RX77Q

Intel® Q77 Micro ATX Motherboard (uATX) supports
2nd/3rd Gen. 22nm Intel® Core™ i7 / i5 / i3 Processors

bcm

A D V A N C E D
R E S E A R C H

Copyright Notice

The material in this document is our intellectual property. We take every care in the preparation of this document, but no guarantee is given as to the correctness of its contents. Our products are under continual improvement and we reserve the right to make changes without notice.

Trademarks

All trademarks are the properties of their respective owners.

- Intel® is registered trademarks of Intel Corporation.
- Windows® is registered trademarks of Microsoft Corporation.
- AMI® is registered trademark of Advanced Micro Devices, Inc.
- Realtek® is registered trademark of Realtek Semiconductor Corporation.

Safety Instructions

- ■ Always read the safety instructions carefully.
- ■ Keep this User's Manual for future reference.
- ■ Keep this equipment away from humidity.
- ■ Lay this equipment on a reliable flat surface before setting it up.
- ■ Make sure the voltage of the power source and adjust properly 110/220V before connecting the equipment to the power inlet.
- ■ Place the power cord such a way that people can not step on it. Do not place anything over the power cord.
- ■ Always Unplug the Power Cord before inserting any add-on card or module.
- ■ All cautions and warnings on the equipment should be noted.
- ■ Never pour any liquid into the opening that could damage or cause electrical shock.
- ■ If any of the following situations arises, get the equipment checked by service personnel:
  - ○ The power cord or plug is damaged.
  - ○ Liquid has penetrated into the equipment.
  - ○ The equipment has been exposed to moisture.
  - ○ The equipment does not work well or you can not get it work according to User's Manual.
  - ○ The equipment has dropped and damaged.
  - ○ The equipment has obvious sign of breakage.
- ■ DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT UNCONDITIONED, STORAGE TEMPERATURE ABOVE 80°C (176°F), IT MAY DAMAGE THE EQUIPMENT.

CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.

For better environmental protection, waste batteries should be collected separately for recycling or special disposal.

CE Conformity

Hereby, we declare that this device is in compliance with the essential safety requirements and other relevant provisions set out in the European Directive.

FCC-B Radio Frequency Interference Statement

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 instruction manual, 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 measures listed below:

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

NOTICE 1

The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTICE 2

Shielded interface cables and AC power cord, if any, must be used in order to comply with the emission limits.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. this device may not cause harmful interference, and
2. this device must accept any interference received, including interference that may cause undesired operation.

<u>WEEE Statement</u>

Under the European Union ("EU") Directive on Waste Electrical and Electronic Equipment, Directive 2002/96/EC, which takes effect on August 13, 2005, products of "electrical and electronic equipment" cannot be discarded as municipal waste anymore and manufacturers of covered electronic equipment will be obligated to take back such products at the end of their useful life.

Contents

Chapter 1
Overview

Thank you for choosing the RX77Q, an excellent industrial computer board.

Based on the innovative **Intel® Cougar Point** chipset for optimal system ef f ciency, the RX77Q accommodates the **Intel® Core i3/ i5/ i7/ Celeron** processor in socket LGA1 155 and supports up to four DDR3 1066/1333/1600 DIMM slots to provide the maximum of 32GB memory capacity.

In the advanced-level and mid-range market segment, the RX77Q provides a high-performance solution for today's front-end and general purpose workstation, as well as in the future.
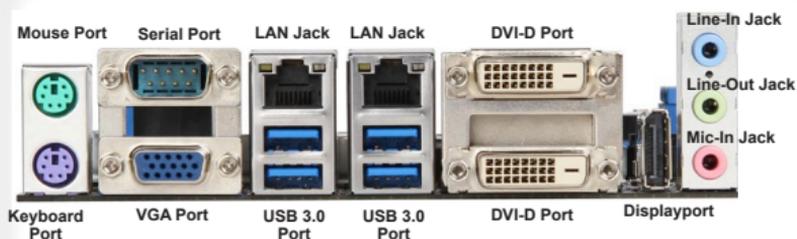
Mainboard Specifications

CPU (Optional)	■ÁQ¢^¦ÁŌ[¦^Ă†ĐĂ¦ĐĂ¦ĐÒ^¦^¦[}Á¦¦&^••[¦¦Å¤¦Á¦&^¢Á ŠŌŒFFÍÍ
Chipset	■ÁQ¢^¦ÁŰ¦ÏÁÙÔPÁ
Memory	■Á¦ÄŐÜÜÐHĂ¦Î̂ÐFH¦¦ÐFͨ¦¦¦ÐÒŒQÏTÁ¦[¦¶ ■ÁÙ¯¦]][¦·¦Ậ@¦Á¦ææ¦ã¦¨¦¦Ă†ÐGŌÓ
LAN	■ÁŌ¦ã¦æà¦ĂÒœ¦¦ÔQœ@¦}^¦¦¦¦ÁQ¢^¦ÁÔG¦ÏÏÁIŠĂ¦ÁBÁ¦ÔG¦ÏÁJŠTÁ ŌàÒÒ¦&¦}¦¦d¦¦¦¦^¦•
SATA	■Á¦ÄŰŒꞨ¦ÐÒÐ¦àÐÓₐᐡ¦Á[¦¦¦æ°ÁÁQ¢^¦ÁŌ[¦¯¤æàÁ¦[ₐ¦c ■ÁŒ¦ÄŰŒꞨ¦ÐÒÐ¦àÐÓₐᐡ¦Á[¦¦¦æ°ÁÁQ¢^¦ÁŌ[¦¯¤æàÁ¦[ₐ¦c
RAID	■ÁÙŒꞨ¦ŒF¦dÁᐡ^¦¦]¦[¦·¦Á[¦¦Q¢^¦¦Á¦æ¦¦æĂ¦Á¦¦¦æà^¦^¦Á&@¦¦[[¦¦^¦¦¦Á QŒꞨ¦ÔŒꞨ¦ŒꞨ¦ŒꞨ¦¦ĂÁꞨĂÁ¦ĂÁ¦¦ꞨꞨĂÁ[¦¦¦æ°ÁQ¢^¦ÁŌ[¦¯¤æàÁ¦[ₐ¦c
Audio	■ÁPÖŒꞨÔÁ[å^¦&¦æ°¦ĂÄÜ^¦æ¦&¦¦\¦ÁŒꞨꞨÒÒÒ¦ÌÏÏ ■ÁŌ[¦{¦]¦¦ᐧᐡ¦¦¦¦ä°Á¦æĐÔÁ¦æ¦ĂꞨÒ¦FĔꞨÁ¦¦^¦•
Graphics	■ÁÙ¯¦]][¦·¦Ậ@¦Á¦ããᐧᐡ•œ¦^¦¦åÁ¦¦&^••[¦¦
Back Panel I/O	■ÁÁÖÁÙꞨÒÃÁ¦¨•^¦Á¦[¦¦c ■ÁÁÖÁÙꞨÒÃÁ¦^¦à¦æ¦åÁ¦[¦¦c ■ÁÁÖÁ¦ÄŌꞨꞨÒꞨÁ¦[¦¦c ■ÁŒꞨ¦ÄÖꞨꞨꞨꞨÒꞨÁ¦[¦¦Á ■ÁÁÖÁ¦^¦¦¦æ¦¦åÁ¦[¦¦c ■ÁÁÖÁ¦Ō¦ᐧᐡ¦¦¦æ¦][¦¦c ■ÁŒꞨ¦Ō¦ᐧᐡ¦¦æà¦ã¦æ¦¦ÒꞨÔꞨÒꞨÁ¦æ¦&¦• ■Á¦ÁꞨÙꞨÔꞨÁ¦ĔꞨÒꞨÁ¦[¦¶ ■ÁÁÖÁꞨꞨã¦^¦ÐꞨÒꞨꞨ¦æ¦¦å¦ã¦æ¦¦Ꞩæ¦¦æ¦¦&¦\ ■ÁÁÖꞨꞨã¦^¦ÐꞨÜꞨ¨¦[¦¦æ¦¦å¦ã¦æ¦¦Ꞩæ¦¦æ¦¦&¦\ ■ÁÁÖꞨÁT¦æꞨꞨÒꞨÒꞨÁ¦æ¦¦å¦ã¦æ¦¦Ꞩæ¦¦æ¦¦&¦\
Onboard Connectors/ Pinheaders	■Á¦ÁꞨÙꞨÔꞨÁꞨÒÒÐꞨÔꞨ¦Á¦ãᐡ¦Ꞩ@Á¦æà¦^¦¦• ■ÁÁÖꞨæᐧᐡ¦¦¦ᐧᐡ¦¦ᐧᐡ¦åᐧᐡꞨ¦Á¦ãᐧᐡꞨ¦ãᐧᐡ@Á¦æà¦^¦ ■Á¦ÁꞨ^¦¦¦æ¦¦åÁÁ¦[¦¶&Á¦}¦}^¦&¦dᐧᐡ¦• ■ÁÁÖꞨꞨÒꞨÚꞨꞨꞨꞨÁꞨ¦ãᐧᐡ¦Ꞩ@Á¦æà¦^¦ ■ÁÁÖꞨꞨꞨŜꞨꞨꞨÖꞨÜꞨÁꞨ¦¦&¦}¦}^¦&¦dᐧᐡ¦¦ ■ÁÁÖꞨꞨÁꞨꞨ¦[¦·¦Ꞩæ¦¦åᐧᐡ¦ãᐧᐡ¦Ꞩ@Á¦æà¦^¦ ■ÁÁÖꞨ&¦@¦¦¦•¦·ᐧᐡ¦¦ãᐧᐡ¦åᐧᐡ¦·¦•¦ãᐧᐡ¦Á¦ãᐧᐡ¦Ꞩ@Á¦æà¦^¦ ■ÁÁÖꞨꞨꞨÙꞨꞨÒꞨÜꞨÒꞨꞨꞨꞨÒꞨꞨÁ¦ãᐧᐡ¦Ꞩ@Á¦æà¦^¦

