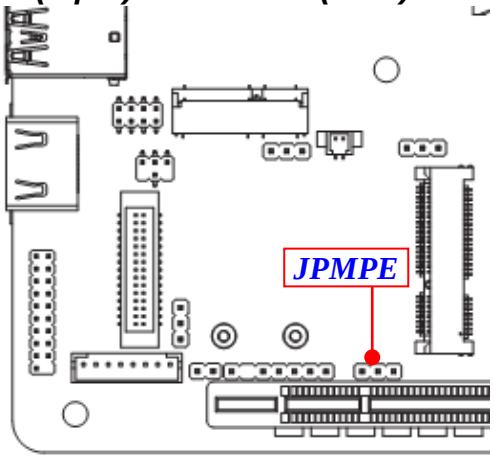


1-2 Closed: Inverter 5V Selected;

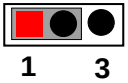


2-3 Closed: Inverter 12V Selected.

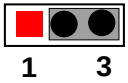
JPMPE (3-pin): Mini PCI-E (MPE) Slot VCC 3.3V/3.3 VSB Select



JPMEP→ MPE Slot VCC Select

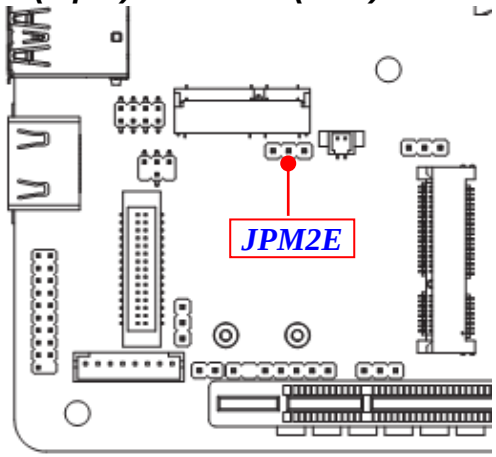


1-2 Closed: MPE VCC= VCC3V;



2-3 Closed: MPE VCC=3VSB.

JPM2E (3-pin): M.2 PCIe (M2E) Slot VCC 3.3V/3.3 VSB Select

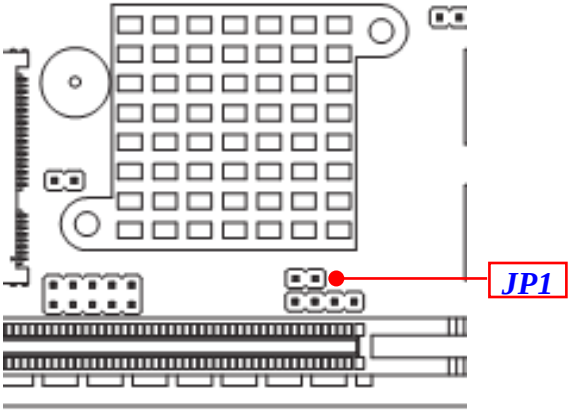


JPM2E→ M2E Slot VCC Select

1-2 Closed: M2E Slot VCC= VCC3V;

2-3 Closed: M2E Slot VCC=3VSB.

JP1(2-pin): DFDS Override Select



JP1→*DFDS Override*

Pin1

1-2 Open: Normal(Default);

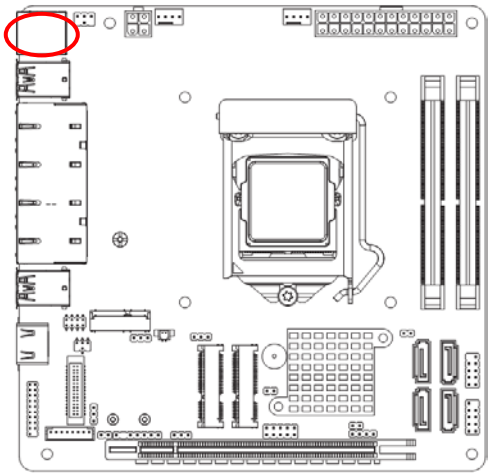
Pin1

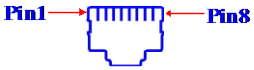
1-2 Closed: Disable Flash Descriptor Security (override).

2-2 Connectors and Headers

2-2-1 Connectors

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

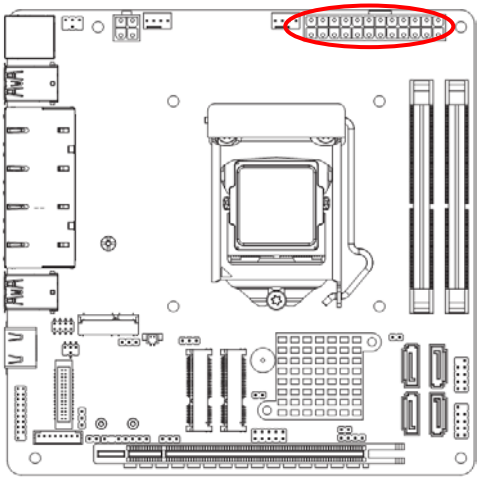


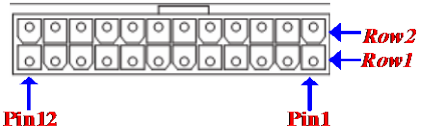


RJ45_COM1

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

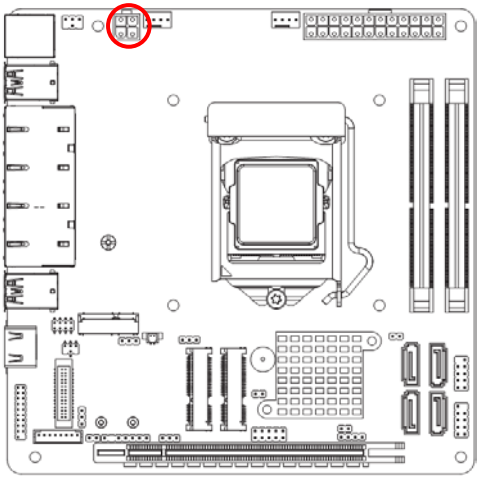
(2) ATXPWR(24-pin block): Main Power Connector

