TECHNICAL MANUAL

Of

Intel Q87 Express Chipset

Based Mini-ITX M/B

NO. G03-NF9J-F

Revision: 2.0

Release date: August 16, 2013

Trademark:

*** Specifications and Information contained in this documentation are furnished for information use only, and are subject to change at any time without notice, and should not be construed as a commitment by manufacturer.**

Environmental Protection Announcement

Do not dispose this electronic device into the trash while discarding. To minimize pollution and ensure environment protection of mother earth, please recycle.

TABLE OF CONTENT

Environmental Safety Instruction

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

- 0 to 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.

USER'S NOTICE

Manual Revision Information

Reversion	Revision History	Date
2.0	Second Edition	2013-08-16

Item Checklist

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

Chapter 1
Introduction of the Motherboard

1-1 Feature of Motherboard

- Intel® Q87 express chipset
- Support Intel® LGA 1150 Socket Intel® Core™ i3, i5, i7 & Pentium Processors in LAG1150 Package
- Support 2 * DDRIII SO-DIMM 1066/1333/1600 MHz up to 16GB and dual channel function
- Integrated with Intel® i211AT and Intel® i217-LM Gigabit Ethernet LAN chip
- Integrated ALC662 6-channel HD Audio Codec
- Support HDMI, DVI-D and VGA Video Outputs
- Support 5* SATAIII 6GB/S ports with RAID 0,1,5,10 function
- Support Mini-PCIE slot (Selectable with MSATA)
- Support PCI Express x16 slot
- Support USB 3.0 data transport demand
- Integrated with 24-bit dual channel LVDS
- Support CPU Smart FAN
- Supports ACPI S3 Function
- Compliance with EuP Standard
- Support Watchdog Timer Technology

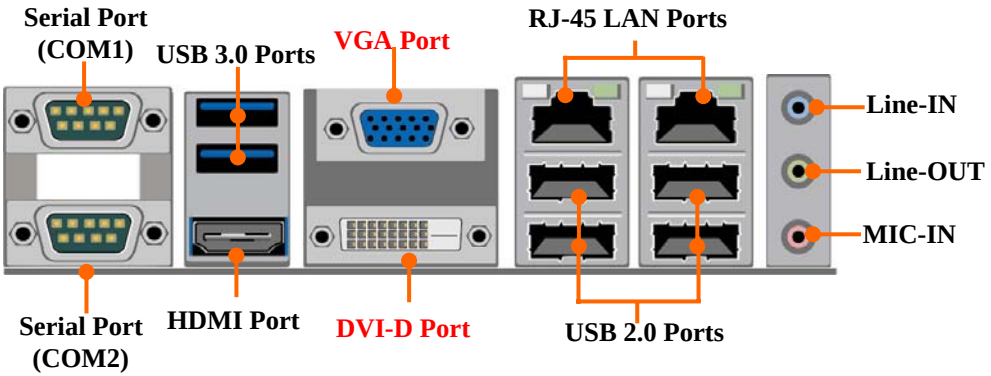
1-2 Specification

Spec	Description
Design	● Mini-ITX form factor; 6 layers ; PCB size: 17.0x17.0cm
Chipset	● Intel® Q87 Express Chipset
CPU Socket	● Supports Intel® Core™ i7, Core™ i5, Core™ i3 series, Pentium® processor in LAG1150 Package ** for detailed CPU support information please visit our website*
Memory Slot	● DDRIII SO-DIMM slot x2 ● Support DDRIII 1066/1333/1600 MHz DDRIII SO-DIMM expandable to 16GB ● Support dual channel function
Expansion Slot	● 1 pcs of PCI Express x16 slot, support PCI Express 3.0 specification ● 1 pcs of Mini-PCIE slot (Selectable with MSATA)
Storage	● 5 * SATAIII 6Gb/s ports support RAID 0, 1, 5, 10 function
Dual LAN Chip	● Integrated Intel® i211AT and i217-LM Gigabit Ethernet LAN chip that support Fast Ethernet LAN function of providing 10/100/1000Mbps Ethernet data transfer rate
Audio Chip	● Realtek ALC662 6-channel Audio Codec integrated ● Audio driver and utility included
BIOS	● 64M bit DIP Flash ROM
Multi I/O	***Rear Panel I/O:*** ● COM port connector x 2 ● USB 3.0 port connector x2 ● HDMI port connector x1 ● VGA port connector x1 ● DVI-D port connector x 1 ● USB 2.0 port connector x4 ● RJ-45 LAN connector x2 ● Audio connector x3(Line-in, Line-out, MIC)

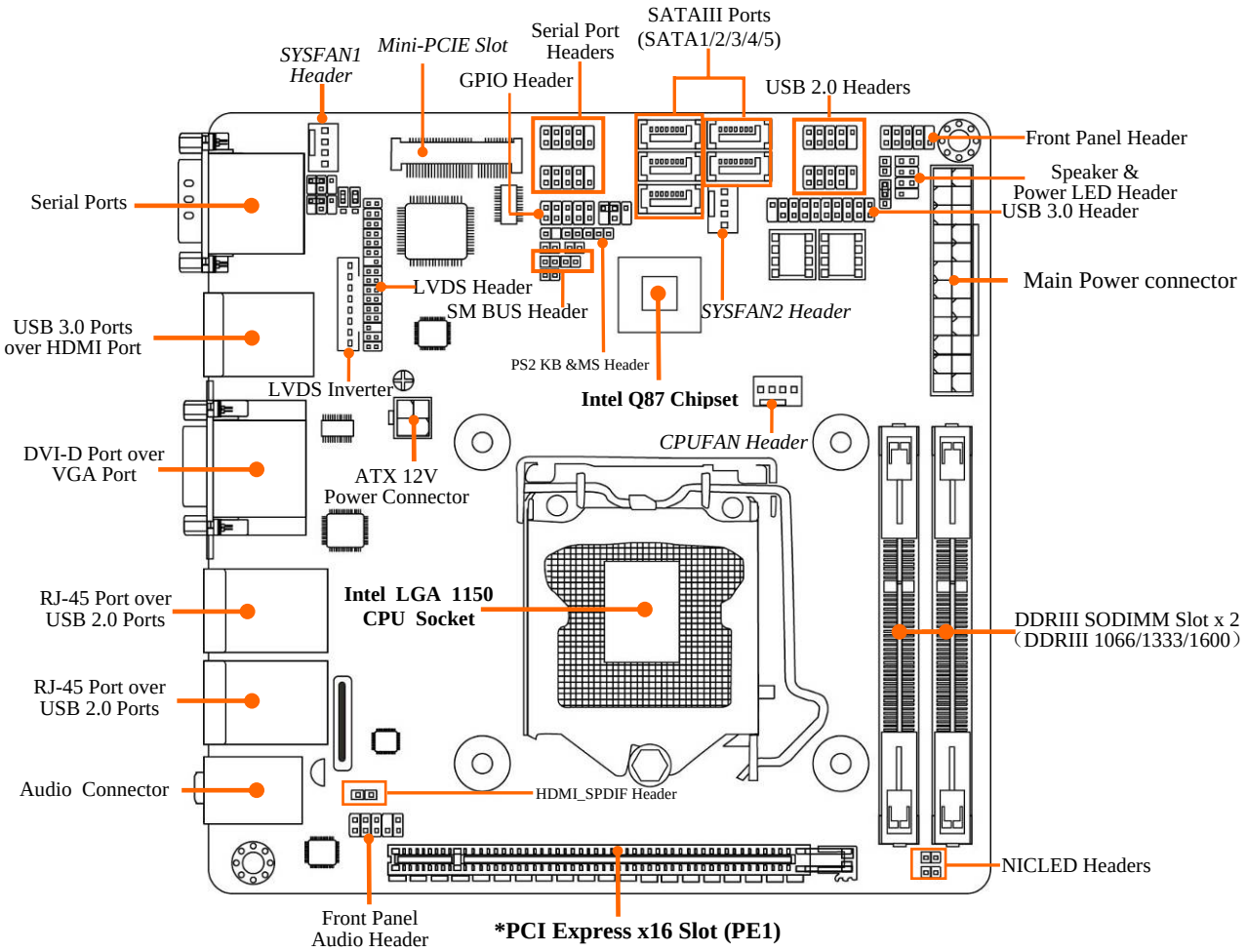
	Internal I/O Connectors& Headers: ● 1 *24-pin main power connector ● 1 *4-pin 12V Power connector ● SATAIII Connector x5 ● Front panel audio header x1 ● HDMI_SPDIF header x1 ● NICLED header x2 ● Serial port header x2 ● GPIO header x1 ● PS/2 KB & MS header x1 ● SM BUS header x1 ● LVDS Inverter x1 ● LVDS header x1 ● USB 2.0 header x2 (support four expansion USB 2.0 ports) ● USB 3.0 header x1 (support two expansion USB 3.0 ports) ● Speaker header + PWRLED header x1 ● Front panel header x1 ● Fan header x 3

