Technical Manual

Of

Intel Braswell Series CPU

Based Mini-ITX M/B

NO.G03-NF591-F

Revision: 3.0

Release date: January 24, 2022

Trademark:

* Specifications and Information contained in this documentation are furnished for information use only, and are

  subject to change at any time without notice, and should not be construed as a commitment by manufacturer.

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

⚠️ CAUTION Environmental Safety Instruction

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

- 0 to 60 centigrade is the suitable temperature. (The figure comes from the request of the main chipset)

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

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

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

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Manual Revision Information

Reversion	Revision History	Date
3.0	Third Edition	January 24, 2022

Item Checklist

☑ Motherboard
☑ Cable(s)

Chapter 1
Introduction of the Motherboard

1-1   Feature of Motherboard

- Onboard Intel® Braswell series SoC Processor, with low power consumption never denies high performance

- Support 2* DDR3L 1600 MHz SO-DIMM, up to 8GB

- Onboard 2 * RJ-45 gigabit Ethernet LAN port

- Support 2 * SATAIII device

- Support USB 3.0 data transport demand

- Support DVI-D, VGA & LVDS multi-display

- Onboard 1* full-size Mini-PCIE slot

- Onboard 1* M.2 slot (M key-2242/2260/2280 SATA interface for SSD device)

- 1* SIM card slot

- Support CPU Over-Temperature protection

- Support CPU Over-Current/Under Voltage protection

- Support DRAM Over-Current/Under Voltage protection

- Amplifier implement to support 3W Speaker

- Support Smart FAN

- Compliance with ErP standard
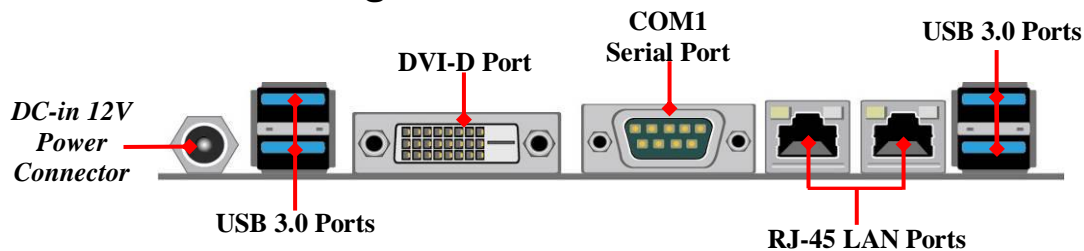
- Support Watchdog function

1-2 Specification

Spec	Description
Design	● 6 layers; PCB size: 17x 17 cm
Embedded CPU	● Intel® Braswell *SoC* CPU *CPU model varies from different IPC options. Please consult your dealer for more information of onboard CPU.*
Memory Slot	● 2* DDR3L SODIMM Slot for un-buffered *DDR3L 1600 MHz* SDRAM, expandable to 8GB ● Dual-channel function supported
Expansion Slot	● 1* Full-size Mini-PCIE slot ● 1* PCIE x1 slot
LAN Chip	● Integrated with 2* Realtek RTL8111G PCI-E Gigabit LAN chip ● Support Fast Ethernet LAN function of providing 10/100/1000Mbps Ethernet data transfer rate
Storage	● 2* SATAIII port (SATA1/2) ● 1*M.2 M-key 2242/2260/2280 slot *(*share with SATA2 port)*
BIOS	● AMI 64MB Flash ROM
Rear I/O	● 1* 12V DC-in system power Jack ● 4* USB 3.0 port ● 1* DVI-D port ● 1* RS232/422/485 serial port (**COM1**) ● 2* RJ-45 LAN port
Internal I/O	● 1* 2-Pin Internal 12V DC-in power connector ● 1* SATA Power-out connector ● 1* CPUFAN header ● 2* SYSFAN header ● 1* Front panel audio header ● 1* SPEAK_CON header ● 2* LAN LED activity header

	• 1* 4-pin USB 2.0 header (Expansible to 1* USB 2.0 port) • 1* 9-pin USB 2.0 header (Expansible to 2* USB 2.0 ports) • 1* Front panel header • 1* Power LED & speaker header • 1* PS/2 keyboard & mouse header • 1* SMBUS header • 1* GPIO_CON header • 5* RS232 serial port header**(COM2/3/4/5/6)** • 1* LVDS header • 1* LVDS inverter header • 1* Front panel VGA header

** **Note: 1.** 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. **2.** Braswell SOC will support memory speed at 1600 MHz and 1066 MHz only. If 1333 MHz DIMM is installed, it will run at 1066 MHz. It is not validated while installing 1066MHz DIMM with this SOC.*
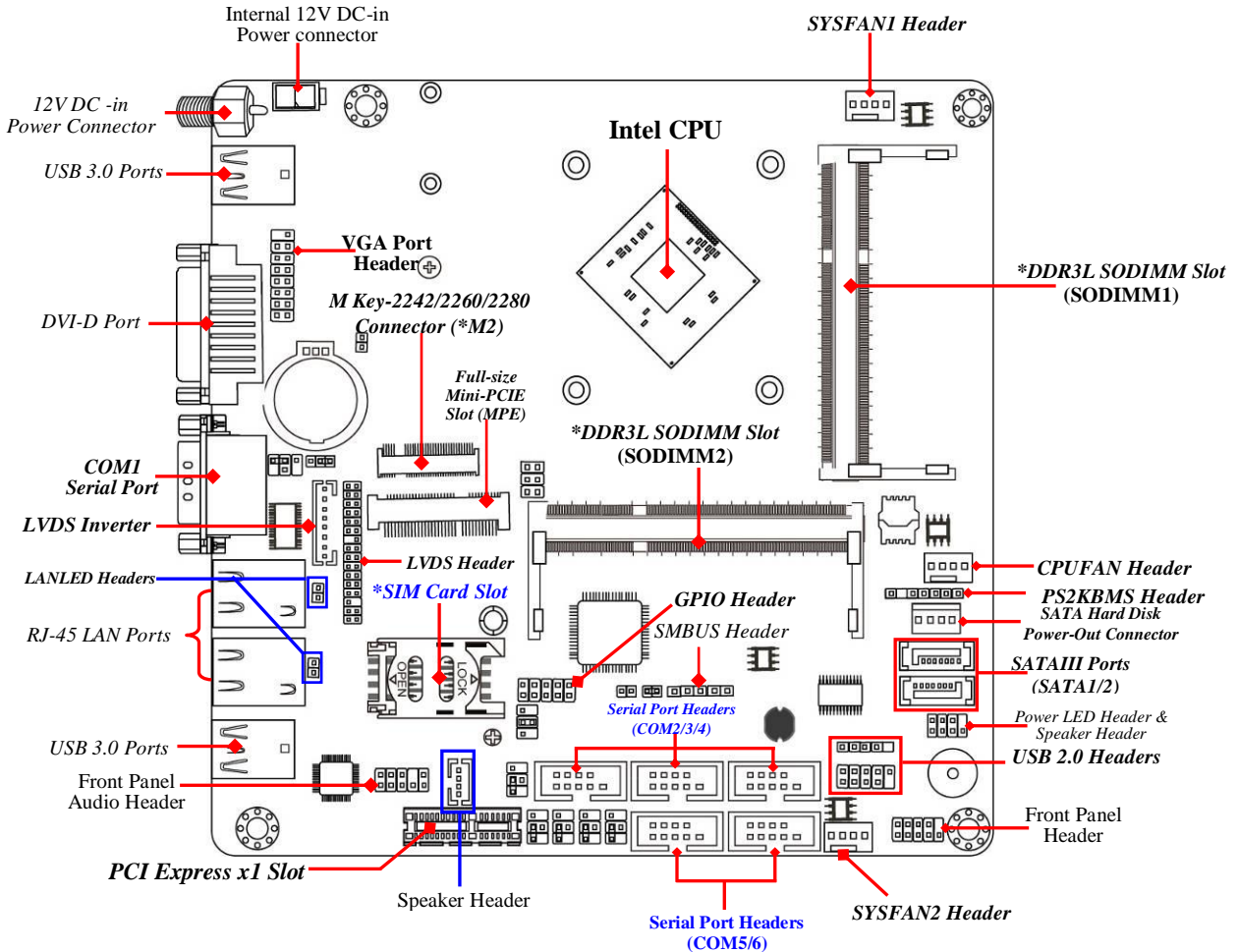
1-3   Layout Diagram
Rear IO Panel Diagram:

Motherboard Internal Diagram

Note: 1. SODIMM1 must be used for single DIMM use case; the module should be **1.35V DDRIII** SODIMM and **not exceeding 8GB total capacity**. **2. M2** slot shares function with **SATA2** port; i.e. only one can function at a time; **M2** slot functions as **M Key interface** and can only support **SATA SSD device**, not PCI-E NAND device.

