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Version 1.0

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Federal Communications Commission (FCC)

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and the receiver
- Connect the equipment onto an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

Shielded interconnect cables and a shielded AC power cable must be employed with this equipment to ensure compliance with the pertinent RF emission limits governing this device. Changes or modifications not expressly approved by the system's manufacturer could void the user's authority to operate the equipment.

Declaration of Conformity

This device complies with part 15 of the FCC rules. Operation is subject to the following conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

This device is in conformity with the following EC/EMC directives:

- ❑ **EN 55022** Limits and methods of mesurement of radio disturbance characteristics of information technology equipment
- ❑ **EN 61000-3-2** Disturbances in supply systems caused
- ❑ **EN 61000-3-3** Disturbances in supply systems caused by household appliances and similar electrical equipment " Voltage fluctuations"
- ❑ **EN 55024** Information technology equipment-Immunity characteristics-Limits and methods of measurement
- ❑ **EN 60950** Safety for information technology equipment including electrical business equipment
- ❑ **CE marking** CE

Canadian Department of Communications

This class B digital apparatus meets all requirements of the Canadian Interference-causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Réglement sur le matériel brouilieur du Canada.

About the Manual

The manual consists of the following:

TABLE OF CONTENTS

Chapter 1
Introducing the Motherboard

Introduction

Thank you for choosing the **Q77H2-TI** motherboard. This motherboard is a high performance, enhanced function motherboard designed to support the LGA1155 socket for Intel® 3rd Generation Core™ vPro i7/i5 and Core™ i3/Pentium®/Celeron® processors for high-end business or personal desktop markets.

This motherboard is based on Intel® Q77 Express Chipset for best desktop platform solution. It supports up to 16 GB of system memory with dual channel DDR3 1600/ 1333 SO-DIMM. Two mini PCI Express x1 slots are for extending usage (the PCIE1 supports half-card, the PCIE2 supports full-card and you can install a Mini SATA (mSATA) card into it).

It integrates USB 2.0 ports and USB 3.0 interface, supporting up to four USB 3.0 ports at the rear panel and five USB 2.0 ports (one 10-pin USB 2.0 header supports two USB 2.0 ports and three 5-pin USB 2.0 headers support additional 3 USB 2.0 ports).

The motherboard is equipped with advanced full set of I/O ports in the rear panel, including one RJ45 LAN connector, one Display port (DP), four USB 3.0 ports, one HDMI port, one DC_IN port and audio jacks for line-out and mircophone.

In addition, this motherboard supports two SATA 6Gb/s connectors for storage expansion.

Package Contents

Your motherboard package ships with the following items:

- ❑ Q77H2-TI Motherboard
- ❑ User Manual
- ❑ DVD
- ❑ I/O Shield
- ❑ 1 SATA Cable and 1 SATA/Power Cable

Accessories may vary, please refer to actual goods you purchase.

Specifications

CPU	• LGA1155 socket for Intel® 3rd Generation Core™ vPro i7/i5 and Core™ i3/Pentium®/Celeron® processors • DMI 5.0GT/s • Supports Intel® Active Management Technology • Supports Intel® Virtualization Technology • Supports Intel® Trusted Execution Technology • Supports Intel® Anti-Theft Technology • 4 Phase Thermal Design Power • VRD 12.0 • Supports DirectX 11.1 graphic core • Supports Intel® Turbo Boost 2.0 Technology • Supports Intel® Hyper-Threading Technology
Chipset	• Intel® Q77 Chipset • Supports Intel® Small Business Advantage • Supports Intel® Smart Connect Technology • Supports Intel® Rapid Start Technology
Extra Chips	• NUVOTON NPCT420AA0WX TPM IC
Memory	• Dual-channel DDR3 memory architecture • 2 x 204-pin DDR3 SO-DIMM sockets support up to 16 GB • Supports DDR3 1600/1333 MHz DDR3 SDRAM
Expansion Slots	• 2 x mini PCI Express x1 slots (the PCIE1 supports half-card, the PCIE2 supports full-card and you can install a Mini SATA (mSATA) card into it)
Storage	• Supported by Intel® Q77 Express Chipset - 2 x Serial ATA 6Gb/s devices - RAID 0/1/5/10 Configuration
Audio	• Realtek ALC662 - 2 Channel High Definition Audio Codec - Compliant with HD audio specification
LAN	• Intel 82579LM Gigabit LAN - 10/100/1000 Fast Ethernet Controller - Wake-on-LAN and remote wake-up support
Rear Panel I/O	• 1 x HDMI port • 1 x Display port (DP) • 1 x 19V DC_IN port • 1 x RJ45 LAN connector • 4 x USB 3.0 ports • 1 x Audio port (1 x line-out, 1 x Microphone)

Internal I/O Connectors & Headers	•	1 x 4-pin CPU_FAN connector with smart fan function
	•	1 x 4-pin SYS_FAN connector supports smart fan function
	•	1 x 10-pin USB 2.0 header supports additional two USB 2.0 ports
	•	3 x 5-pin USB 2.0 headers support additional 3 USB 2.0 ports
	•	2 x Serial SATA 6Gb/s connectors
	•	1 x Case open header
	•	1 x Front Panel switch/LED header
	•	1 x Front Panel audio header
	•	1 x Clear CMOS jumper
	•	1 x ME Unlock jumper
	•	1 x COM header
	•	1 x SATA power connector
	•	1 x Buzzer header
	•	1 x CIR header
	•	1 x Digital Microphone header (optional)
	•	1 x 2 channel audio speaker header (optional)
	•	1 x LCD select jumper (optional)
	•	1 x LVDS connetor (optional)
	•	1 x Monitor switch header
System BIOS	•	AMI BIOS with 64Mb SPI Flash ROM - Supports Plug and Play - Supports ACPI & DMI - Supports STR (S3) /STD (S4) - Supports Hardware monitor - Audio, LAN, can be disabled in BIOS - F7 hot key for boot up devices option - Supports PgUp clear CMOS Hotkey (Has PS2 KB Model only) - Supports Multi-Language
AP Support	•	Supports Norton/Cyberlink
Form Factor	•	Thin Mini ITX Size, 170mm x 170mm

Motherboard Components

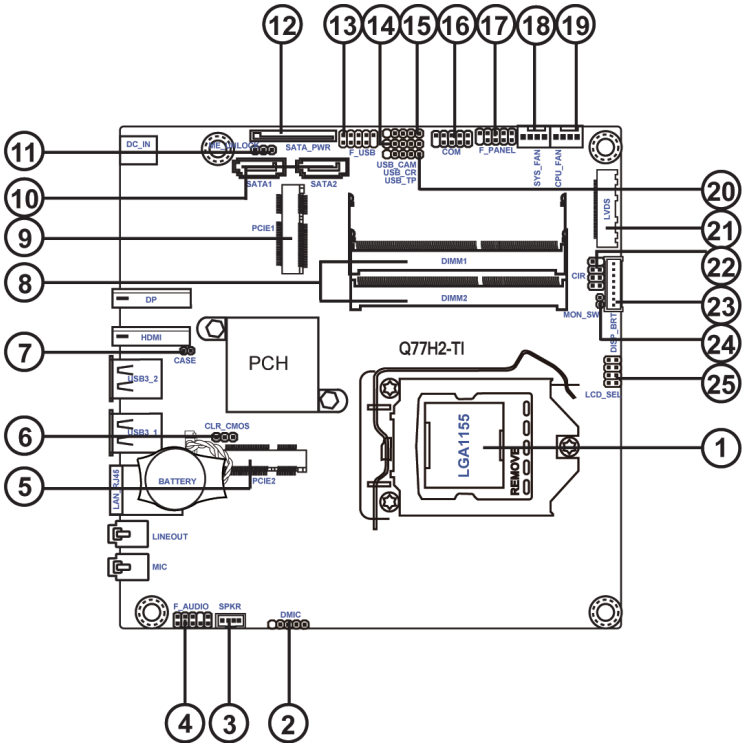
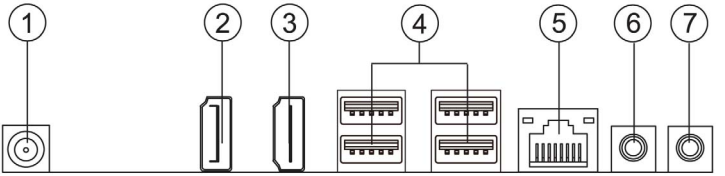


Table of Motherboard Components

LABEL	COMPONENTS
1. CPU Socket	LGA1155 socket for Intel® 3rd Generation Core™ vPro i7/i5 and Core™ i3/Pentium®/Celeron® Processors
2. DMIC	Digital microphone header (optional)
3. SPKR	2 Channel audio speaker header (optional)
4. F_AUDIO	Front panel audio header
5. PCIE2	Mini PCI Express x 1 slot (supports full-card and you can install a Mini SATA (mSATA) card into it)
6. CLR_CMOS	Clear CMOS jumper
7. CASE	Case open header
8. DIMM1~2	204-pin DDR3 SDRAM SO-DIMMs
9. PCIE1	Mini PCI Express x 1 slot (supports half-card)
10. SATA1~2	Serial ATA 6Gb/s connectors
11. ME_UNLOCK	ME Unlock jumper
12. SATA_PWR	SATA power connector
13. F_USB	Front panel USB 2.0 header
14. USB_CR	5-pin USB 2.0 header supports card reader or other USB 2.0 device
15. USB_CAM	5-pin USB 2.0 header supports camera or other USB 2.0 device
16. COM	Onboard serial port header
17. F_PANEL	Front panel switch/LED header
18. SYS_FAN	4-pin system cooling fan connector
19. CPU_FAN	4-pin CPU cooling fan connector
20. USB_TP	5-pin USB 2.0 header supports one USB 2.0 device
21. LVDS	LVDS connector (optional)
22. CIR	Consumer infrared header
23. DISP_BRT	LVDS brightness control header
24. MON_SW	LVDS brightness ON/OFF switch header
25. LCD_SEL	LCD panel select header (optional)

I/O Ports



1. 19V DC_IN Port
Connect the DC_IN port to the power adapter.

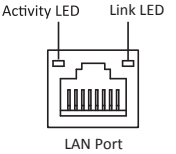
2. Display Port (DP)
You can connect the display device to the display port.

3. HDMI Port
You can connect the display device to the HDMI port.

4. USB 3.0 Ports
Use the USB 3.0 ports to connect USB 3.0 devices.

5. LAN Port
Connect an RJ-45 jack to the LAN port to connect your computer to the Network.

LAN LED	Status	Description
Activity LED	OFF	No data
	Orange blinking	Active
Link LED	OFF	No link
	Green	Link



6. Line-out (lime)
It is used to connect to speakers or headphones.

7. Microphone (pink)
It is used to connect to a microphone.

Chapter 2
Installing the Motherboard

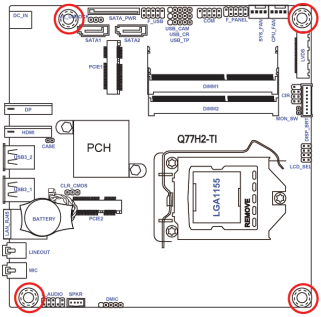
2-1. Safety Precautions

Follow these safety precautions when installing the motherboard:

- Wear a grounding strap attached to a grounded device to avoid damage from static electricity.
- Discharge static electricity by touching the metal case of a safely grounded object before working on the motherboard.
- Leave components in the static-proof bags.
- Always remove the AC power by unplugging the power cord from the power outlet before installing or removing the motherboard or other hardware components.

2-2. Installing the motherboard in a Chassis

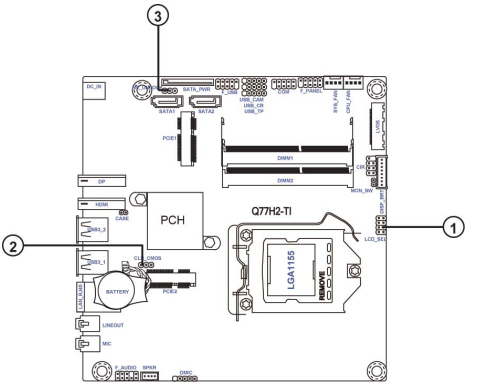
This motherboard carries a Thin Mini ITX form factor of 170 x 170 mm. Choose a chassis that accommodates this form factor. Make sure that the I/O template in the chassis matches the I/O ports installed on the rear edge of the motherboard. Most system chassis have mounting brackets installed in the chassis, which corresponds to the holes in the motherboard. Place the motherboard over the mounting brackets and secure the motherboard onto the mounting brackets with screws.



Do not over-tighten the screws as this can stress the motherboard.