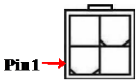




PIN	ROW1	ROW2
1	+3.3V	+3.3V
2	+3.3V	-12V
3	GND	GND
4	+5V	Soft Power on
5	GND	GND
6	+5V	GND
7	GND	GND
8	Power OK	-5V
9	+5V Stand by	+5V
10	+12V	+5V
11	+12V	+5V
12	+3.3V	GND

(3) ATX12V (4-pin block): 12V Internal Power Connector

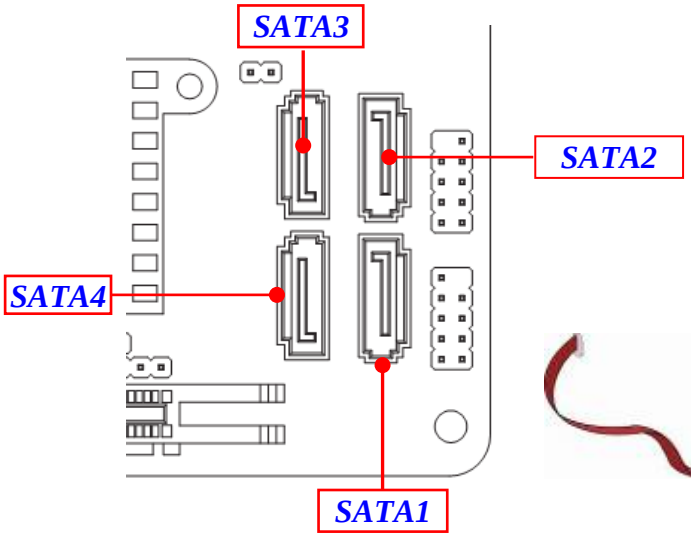




Pin No.	Definition
1	GND
2	GND
3	+12V
4	+12V

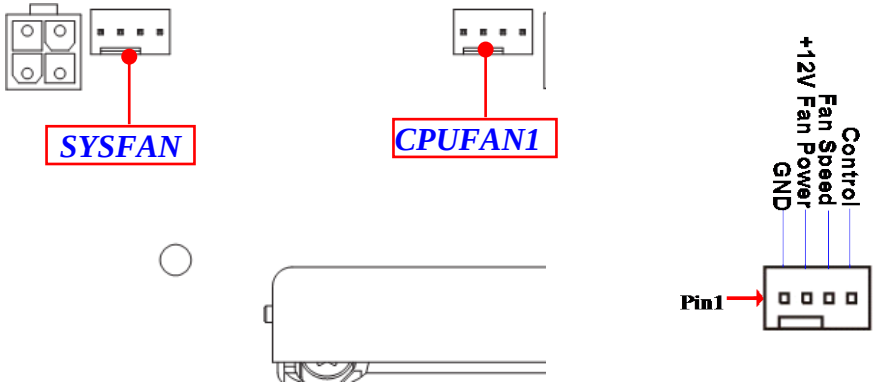
(4) SATA1/2/3/4 (7-pin): SATA III Port connector

These are high-speed SATAIII port that supports 6 GB/s transfer rate.



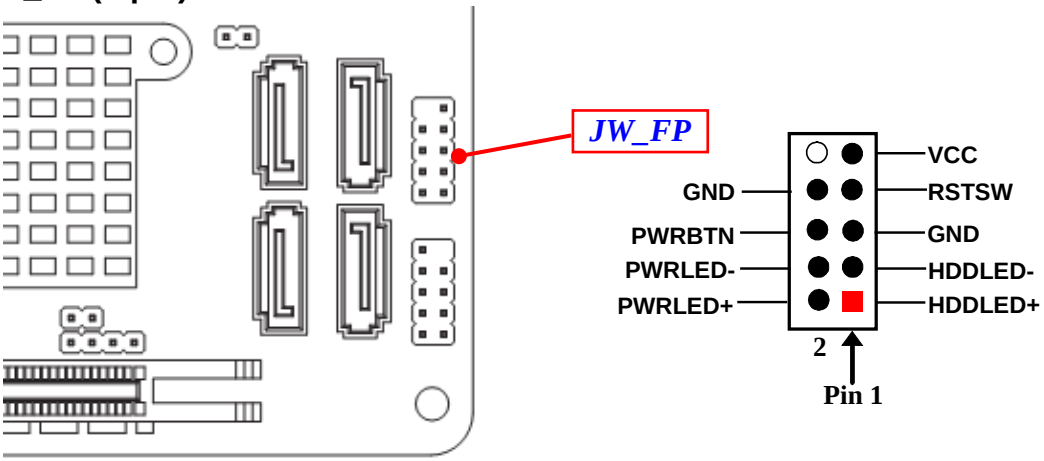
Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

