EMB-Q77B

Industrial Motherboard

E8890
First Edition
January 2014

Copyright Notice

Acknowledgments

Contents

Chapter 1

Product overview

1.1 Package contents

Check your industrial motherboard package for the following items.

- ☑ 1 x Industrial Motherboard
- ☑ 1 x SATA Cable
- ☑ 1 x I/O Shield
- ☑ 1 x Support CD

> If any of the above items is damaged or missing, contact your distributor or sales representative immediately.

1.2 Features

- Intel® Socket 1155 for 3nd/2nd Generation Core™ i7/Core™ i5 / Core™ i3 / Pentium® / Celeron® Processors up to 95W
- Two 240-pin Dual Channel DDR3 1600/1333/1066MHz DIMMs up to 16GB
- SATA 6.0 Gb/s x 2, SATA 3.0 Gb/s x 2 (supports RAID 0/1/5/10), USB3.0 x 4, USB2.0 x 4, COM x 2
- PCI-Express[x16] x 1, Mini Card (USB+PCIe) Half size x 1
- EuP/ErP Compliance

1.3   Specifications

SYSTEM	
CPU	LGA1155 socket for Intel® 3nd/2nd Generation Core™ i7 / Core™ i5 / Core™ i3, Pentium®, and Celeron® processors
	Supports Intel® 22/32nm CPU up to 95W
Chipset	Intel® Q77 Express Chipset
Memory	2 x DIMMs, max. 16GB, DDR3 1600/1333/1066 Mhz non-ECC. unbuffered memory
	Dual-channel memory architecture
Graphics	Integrated Graphics Media Accelerator
I/O Chipset	NCT6779D
Storage	2 x Serial ATA 6Gb/s ports (gray)
	2 x Serial ATA 3Gb/s ports (blue)
Ethernet	1 x Intel® 82579LM Gigabit LAN (Supports Intel® AMT 8.X)
	1 x Intel® 82583V
Audio	Realtek® ALC887
TPM	Infineon SLB9635 TT 1.2
Expansion slots	1 x PCI Express 3.0/2.0 x16 slot
	1 x Mini Card (mSATA) Half size (PCIe + USB optional)
BIOS	128Mbit Flash AMI BIOS ROM
H/W Status Monitor	Monitors CPU/Chassis temperature
	Monitors Vcore/5V/3.3V/12V voltages
	Monitors CPU/Chassis fan speed
Smart Fan Control	CPU Fan/Chassis Fan
Watchdog Timer	1~255 steps by software program
Wake on LAN/PXE	Yes (WOL/PXE)
Power State	S3, S4, S5
GRAPHICS	
Graphics Chipset	Integrated Graphics Media Accelerator
Graphics Multi Display	HDMI
	VGA
VGA	Up to 1920 x 1200 @60Hz
HDMI	Up to 1920 x 1200 @60Hz
I/O	
Storage	2 X SATA 6Gb/s connectors (gray)
	2 x SATA 3Gb/s connectors (blue)
	Supports RAID 0,1, 5, and 10 configurations
USB	4 x USB 3.0/2.0 ports (4 ports at the back panel)
	4 x USB 2.0/1.1 ports (4 ports at mid-board)

I/O	
Display	1 x HDMI port
	1 x VGA port
Audio	3 Audio jack (Line-in, Mic-in, Line-out)
LAN	2 x LAN (RJ-45) ports
Serial Port	1 x RS-232/422/485 supports 5V/12V/RI option (COM1, D-Sub 9)
	1 x RS-232 (COM2, D-Sub 9)
PS/2 Port	1 x PS/2 Keyboard port
	1 x PS/2 Mouse port
FAN	1 x 4-pin CPU Fan connector
	1 x 4-pin Chassis Fan connector
ENVIRONMENT & POWER & ME	
Battery	Lithium battery
Power Requirement	1 x 24-pin ATX connector
	1 x 4-pin ATX 12V power connector
Power Compliance	EuP/ErP compliant
Operating Temperature	32~140°F (0~60°C)
Operating Humidity	0%~90%RH, non-condensing
Certificate	CE & FCC
Form Factor	Mini ITX form factor: 6.7 in x 6.7 in (170 mm x 170 mm)
Weight	1.1 lb (05. kg)
PLACEMENT	
Rear panel ports	1 x PS/2 Keyboard port
	1 x PS/2 Mouse port
	1 x HDMI port
	1 x VGA port
	2 x LAN (RJ-45) ports
	2 x COM ports
	4 x USB 3.0 ports
	3 x Audio jacks

PLACEMENT	
Rear panel ports	31 x PS/2 Keyboard port
	1 x PS/2 Mouse port
	1 x HDMI port
	1 x VGA port
	2 x LAN (RJ-45) ports
	2 x COM ports
	4 x USB 3.0 ports
	3 x Audio jacks
Internal connectors/ jumpers	2 x USB 2.0 connectors support additional 4 USB 2.0 ports
	2 x Serial ATA 6Gb/s connectors
	2 x Serial ATA 3 Gb/s connectors
	1 x CPU Fan connector
	1 x Chassis Fan connector
	1 x Mini card (Half size)
	1 x 24-pin ATX power connector
	1 x 4-pin ATX 12V power connector
	1 x Chassis intrusion connector
	1 x Front panel connector
	1 x AT/ATX mode select jumper
	1 x CMOS jumper
OTHERS	
Operating System Support	Windows® XP 32bit
	Windows® XP 64bit
	Windows® 7 32bit
	Windows® 7 64bit
	Windows® 8
	Linux Fedrora

NOTE: Specifications are subject to change without notice.

Chapter 2

Motherboard information

2.1 Before you proceed

Take note of the following precautions before you install motherboard components or change any motherboard settings.

CAUTION!

- Unplug the power cord from the wall socket before touching any component.

- Before handling components, use a grounded wrist strap or touch a safely grounded object or a metal object, such as the power supply case, to avoid damaging them due to static electricity.

- Hold components by the edges to avoid touching the ICs on them.

- Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that came with the component.

- Before you install or remove any component, ensure that the ATX power supply is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, or components.

2.2 Motherboard layout

NOTE: Place four screws into the holes indicated by circles to secure the motherboard to the chassis.

CAUTION! Do not overtighten the screws! Doing so can damage the motherboard.