1-3 Layout Diagram

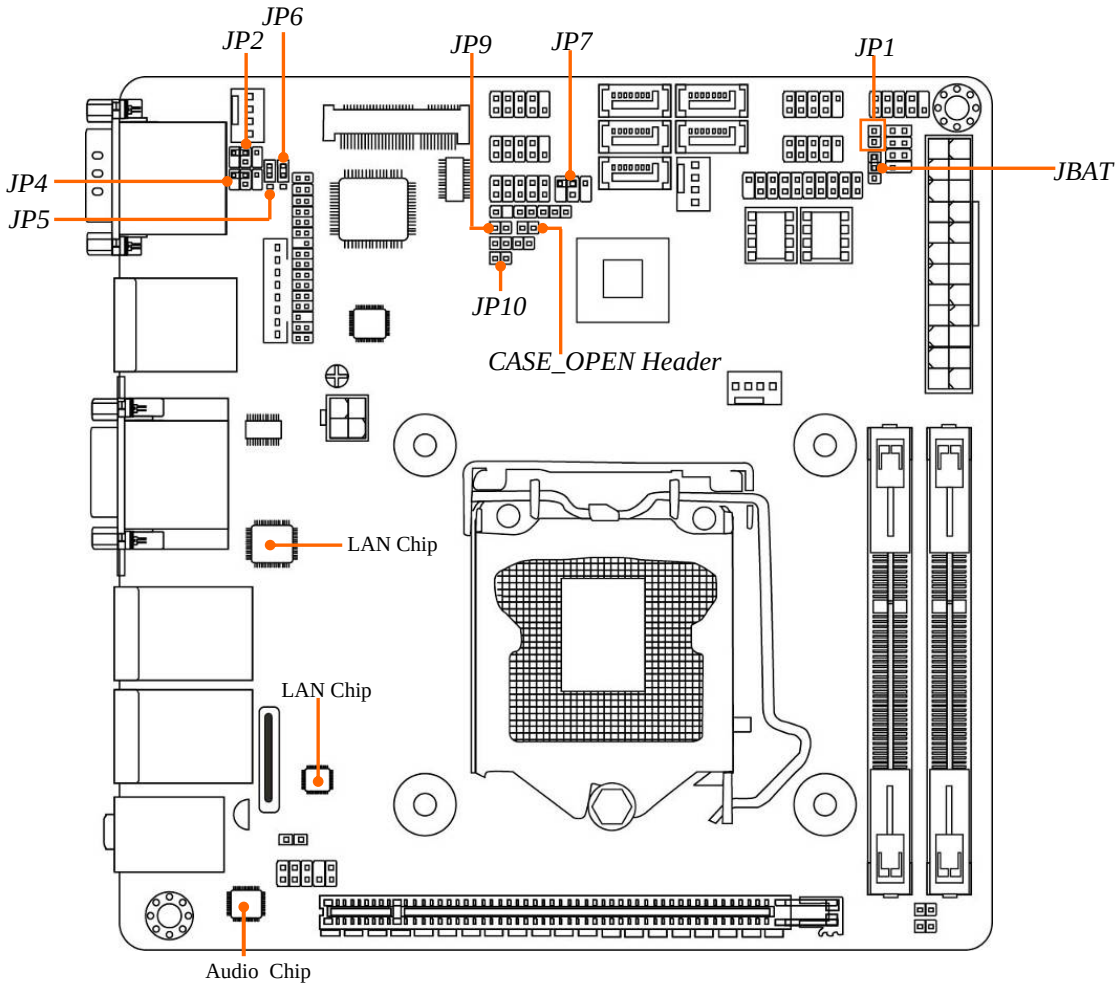
Rear IO Diagram



Motherboard Internal Diagram



Motherboard Jumper Position



Jumper

Jumper	Name	Description
JP2	COM1 Connector Pin9 Function Select	4-pin Block
JP7	COM4 Header Pin9 Function Select	4-pin Block
JP4	LVDS VCC 3.3V/5V/12V Select	4-pin Block
JP5	Inverter 5V/12V Select	3-pin Block
JP6	MSATA Slot VCC3.3V /3VSB Select	3-pin Block
JBAT	CMOS RAM Clear Function Setting	3-pin Block
JP1	ME_Features Select	2-pin Block
JP10	ATX Mode & AT Mode Select	2-pin Block
CASE_OPEN	Case Open Message Display Function	2-pin Block

Connectors

Connector	Name
ATXPWR	Main Power Connector
ATX12V	12V Power Connector
SATA1/2/3/4/5	SATAIII Connector x 5
COM1_2	Serial Port Connector x2
USB1	USB 3.0 Port Connector x2
HDMI	High-Definition Multimedia Interface
CRT+DVI1(Top) (Bottom)	Video Graphic Attach Connector
CRT+DVI1(Bottom)	DVI-D Port Connector
UL1(Middle & Bottom) /UL2(Middle & Bottom)	USB 2.0 Port Connector x4
UL1(Top) / UL2(Top)	RJ-45 LAN Connector x2
AUDIO	Line Out /Line In /MIC Audio Connector

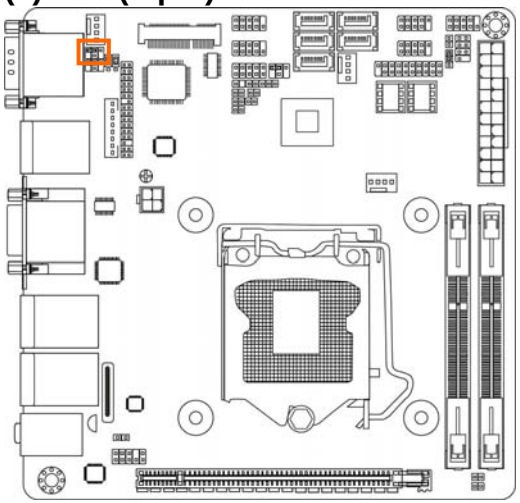
Headers

Header	Name	Description
FP_AUDIO	Front Panel Audio Header	9-pin Block
HDMI_SPDIF	HDMI_SPDIF Out Header	2-pin Block
NIC_LED1/NIC_LED2	LANLED Header	2-pin Block
COM3/4	Serial Port Header	9-pin block
GPIO_CON	GPIO Header	10-pin Block
KBMS	PS2 KB & MS Header	6-pin Block
SM_BUS	SM BUS Header	4-pin Block
INVERTER	LVDS Inverter	8-pin Block
LVDS	LVDS Header	30-pin Block
USB2/3	USB 2.0 Port Header	9-pin block
USB4	USB 3.0 Port Header	19-pin block
JP3	Power LED+ Speaker Header	7-pin Block
JW_FP	Front Panel Header(PWR LED/ HD LED/ /Power Button /Reset)	9-pin Block
SYSFAN1/SYSFAN2 /CPU FAN	FAN Headers	4-pin Block

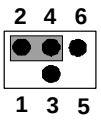
Chapter 2
Hardware Installation

2-1 Jumper Setting

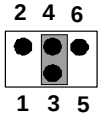
(1) JP2 (4-pin): COM1 Connector Pin9 Function Select



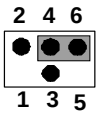
JP2



2-4 Closed:
RI=RS232

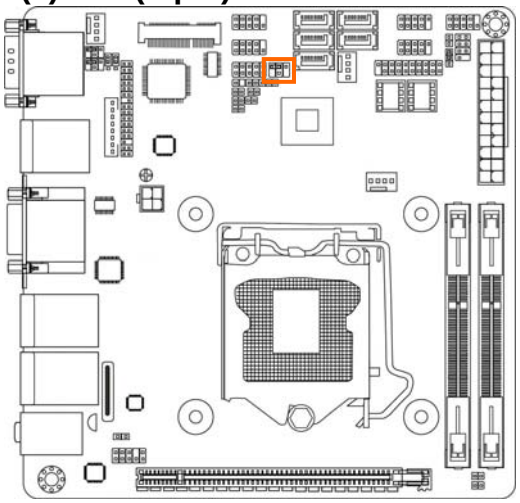


3-4 Closed:
RI= 5V;

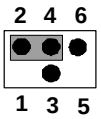


4-6 Closed:
RI= 12V;

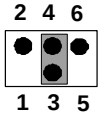
(2) JP7 (4-pin): COM4 Header Pin9 Function Select



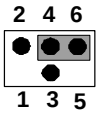
JP7



2-4 Closed:
RI=RS232

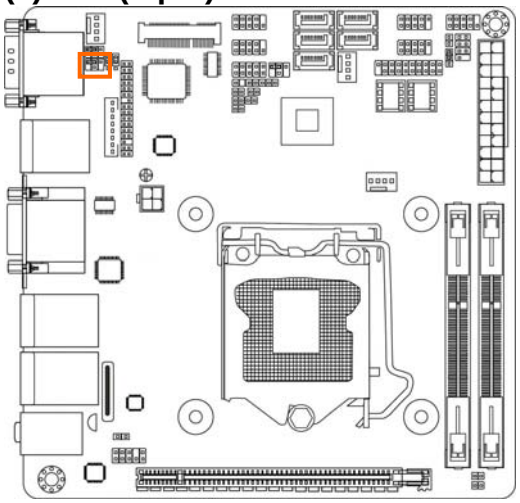


3-4 Closed:
RI= 5V;

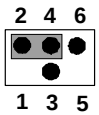


4-6 Closed:
RI= 12V;

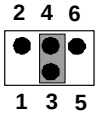
(3) JP4 (4-pin): LVDS VCC 3.3V/5V/12V Select



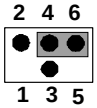
JP4



2-4 Closed: LVDS VCC= 3.3V

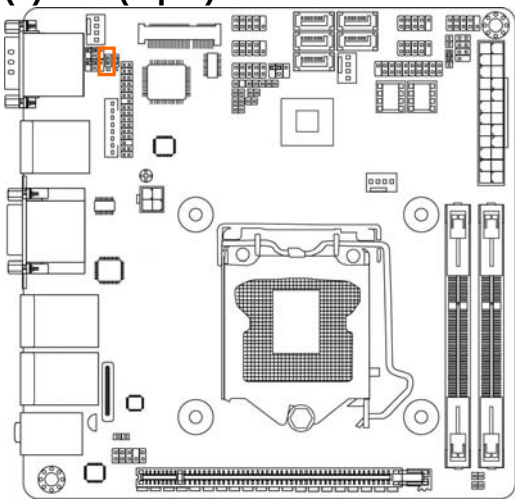


3-4 Closed: LVDS VCC= 5V;