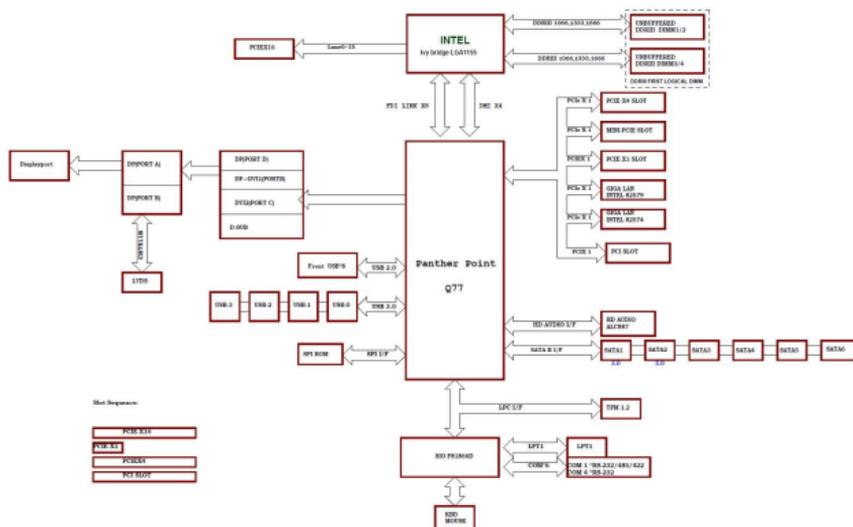| Slot	■ 1 PCIe x16 slot (1st slot) ■ 1 PCIe x1 slot (2nd slot) ■ 1 PCIe x4 slot (3rd slot) ■ 1 PCI slot (4th slot) ■ 1 Mini-PCIe slot
Form Factor	■ uATX: 244mm x 244mm
Environmental	■ Operating Temperature: 0°C to 60°C ■ Storage Temperature: -20°C to 80°C ■ Humidity: 5% ~ 90% RH, Non-Condensing

Mainboard Layout

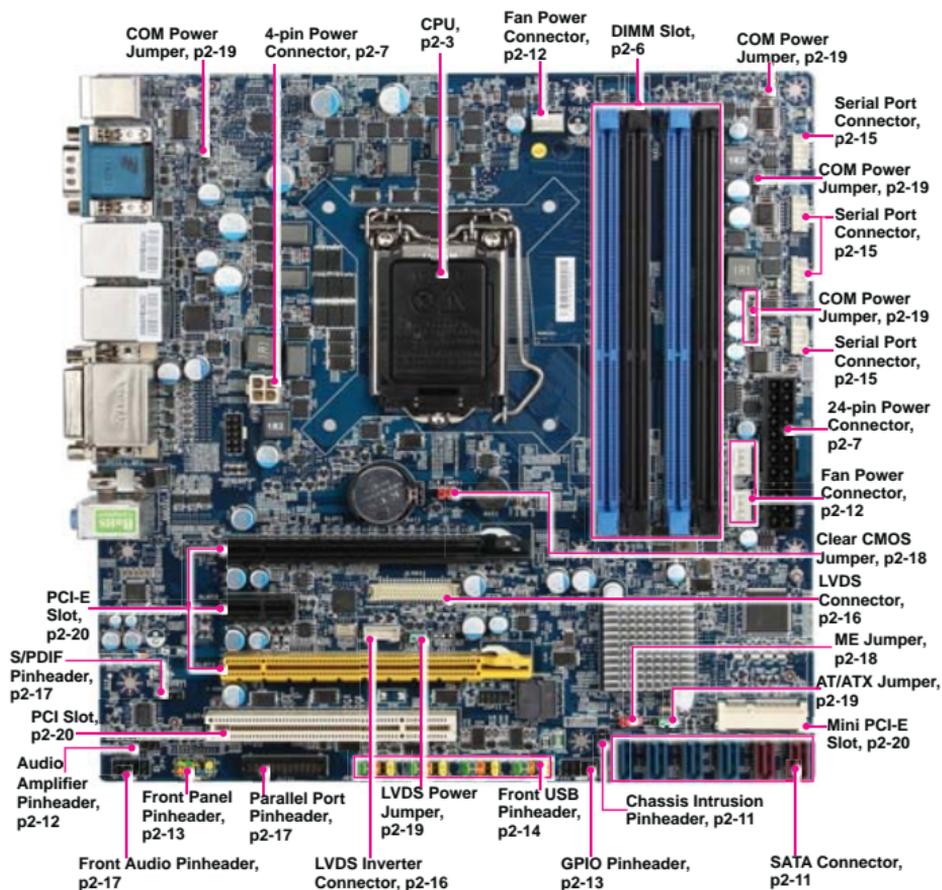COM Power Jumper   Power Connector   CPU   Fan Power Connector   DIMM Slot

COM Power Jumper

Serial Port Connector

COM Power Jumper

Serial Port Connector

Serial Port Connector

COM Power Jumper

Serial Port Connector

24-pin Power Connector

Fan Power Connector

Clear CMOS Jumper

LVDS Connector

Intel AMT ME Jumper

AT/ATX Jumper

Mini PCI-E Slot

SATA Connector

PCI-E Slot

S/PDIF Pinheader

PCI Slot

Audio Amplifier Pinheader

Front Panel Pinheader   Parallel Port Pinheader   LVDS Power Jumper   Front USB Pinheader   Chassis Intrusion Pinheader

Front Audio Pinheader   LVDS Inverter Connector   GPIO Pinheader

Back Panel I/O

Mouse Port   Serial Port   LAN Jack   LAN Jack   DVI-D Port

Line-In Jack

Line-Out Jack

Mic-In Jack

Keyboard Port   VGA Port   USB 3.0 Port   USB 3.0 Port   DVI-D Port   Displayport

Block Diagram

Chapter 2
Hardware Setup

This chapter provides you with the information on mainboard hardware configurations. Incorrect setting of jumpers and connectors may damage your mainboard. Please pay special attention not to connect these headers in wrong direction. DO NOT adjust any jumper while the mainboard is powered on.

Quick Components Guide

COM Power Jumper, p2-19

4-pin Power Connector, p2-7

CPU, p2-3

Fan Power Connector, p2-12

DIMM Slot, p2-6

COM Power Jumper, p2-19

Serial Port Connector, p2-15

COM Power Jumper, p2-19

Serial Port Connector, p2-15

COM Power Jumper, p2-19

Serial Port Connector, p2-15

24-pin Power Connector, p2-7

Fan Power Connector, p2-12

Clear CMOS Jumper, p2-18

LVDS Connector, p2-16

ME Jumper, p2-18

AT/ATX Jumper, p2-19

Mini PCI-E Slot, p2-20

PCI-E Slot, p2-20

S/PDIF Pinheader, p2-17

PCI Slot, p2-20

Audio Amplifier Pinheader, p2-12

Front Panel Pinheader, p2-13

Parallel Port Pinheader, p2-17

LVDS Power Jumper, p2-19

Front USB Pinheader, p2-14

Chassis Intrusion Pinheader, p2-11

Front Audio Pinheader, p2-17

LVDS Inverter Connector, p2-16

GPIO Pinheader, p2-13

SATA Connector, p2-11

CPU (Central Processing Unit)

When you are installing the CPU, make sure that you install the cooler to prevent overheating. If you do not have the CPU cooler, consult your dealer before turning on the computer.