(5) SYSFAN/CPUFAN (4-pin): Fan Connectors

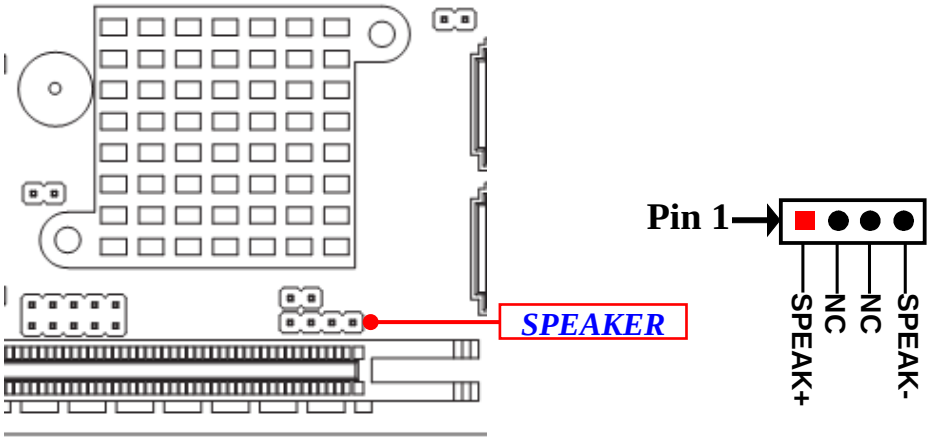


2-2-2 Headers

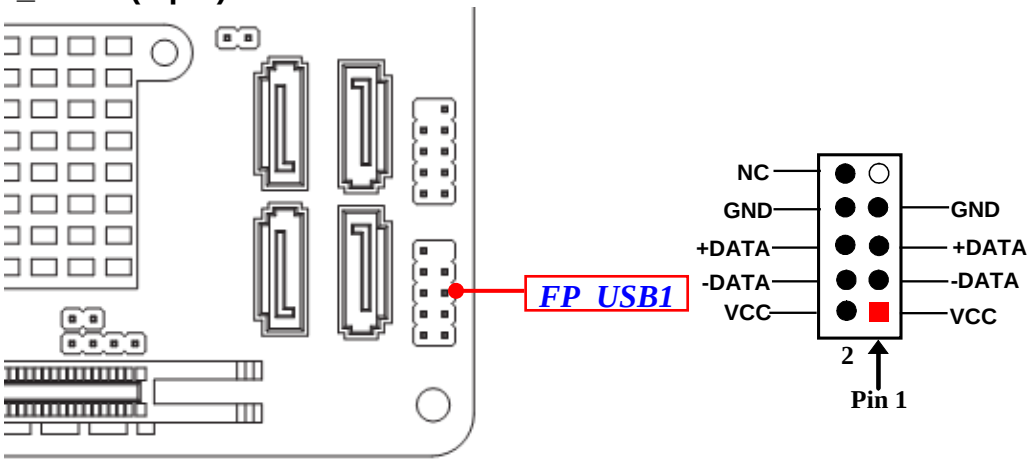
(1) JW_FP (9-pin): Front Panel Header



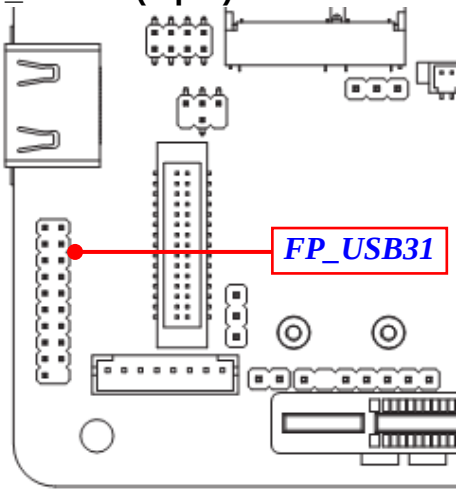
(2) SKEAKER (4-pin): Speaker Header

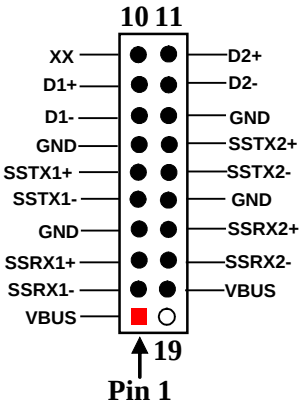


(3) FP_USB1 (9-pin): USB 2.0 Port Header

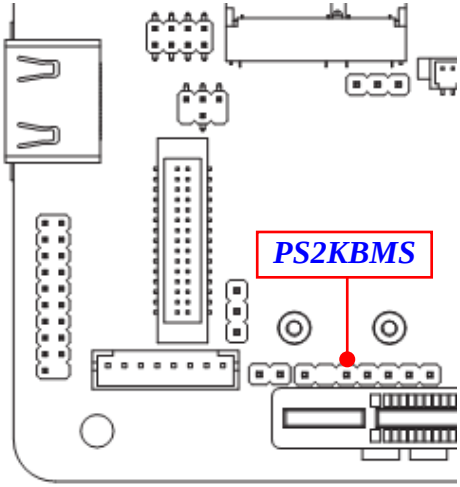


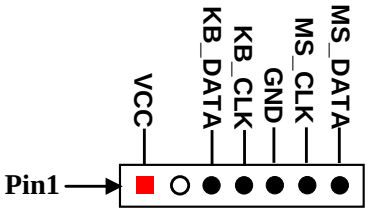
(4) FP_USB31 (9-pin): USB 2.0 Port Header



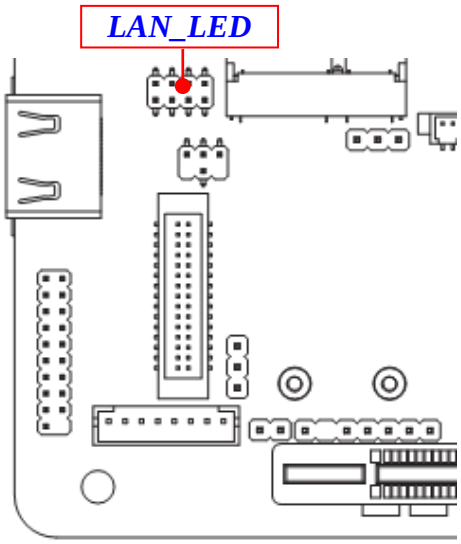


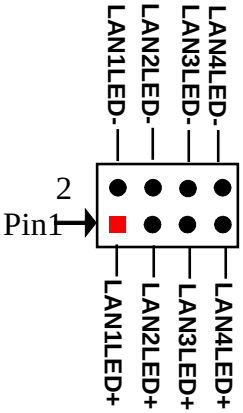
(5) PS2KBMS (6-pin): PS/2 Keyboard & Mouse Header