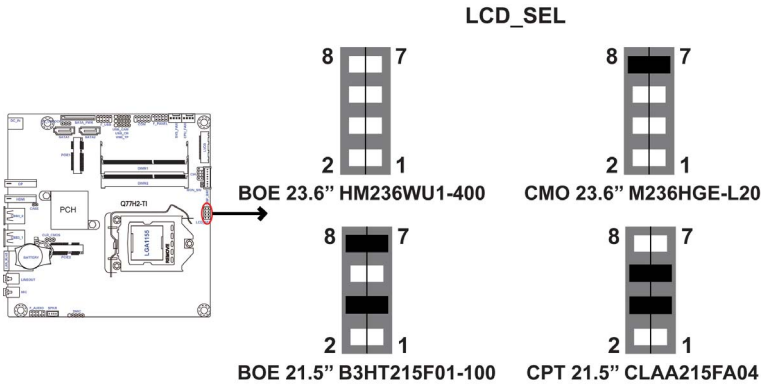
2-3. Checking Jumper Settings

This section explains how to set jumpers for correct configuration of the motherboard.



No.	Components
1	LCD_SEL
2	CLR_CMOS
3	ME_UNLOCK

1. LCD_SEL: LCD panel select header (optional)

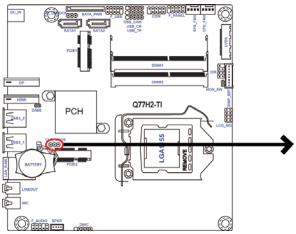


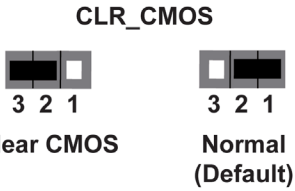
1.When your panel connects to LVDS, please check LCD_SEL header setting first.

2.Due to the differences of the panel parameters, please follow the above illustration to place the jumper caps.

2. CLR_CMOS: Clear CMOS jumper

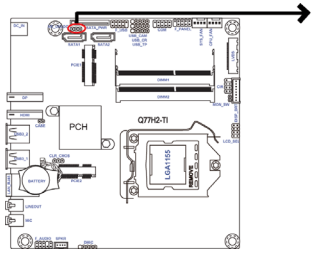
The following illustration shows the location of the motherboard jumpers. Pin 1 is labeled.

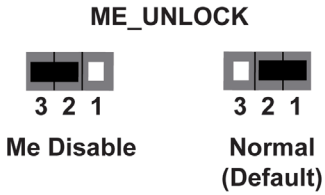




To avoid the system instability after clearing CMOS, we recommend users to enter the main BIOS setting page to "Load Default Settings" and then "Save and Exit Setup".

3. ME_UNLOCK: ME unlock jumper





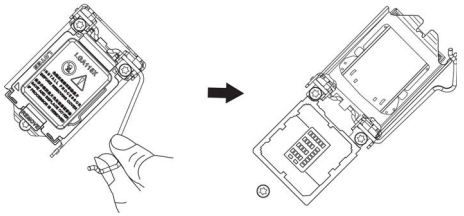
2-4. Installing Hardware

2-4-1. Installing the Processor

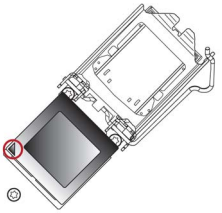
- This motherboard has an LGA1155 socket.
- When choosing a processor, consider the performance requirements of the system. Performance is based on the processor design, the clock speed and system bus frequency of the processor, and the quantity of internal cache memory and external cache memory.
- You may be able to change the settings in the system Setup Utility. We strongly recommend you do not over-clock processor or other components to run faster than their rated speed.
- The following illustration shows CPU installation components.

A. Press the hook of lever down with your thumb and pull it to the right side to release it from retention tab.

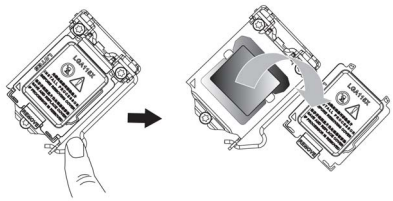
B. Lift the tail of the load lever and rotate the load plate to fully open position.



C. Grasp the edge of the package substrate. Make sure pin 1 indicator is on your bottom-left side. Aim at the socket and place the package carefully into the socket by purely vertical motion.



D. Rotate the load plate onto the package IHS (Intergraded Heat Spreader). Engage the load lever while pressing down lightly onto the load plate. Secure the load lever with the hook under retention tab. Then the cover will flick automatically.

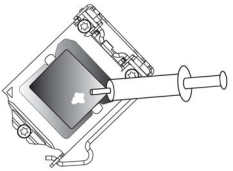


Please save and replace the cover onto the CPU socket if processor is removed.

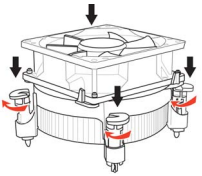
2-4-2. Installing the CPU Cooler

- Install the cooling fan in a well-lit work area so that you can clearly see the motherboard and processor socket.
- Avoid using cooling fans with sharp edges in case the fan casing and the clips cause serious damage to the motherboard or its components.
- To achieve better airflow rates and heat dissipation, we suggest that you use a high quality fan with 3800 rpm at least. CPU fan and heat sink installation procedures may vary with the type of CPU fan/heatsink supplied. The form and size of fan/heatsink may also vary.
- DO NOT remove the CPU cap from the socket before installing a CPU.
- Return Material Authorization (RMA) requests will be accepted only if the motherboard comes with the cap on the LGA1155 socket.
- The following illustration shows how to install CPU fan.

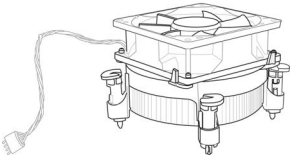
A. Apply some thermal grease onto the contacted area between the heatsink and the CPU, and make it to be a thin layer.



B. Fasten the cooling fan supporting base onto the CPU socket on the motherboard. And make sure the CPU fan is plugged to the CPU fan connector.



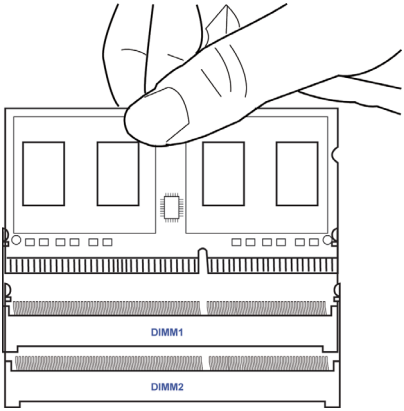
C. Connect the CPU cooler power connector to the CPU_FAN connector.



2-4-3. Installing Memory Modules

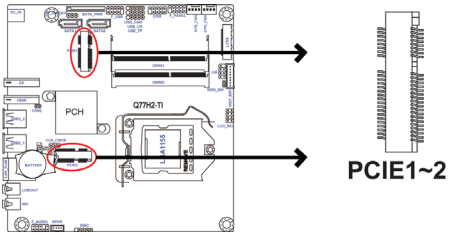
- This motherboard accommodates two memory modules. It can support two 204-pin DDR3 1600/1333.
- Do not remove any memory module from its antistatic packaging until you are ready to install it on the motherboard. Handle the modules only by their edges. Do not touch the components or metal parts. Always wear a grounding strap when you handle the modules.
- You must install at least one module in any of the two slots. Total memory capacity is 16 GB.
- Refer to the following to install the memory modules.

  Install the DIMM module into the slot and press it firmly down until it fits in place. Check that the cutouts on the DIMM module edge connector match the notches in the DIMM slot.



2-4-4. Installing Add-on Cards

The slots on this motherboard are designed to hold expansion cards and connect them to the system bus. Expansion slots are a means of adding or enhancing the motherboard's features and capabilities. With these efficient facilities, you can increase the motherboard's capabilities by adding hardware that performs tasks that are not part of the basic system.



PCIE1~2 Slots The mini PCI Express x1 slots are for extending usage, one supports half-card, and the other supports full-card.

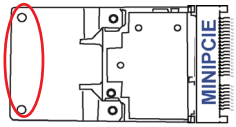
Before installing an add-on card, check the documentation for the card carefully. If the card is not Plug and Play, you may have to manually configure the card before installation.

Follow these instructions to install a wireless card:

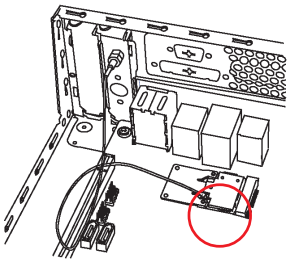
1 Remove a blanking plate from the system case, and insert the wireless card into the MINIPCIE slot rightwards, then tighten the two screws (Please refer to Picture 1).

2 Press the metal connector of the cable into the connector on the wireless card. Ensure that the metal connector is correctly seated (Please refer to Picture 2).

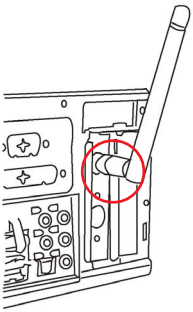
3 Make the other end of the cable (with a gold screw) through the upper hole of the bracket, and tighten the antenna on to the gold screw after installing a metal gasket on the screw (Please refer to Picture 3).



Picture 1



Picture 2

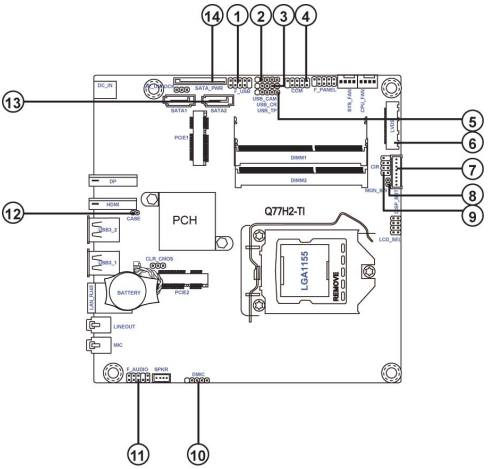


Picture 3

** For reference only*

2-4-5. Connecting Optional Devices

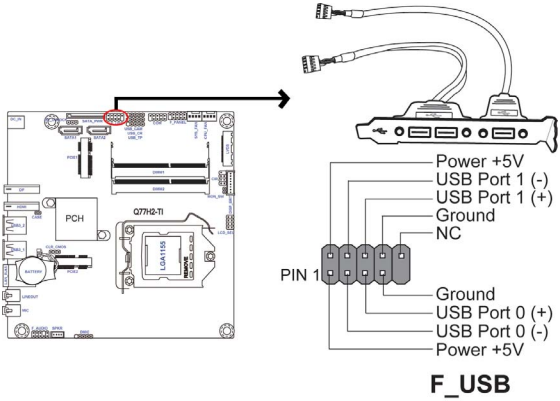
Refer to the following for information on connecting the motherboard's optional devices:



No.	Components	No.	Components
1	F_USB	8	MON_SW
2	USB_CAM	9	CIR
3	USB_CR	10	DMIC
4	COM	11	F_AUDIO
5	USB_TP	12	CASE
6	LVDS	13	SATA1~2
7	DISP_BRT	14	SATA_PWR

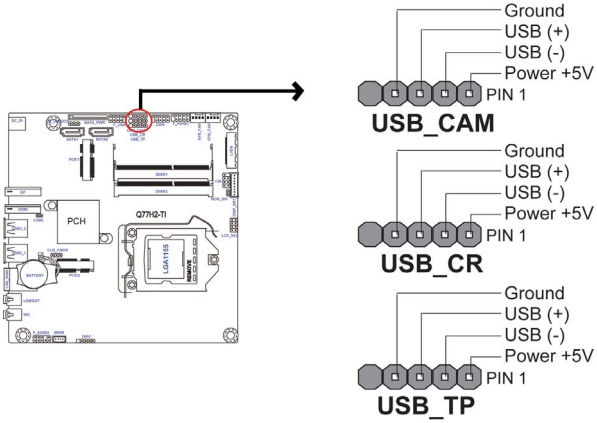
1. F_USB: Front Panel USB 2.0 header

The motherboard has one USB 2.0 headers supporting two USB 2.0 ports. Additionally, some computer cases have USB 2.0 ports at the front of the case. If you have this kind of case, use auxiliary USB 2.0 connector to connect the front-mounted ports to the motherboard.



Please make sure that the USB cable has the same pin assignment as indicated above. A different pin assignment may cause damage or system hang-up.