Jumper Position:

RTC_RST

JP4

JP1

JBAT

COPEN

JP5

JP3

AT_MODE

JP6

JP7

JP8

JP9
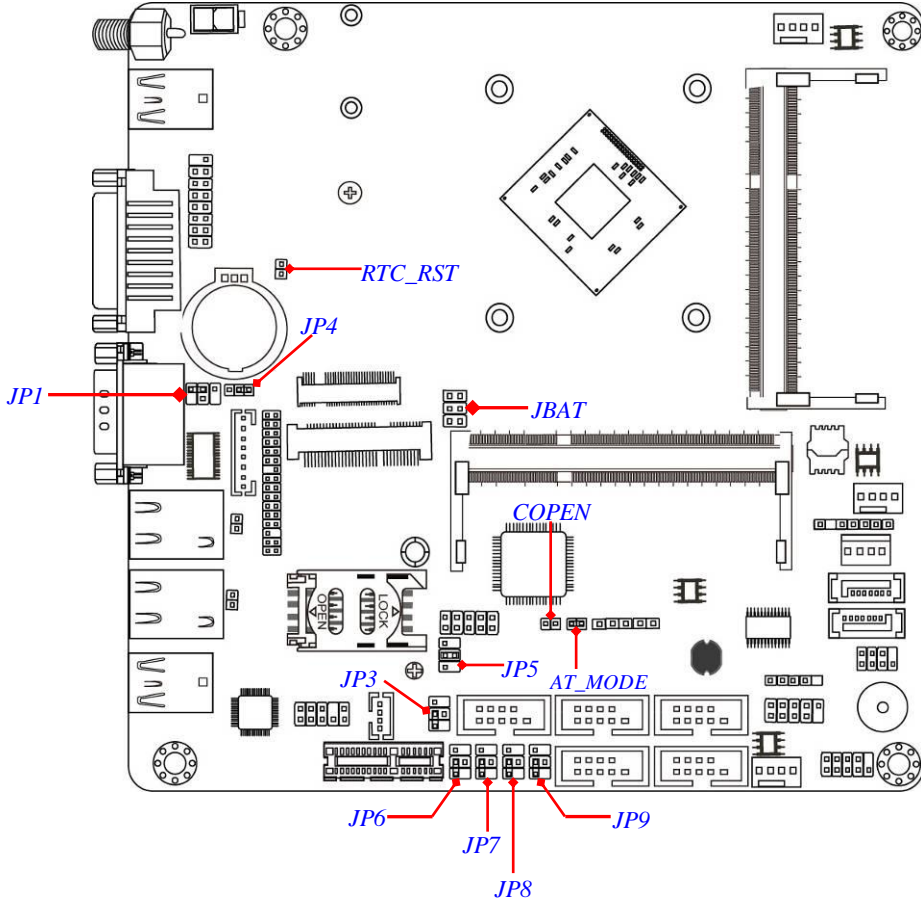
Jumper

Jumper	Name	Description
JP1	COM1 Port Pin9 Function Select	4-Pin Block
JP3	COM2 Header Pin9 Function Select	4-Pin Block
JP6	COM3 Header Pin9 Function Select	4-Pin Block
JP7	COM4 Header Pin9 Function Select	4-Pin Block
JP8	COM5 Header Pin9 Function Select	4-Pin Block
JP9	COM6 Header Pin9 Function Select	4-Pin Block
JP5	LVDS Panel VCC 3.3V /5V/12V Select	4-Pin Block
JP4	INVERTER Back Light 5V/12V Select	3-Pin Block
COPEN	Case Open Message Display Function	2-Pin Block
AT_MODE	ATX Mode / AT Mode Select	2-Pin Block
RTC_RST	Reset all RTC register bits	2-Pin Block
JBAT	*Pin (1&2):* Flash Descriptor Security Override *Pin (3&4):* Clear CMOS RAM Function Setting *Pin (5&6):* ODD Present Setting	6-Pin Block

Connectors

| Connector	Name
DCIN	DC 12V System Power–in Connector
ATX2P	Internal DC 12V System Power–in Connector
USB30/USB31	USB 3.0 Port Connector X2
DVI	DVI-D Port Connector
COM1	Serial Port Connector
LAN1/LAN2	RJ-45 LAN Port Connector X2
SATA1/2	SATAIII Port Connector X2
SATAPW	SATA Power out Connector
CPUFAN	CPUFAN Connector
SYSFAN1/SYSFAN2	SYSFAN Connector X2

Headers

Header	Name	Description
FP_AUDIO	Front Panel Audio Header	9-pin Block
SPEAK_CON	Speaker Header	4-pin Block
LAN1_LED/LAN2LED	LAN Activity LED Header	2-pin Block
FP_USB21	USB 2.0 Header	4-pin Block
FP_USB20	USB 2.0 Header	9-pin Block
JW_FP	Front Panel Header(PWR LED/ HDD LED/Power Button /Reset)	9-pin Block
SPK-LED	Power LED & Speaker Header	7-pin Block
PS2KBMS	PS/2 Keyboard & Mouse Header	6-pin Block
SMBUS	SMBUS Header	5-pin Block
GPIO_CON	GPIO Header	10-pin Block
COM2/3/4/5/6	Serial Port Header X5	9-pin Block
LVDS	LVDS Header	32-pin Block
INVERTER	LVDS Inverter	8-pin Block
FP_VGA	Front Panel VGA Header	15-pin Block

Chapter 2
Hardware Installation
2-1 Jumper Setting
JP1 (4-pin): COM1 Port Pin9 Function Select
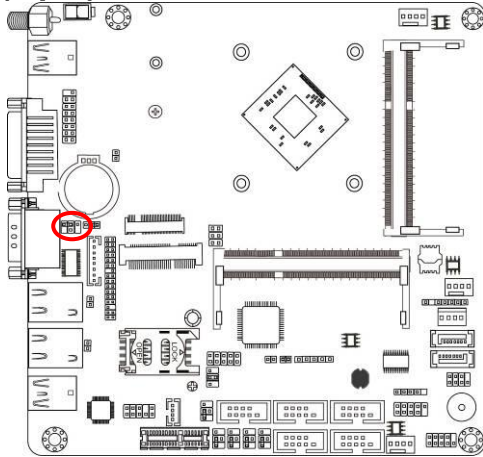
JP1→COM1 Port Pin-9
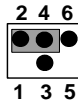
2 4 6
1 3 5
2-4 Closed:
RI=RS232(Default);

2 4 6
1 3 5
3-4 Closed:
RI= 5V;
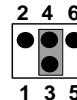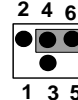
2 4 6
1 3 5
4-6 Closed:
RI= 12V.

JP3 (4-pin): COM2 Header Pin9 Function Select

JP3→COM2 Header Pin-9

6   5
4   3
2   1
2-4 Closed:
RI=RS232;

6   5
4   3
2   1
3-4 Closed:
RI= +5V;
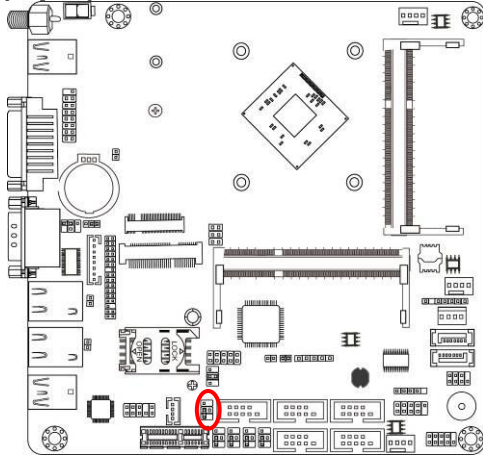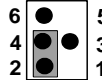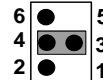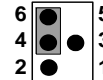
6   5
4   3
2   1
4-6 Closed:
RI= +12V.

JP6 (4-pin): COM3 Header Pin9 Function Select

JP6→COM3 Header Pin-9
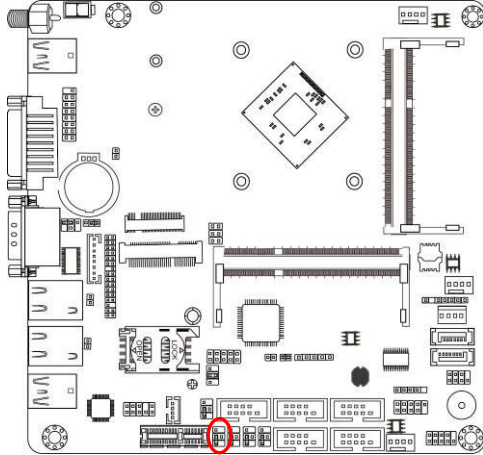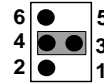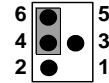
6 ● 5 4 ● ● 3 2 ● 1	6 ● 5 4 ● ● 3 2 ● 1	6 ● 5 4 ● ● 3 2 ● 1
2-4 Closed: **RI=RS232;**	**3-4 Closed:** **RI= +5V;**	**4-6 Closed:** **RI= +12V.**

JP7 (4-pin): COM4 Header Pin9 Function Select

JP7→COM4 Header Pin-9
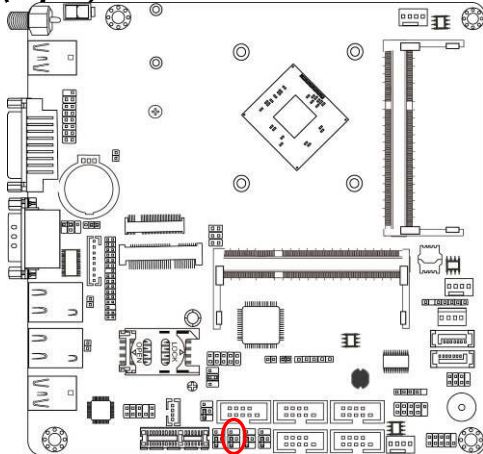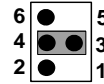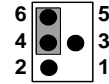
6 ● 5 4 ● ● 3 2 ● 1	6 ● 5 4 ● ● 3 2 ● 1	6 ● 5 4 ● ● 3 2 ● 1
2-4 Closed: **RI=RS232;**	**3-4 Closed:** **RI= +5V;**	**4-6 Closed:** **RI= +12V.**

JP8 (4-pin): COM5 Header Pin9 Function Select

JP8→COM5 Header Pin-9

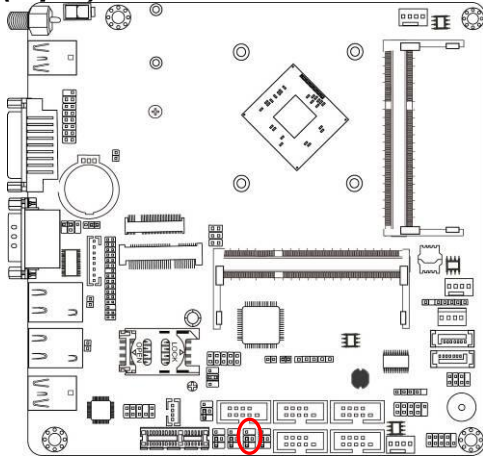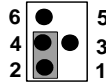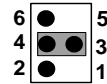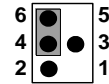|		
2-4 Closed: RI=RS232;	**3-4 Closed:** RI= +5V;	**4-6 Closed:** RI= +12V.

