TECHNICAL MANUAL

Of

Intel Q87 Express Chipset

Based Mini-ITX M/B

Smart T6003

Revision: 3.0

Release date: December 7, 2017

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
3.0	Third Edition	2017-12-7

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 1333/1600 MHz up to 16GB and dual channel function
- Integrated with Intel® i211AT and Intel® i217-LM Gigabit Ethernet LAN chip
- Integrated ALC662 HD audio codec
- Support HDMI , DVI-D and VGA video outputs
- Support 4* SATAIII 6GB/S ports with RAID 0,1,5,10 function
- Support 1*full-size Mini-PCIE slot (Selectable with MSATA)
- Support 1*half-size Mini-PCIE slot
- Support PCI Express x4 slot
- Support USB 3.0 data transport demand
- Support CPU Smart FAN
- Supports ACPI S3 Function
- Compliance with EuP Standard
- Support TPM function
- Support Watchdog Timer Technology

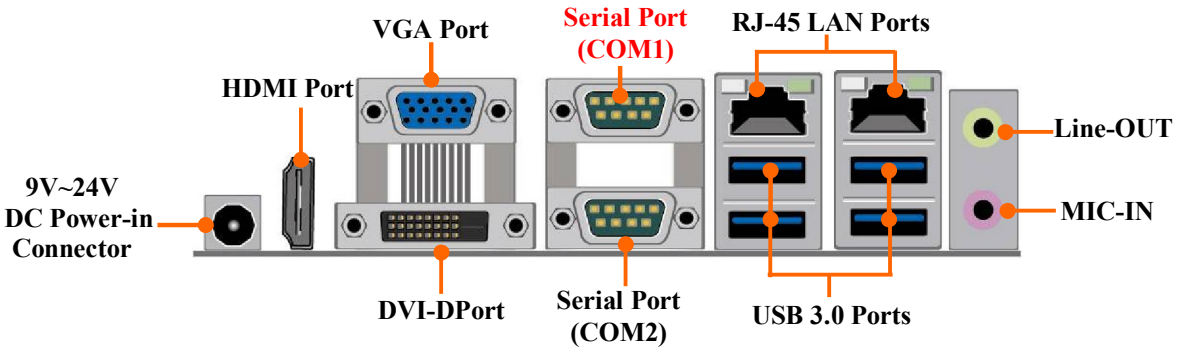
1-2 Specification

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 1333/1600 MHz DDRIII SO-DIMM expandable to 16GB ● Support dual channel function
Expansion Slot	● 1* PCI Express x 4 slot ● 1 * full-size Mini-PCIE slot (Selectable with MSATA) ● 1 * half-size Mini-PCIE slot
Storage	● 4 * 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 Audio Codec integrated ● Audio driver and utility included
BIOS	● 64M bit Flash ROM
Multi I/O	***Rear Panel I/O:*** ● 1* 9V~24V DC power in jack ● 1* HDMI port connector ● 1* VGA port connector ● 1* DVI-D port connector ● 1* RS232/422/485 Serial port connector(COM1) ● 1* RS232 Serial port connector (COM2) ● 4* USB 3.0 port connector ● 2* RJ-45 LAN connector ● 1* Audio Line-out connector

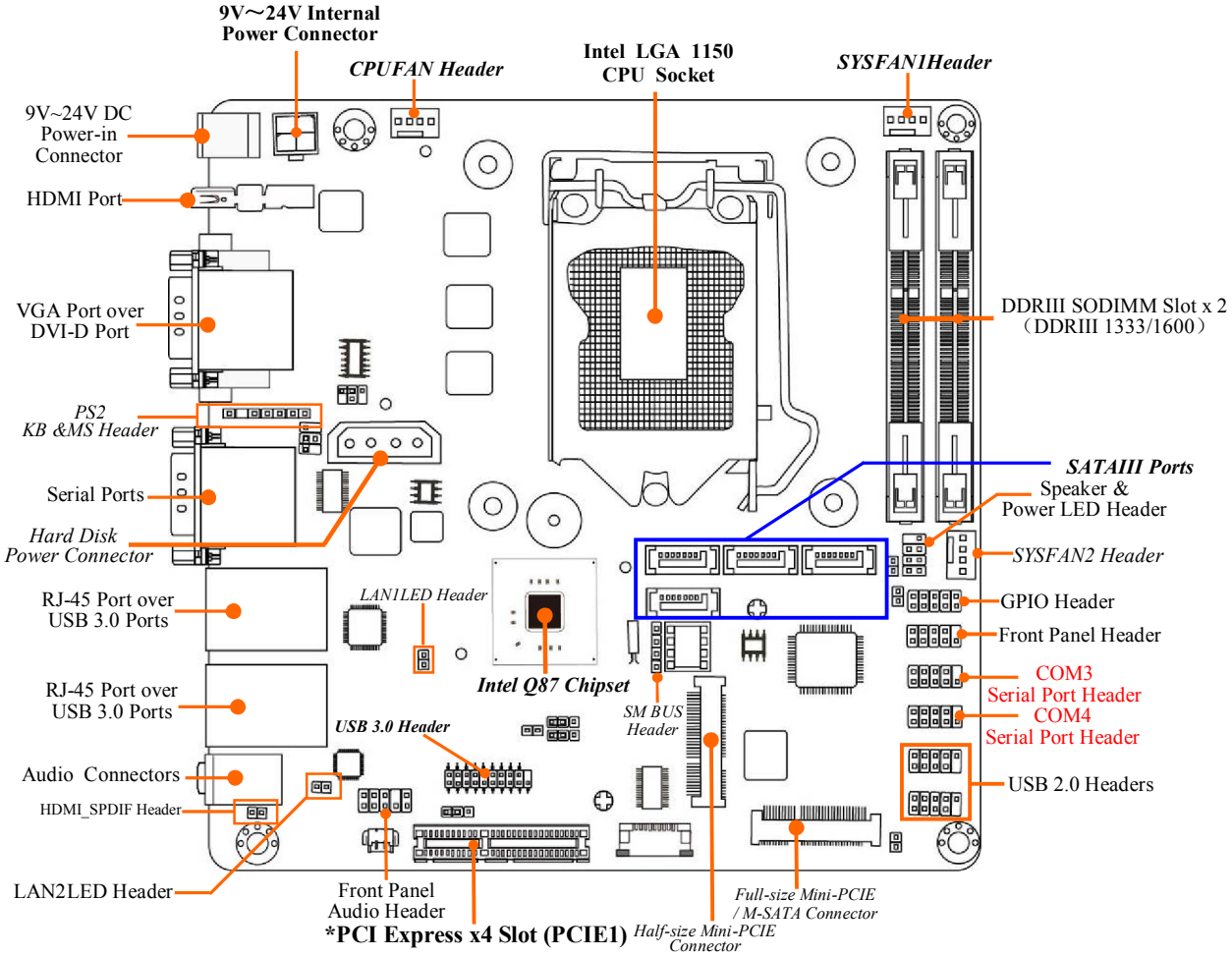
	● 1* Audio MIC connector ***Internal I/O Connectors& Headers:*** ● 1 *4-pin 9V~24V internal power connector ● 4* SATAIII connector ● 1* 4-pin SATA hard disk power connector ● 1* Front panel audio header ● 1* HDMI_SPDIF out header ● 2* LAN port activity indicator LED header ● 2* RS232 Serial port header(COM3/COM4) ● 1* GPIO header ● 1* PS/2 KB & MS header ● 1* SM BUS header ● 2* USB 2.0 header (support four expansion USB 2.0 ports) ● 1* USB 3.0 header (support two expansion USB 3.0 ports) ● 1* Speaker header + PWRLED header ● 1* Front panel header ● 1* CPU fan header ● 2* System fan header