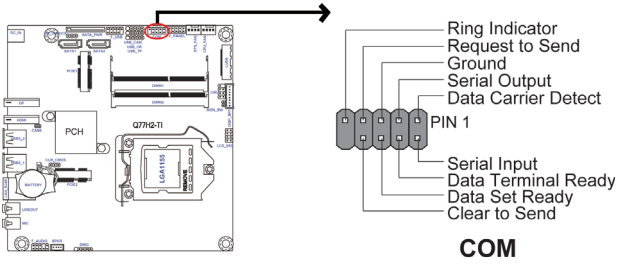
2 & 3 & 5. USB_CAM/USB_CR/USB_TP: 5-pin USB 2.0 header supports camera /card reader or other USB 2.0 devices



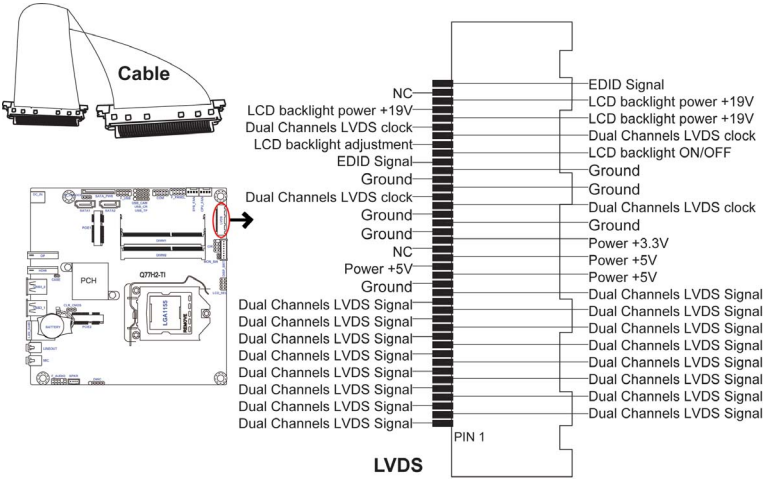
Users please note to install the card to the correct header.

4. COM: Onboard serial port header

Connect a serial port extension bracket to this header to add a serial port to your system.



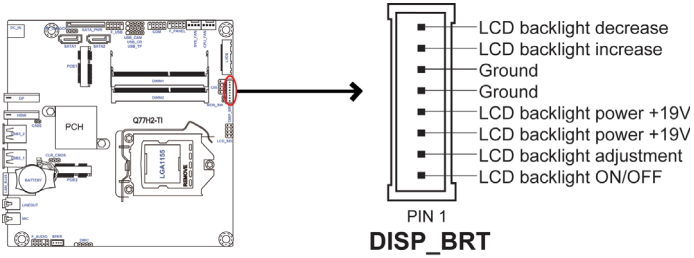
6. LVDS: LVDS connector (optional)



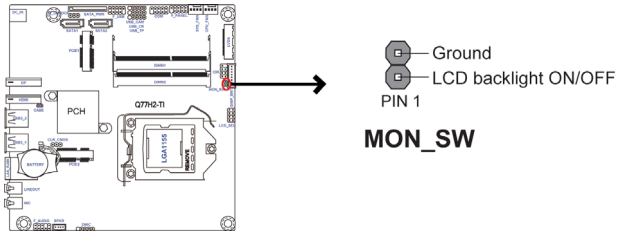
1. You can connect the large end of the cable to the LED Panel, and connect the other small end to the slot on the motherboard.

2.Due to the chipset limitation, using dual displays LVDS(AIO) + VGA or LVDS(AIO) + HDMI will cause the problem that you may not enter BIOS setup or have the display problem.

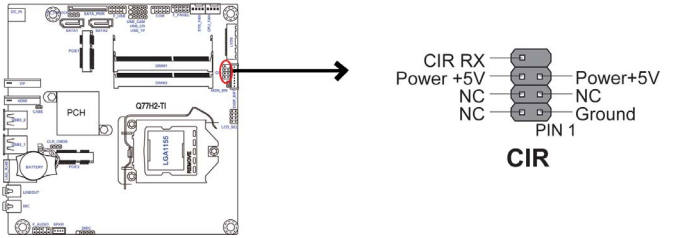
7. DISP_BRT: LVDS connector (optional)



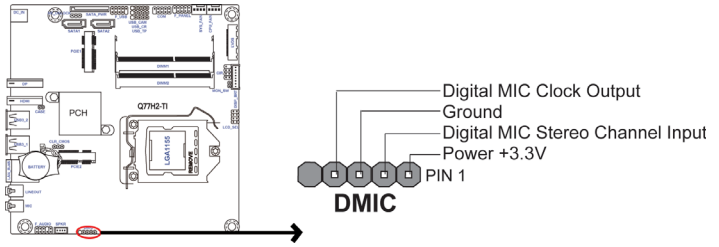
8. MON_SW: LVDS brightness ON/OFF switch header



9. CIR: Consumer infrared header

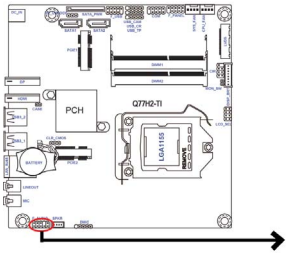


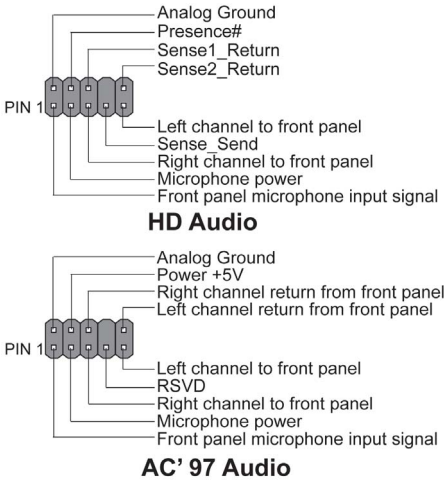
10. DMIC: Digital microphone header (optional)



11. F_AUDIO: Front Panel Audio Header

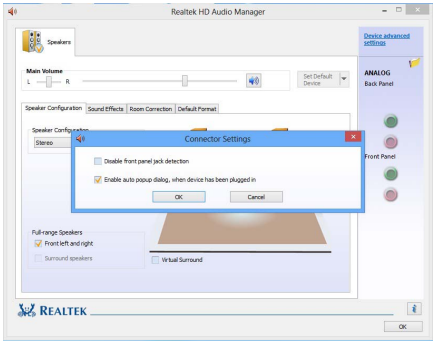
The front panel audio header allows the user to install auxiliary front-oriented microphone and line-out ports for easier access. This header supports HD audio by default. If you want connect an AC' 97 front panel audio to HD onboard headers, please set as below picture.





AC' 97 Audio Configuration: To enable the front panel audio connector to support AC97 Audio mode.

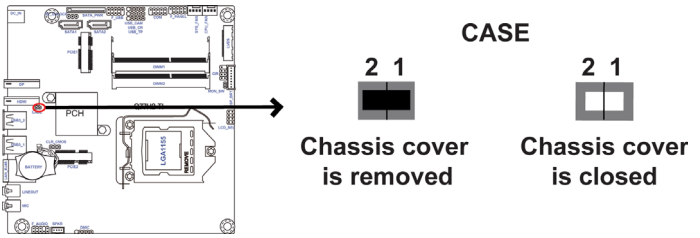
If you use AC' 97 Front Panel, please tick off the option of "Disabled Front Panel Detect ". If you use HD Audio Front Panel, please don' t tick off "Disabled Front Panel Detect ".



** For reference only*

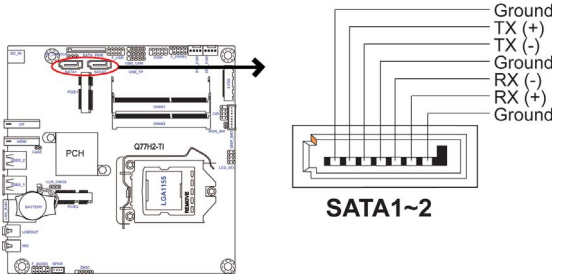
12. CASE: Chassis Intrusion Detect Header

This detects if the chassis cover has been removed. This function needs a chassis equipped with instrusion detection switch and needs to be enabled in BIOS.

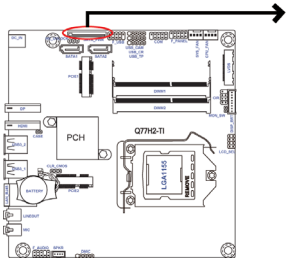


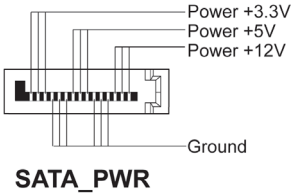
13. SATA1~2: Serial ATA III connectors

SATA1~2 connectors are used to support the Serial ATA 6Gb/s device. Simpler disk drive cabling and easier PC assembly. It eliminates limitations of the current Parallel ATA interface. But maintains register compatibility and software compatibility with Parallel ATA.



14. SATA_PWR: SATA power connector





SATA_PWR

2-4-6. Installing a Hard Disk Drive/Optical Disk Drive

This section describes how to install a Hard Disk Drive/Optical Disk Drive.

About SATA Connectors

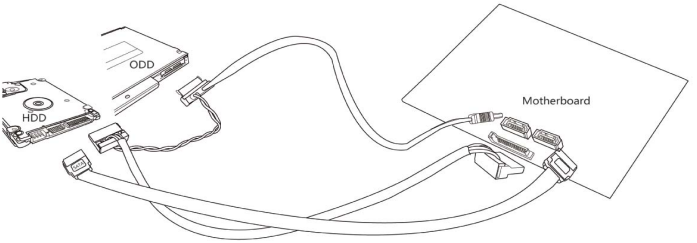
Your motherboard features two SATA connectors supporting a total of two drives. SATA refers to Serial ATA (Advanced Technology Attachment) is the standard interface for the IDE hard drives which are currently used in most PCs. These connectors are well designed and will only fit in one orientation. Locate the SATA connectors on the motherboard and follow the illustration below to install the Hard Disk Drive/ Optical Disk Drive.

Installing Hard Disk Drive/Optical Disk Drive

To install the Hard Disk Drive (HDD)/Optical Disk Drive (ODD), use the HDD/ODD/SATA cables that support the Hard Disk Drive/Optical Disk Drive/Serial ATA protocol.

Refer to the illustration below for proper installation:

1. Attach either end of the single SATA cable to the SATA port on the motherboard.
2. Attach the other end of the single SATA cable to the hard disk drive.
3. Attach the linked end of the combo HDD/ODD cable to the Hard Disk Drive/ Optical Disk Drive. Please note that, connect the black cable to the hard disk Drive, then connect the orange cable to the optical disk drive.
4. Attach the other end of the combo HDD/ODD cable to the SATA port and SATA_PWR connector on the motherboard. Please note that, connect the black cable to the SATA_PWR connector, and connect the orange cable to the SATA port.



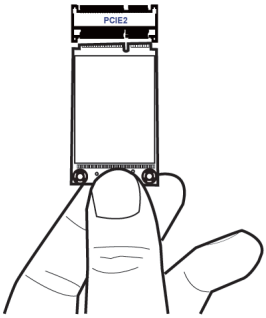
** For reference only*

About mSATA Connectors

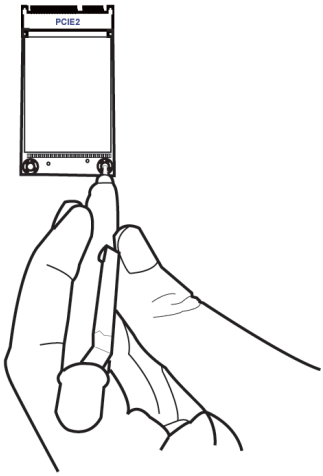
Your motherboard features two Mini PCI Express x1 slots, the PCIE2 supports full-card, you can install a Mini SATA (mSATA) card into it.

Refer to the illustration below for proper installation:

1 Insert a Mini SATA (mSATA) card into the PCIE2 Slot.

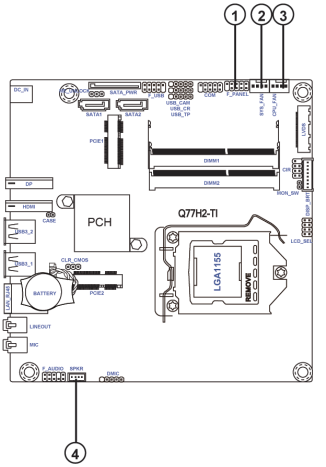


2 Lower the handle and tighten the screws.



2-4-7. Connecting Case Components

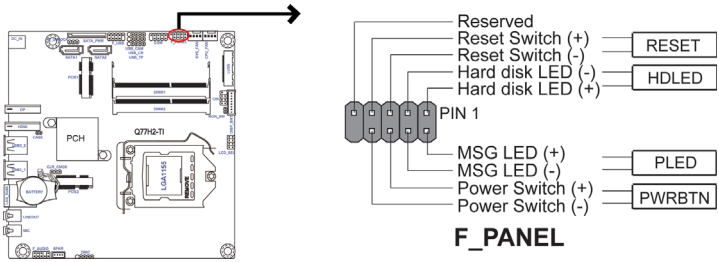
After you have installed the motherboard into a case, you can begin connecting the motherboard components. Refer to the following:



No.	Components
1	F_PANEL
2	SYS_FAN
3	CPU_FAN
4	SPKR

1. F_PANEL: Front Panel Header

The front panel header (F_PANEL) provides a standard set of switch and LED headers commonly found on ATX or Micro ATX cases.



Hard Drive Activity LED

Connecting pins 1 and 3 to a front panel mounted LED provides visual indication that data is being read from or written to the hard drive. For the LED to function properly, an IDE drive should be connected to the onboard IDE interface. The LED will also show activity for devices connected to the SCSI (hard drive activity LED) connector.

