

Technical Manual
Of
Intel Braswell Series CPU
Based
SBC

NO.G03-NP591-F

Revision: 1.0

Release date: November 12, 2015

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.



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Environmental Safety Instruction

- Avoid the dusty, humidity and temperature extremes. Do not place the product in any area where it may become wet.
- 0 to 40 centigrade is the suitable temperature. (The figure comes from the request of the main chipset)
- Generally speaking, dramatic changes in temperature may lead to contact malfunction and crackles due to constant thermal expansion and contraction from the welding spots' that connect components and PCB. Computer should go through an adaptive phase before it boots when it is moved from a cold environment to a warmer one to avoid condensation phenomenon. These water drops attached on PCB or the surface of the components can bring about phenomena as minor as computer instability resulted from corrosion and oxidation from components and PCB or as major as short circuit that can burn the components. Suggest starting the computer until the temperature goes up.
- The increasing temperature of the capacitor may decrease the life of computer. Using the close case may decrease the life of other device because the higher temperature in the inner of the case.
- Attention to the heat sink when you over-clocking. The higher temperature may decrease the life of the device and burned the capacitor.

USER'S NOTICE

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Manual Revision Information

Reversion	Revision History	Date
1.0	First Edition	2015-11-12

Item Checklist

- Motherboard
- User's Manual
- CD for motherboard utilities
- 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
- Onboard optional 2GB/4GB DDR3L 1600 MHz DRAM
- Support 1 * SATAIII (6Gb/s) device
- Onboard 1* full-size Mini-PCIE slot
- Onboard 1* M.2 slot (M-key 2242 SATA interface for SSD device)
- Integrated with 1 * 24-bit dual channel LVDS header
- Support DP 1.1 output (Max. resolution 2560*1600@60Hz)
- Support USB 3.0 data transport demand
- Support CPU Over-Temperature protection
- Support CPU Over-Current/Under Voltage protection
- Support DRAM Over-Current/Under Voltage protection
- Compliance with ErP standard
- Support Watchdog function

1-2 Specification

Spec	Description
Design	<ul style="list-style-type: none"> ● Pico Form Factor;8-layer SBC; ● PCB size: 100 mm x 72 mm
Embedded CPU	<ul style="list-style-type: none"> ● Intel® Braswell SoC CPU* <p><i>*CPU model varies from different IPC options. Please consult your dealer for more information of onboard CPU.</i></p>
Memory	<ul style="list-style-type: none"> ● Onboard optional 2GB/4GB un-buffered DDR3L 1600 MHz DRAM
Expansion Slot	<ul style="list-style-type: none"> ● 1* Full-size Mini-PCIE slot (MPE)
Storage	<ul style="list-style-type: none"> ● 1* SATAIII port ● 1*M.2 M-key 2242 slot(M2)
LAN Chip	<ul style="list-style-type: none"> ● Integrated with Intel® i211AT PCI-E Gigabit LAN chip ● Support Fast Ethernet LAN function of providing 10/100/1000Mbps Ethernet data transfer rate
Audio Chip	<ul style="list-style-type: none"> ● Realtek ALC662 2-CH HD Audio Codec integrated ● Audio driver and utility included
BIOS	<ul style="list-style-type: none"> ● 64Mbit Flash ROM
Rear I/O	<ul style="list-style-type: none"> ● 1* 12V DC-in power jack ● 2* USB 3.0 port ● 1* Display port (HDMI port optional by order) ● 1* RJ-45 LAN port
Internal I/O	<ul style="list-style-type: none"> ● 1* 2-Pin Internal 12V DC-in power connector ● 1* SATA Power-out connector ● 1* Front panel audio header ● 1* 9-pin USB 2.0 header (Expansible to 2* USB 2.0 ports) ● 2* Serial port header (COM1 support RS232/RS422/RS485) ● 1* Front panel header ● 1* LAN LED activity header ● 1* LVDS header ● 1* LVDS inverter