1-3 Layout Diagram

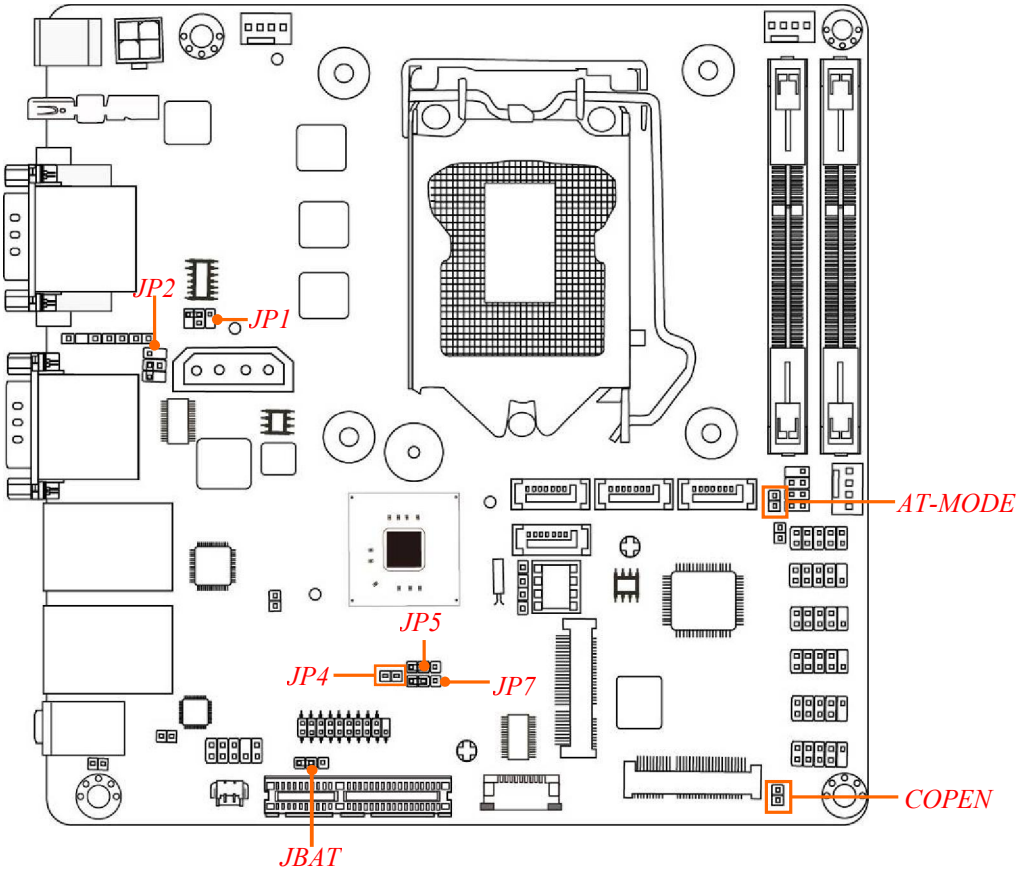
Rear IO Diagram



Motherboard Internal Diagram



Motherboard Jumper Position



Jumper

Jumper	Name	Description
JP1	COM1 Port Pin9 Function Select	4-pin Block
JP2	COM2 Port Pin9 Function Select	4-pin Block
JP5	MPE Slot VCC3.3V /3VSB Select	3-pin Block
JP7	MMPE Slot VCC3.3V /3VSB Select	3-pin Block
JBAT	CMOS RAM Clear Function Setting	3-pin Block
JP4	Security Measure Function Select	2-pin Block
AT-MODE	ATX Mode & AT Mode Select	2-pin Block
COPEN	Case Open Message Display Function	2-pin Block

Connectors

Connector	Name
DCIN	9V~24V Main Power Connector
DCPWRIN	9V~24V Internal Power Connector
PWROUT	SATA Hard Disk Power Connector
SATA1/2/3/4	SATAIII Connector x 4
HDMI	High-Definition Multimedia Interface
DVI	DVI-D Port Connector
VGA	VGA Port Connector
USB1	USB 3.0 Port Connector x2
COM1 (Top)	RS232/422/485 Serial Port Connector
COM2 (Bottom)	RS232 Serial Port Connector
UL1(Middle & Bottom) /UL2(Middle & Bottom)	USB 3.0 Port Connector x4
UL1(Top) / UL2(Top)	RJ-45 LAN Connector x2
AUDIO(Bottom)	Audio MIC Audio Connector
AUDIO(Top)	Audio Line out Audio Connector

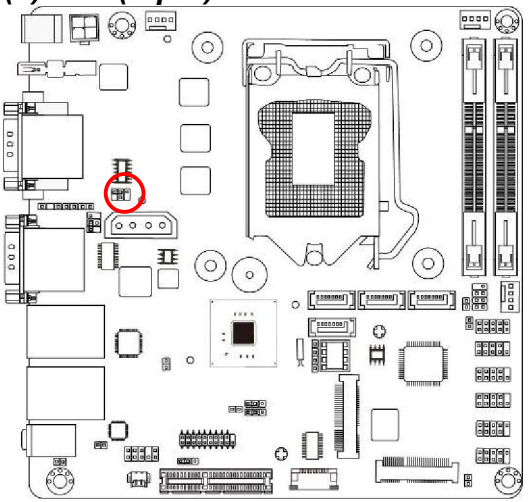
Headers

Header	Name	Description
FP_AUDIO	Front Panel Audio Header	9-pin Block
SPDIFOUT	HDMI_SPDIF Out Header	2-pin Block
LAN1LED/LAN2LED	LAN LED Header	2-pin Block
COM3/COM4	RS232 Serial Port Header X2	9-pin Block
GPIO	GPIO Header	10-pin Block
PS2KBMS	PS2 KB & MS Header	6-pin Block
SMBUS	SM BUS Header	4-pin Block
USB2/USB3	USB 2.0 Port Header x2	9-pin block
USB1	USB 3.0 Port Header	19-pin block
SPK-LED	Power LED+ Speaker Header	7-pin Block
FP	Front Panel Header(PWR LED/ HD LED/ /Power Button /Reset)	9-pin Block
SYSFAN1/SYSFAN2 /CPU FAN	FAN Header x3	4-pin Block

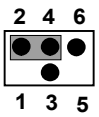
Chapter 2
Hardware Installation

2-1 Jumper Setting

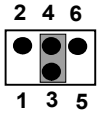
(1) JP1 (4-pin): COM1 Port Pin9 Function Select



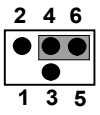
JP1→COM1 Port



2-4 Closed:
RI=RS232;

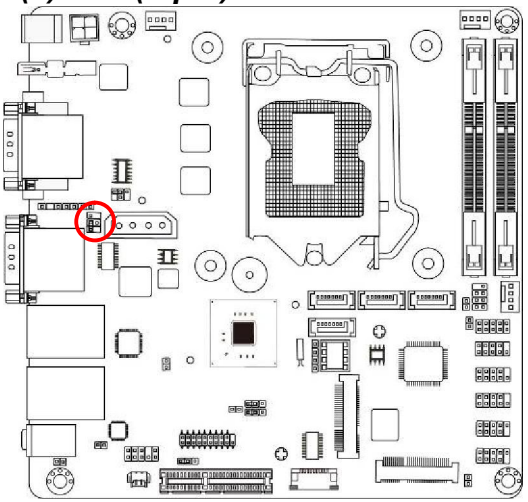


3-4 Closed:
RI= 5V;

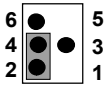


4-6 Closed:
RI= 12V.