JP9 (4-pin): COM6 Header Pin9 Function Select

JP9→COM6 Header Pin-9

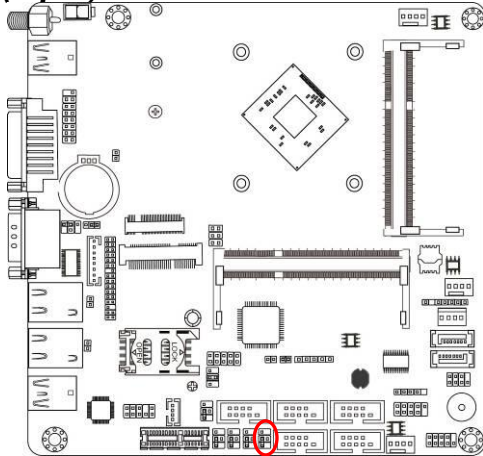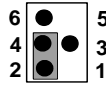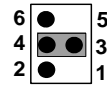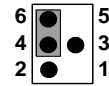|		
2-4 Closed: RI=RS232;	**3-4 Closed:** RI= +5V;	**4-6 Closed:** RI= +12V.

JP5 (4-pin): LVDS Panel VCC 3.3V/5V/12V Select
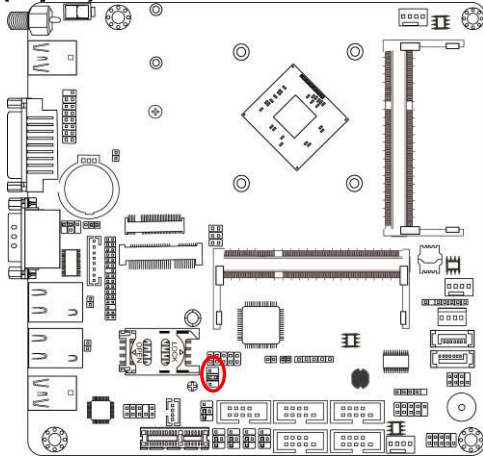
JP5→LVDS Panel VCC

```
6 ● ● 5          6 ● ● 5          6 ● ● 5
4 ● ● 3          4 ● ● 3          4 ● ● 3
2 ● ● 1          2 ● ● 1          2 ● ● 1
```
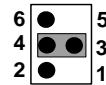
2-4 Closed: **3-4 Closed:**   **4-6 Closed:**
VCC=3.3V;   **VCC= 5V**   **VCC= 12V.**
                        (Default);
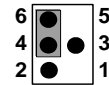
JP4 (3-pin): INVERTER Back Light VCC 5V/12V Select
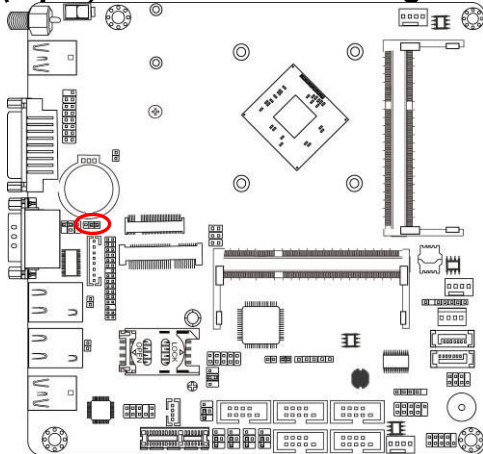
JP4→INVERTER Back Light VCC

```
1        3
■ ● ●
```
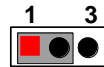
1-2 Close: INVERTER Back Light 5V Selected;

```
1        3
■ ● ●
```
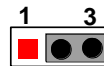
2-3 Close: INVERTER Back Light 12V Selected(Default).

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

COPEN

1

1-2 Open: Normal(Defualt);

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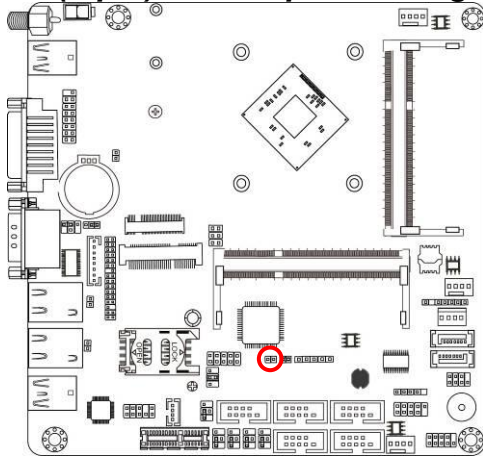
1-2 Closed: Case Open Function Selected(One Touch).

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.*

AT_MODE (2-pin): ATX Mode/AT Mode Select

AT_MODE

1
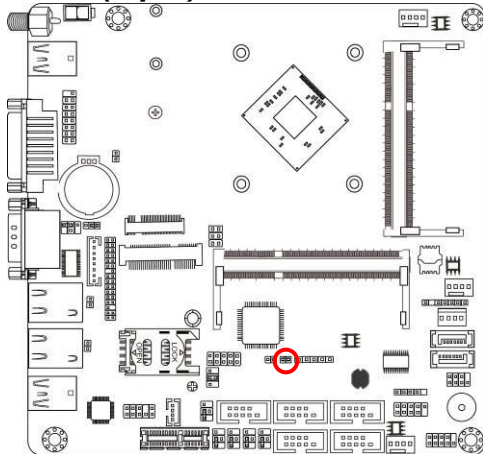
1-2 Open: ATX Mode Selected;

1

1-2 Closed：AT Mode Selected.

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

RTC_RST (2-pin): Reset All RTC Register Bits

RTC_RST

1
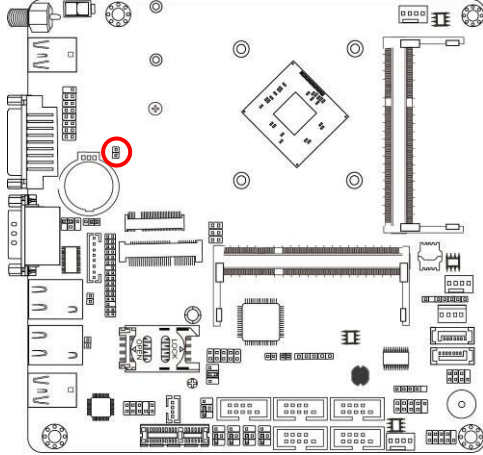
1-2 Open: Normal(Default);

1

1-2 Close: RTC Reset.

Pin 1 & 2 of JBAT (6-pin): Flash Descriptor Security Override
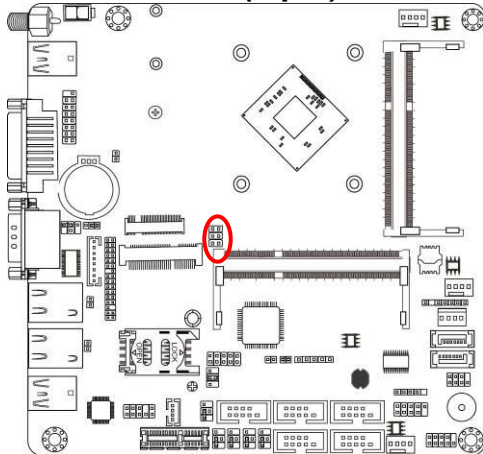
Pin 1-2 of JBAT→ Flash Desciptor Security Override

Pin 1→ **2**

1-2 Open: Normal (Default);

Pin 1 → **2**
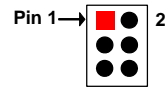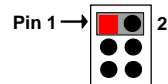
1-2 Closed: Flash Descriptor Security Override.

Pin 3 & 4 of JBAT (6-pin): Clear CMOS Setting
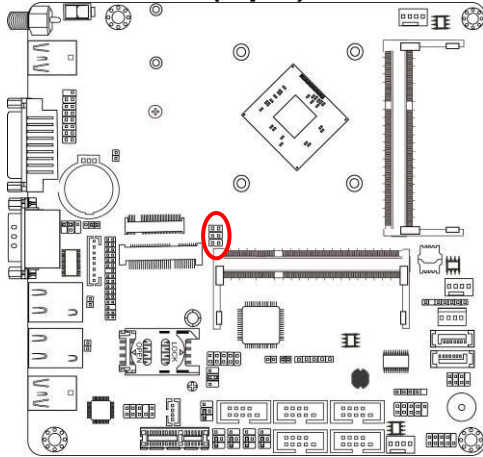
Pin 3-4 of JBAT→Clear CMOS

Pin1→ ■ ● 2
3 ● ● 4
● ●
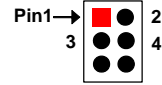
3-4 Open: Normal(Default);

Pin1→ ■ ● 2
3 ● ● 4
● ●
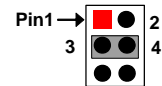
3-4 Closed: Clear CMOS(One Touch).