Place this side towards the rear of the chassis
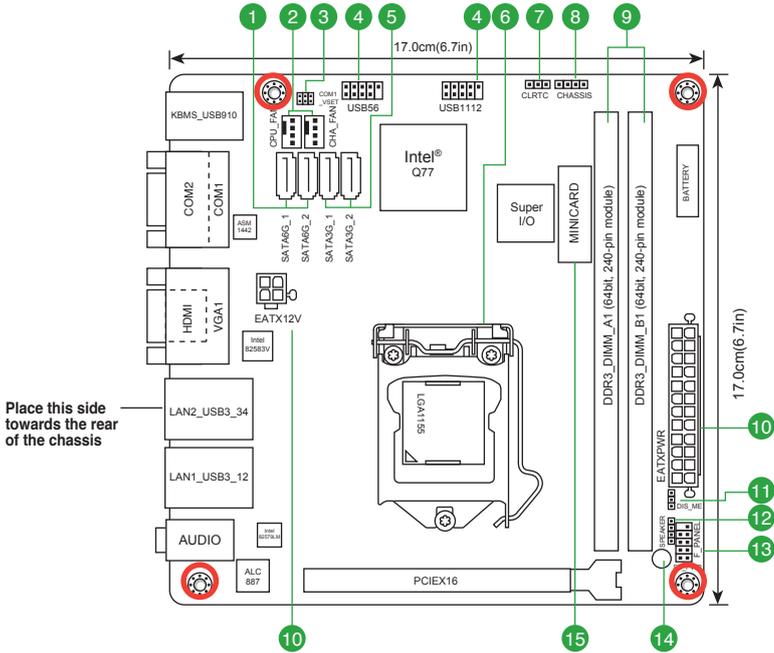
Connectors/Jumpers/Slots	Page
1. Serial ATA 6.0Gb/s connectors (7-pin SATA6G_1, SATA6G_2)	2-21
2. CPU and chassis fan connectors (4-pin CPU_FAN, 4-pin CHA_FAN)	2-19
3. COM1 Ring/+5V/+12V selection (COM1_VSET)	2-14
4. USB 2.0 connector (10-1 pin USB56, USB1112)	2-22
5. Serial ATA 3.0Gb/s connectors (7-pin SATA3G_1, SATA3G_2)	2-21
6. Intel® LGA1155 CPU socket	2-6
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9. DIMM memory slots	2-11
10. ATX power connectors (24-pin EATXPWR, 4-pin EATX12V)	2-18
11. Intel® ME Jumper (3-pin DIS_ME)	2-14
12. Speaker connector (4-pin SPEAKER)	2-22
13. System panel connector (10-1 pin F_PANEL)	2-20
14. Standby Power LED (SB_PWR)	2-15
15. Minicard connector	2-20

2.3 Screw size

2.3.1 Component side
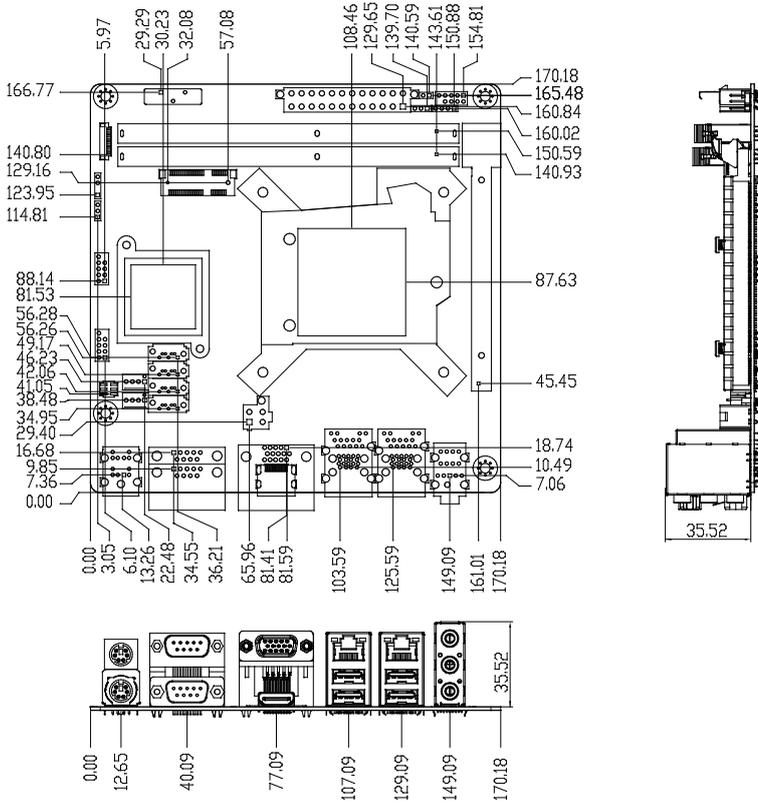
2.3.2 Solder side
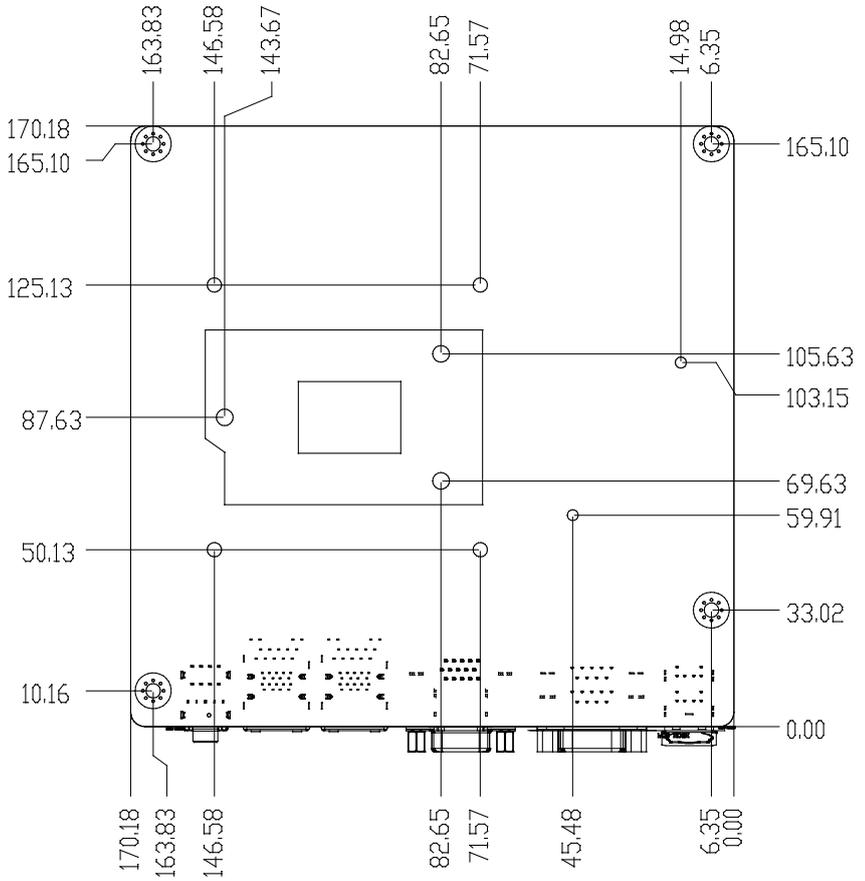
2.4 Central Processing Unit (CPU)

The motherboard comes with a surface mount LGA1155 socket designed for the Intel® 3rd/2nd Generation Core™ i7 / Core™ i5 / Core™ i3 / Pentium® / Celeron® processors.
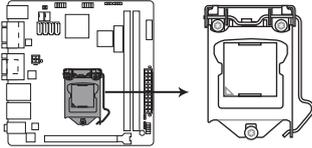
EMB-Q77B CPU socket LGA1155

IMPORTANT: Unplug all power cables before installing the CPU.