Power/Sleep/Message waiting LED

Connecting pins 2 and 4 to a single or dual-color, front panel mounted LED provides power on/off, sleep, and message waiting indication.

Reset Switch

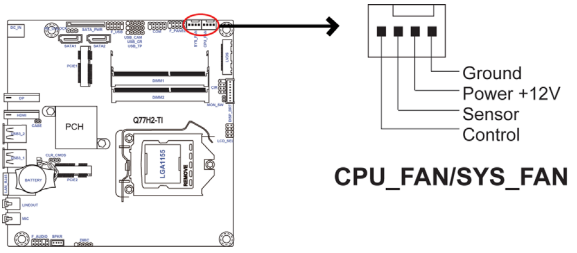
Supporting the reset function requires connecting pin 5 and 7 to a momentary-contact switch that is normally open. When the switch is closed, the board resets and runs POST.

Power Switch

Supporting the power on/off function requires connecting pins 6 and 8 to a momentary-contact switch that is normally open. The switch should maintain contact for at least 50 ms to signal the power supply to switch on or off. The time requirement is due to internal de-bounce circuitry. After receiving a power on/off signal, at least two seconds elapses before the power supply recognizes another on/off signal.

2 & 3 . SYS_FAN (System Cooling FAN Power Connector) &CPU_FAN (CPU cooling FAN Power Connector)

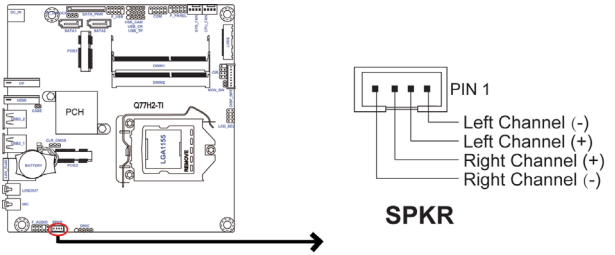
Connect the CPU cooling fan cable to **CPU_FAN**.
Connect the system cooling fan connector to **SYS_FAN**.



Users please note that the fan connector supports the CPU cooling fan of 1.1A ~ 2.2A (26.4W max) at +12V.

4. SPKR: 2 Channel audio speaker header (optional)

Connect the case speaker cable to **SPKR**.



This concludes Chapter 2. The next chapter covers the BIOS.

Chapter 3
Using BIOS

About the Setup Utility

The computer uses the latest "American Megatrends Inc. " BIOS with support for Windows Plug and Play. The CMOS chip on the motherboard contains the ROM setup instructions for configuring the motherboard BIOS.

The BIOS (Basic Input and Output System) Setup Utility displays the system's configuration status and provides you with options to set system parameters. The parameters are stored in battery-backed-up CMOS RAM that saves this information when the power is turned off. When the system is turned back on, the system is configured with the values you stored in CMOS.

The BIOS Setup Utility enables you to configure:

- Hard drives, diskette drives and peripherals
- Video display type and display options
- Password protection from unauthorized use
- Power Management features

The settings made in the Setup Utility affect how the computer performs. Before using the Setup Utility, ensure that you understand the Setup Utility options.

This chapter provides explanations for Setup Utility options.

The Standard Configuration

A standard configuration has already been set in the Setup Utility. However, we recommend that you read this chapter in case you need to make any changes in the future.

This Setup Utility should be used:

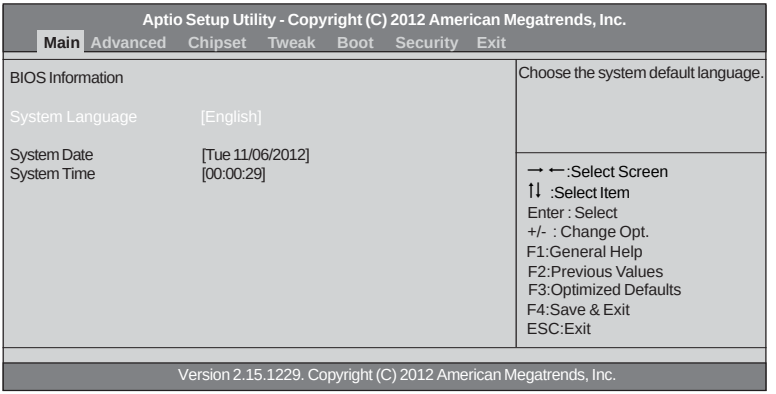
- when changing the system configuration
- when a configuration error is detected and you are prompted to make changes to the Setup Utility
- when trying to resolve IRQ conflicts
- when making changes to the Power Management configuration
- when changing the password or making other changes to the Security Setup

Entering the Setup Utility

When you power on the system, BIOS enters the Power-On Self Test (POST) routines. POST is a series of built-in diagnostics performed by the BIOS. After the POST routines are completed, the following message appears:

Press DEL to enter SETUP

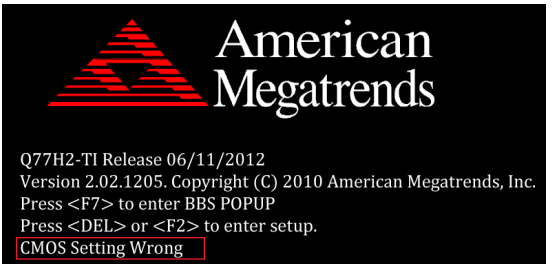
Press the delete key to access BIOS Setup Utility.



Resetting the Default CMOS Values

When powering on for the first time, the POST screen may show a "CMOS Settings Wrong" message. This standard message will appear following a clear CMOS data at factory by the manufacturer. You simply need to Load Default Settings and Save it to reset the default CMOS values.

Note: Changes to system hardware such as different CPU, memories, etc. may also trigger this message.



Using BIOS

When you start the Setup Utility, the main menu appears. The main menu of the Setup Utility displays a list of the options that are available. A highlight indicates which option is currently selected. Use the cursor arrow keys to move the highlight to other options. When an option is highlighted, execute the option by pressing <Enter>.

Some options lead to pop-up dialog boxes that prompt you to verify that you wish to execute that option. Other options lead to dialog boxes that prompt you for information.

Some options (marked with a triangle ▶) lead to submenus that enable you to change the values for the option. Use the cursor arrow keys to scroll through the items in the submenu.

In this manual, default values are enclosed in parenthesis. Submenu items are denoted by a triangle ▶.

The default BIOS setting for this motherboard apply for most conditions with optimum performance. We do not suggest users change the default values in the BIOS setup and take no responsibility to any damage caused by changing the BIOS settings.

BIOS Navigation Keys

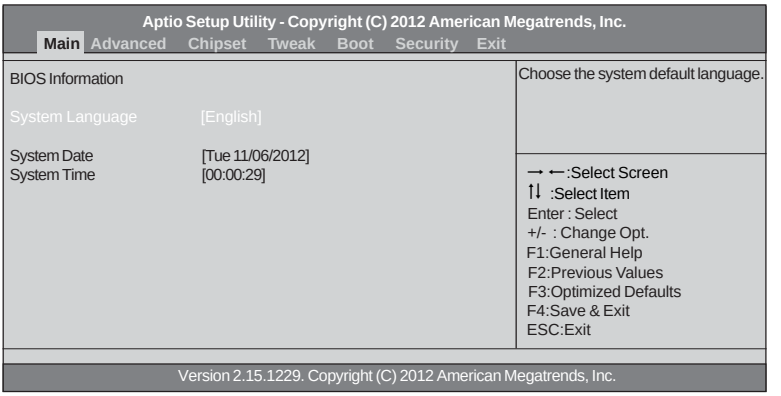
The BIOS navigation keys are listed below:

KEY	FUNCTION
ESC	Exits the current menu
↑↓→←	Scrolls through the items on a menu
+/-	Change Opt.
Enter	Select
F1	General Help
F2	Previous Value
F3	Optimized Defaults
F4	Save & Exit

For the purpose of better product maintenance, the manufacture reserves the right to change the BIOS items presented in this manual. The BIOS setup screens shown in this chapter are for reference only and may differ from the actual BIOS. Please visit the manufacture's website for updated manual.

Main Menu

When you enter the BIOS Setup program, the main menu appears, giving you an overview of the basic system information. Select an item and press <Enter> to display the submenu.



System Language (English)

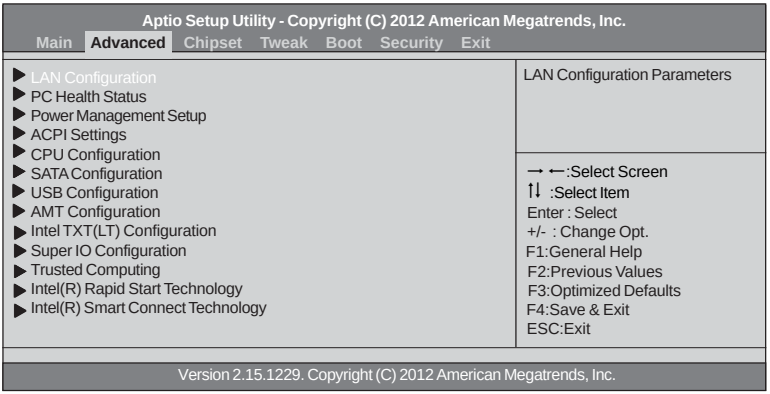
This item is used to set system language.

System Date & Time

The Date and Time items show the current date and time on the computer. If you are running a Windows OS, these items are automatically updated whenever you make changes to the Windows Date and Time Properties utility.

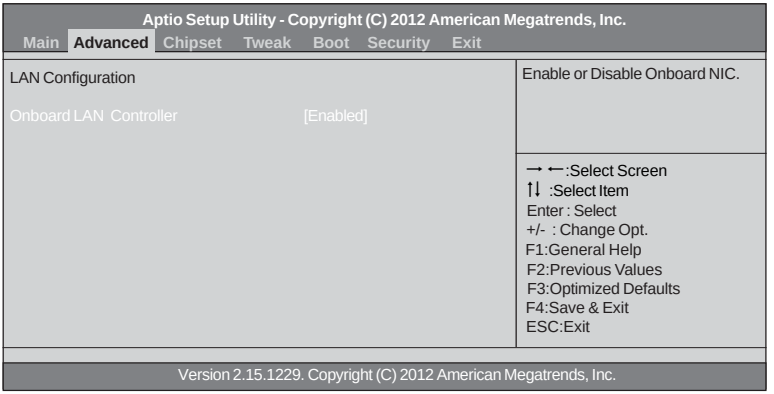
Advanced Menu

The Advanced menu items allow you to change the settings for the CPU and other system.



▶ LAN Configuration

The item in the menu shows the LAN-related information that the BIOS automatically detects.



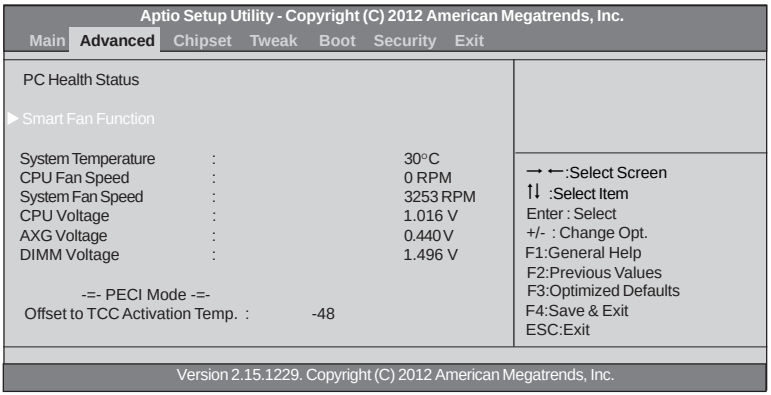
Onboard LAN Controller (Enabled)

Use this item to enable or disable Onboard LAN 1 controller.

Press <Esc> to return to the Advanced Menu page.

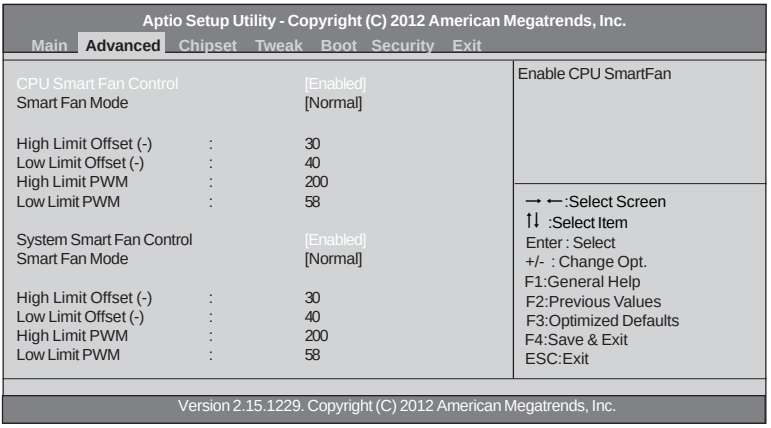
▶ PC Health Status

On motherboards support hardware monitoring, this item lets you monitor the parameters for critical voltages, temperatures and fan speeds.