Pin 5&6 of JBAT (6-pin): ODD Present Select
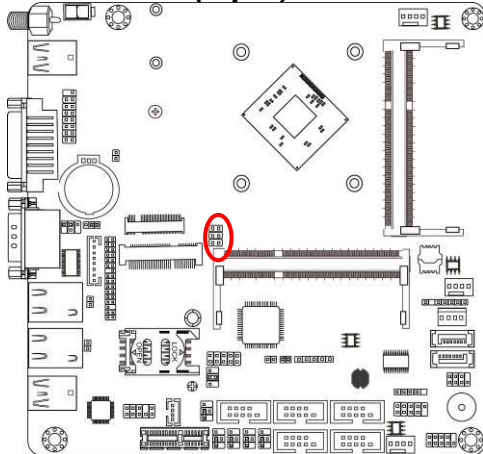
Pin 5-6 of JBAT→ODD Present Select

Pin1 → ■ ● 2
3 ● ● 4
5 ● ● 6
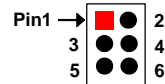
5-6 Open: Normal (Default);

Pin1 → ■ ● 2
3 ● ● 4
5 ● ● 6
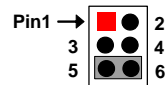
5-6 Closed: ODD Present.

2-2   Connectors and Headers
2-2-1 Connectors

(1) Rear I/O Connectors
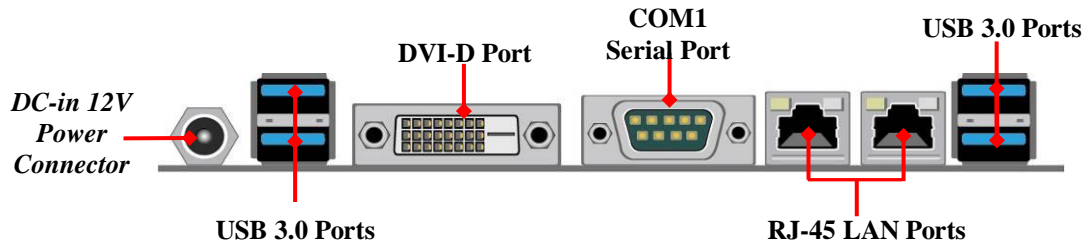
Icon	Name	Function
	12V DC-in Power Connector	For user to connect compatible power adapter to provide power supply for the system.
	USB 3.0 Port	To connect USB keyboard, mouse or other devices compatible with USB specification. USB 3.0 ports supports up to 5Gbps data transfer rate.
	DVI-D Port	To connect display device that support DVI specification.
	COM1: *RS232/422/485 Serial Port*	Mainly for user to connect external MODEM or other devices that supports Serial Communications Interface.
	RJ-45 LAN Port	This connector is standard RJ-45 LAN jack for Network connection.

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

COM1 port can function as RS232/422/485 port. In normal settings COM1 functions as RS232 port. With compatible COM cable COM1 can function as RS422 or RS 485 port.

User also needs to go to BIOS to set **'Transmission Mode Select'** for COM1 (*refer to Page 31*) at first, before using specialized cable to connect different pins of this port.
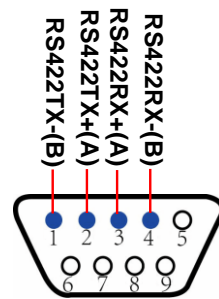
For RS422 Mode
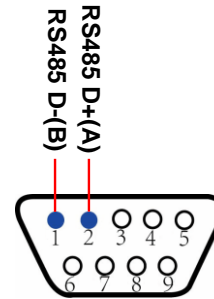
For RS485 Mode

(3) ATX2P (2-pin Block): Internal 12V DC-in Power Connector

Pin1
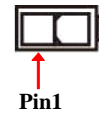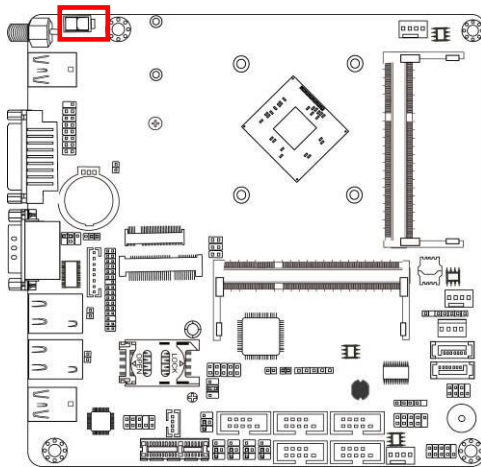
Pin.	Definition
1	GND
2	+12V DC_IN

(4) SATA1/SATA2(7-pin Block): SATAIII Port connector

These are high-speed SATAIII ports that support 6GB/s transfer rate.
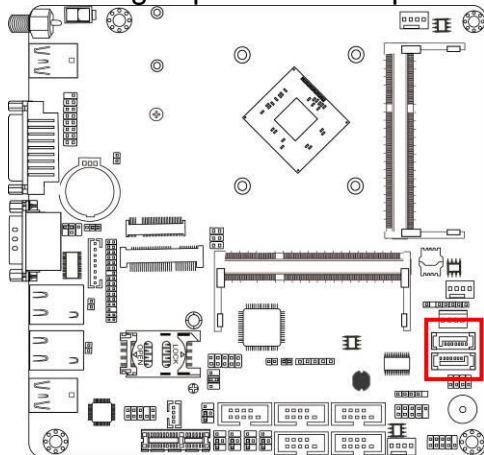
Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND
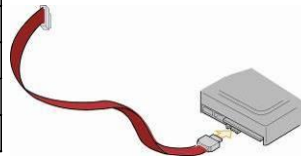
(5) SATAPW (4-pin): SATA Power Out Connector

Pin 1 →

+5V GND GND +12V
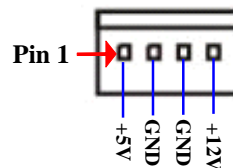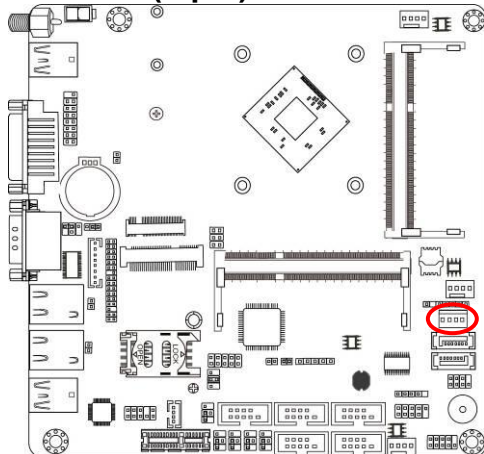
Warning: *Make sure that Pin-1 of compatible SATA Power connector is inserted into corresponding Pin-1 of PWOUT to avoid possible damage to the board and hard disk driver!*

(6) CPUFAN1/SYSFAN1/SYSFAN2 Connector (4-pin): FAN Connectors

Control
Fan Speed
+12V Fan Power
GND

Pin1
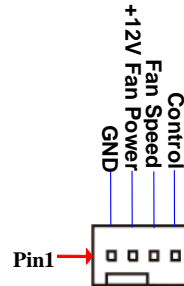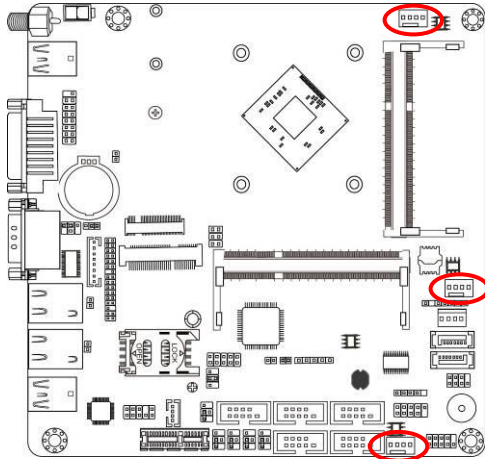
2-2-2 Headers

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

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

LINE_OUT_JD
MIC_JD
DETECT
GND

2
Pin 1

MIC2-L
MIC2-R
LINE OUT-R
SENSE
LINE OUT-L
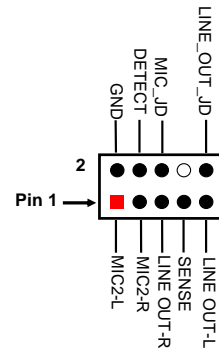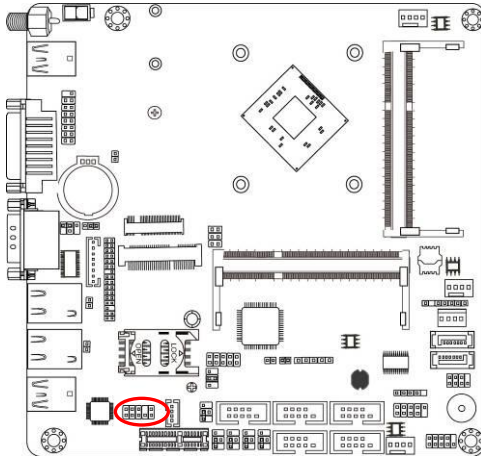
Line-Out, MIC Header

(2) SPEAK_CON (4-pin): Speaker Connector

Pin1
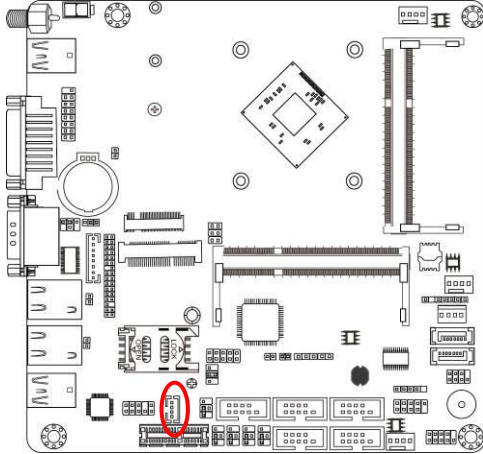
Pin No.	Definition
1	L-
2	L+
3	R+
4	R-