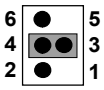
(2) JP2 (4-pin): COM4 Header Pin9 Function Select



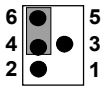
JP2→COM4 Port



2-4 Closed:
RI=RS232;

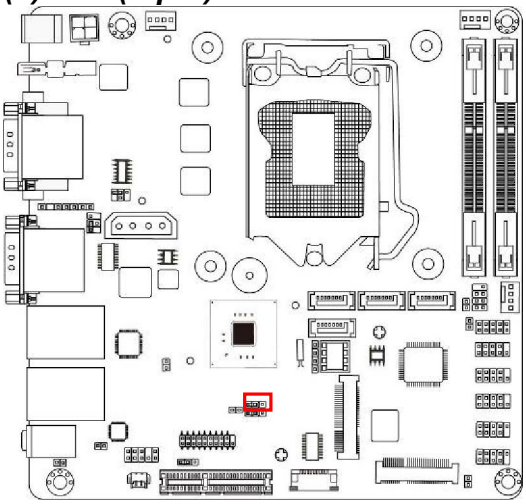


3-4 Closed:
RI= 5V;

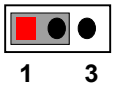


4-6 Closed:
RI= 12V.

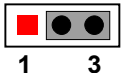
(3) JP5 (3-pin): MPE Slot VCC3.3V/ 3VSB Select



JP5→MPE Slot(Half-size Mini-PCIE Slot)

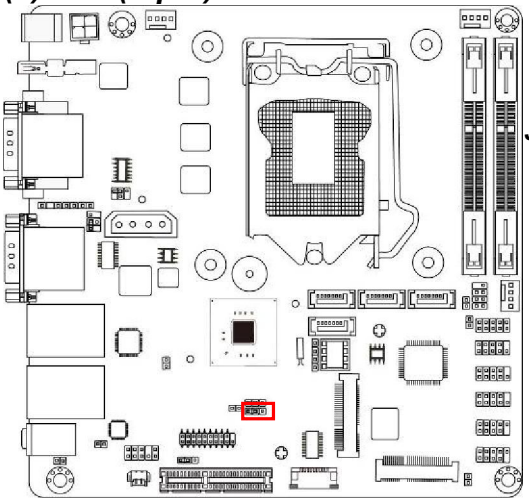


1-2 Closed: MPE Slot VCC= 3.3V;

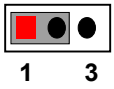


2-3 Closed: MPE Slot VCC= 3VSB.

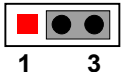
(4) JP7 (3-pin): MMPE Slot VCC3.3V/ 3VSB Select



JP7→MMPE Slot(Full-size Mini-PCIE/MSATA Slot)

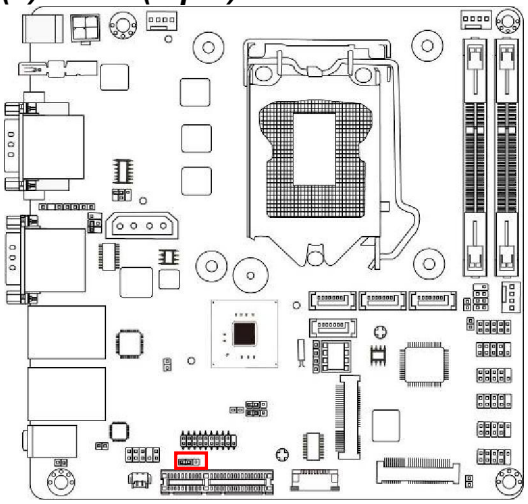


1-2 Closed: MMPE Slot VCC= 3.3V;

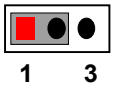


2-3 Closed: MMPE Slot VCC= 3VSB.

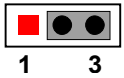
(5) JBAT (3-pin): Clear CMOS Function Settings



JBAT→Clear COMS

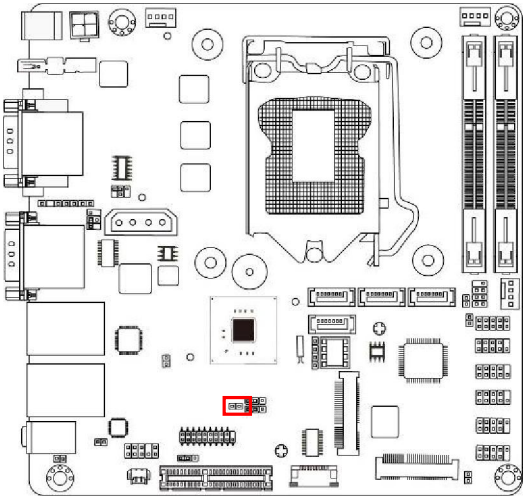


1-2 Closed: Normal;



2-3 Closed:Clear CMOS.

(6)JP4 (2-pin): Security Measure Function Select



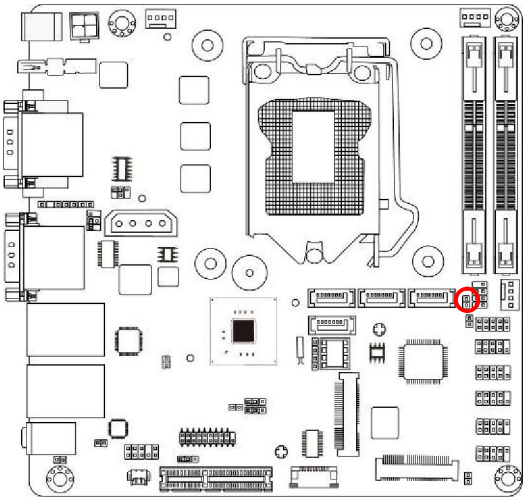
JP4

1-2 Open:Enable Security Measures in the Flash Descriptor(Default);

1-2 Closed: Disable Security Measures in the Flash Descriptor(Override).

(7)AT_MODE (2-pin): AT Mode Function Select

Pin 1-2 closed: AT_MODE function is enabled. In this case your computer will automatically turns on after a sudden power failure when power supply resumes.



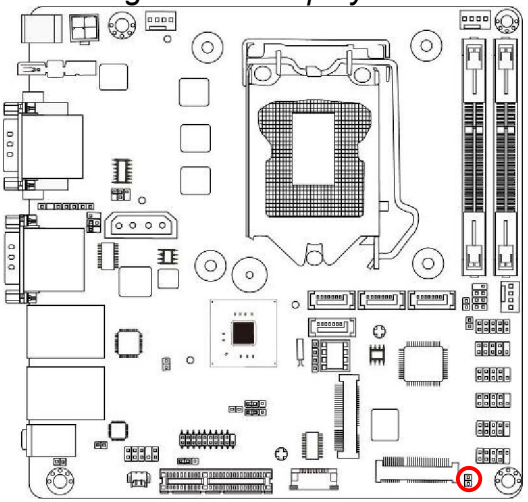
AT-MODE

1-2 Open: Normal;

1-2 Closed: AT Mode Selected.

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

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

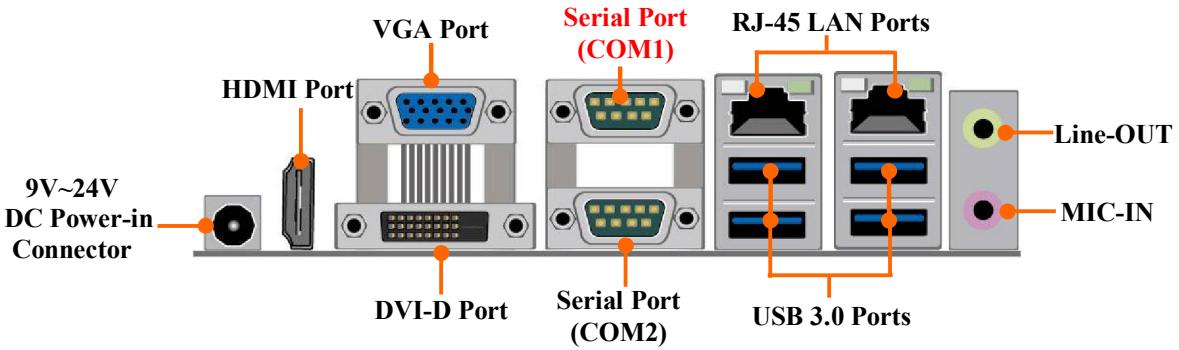


COPEN

2-2 Connectors and Headers

2-2-1 Connectors

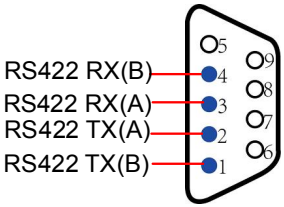
(1) Rear Panel Connectors



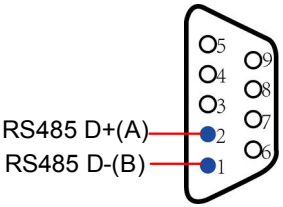
(2) COM1 (9-pin Block): RS232/422/485 Serial Port