▶Smart Fan Function

Scroll to this item and press <Enter> to view the following screen:



CPU/System Smart FAN Control (Enabled)

This item allows you to enable/disable the control of the CPU/System fan speed by changing the fan voltage.

SMART Fan Mode (Normal)

This item allows you to select the fan mode (Normal, Quiet, Silent, or Manual) for a better operation environment. If you choose Normal mode, the fan speed will be auto adjusted depending on the CPU temperature. If you choose Quiet mode, the fan speed will be auto minimized for quiet environment. If you choose Silent mode, the fan speed will be auto restricted to make system more quietly. If you choose Manual mode, the fan speed will be adjust depending on users' parameters.

Press <Esc> to return to the PC Health Status page.

System Component Characteristics

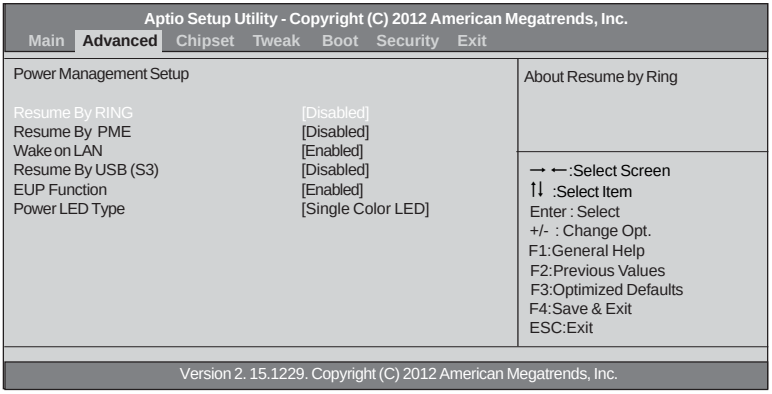
These items display the monitoring of the overall inboard hardware health events, such as System temperature, CPU & DIMM voltage, CPU & System fan speed... etc.

- System Temperature
- CPU Fan Speed
- System Fan Speed
- CPU Voltage
- AXG Voltage
- DIMM Voltage

Press <Esc> to return to the Advanced Menu page.

▶Power Management Setup

This page sets up some parameters for system power management operation.



Resume By RING (Disabled)

The system can be turned off with a software command. If you enable this item, the system can automatically resume if there is an incoming call on the Modem. You must use an ATX power supply in order to use this feature.

Resume By PME (Disabled)

This item specify whether the system will be awakened from power saving modes when activity or input signal of the specified hardware peripheral or components is detected.

Wake on LAN (Enabled)

Use this item to enable or disable integrated LAN to wake the system. (The Wake on LAN cannot be disabled if ME is on at Sx state.) If disabled, resume by USB (S3) will not be available.

Resume By USB(S3) (Disabled)

This item allows you to enable/disable the USB device wakeup function from S3 mode.

EUP Function (Enabled)

This item allows user to enable or disable EUP support.

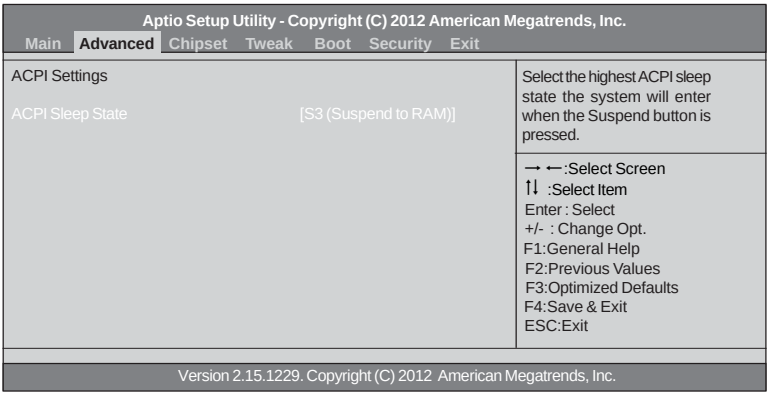
Power LED Type (Single Color LED)

This item shows the type of the power LED.

Press <Esc> to return to the Advanced Menu page.

▶ACPI Configuration

The item in the menu shows the highest ACPI sleep state when the system enters suspend.



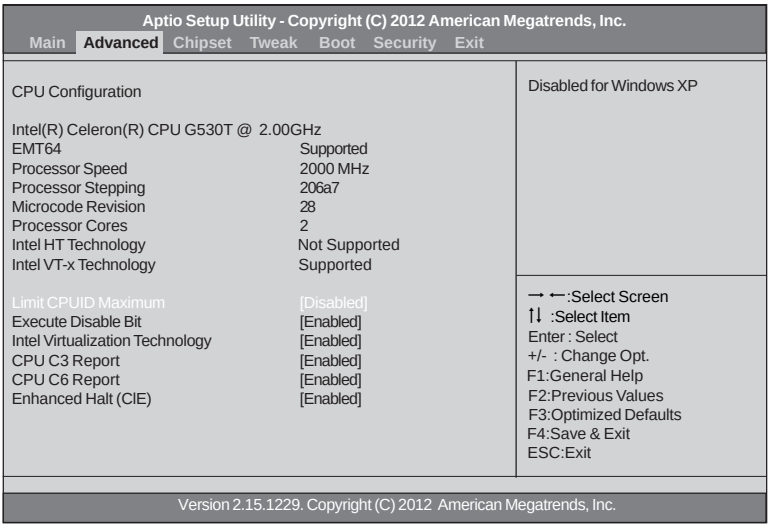
ACPI Sleep State [S3(Suspend to RAM)]

This item allows user to enter the ACPI S3 (Suspend to RAM) Sleep State (default).

Press <Esc> to return to the Advanced Menu page.

▶CPU Configuration

The item in the menu shows the CPU Configuration.



Intel(R) Celeron(R) CPU G530T @ 2.00GHz

This is display-only field and diaplays the information of the CPU installed in your computer.

EM64T (Supported)

This item shows the computer supports EMT64.

Processor Speed (2000MHz)

This item shows the current processor speed.

Processor Stepping (206a7)

This item shows the processor stepping version.

Microcode Revision (28)

This item shows the Microcode version.

Processor Cores (2)

This item shows the core number of the processor.

Intel HT Technology (Not Supported)

This item shows that the computer supports Intel HT Technology or not.

Intel VT-x Technology (Supported)

This item shows that the computer supports Intel VT-x Technology or not.

Limit CPUID Maximum (Disabled)

Use this item to enable or disable the maximum CPUID value limit, you can enable this item to prevent the system from “rebooting” when trying to install Windows NT 4.0.

Excute Disable Bit (Enabled)

This item allows the processor to classify areas in memory by where application code can execute and where it cannot. When a malicious worm attempts to insert code in the buffer, the processor disables code execution, preventing damage or worm propagation. Replacing older computers with Execute Disable Bit enabled systems can halt worm attacks, reducing the need for virus related repair.

Intel Virtualization Technology (Enabled)

When disabled, a VMM cannot utilize the additional hardware capabilities provided by Vandor Pool Technology.

CPU C3 Report (Disabled)

Use this item to enable or disable CPU C3 (ACPI C2) report to OS.

CPU C6 Report (Enabled)

Use this item to enable or disable CPU C6 (ACPI C3) report to OS.

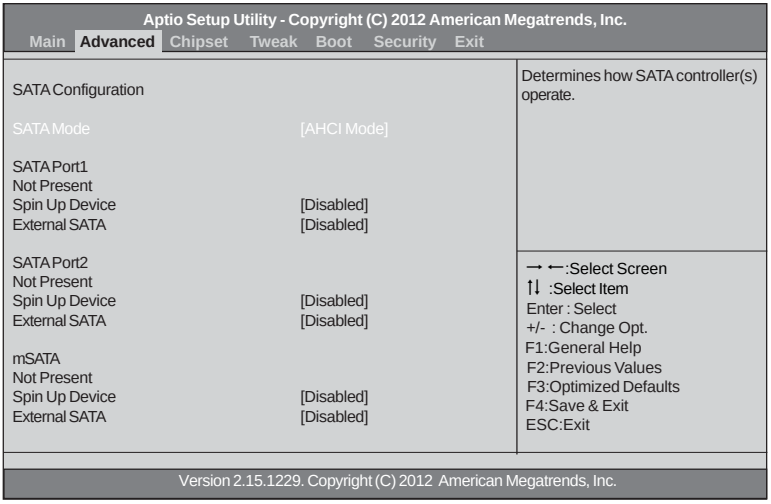
Enhanced Halt (ClE) (Enabled)

Use this item to enable the CPU energy-saving function when the system is not running.

Press <Esc> to return to the Advanced Menu page.

▶SATA Configuration

Use this item to show the mode of serial SATA configuration options.



SATA Mode (AHCI Mode)

Use this item to select SATA mode.

mSATA/SATA Port1~2 (Not Present)

This motherboard supports two SATA channels and one mSATA channel, each channel allows one mSATA/SATA device to be installed. Use these items to configure each device on the mSATA/SATA channel.

Spin Up Device (Disabled)

Use this item to enable or disable the spin up device.

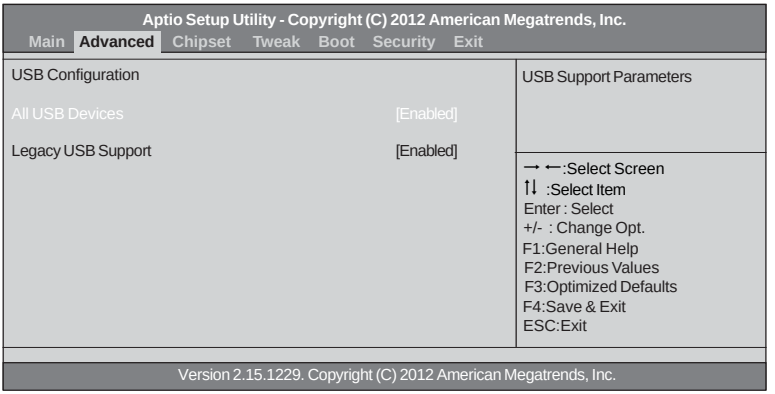
External SATA (Disabled)

Use this item to enable or disable the external SATA.

Press <Esc> to return to the Advanced Menu page.

▶USB Configuration

Use this item to show the information of USB configuration.



All USB Devices (Enabled)

Use this item to enable or disable all USB devices.

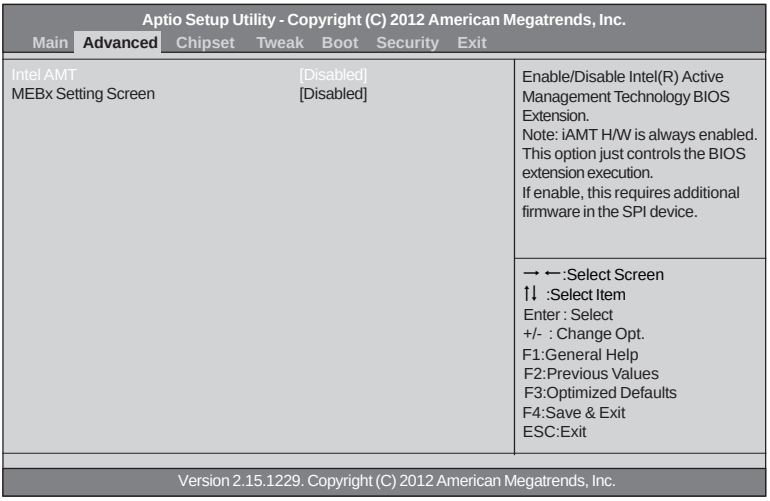
Legacy USB Support (Enabled)

Use this item to enable or disable support for legacy USB devices.

Press <Esc> to return to the Advanced Menu page.

▶AMT Configuration

Use this item to show the information of AMT configuration.



Intel AMT (Disabled)

Use this item to enable or disable Intel(R) Active Management Technology BIOS Extension. iAMT H/W is always enabled. This option just controls the BIOS extension execution. If enabled, this requires additional firmware in the SPI device.

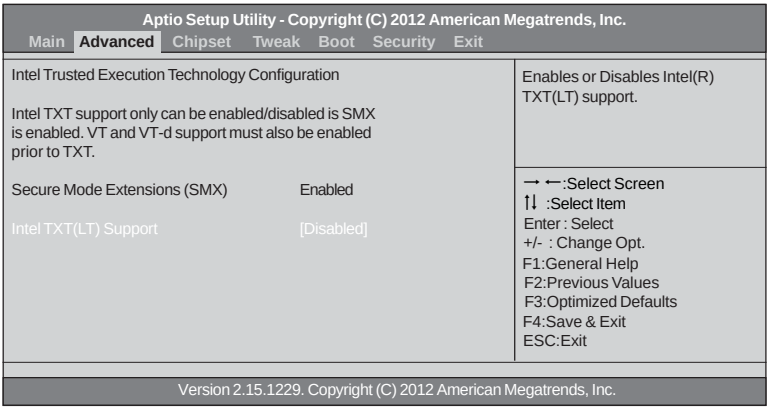
MEBx Setting Screen (Disabled)

Use this item to enable or disable Intel ME BIOS Extension setting screen.

