IEI Technology Corp.

MODEL:

IOPS-Q67/H61

OPS Compliant Pluggable Module PC with Intel® Core™ i5/Celeron® G530, Intel® Q67/H61 Express Chipset, GbE LAN, DisplayPort, RS-232, USB 2.0, SDHC Slot, RoHS Compliant

User Manual

Rev. 1.00 – 4 December, 2012

RoHS Lead Free

Revision

Date	Version	Changes
4 December, 2012	1.00	Initial release

Copyright

COPYRIGHT NOTICE

The information in this document is subject to change without prior notice in order to improve reliability, design and function and does not represent a commitment on the part of the manufacturer.

In no event will the manufacturer be liable for direct, indirect, special, incidental, or consequential damages arising out of the use or inability to use the product or documentation, even if advised of the possibility of such damages.

TRADEMARKS

All registered trademarks and product names mentioned herein are used for identification purposes only and may be trademarks and/or registered trademarks of their respective owners.

WARNING

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.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

—Reorient or relocate the receiving antenna.

—Increase the separation between the equipment and 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/ TV technician for help.

You are cautioned that any change or modifications to the equipment not expressly approve by the party responsible for compliance could void your authority to operate such equipment.

IMPORTANT NOTE:

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

Table of Contents

List of Figures

List of Tables

List of BIOS Menus

Chapter

1

Introduction

1.1 Overview

Figure 1-1: IOPS-Q67/H61 Series Pluggable Module PC

The IOPS-Q67/H61 series is a pluggable module PC with 2nd-generation Intel® Core™ i5 or Intel® Celeron® dual-core processor and Intel® Q67 or H61 Express Chipset. The IOPS-Q67/H61 is preinstalled 4 GB of DDR3 SO-DIMM and can accommodate up to 8 GB of DDR3 memory. Storage in the system is handled by the preinstalled 32 GB mSATA module and the SDHC card slot on the front panel.

The IOPS-Q67/H61 includes a DisplayPort output interface supporting up to 2560 x 1600 resolutions. Other slots and connectors include half-size PCIe Mini card slot, RS-232, Gigabit Ethernet, USB 2.0 ports and audio out.

The IOPS-Q67-i5 model with Intel® Core™ i5 processor also supports Intel® AMT 7.0 that make maintenance a lot easier for system integrators.

1.2 Features

The IOPS-Q67/H61 has the following features

- Intel® Open Pluggable Specification (OPS) compliant
- LGA1155 Intel® Core™ i5, or Celeron® G530 CPU supported
- Intel® HD Graphics with full HD video decoding capability
- One 32 GB mSATA module preinstalled
- One SDHC card supported
- One GbE LAN for high speed network applications
- One DisplayPort connector
- Two USB 2.0 ports

- One RS-232 RJ-45 serial port
- One audio line-out jack
- RoHS compliant design

1.3 Model Variations

There are two models in the IOPS-Q67/H61 series. Both models are preinstalled with 4 GB of DDR3 memory and a 32 GB mSATA module. The model variations are listed in **Table 1-1** below.

	LGA1155 CPU	Express Chipset
IOPS-Q67-i5-4GB	2.70GHz Intel® Core™ i5-2390T	Intel® Q67
IOPS-H61-C-4GB	2.40GHz Intel® Celeron® G530	Intel® H61

Table 1-1: Model Variations

1.4 External Overview

1.4.1 Front Panel

The IOPS-Q67/H61 front panel provides access to the following external I/O connectors:

- 1 x Audio line-out jack
- 1 x DisplayPort connector
- 1 x GbE RJ-45 connector
- 1 x RS-232 RJ-45 serial port
- 2 x USB 2.0 port connectors
- 1 x SDHC slot
- 1 x Storage device LED indicator
- 1 x USB LED indicator
- 1 x Status LED indicator (Blinking: booting; Solid: complete booting)
- 1 x Power button
- 1 x Reset button

An overview of the front panel is shown in **Figure 1-2** below.