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

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

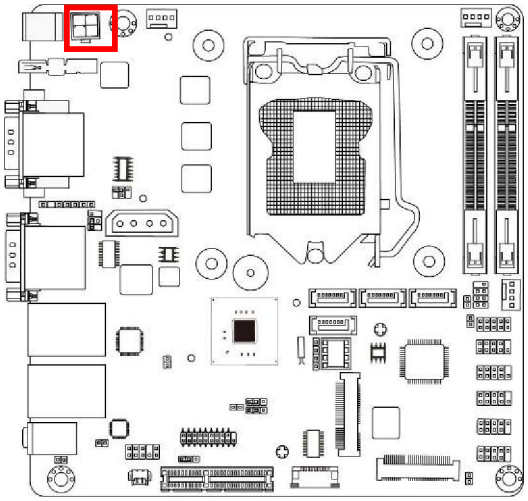


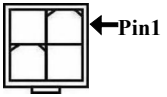
For RS422 Mode



For RS485 Mode

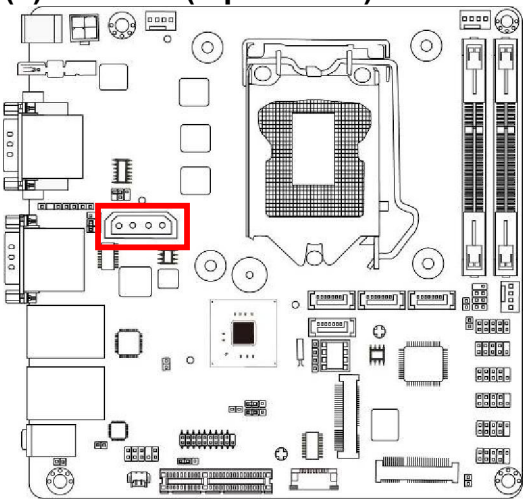
(3) DCPWRIN (4-pin block): 9V~24V Internal Power Connector

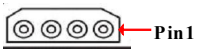




Pin No.	Definition
1	GND
2	GND
3	+9V~+24V
4	+9V~+24V

(4) PWOUT (4-pin block): SATA Hard Disk Power Connector

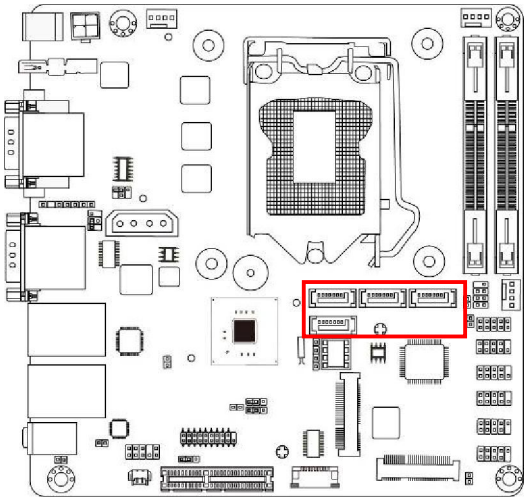




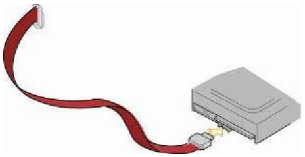
Pin No.	Definition
1	+12V
2	GND
3	GND
4	VCC

(5) SATA1/2/3/4(7-pin block): SATAIII Port connector

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



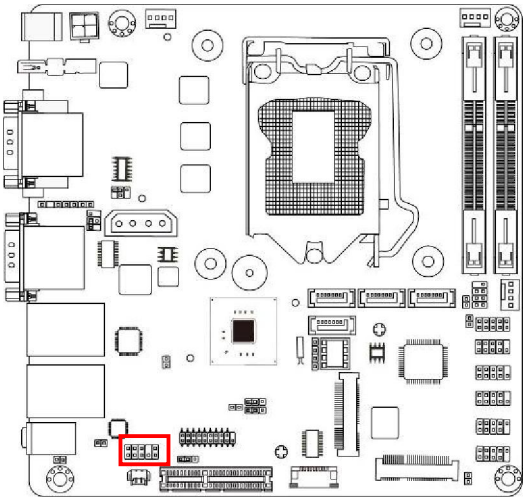
Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

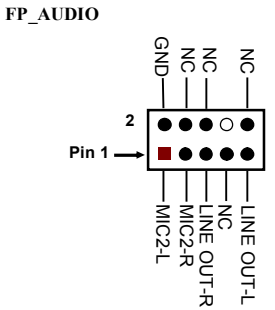


2-2-2 Headers

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

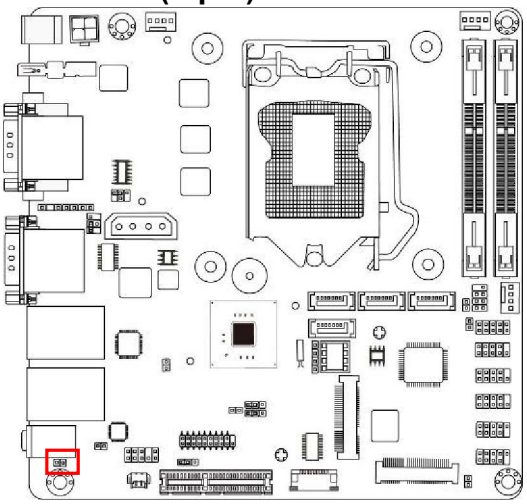
This header connects to Front Panel Line-out, MIC-In connector with cable.

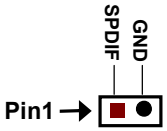




Line-Out, MIC Header

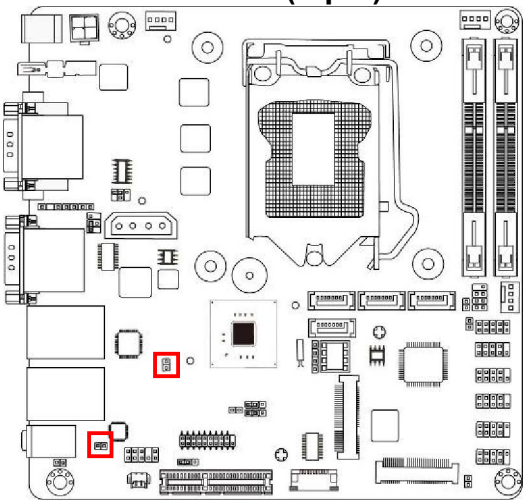
(2) SPDIFOUT (2-pin): HDMI-SPDIF Out Header