CAUTION!

- Upon purchase of the motherboard, ensure that the PnP cap is on the socket and the socket contacts are not bent. Contact your retailer immediately if the PnP cap is missing, or if you see any damage to the PnP cap/socket contacts/motherboard components. The manufacturer will shoulder the cost of repair only if the damage is shipment/transit-related.

- Keep the cap after installing the motherboard. The manufacturer will process Return Merchandise Authorization (RMA) requests only if the motherboard comes with the cap on the LGA1155 socket.

- The product warranty does not cover damage to the socket contacts resulting from incorrect CPU installation/removal, or misplacement/loss/ incorrect removal of the PnP cap.

2.4.1   Installing the CPU

⚠️ **CAUTION!** The LGA1156 CPU is incompatible with the LGA1155 socket. DO NOT install a LGA1156 CPU on the LGA1155 socket.
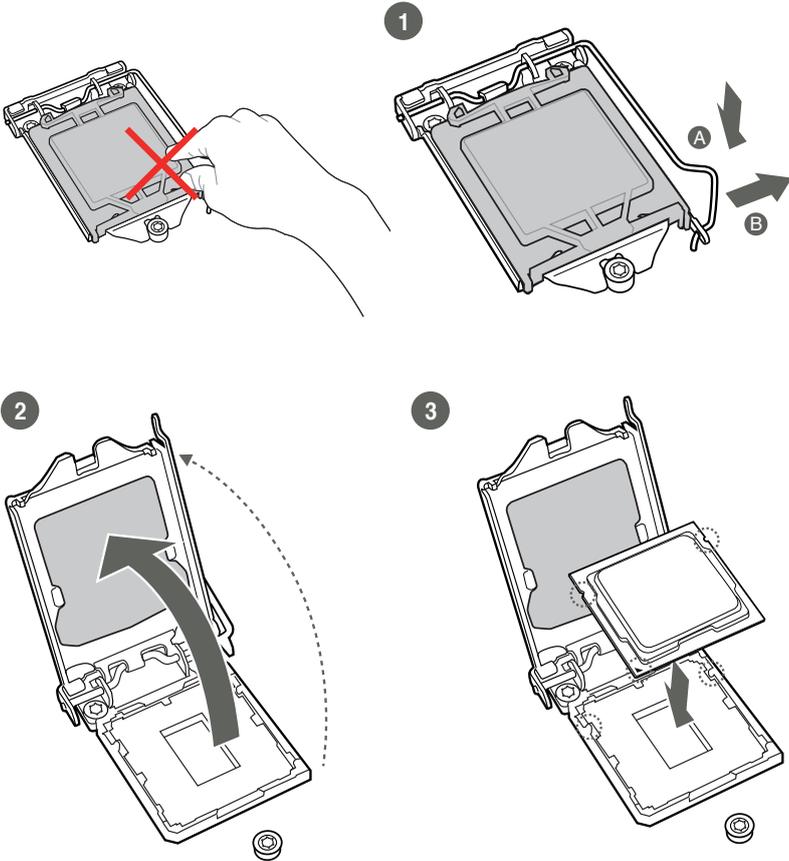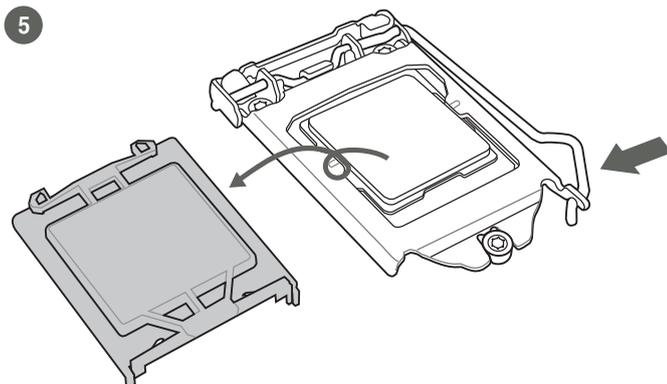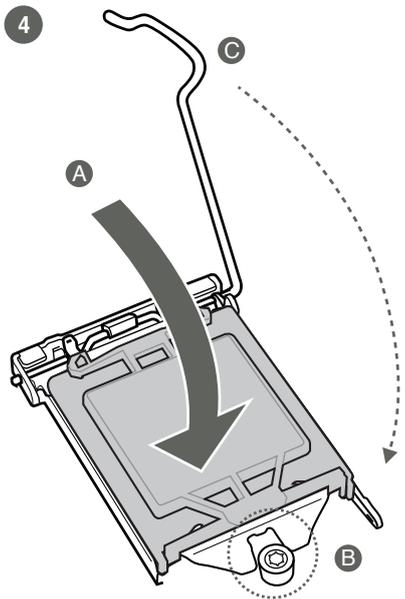
2.4.2 CPU heatsink and fan assembly installation
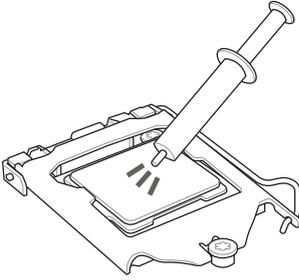
CAUTION! Apply the Thermal Interface Material to the CPU heatsink and CPU before you install the heatsink and fan if necessary.

To install the CPU heatsink and fan assembly
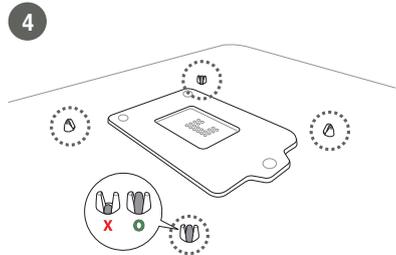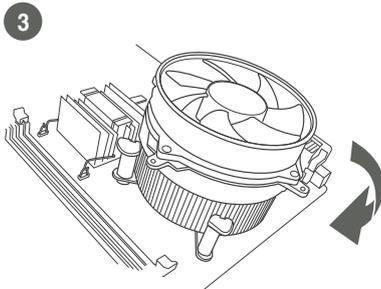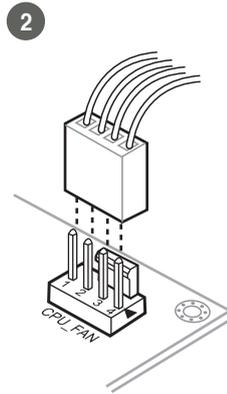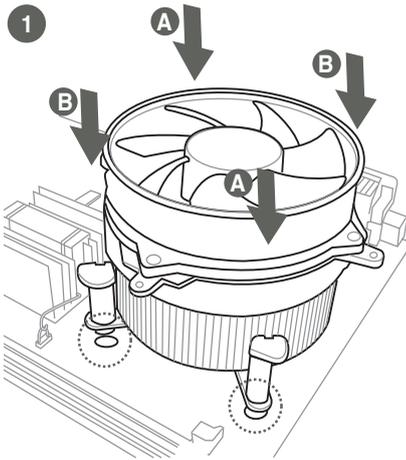
To uninstall the CPU heatsink and fan assembly
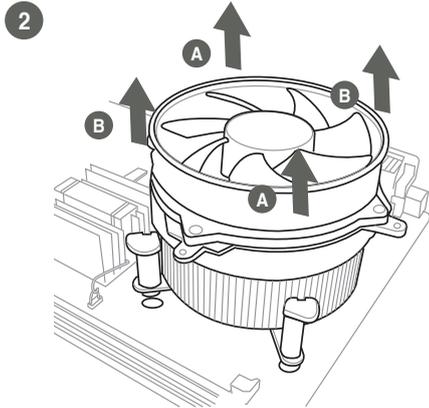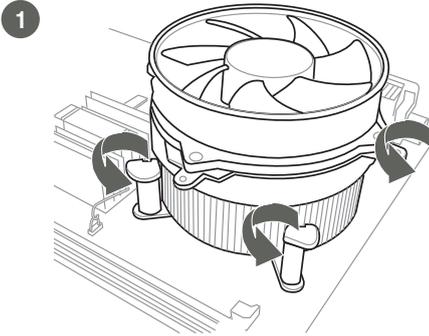
2.5   System memory