*** 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:

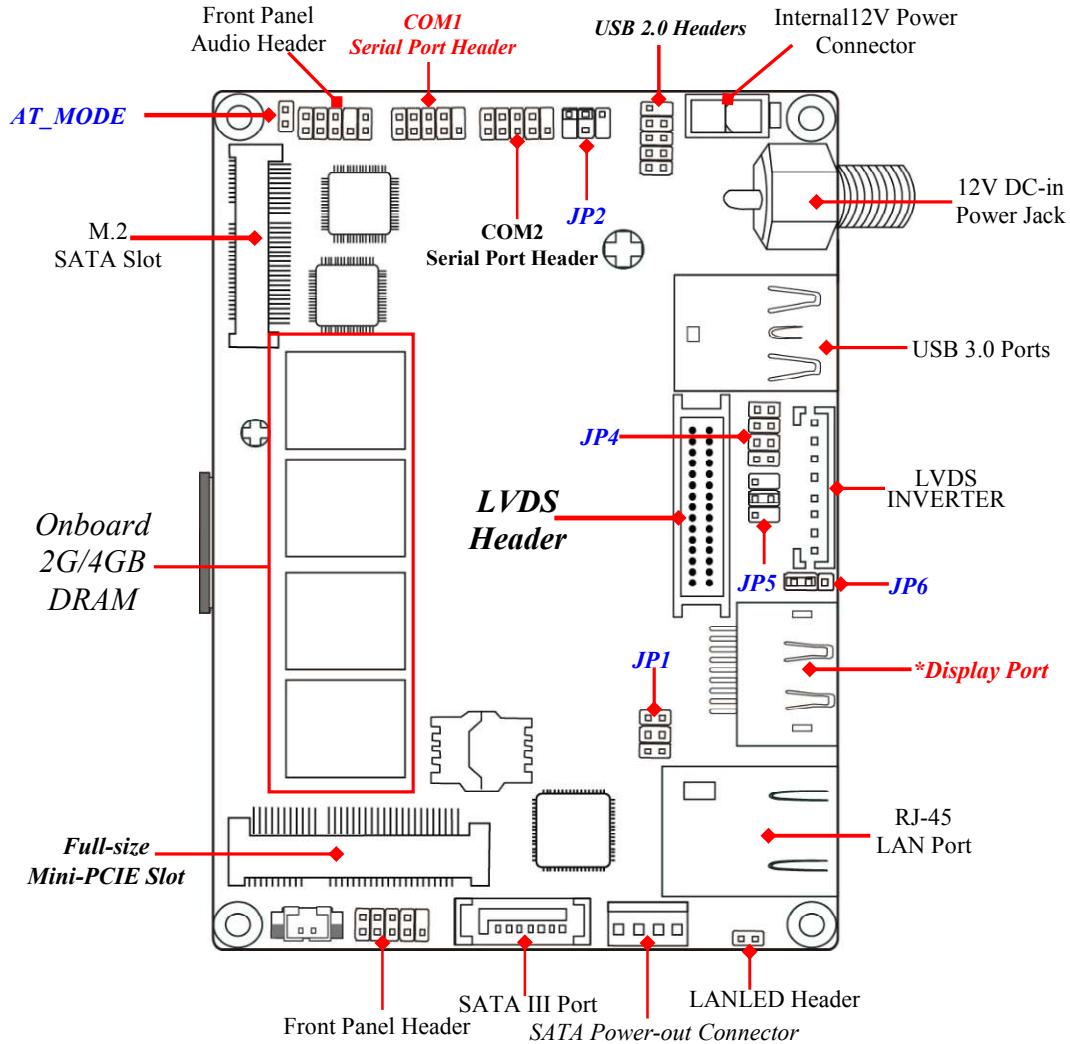


***Note:** Display port may be replaced by HDMI port option by customized order.

Warning!

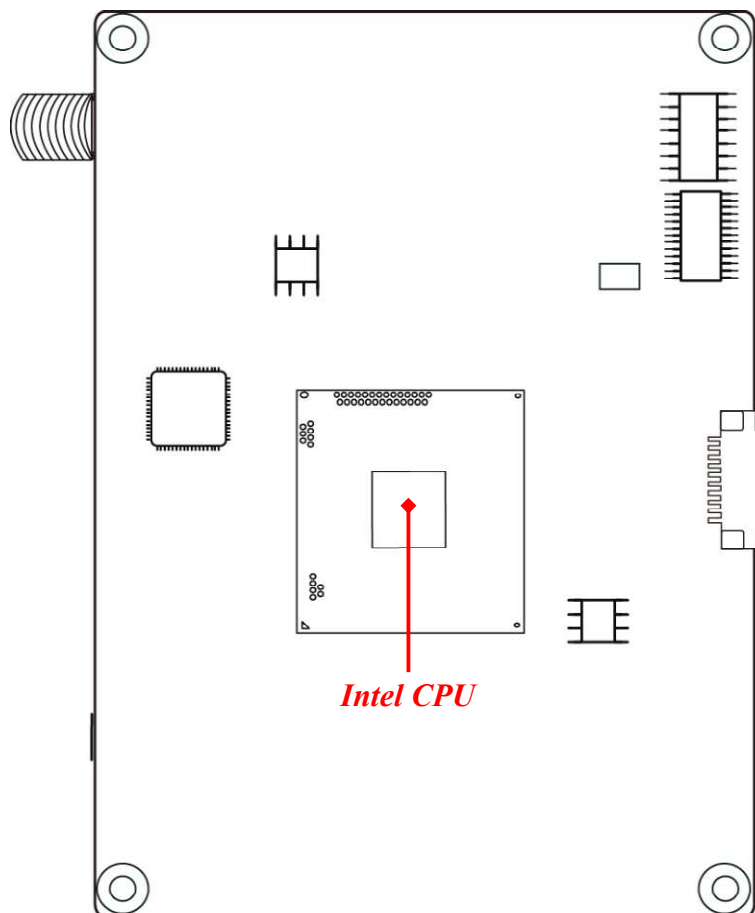
The board has a DC 12V power connector (DCIN) in I/O back panel and an internal ATX12V (ATX2P) power connector. User can only connect one type of compatible power supply to one of them to power the system.

Internal Diagram-Front Side:



***Note:** Display port may be replaced by HDMI port option by customized order.

Internal Diagram-Back Side:



Warning: CPU is the most important part of the board and very fragile to any possible harm. Make sure that there is no damage to the CPU during any installation procedures!

Connectors

Connector	Name
DCIN	12V DC-in Power Jack Connector
ATX2P	Internal 12V System DC-in Power Connector
USB30	USB 3.0 Port Connector x2
DP	Display Port Connector
LAN	RJ-45 Gigabit LAN Port Connector
SATA1	SATAIII Port Connector
SATAPW	SATA Power-out Connector

Headers

Header	Name	Description
FP_AUDIO	Front Panel Audio Header	9-pin Block
FP_USB20	USB 2.0 Header	9-pin Block
COM1/COM2	Serial Port Header x2	9-pin Block
JW_FP	Front Panel Header	9-pin Block
LAN_LED	LAN Activity LED Header	2-pin Block
LVDS	LVDS Header	30-pin Block
INVERTER	LVDS Inverter Header	8-pin Block

Jumper

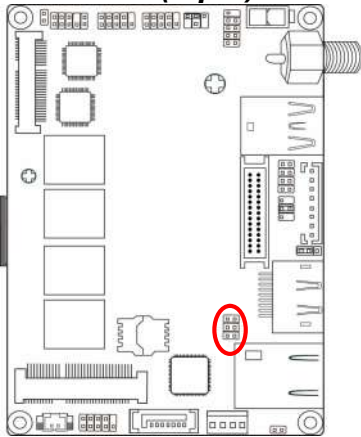
Jumper	Name	Description
JP1	Pin (1&2): Clear CMOS RAM Function Setting Pin (3&4): Reset all RTC register bits Pin (5&6): Flash Descriptor Security Override	6-Pin Block
JP2	COM1 Header Pin9 Function Select	4-Pin Block
JP5	LVDS VCC 3.3V /5V/12V Select	4-Pin Block
JP6	INVERTER Backlight 5V/12V Select	3-Pin Block
AT_MODE	AT Mode Function Select	2-Pin Block
JP4	LVDS Panel Resolution Select	8-Pin Block

Chapter 2

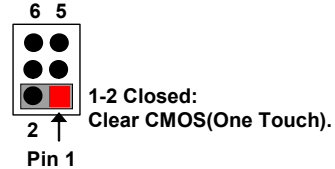
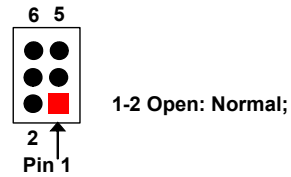
Hardware Installation

2-1 Jumper Setting

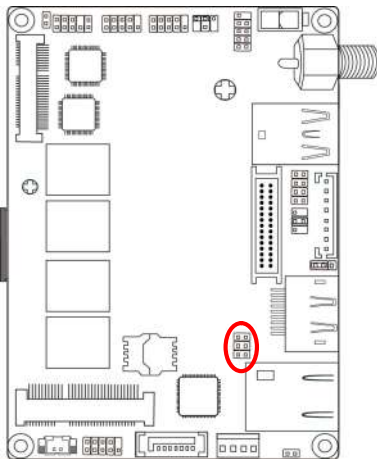
Pin 1&2 of JP1 (6-pin): Clear CMOS RAM Function Setting