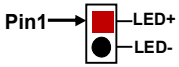




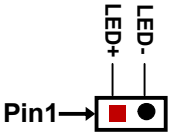
HDMI_SPDIF Header

(3) LAN1LED/LAN2LED (2-pin): RJ-45 LAN LED Activity Headers



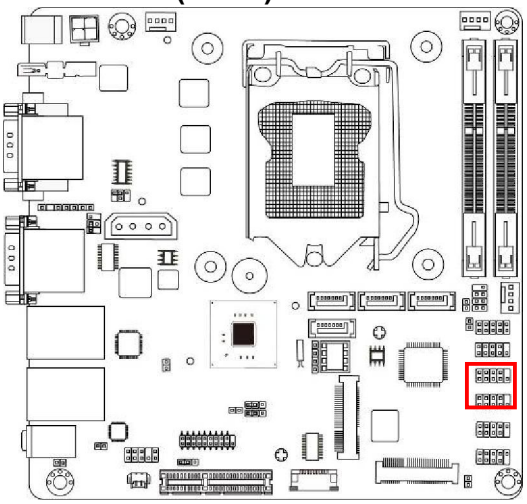


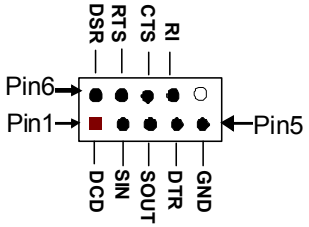
LAN1LED



LAN2LED

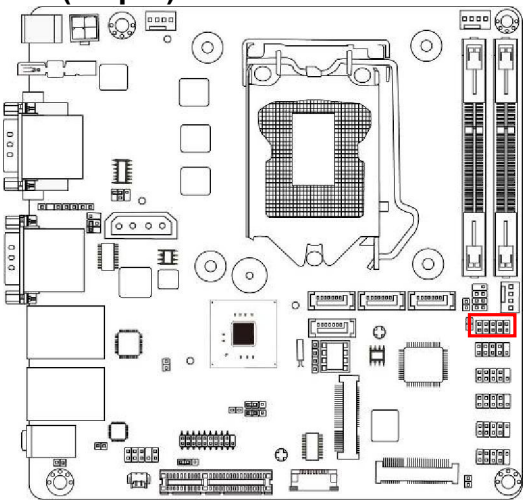
(4) COM3/COM4 (9-Pin): RS232 Serial Port Headers

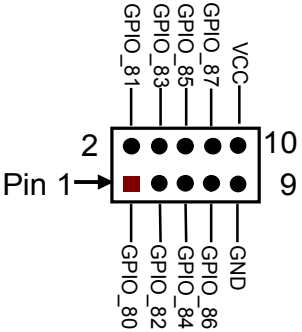




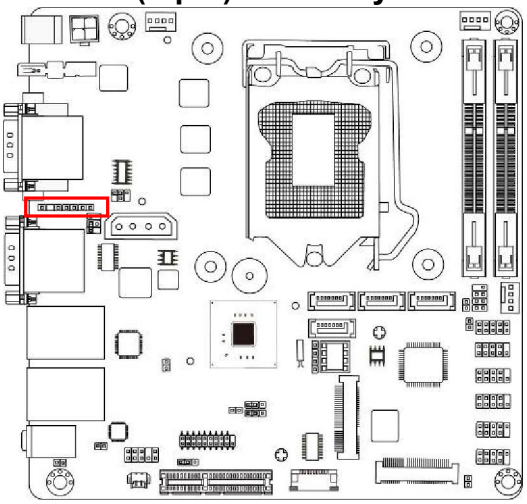
Serial Port Header

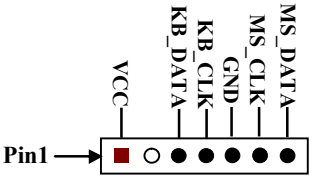
(5) GPIO (10-pin): GPIO Header



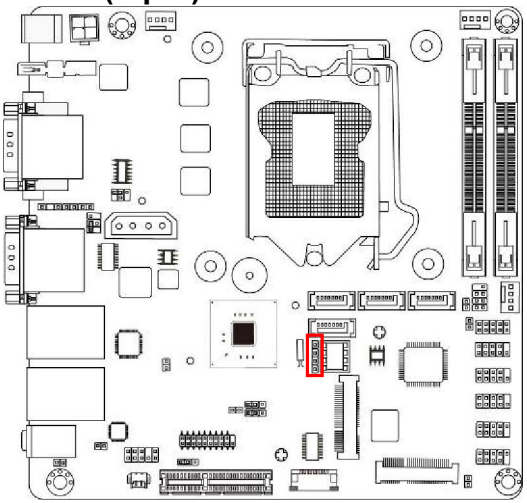


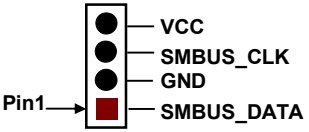
(6) PS2KBMS (6-pin): PS/2 Keyboard & Mouse Header





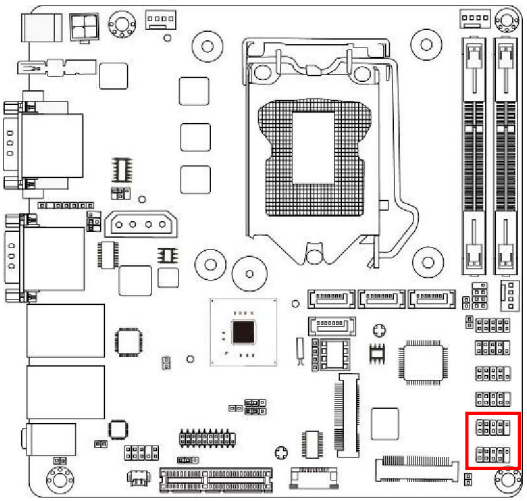
(7)SMBUS (4-pin): SM BUS Header

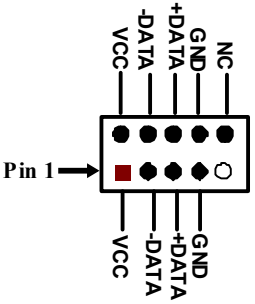




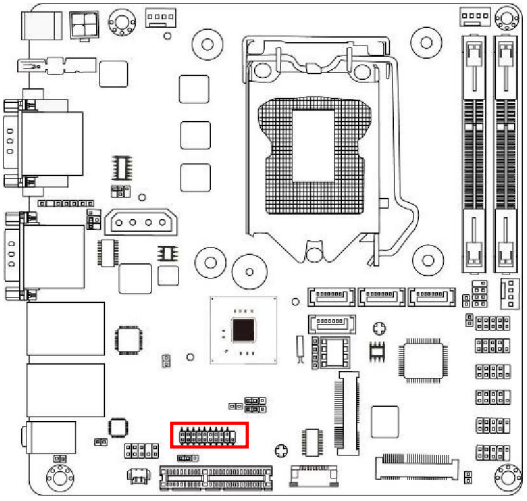
SMBUS

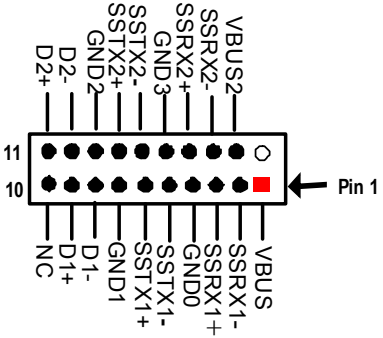
(8) USB2/USB3 (9-pin): USB 2.0 Port Header



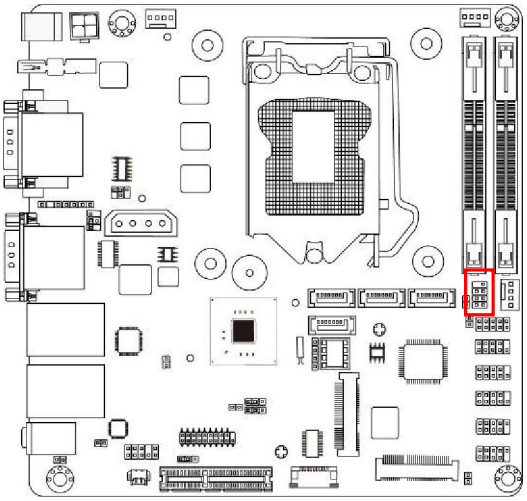


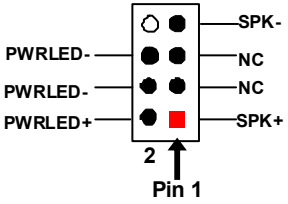
(9) USB1 (19-pin): USB 3.0 Port Header



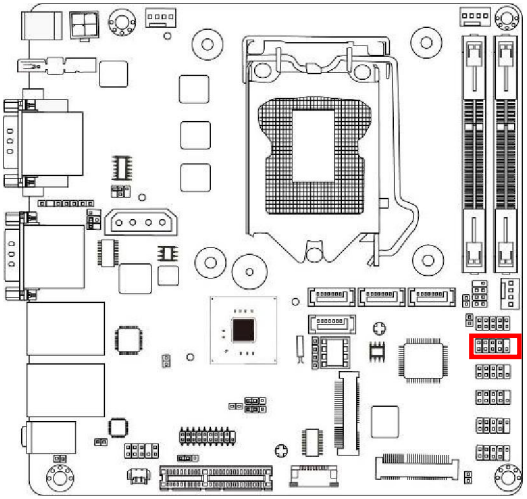


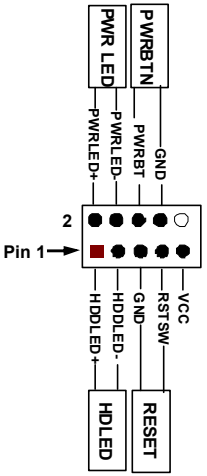
(10) SPK-LED (7-pin): Speaker Header & PWR LED Header