This motherboard comes with two Double Data Rate 3 (DDR3) Dual Inline Memory Module (DIMM) sockets. A DDR3 module has the same physical dimensions as a DDR2 DIMM but is notched differently to prevent installation on a DDR2 DIMM socket. DDR3 modules are developed for better performance with less power consumption.

The figure below illustrates the location of the DDR3 DIMM sockets:

Channel	Sockets
Channel A	DIMM_A1
Channel B	DIMM_B1
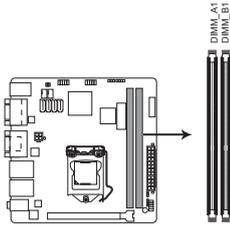
EMB-Q77B 240-pin DDR3 DIMM sockets

2.5.1   Installing a DIMM
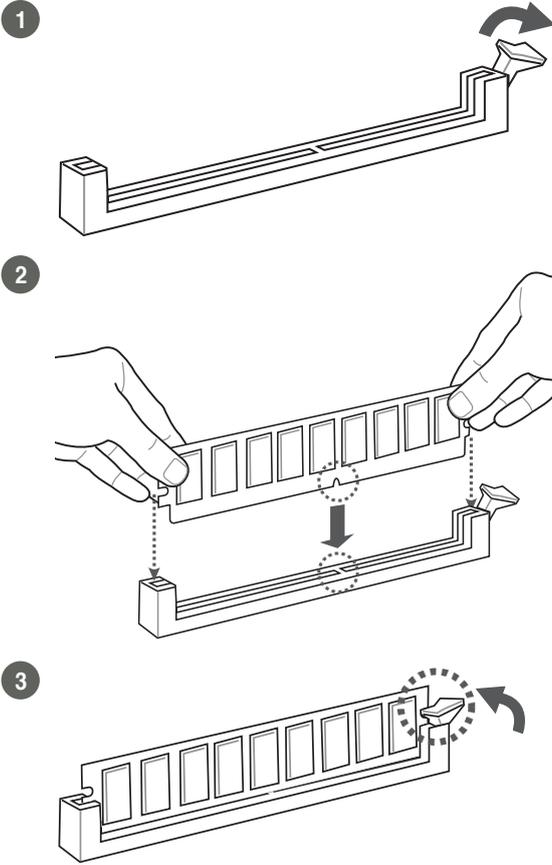
To remove a DIMM
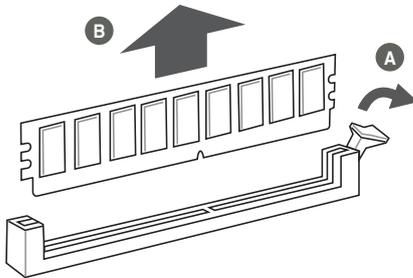
2.6   Jumpers

1.   Clear RTC RAM (CLRTC)

This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of system setup parameters by erasing the CMOS RTC RAM data. The onboard button cell battery powers the RAM data in CMOS, which include system setup information such as system passwords.
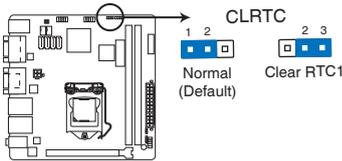
EMB-Q77B Clear RTC RAM

To erase the RTC RAM:

1.   Turn OFF the computer and unplug the power cord.

2.   Move the jumper cap from pins 1-2 (default) to pins 2-3. Keep the cap on pins 2-3 for about 5~10 seconds, then move the cap back to pins 1-2.

3.   Plug the power cord and turn ON the computer.

4.   Hold down the **<Del>** key during the boot process and enter BIOS setup to reenter data.

CAUTION! Except when clearing the RTC RAM, never remove the cap on CLRTC jumper default position. Removing the cap will cause system boot failure!

NOTES:

•   If the steps above do not help, remove the onboard battery and move the jumper again to clear the CMOS RTC RAM data. After clearing the CMOS, reinstall the battery.

•   You do not need to clear the RTC when the system hangs due to overclocking. For system failure due to overclocking, use the CPU Parameter Recall (C.P.R) feature. Shut down and reboot the system so the BIOS can automatically reset parameter settings to default values.

2. Intel® ME Jumper (3-pin DIS_ME)

This jumper allows you to force Intel® Management Engine (ME) boot from recovery mode when ME become corrupted.

DIS_ME

ME Enable
(Default)

ME Disable
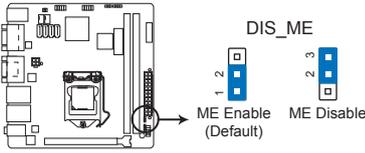
EMB-Q77B Intel® ME jumper

3. COM1 Ring/+5V/+12V selection (COM1_VSET)

Com1_Vset

RI_VCC
RI_VCC
RI_VCC

PIN 1

+12V
+5V
RI
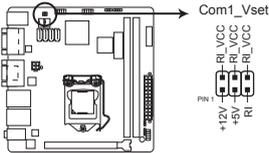
EMB-Q77B COM VSET connector

Setting	Pins
+12V	1-2
+5V	3-4
Ring (Default)	5-6

2.7 Onboard LEDs

1. Standby Power LED

The motherboard comes with a standby power LED that lights up to indicate that the system is ON, in sleep mode, or in soft-off mode. This is a reminder that you should shut down the system and unplug the power cable before removing or plugging in any motherboard component. The illustration below shows the location of the onboard LED.