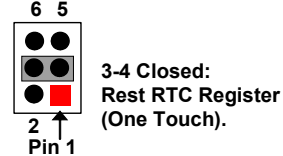
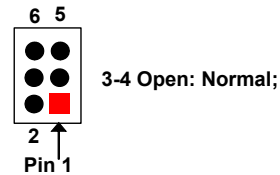
Pin 1&2 of JP1 → Clear CMOS RAM



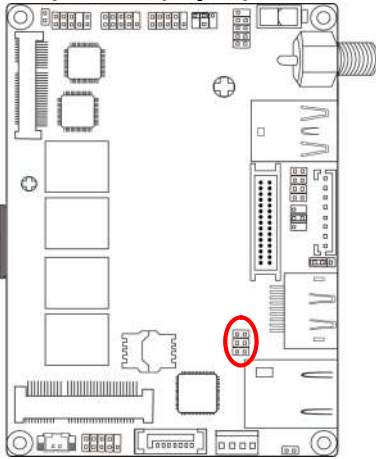
Pin 3&4 of JP1 (6-pin): Reset all RTC Register Bits



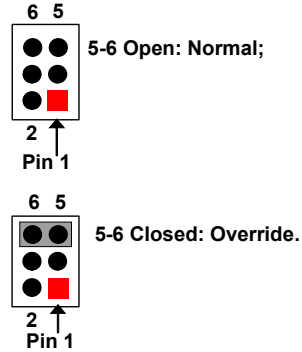
Pin 3&4 of JP1 → Reset RTC Register



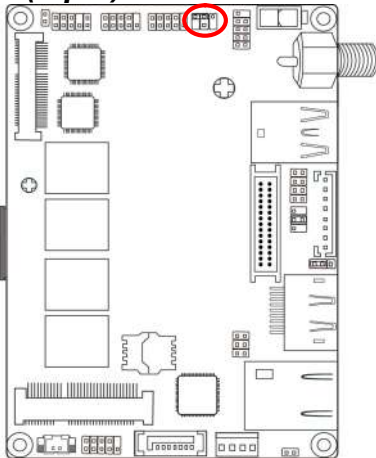
Pin (5&6) of J1 (6-pin): Flash Descriptor Security Override



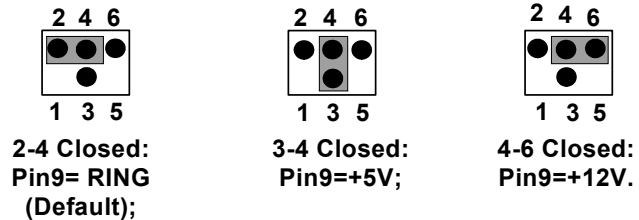
Pin (5&6) of JP1 → TXE Security Function Select



JP2 (4-pin): COM1 Header Pin9 Function Select

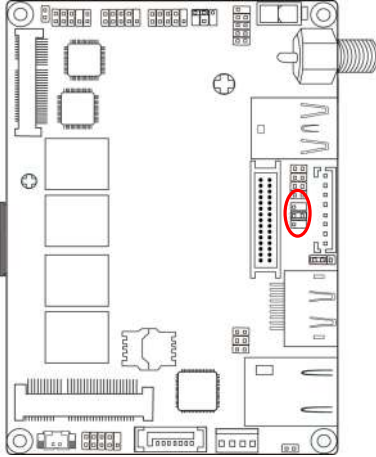


JP2 → COM1 Header Pin-9

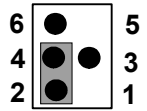


Note: Maximum current limit is 500mA while using 5V or 12V.

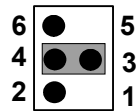
JP5 (4-pin): LVDS VCC 3.3V/5V/12V Select



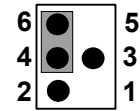
JP5→LVDS VCC



2-4 Closed:
VCC = 3.3V

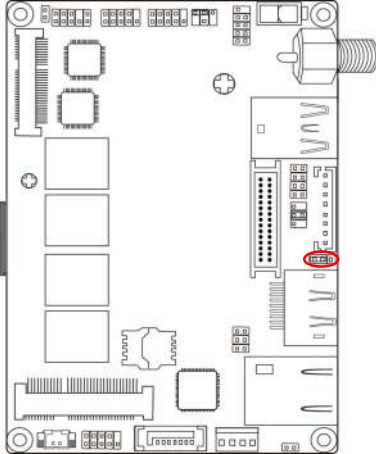


3-4 Closed:
VCC = 5V;

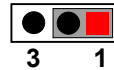


4-6 Closed:
VCC = 12V;

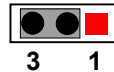
JP6 (3-pin): INVERTER Backlight 5V/12V Select



JP6→INVERTER Backlight



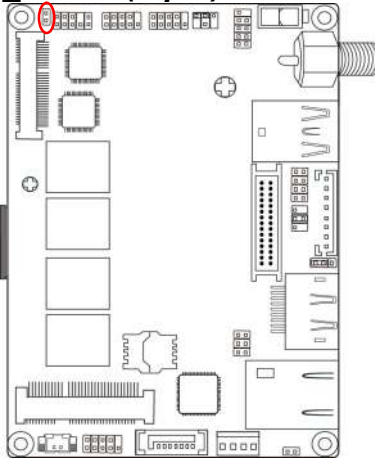
1-2 Closed: Inverter Backlight= 5V;



2-3 Closed: Inverter Backlight= 12V.

Note: Maximum current limit is 1A.

AT_MODE (2-pin): AT Mode Function Select



AT-MODE



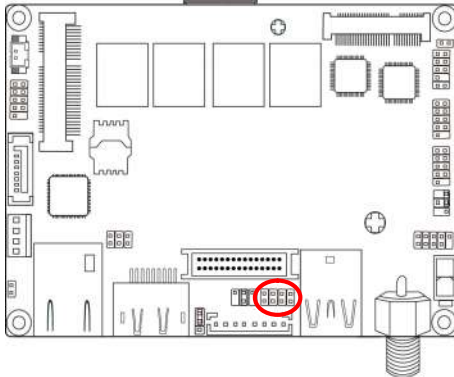
1-2 Open: Normal;



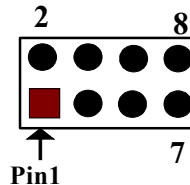
1-2 Closed: AT Mode Selected.