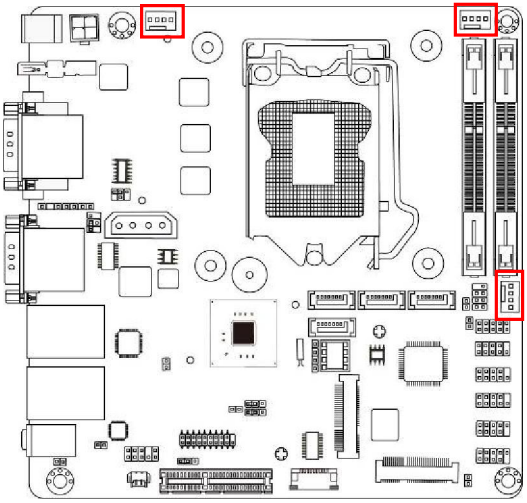


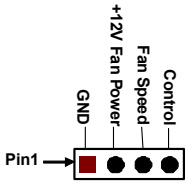
(11) FP (9-pin): Front Panel Header



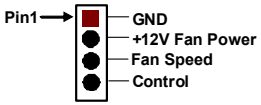


(12) CPUFAN1/SYSFAN1/SYSFAN2 (4-pin): FAN Headers





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.

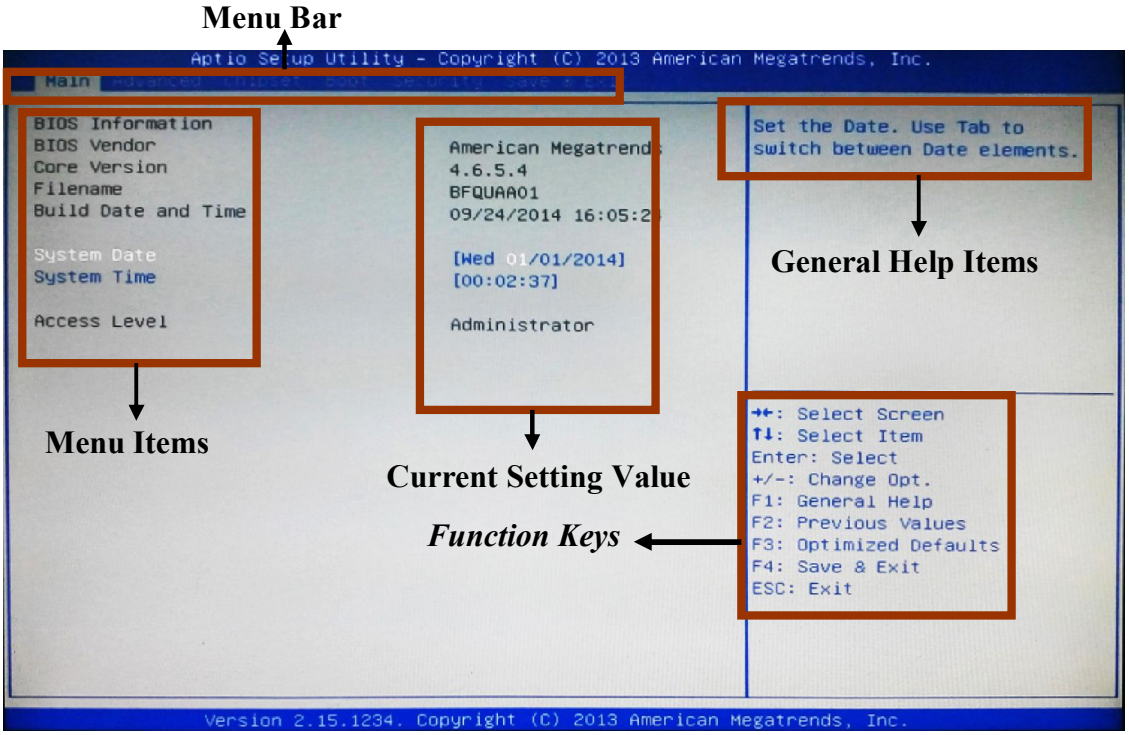
3-1 Entering Setup

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; press < **F7**> for Pop Menu.

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 & Exit.
- 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

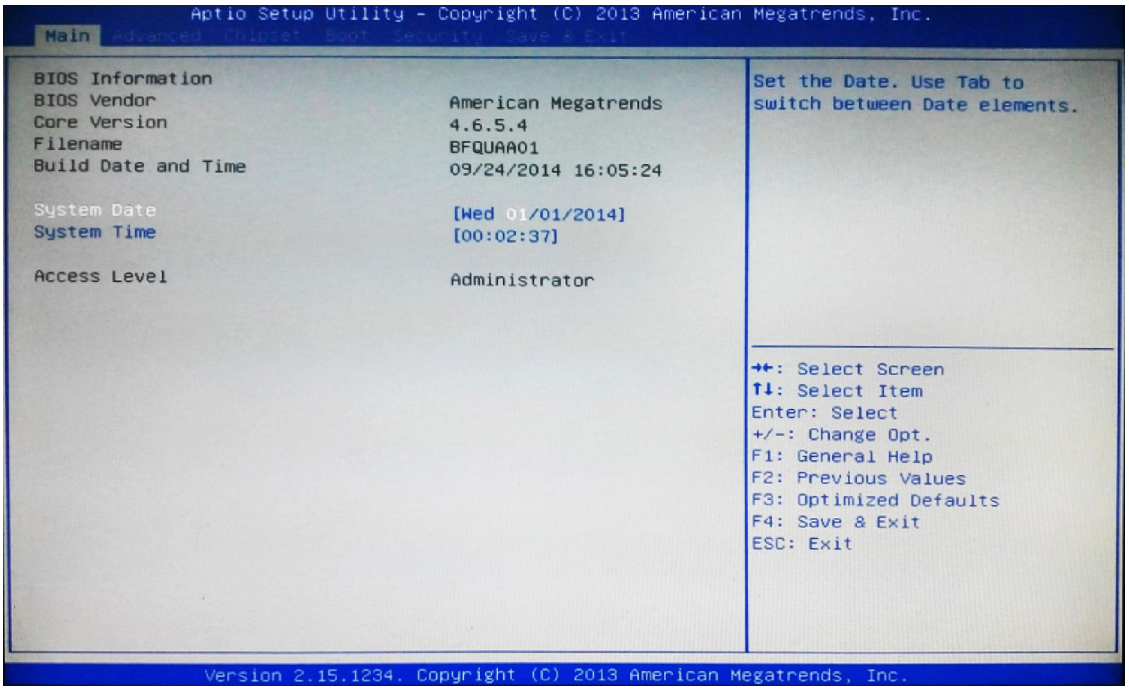
There are six menu bars on top of BIOS screen:

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.