SB_PWR

ON
Standby Power

OFF
Powered Off
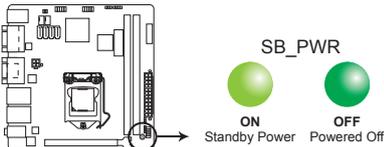
EMB-Q77B Onboard LED

2.9   Connectors

2.9.1   Rear panel connectors
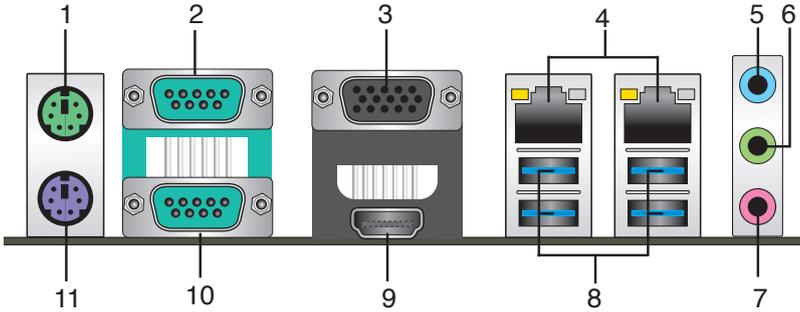
1.   **PS/2 mouse port (green).** This port is for a PS/2 mouse.

2.   **COM1 (Serial) port.** This port allow you to connect devices that have serial connectors such as mouse, modem, or printers. This port supports RS-232, RS-422, and RS-485 serial specifications.

PIN	SIGNAL	PIN	SIGNAL
1	DCD (422TXD-/485DATA-)	2	RXD (422RXD+)
3	TXD (422TXD+/485DATA+)	4	DTR (422RXD-)
5	GND	6	DSR
7	RTS	8	CTS
9	RI/+12V/+5V	10	N.C.

3.   **Video Graphics Adapter (VGA) port.** This 15-pin port is for a VGA monitor or other VGA-compatible devices.

4.   **LAN (RJ-45) ports.** These ports allow Gigabit connection to a Local Area Network (LAN) through a network hub. Refer to the table below for the LAN port LED indications.

LAN port LED indications

ACT/LINK LED		SPEED LED	
Status	Description	Status	Description
OFF	No link	OFF	10 Mbps connection
ORANGE	Linked	ORANGE	100 Mbps connection
BLINKING	Data activity	GREEN	1 Gbps connection

Activity Link LED   Speed LED

LAN port
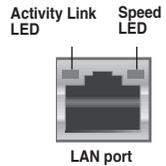
5. **Line In port (light blue).** This port connects the tape, CD, DVD player, or other audio sources.

6. **Line Out port (lime).** This port connects to a headphone or a speaker. In a 4-channel, 6-channel and 8-channel configurations, the function of this port becomes Front Speaker Out.

7. **Microphone port (pink).** This port connects a microphone.

> **NOTE:** Refer to the audio configuration table below for the function of the audio ports in the 2.1, 4.1, 5.1, or 7.1-channel configuration.

Audio 2.1, 4.1, 5.1, or 7.1-channel configuration

Port	Headset 2.1-channel	4.1-channel	5.1-channel	7.1-channel
Light Blue (Rear panel)	Line In	Rear Speaker Out	Rear Speaker Out	Rear Speaker Out
Lime (Rear panel)	Line Out	Front Speaker Out	Front Speaker Out	Front Speaker Out
Pink (Rear panel)	Mic In	Mic In	Bass/Center	Bass/Center
Lime (Front panel)	-	-	-	Side Speaker Out

> **To configure a 7.1-channel audio output**:
>
> Use a chassis with an HD audio module in the front panel to support an 7.1-channel audio output.

8. **USB 3.0 ports.** These two 9-pin Universal Serial Bus (USB) ports connect to USB 3.0/2.0 devices.

> **NOTES:**
> - DO NOT connect a keyboard / mouse to any USB 3.0 port when installing Windows® operating system.
>
> - Due to USB 3.0 controller limitation, USB 3.0 devices can only be used under Windows® OS environment and after the USB 3.0 driver installation.
>
> - USB 3.0 devices can only be used as data storage only.
>
> - We strongly recommend that you connect USB 3.0 devices to USB 3.0 ports for faster and better performance for your USB 3.0 devices.

9. **HDMI port.** This port is for a High-Definition Multimedia Interface (HDMI) connector, and is HDCP compliant allowing playback of HD DVD, Blu-Ray, and other protected content.

10. **COM2 (Serial) port.** This port allow you to connect devices that have serial connectors such as mouse, modem, or printers. This port supports RS-232 serial specification.

11. **PS/2 Keyboard port (purple).** This port connects to a PS/2 keyboard.

2.9.2   Internal connectors

1. **ATX power connectors (24-pin EATXPWR, 4-pin EATX12V)**

    These connectors are for ATX power supply plugs. The power supply plugs are designed to fit these connectors in only one orientation. Find the proper orientation and push down firmly until the connectors completely fit.

EMB-Q77B ATX power connectors
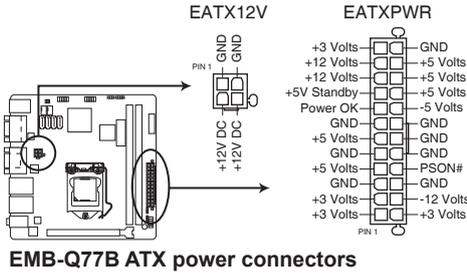
IMPORTANT:

- For a fully configured system, we recommend that you use a power supply unit (PSU) that complies with ATX 12 V Specification 2.0 (or later version) and provides a minimum power of 230W.

- DO NOT forget to connect the 4-pin ATX +12V power plug. Otherwise, the system will not have enough power.

- We recommend that you use a PSU with higher power output when configuring a system with more power-consuming devices. The system may become unstable or may not boot up if the power is inadequate.

2. **CPU and chassis fan connectors (4-pin CPU_FAN, 4-pin CHA_FAN)**

    Connect the fan cables to the fan connectors on the motherboard, ensuring that the black wire of each cable matches the ground pin of the connector.

CPU_FAN

GND
VCC
SENSE
PWM
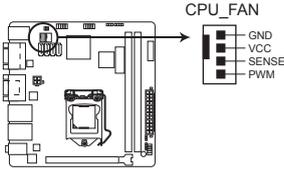
EMB-Q77B CPU fan connector

CAUTION: Do not forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components. These are not jumpers! Do not place jumper caps on the fan connectors!

NOTE: The CPU_FAN connector supports a CPU fan of maximum 2A (24 W) fan power.

3   **Chassis intrusion connector (4-1 pin CHASSIS)**

    This connector is for a chassis-mounted intrusion detection sensor or switch. Connect one end of the chassis intrusion sensor or switch cable to this connector. The chassis intrusion sensor or switch sends a high-level signal to this connector when a chassis component is removed or replaced. The signal is then generated as a chassis intrusion event.

    By default, the pins labeled "Intruder" are shorted with a jumper cap. Remove the jumper caps only when you intend to use the chassis intrusion detection feature.