(3) LAN1_LED/LAN2_LED (2-pin): LAN Activity LED Header

LED-
LED+

Pin 1
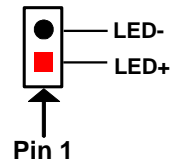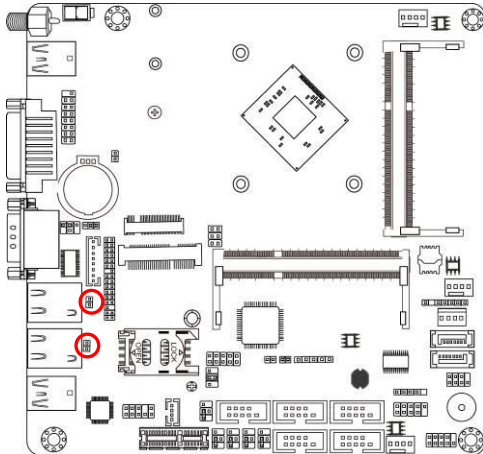
(4) FP_USB21 (4-pin): USB 2.0 Port Header

Pin 1 →

VCC
-DATA
+DATA
GND
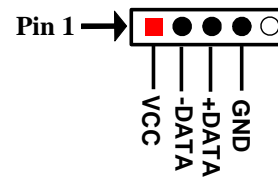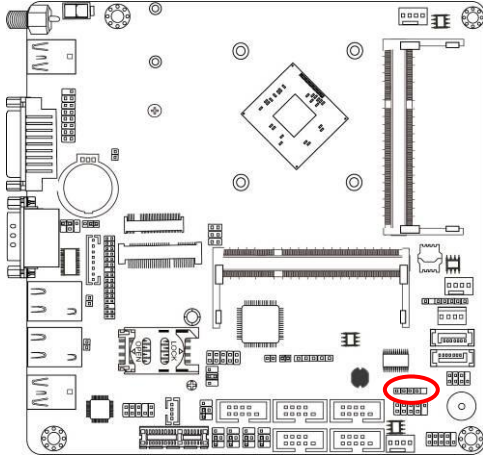
(5) FP_USB20 (9-pin): USB 2.0 Port Header

-DATA
VCC
+DATA
GND
NC

Pin 1 →

VCC
-DATA
+DATA
GND
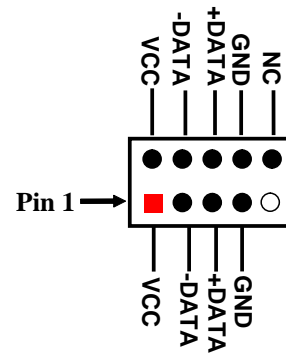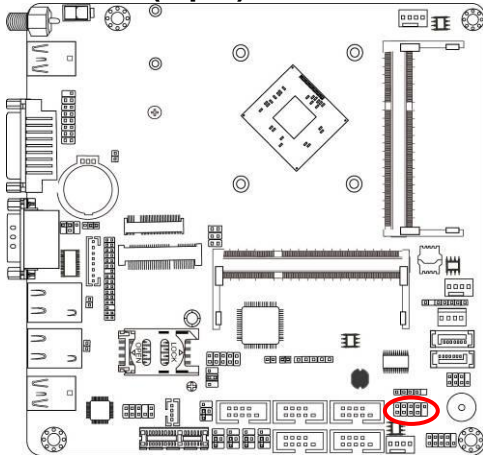
(6) JW_FP (9-pin): Front Panel Header
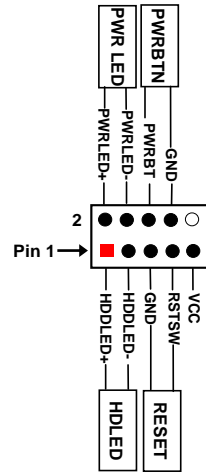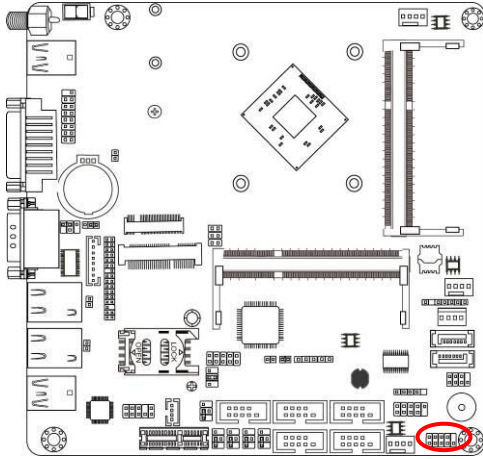
(7) SPK-LED (7-pin): Speaker Header & PWR LED Header
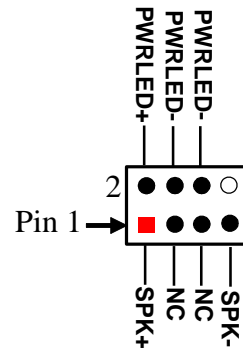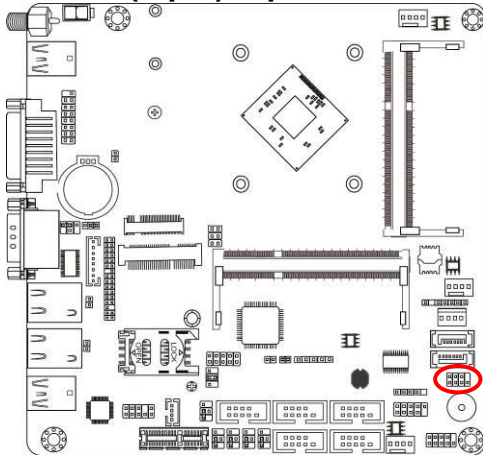
(8) PS2KBMS (6-pin): PS2 Keyboard & Mouse Header

VCC
KB_DATA
KB_CLK
GND
MS_CLK
MS_DATA
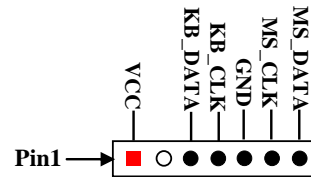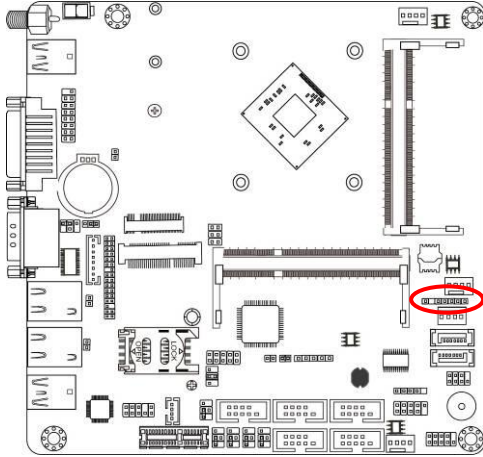
Pin1 →

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

SMBUS_CLK
SMBUS_DATA
NC
GND
3VSB
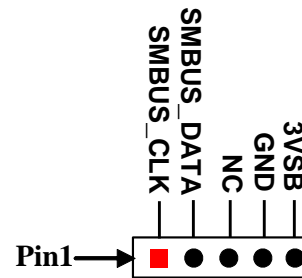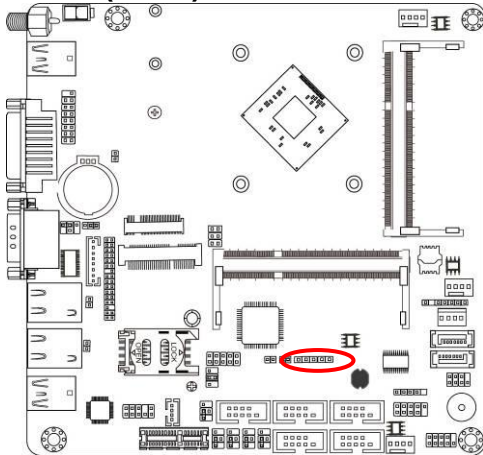
Pin1 →