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

JP4 (8-pin): LVDS Panel Resolution Type Select







JP4

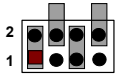
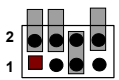
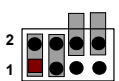
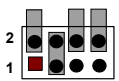
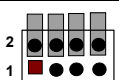


User can select LVDS panel resolution by jumper settings. There are two basic setting modes:

- **Close:** in which user can close pin1-pin2, pin3-pin4, pin5-pin6, pin7-pin8 respectively;

- *Open*: in which user leave jumper hat just in pin 2, pin4, pin6 or pin8.

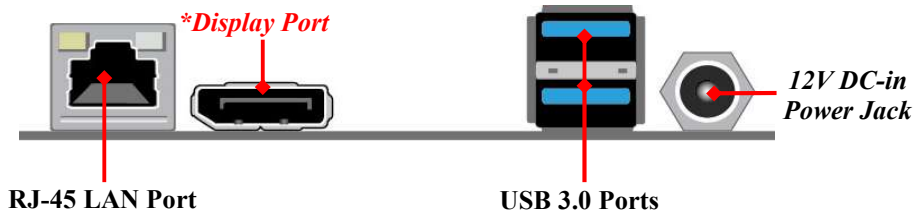
Jumper Setting	Description	Panel Resolution	Color Depth
	Pin 1-2: Close Pin 3-4: Close Pin 5-6: Close Pin 7-8: Close	800 x 480 @ 60Hz	18-bit
	Pin 1-2: Open Pin 3-4: Close Pin 5-6: Close Pin 7-8: Close	800 x 600 @ 60Hz	18-bit
	Pin 1-2: Close Pin 3-4: Open Pin 5-6: Close Pin 7-8: Close	800 x 600 @ 60Hz	24-bit
	Pin 1-2: Open Pin 3-4: Open Pin 5-6: Close Pin 7-8: Close	1024 x 600 @ 60Hz	18-bit
	Pin 1-2: Close Pin 3-4: Close Pin 5-6: Open Pin 7-8: Close	1024 x 768 @ 60Hz	18-bit
	Pin 1-2: Open Pin 3-4: Close Pin 5-6: Open Pin 7-8: Close	1024 x 768 @ 60Hz	24-bit
	Pin 1-2: Close Pin 3-4: Open Pin 5-6: Open Pin 7-8: Close	1280 x 768 @ 60Hz	24-bit
	Pin 1-2: Open Pin 3-4: Open Pin 5-6: Open Pin 7-8: Close	1280 x 800 @ 60Hz	18-bit
	Pin 1-2: Close Pin 3-4: Close Pin 5-6: Close Pin 7-8: Open	1280 x 800 @ 60Hz	24-bit
	Pin 1-2: Open Pin 3-4: Close Pin 5-6: Close Pin 7-8: Open	1366 x 768 @ 60Hz	18-bit

	Pin 1-2: Close Pin 3-4: Open Pin 5-6: Close Pin 7-8: Open	1366 x 768 @ 60Hz	24-bit
	Pin 1-2: Open Pin 3-4: Open Pin 5-6: Close Pin 7-8: Open	1440 x 900 @ 60Hz	18-bit
	Pin 1-2: Close Pin 3-4: Close Pin 5-6: Open Pin 7-8: Open	1440 x 900 @ 60Hz	24-bit
	Pin 1-2: Open Pin 3-4: Close Pin 5-6: Open Pin 7-8: Open	1280 x 1024 @ 60Hz	24-bit
	Pin 1-2: Close Pin 3-4: Open Pin 5-6: Open Pin 7-8: Open	1680 x 1050 @ 60Hz	24-bit
	Pin 1-2: Open Pin 3-4: Open Pin 5-6: Open Pin 7-8: Open	1920 x 1080 @ 60Hz	24-bit





2-2 Connectors and Headers

2-2-1 Connectors

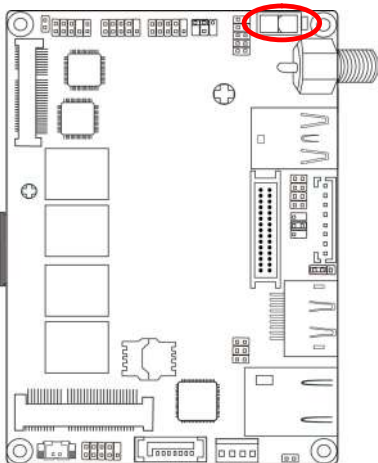
(1) Rear I/O Connectors



***Note:** Display port may be replaced by HDMI port option by customized order.

Icon	Name	Function
	12V DC-in Power Jack 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.
	Display Port	To the system to corresponding display device with compatible DP cable.
	RJ-45 LAN Port	This connector is standard RJ-45 LAN jack for Network connection.

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



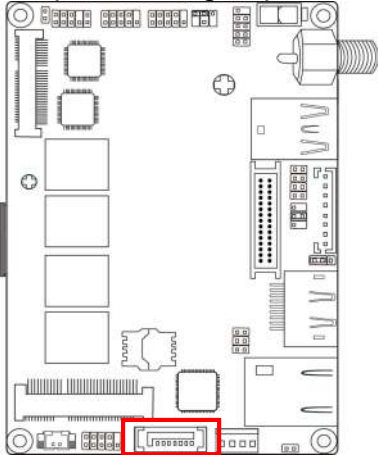
Pin1

Pin.	Definition
1	GND
2	+12V DC_IN

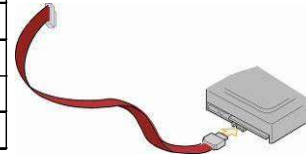
Warning: Find Pin-1 position before connecting power cable to this 2-pin power connector. **WRONG INSTALLATION DIRECTION WILL DAMAGE THE BOARD!!**

(3) SATA1 (7-pin): SATAIII Port connector

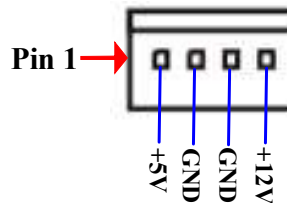
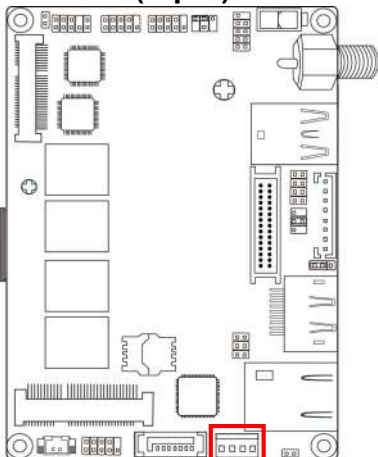
SATA1 port is a high-speed SATAIII port that supports 6GB/s transfer rate.