CHASSIS

No Intrudor
Intrudor
Intrudor

PIN1
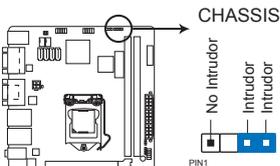
EMB-Q77B Chassis intrusion connector

4. System panel connector (10-1 pin F_PANEL)

This connector supports several chassis-mounted functions.
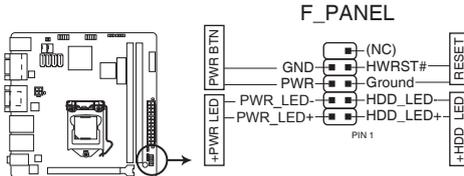
F_PANEL

EMB-Q77B System panel connector

- **System power LED (2-pin PWR_LED)**

  This 2-pin connector is for the system power LED. Connect the chassis power LED cable to this connector. The system power LED lights up when you turn on the system power, and blinks when the system is in sleep mode.

- **Hard disk drive activity LED (2-pin HDD_LED)**

  This 2-pin connector is for the HDD Activity LED. Connect the HDD Activity LED cable to this connector. The HDD LED lights up or flashes when data is read from or written to the HDD.

- **ATX power button/soft-off button (2-pin PWR_BTN)**

  This 2-pin connector is for the system power button.

- **Reset button (2-pin RESET)**

  This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.

5. Minicard connector

Use this connector to connect a Minicard reader.
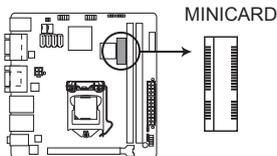
MINICARD

EMB-Q77B MINICARD connector

6. Serial ATA 3.0Gb/s connectors (7-pin SATA3G_1, SATA3G_2)

These connectors connect to Serial ATA 3.0 Gb/s hard disk drives and optical drives via Serial ATA 3.0 Gb/s signal cables.
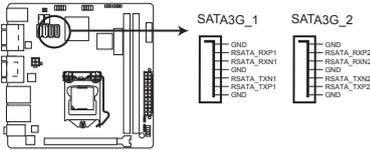
EMB-Q77B SATA 3.0Gb/s connectors

NOTES:

•   You must install Windows® XP Service Pack 3 or later version before using Serial ATA hard disk drives.

•   When using hot-plug and NCQ, set the SATA Mode Selection item in the BIOS to [AHCI]. See section **3.3.4 SATA Configuration** for details.

7. Serial ATA 6.0Gb/s connector (7-pin SATA6G_1, SATA6G_2)

ThIS connector connects to Serial ATA 6.0 Gb/s hard disk drives via Serial ATA 6.0 Gb/s signal cables.
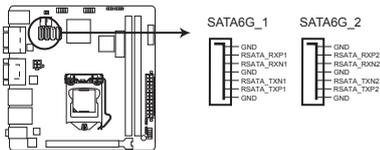
EMB-Q77B SATA 6.0Gb/s connectors

NOTES:

•   You must install Windows® XP Service Pack 3 or later version before using Serial ATA hard disk drives.

•   When using hot-plug and NCQ, set the SATA Mode Selection item in the BIOS to [AHCI]. See section **3.3.3 SATA Configuration** for details.

8. **USB 2.0 connectors (10-1 pin USB56, USB1112)**

This connector is for USB 2.0 ports. Connect the USB module cable to connector USB1112. This USB connector complies with USB 2.0 specification that supports up to 480 Mbps connection speed.
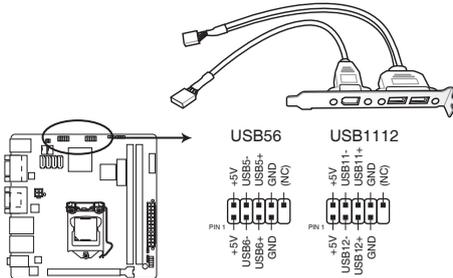
EMB-Q77B USB2.0 connector

⚠️ Never connect a 1394 cable to the USB connector. Doing so will damage the motherboard.

✎ The USB module cable is purchased separately.

9. **Speaker connector (4-pin SPEAKER)**

The 4-pin connector is for the chassis-mounted system warning speaker. The speaker allows you to hear system beeps and warnings.
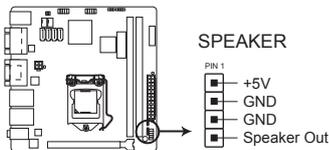
EMB-Q77B Speaker Out Connector

Chapter 3

BIOS setup

3.1   BIOS setup program

Use the BIOS Setup program to update the BIOS or configure its parameters. The BIOS screens include navigation keys and brief online help to guide you in using the BIOS Setup program.

Entering BIOS Setup at startup

To enter BIOS Setup at startup:

Press <Delete> during the Power-On Self Test (POST). If you do not press <Delete>, POST continues with its routine.

Entering BIOS Setup after POST

To enter BIOS Setup after POST:

- Press **<Ctrl>**+**<Alt>**+**<Del>** simultaneously.

- Press the reset button on the system chassis.

- Press the power button to turn the system off then back on. Do this option only if you failed to enter BIOS Setup using the first two options.

NOTE: Using the power button, reset button, or the <Ctrl>+<Alt>+<Del> keys to reboot a running operating system can cause damage to your data or system. Always shut down the system properly from the operating system.

IMPORTANT:

- The default BIOS settings for this motherboard apply to most working conditions and ensures optimal performance. If the system becomes unstable after changing any BIOS settings, load the default settings to regain system stability. Select the option **Restore Defaults** under the Save & Exit Menu. See section **3.7 Exit Menu**.

- The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.

3.1.1 BIOS menu screen

Menu items   Menu bar   Configuration fields   General help

```
        Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
  Main    Advanced    Chipset    Boot    Security    Save & Exit

  BIOS Information                                    Set the Date. Use Tab
    RO.5(EQ77BM05) (12/10/2013)                       to switch between
                                                      Date elements.
  BIOS Vendor              American Megatrends
  Core Version             4.6.5.4
  Compliancy               UEFI 2.3.1; PI 1.2

  System Date              [Fri 12/13/2013]
  System Time              [17:03:24]                 ←→:    Select Screen
  Access Level             Administrator              ↓↑:    Select Item
                                                      Enter: Select
                                                      +-     Change Opt.
                                                      F1:    General Help
                                                      F2:    Previous Values
                                                      F4:    Save and Exit
                                                      ESC:   Exit

        Version 2.14.1219. Copyright (C) 2011, American Megatrends, Inc.
```

Navigation keys

3.1.2 Menu bar

The menu bar on top of the screen has the following main items:

Main   For changing the basic system configuration.

Advanced   For changing the advanced system settings.

Chipset   For changing the chipset configuration.

Boot   For changing the system boot configuration.

Security   For selecting the exit options and loading default settings.

Save & Exit   For selecting the exit options and loading default settings.

To select an item on the menu bar, press the right or left arrow key on the keyboard until the desired item is highlighted.