(10)   GPIO_CON (10-pin): GPIO Header
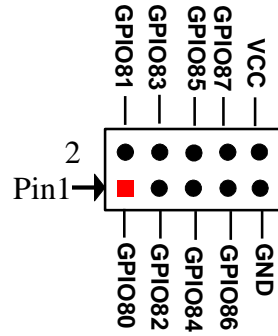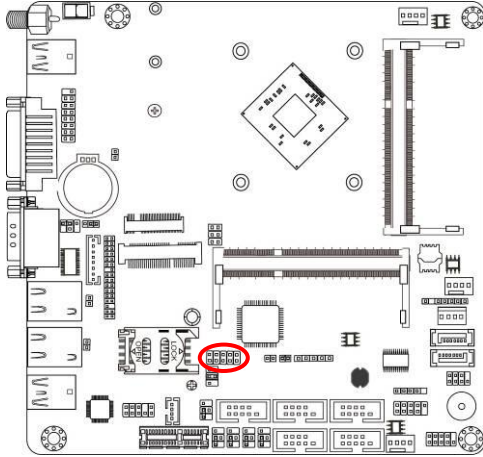
(11)   COM2/3/4/5 (9-pin): Serial Port Header
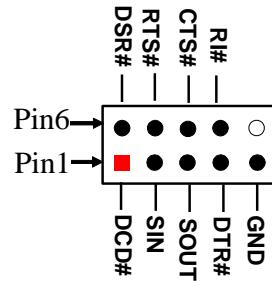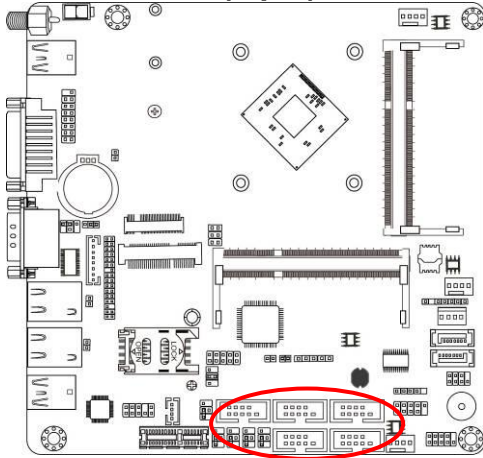
(12)   LVDS (32-pin): 24-bit Dual Channel LVDS Header
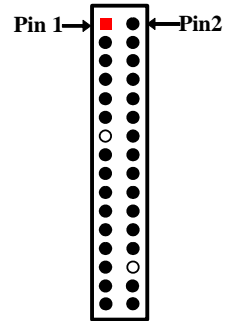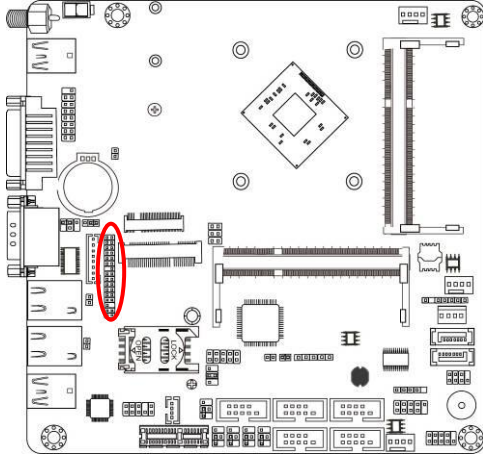
Pin NO.	Pin Define	Pin NO.	Pin Define
Pin 1	LVDSB_DATAN3	Pin 2	LVDSB_DATAP3
Pin 3	LVDS_CLKBN	Pin 4	LVDS_CLKBP
Pin 5	LVDSB_DATAN2	Pin 6	LVDSB_DATAP2
Pin 7	LVDSB_DATAN1	Pin 8	LVDSB_DATAP1
Pin 9	LVDSB_DATAN0	Pin 10	LVDSB_DATAP0
Pin 11	LVDS_DDC_DAT	Pin 12	LVDS_DDC_CLK
Pin 13	N/A	Pin 14	GND
Pin 15	GND	Pin 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	PVDD	Pin 28	N/A
Pin 29	PVDD	Pin 30	PVDD
Pin 31	GND	Pin 32	GND

(13)　INVERTER (8-pin): LVDS Inverter Connector
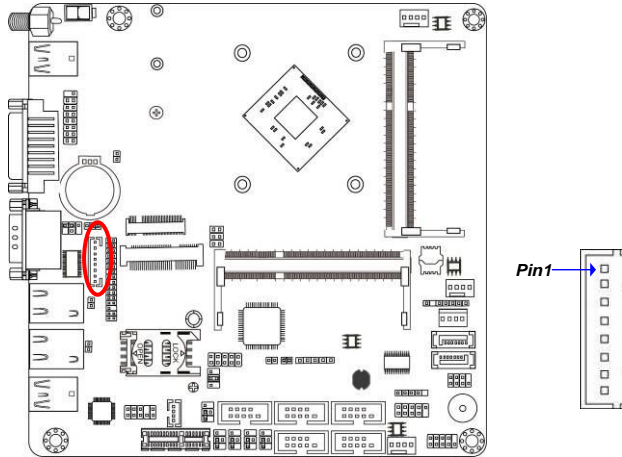
Pin No.	Definition
1	Backlight Enable
2	Backlight PWM
3	Backlight VCC
4	Backlight VCC
5	GND
6	GND
7	Backlight Brightness Up SW
8	Backlight Brightness Down SW

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

(14)　FP_VGA(15-pin): VGA Port Header
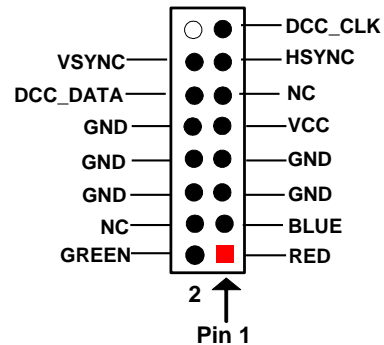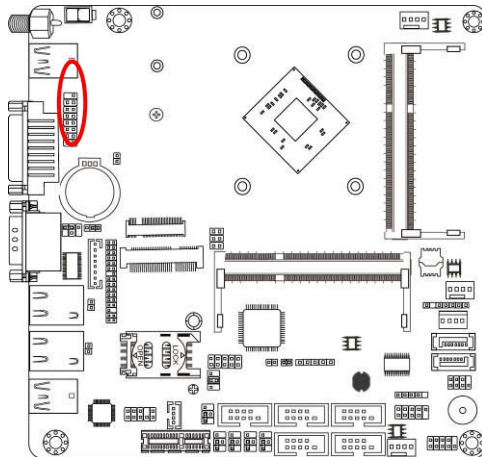
Chapter 3
Introducing BIOS

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

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

3-1   Entering Setup

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

   Press   **<Del>** to enter Setup; press < **F7**> to enter pop-up Boot menu.

3-2 BIOS Menu Screen

The following diagram show a general BIOS menu screen:

Menu Bar

General Help Items

Menu Items

Current Setting Value
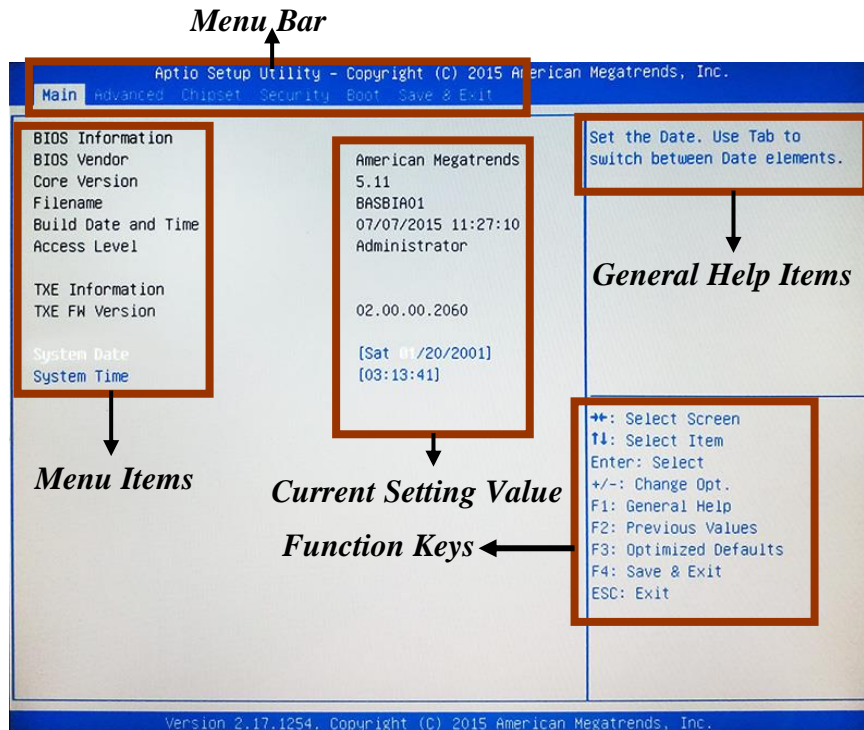
Function Keys

3-3 Function Keys

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

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

- Press **<+>/<−>** keys when you want to modify the BIOS parameters for the active option.
- **[F1]:** General help.
- **[F2]:** Previous value.
- **[F3]:** Optimized defaults.
- **[F4]:** Save & Exit.
- **[F7]:** To enter pop-up boot menu to select boot device.
- Press **<Esc>** to quit the BIOS Setup.

3-4   Getting Help

Main Menu

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

Status Page Setup Menu/Option Page Setup Menu

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

3-5 Menu Bars

There are six menu bars on top of BIOS screen:

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

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

3-6   Main Menu

Main menu screen includes some basic system information. Highlight the item and then use the <+> or <-> and numerical keyboard keys to select the value you want in each item.
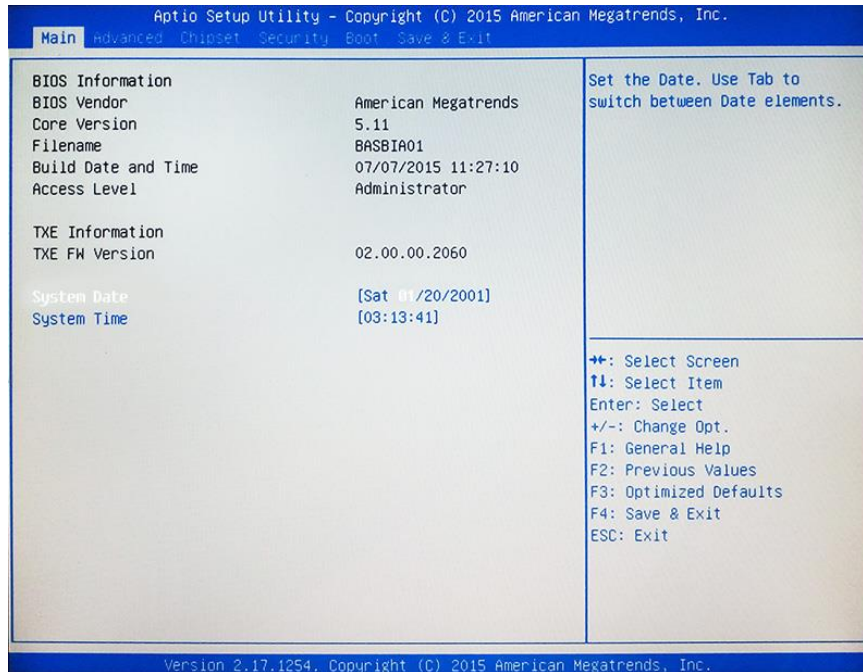
System Date
Set the date. Please use [Tab] to switch between data elements.
System Time
Set the time. Please use [Tab] to switch between time elements.