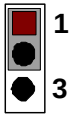


4-6 Closed: LVDS VCC= 12V;

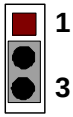
(4) JP5 (3-pin): Inverter 5V/12V Select



JP5

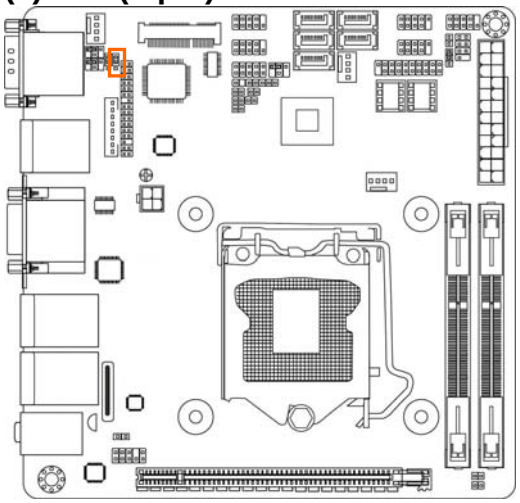


1-2 Closed: Inverter 5V Selected;

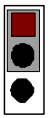


2-3 Closed: Inverter 12V Selected

(5) JP6 (3-pin): MSATA Slot VCC3.3V/ 3.3VSB Function Select



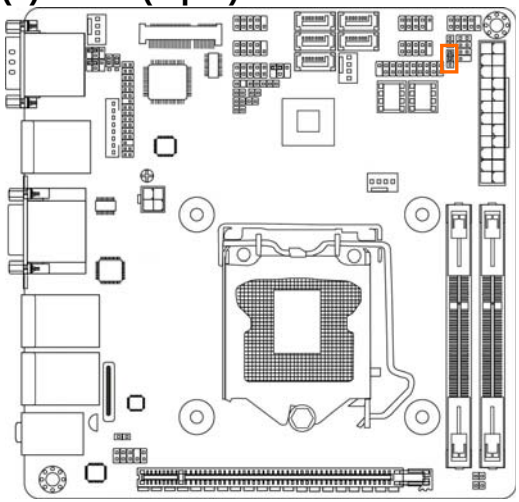
JP6



1-2 Closed: MSATA Slot VCC= VCC3.3V;

2-3 Closed: MSATA Slot VCC=3VSB

(6) JBAT (3-pin): Clear CMOS Function Settings

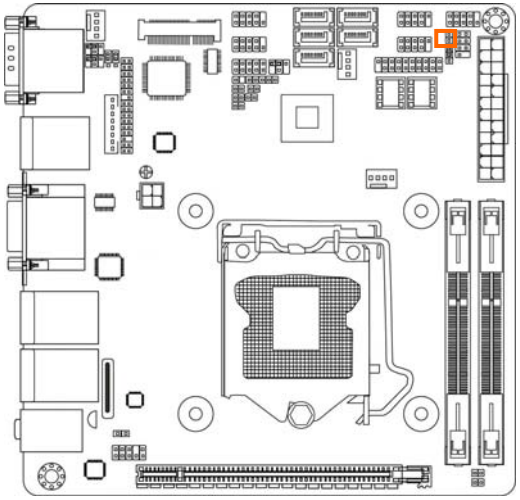


JBAT

1-2 Closed: Normal;

2-3 Closed: Clear CMOS

(7)JP1 (2-pin): ME Features Select

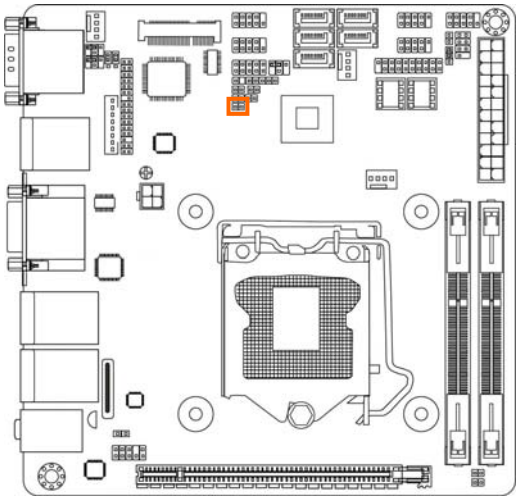


JP1

1-2 Open:ME Features Enabled;

1-2 Closed:ME Features Disabled.

(8)JP10 (2-pin): ATX Mode & AT Mode Select

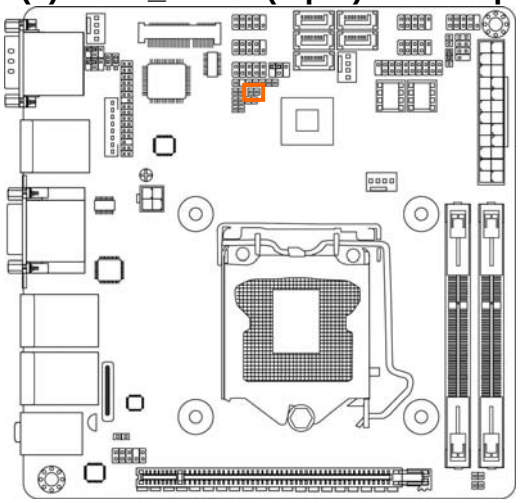


JP10

1-2 Open: ATX Mode Selected;

1-2 Closed: AT Mode Selected;

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



CASE_OPEN

1-2 Open: Normal;

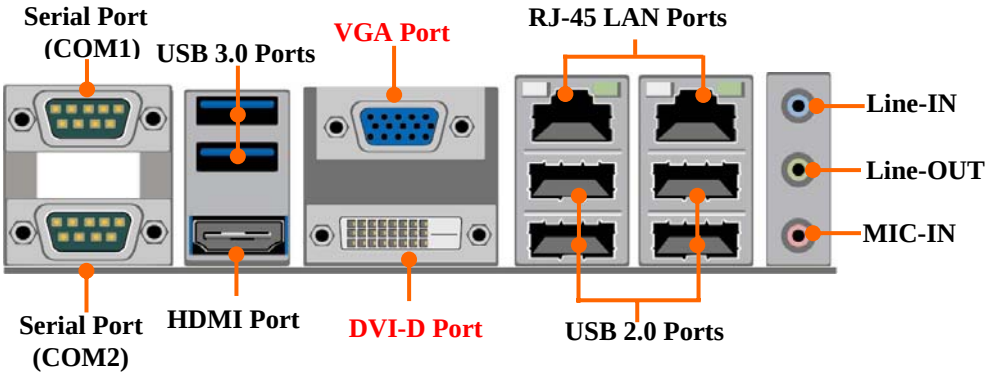
1-2 Closed : Case Open Function Selected.

Pin 1-2 Closed: Case open display function enabled. Use needs to enter BIOS and enable 'Case Open Detect' function. In this case if you case is removed, next time when you restart your computer a message will be displayed onscreen to inform you of this.

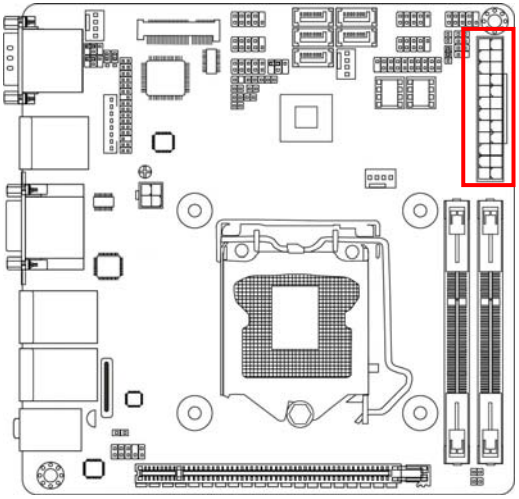
2-2 Connectors and Headers

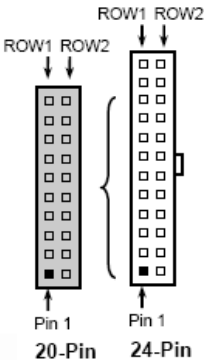
2-2-1 Connectors

(1) Rear Panel Connectors



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

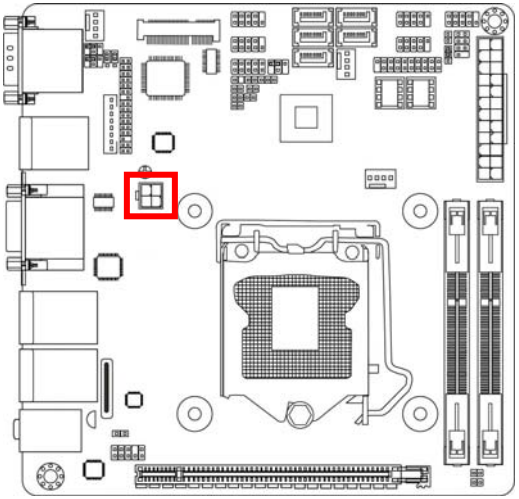


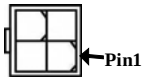


PIN	ROW1	ROW2
1	+3.3V	+3.3V
2	+3.3V	-12V
3	GND	GND
4	+5V	Soft Power on
5	GND	GND
6	+5V	GND
7	GND	GND
8	Power OK	-5V
9	+5V Stand by	+5V
10	+12V	+5V
11	+12V	+5V
12	+3.3V	GND