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



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

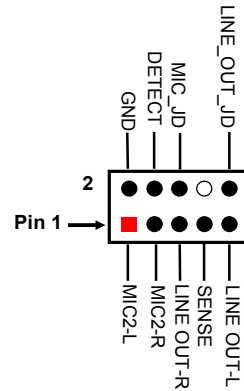
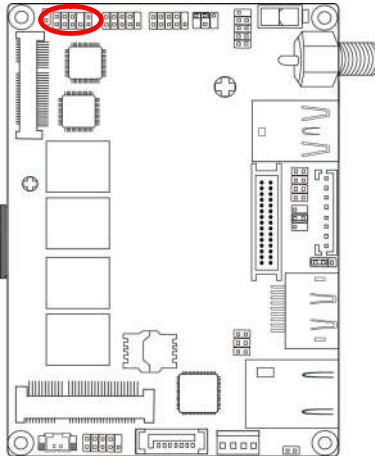


Warning: Make sure that Pin-1 of compatible SATA Power connector is inserted into corresponding Pin-1 of **SATA PW** to avoid possible damage to the board and hard disk driver!

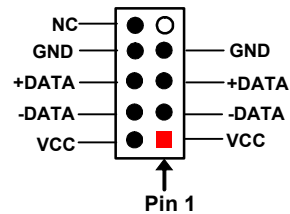
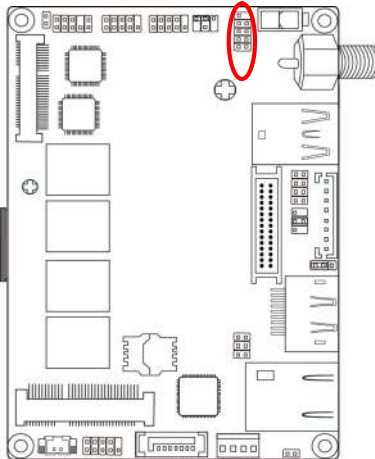
2-2-2 Headers

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

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



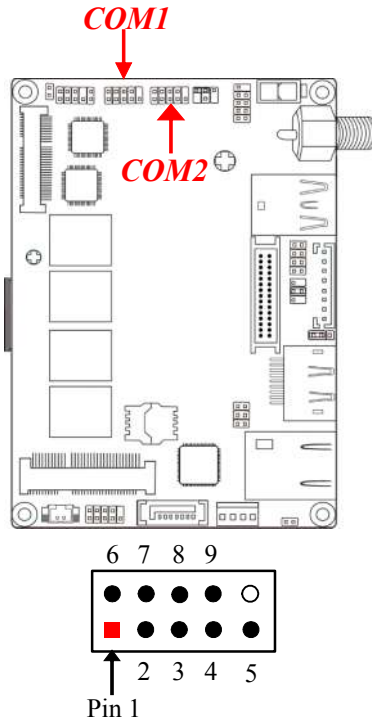
(2) FP_USB20 (9-pin): USB 2.0 Port Header



(3) COM1/COM2 (9-pin): Serial Port Header

COM1: RS232/422/485 Serial Port Header

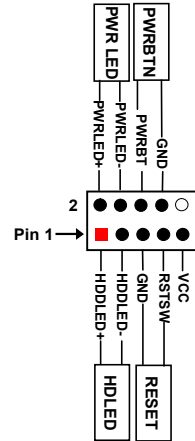
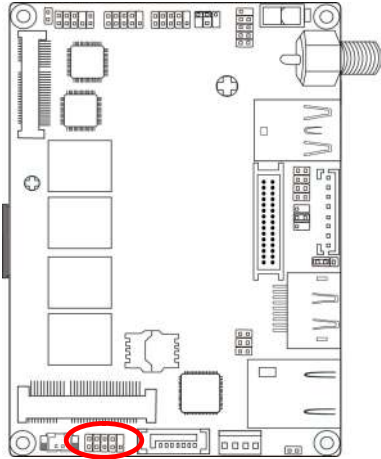
COM2: RS232 Serial Port Header



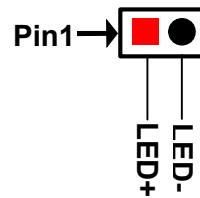
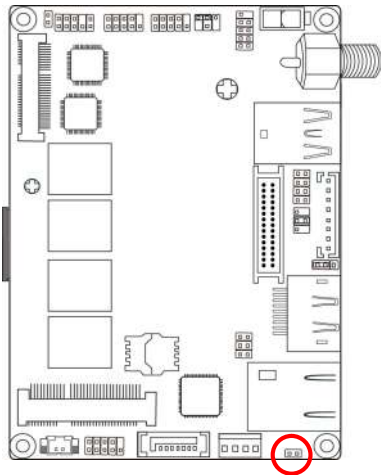
Pin NO.	RS232	*RS422 (COM1)	*RS485 (COM1)
Pin 1	DCD	TX-	DATA-
Pin 2	RXD	TX+	DATA+
Pin 3	TXD	RX+	NC
Pin 4	DTR	RX-	NC
Pin 5	GND	GND	GND
Pin 6	DSR	NC	NC
Pin 7	RTS	NC	NC
Pin 8	CTS	NC	NC
Pin 9	RI	NC	NC

***Notice:** **COM1** servers as RS232 serial port header in most cases. RS422 & RS485 function is only optional to customized models. User also needs to go to BIOS to set 'Transmission Mode Select' for COM1 as [RS422] or [RS485] for boards that support RS422/485 function before connecting compatible COM cable to COM1 header (refer to Page 25).

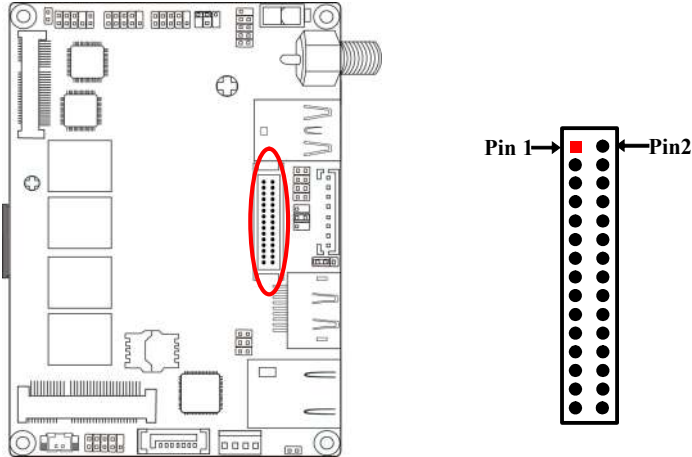
(4) JW_FP (9-pin): Front Panel Header



(5) LAN_LED (2-pin): LAN Activity LED Header

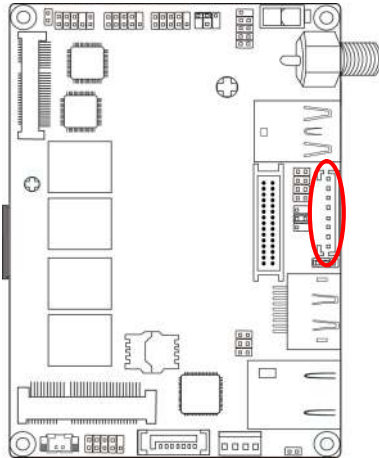


(6) LVDS (30-pin): 24-bit Dual Channel LVDS Header



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

(7) INVERTER (8-pin): LVDS Inverter Header



Pin No.	Definition
1	Backlight Enable
2	Backlight PWM
3	VLED
4	VLED
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.