3-7 Advanced Menu
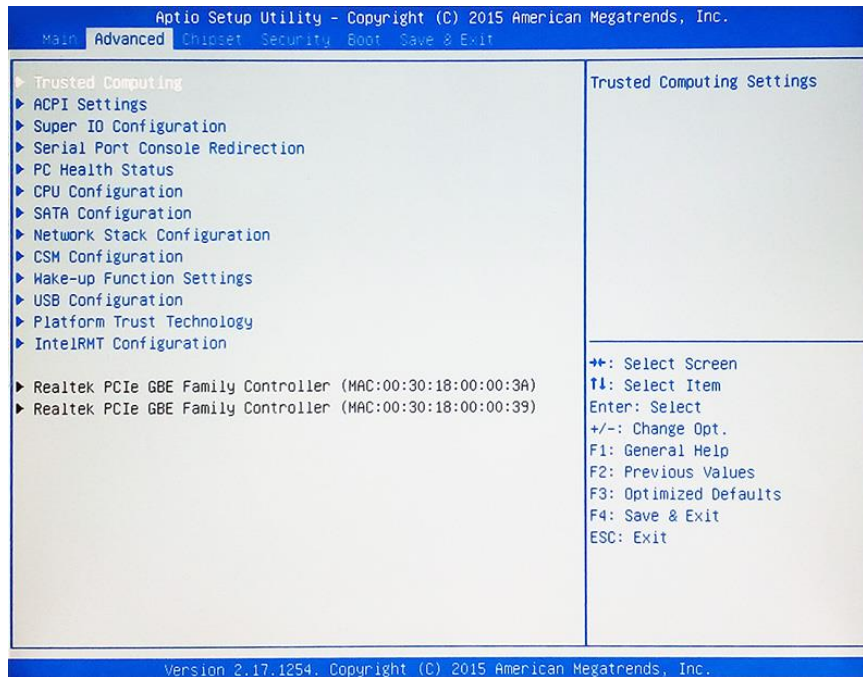
▸ **Trusted Computing**
Press [Enter] to enable or disable Security Device Support.
TPM20 Device Found

Security Device Support
Use this item to enable or disable BIOS support for security device. TCG EFI protocol and INT1A interface will not be available.
The optional settings: [Disabled]; [Enabled].
HashPolicy
Use this item to enable or disable the Hash policy to use. SHA-2 is most secure but might not be supported by all operating systems.
The optional settings: [Sha-1]; [Sha-2].

▶ **ACPI Settings**

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

ACPI Sleep State

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

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

▶ **Super I/O Configuration**

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

▶ **Serial Port 1 Configuration**

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

Serial Port

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

Change Settings

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

Transmission Mode Select

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

Mode Speed Select

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

Serial Port FIF0 Mode

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

▶ **Serial Port 2 Configuration/ Serial Port 3 Configuration/ Serial Port 4 Configuration/ Serial Port 5 Configuration/ Serial Port 6 Configuration**

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

Serial Port

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

Change Settings

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

Serial Port FIF0 Mode

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

OS Select for Serial Port

The optional settings: [Windows]; [LINUX].

ERP Support

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

This item should be set as **[Disabled]** if you wish to have all active wake-up functions.

Case Open Detect

This item controls detect case open function.

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

WatchDog Reset Timer

Use this item to enable or disable WatchDog Timer 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 [10] to [255].

WatchDog Reset Timer Unit

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

WatchDog Wake-up Timer

This item support WDT wake-up while ERP function is set as [Enabled].

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

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

WatchDog Wake-up Timer Value

The setting range is [10] ~ [4095] seconds, or [1] ~ [4095] minutes.

WatchDog Wake-up Timer Unit

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

ATX Power Emulate AT Power

This item displays current Emulate AT Power Status, motherboard power On/Off control by power supply. User needs to select 'AT or ATX Mode' on MB jumper at first (refer to *Page 9*, **Pin (1&2) of J1** for ATX Mode & AT Mode Select).

‣ **Serial Port Console Redirection**
Press [Enter] to make settings for the following sub-items:
<u>*COM1*</u>

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':

▸ **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 default setting is: [COM1].
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.

▶ **PC Health Status**
Press [Enter] to view current hardware health status, set shutdown temperature, or make further settings in '**SmartFan Configuration**'.

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

CPUFAN / SYSFAN1/SYSFAN2 Smart Mode
The optional settings: [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 the preset 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 the 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 the 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 the pre-set duty.

Shutdown Temperature Configuration

Use this item to select system shutdown temperature.

The optional settings are: [Disabled]; [65℃/148℉]; [70℃/156℉]; [75℃/164℉]; [80℃/172℉]; [85℃/180℉].

▶ **CPU Configuration**

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

Limit CPUID Maximum

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

This item should be set as [Disabled] for Windows XP.

Intel Virtualization Technology

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

When set as [Enabled], a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

EIST

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

Use this item to enable or disable Intel SpeedStep.

CPU C State Report

Use this item to enable or disable CPU C state report to OS.

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

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

Max CPU C State

This item controls Max C state that the processor will support.

The optional settings: [C7]; [C6]; [C1].

▶ **SATA Configuration**

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

SATA Configuration

SATA Controller

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

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

SATA Mode Selection

The default setting is: [AHCI].

SATA Interface Speed
The item is for user to set the maximum speed the SATA controller can support.
The optional settings are: [Gen1]; [Gen2]; [Gen3].
SATA Port1/ SATA Port2
Port1/ Port2
The optional settings are: [Enabled]; [Disabled].
‣ **Network Stack Configuration**
Press [Enter] to go to '**Network Stack**' screen to make further settings.
Network Stack
The optional settings are: [Enabled]; [Disabled].
When set as [Enabled], the following sub-items shall appear:
Ipv4 PXE Support
The optional settings are: [Disabled]; [Enabled].
Use this item to enable Ipv4 PXE Boot Support. When set as [Disabled], Ipv4 boot optional 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], Ipv4 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.
The optional settings range from [1] to [50].
‣ **CSM Configuration**
Press [Enter] to make settings for the following sub-items:
Compatibility Support Module Configuration
Boot Option Filter
This item controls Legacy/UEFI ROMs priority.
The optional settings are: [UEFI and Legacy]; [Legacy only]; [UEFI only].
Network

This item controls the execution of UEFI and legacy PXE OpROM.

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

Storage

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

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

Other PCI devices

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

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

‣ **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-up by RTC alarm.

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-up by RTC alarm.

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

When set as [Enabled], system will wake on the current time + increased minute(s).The settings range is from [1] ~ [60] minute(s).

PS2 KB/MS Wake-up from S3-S5

Use this item to enable or disable USB Wake-up from S3-S5.

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

*This item is only supported when **'ERP Support'** is set as [Disabled]. Please disable ERP before activating this function in S4 or S5 state .*

‣ **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].

EHCI Hand-off

This is a workaround for OSes without EHCI hand-off support. The EHCI ownership change should be claimed by EHCI driver.

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

USB Mass Storage Driver Support

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

USB Hardware Delays and Time-outs:

USB Transfer Time-out

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

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

Device Reset Time-out

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

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

Device Power-up Delay

Use this item to set maximum time the device will take before it properly reports itself to the host controller.

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

'Auto' uses default value: for a root port it is 100 ms, for a hub port the delay is taken from hub descriptor.

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

Device Power-up Delay in Seconds

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

‣ **Platform Trust Technology**

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

TPM Configuration
fTPM

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

▸ **IntelRMT Configuration**

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

IntelRMT Configuration
Intel RMT Support

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

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

   HW Notification

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

3-8 Chipset Menu
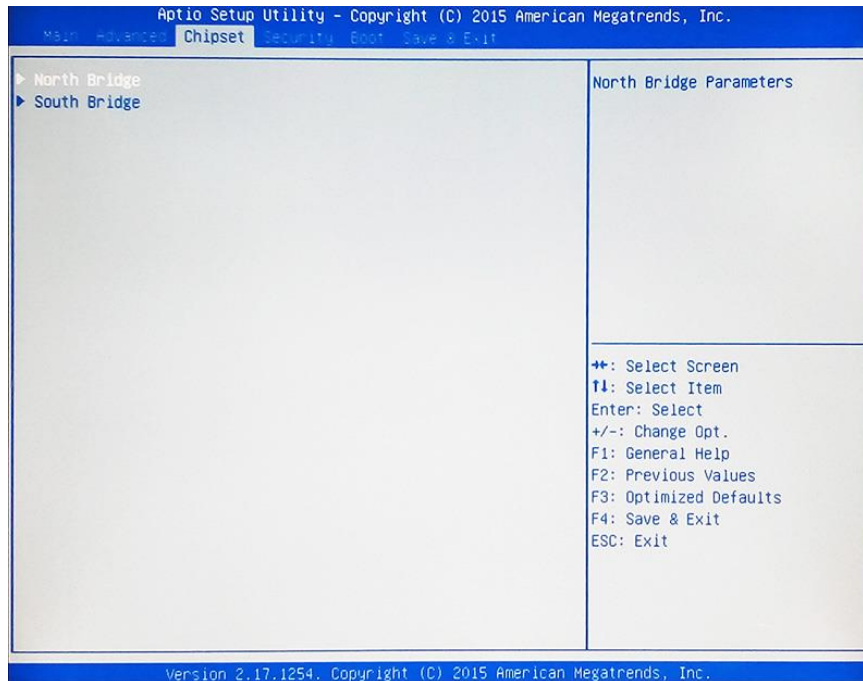
▸ **North Bridge**

Press [Enter] to view memory configurations or make settings for the following sub-items:

PAVC

Use this item to enable or disable protected audio video control.