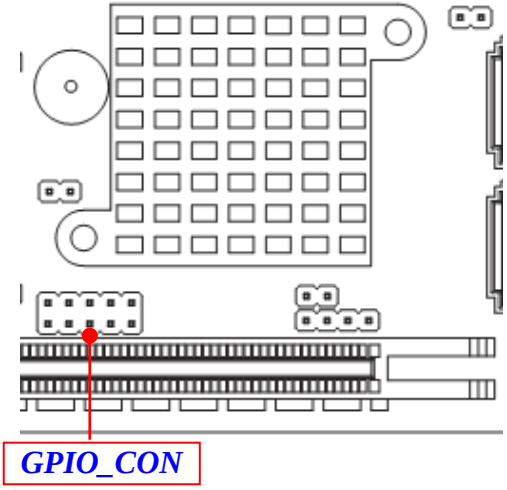


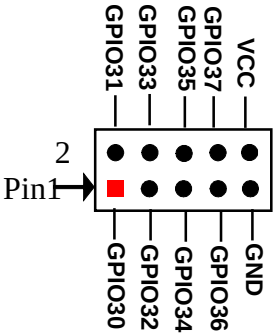
(6) LAN_LED (8-pin): LANLED Header



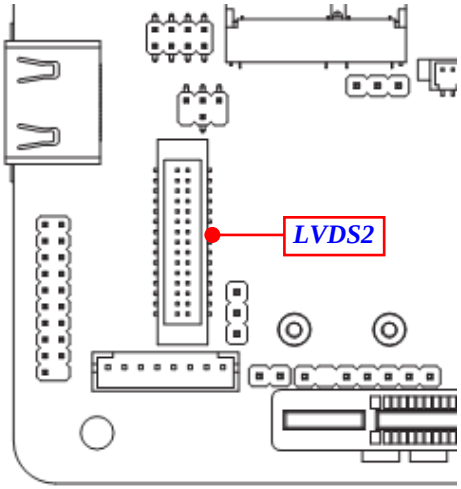


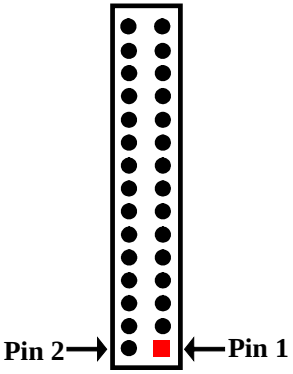
(7) GPIO_CON (10-pin): GPIO Header





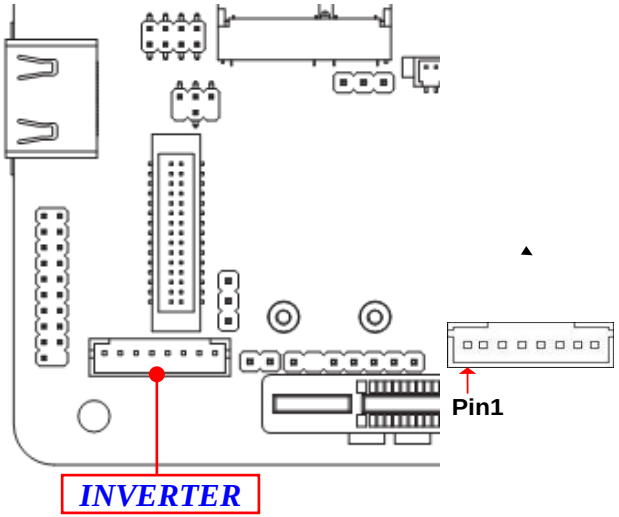
(8) LVDS2 (30-Pin): 24-bit dual channel LVDS Header





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	PVCC	Pin 28	PVCC
Pin 29	PVCC	Pin 30	PVCC

(9) INVERTER2 (8-pin): LVDS Inverter Connector



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

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

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.