Press <Esc> to return to the Advanced Menu page.

▶Intel TXT(LT) Configuration

Use this item to show the information of Intel TXT(LT) configuration.



Secure Mode Extensions (Enabled)

Use this item to enable or disable secure mode extension.

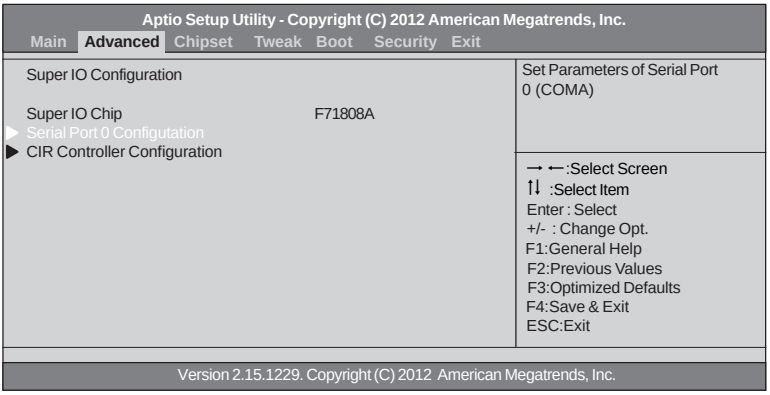
Intel TXT(LT) Configuration (Disabled)

Use this item to enable or disable Intel Intel(R) TXT(LT) support.

Press <Esc> to return to the Advanced Menu page.

▶Super IO Configuration

Use this item to show the information of Super IO configuration.

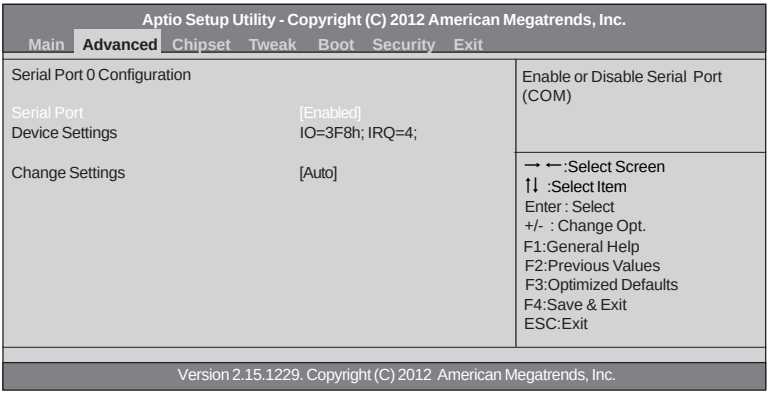


Super IO Chip (F71808A)

This item shows the information of the super IO chip.

▶Serial Port 0 Configuration

Scroll to this item and press <Enter> to view the following screen:



Serial Port (Enabled)

This item allows you to enable or disable serial port.

Device Settings (IO=3F8h; IRQ=4)

This item shows the information of the device settings.

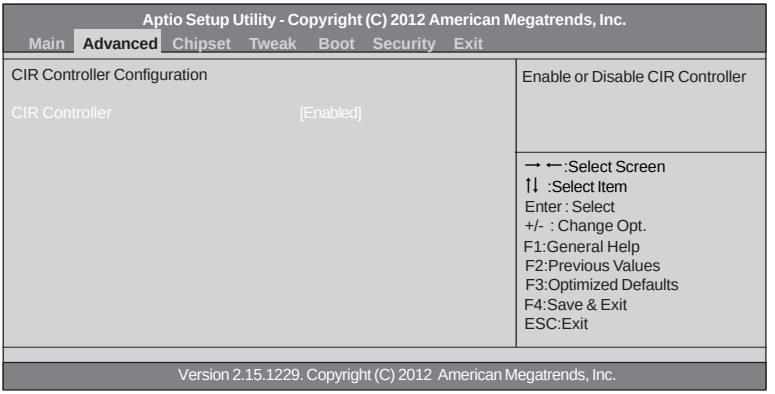
Change Settings (Auto)

Use this item to change device settings.

Press <Esc> to return to the Super IO Configuration page.

▶CIR Controller Configuration

Scroll to this item and press <Enter> to view the following screen:



CIR Controller (Enabled)

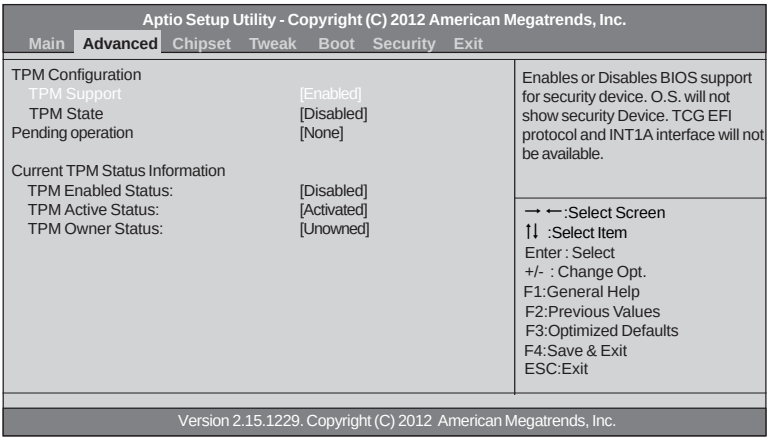
This item allows you to enable or disable CIR controller.

Press <Esc> to return to the Super IO Configuration page.

Press <Esc> to return to the Advanced Menu page.

▶Trusted Computing

Use this item to show the information of trusted computing.



TPM Support (Enabled)

Use this item to enable or disable the TPM support. O.S will not show TPM. Reset of platform is required.

TPM State (Disabled)

Use this item to enable or disable the security device.

Pending Operation (None)

Use this item to schedule an operation for the security device.

TPM Enabled Status (Disabled)

This item displays the TPM status to be enabled or disabled.

TPM Active Status (Activated)

This item displays the TPM status to be activated or not.

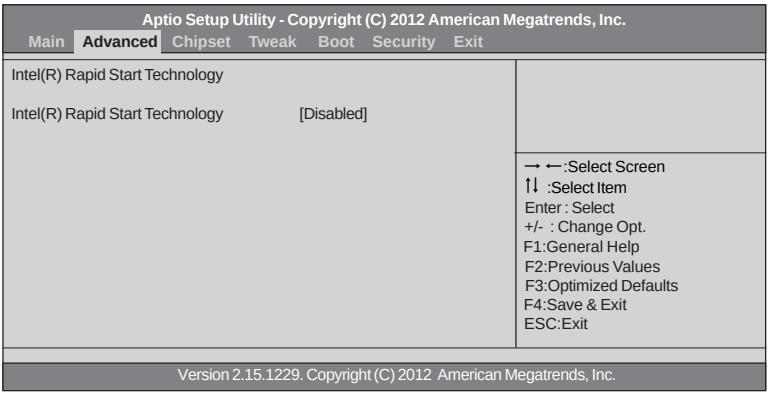
TPM Owner Status (Unowned)

This item displays the TPM status to be owned or not.

Press <Esc> to return to the Advanced Menu page.

▸Intel(R) Rapid Start Technology

Use this item to show the information of Intel(R) Rapid Start Technology.



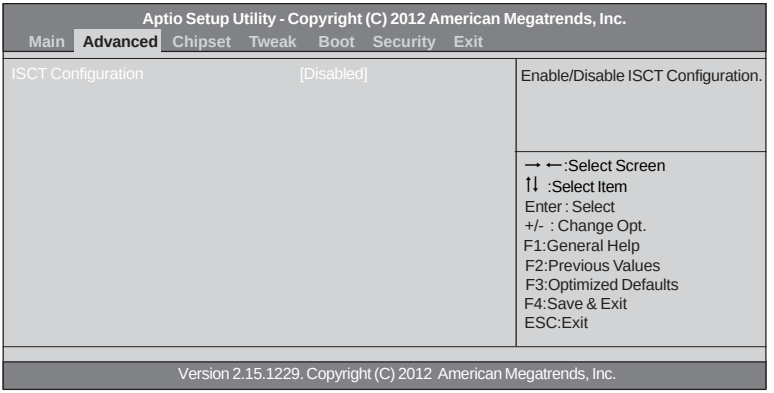
Intel(R) Rapid Start Technology (Disabled)

Use this item to enable or disable Intel(R) Rapid Start Technology.

Press <Esc> to return to the Advanced Menu page.

▶Intel(R) Smart Connect Technology

Use this item to show the information of Intel(R) Smart Connect Technology.



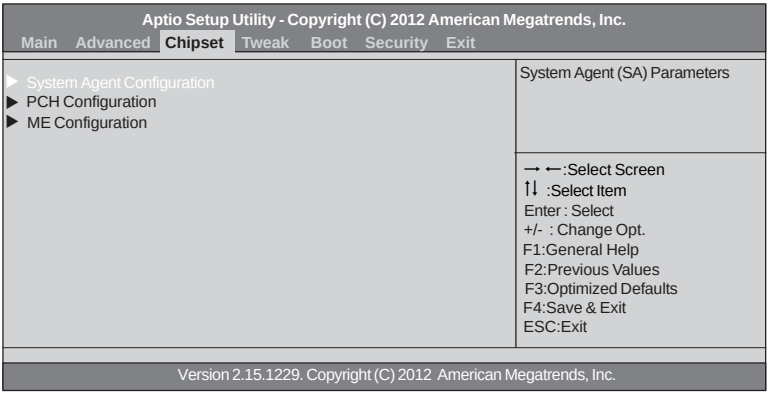
ISCT Configuration (Disabled)

Use this item to enable or disable ISCT configuration.

Press <Esc> to return to the Advanced Menu page.

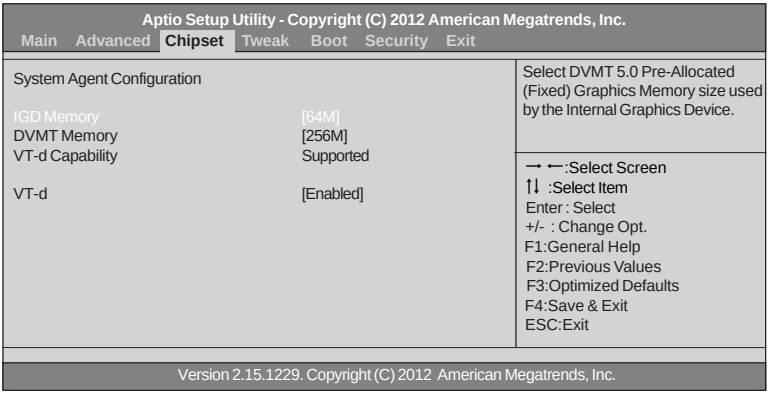
Chipset Menu

The chipset menu items allow you to change the settings for the North Bridge chipset, South Bridge chipset and other system.



▶System Agent Configuration

Scroll to this item and press <Enter> and view the following screen:



IGD Memory (64M)

This item shows the information of the IGD (Internal Graphics Device) memory.

DVMT Memory (256M)

When set to Fixed Mode, the graphics driver will reserve a fixed position of the system memory as graphics memory, according to system and graphics requirements.

VT-d Capability (Supported)

This item shows that the computer supports VT-d capability or not.

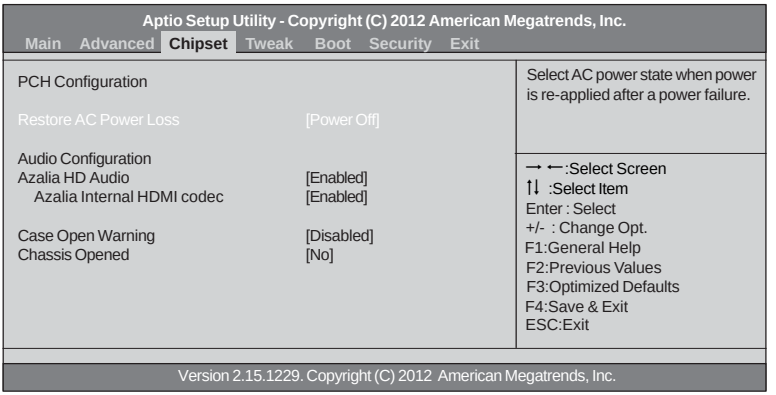
VT-d (Enabled)

Use this item to check to enable VT-d function on MCH.

Press <Esc> to return to the Chipset Menu page.

▶PCH Configuration

Scroll to this item and press <Enter> to view the following screen:



Restore AC Power Loss (Power Off)

This item enables your computer to automatically restart or return to its operating status.

Azalia HD Audio (Enabled)

This item enables or disables Azalia HD audio.

Azalia Internal HDMI codec (Enabled)

This item enables or disables Azalia Internal HDMI codec.