Important

Overheating

Overheating will seriously damage the CPU and system. Always make sure the cooling fan can work properly to protect the CPU from overheating. Make sure that you apply an even layer of thermal paste (or thermal tape) between the CPU and the heatsink to enhance heat dissipation.

Replacing the CPU

While replacing the CPU, always turn off the power supply or unplug the power supply's power cord from the grounded outlet first to ensure the safety of CPU.

Introduction to LGA 1155 CPU
The surface of LGA 1155 CPU. Remember to apply some thermal paste on it for better heat dispersion.

Alignment Key   Alignment Key

Yellow triangle is the Pin 1 indicator
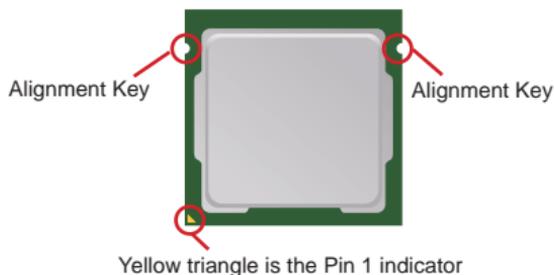
CPU & Cooler Installation

When you are installing the CPU, **make sure the CPU has a cooler attached on the top to prevent overheating**. Meanwhile, do not forget to apply some thermal paste on CPU before installing the heat sink/cooler fan for better heat dispersion.

Follow the steps below to install the CPU & cooler correctly. Wrong installation will cause the damage of your CPU & mainboard.

1. Open the load lever.

2. Lift the load lever up to fully open position.
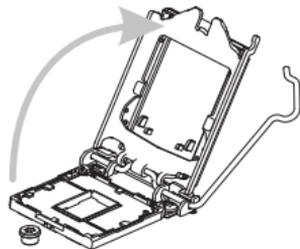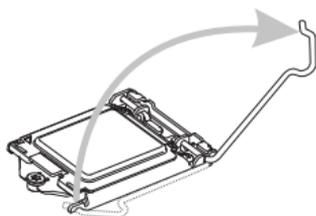
3. After confirming the CPU direction for correct mating, put down the CPU in the socket housing frame. Be sure to grasp on the edge of the CPU base. Note that the alignment keys are matched.

4. Remove the plastic cap. Engage the load lever while pressing down lightly onto the load plate.
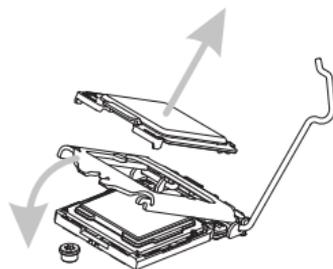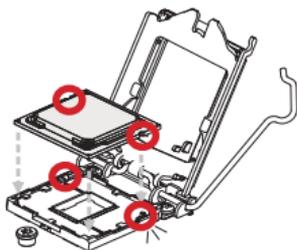
Important

Visually inspect if the CPU is seated well into the socket. If not, take out the CPU with pure vertical motion and reinstall.

5. Secure the lever near the hook end under the retention tab.
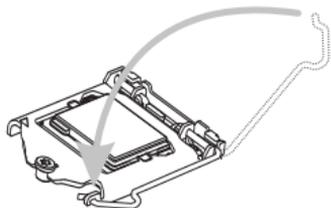
6. Make sure the four hooks are in proper position before you install the cooler. Align the holes on the mainboard with the cooler. Push down the cooler until its four clips get wedged into the holes of the mainboard.
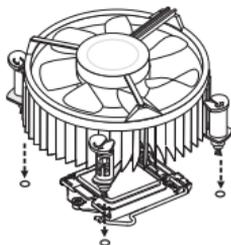
7. Press the four hooks down to fasten the cooler. Turn over the mainboard to confirm that the clip-ends are correctly inserted.
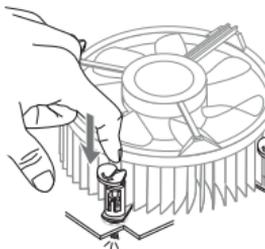
8. Finally, attach the CPU Fan cable to the CPU fan connector on the mainboard.
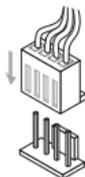
Important

- *Confirm if your CPU cooler is firmly installed before turning on your system.*
- *Do not touch the CPU socket pins to avoid damaging.*
- *Whenever CPU is not installed, always protect your CPU socket pin with the plastic cap covered to avoid damaging.*
- *Please refer to the documentation in the CPU cooler package for more details about the CPU cooler installation.*

Memory

These DIMM slots are intended for memory modules.

DDR3
240-pin, 1.5V

48x2=96 pin   72x2=144 pin
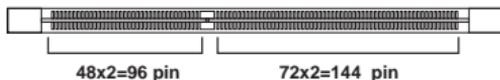
Installing Memory Modules

1. The memory module has only one notch on the center and will only fit in the right orientation.

2. Insert the memory module vertically into the DIMM slot. Then push it in until the golden finger on the memory module is deeply inserted in the DIMM slot. **You can barely see the golden finger if the memory module is properly inserted in the DIMM slot.**

3. The plastic clip at each side of the DIMM slot will automatically close.

Important

- *DDR3 memory modules are not interchangeable with DDR2 and the DDR3 standard is not backwards compatible. You should always install DDR3 memory modules in the DDR3 DIMM slots.*

- *To enable successful system boot-up, always insert the memory modules into the DIMM1 first.*
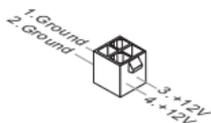
Power Supply

24-Pin Power Connector: JPWR2

This connector allows you to connect an 24-pin power supply. To connect the 24-pin power supply, make sure the plug of the power supply is inserted in the proper orientation and the pins are aligned. Then push down the power supply firmly into the connector.
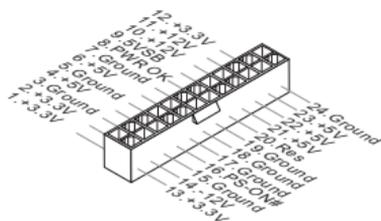
4-Pin Power Connector: JPWR1

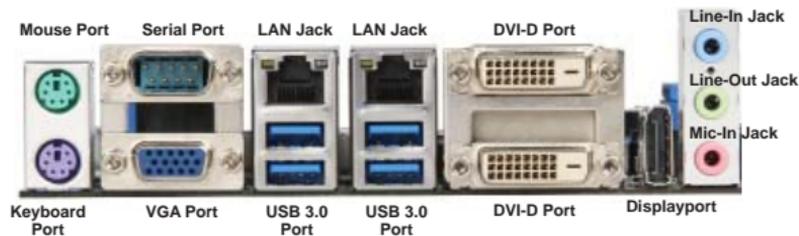This 12V power connector is used to provide power to the CPU.

Important

Make sure that all the connectors are connected to proper ATX power supplies to ensure stable operation of the mainboard.

Back Panel I/O

Mouse Port | Serial Port | LAN Jack | LAN Jack | DVI-D Port | Line-In Jack | Line-Out Jack | Mic-In Jack

Keyboard Port | VGA Port | USB 3.0 Port | USB 3.0 Port | DVI-D Port | Displayport

▶ **Mouse/Keyboard Port**

The standard PS/2 mouse/keyboard DIN connector is for a PS/2 mouse/keyboard.

▶ **VGA Port**

The DB15-pin female connector is provided for monitor.

▶ **DVI-D Port**

The DVI-D (Digital Visual Interface-Digital) connector allows you to connect an LCD monitor. It provides a high-speed digital interconnection between the computer and its display device. To connect an LCD monitor, simply plug your monitor cable into the DVI connector, and make sure that the other end of the cable is properly connected to your monitor (refer to your monitor manual for more information.)