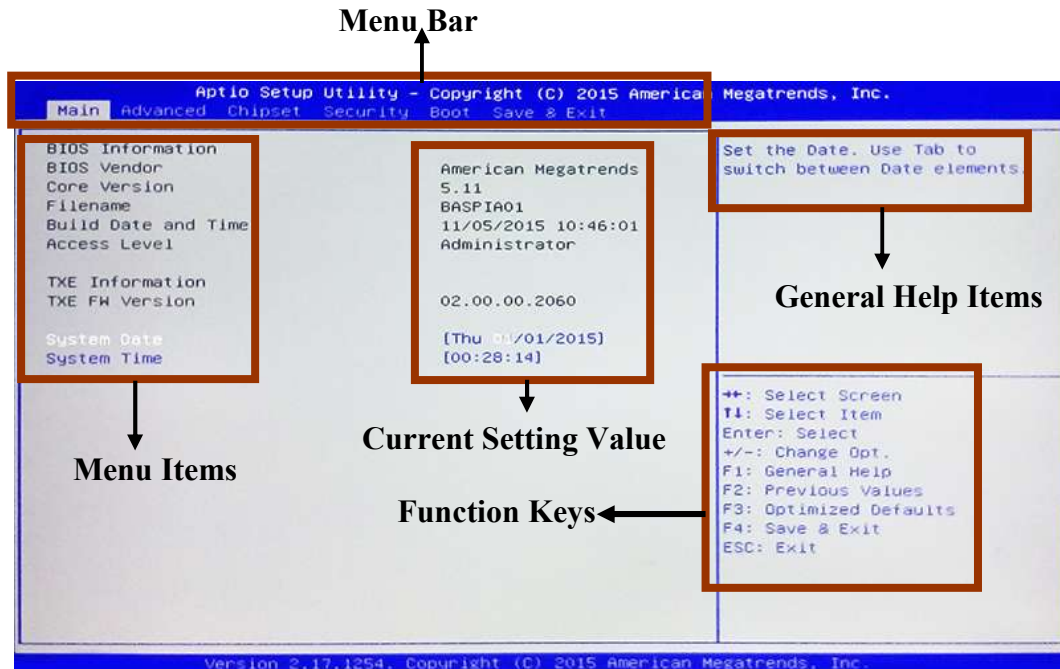
3-1 Entering Setup

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

Press **** to enter Setup; press **< F7>** for Pop Menu.

3-2 BIOS Menu Screen

The following diagram show a general BIOS menu screen:



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 quit the BIOS Setup.
 - **[F7]**: User can press this key to enter Boot Menu when system start up.

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

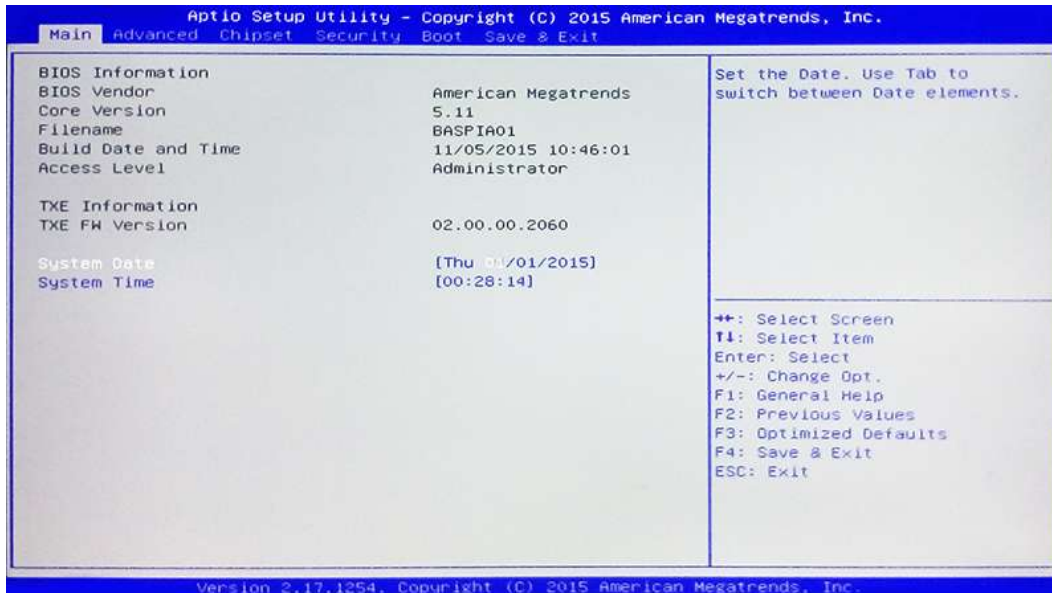
There are six menu bars on top of BIOS screen:

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.