24-pin Main Power Connector

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

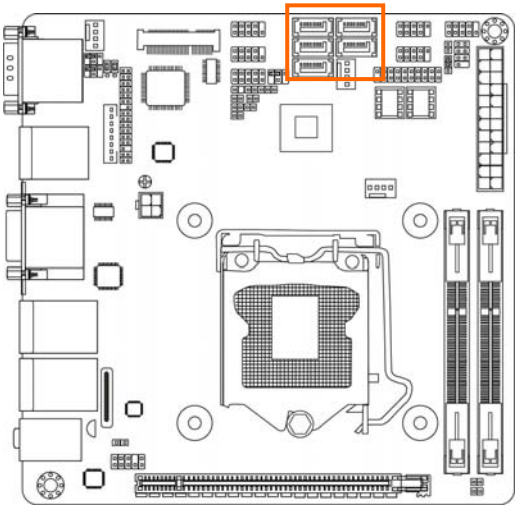




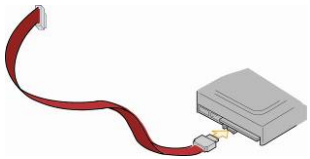
Pin No.	Definition
1	GND
2	GND
3	+12V
4	+12V

(4) SATA1/2/3/4/5: SATAIII Port connector

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



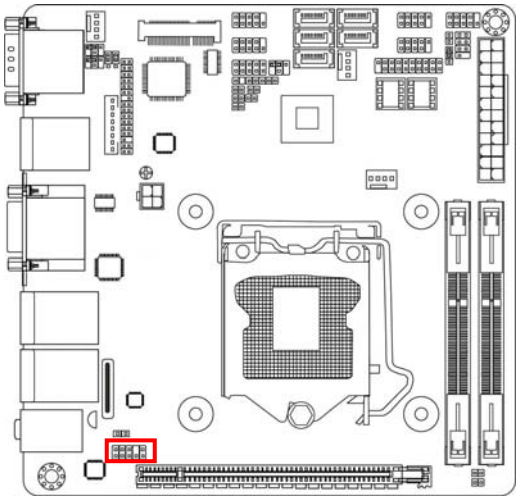
Pin No.	Defnition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

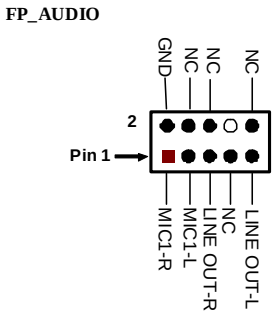


2-2-2 Headers

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

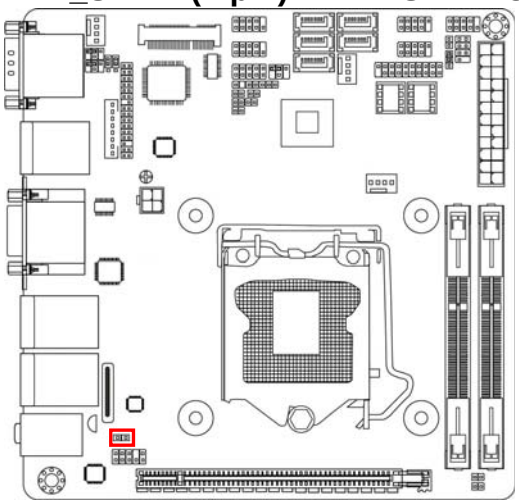
This header connects to Front Panel Line-out, MIC-In connector with cable.

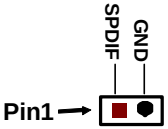




Line-Out, MIC Header

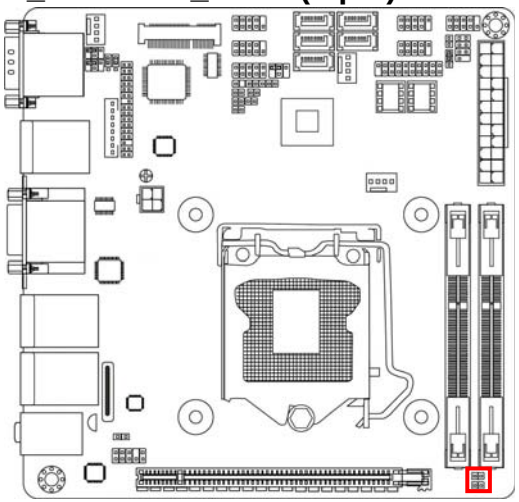
(2) HDMI_SPDIF (2-pin): HDMI-SPDIF Out Header

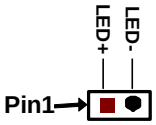




HDMI_SPDIF Header

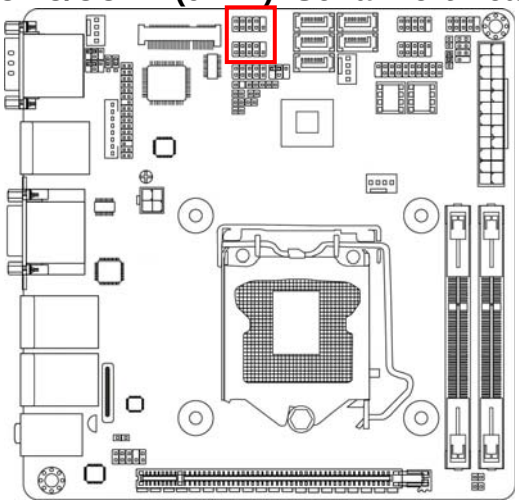
(3) NIC_LED1/NIC_LED2 (2-pin): LANLED Headers

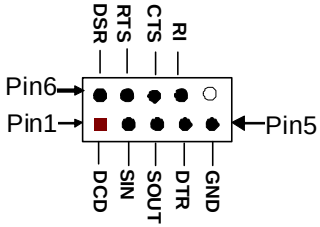




NIC_LED1/NIC_LED2

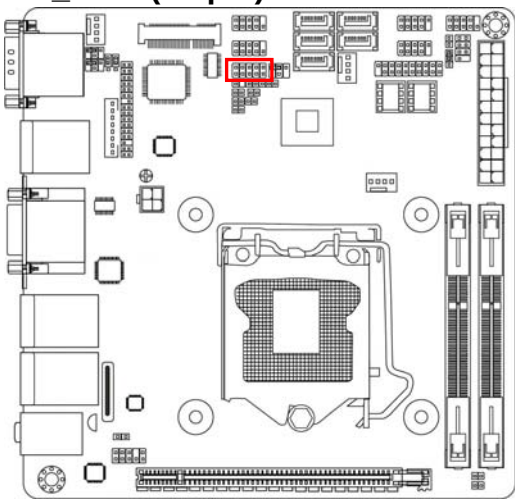
(4) COM3/COM4 (9-Pin): Serial Port Headers

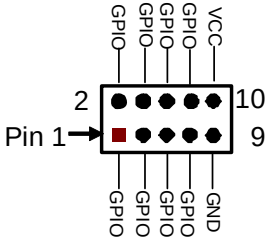




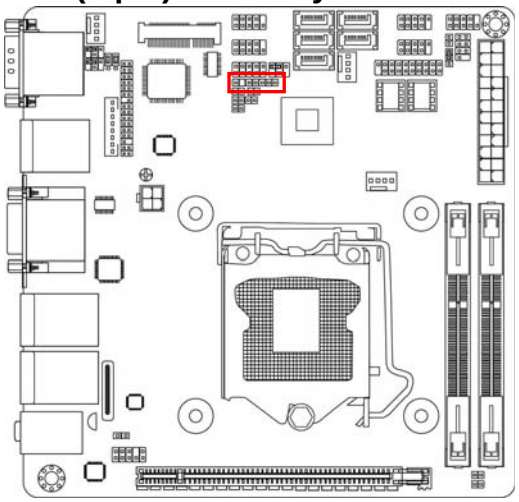
Serial Port Header

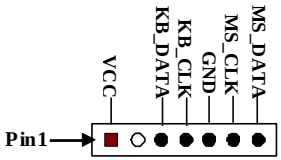
(5) GPIO_CON (10-pin): GPIO Header



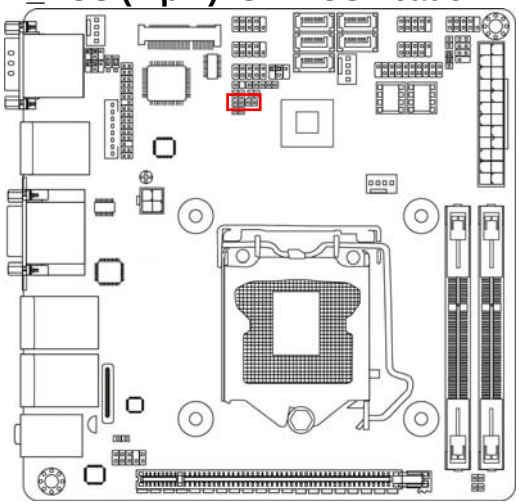


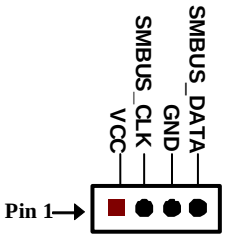
(6) KBMS (6-pin): PS/2 Keyboard & Mouse Header