3.2 Main menu

When you enter the BIOS Setup program, the **Main** menu screen appears, giving you an overview of the basic system information.

Refer to section **3.1.1 BIOS menu screen** for information on the menu screen items and how to navigate through them.

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

   BIOS Information                                      Set the Date. Use Tab
     R0.5 (EQ77BM05) (12/10/2013)                        to switch between
                                                         Date elements.
   BIOS Vendor            American Megatrends
   Core Version           4.6.5.4
   Compliancy             UEFI 2.3.1; PI 1.2

   System Date            [Fri 12/13/2013]
   System Time            [17:03:24]               →←: Select Screen
   Access Level           Administrator            ↓↑: Select Item
                                                   Enter: Select
                                                   +-: Change Opt.
                                                   F1: General Help
                                                   F2: Previous Values
                                                   F3: Optimized Defaults
                                                   F4: Save and Exit
                                                   ESC: Exit

        Version 2.14.1219. Copyright (C) 2012, American Megatrends, Inc.
```

3.2.1 System Time [xx:xx:xx]

Allows you to set the system time.

3.2.2 System Date [Day xx/xx/xxxx]

Allows you to set the system date.

3.3 Advanced menu

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

> ⚠️ Be cautious when changing the settings of the Advanced menu items. Incorrect field values can cause the system to malfunction.

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

                                                     Enable Spread
                                                     Spectrum function
  ICC Spread Spectrum            [Disabled]          for BCLK, DMI, PEG,
  AAEON ICC Spread Spectrum       45                 PCIe,PCI33, SATA,
  ▶  ACPI Settings                                   USB3.
  ▶  S5 RTC Wake Settings
  ▶  Trusted Computing
  ▶  CPU Configuration
  ▶  SATA Configuration
  ▶  Intel TXT(LT) Configuration
  ▶  AMT Configuration
  ▶  USB Configuration
  ▶  NCT6779D Super IO Configuration
  ▶  NCT6779D H/W Monitor
  ▶  CPU PPM Configuration
```

3.3.1 ICC Spread Spectrum

This item allows you to enable or disable the Spread Spectrum function for BCLK, DMI, PEG, PCIe, PCI33, SATA, USB3. Configuration options: [Enabled] [Disabled]

3.3.2 AAEON ICC Spread Spectrum

This item provides the AAEON ICC Spread Spectrum default value.

3.3.3 ACPI Settings

The items in this menu allows you to configure the system ACPI parameters.

ACPI Sleep State [S3 only (Suspend to...]

Allows you to select the ACPI sleep state that the system will enter when the SUSPEND button is pressed. Configuration options: [Suspend Disabled] [S1 only(CPU Stop Clock] [S3 only(Suspend to RAM)]

Wake on Ring [S3 only (Enabled]

Allows you to enable or disable the Wake on Ring function.

Configuration options: [Enabled] [Disabled]

3.3.4   S5 RTC Wake Settings

This item allows you to enable the system to wake up from S5 state using an alert event.

Wake system with Fixed Time [Disabled]

Allows you to enable or disable the system's wake-on alert event. When enabled, the system wakes up on the specified time.

Configuration options: [Enabled] [Disabled]

Wake system with Dynamic Time [Disabled]

Allows you to enable or disable the system's wake-on alert event. When enabled, the system wakes up on the current time plus the specified wake-up minute.

Configuration options: [Enabled] [Disabled]

3.3.5   Trusted Computing

The items in this menu allows you to configure the Trusted Computing settngs.

Security Device Support [Disabled]

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

Configuration options: [Disabled] [Enabled]

3.3.6   CPU Configuration

The items in this menu show the CPU-related information that the BIOS automatically detects.

Hyper-threading [Enabled]

Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology). When Disabled, only one thread per enabled core is enabled.

Active Processor Cores [All]

Allows you to choose the number of CPU cores to activate in each processor package. Configuration options: [All] [1]]

> Configuration options for active processor cores are dependent on the installed CPU.

Intel(R) Virtualization Tech [Enabled]

Enables or disables Intel® Virtualization Technology. Virtualization enhanced by Intel® Virtualization Technology allows a platform to run multiple operating systems and applications in independent partitions. With virtualization, one computer system can function as multiple virtual systems.

Configuration options: [Enabled] [Disabled]

3.3.7   SATA Configuration

While entering Setup, the BIOS automatically detects the presence of SATA devices. The SATA Port items show **Not Present** if no SATA device is installed to the corresponding SATA port.

SATA Mode Selection [AHCI]

Allows you to set the SATA configuration.

[Disabled]	Disables the SATA function.
[IDE]	Set to [IDE] when you want to use the Serial ATA hard disk drives as Parallel ATA physical storage devices.
[AHCI]	Set to [AHCI] when you want the SATA hard disk drives to use the AHCI (Advanced Host Controller Interface). The AHCI allows the onboard storage driver to enable advanced Serial ATA features that increases storage performance on random workloads by allowing the drive to internally optimize the order of commands.
[RAID]	Set to [RAID] when you want to create a RAID configuration from the SATA hard disk drives.

3.3.8   Intel TXT(LT) Configuration

Allows you to enable/disable Intel Trusted Execution Technology support.

Secure Mode Extensions (SMX)

[Enabled]	Enables Secure Mode Extensions.
[Disabled]	Disables Secure Mode Extensions.

Intel TXT(LT) Support

[Enabled]	Enables support for Intel Trusted Execution Technology.
[Disabled]	Disables support for Intel Trusted Execution Technology.

To enable **Intel TXT(LT) Support**, SMX and VT-d items should also be enabled.

3.3.9 AMT Configuration

The items in this menu allow you to change the Intel® Active Management Technology (AMT) feature.

Intel® AMT [Enabled]

Allow you to enable or disable the Intel® Active Management Technology (AMT) in the BIOS extension. Configuration options: [Enabled] [Disabled]

> • iAMT H/W is always enabled. This option just controls the BIOS extension execution. If enabled, this requires additional firmware in the SPI device.
>
> • The following two items become configurable only when you set the Intel®AMT item to [Enabled].

Un-Configure ME [Disabled]

Sets this item to [Disabled] to unconfigure AMT/ME without using a password or set it to [Enabled] to use a password. Configuration options: [Enabled] [Disabled]

3.3.10 USB Configuration

The items in this menu allow you to change the USB-related features.

> The USB Devices item shows the auto-detected values. If no USB device is detected, the item shows **None**.

Legacy USB Support [Enabled]

[Enabled]   Enables the support for USB devices on legacy operating systems (OS).

[Disabled]   The USB devices can be used only for the BIOS setup program.

[Auto]   Allows the system to detect the presence of USB devices at startup. If detected, the USB controller legacy mode is enabled. If no USB device is detected, the legacy USB support is disabled.

USB3.0 Support [Enabled]

[Enabled]   Enables the USB 3.0 (XHCI) Controller support.

[Disabled]   Disables the function.

3.3.11   NCT6779D Super IO Configuration

The items in this menu allow you to configure the system super IO chip settings.