▶ **DisplayPort**

DisplayPort is a digital display interface standard. This connector is used to connect a monitor with DisplayPort inputs.

▶ **USB 3.0 Port**

USB 3.0 port is backward-compatible with USB 2.0 devices. It supports data transfer rate up to 5 Gbit/s (SuperSpeed).

► **RS-232/422/485 Serial Port Connector (Optional)**

The serial port is a 16550A high speed communications port that sends/ receives 16 bytes FIFOs. You can attach a serial mouse or other serial devices directly to the connector.

RS-232

PIN	SIGNAL	DESCRIPTION
1	DCD	Data Carrier Detect
2	RXD	Receive Data
3	TXD	Transmit Data
4	DTR	Data Terminal Ready
5	GND	Signal Ground
6	DSR	Data Set Ready
7	RTS	Request To Send
8	CTS	Clear To Send
9	VCC_COM1	Voltage select setting by JCOMP1

RS-422

PIN	SIGNAL	DESCRIPTION
1	422 TXD-	Transmit Data, Negative
2	422 RXD+	Receive Data, Positive
3	422 TXD+	Transmit Data, Positive
4	422 RXD-	Receive Data, Negative
5	GND	Signal Ground
6	NC	No Connection
7	NC	No Connection
8	NC	No Connection
9	NC	No Connection

RS-485

PIN	SIGNAL	DESCRIPTION
1	485 TXD-	Transmit Data, Negative
2	NC	No Connection
3	485 TXD+	Transmit Data, Positive
4	NC	No Connection
5	GND	Signal Ground
6	NC	No Connection
7	NC	No Connection
8	NC	No Connection
9	NC	No Connection

▶ **LAN**

The standard RJ-45 LAN jack is for connection to the Local Area Network (LAN). You can connect a network cable to it.

Activity Indicator ——— [icon] ——— Speed Indicator
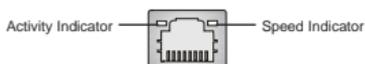
		Left LED (Active LED)	Right LED (100M/1000M Speed LED)
LED Color		Yellow	Green/Orange
10M Cable Plug-in	No Transmission	Yellow (Lighting)	OFF
	Transmission	Yellow (Blinking)	OFF
100M Cable Plug-in	No Transmission	Yellow (Lighting)	Green (Lighting)
	Transmission	Yellow (Blinking)	Green (Lighting)
1000M Cable Plug-in	No Transmission	Yellow (Lighting)	Orange (Lighting)
	Transmission	Yellow (Blinking)	Orange (Lighting)
In S3/S4/S5 Standby State		Yellow (Lighting)	OFF

▶ **Audio Jack**
- **Line-In (Blue)** - for external CD player or other audio devices
- **Line-Out (Green)** - for speakers or headphones
- **Mic-In (Pink)** - for microphones

Connector

Chassis Intrusion Pinheader: CI1

This connector is provided to connect the chassis intrusion switch cable. If the chassis is opened, the chassis intrusion mechanism will be activated. The system will record this status and show a warning message on the screen. To clear the warning, you must enter the BIOS utility and clear the record.

1. +VBAT
2. INTR_ALERT

Serial ATA Connector: SATA1 ~ SATA6

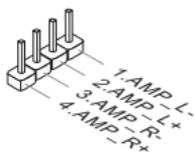This connector is a high-speed Serial ATA interface port. Each connector can connect one Serial ATA device.
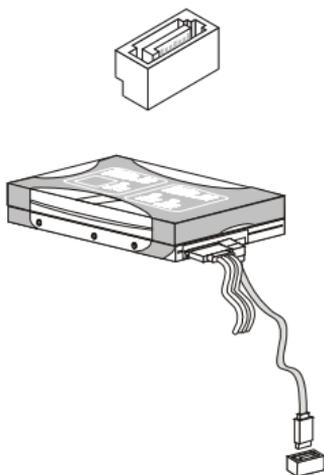
Important

*Please do not fold the Serial ATA cable into 90-degree angle. Otherwise, data loss may occur during transmission.*

Audio Amplifier Pinheader: JAMP1

The JAMP1 is used to connect audio amplifiers to enhance audio performance.

1. AMP_L-
2. AMP_L+
3. AMP_R-
4. AMP_R+

Fan Power Connector: CPUFAN1, SYSFAN1, SYSFAN2

The fan power connector supports system cooling fan with +12V. When connecting the wire to the connectors, always note that the red wire is the positive and should be connected to the +12V; the black wire is Ground and should be connected to GND. If the mainboard has a System Hardware Monitor chipset onboard, you must use a specially designed fan with speed sensor to take advantage of the CPU fan control.
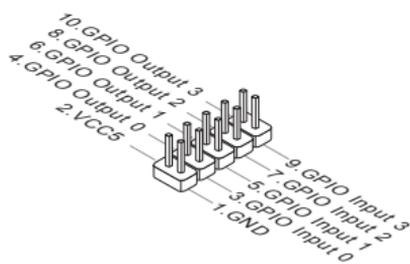

1. Ground
2. +12V
3. Sensor
4. Control
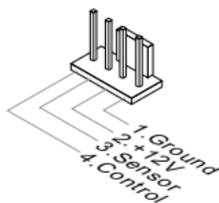
Important

Please refer to the recommended CPU fans at processor's official website or consult the vendors for proper CPU cooling fan.
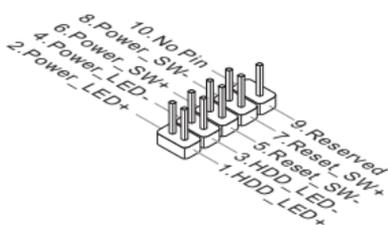
GPIO Pinheader: JGPIO1

This connector is provided for the General-Purpose Input/Output (GPIO) peripheral module.

```
10. GPIO Output 3
8. GPIO Output 2
6. GPIO Output 1
4. GPIO Output 0
2. VCC5
                    9. GPIO Input 3
                    7. GPIO Input 2
                    5. GPIO Input 1
                    3. GPIO Input 0
                    1. GND
```

Front Panel Pinheader: JFP1

This front panel connector is provided for electrical connection to the front panel switches & LEDs and is compliant with Intel Front Panel I/O Connectivity Design Guide.

```
10. No Pin
8. Power_ SW-
6. Power_ SW+
4. Power_ LED-
2. Power_ LED+
                    9. Reserved
                    7. Reset_ SW+
                    5. Reset_ SW-
                    3. HDD_ LED-
                    1. HDD_ LED+
```

Front USB Pinheader: JUSB1 ~ JUSB4

This connector, compliant with Intel I/O Connectivity Design Guide, is ideal for connecting high-speed USB interface peripherals such as USB HDD, digital cameras, MP3 players, printers, modems and the like.
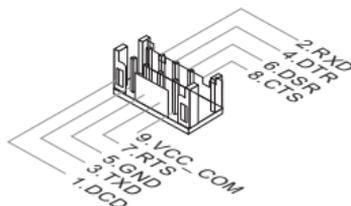

USB 2.0 Bracket (Optional)
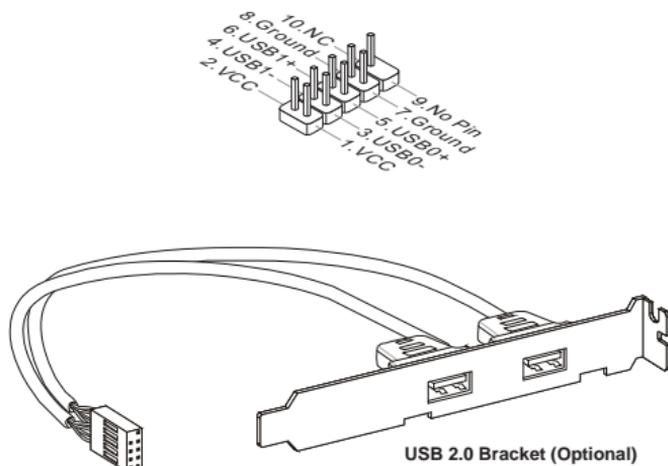
Important

Note that the pins of VCC and GND must be connected correctly to avoid possible damage.

Serial Port Connector: COM2 ~ COM5

This connector is a 16550A high speed communications port that sends/ receives 16 bytes FIFOs. You can attach a serial device to it through an optional serial port bracket.