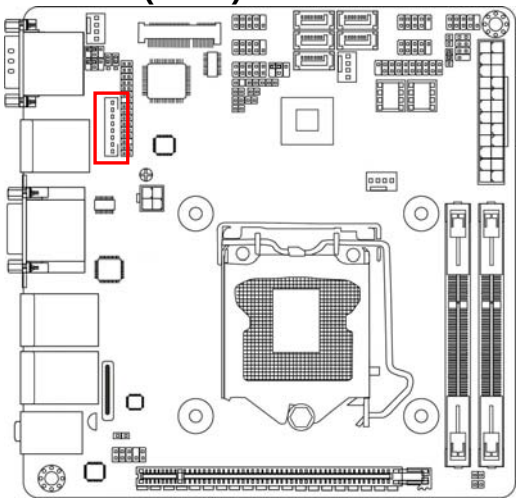
(7)SM_BUS (4-pin): SM BUS header

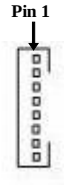




SM_BUS Header

(8) INVERTER (8-Pin): LVDS Inverter

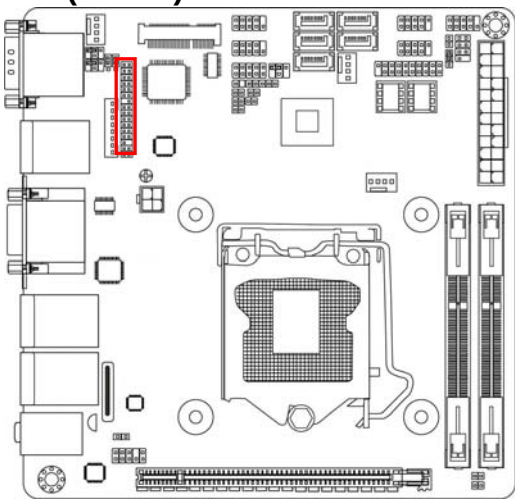


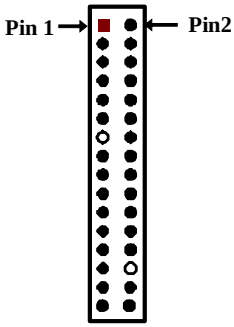


INVERTER

Pin No.	Definition
1	Backlight Enable
2	Backlight Duty
3	Backlight Power
4	Backlight Power
5	GND
6	GND
7	Backlight+ SW
8	Backlight- SW

(9) LVDS (30-Pin): LVDS Header

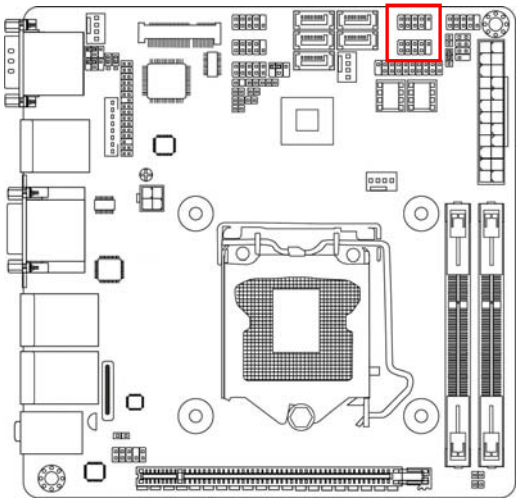


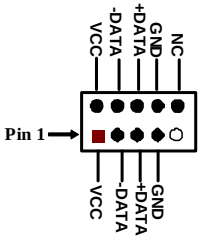


LVDS Header

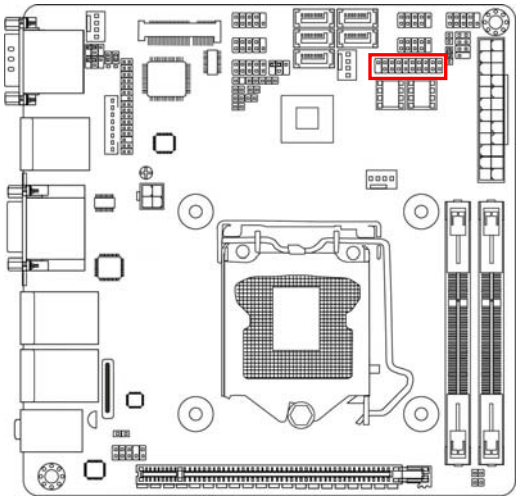
Pin NO.	Pin Define	Pin NO.	Pin Define
Pin 1	LVDSB_DATAN3	Pin 2	LVDSB_DATAP3
Pin 3	LVDS_CLKBN	Pin 4	LVDS_CLKBP
Pin 5	LVDSB_DATAN2	Pin 6	LVDSB_DATAP2
Pin 7	LVDSB_DATAN1	Pin 8	LVDSB_DATAP1
Pin 9	LVDSB_DATAN0	Pin 10	LVDSB_DATAP0
Pin 11	LVDS_DDC_DATA	Pin 12	LVDS_DDC_CLK
Pin 13	N/A	Pin 14	GND
Pin 15	GND	Pin 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

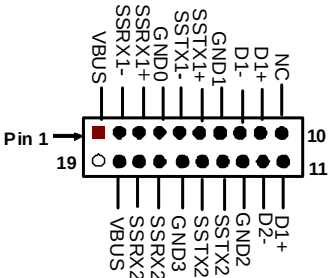
(10) USB2/USB3 (9-pin): USB 2.0 Port Header



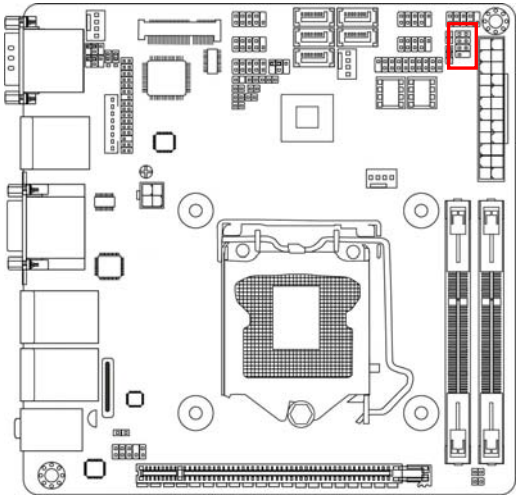


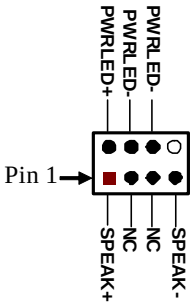
(11) USB4 (19-pin): USB 3.0 Port Header



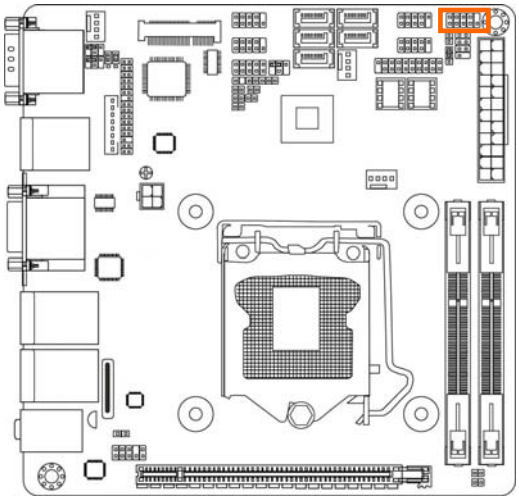


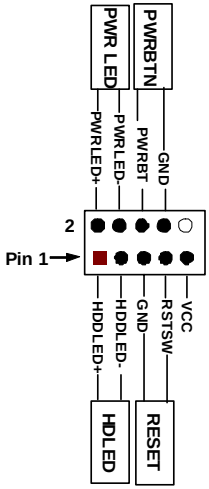
(12) JP3 (7-pin): PWR LED Header & Speaker Header