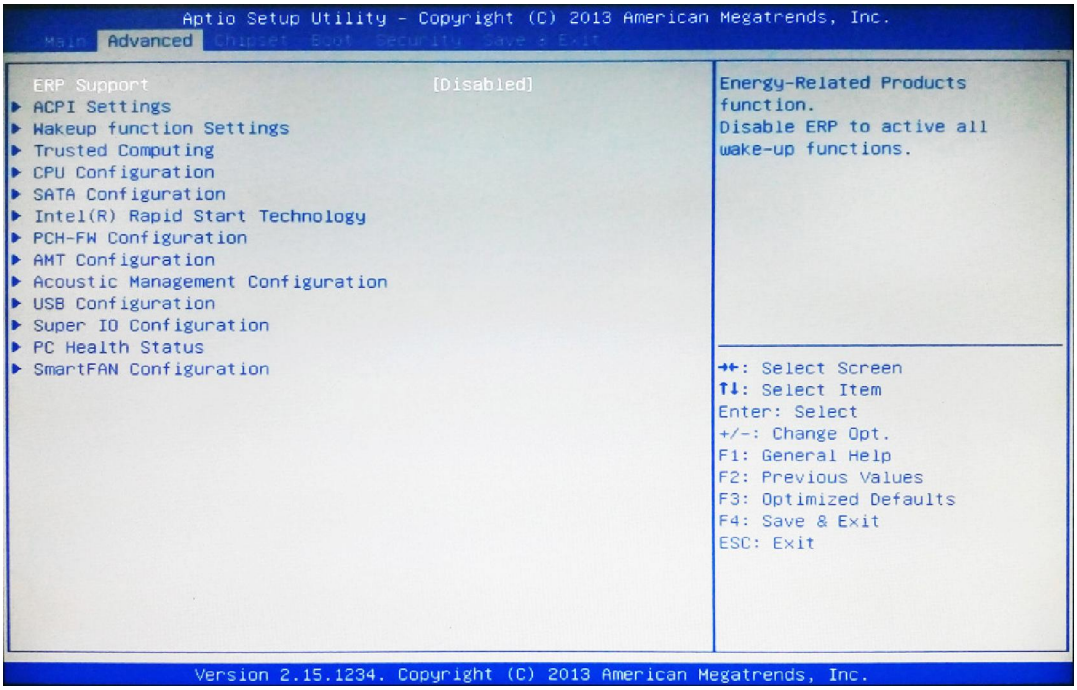
System Date

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

The optional settings: [Auto]; [Disabled].
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 from S3/S4/S5 state.

This item will only show when **'EUP Support' is set as [Disabled].*

USB S3/S4 Wakeup

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

This item will only show when **'EUP Support' is set as [Disabled].*

- **Trusted Computing**

Press [Enter] to make further settings for Trusted Computing and view current TPM status information.

Configuration

Security Device Support

Use this item to enable or disable BIOS support for security device. O.S, will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

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

When set as [Enabled], TPM State will show up for user to enable or disable Security Device.

TPM State

Use this item to enable or disable Security Device.

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

Your computer will reboot during restart in order to change state of the device.

Pending Operation

The default setting is [None].

Current Status Information

Current TPM Enabled Status and TPM Active Status will show on the screen.

- **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 VMM 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/MMPE(mSATA)

Port 1/ Port 2/ Port 3/ Port 4/MMPE(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 watchdog timer.
BIOS Timer
Use this item to set BIOS watchdog timer.

- **Acoustic Management Configuration**
  Press [Enter] to make settings for the following sub-items:
  Acoustic Management Configuration
  Use this item 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'.**
Device Power-up delay in seconds
The delay range is 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**

Press [Enter] to make settings for the following items:
Serial Port
Use this item to enable or disable serial port (COM).
Change Settings
Use this item to select an optimal setting for super IO device.
Transmission Mode Select
The optional settings are: [RS422]; [RS232]; [RS485].

Mode Speed Select
The optional settings are: [RS232/RS422/RS485=250kbps]; [RS232=1Mbps, RS422/RS485=10Mbps].
Serial Port FIF0 Mode
The optional settings are: [16-Byte FIF0]; [32-Byte FIF0]; [64-Byte FIF0]; [128-Byte FIF0].

- **Serial Port 2 Configuration/Serial Port 3 Configuration/Serial Port 4 Configuration/Serial Port 5 Configuration**

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 displays current Emulate AT Power Status, motherboard power On/Off control by power supply. User needs to select 'AT or ATX Mode' on MB jumper at first (refer to Page 10~11, Jumper AT_MODE for ATX Mode & AT Mode Select).
Case Open Detect
This item controls detect case open function.
The optional settings are: [Enabled]; [Disabled].

- **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:

SmartFan Configuration

CPUFAN / SYSFAN1/ SYSFAN2 Smart Mode

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

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

CPUFAN / SYSFAN1/ SYSFAN2 Full-Speed Temperature

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

CPUFAN / SYSFAN1/ SYSFAN 2 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/ SYSFAN 2 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

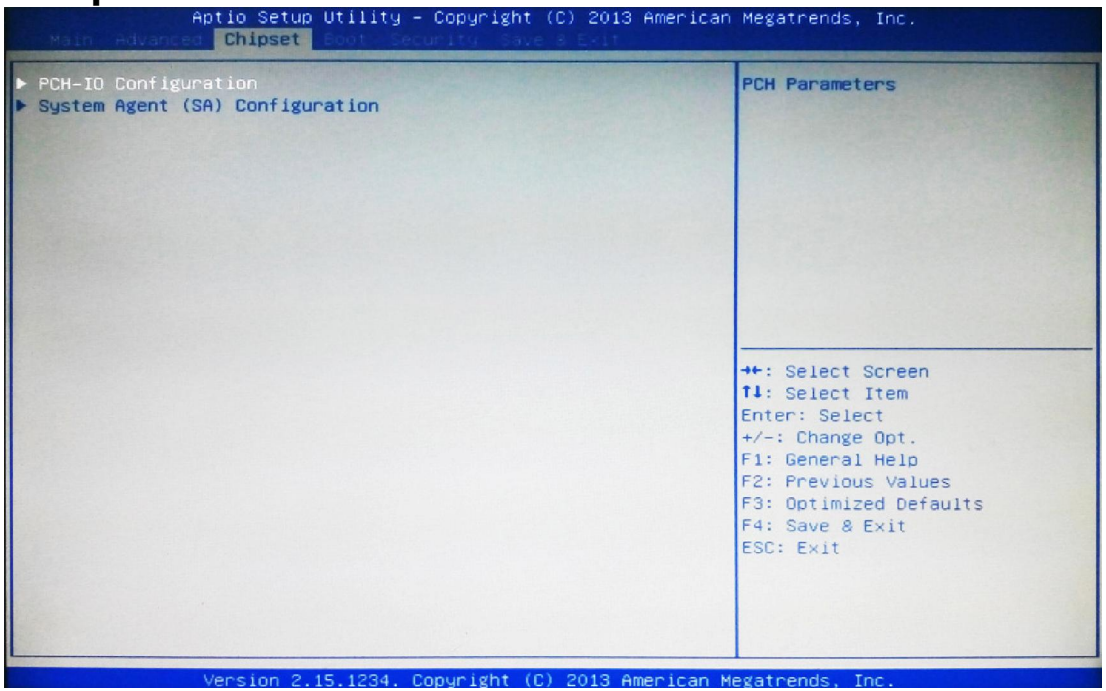
Use this item to set CPUFAN/SYSFAN1/ SYSFAN2 idle speed duty. Fan will run at idle speed when below the pre-set duty.

SYSFAN2 Type

The optional settings are: [4-Pin]; [3-Pin].

**Note: We recommend user to select fan type according to the specific fan connected to fan connector, i.e. to select [3-Pin] for fan with 3-Pin connector, or select [4-Pin] for fan with 4-Pin connector.*

3-8 Chipset Menu



- **PCH-IO Configuration**

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

  - **USB 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 LAN1 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 enable or disable onboard LAN2 controller.

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].

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

Secondary IGFX Boot Display

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

Primary Display

Use this item to select which of IGFX/PEG graphics device should be primary display.