PIN	SIGNAL	DESCRIPTION
1	DCD	Data Carrier Detect
2	RXD	Receive Data
3	TXD	Transmit Data
4	DTR	Data Terminal Ready
5	GND	Signal Ground
6	DSR	Data Set Ready
7	RTS	Request To Send
8	CTS	Clear To Send
9	VCC_COM	12V or 5V power output, selected by jumper

LVDS Inverter Connector: JINV1

The connector is provided for LCD backlight options.

5. VCC5
4. L_BKLT_CTRL#
3. LVDS_BLON
2. GND
1. +12V
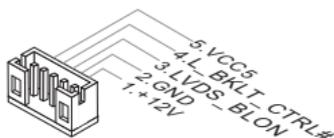
LVDS Connector: JLVDS1

The LVDS (Low Voltage Differential Signal) connector provides a digital interface typically used with flat panels. After connecting an LVDS interface flat panel to the JLVDS1, be sure to check the panel datasheet and set the JVDD1 jumper to proper power voltage.
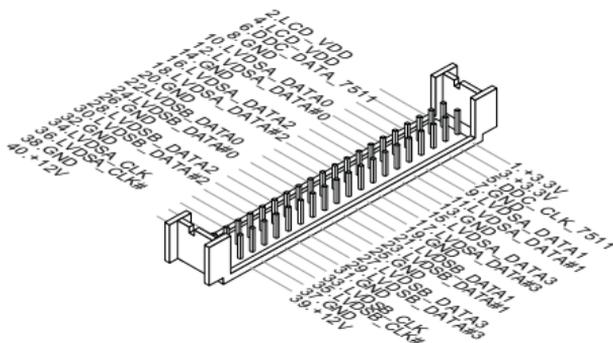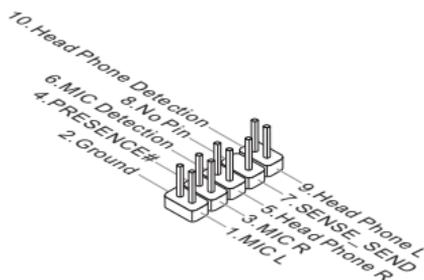
S/PDIF-Out Pinheader: JSPDI1

This connector is used to connect S/PDIF (Sony & Philips Digital Interconnect Format) interface for digital audio transmission.
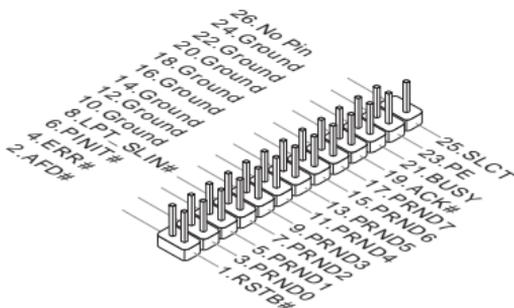
```
3. GND
2. SPDIF
1. VCC
```
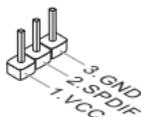
Front Audio Pinheader: JAUD1

This connector allows you to connect the front panel audio and is compliant with Intel Front Panel I/O Connectivity Design Guide.

```
10. Head Phone Detection
8. No Pin
6. MIC Detection
4. PRESENCE#
2. Ground
9. Head Phone L
7. SENSE_SEND
5. Head Phone R
3. MIC R
1. MIC L
```

Parallel Port Header: JLPT1

The mainboard provides a 26-pin header for connection to an optional parallel port bracket. The parallel port is a standard printer port that supports Enhanced Parallel Port (EPP) and Extended Capabilities Parallel Port (ECP) mode.

```
26. No Pin
24. Ground
22. Ground
20. Ground
18. Ground
16. Ground
14. Ground
12. Ground
10. Ground
8. LPT_S-IN#
6. PINIT#
4. ERR#
2. AFD#

25. SLCT
23. PE
21. BUSY
19. ACK#
17. PRND7
15. PRND6
13. PRND5
11. PRND4
9. PRND3
7. PRND2
5. PRND1
3. PRND0
1. RSTB#
```

Jumper

Clear CMOS Jumper: CLR CMOS1

There is a CMOS RAM onboard that has a power supply from an external battery to keep the data of system configuration. With the CMOS RAM, the system can automatically boot OS every time it is turned on. If you want to clear the system configuration, set the jumper to clear data.
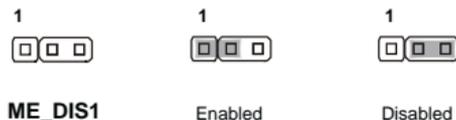
$$1 \; \boxed{\square\;\square\;\square}$$ $$1 \; \boxed{\blacksquare\;\square}$$ $$1 \; \boxed{\square\;\blacksquare}$$

CLR_CMOS1   Clear CMOS   Keep CMOS

Important

You can clear CMOS by shorting 1-2 pin while the system is off. Then return to 2-3 pin position. Avoid clearing the CMOS while the system is on; it will damage the mainboard.

ME Jumper: ME_DIS1

This jumper is used to disable/ enable the Intel AMT ME technology.

$$\begin{matrix} 1 \\ \boxed{\square\;\square\;\square} \end{matrix}$$ $$\begin{matrix} 1 \\ \boxed{\square\;\square} \end{matrix}$$ $$\begin{matrix} 1 \\ \boxed{\square\;\blacksquare} \end{matrix}$$

ME_DIS1   Enabled   Disabled

AT/ATX Select Jumper: JAT1

This jumper allows users to select between AT and ATX power.

1 JAT1   **1** AT Power   **1** ATX Power

COM Port Power Jumper: JCOMP1 ~ JCOMP5

These jumpers specify the operation voltage of the onboard serial ports.

1 JCOMP1~5   **1** +5V   **1** +12V

LVDS Power Jumper: JVDD1

Use this jumper to specify the operation voltage of the LVDS interface flat panel.
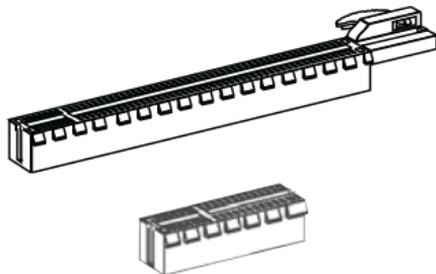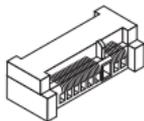
1 JVDD1   **1** +3.3V   **1** +5V

Slot

PCI-E (Peripheral Component Interconnect Express) Slot

The PCIE slot supports the PCIE interface expansion card.

Mini PCI-E Slot

The Mini PCI-E slot is provided for wireless LAN card, TV tuner card, and Robson NAND Flash card.

PCI (Peripheral Component Interconnect) Slot

The PCI slot supports LAN card, SCSI card, USB card, and other add-on cards that comply with PCI specifications.

32-bit PCI Slot

Important

When adding or removing expansion cards, make sure that you unplug the power supply first. Meanwhile, read the documentation for the expansion card to configure any necessary hardware or software settings for the expansion card, such as jumpers, switches or BIOS configuration.

Chapter 3
BIOS Setup

This chapter provides information on the BIOS Setup program and allows you to configure the system for optimum use.

You may need to run the Setup program when:

- An error message appears on the screen during the system booting up, and requests you to run SETUP.
- You want to change the default settings for customized features.

Entering Setup

Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press <DEL> key to enter Setup.

PRESS DEL TO ENTER SETUP

If the message disappears before you respond and you still wish to enter Setup, restart the system by turning it OFF and On or pressing the RESET button. You may also restart the system by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys.

Important

The items under each BIOS category described in this chapter are under continuous update for better system performance. Therefore, the description may be slightly different from the latest BIOS and should be held for reference only.

Upon boot-up, the 1st line appearing after the memory count is the BIOS version. It is usually in the format:

ÜÝÏ Ï ÛÆÏ €Ì Î FÆÓÕÙÙ̀XFÈ¢

Á

CONTROL KEYS

← →	Select Screen
↑ ↓	Select Item
+ -	Change Field
Tab	Select Field
F1	General Help
F10	Save and Exit
Esc	Exit

GETTING HELP

After entering the Setup menu, the first menu you will see is the Main Menu.

Main Menu

The main menu lists the setup functions you can make changes to. You can use the arrow keys (↑↓) to select the item. The on-line description of the highlighted setup function is displayed at the bottom of the screen.