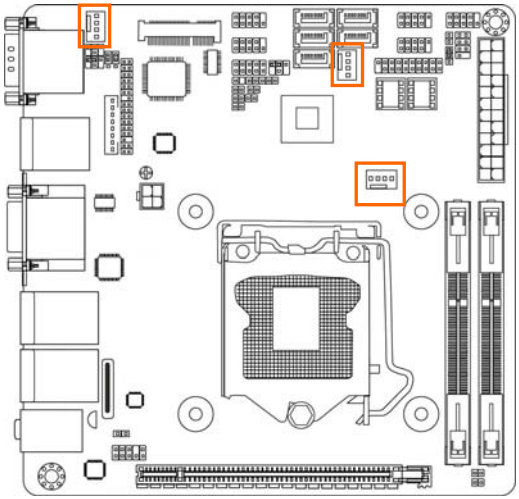


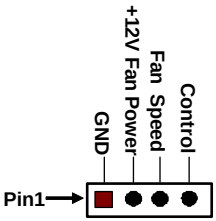
(13) JW-FP (9-pin): Front Panel Header





(14) CPUFAN1/SYSFAN1/SYSFAN2 (4-pin): FAN Headers





CPUFAN/SYSFAN1/SYSFAN2

Chapter 3
Introducing BIOS

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

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

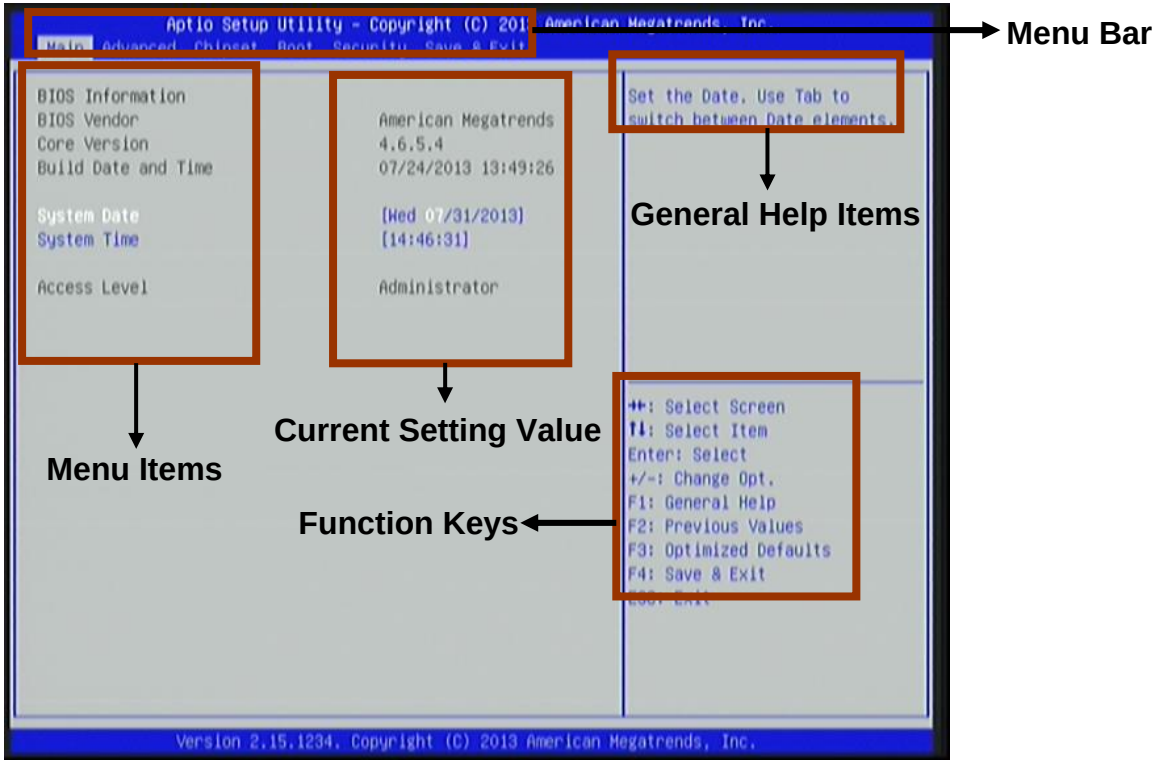
3-1 Entering Setup

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

Press **<Del>** to enter Setup

3-2 BIOS Menu Screen

The following diagram show a general BIOS menu screen:



BIOS Menu Screen

3-3 Function Keys

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

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

- Press <Enter> to select.
- Press <+>/<–> keys when you want to modify the BIOS parameters for the active option.
- [F1]: General help.
- [F2]: Previous value.
- [F3]: Optimized defaults.
- [F4]: Save & Reset.
- 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

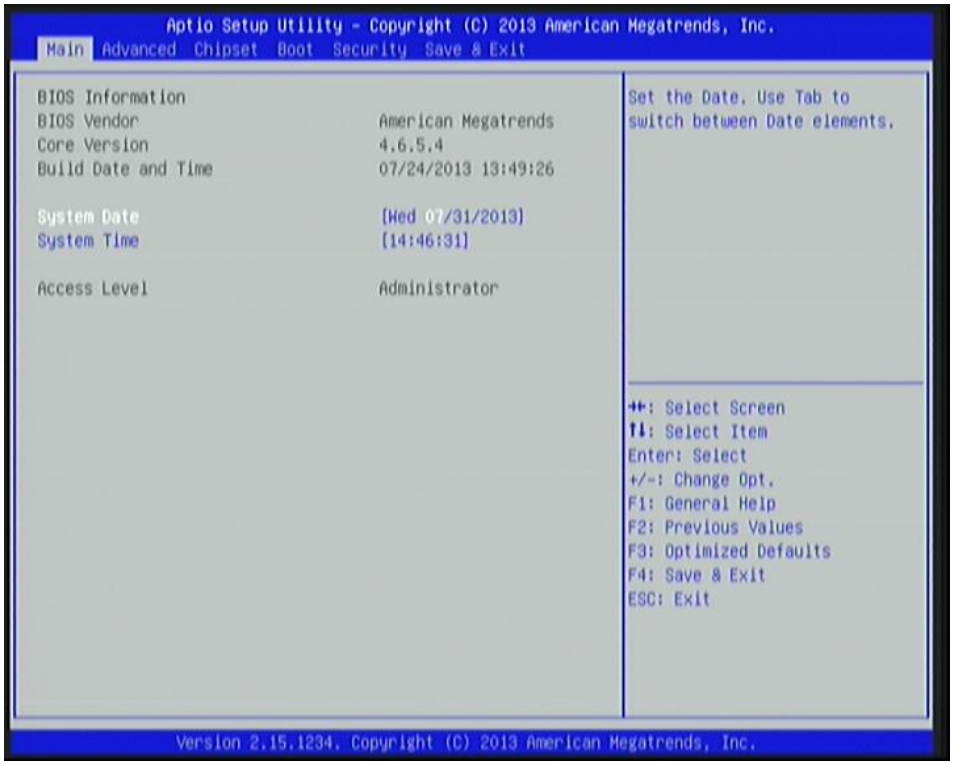
There are six menu bars on top of BIOS screen:

Main	To change system basic configuration
Advanced	To change system advanced configuration
Chipset	To change chipset configuration
Boot	To change boot settings
Security	Password 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.



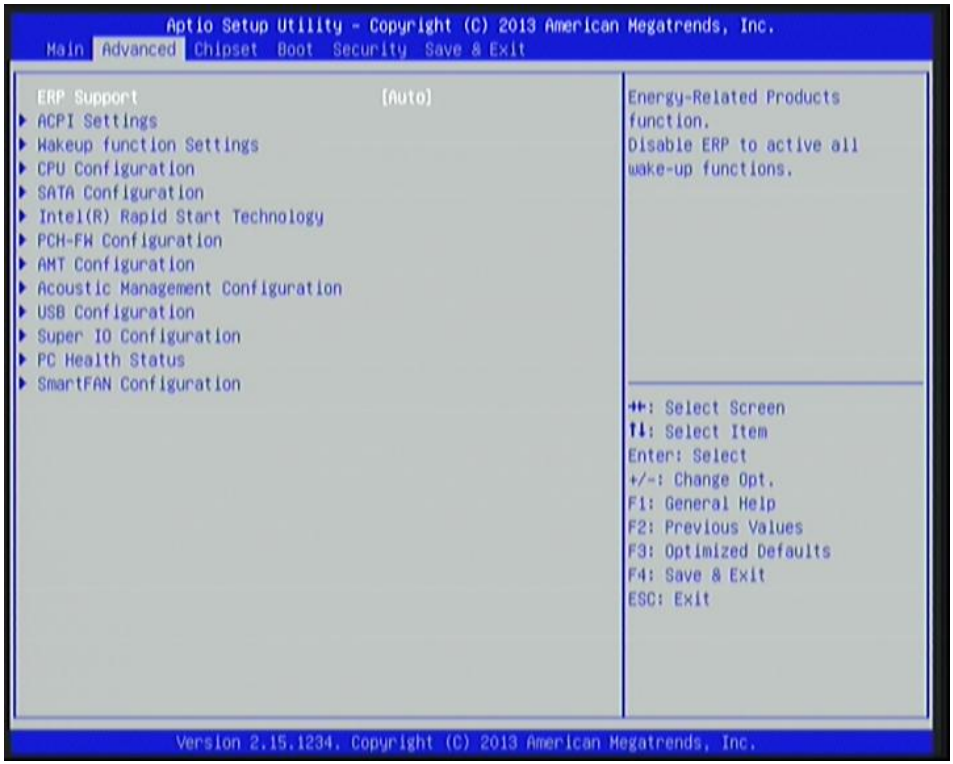
System Date

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



ERP Function

Use this item to enable or disable ERP function for this board. This item should be set as [**Disabled**] if you wish to have all active wake-up functions.

- **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 only (Suspend to RAM)].

- **Wakeup Function Settings**

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

Wake System with Fixed Time

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

PS2 KB/MS Wakeup

Use this item to enable or disable PS2 KB/MS wakeup. This function is only supported when ERP function is disabled.

USB S3/S4 Wakeup

Use this item to enable or disable USB S3/S4 wakeup. This function is only supported when ERP function is disabled.

► **CPU Configuration**

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

Hyper-Threading

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

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

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

Active Processor Cores

Use this item to select number of cores to enable in each processor package.

Limit CPUID Maximum

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

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

Execute Disable Bit

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

Intel Virtualization Technology

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

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

EIST

Use this item to enable or disable Intel SpeedStep.

Turbo Mode

Use this item to enable or disable Turbo Mode.

**This item might not be available depending on configuration.*

Energy Performance

Use this item to optimize between performance and power savings.

The optional settings are: [Performance]; [Balanced Performance]; [Balanced Energy]; [Energy Efficient].

**This item might not be available depending on configuration.*

CPU C Status

Use this item to enable or disable CPU C status.

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

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

CPU C6 Report

Use this item to enable or disable CPU C6 report to OS.

CPU C7 Report

Use this item to enable or disable CPU C7 report to OS.

The optional settings are: [Disabled]; [CPU C7]; [CPU C7s].

► **SATA Configuration**

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

SATA Controller(s)

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

SATA Mode Selection

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

When set as [IDE] or [RAID], user can make further settings in 'IDE Legacy/Native Mode Selection**'.*

IDE Legacy/Native Mode Selection

The optional settings are: [Native]; [Legacy].

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

Aggressive LPM Support

Use this item to enable PCH to aggressively enter link power state.