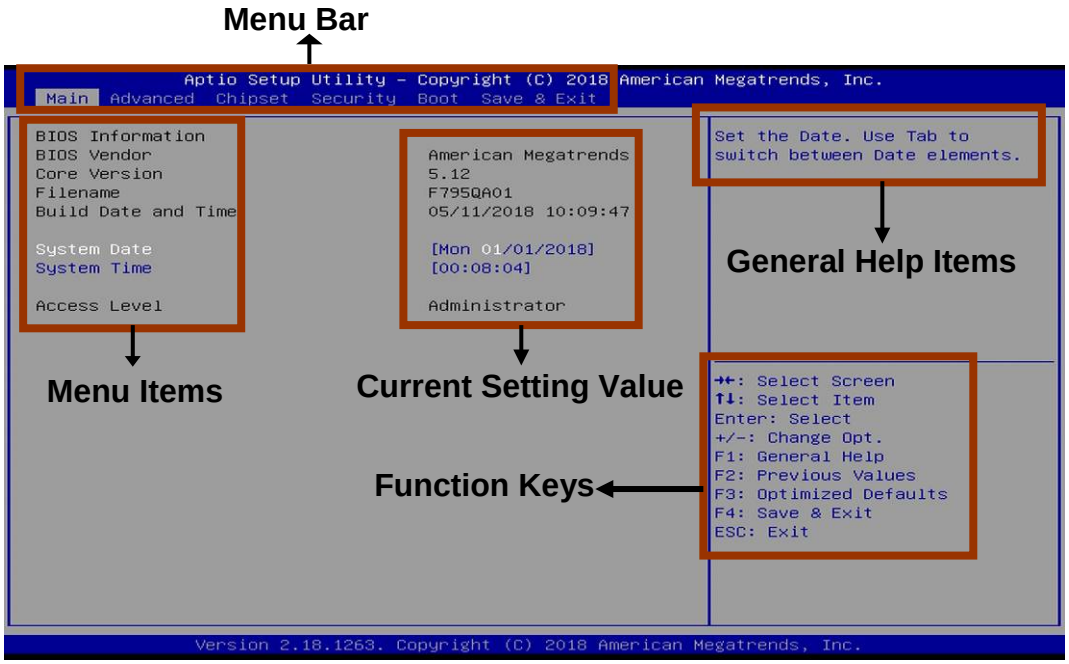
3-1 Entering Setup

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

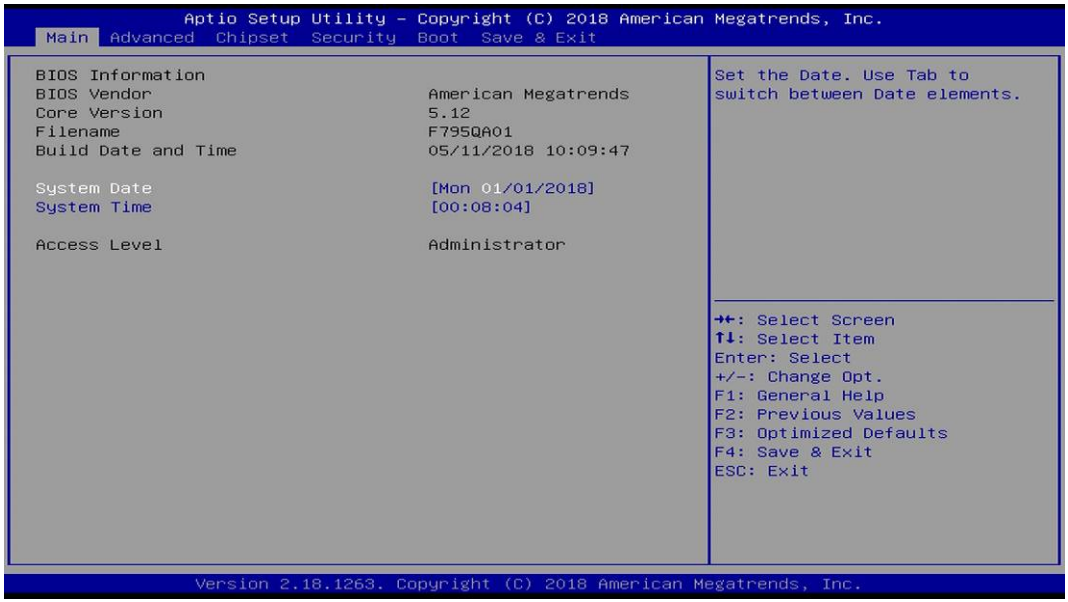
There are six menu bars on top of BIOS screen:

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.



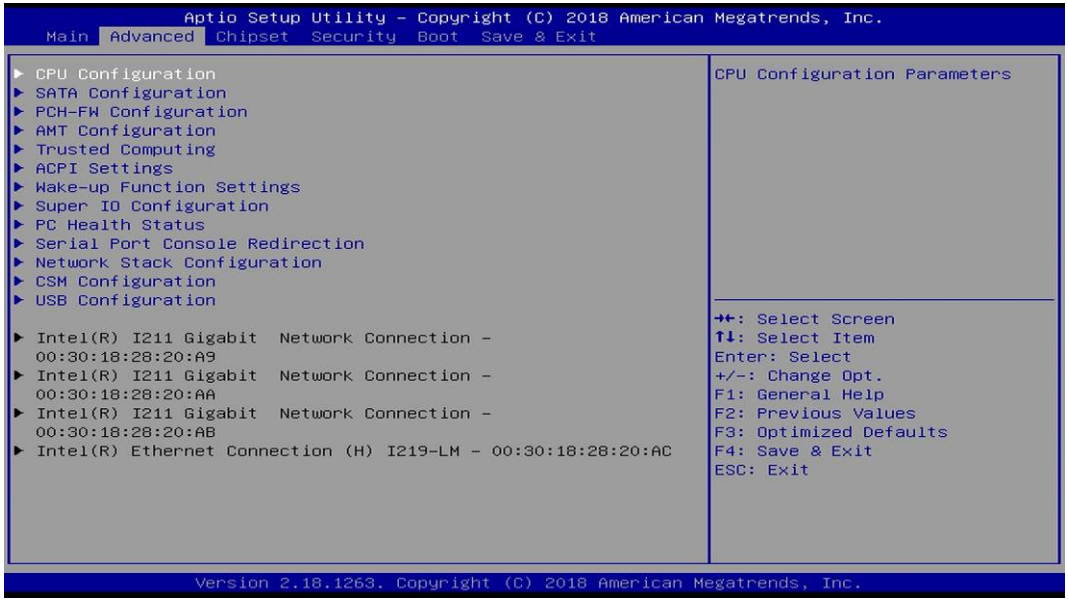
System Date

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



- **CPU Configuration**

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

  Hyper-Threading

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

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

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

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

  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].

When set as [Enabled], it allows CPU to go to C states when it's not 100% utilized.

Package C State Limit

The optional settings are: [C0/C1]; [C2]; [C3]; [C6]; [C7]; [C7s]; [C8]; [C9]; [C10]; [Cpu Default]; [Auto].

[Cpu Default]: left to Factory default value;

[Auto]: initialized to deepest available Packaged C state limit.

- **SATA Configuration**

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

SATA Controller(s)

Use this item to enable of disable device.

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

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

SATA Mode Selection

This item controls how SATA controller(s) operate.

The optional settings are: [AHCI]; [RAID].

SATA1/SATA2/SATA3/SATA4

Port

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

Use this item to enable or disable SATA port.

Hot Plug

Use this item to designate this port as Hot Pluggable.

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

mSATA

Port

Use this item to enable or disable device connected to MSATA port.
The optional settings: [Disabled]; [Enabled].

- **PCH-FW Configuration**

Press [Enter] to view Management Engine technology parameters and make settings in the following sub-items:

TPM Device Selection

Use this item to select TPM device. The optional settings: [dTPM]; [PTT].
[PTT]: Enable PTT in SkuMgr.
[dTPM]: Disable PTT in SkuMgr.
Warnning!! PTT/dTPM will be disabled and all data saved on it will be lost!

- **Firmware Update Configuration**

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

ME FW Image Re-Flash

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

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

- **AMT Configuration**

Use this item to configure Active Management Technology parameters.
Press [Enter] to make settings for the following sub-items:

Intel AMT

Use this item to enable or disable Intel Active Management Technology BIOS extension. The optional settings: [Disabled]; [Enabled].
When set as [Disabled], AMT BIOS Features are no longer supported and user is no longer able to access MEBx Setup.
When set as [Enabled], the following sub-items shall appear:

Hide Un-Configure ME Confirmation Prompt

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

Configuration Prompt function.
The optional settings: [Disabled]; [Enabled].

MEBx Debug Message Output

Use this function to enable or disable MEBx Debug Message Output function.
The optional settings: [Disabled]; [Enabled].

Un-Configure ME

Use this function to enable or disable Un-Configure ME without password function.
The optional settings: [Disabled]; [Enabled].

ASF

Use this item to enable or disable Alert Specification Format.
The optional settings: [Disabled]; [Enabled].