Sub-Menu

If you find a right pointer symbol ▶ appears to the left of certain fields that means a sub-menu can be launched from this field. A sub-menu contains additional options for a field parameter. You can use arrow keys (↑↓) to highlight the field and press <Enter> to call up the sub-menu. Then you can use the control keys to enter values and move from field to field within a sub-menu. If you want to return to the main menu, just press the <Esc >.

GENERAL HELP <F1>

The BIOS setup program provides a General Help screen. You can call up this screen from any menu by simply pressing <F1>. The Help screen lists the appropriate keys to use and the possible selections for the highlighted item. Press <Esc> to exit the Help screen.

The Menu Bar
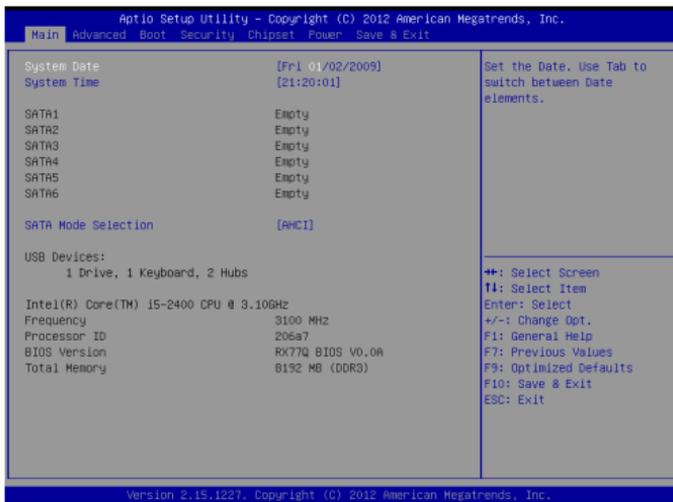
▶ **Main**

Use this menu for basic system configurations, such as time, date etc.

▶ **Advanced**

Use this menu to set up the items of special enhanced features.

▶ **Boot**

Use this menu to specify the priority of boot devices.

▶ **Security**

Use this menu to set supervisor and user passwords.

▶ **Chipset**

This menu controls the advanced features of the onboard Northbridge and Southbridge.
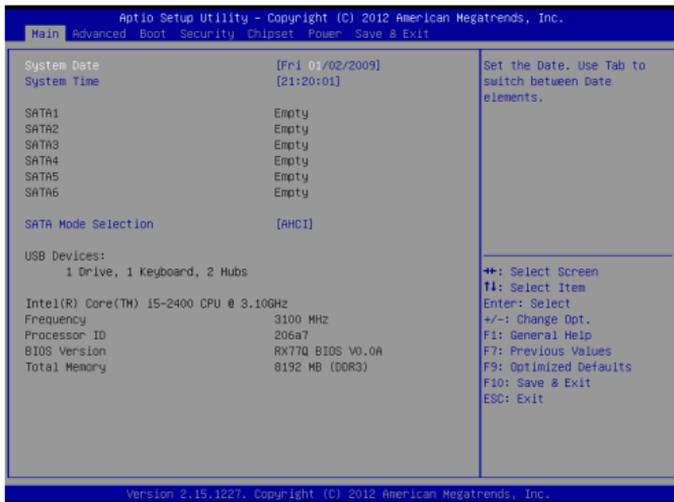
▶ **Power**

Use this menu to specify your settings for power management.

▶ **Save & Exit**

This menu allows you to load the BIOS default values or factory default settings into the BIOS and exit the BIOS setup utility with or without changes.

Main

▶ **System Date**

This setting allows you to set the system date. The date format is <Day>, <Month> <Date> <Year>.

▶ **System Time**

This setting allows you to set the system time. The time format is <Hour> <Minute> <Second>.

▶ **SATA1, SATA2, SATA3, SATA4, SATA5, SATA6**

[Type]	Press PgUp/<+> or PgDn/<-> to select [Manual], [None] or [Auto] type. Note that the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information for this category. If your hard disk drive type is not matched or listed, you can use [Manual] to define your own drive type manually.

[LBA/Large Mode]	Enabling LBA causes Logical Block Addressing to be used in place of Cylinders, Heads and Sectors
[Block (Multi-Sector Transfer)]	Any selection except Disabled determines the number of sectors transferred per block
[PIO Mode]	Indicates the type of PIO (Programmed Input/Output)
[DMA Mode]	Indicates the type of Ultra DMA
[S.M.A.R.T.]	This allows you to activate the S.M.A.R.T. (Self-Monitoring Analysis & Reporting Technology) capability for the hard disks. S.M.A.R.T is a utility that monitors your disk status to predict hard disk failure. This gives you an opportunity to move data from a hard disk that is going to fail to a safe place before the hard disk becomes offline.
[32 Bit Data Transfer]	Enables 32-bit communication between CPU and IDE controller

▸ **SATA Mode Selection**

This setting specifies the SATA controller mode.

Advanced
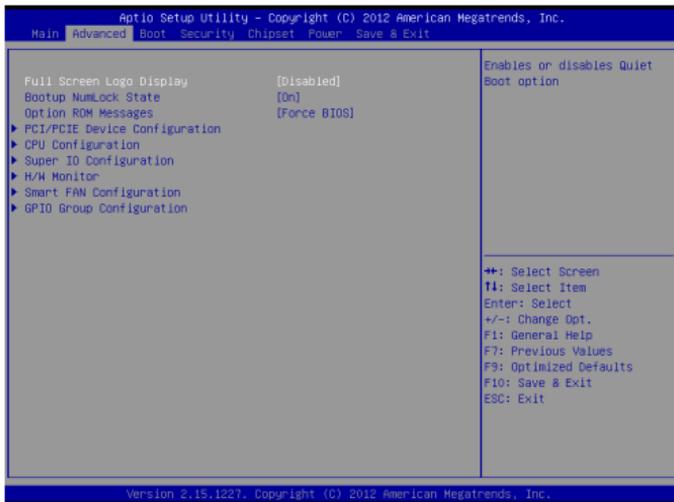
▸ **Full Screen Logo Display**

This BIOS feature determines if the BIOS should hide the normal POST messages with the motherboard or system manufacturer's full-screen logo.

When it is enabled, the BIOS will display the full-screen logo during the boot-up sequence, hiding normal POST messages.

When it is disabled, the BIOS will display the normal POST messages, instead of the full-screen logo.

Please note that enabling this BIOS feature often adds 2-3 seconds of delay to the booting sequence. This delay ensures that the logo is displayed for a sufficient amount of time. Therefore, it is recommended that you disable this BIOS feature for a faster boot-up time.

▸ **Bootup NumLock State**

This setting is to set the Num Lock status when the system is powered on. Setting to [On] will turn on the Num Lock key when the system is powered on. Setting to [Off] will allow users to use the arrow keys on the numeric keypad.

▸ **Option ROM Messages**

This item is used to determine the display mode when an optional ROM is initialized during POST. When set to [Force BIOS], the display mode used by AMI BIOS is used. Select [Keep Current] if you want to use the display mode of optional ROM.

▸ **D7 ⩽D7 ⩾9 ˙8 Yj]W Configuration**
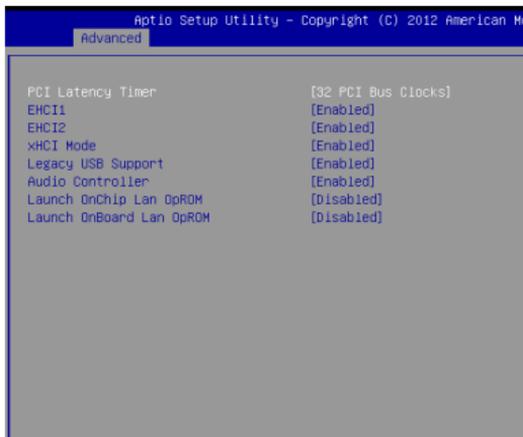
▸ **PCI Latency Timer**

This item controls how long each PCI device can hold the bus before another takes over. When set to higher values, every PCI device can conduct transactions for a longer time and thus improve the effective PCI bandwidth. For better PCI performance, you should set the item to higher values.

▸ **EHCI1**

This setting enables/disables the EHCI1.

▸ **EHCI2**

This setting enables/disables the EHCI2.

▸ **xHCI**

This setting enables/disables the xHCI mode.