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

SATA Controller Speed

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

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

When set as [AHCI] or [RAID], user can also make further settings for each available SATA (1~6) port or MSATA port:

Serial ATA Port 1/2/3/4/5/6/mSATA

Port 1/ Port 2/ Port 3/ Port 4/ Port 5/ Port 6/ mSATA

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

Use this item to enable or disable each SATA port.

SATA Device Type

The optional settings are: [Hard Disk Drive]; [Solid State Drive].

► **Intel(R) Rapid Start Technology**

Press [Enter] to go to next screen to enable or disable '**Intel(R) Rapid Start Technology'.**

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

Entry on S3 RTC Wake

Use this item to enable or disable RapidStart innovation upon S3 RTC wake.

Entry After

Use this item to enable RTC wake timer at S3 entry. Value ranges from 0 (immediately) to 120 minutes.

Active Page Threshold Support

Use this item to enable or disable support for RST with small partition.

Hybrid Hard Disk Support

Use this item to enable or disable Hybrid Hard Disk Support.

RapidStart Display Save/Restore

Use this function to enable or disable RapidStart Display Save/Restore function.

► **PCH-FW Configuration**

Press [Enter] to view ME information and make settings for '**Firmware Update Configuration'**.

► **Firmware Update Configuration**

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

ME FW Image RE-Flash

Use this item to enable or disable ME FW Image Re-Flash function.

► **AMT Configuration**

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

Intel AMT

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

BIOS Hotkey Pressed

Use this function to enable or disable BIOS Hotkey Press function.

MEBx Selection Screen

Use this function to enable or disable MEBx Selection Screen function.

Hide Un-Configure ME Confirmation

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

MEBx Debug Message Output

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

Un-Configure ME

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

Amt Wait Timer

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

Disable ME

Use this item to set ME to soft Temporary Disabled function.

ASF

Use this item to enable or disable Alert Specification Format.

Active Remote Assistance Process

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

USB Configure

Use this item to enable or disable USB configure function.

PET Progress

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

WatchDog

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

OS Timer

Use this item to set OS watch dog timer.

BIOS Timer
Use this item to set BIOS watch dog timer.

► **Acoustic Management Configuration**
Press [Enter] to make settings for the following sub-items:
Press [Enter] to go to next screen to enable or disable **'Automatic Acoustic Management'.**

► **USB Configuration**
Press [Enter] to make settings for the following sub-items:
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 delay and time-out:

USB Transfer time-out
Use this item to set the time-out value for control, bulk, and interrupt transfers.
The optional settings are: [1 sec]; [5 sec]; [10 sec]; [20 sec].
Device reset time-out
Use this item to set USB mass storage device start unit command time-out.
The optional settings are: [10 sec]; [20 sec]; [30 sec]; [40 sec].
Device power-up delay
Use this item to set maximum time the device will take before it properly reports itself to the host controller. 'Auto' uses default value: for a root port it is 100 ms, for

a hub port the delay is taken from hub descriptor. The optional settings: [Auto]; [Manual].Select [Manual] you can set value for the following sub-item: '**Device Power-up delay in seconds',** the delay range in from 1 to 40 seconds, in one second increments.

► **Super I/O Configuration**

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

Super IO Configuration

► **Serial Port 1 Configuration/ Serial Port 4 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=250kbsp]; [RS232=1Mbsp, RS422/RS485=10Mbsp].

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**

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].

WatchDog Timer

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

WatchDog Timer Value
User can set a value in the range of 4 to 255.

WatchDog Timer Unit
The optional settings are: [Sec.]; [Min.].

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(ATX Mode & AT Mode Select).
The optional settings are: Enabled]; [Disabled].
Case Open Detect
Use this item to detect case has already open or not, show message in POST.

► **PC Health Status**
Press [Enter] to view hardware health status and set '**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].

► **SmartFan Configuration**
Press [Enter] to make settings for SmartFan Configuration:
CPUFAN Type
The optional settings are: [3 pin]/ [4 pin].
SYSFAN1 Type
The optional settings are: [3 pin]/ [4 pin].
SYSFAN2 Type
The optional settings are: [3 pin]/ [4 pin].

CPUFAN / SYSFAN1/ SYSFAN2 Smart Mode
When set as [Enabled], the following sub-items shall appear:
CPUFAN / SYSFAN1/ SYSFAN2 Full-Speed Temperature
Use this item to set CPUFAN/SYSFAN1/SYSFAN2 full speed temperature. Fan will run at full speed when above this 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.

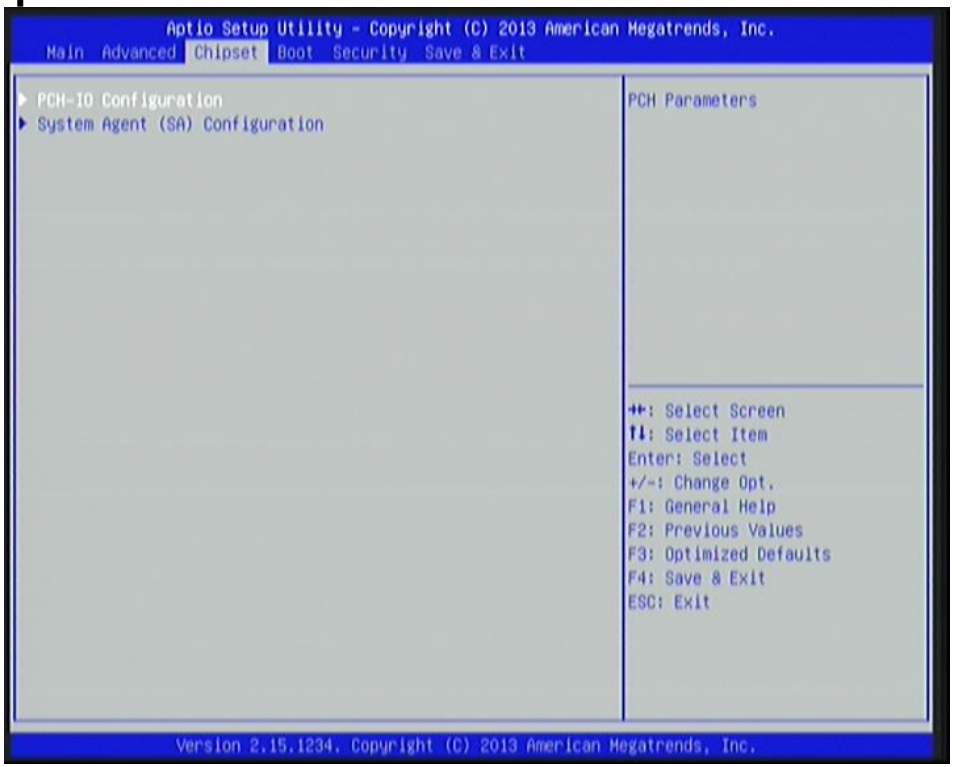
CPUFAN / SYSFAN1/ SYSFAN2 Idle-Speed Temperature

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

3-8 Chipset Menu



► **PCH-IO Configuration**

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

► **USB Devices Configuration**

Press [Enter] to further setting USB device configuration.

USB Configuration

XHCI Mode

Use this item to select mode of operation for XHCI controller.

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

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

EHCI1/EHCI2

Use this item to control the USB EHCI (USB 2.0) functions.

One EHCI controller must always be enabled.

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

Route USB 2.0 pins to which HC?

The optional settings are: [Route Per-Pin]; [Route all Pins to EHCI]; [Route all Pins to XHCI].

Enable USB 3.0 pins

The optional settings are: [Select Per-Pin]; [Disable all Pins]; [Enable all Pins].

Azalia

Use this function to control the detection of the Azalia device.

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

Onboard LAN1 Controller

Use this item to enable or disable onboard LAN controller.

Wake on LAN1

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

Onboard LAN2 Controller

Use this item to control the PCI Express root port.

SLP_S4 Assertion Width

Use this item to select a minimum assertion width of the SLP_S4# signal to ensure that the DRAMs has been safely power-cycled.

The optional settings are: [1-2 Seconds]; [2-3 Seconds]; [3-4 Seconds]; [4-5 Seconds].

Restore AC Power Loss

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

failure. The optional settings are: [Power Off]; [Power On]; [Last State].

► **System Agent (SA) Configuration**

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

VT-D

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

**This item might not be available depending on configuration.*

Azalia Internal HDMI Codec

Use this item to enable or disable DP/HDMI/DVI port audio device.

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

► **Graphics Configuration**

Press [Enter] to make further settings for Graphics Configuration.

Graphics Configuration

Primary IGFX Boot Display

Use this item to select the video device which will be activated during POST. This has no effect if external graphics present. 'Secondary boot display selection will appear based on your selection. VGA modes will be supported only on primary display.

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

When set as **[CRT]; [HDMI]; [DVI] or **[LVDS]**, the following sub-item shall appear:*

Secondary IGFX Boot Display

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

Primary Display

Use this item to select which of IGFX/PEG/PCI graphics device should be primary display or select SG for switchable GFX.

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

Internal Graphics

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

Aperture Size

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

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]; [128M]; [256M]; [512M]; [1024M].

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].

LCD Control

Active LFP

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

[Disable]: VBIOS does not enable LVDS.

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

LVDS Panel Type

Use this item to select LVDS panel resolution.