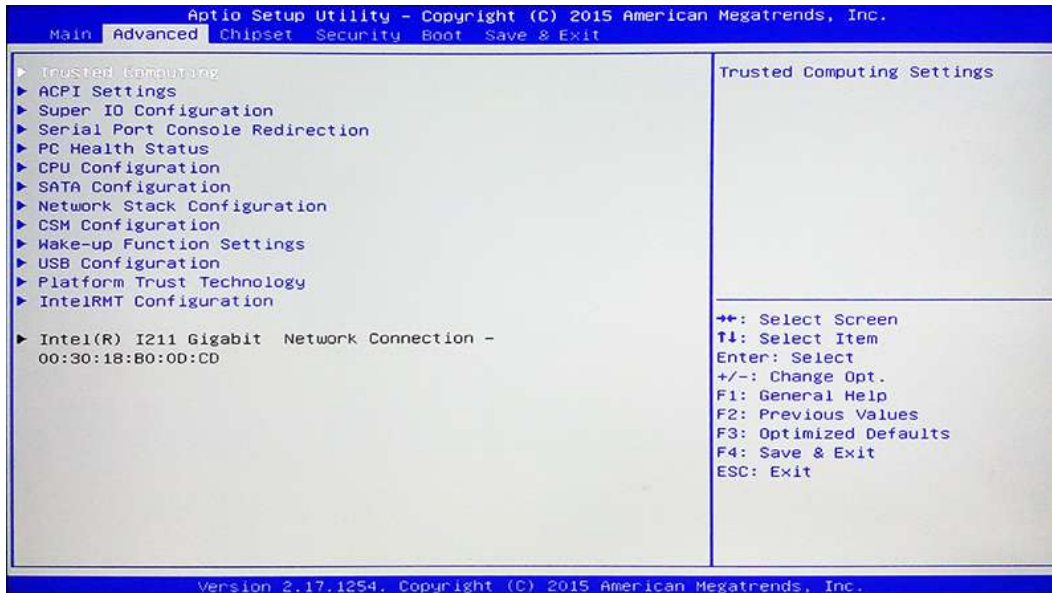
System Date

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

System Time

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

3-7 Advanced Menu



▶ **Trusted Computing**

Press [Enter] to make settings to make further settings in the following settings:

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 are: [Disabled]; [Enabled].

Hash Policy

Use this item to select the Hash policy to use. SHA-2 is most secure but might not be supported by all operating systems.

The optional settings are: [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**

**Note: 'Super I/O Configuration' is only optional for model NP591D4 series.*

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

Super I/O 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 FIFO Mode

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

▶ **Serial Port 2 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 FIFO Mode

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

FIFO].

ERP Function

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

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

WatchDog Reset Timer

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

WatchDog Reset Timer Value

User can set a value in the range of [10] to [255].

WatchDog Reset Timer Unit

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

WatchDog Wake-up Timer

This item support WDT wake-up.

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

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

WatchDog Wake-up Timer Value

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

WatchDog Wake-up Timer Unit

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

ATX Power Emulate AT Power

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

▶ **Serial Port Console Redirection**

***Note: 'Serial Port Console Redirection' is only optional for model NP591D4 series.**

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

COM1

Console Redirection

Use this item to enable or disable COM1 Console Redirection.

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

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

▶ **Console Redirection Settings**

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

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

Terminal Type

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

Bits per second

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

Data Bits

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

Parity

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

Stop Bits

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

Flow Control

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

VT-UTF8 Combo Key Support

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

Recorder Mode

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

Resolution 100x31

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

Legacy OS Redirection Resolution

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

Putty Keypad

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

Redirection After BIOS POST

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

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

Console Redirection

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

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

▶ Console Redirection Settings

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

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

Out-of-Band Mgmt Port

The 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 and set value in '**Shutdown Temperature**'.

Shutdown Temperature

Use this item to select system shutdown temperature.

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

▶ **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: [Disabled]; [Enabled].

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 are: [Disabled]; [Enabled].

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

Max CPU C-state

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

The optional items are: [C7]; [C6]; [C1].

▶ **SATA Configuration**

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

SATA Controller(s)

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

When set as [Enabled], user can make further settings in the 'SATA Mode Selection' & 'SATA Interface Speed' items:

SATA Mode Selection

The default setting is: [AHCI].

SATA Interface Speed

The item is for user to set the maximum speed the SATA interface can support.

CHA A1 is always with Gen1 speed.

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

SATA Port

Port

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

M.2 SATA

Port

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

▶ **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 are: [Enabled]; [Disabled].

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

Ipv4 PXE Support

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

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

option will not be created.

Ipv6 PXE Support

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

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

PXE boot wait time

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

Media Detect Count

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

▶ **CSM Configuration**

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

Compatibly 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]; [Legacy].

Storage

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

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

**This function is supported when EUP Function is set as [Disabled].*

USB Wake-up from S3-S4

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

Use this item to enable or disable USB S3/S4 wakeup.

**USB wake-up is affected by ERP function in S4. Please disable ERP function before activating this function in S4.*

▶ **USB Configuration**

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

USB Configuration

Legacy USB Support

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

[Enabled]: To enable legacy USB support.

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

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

XHCI Hand-off

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

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

USB Mass Storage Driver Support

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

USB hardware delay and time-outs:

USB Transfer Time-out

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

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

Device Reset Time-out

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

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

Device Power-up Delay

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

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

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

Device Power-up Delay in Seconds

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

Mass Storage Devices:

Generic Flash Disk XX

This is for user to set emulation type for current available mass storage device.

The optional settings are: [Auto]; [Floppy]; [Forced FDD]; [Hard disk]; [CD-ROM]. 'Auto' enumerates devices according to their media format. Optical drives are emulates as 'CDROM'. Driver with no media will be emulated according to driver type.

▶ **Platform Trust Technology**

Press [Enter] to make settings to make further settings in '**fTPM**'.

fTPM Configuration

fTPM

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

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

▶ **Intel RMT Configuration**

This item is for user to select Intel RMT (Ready Mode Technology) support.

Press [Enter] to make settings to make further settings in '**fTPM**'.

Intel RMT Configuration

Intel RMT Support

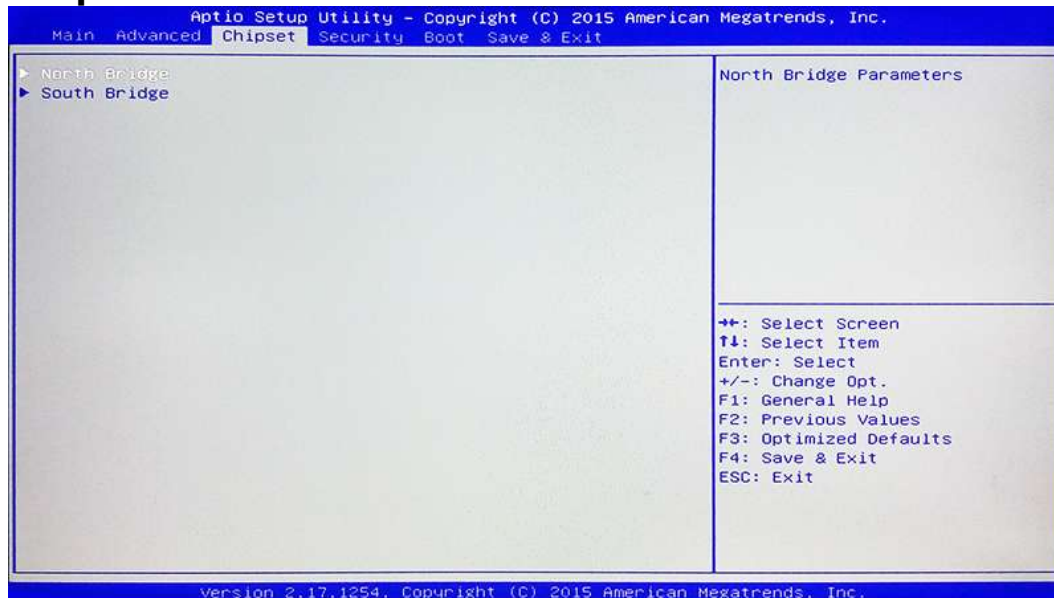
The optional settings are: [Disabled]; [Enabled].