▶ **Legacy USB Support**

Set to [Enabled] if you need to use any USB 1.1/2.0 device in the operating system that does not support or have any USB 1.1/2.0 driver installed, such as DOS and SCO Unix.
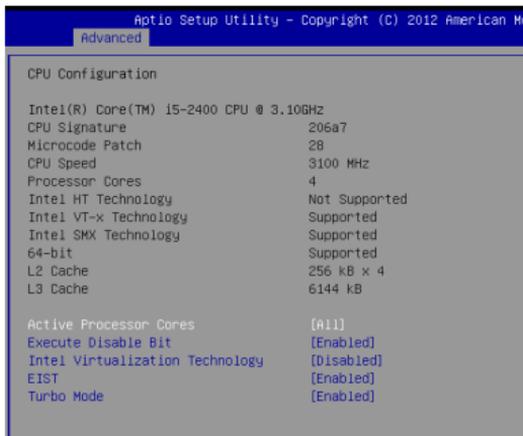
▶ **Audio Controller**

This setting enables/disables the onboard audio controller.

▶ **Launch OnChip/ OnBoard Lan OpROM**

These settings enable/disable the initialization of the onchip/ onboard PXE Boot ROM during bootup. Selecting [Disabled] will speed up the boot process.

▶ **CPU Configuration**


```
                Aptio Setup Utility - Copyright (C) 2012 American Me
        Advanced

 CPU Configuration

 Intel(R) Core(TM) i5-2400 CPU @ 3.10GHz
 CPU Signature                      206a7
 Microcode Patch                    28
 CPU Speed                          3100 MHz
 Processor Cores                    4
 Intel HT Technology                Not Supported
 Intel VT-x Technology              Supported
 Intel SMX Technology               Supported
 64-bit                             Supported
 L2 Cache                           256 kB x 4
 L3 Cache                           6144 kB

 Active Processor Cores             [All]
 Execute Disable Bit                [Enabled]
 Intel Virtualization Technology    [Disabled]
 EIST                               [Enabled]
 Turbo Mode                         [Enabled]
```

▶ **Active Processor Cores**

This item allows you to select the number of active processor cores.

▶ **Execute Disable Bit**

Intel's Execute Disable Bit functionality can prevent certain classes of malicious "buffer overflow" attacks when combined with a supporting operating system. This functionality 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.

▶ **Intel Virtualization Technology**

Virtualization enhanced by Intel Virtualization Technology will allow a platform to run multiple operating systems and applications in independent partitions. With virtualization, one computer system can function as multiple "Virtual" systems.

▶ **EIST**

EIST (Enhanced Intel SpeedStep Technology) allows the system to dynamically adjust processor voltage and core frequency, which can result in decreased average power consumption and decreased average heat production. When disabled, the processor will return the actual maximum CPUID input value of the processor when queried.

▶ **Turbo Mode**

In this mode, select [Enabled] to increase the performance of CPU.

▶ **Super IO Configuration**
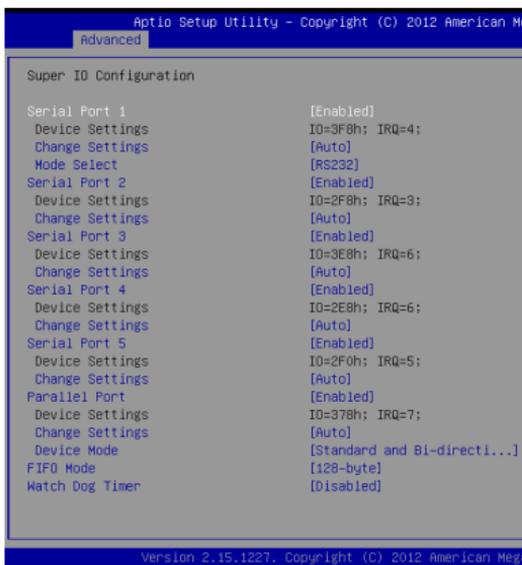
▶ **Serial Port 1/ 2/ 3/ 4/ 5/ Parallel Port**

Select an address for the specified serial/parallel port.

▸ **Change Settings Serial Port 1/ 2/ 3/ 4/ 5/ˊParallel Port**

This setting is used to change the address & IRQ settings of the specified serial port.

▸ **Mode Select**

Select an operation mode for the serial port 1.

▸ **Watch Dog**

You can enable the system watch-dog timer, a hardware timer that generates a reset when the software that it monitors does not respond as expected each time the watch dog polls it.

▸ **H/W Monitor**

These items display the current status of all monitored hardware devices/ components such as voltages, temperatures and all fans' speeds.

▸ **Smart Fan Configuration**

▸ **CPUFAN1/ SYSFAN1 / 2 Type**

These settings specify the fans' type.

▶ **Smart CPUFAN1/ SYSFAN1 / 2 Function**

These settings enable/disable the Smart Fan function. Smart Fan is an excellent feature which will adjust the CPU/system fan speed automatically depending on the current CPU/system temperature, avoiding the overheating to damage your system.

▶ **GPIO Configuration**
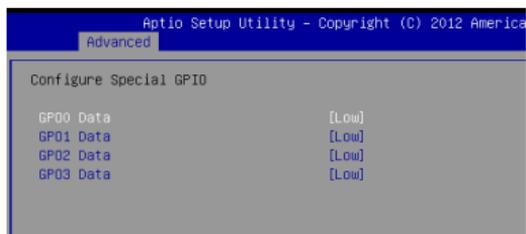
▶ **GPO 0/1/2/3 Data**

These settings specify the GPO data.

Boot
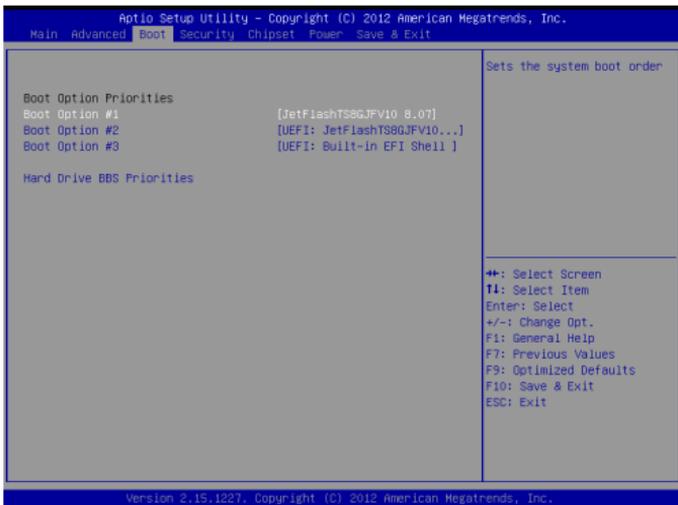
▸ **Boot Option #1 / 2 / 3**

This setting allows users to set the sequence of boot devices where BIOS attempts to load the disk operating system.

▸ **Hard Drive BBS Priorities**

This setting allows users to set the priority of the specified devices. First press <Enter> to enter the sub-menu. Then you may use the arrow keys (↑ ↓) to select the desired device, then press <+>, <-> or <PageUp>, <Page-Down> key to move it up/down in the priority list.

Security
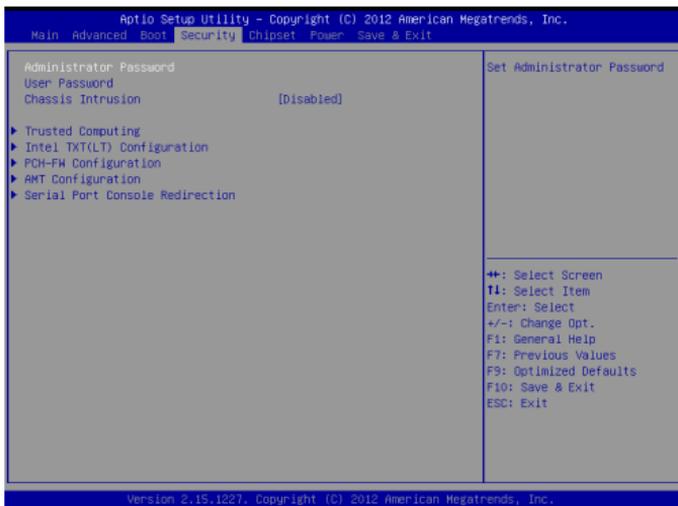
▸ **Administrator Password**

Administrator Password controls access to the BIOS Setup utility.