The optional setting are: [640 x 480 18bit Single]; [800 x 480 18bit Single]; [800x 600 18bit Single]; [1024 x 600 18bit Single]; [1024 x 768 24bit Single]; [1280 x 720 18bit Single]; [1280 x 1024 24bit Dual]; [1366 x 768 18bit Single]; [1366 x 768 24bit Single]; [1440 x 900 18bit Dual]; [1400 x 900 24bit Dual]; [1400 x 1050 24bit Dual]; [1600 x 900 24bit Dual]; [1680 x 1050 24bit Dual]; [1600 x 1200 24bit Dual]; [1920 x 1080 24bit Dual].

► **PEG Configuration**

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

PEG Slot Configuration

PEG-Gen X

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

Enable PEG

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

Detect Non-Compliance Device

Use this item to detect non-compliance PCI Express device in PEG.

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

Program PCIe ASPM after OpROM

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

[Enabled]: PCIe ASPM will be programmed after OpROM.

[Disabled]: PCIe ASPM will be programmed before OpROM.

PEG De-emphasis Control

Use this item to configure the De-emphasis control on PEG.

The optional settings are: [-6 dB]; [-3.5 dB].

PEG ASPM

Use this item to control ASPM support for the PEG device. This has no effect if PEG is not the currently active device.

The optional settings are: [Disabled]; [Auto]; [ASPM L0s]; [ASPM L1]; [ASPM L0sL1].

► **Memory Configuration**

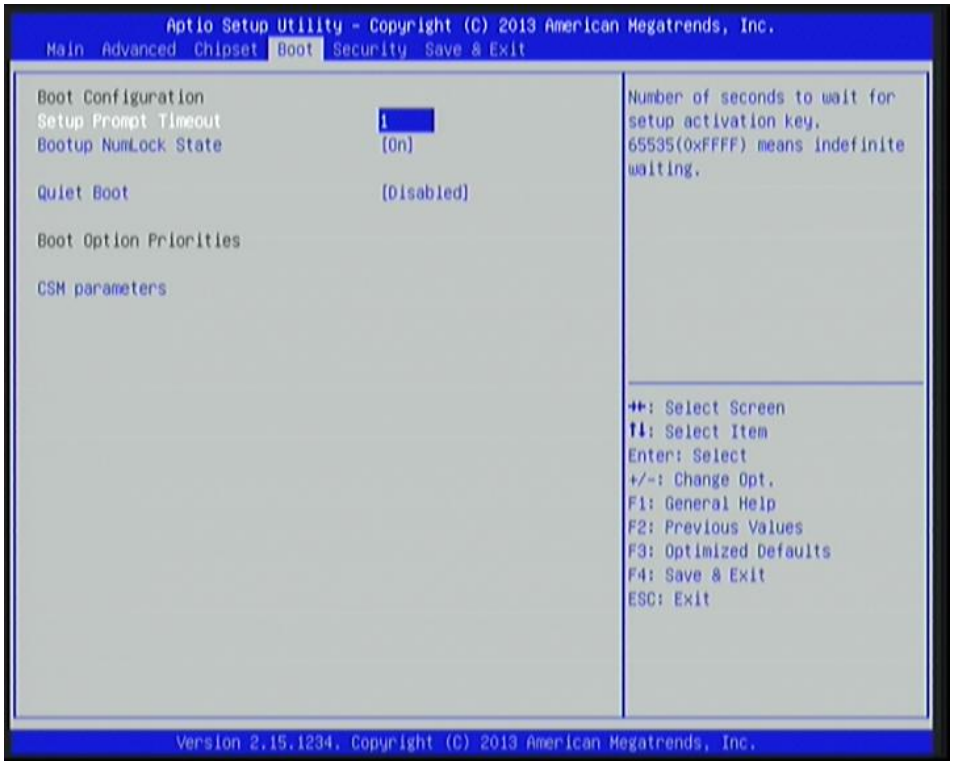
Press [Enter] to make settings for the following sub-item:

Memory Frequency Limiter

Use this item to set maximum memory frequency selection in Mhz.

The optional settings are: [Auto]; [1067]; [1333]; [1600]; [1867].

3-9 Boot Menu

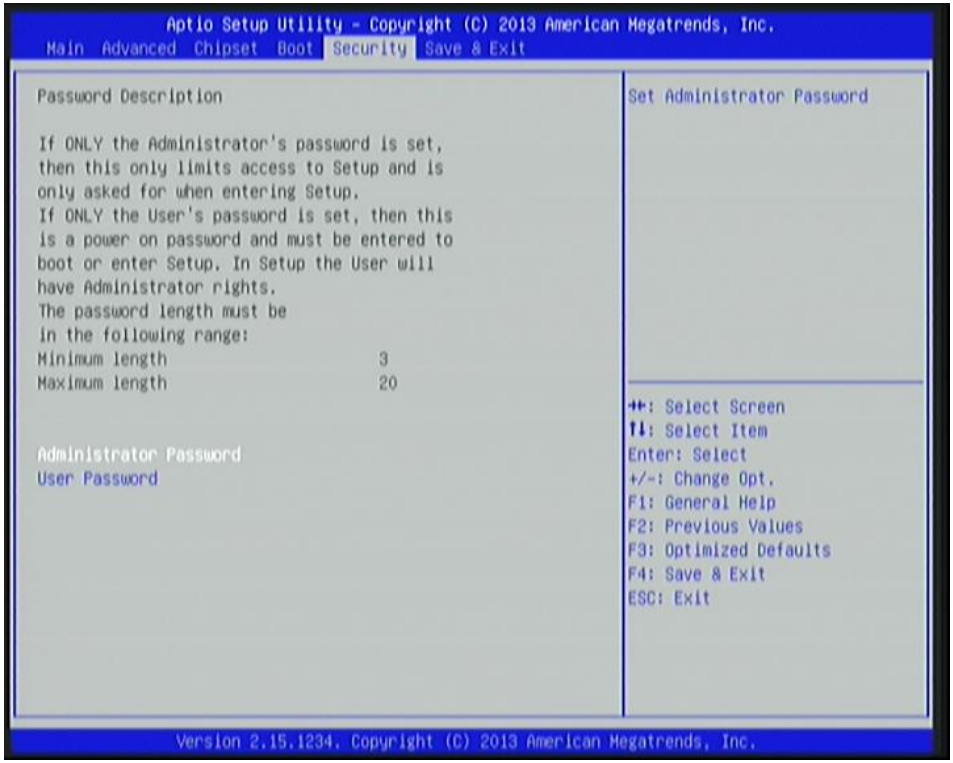


Boot Configuration

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

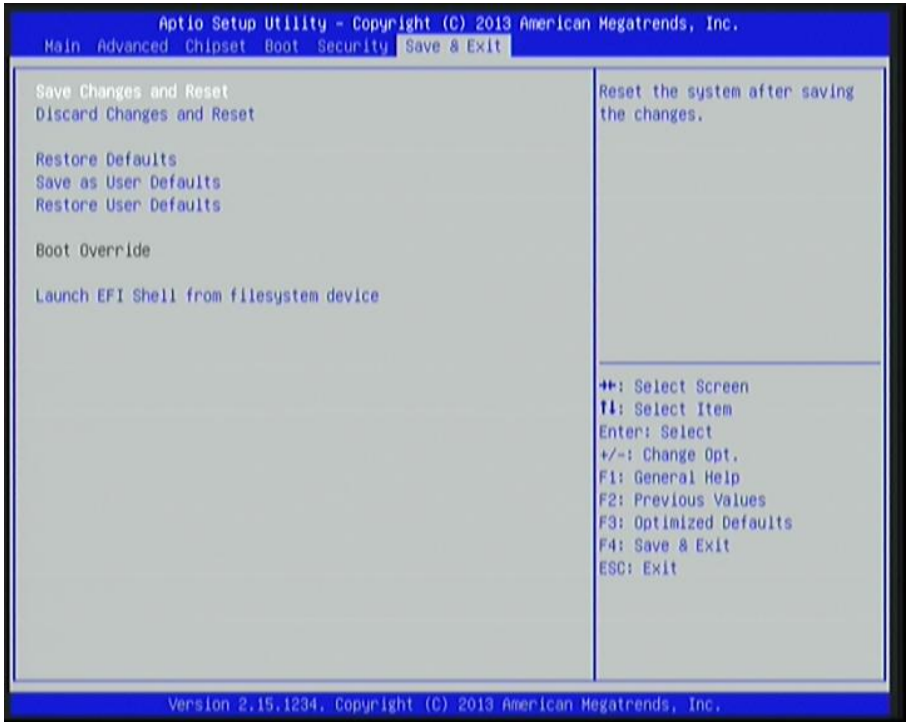
- **CSM parameters**
  Press [Enter] to make settings for the following sub-items:
  Boot option filter
  This option controls what device system can boot to.
  The optional settings are: [UEFI and Legacy]; [Legacy only]; [UEFI only].
  Launch PXE OpROM policy
  This option controls the execution of UEFI and Legacy PXE OpROM.
  The optional settings are: [Do not launch]; [UEFI only]; [Legacy only].
  Launch Storage OpROM policy
  This option controls the execution of UEFI and Legacy Storage OpROM.
  The optional settings are: [Do not launch]; [UEFI only]; [Legacy only].
  Launch Video OpROM policy
  This option controls the execution of UEFI and Legacy Video OpROM.
  The optional settings are: [Do not launch]; [UEFI only]; [Legacy only].
  Other PCI device ROM priority
  This item is for PCI devices other than Network, Mass storage or video defines which OpROM to launch.
  The optional settings are: [UEFI OpROM]; [Legacy OpROM].

3-10 Security Menu



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

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.
Launch EFI Shell from file system device
This item is for attempts to launch EFI shell application (Shell x64.efi) from one of the available filesystem devices.