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

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].

- **PCIE Slot Configuration**

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

PCIE Slot Configuration

PCIE1-Gen X

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

Enable PCIE1

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

PCIE1- 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**

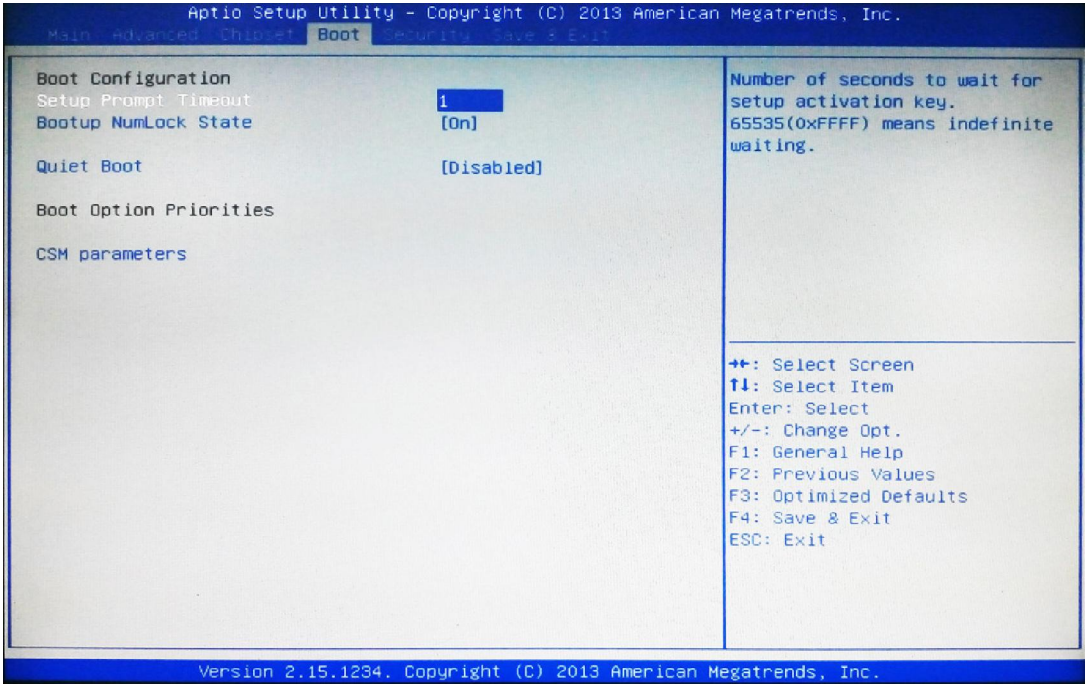
Press [Enter] to make settings for the following sub-item:

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

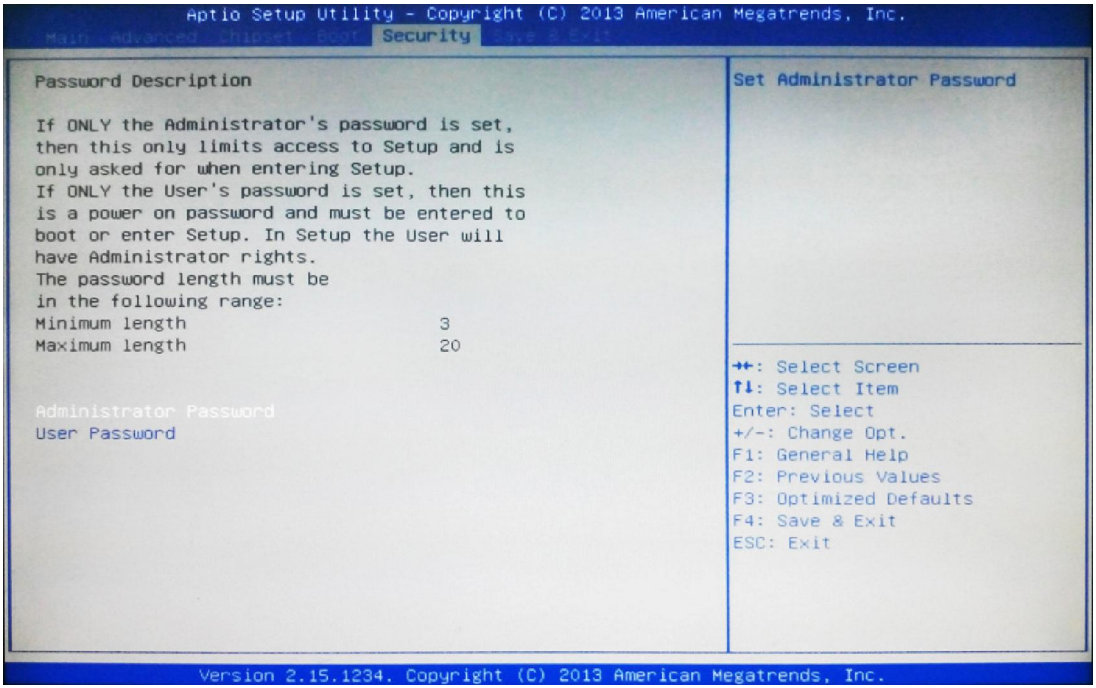


Boot Configuration

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

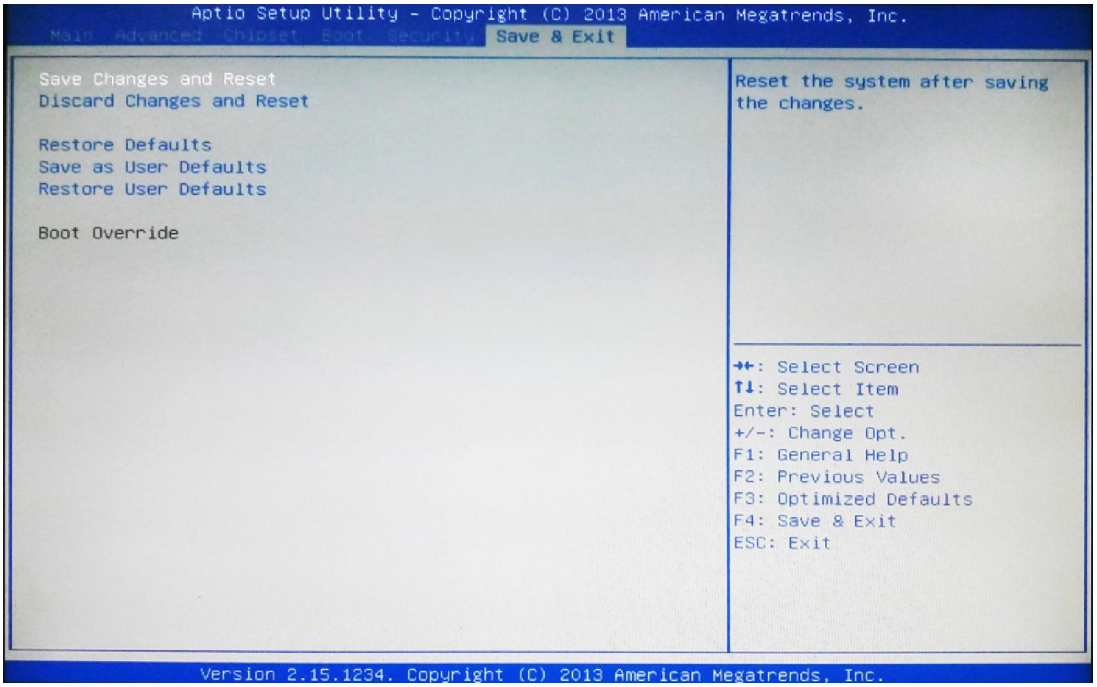
- **CSM parameters**
  Press [Enter] to make settings for the following sub-items:
  Boot option filter
  This option controls what device system can boot to.
  The optional settings are: [UEFI and Legacy]; [Legacy only]; [UEFI only].
  Launch PXE OpROM policy
  This option controls the execution of 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.