▸ **User Password**

User Password controls access to the system at boot and to the BIOS Setup utility.
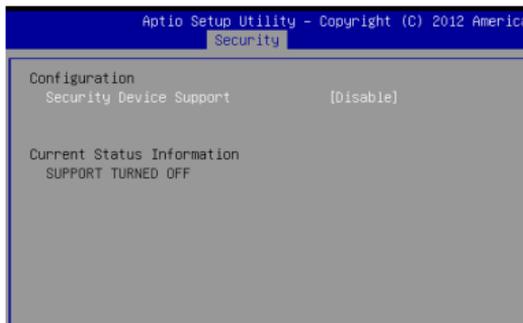
▸ **Chassis Intrusion**

The field enables or disables the feature of recording the chassis intrusion status and issuing a warning message if the chassis is once opened. To clear the warning message, set the field to [Reset]. The setting of the field will automatically return to the default value later.

▸ **Trusted Computing**


```
            Aptio Setup Utility - Copyright (C) 2012 America
                     Security

Configuration
  Security Device Support        [Disable]


Current Status Information
  SUPPORT TURNED OFF
```

▸ **Security Support**

This setting controls the Trusted Platform Module (TPM) designed by the Trusted Computing Group (TCG). TPMs are special-purpose integrated circuits (ICs) built into a variety of platforms to enable strong user authentication and machine attestation - essential to prevent inappropriate access to confidential and sensitive information and to protect against compromised networks.

▸ **Intel TXT(LT) Configuration**

When SMX(Secure Mode Extensons) is enabled, this item can be used to enable/ disable Intel TXT(Trusted Execution Technology) support.

▸ **PCH-FW Configuration**

This item is used to disable or enable ME (Management Engine) F/W write protect and show the ME (Management Engine) F/W information.

▸ **AMT Configuration**

▸ **Intel AMT**

This setting allows you to enable/disable the Intel Active Management Technology(AMT) support.

▸ **Serial Port Console Redirection**

Console Redirection operates in host systems that do not have a monitor and keyboard attached. This setting enables/disables the operation of console redirection. When set to [Enabled], BIOS redirects and sends all contents that should be displayed on the screen to the serial COM port for display on the terminal screen. ⊞▪[, all data received from the serial] [¦c is interpreted as keystrokes from a local keyboard.

Chipset
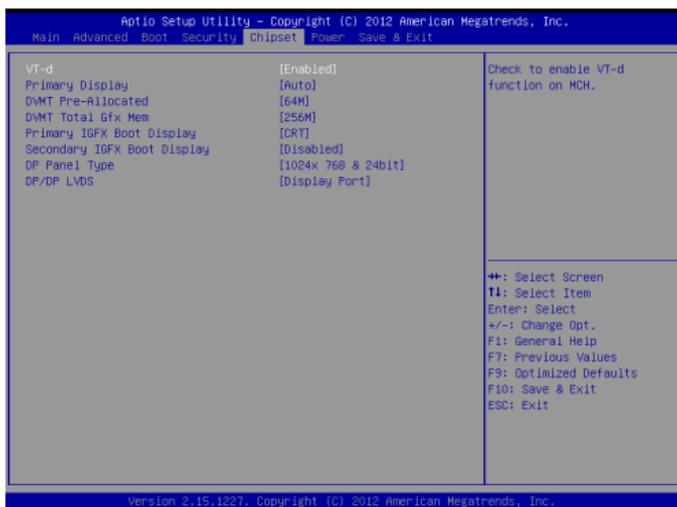
▶ **VT-d**

This item is used to enable/disable the Intel VT-D technology.

▶ **Primary Display**

This item specifies o@ primary graphics adapter.

▶ **DVMT Pre-Allocated**

This setting defines the DVMT pre-allocated memory. Pre-allocated memory is the small amount of system memory made available at boot time by the system BIOS for video. Pre-allocated memory is also known as locked memory. This is because it is "locked" for video use only and as such, is invisible and unable to be used by the operating system.

▶ **DVMT Total Gfx Mem**

When set to DVMT/FIXED Mode, the graphics driver will allocate a fixed amount of memory as dedicated graphics memory, as well as allow more system memory to be dynamically allocated between the graphics/processor and the operating system.

▶ **Primary/ Secondary IGFX - Boot Type**

Use the field to select the type of device you want to use as the boot display of the system.

▶ **DP Panel Type**

This setting allows you to set your preferences for the boot display device.

▶ **DP/DP LVDS**

This item is used ¢ Á^¦^&¢ã^ç ^^} ÅÖã] |æÁ[¦¦ðɺ¦ÆXÖÙÁˇ ɖˇ ɖÈ
Á
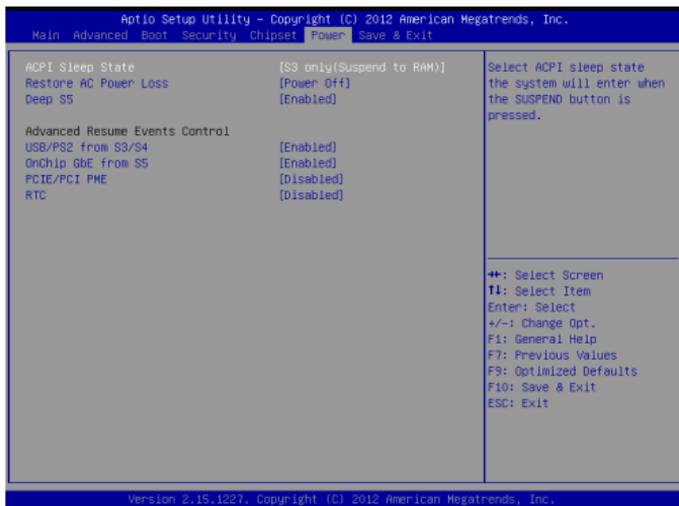
Power

▶ **ACPI Sleep State**

This item specifies the power saving modes for ACPI function. If your operating system supports ACPI, you can choose to enter the Standby mode in S1 (POS) or S3 (STR) fashion through the setting of this field.

▶ **Restore on AC Power Loss**

This setting specifies whether your system will reboot after a power failure or interrupt occurs. Available settings are:

[Power Off]	Leaves the computer in the power off state.
[Power On]	Leaves the computer in the power on state.
[Last State]	Restores the system to the previous status before a power failure or interrupt occurred.

▸ **Deep S5**

The setting enables/disables the Deep S5 power saving mode. In the Deep S5 state, the Suspend wells are powered off for enhanced power savings.

OẮ˙ ||Ắ^boot is required. No previous content is retained. Other components { æ̂ Âemain powered so the computer can "wake" on input from the \ ^˙ à[æ̂àẴclock,Âmodem, LAN, or USB device.

▸ **USB/ PS2 from S3/S4**

The item allows the activity of the USB/PS2 device to wake up the system from S3/S4 sleep state.

▸ **OnChip GbE from S5**

This field specifies whether the system will be awakened from S5 state when activity or input signal of onboard LAN is detected.

▸ **PCIE/PCI PME**

This field specifies whether the system will be awakened from power saving modes when activity or input signal of onboard PCIE/PCI PME is detected.This field specifies whether the system will be awakened from power saving modes when activity or input signal of onboard LAN/mini PCI-E is detected.

▸ **RTC**

When [Enabled], your can set the date and time at which the RTC (real-time clock) alarm awakens the system from suspend mode.

Exit

```
                Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
   Main  Advanced  Boot  Security  Chipset  Power  Save & Exit

 Save Changes and Reset                                   Reset the system after
 Discard Changes and Exit                                 saving the changes.
 Discard Changes

 Optimized Defaults
 Save as User Defaults
 Restore User Defaults




                                                          →←: Select Screen
                                                          ↑↓: Select Item
                                                          Enter: Select
                                                          +/-: Change Opt.
                                                          F1: General Help
                                                          F7: Previous Values
                                                          F9: Optimized Defaults
                                                          F10: Save & Exit
                                                          ESC: Exit


                Version 2.15.1227. Copyright (C) 2012 American Megatrends, Inc.
```

▸ **Save Changes and Exit**

Save changes to CMOS and exit the Setup Utility.

▸ **Discard Changes and Exit**

Abandon all changes and exit the Setup Utility.

▸ **Discard Changes**

Abandon all changes.

▸ **Optimized Defaults**

Restore the optimized defaults.

▸ **Save as User Defaults**

Save all changes as user defaults.

▸ **Restore User Defaults**

Restore the preset user defaults.