Activate Remote Assistance Process

Use this item to enable or disable Trigger CIRA boot function.
The optional settings: [Disabled]; [Enabled].

USB Configure

Use this item to enable or disable USB configure function.
The optional settings: [Disabled]; [Enabled].

PET Progress

Use this item to enable or disable PET events progress to receive PET events or not.The optional settings: [Disabled]; [Enabled].

Amt CIRA Timeout

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

WatchDog

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

OS Timer

Use this item to set OS watch dog timer.

BIOS Timer

Use this item to set BIOS watch dog timer.

- **Trusted Computing**

Press [Enter] to view current status information, or make further settings in '**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)].

- **Wake-up Function Settings**

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

Wake-up System with Fixed Time

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

Wake-up System with Dynamic Time

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

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

The optional settings: [Enabled]; [Disabled].
Use this item to enable or disable PS2 KB/MS wake-up from S3/S4/S5 or USB from S3/S4 state.
**This function is supported when 'ERP Support' is set as [Disabled].*

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

- **Super IO Configuration**

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

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

- **Serial Port 1 Configuration**

Press [Enter] to make settings for the following items:
Serial Port
Use this item to enable or disable serial port (COM).
Change Settings
Use this item to select an optimal setting for super IO device. Changing setting may conflict with system resources.
Serial Port FIFO Mode
The optional settings are: [16-Byte FIFO]; [32-Byte FIFO]; [64-Byte FIFO]; [128-Byte FIFO].

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

WatchDog Timer Value
User can set a value in the range of [4] to [255].
WatchDog Timer Unit
The optional settings are: [Sec.]; [Min.].

WatchDog Wake-up Timer in ERP

This item support WDT wake-up while '**ERP Support**' is set as [Auto].
The optional settings: [Disabled]; [Enabled].
When set as [Enabled], the following sub-items shall appear:

WatchDog Timer Value in ERP
User can select a value in the range of [10] to [4095] seconds when '**WatchDog Reset Timer Unit in ERP**' set as [Sec]; or in the range of [1] to [4095] minutes when '**WatchDog Reset Timer Unit in ERP**' set as [Min].
WatchDog Timer Unit in ERP
The optional settings are: [Sec.]; [Min.].

ATX Power Emulate AT Power
This item support Emulate AT power function, MB power On/Off control by power supply. Use needs to select 'AT or ATX Mode' on MB jumper at first (refer to ***Page 10***, AT_MODE jumper for ATX Mode & AT Mode Select).

Case Open Detect
Use this item to detect case has already open or not, show message in POST.
The optional settings: [Disabled]; [Enabled].
When set as [Enabled], system will detect if COPEN has been short or not (refer to Page 9); if COPEN is short, system will show Case Open Message during 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 Smart Mode
    The optional settings are: [Disabled]; [Enabled].
    When set as [Enabled], the following sub-items shall appear:
    CPUFAN / SYSFAN1 Full-Speed Temperature

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

CPUFAN / SYSFAN1 Full-Speed Duty

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

CPUFAN / SYSFAN1 Idle-Speed Temperature

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

CPUFAN / SYSFAN1 Idle-Speed Duty

Use this item to set CPUFAN/SYSFAN1 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/158°F]; [75°C/167°F]; [80°C/176°F]; [85°C/185°F]; [90°C/194°F].

- **Serial Port Console Redirection**

COM1

Console Redirection

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

- **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 items:

Terminal Type

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

Emulation: [ANSI]: Extended ASCII char set; [VT100]: ASCII char set; [VT100+]: Extends VT100 to support color, function keys, etc.; [VT-UTF8]: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.

Bits per second

Use this item to select serial port transmission speed. The speed must be

matched on the other side. Long or noisy lines may require lower speeds.
The optional settings: [9600]; [19200]; [38400]; [57600]; [115200].

Data Bits

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

Parity

A parity bit can be sent with the data bits to detect some transmission errors.
The optional settings: [None]; [Even]; [Odd]; [Mark]; [Space].
[Even]: parity bit is 0 if the num of 1's in the data bits is even; [Odd]: parity bit is 0 if num of 1's in the data bits is odd; [Mark]: parity bit is always 1; [Space]: Parity bit is always 0; [Mark] and [Space] Parity do not allow for error detection.

Stop Bits

Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit.
The optional settings: [1]; [2].

Flow Control

Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a "stop" signal can be sent to stop the data flow. Once the buffers are empty, a "start" signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.
The optional settings: [None]; [Hardware RTS/CTS].

VT-UTF8 Combo Key Support

Use this item to enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals.
The optional settings: [Disabled]; [Enabled].

Recorder Mode

With this mode enable only text will be sent. This is to capture Terminal data.
The optional settings: [Disabled]; [Enabled].

Resolution 100x31

Use this item to enable or disable extended terminal resolution.
The optional settings: [Disabled]; [Enabled].

Legacy OS Redirection Resolution

On Legacy OS, the Number of Rows and Columns supported redirection.

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

Putty KeyPad

Use this item to select FunctionKey and KeyPad on Putty.

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

Redirection After BIOS POST

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

Whet Bootloader is selected, then Lagacy Console Redirection is disabled before booting to legacy OS. When Always Enable is selected, then Legacy Console is enabled for legacy OS. Default setting for this option is set to Always Enable.

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

Console Redirection

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

▸ **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 items:

Out-of-Band Mgmt Port

Microsoft Windows Emergency Management Services (EMS) allows for remote management of a Windows Server OS through a serial port.

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

Terminal Type

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

[VT-UTF8] is the preferred terminal type for out-of-band management. The next best choice is [VT100+] and them [VT100]. See above, in Console Redirection Settings page, for more help with Terminal Type/Emulation.

Bits per second

Use this item to select serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.

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

Flow Control

Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a “stop” signal can be sent to stop the data flow. Once the buffers are empty, a “start” signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.

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

Data Bits

The default setting is: [8].

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

Parity

The default setting is: [None].

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

Stop Bits

The default setting is: [1].

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

- **Network Stack Configuration**

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

Network Stack

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.

Ipv4 HTP Support

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

Use this item to enable Ipv4 HTTP Boot Support. When set as [Disabled], Ipv4 HTTP 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

option will not be created.