Case Open Warning (Disabled)

This item enables or disables the warning if the case is opened up, and the item below indicates the current status of the case.

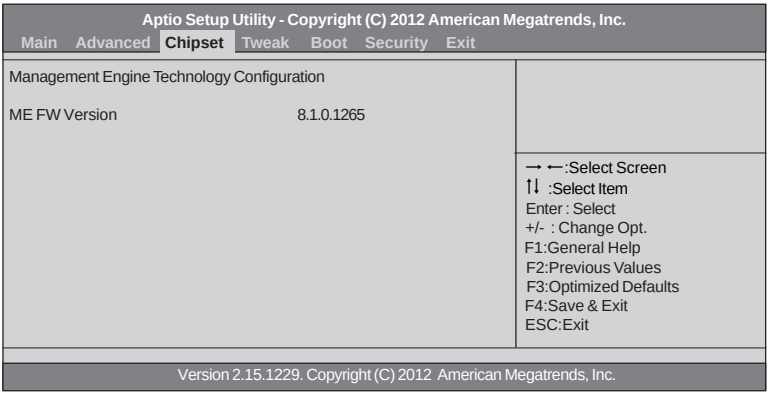
Chassis Opened (No)

This item indicates whether the case has been opened.

Press <Esc> to return to the Chipset Menu page.

▶ ME Configuration

Scroll to this item and press <Enter> to view the following screen:



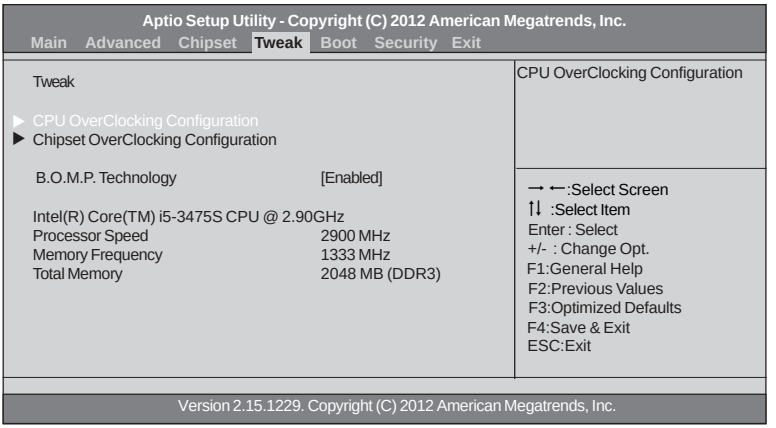
ME FW Version (8.1.0.1265)

This item shows the ME FW version.

Press <Esc> to return to the Chipset Menu page.

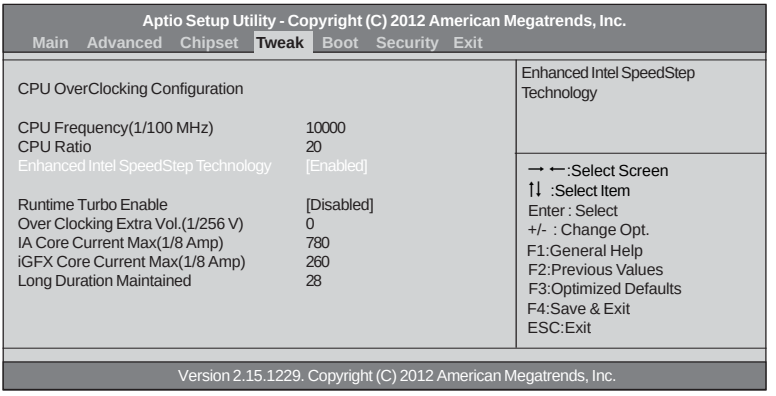
Tweak Menu

This page enables you to set the clock speed and system bus for your system. The clock speed and system bus are determined by the kind of processor you have installed in your system.



▶CPU OverClocking Configuration

Scroll to this item to view the following screen:



CPU Frequency (1/100 MHz) (10000)

This item shows the information of CPU frequency.

CPU Ratio (20)

This item allows users to control non turbo CPU ratio.

Enhanced Intel SpeedStep Technology (Enabled)

This item allows users to enable or disable the EIST (Enhanced Intel SpeedStep Technology).

Runtime Turbo Enable (Disabled)

This item shows if CPU support runtime turbo or not.

OverClocking Extra Vol.(1/256V) (0)

Use this item to set over clocking extra voltage.

IA Core Current Max(1/8 Amp) (780)

Use this item to control CPU Current Limit.

iGFX Core Current Max(1/8 Amp) (260)

Use this item to control iGFX Core Current Limit.

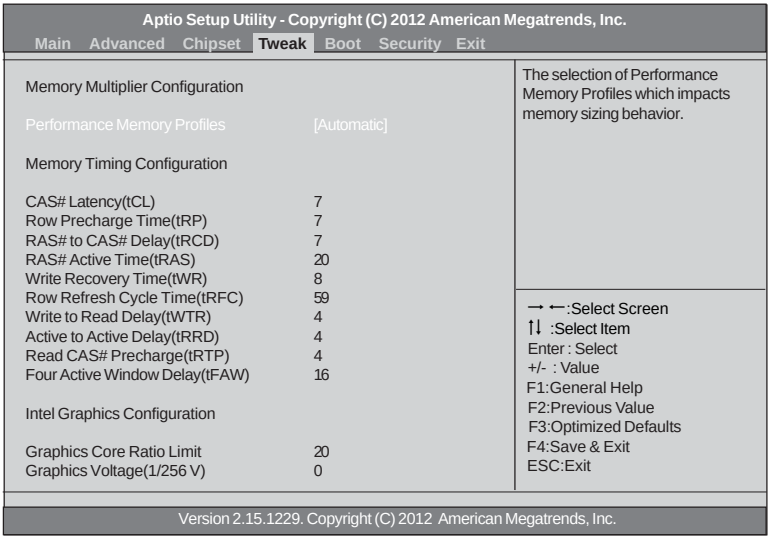
Long Duration Maintained (28)

Use this item to control the time window over PL1 value should be maintained. This is for Turbo mode.

Press <Esc> to return to the Tweak Menu page.

►Chipset OverClocking Configuration

Scroll to this item to view the following screen:



Performance Memory Profiles (Automatic)

This item allows you to select the memory mode: Automatic, Manual, XMP Profile 1 or 2.

CAS# Latency(tCL) (7)

This item determines the operation of DDR SDRAM memory CAS (column address strobe). It is recommended that you leave this item at the default value. The 2T setting requires faster memory that specifically supports this mode.

Row Precharge Time(tRP) (7)

This item specifies Row precharge to Active or Auto-Refresh of the same bank.

RAS# to CAS# Delay(tRCD) (7)

This item specifies RAS# to CAS# delay to Rd/Wr command to the same bank.

RAS# Active Time(tRAS) (20)

This item specifies the RAS# active time.

Write Recovery Time(tWR) (8)

This item specifies the write recovery time.

Row Refresh Cycle Time(tRFC) (59)

This item specifies the row refresh cycle time.

Write to Read Delay(tWTR) (4)

This item specifies the write to read delay time.

Active to Active Delay(tRRD) (4)

This item controls the active bank x to active bank y in memory clock cycles.

Read CAS# Precharge(tRTP) (4)

This item controls the Read to precharge delay for memory devices, in memory clock cycles.

Four Active Window Delay(tFAW) (16)

This item controls the four bank activate time in memory clock cycles.

Graphics Core Ratio Limit (20)

This item allows you to control the internal GFX Turbo ratio.

Graphics Voltage(1/256) (0)

This item allows you to adjust the internal GFX voltage.

Press <Esc> to return to the Tweak Menu page.

B.O.M.P. Technology (Enabled)

This item allows users to enable or disable B.O.M.P. technology. This function can run safe setting to setup menu when system boot fail 3 times.

Intel(R) Core(TM) i5-3475S CPU @ 2.90GHz

This is display-only field and displays the information of the CPU installed in your computer.

Processor Speed (2900 MHz)

This item shows the CPU speed.

Memory Frequency (1333 MHz)

This item shows the memory frequency.

Total Memory (2048 MB (DDR3))

This item shows the total memory.

Warning:
Over-clocking components can adversely affect the reliability of the system and introduce errors into your system. Over-clocking can permanently damage the motherboard by generating excess heat in components that are run beyond the rated limits.

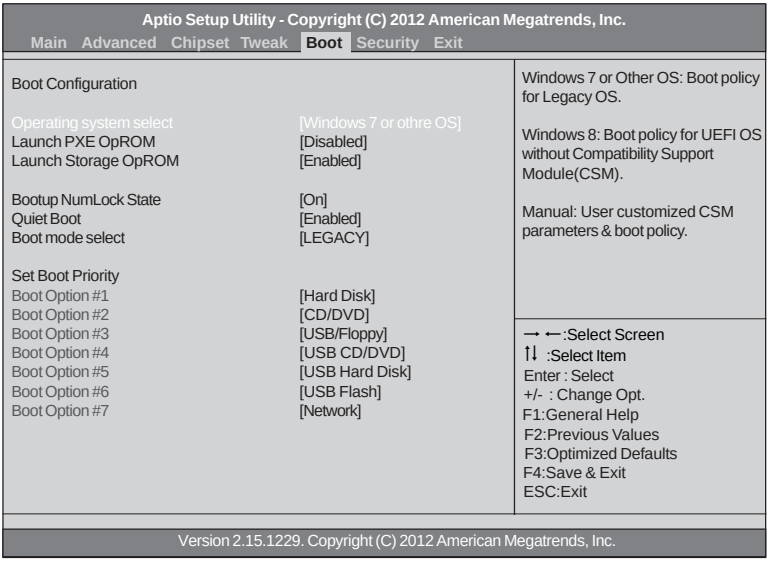
Fail-Safe Procedures for Over-clocking

When end-users encounter failure after attempting over-clocking, please take the following steps to recover from it.

1. Shut down the computer.
2. Press and hold the “Page Up Key (PgUp)” of the keyboard, and then boot the PC up.
3. Two seconds after the PC boots up, release the “Page Up Key (PgUp)”.
4. The BIOS returns to the default setting by itself.

Boot Menu

This page enables you to set the keyboard NumLock state.



Boot Configuration

This item shows the information of the Boot Configuration.

Operation System Select (Windows 7 or other OS)

This item is used to select the operation system.

Launch PXE OpROM (Disabled)

The item enables or disables launch PXE Option ROM.

Launch Storage OpROM (Enabled)

Use this item to enable or disable the Storage OpROM.

Bootup NumLock State (On)

This item enables you to select NumLock state.

Quiet Boot (Enabled)

Use this item to enable or disable quiet boot.

Boot mode select (LEGACY)

Use this item to select boot mode.

Set Boot Priority

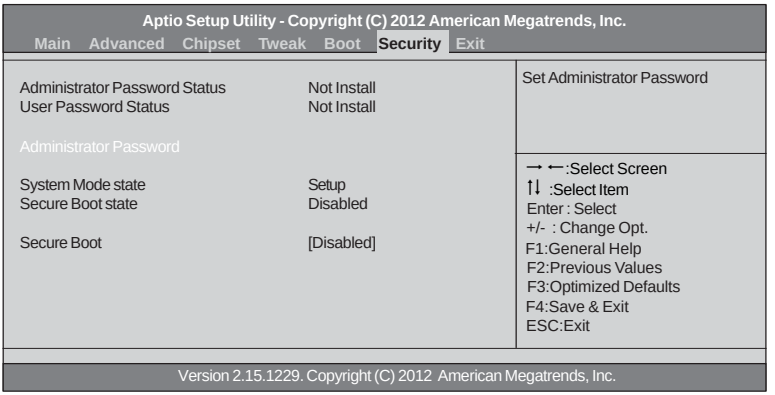
This item enables you to set boot priority for all boot devices.

Boot Option #1 /2 /3 /4 /5 /6 /7

These items show the boot priorities.

Security Menu

This page enables you to set setup administrator password and user password.



Administrator Password Status (Not Install)

This item shows administrator password installed or not.

User Password Status (Not Install)

This item shows user password installed or not.

System Mode state (Setup)

This item shows system mode setup or not.

Secure Boot state (Disabled)

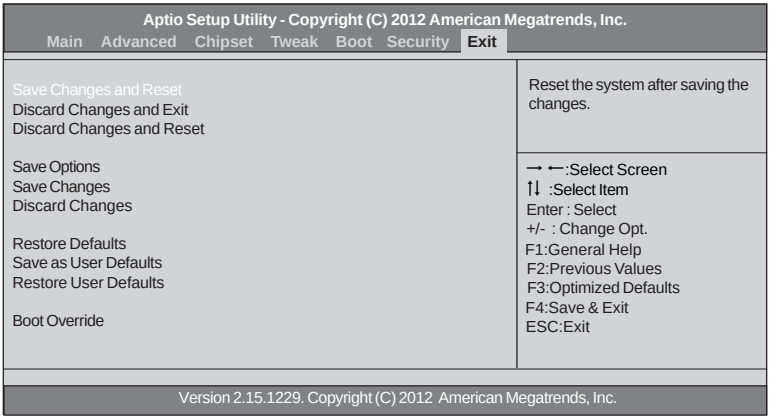
This item allows you to enable or disable the secure boot state.