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

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].

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].

Aperture Size

The optional settings are: [128MB]; [256MB]; [512MB].

GTT Size

The optional settings are: [2MB]; [4MB]; [8MB].

Primary IGFX Boot Display

The optional settings are: [Auto]; [DVI].

Secondary IGFX Boot Display

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

Active LFP

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

[Disable]: VBIOS disable LVDS.

[Enable]: VBIOS enable LVDS.

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

LCD Panel Type

Use this item to manually select LVDS panel type.

The optional setting are: [800x 480 1ch 18-bit]; [800x 600 1ch18-bit]; [800x 600 1ch 24-bit]; [1024 x 600 1ch 18-bit]; [1024 x 768 1ch 18-bit]; [1024 x 768 1ch 24-bit]; [1280 x 768 1ch 24-bit]; [1280 x 800 1ch 18-bit]; [1280 x 800 1ch 24-bit]; [1366 x 768 1ch 18-bit]; [1366 x 768 1ch 24-bit]; [1440 x 900 2ch 18-bit]; [1440 x 900 2ch 24-bit]; [1280 x 1024 2ch 24-bit]; [1680 x 1050 2ch 24-bit]; [1920 x 1080 2ch 24-bit].

LVDS FW Protect

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

DDC Pass to CRT

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

▶ **South Bridge**

Press [Enter] to further setting USB device configuration.

Mini PCIE

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

> **Mini PCIE Speed**
> The optional settings are: [Auto]; [Gen 2]; [Gen 1].

Onboard PCIE LAN1

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

Onboard PCIE LAN2

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

Audio Controller

Use this item to control detection of the Azalia device.

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

[Disabled]: Azalia will be unconditionally disabled;

[Enabled]: Azalia will be unconditionally enabled.

> **Azalia HDMI Codec**
> Use this item to enable or disable internal HDMI codec for Azalia.
> The optional settings are: [Disabled]; [Enabled].

PWR Status after PWR Failure

Use this item to select AC power state when power is re-applied after a power failure.

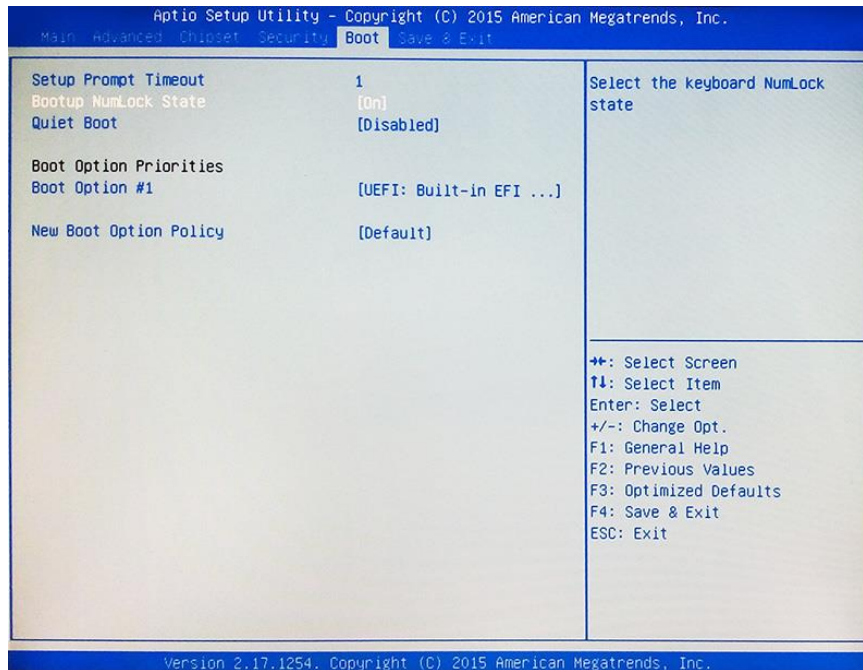The optional settings are: [Always Off]; [Always On]; [Former State].
*The option [Always On] and [Former State] are affected by ERP function. Please
disable ERP to support [Always On] and [Former State] function.*

3-9 Security Menu
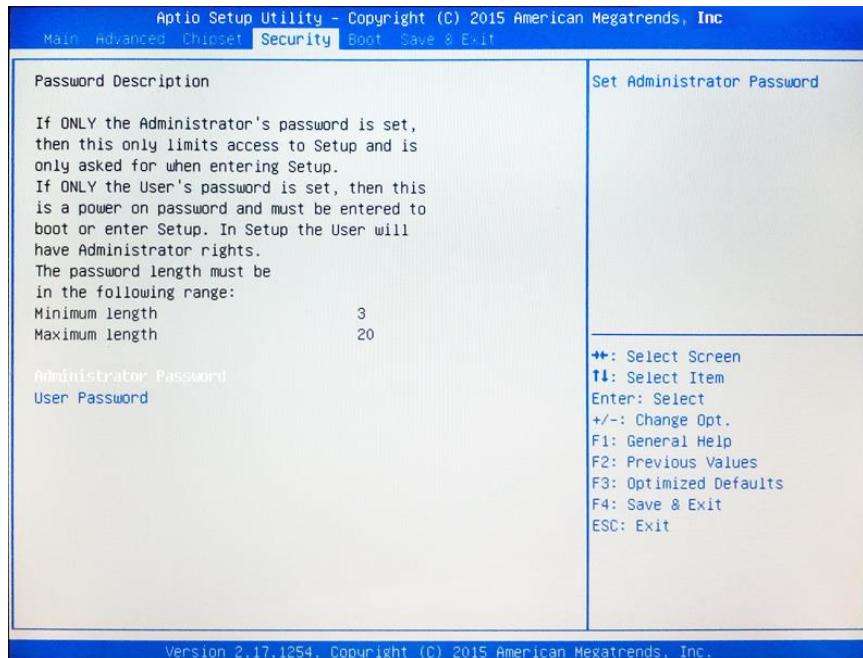
Security menu allow users to change administrator password and user password
settings.

3-10 Boot Menu

```
             Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
    Main  Advanced  Chipset  Security   Boot   Save & Exit

    Setup Prompt Timeout              1                       Select the keyboard NumLock
    Bootup NumLock State              [On]                    state
    Quiet Boot                        [Disabled]

    Boot Option Priorities
    Boot Option #1                    [UEFI: Built-in EFI ...]

    New Boot Option Policy            [Default]




                                                             →←: Select Screen
                                                             ↑↓: Select Item
                                                             Enter: Select
                                                             +/-: Change Opt.
                                                             F1: General Help
                                                             F2: Previous Values
                                                             F3: Optimized Defaults
                                                             F4: Save & Exit
                                                             ESC: Exit



             Version 2.17.1254. Copyright (C) 2015 American Megatrends, Inc.
```

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].
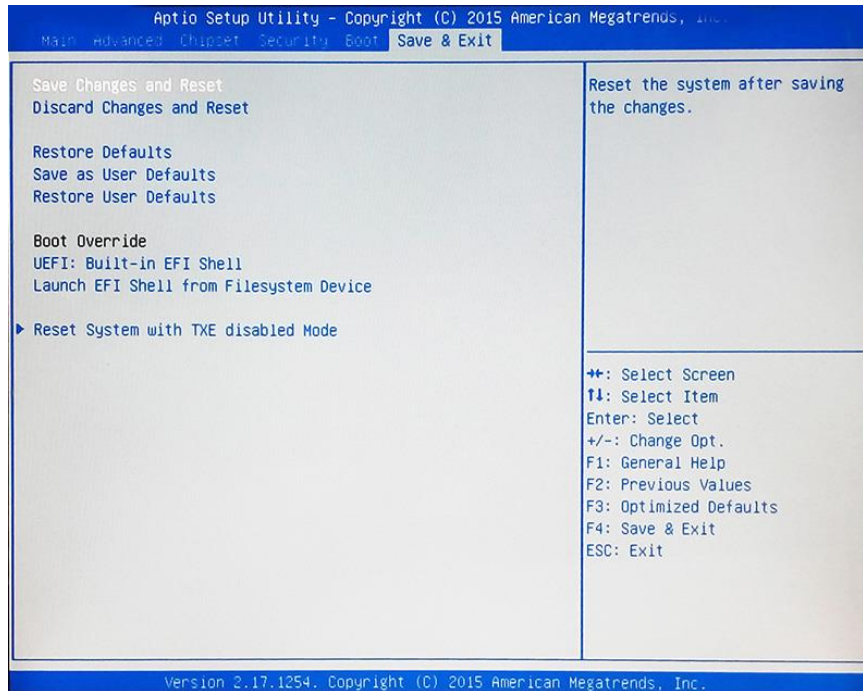### *Boot Option Priorities*

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

New Boot Option Policy

This item controls the placement of newly detected UEFI boot options.
The optional settings are: [Default]; [Place First]; [Place Last].

3-11 Save & Exit Menu

Save Changes and Reset

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

Discard Changes and Reset

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

Restore Defaults

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

Save as User Defaults

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

Restore User Defaults

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

Boot Override

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

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

Reset System with TXE disable Mode

Press [Enter] for TXE to run into the temporary disable mode. Ignore if TXE Ignition FM.