Ipv6 HTTPE Support

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

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

PXE boot wait time

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

Media Detect Count

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

- **CSM Configuration**

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

Option ROM execution

Network

This option controls the execution of Legacy PXE OpROM.

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

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

- **USB Configuration**

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

USB Configuration

Legacy USB Support

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

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

[**Disabled]**: to keep USB devices available only for EFI specification,

[**Auto**]: To disable legacy support if no USB devices are connected.

XHCI Hand-off

This is a workaround for OSes without XHCI hand-off support. The XHCI

ownership change should be claimed by XHCI driver.
The optional settings are: [Enabled]; [Disabled].

USB Mass Storage Driver Support

Use this item to enable or disable 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].

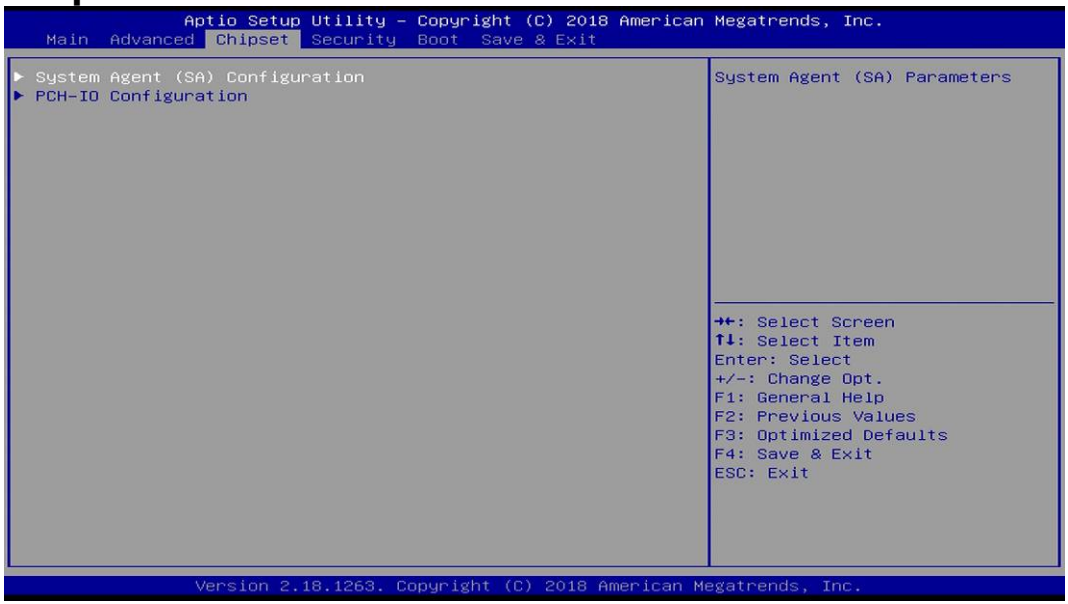
Device power-up delay

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 IGFX/PEG/PCI graphics device should be Primary Display.

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

Internal Graphics

Use this item to keep IGFX enabled or disabled based on he setup options.

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].
***Note**: above 4GB MMIO BIOS assignment is automatically enabled when selecting 2048MB aperture. To use this feature, please disable CSM Support.*
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: [256M]; [128M]; [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.
The optional settings are: [VBIOS Default]; [HDMI]; [LVDS].
***Note:** Secondary boot display selection will appear based on your selection.*
Secondary IGFX Boot Display
Use this item to select Secondary Display Device.
The optional settings are: [Disabled]; [HDMI].
Active LVDS
Use this item to select Active LFP Configuration.
The optional settings are: [Disabled]; [Enabled].
When set as [Enabled], the following sub-items shall appear:
Backlight Control
Use this item to select Back Light Control setting.
The optional settings are: [PWM inverted]; [PWM Normal].

Panel Type

Use this item to select Panel Type.

The optional settings are: [800x480 18bit Single]; [800x600 18bit Single]; [800x600 24bit Single]; [1024x600 18bit Single]; [1024x768 18bit Single]; [1024x768 24bit Single]; [1280x768 24bit Single]; [1280x800 18bit Single]; [1280x800 24bit Single]; [1366x768 18bit Single]; [1366x768 24bit Single]; [1440x900 18bit Dual]; [1440x900 24bit Dual]; [1280x1024 24bit Dual]; [1680x1050 24bit Dual]; [1920x1080 24bit Dual].

LVDS FW Write Protect

Use this item to select LVDS FW Update/Protect.

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

► **PEG Configuration**

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

PEG Port Configuration

PEG(PE1 Slot)

Max Link Speed

Use this item to select PE1 slot max 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].

Onboard Lan1 Controller/ Onboard Lan2 Controller /Onboard Lan3 Controller

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

Onboard Lan4 Controller

Use this item to enable or disable Lan4 onboard device or controller.

Wake on LAN

Use this item to enable or disable integrated LAN to wake the system.

MPE Slot

Use this item to enable or disable MPE slot device or controller.

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

Speed

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

M2E Slot

Use this item to enable or disable M2E slot device or controller.