Serial Port 1/Port 2 Configuration

Allow you to configure the Serial Port 1/Port 2 settings.

Serial Port [Enabled]

Enables or disables the Serial COM port. Configuration options: [Enabled] [Disabled]

Change Settings [Auto]

Allows you to select an optimal setting for the Super IO device.

Configuration options: [Auto] [IO=3F8h; IRQ=4] [IO=3F8h; IRQ=3,4,5,6,7,8,9, 10,11,12] [IO=2F8h; IRQ=3,4,5,6,7,8,9,10,11,12] [IO=3E8h; IRQ=3,4,5,6,7,8, 9,10,11,12] [IO=2E8h; IRQ=3,4,5,6,7,8,9,10,11,12]

COM1 Type Select [RS232]

Allows you to change the Serial Port mode. Configuration options: [RS232] [RS422] [RS485]

3.3.12   NCT6779D H/W Monitor

The items in this menu allows you to monitor the hardware status.

3.3.13   CPU PPM Configuration

The items in this menu allows you to enable or disable the Intel SpeedStep. Configuration options: [Enabled] [Disabled]

3.4 Chipset

The Chipset menu allows you to change the advanced chipset settings. Select an item then press <Enter> to display the sub-menu.

3.4.1 Power Mode [ATX Type]

Allows you to select the power supply type.

Configuration options: [ATX Type] [AT Type]

3.4.2 PCH-IO Configuration

PCIE Express Configuration

Allows you to configure the PCI Express settings.

PCH Azalia Configuration

Allows you to configure the PCH Azalia settings.

PCH LAN Controller

Allows you to enable or disable the integrated LAN.

> The following item appears when you set the PCH LAN Controller item to [Enabled].

Wake on LAN [Enabled]

Allows you to enable or disable the integrated LAN to wake up the system.
Configuration options: [Enabled] [Disabled]

Restore AC Power Loss [Last State]

[Power On]   The system goes into on state after an AC power loss.

[Power Off]   The system goes into off state after an AC power loss.

[Last State]   The system goes into either off or on state, whatever the system state was before the AC power loss.

3.4.3 System Agent (SA) Configuration

Graphics Configuration

Allows you to configure the graphics settings.

Primary Display [Enabled]

Allows you to select the graphics device for primary display.
Configuration options: [Auto] [IGFX] [PEG] [PCI] [SG]

Internal Graphics [Enabled]

Allows you to keep the IGD enabled based on the setup options.
Configuration options: [Auto] [Enabled] [Disabled]

DVMT Pre-Allocated [64M]

Allows you to select the DVMT 5.0 Pre-Allocated (Fixed) graphics memory size used by the integrated graphics device. Configuration options: [32M] [64M] [96M] [128M] [160M] [192M] [224M] [256M] [288M] [320M] [352M] [384M] [416M] [448M] [480M] [512M] [1024M]

DVMT Total Gfx Mem [MAX]

Allows you to select the DVMT 5.0 total graphics memory size used by the integrated graphics device. Configuration options: [128M] [256M] [MAX]

LCD Control

Allows you to select the boot display settings.

> **Primary IGFX Boot Display [VBIOS Default]**
>
> Allows you to select the graphics device that will be activated during POST. Configuration options: [VBIOS Default] [CRI] [HDMI]

Memory Configuration

Provides information on the memory settings.

3.5 Boot menu

The Boot menu items allow you to change the system boot options.

3.5.1 Boot Configuration

Quiet Boot [Enabled]

Enables or disables the Quiet Boot option.
Configuration options: [Enabled] [Disabled]

Launch PXE OpROM policy [Disabled]

Controls the launch of UEFI and Legacy PXE OpROM.

Configuration options: [Disabled] [Enabled]

3.6   Security menu

The Security menu items allow you to change the system security settings.

Administrator Password

If you have set an administrator password, we recommend that you enter the administrator password for accessing the system. Otherwise, you might be able to see or change only selected fields in the BIOS setup program.

To set an administrator password:

1.   Select the **Administrator Password** item and press <Enter>.

2.   From the **Create New Password** box, key in a password, then press <Enter>.

3.   Confirm the password when prompted.

To change an administrator password:

1.   Select the Administrator Password item and press <Enter>.

2.   From the Enter Current Password box, key in the current password, then press <Enter>.

3.   From the Create New Password box, key in a new password, then press <Enter>.

4.   Confirm the password when prompted.

To clear the administrator password, follow the same steps as in changing an administrator password, but press <Enter> when prompted to create/confirm the password. After you clear the password, the Administrator Password item on top of the screen shows Not Installed.

User Password

If you have set a user password, you must enter the user password for accessing the system. The User Password item on top of the screen shows the default Not Installed. After you set a password, this item shows Installed.

To set a user password:

1.   Select the **User Password** item and press <Enter>.

2.   From the **Create New Password** box, key in a password, then press <Enter>.

3.   Confirm the password when prompted.

4.   Confirm the password when prompted.

To clear the user password, follow the same steps as in changing a user password, but press <Enter> when prompted to create/confirm the password. After you clear the password, the User Password item on top of the screen shows Not Installed.

3.7   Save & Exit menu

The Save & Exit menu items allow you to load the optimal default values for the BIOS items, and save or discard your changes to the BIOS items.

Save Changes & Reset

This option allows you to save the changes and exit the Setup program.

Discard Changes & Exit

This option allows you to exit the Setup program without saving your changes. When you select this option or if you press <Esc>, a confirmation window appears. Select **Yes** to discard changes and exit.

Restore Defaults

This option allows you to load the default values for each of the parameters on the Setup menus. When you select this option or if you press <F3>, a confirmation window appears. Select **Yes** to load the default values.

Save as User Defaults

This option allows you to save the current changes as the user's default values.

Restore User Defaults

This option allows you to load the user's default values.

Appendix

Notices

Federal Communications Commission Statement

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

• This device may not cause harmful interference.

• This device must accept any interference received including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A 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 manufacturer's 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 receiver.

• Connect the equipment to 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.

> **WARNING!** The use of shielded cables for connection of the monitor to the graphics card is required to assure compliance with FCC regulations. Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

> DO NOT throw the motherboard in municipal waste. This product has been designed to enable proper reuse of parts and recycling. This symbol of the crossed out wheeled bin indicates that the product (electrical and electronic equipment) should not be placed in municipal waste. Check local regulations for disposal of electronic products.

> DO NOT throw the mercury-containing button cell battery in municipal waste. This symbol of the crossed out wheeled bin indicates that the battery should not be placed in municipal waste.

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有毒有害物質或元素的名稱及含量說明標示：

部件名稱	有害物質或元素					
	鉛 (Pb)	汞 (Hg)	鎘 (Cd)	六　價　鉻 (Cr(VI))	多溴聯苯 (PBB)	多溴二苯醚 (PBDE)
印刷電路板及其電子組件	×	○	○	○	○	○
外部信號連接頭及線材	×	○	○	○	○	○

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