Intel RMT (Ready Mode Technology) SSDT table will be loaded if enabled.

▶ **Intel(R) I211 Gigabit Network Connection- XX:XX:XX:XX:XX:XX**

This item shows current network brief information.

3-8 Chipset Menu



▶ **North Bridge**

Press [Enter] to view current using memory information and 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: [128 MB]; [256 MB]; [MAX].

Aperture Size

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

GTT Size

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

Primary IGFX Boot Display

The optional settings are: [Disabled]; [Display Port].

**Note: 'Primary IGFX Boot Display' is only optional for model NP591D4 series.*

Secondary IGFX Boot Display

The optional settings are: [Disabled]; [Display Port]; [LVDS].

**Note: 'Secondary IGFX Boot Display' is only optional for model NP591D4 series.*

Active LFP

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

[Disable]: VBIOS does not enable LVDS.

[Enable]: VBIOS enable LVDS driver by integrated encoder.

**Note: 'Active LFP' is only optional for model NP591D4 series.*

LVDS FW Protect

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

**Note: 'LVDS FW Protect' is only optional for model NP591D4 series.*

▶ **South Bridge**

Press [Enter] to make further setting in the following sub-items:

Onboard PCIE LAN

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

Audio Controller

Use this item to control the detection of the Azalia Audio 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.

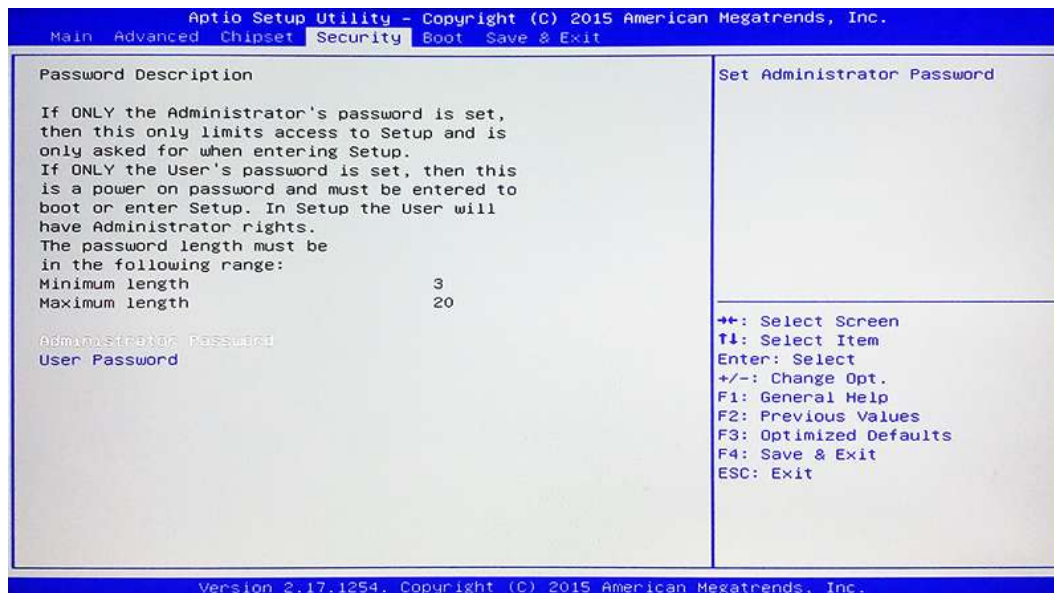
The optional settings are: [Enabled]; [Disabled].

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 Status].

*[Always On] and [Former State] options are affected by ERP function. Please disable ERP to support [Always On] and [Former State].

3-9 Security Menu



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

3-10 Boot Menu



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

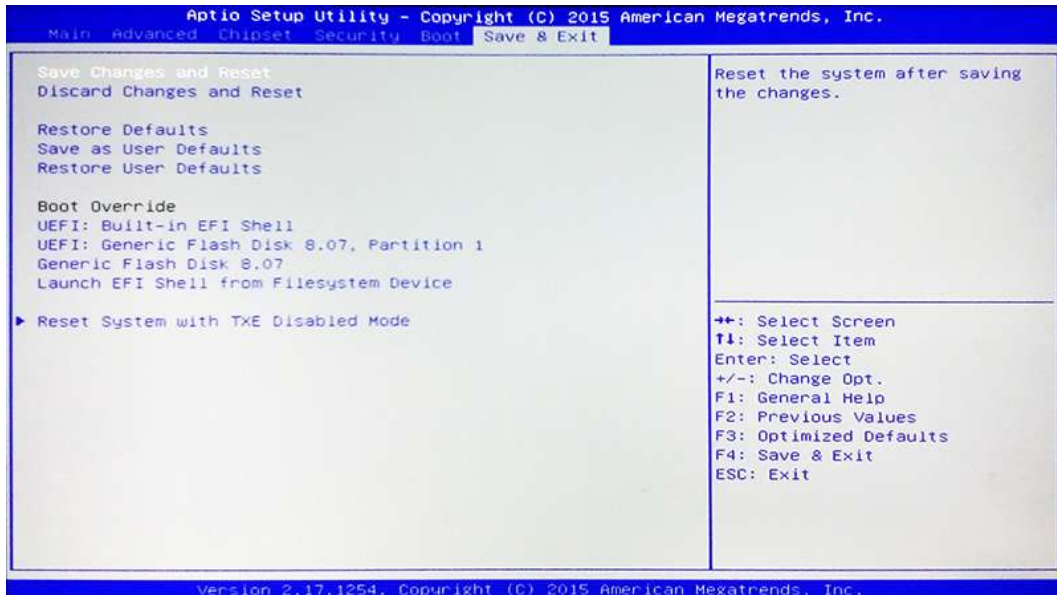
Use this item to control the placement of newly detected UEFI boot options.

The optional settings are: [Default]; [Place First]; [Place Last].

Hard Drive BBS Priorities

Press [Enter] to use this item to set system boot order from available the legacy device sin this group.

3-11 Save & Exit Menu



Save Changes and Reset

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

Discard Changes and Reset

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

Restore Defaults

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

Save as User Defaults

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

Restore User Defaults

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

Boot Override

Boot Override

UEFI:xx/...

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

Reset System with TXE Disable Mode

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