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

Speed

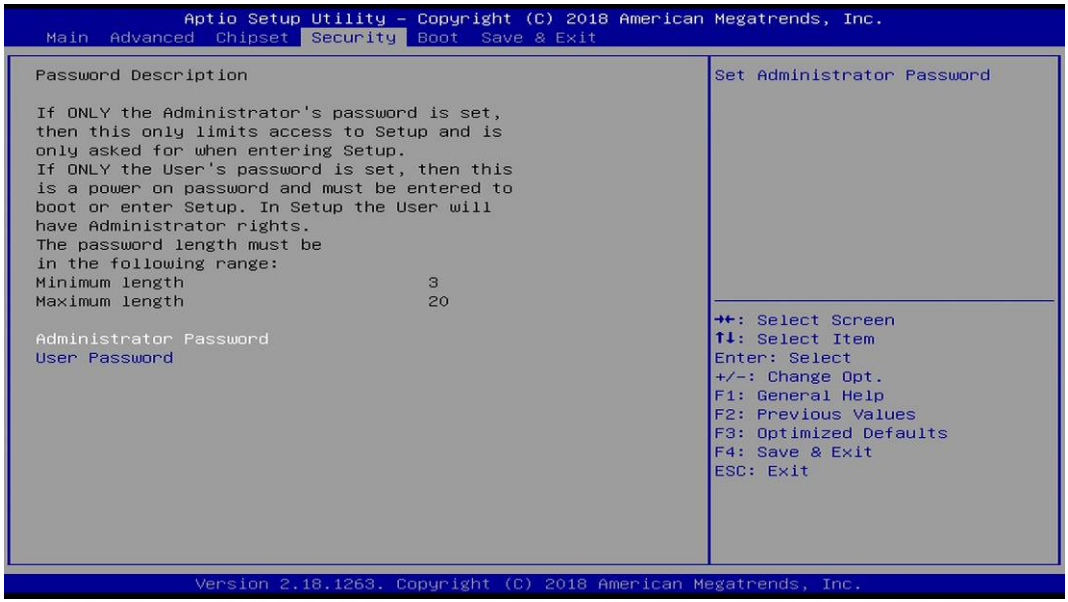
The optional settings are: [Auto]; [Gen1]; [Gen2]; [Gen3].

System State after Power Failure

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

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

3-9 Security Menu



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

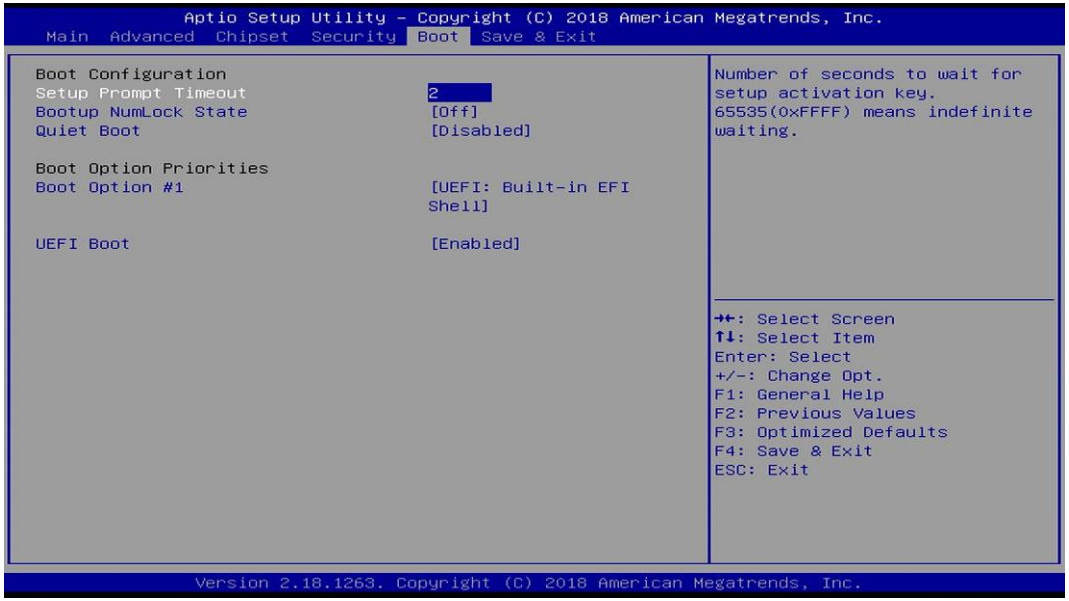
Administrator Password

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

User Password

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

3-10 Boot Menu



Boot Configuration

Setup Prompt Timeout

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

Bootup Numlock State

Use this item to select keyboard numlock state.

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

Quiet Boot

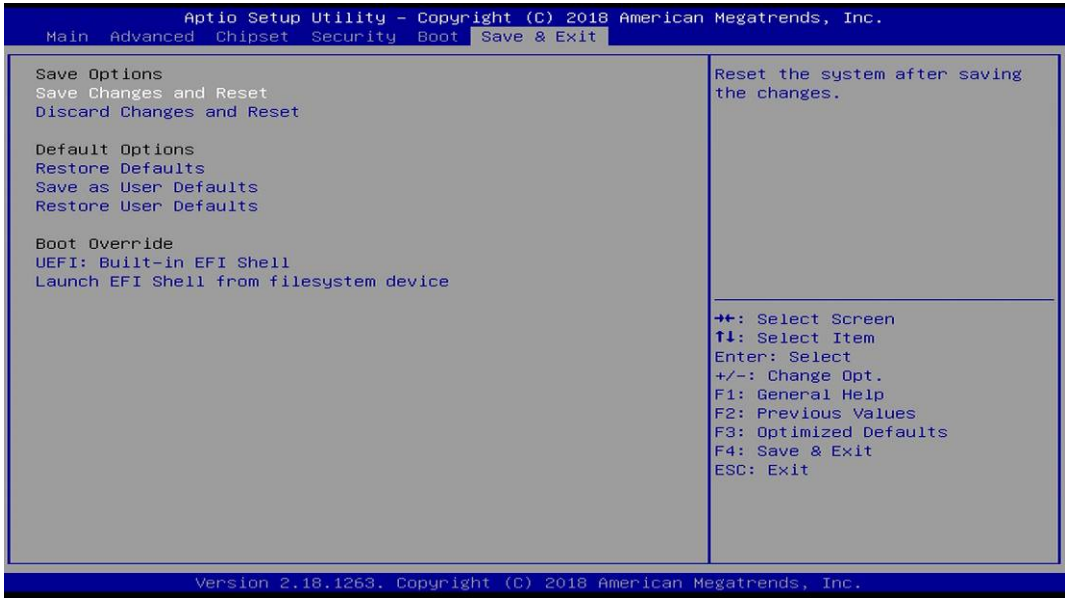
The optional settings are: [Disabled]; [Enabled].

Boot Option Priorities

Boot Option #1/ 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 the user defaults to all the setup options.

Boot Override

UEFI: Built-in EFI Shell

Press this item and a dialogue box shall appear to ask if user wish to save configuration and reset.

Lauch EFI Shell from filesystem device

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