Secure Boot (Disabled)

This item is used to control the secure boot flow, it is possible only if system runs in User Mode.

Exit Menu

This page enables you to exit system setup after saving or without saving the changes.



Save Changes and Reset

This item enables you to reset system setup after saving the changes.

Discard Changes and Exit

This item enables you to exit system setup without saving any changes.

Discard Changes and Reset

This item enables you to reset system setup without saving any changes.

Save Options

This item enables you to save the options that you have made.

Save Changes

This item enables you to save the changes that you have made.

Discard Changes

This item enables you to discard any changes that you have made.

Restore Defaults

This item enables you to restore the system defaults.

Save as User Defaults

This item enables you to save the changes that you have made as user defaults.

Restore User Defaults

This item enables you to restore the user defaults.

Boot Override

Use this item to select the boot device.

Updating the BIOS

You can download and install updated BIOS for this motherboard from the manufacturer's Website. New BIOS provides support for new peripherals, improvements in performance, or fixes for known bugs. Install new BIOS as follows:

1 If your motherboard has a BIOS protection jumper, change the setting to allow BIOS flashing.

2 If your motherboard has an item called Firmware Write Protect in Advanced BIOS features, disable it. (Firmware Write Protect prevents BIOS from being overwritten.)

3 Prepare a bootable device or create a bootable system disk. (Refer to Windows online help for information on creating a bootable system disk.)

4 Download the Flash Utility and new BIOS file from the manufacturer's Web site. Copy these files to the bootable device.

5 Turn off your computer and insert the bootable device in your computer. (You might need to run the Setup Utility and change the boot priority items on the Advanced BIOS Features Setup page, to force your computer to boot from the bootable device first.)

6 At the C:\ or A:\ prompt, type the Flash Utility program name and the file name of the new BIOS and then press <Enter>. Example: AFUDOS.EXE 040706.ROM

7 When the installation is complete, remove the bootable device from the computer and restart your computer. If your motherboard has a Flash BIOS jumper, reset the jumper to protect the newly installed BIOS from being overwritten. The computer will restart automatically.

This concludes Chapter 3. Refer to the next chapter for information on the software supplied with the motherboard.

Chapter 4

Using the Motherboard Software

Auto-installing under Windows XP/7/8

The auto-install DVD-ROM makes it easy for you to install the drivers and software. The support software DVD-ROM disc loads automatically under Windows XP/7/8. When you insert the DVD-ROM disc in the DVD-ROM drive, the auto-run feature will automatically bring up the installation screen. The screen has four buttons on it: **Setup**, **Utilities**, **Browse CD** and **Exit**.

Information:
Displays the path for all software and drivers available on the disk.

Click "**Exit**" button to close the Auto-Setup window.

Browse CD:
Open Windows Explorer and show the contents of the support disk.

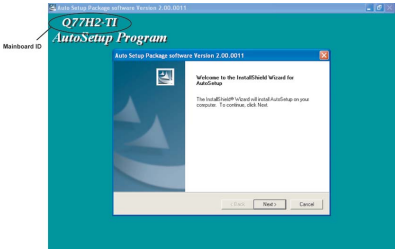
Click the "**Setup**" button to select and run the software installation program.

Click the "**Utilities**" button to select and install the Intelligent Utility.

Running Setup

Follow these instructions to install device drivers and software for the motherboard:

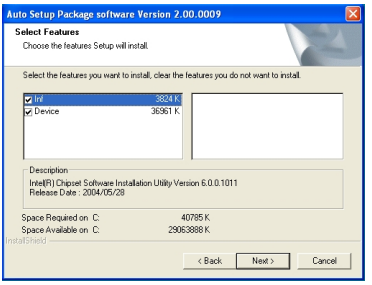
1. Click **Setup**. The installation program begins:



The following screens are examples only. The screens and driver lists will be different according to the motherboard you are installing.

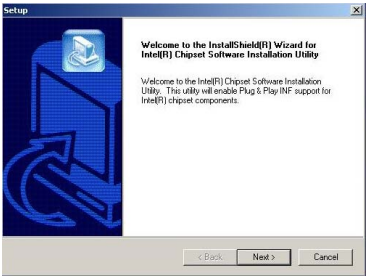
The motherboard identification is located in the upper left-hand corner.

2. Click **Next.** The following screen appears:



3. Check the box next to the items you want to install. The default options are recommended.

4. Click **Next** to run the Installation Wizard. An item installation screen appears:

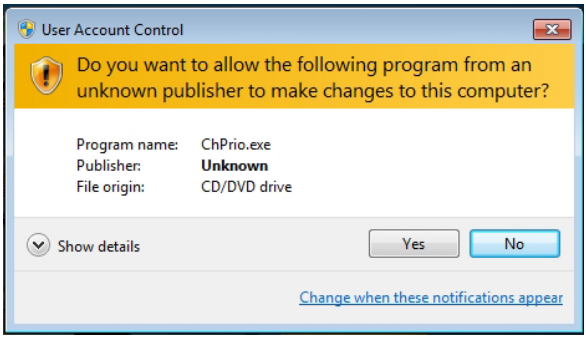


5. Follow the instructions on the screen to install the items.

Drivers and software are automatically installed in sequence. Follow the onscreen instructions, confirm commands and allow the computer to re-start a few times to complete the installation.

Windows 8 will show the following screen after system restart, you must select "Desktop" in the bottom left to install the next driver.

Windows 7/8 will appear below UAC (User Account Control) message after the system restart. You must select "Yes" to install the next driver. Continue this process to complete the drivers installation.



Manual Installation

If the auto-install DVD-ROM does not work on your system, you can still install drivers through the file manager for your OS (for example, Windows Explorer). Look for the chipset and motherboard model, and then browse to the directory and path to begin installing the drivers. Most drivers have a setup program (SETUP.EXE) that automatically detects your operating system before installation. Other drivers have the setup program located in the operating system subfolder.

If the driver you want to install does not have a setup program, browse to the operating system subfolder and locate the readme text file (README.TXT or README.DOC) for information on installing the driver or software for your operating system.

Memo

Chapter 5
Trouble Shooting

Start up problems during assembly

After assembling the PC for the first time you may experience some start up problems. Before calling for technical support or returning for warranty, this chapter may help to address some of the common questions using some basic troubleshooting tips.

a) System does not power up and the fans are not running.

1. Disassemble the PC to remove the VGA adaptor card, DDR memory, LAN, USB and other peripherals including keyboard and mouse. Leave only the motherboard, CPU with CPU cooler and power supply connected. Make sure the power cord is plugged into the wall socket & the switch on the Power Supply Unit (PSU) is turned " on " as well. Turn on again to see if the CPU and power supply fans are running.

2. Make sure to remove any unused screws or other metal objects such as screwdrivers from the inside PC case. This is to prevent damage from short circuit.

3. Check the CPU FAN connector is connected to the motherboard.

4. For Intel platforms check the pins on the CPU socket for damage or bent. A bent pin may cause failure to boot and sometimes permanent damage from short circuit.

b) Power is on, fans are running but there is no display

1. Make sure the monitor is turned on and the monitor cable is properly connected to the PC.

2. Check the VGA adapter card (if applicable) is inserted properly.

3. Listen for beep sounds. If you are using internal PC speaker make sure it is connected.
   a. continuous 3 short beeps: memory not detected
   b. 1 long beep and 8 short beeps: VGA not detected

c) The PC suddenly shuts down while booting up.

1. The CPU may experience overheating so it will shutdown to protect itself. Apply the thermal grease onto the CPU heatsink & ensure the CPU fan is well-connected with the CPU heatsink. Check if the CPU fan is working properly while the system is running.

2. From the BIOS setting, try to disable the Smartfan function to let the fan run at default speed. Doing a Load Optimised Default will also disable the Smartfan.

Start up problems after prolong use

After a prolong period of use your PC may experience start up problems again. This may be caused by breakdown of devices connected to the motherboard such as HDD, CPU fan, etc. The following tips may help to revive the PC or identify the cause of failure.

1. Clear the CMOS values using the CLR_CMOS jumper. Refer to CLR_CMOS jumper in Chapter 2 for Checking Jumper Settings in this user manual. When completed, follow up with a Load Optimised Default in the BIOS setup.

2. Check the CPU cooler fan for dust. Long term accumulation of dust will reduce its effectiveness to cool the processor. Clean the cooler or replace a new one if necessary.

3. Remove the hard drive, optical drive or DDR memory to determine which of these components may be at fault.

4. Check whether there is any bulked up electrolytic capacitor or abnormal component.

Maintenance and care tips

Your computer, like any electrical appliance, requires proper care and maintenance. Here are some basic PC care tips to help prolong the life of the motherboard and keep it running as best as it can.

1. Keep your computer in a well ventilated area. Leave some space between the PC and the wall for sufficient airflow.

2. Keep your computer in a cool dry place. Avoid dusty areas, direct sunlight and areas of high moisture content.

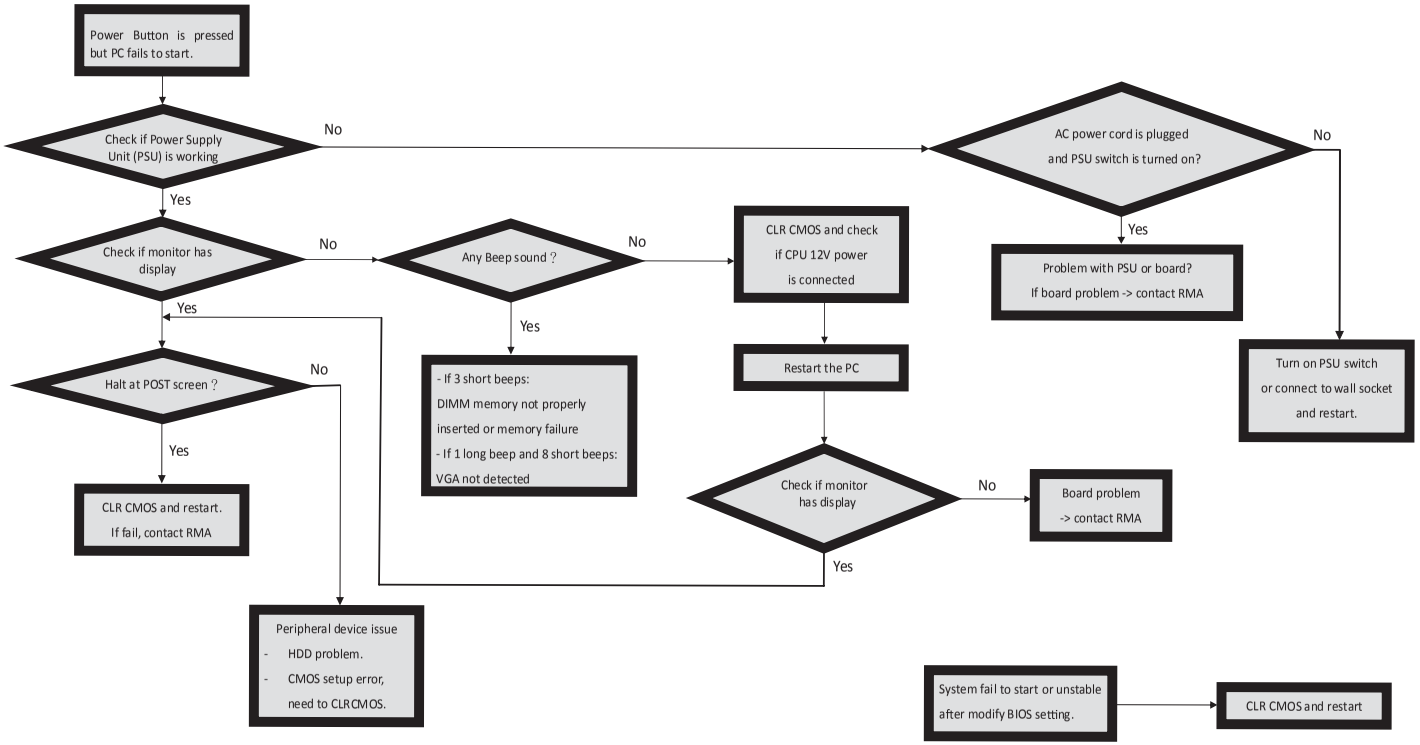
3. Routinely clean the CPU cooler fan to remove dust and hair.

4. In places of hot and humid weather you should turn on your computer once every other week to circulate the air and prevent damage from humidity.

5. Add more memory to your computer if possible. This not only speeds up the system but also reduces the loading of your hard drive to prolong its life span.

6. If possible, ensure the power cord has an earth ground pin directly from the wall outlet. This will reduce voltage fluctuation that may damage sensitive devices.

Basic Troubleshooting Flowchart



Memo