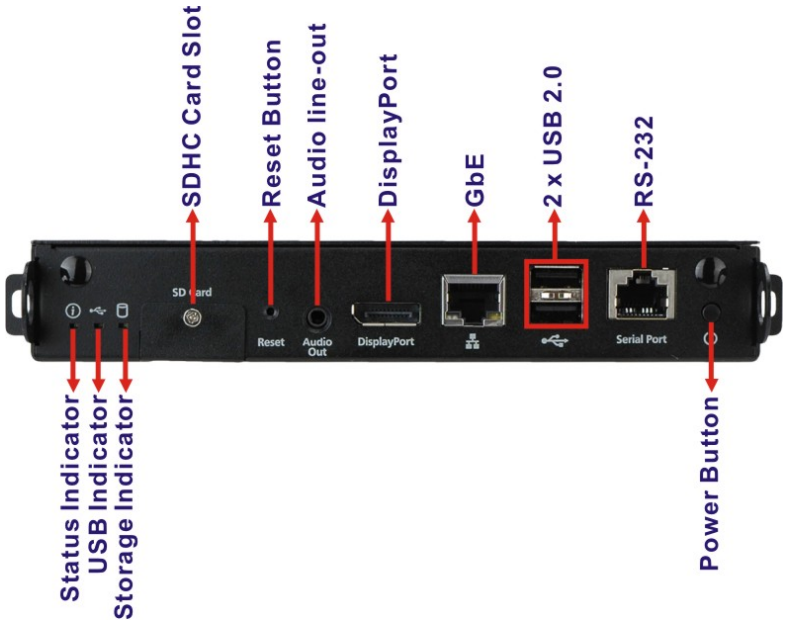


Figure 1-2: Front Panel

1.4.2 Rear Panel

The rear panel of the IOPS-Q67/H61 contains an OPS compliant JAE connector which can connected with OPS displays. An overview of the rear panel is shown in **Figure 1-3**.

Figure 1-3: Rear Panel

1.4.3 Bottom Panel

WARNING:

Never remove the SO-DIMM access panel from the chassis while power is still being fed into the system. Before removing the SO-DIMM access panel, make sure the system has been turned off and all power connectors unplugged.

The bottom panel of the IOPS-Q67/H61 contains a removable cover to access the SO-DIMM.

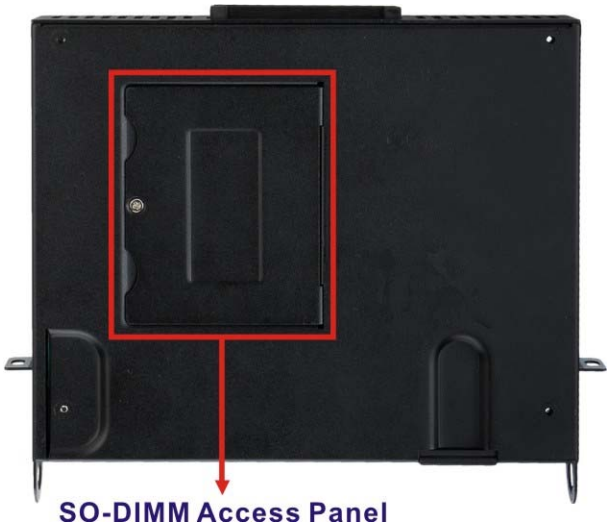


Figure 1-4: Bottom Panel

1.5 Technical Specifications

The specifications for the Intel based embedded systems are listed below.

	IOPS-Q67-i5-4GB	IOPS-H61-C-4GB
CPU	2.70GHz Intel® Core™ i5-2390T dual-core CPU (3M cache)	2.40GHz Intel® Celeron® G530 dual-core CPU (2M cache)
System Chipset	Intel® Q67 Express Chipset	Intel® H61 Express Chipset
System Memory	One 1333 MHz 4 GB DDR3 SDRAM SO-DIMM preinstalled (system max. 8 GB)	
Graphics	Intel® HD Graphics	
Max. Output Resolution	OPS display panel: 1920 x 1200 DisplayPort: 2560 x 1600	
Ethernet	One Intel® 82579LM GbE controller	
Display	One DisplayPort 1.1 connector	
Serial Port	One RS-232 RJ-45 serial port	
USB	Two USB 2.0 ports	
Audio	One audio out (5.1 channel Realtek ALC662 HD Audio codec)	
Storage	One 32 GB mSATA module preinstalled One SDHC card slot on the front panel	
Expansion Slot	One PCIe Mini half-size slot	
Intel® AMT	Supported	Not supported
Buttons	One power button One reset button	
Chassis Construction	Aluminum Alloy	
Power Input	12V DC ~ 19 V DC	

Power Consumption	19 W
Operating Temperature	0ºC ~ 45ºC
Storage Temperature	-10 ºC ~ 55ºC
Color	Black
Supported OS	Windows 7 or Windows Embedded Standard 7
Dimensions (W x D x H)	200 mm x 171 mm x 30 mm
EMC	FCC Class A, CE, LVD
Compatible Display Models	NEC: X461S (46”) TVS: DS-42 (42”) Philips: BDL-4245E (42”) Mitsubishi: MDT551S (55”) eJump: PX420CHN-OPS (42”)

Table 1-2: Technical Specifications

1.6 Dimensions

The physical dimensions of the IOPS-Q67/H61 embedded systems are shown in **Figure 1-5**.

- **Height**: 30.00 mm
- **Width**: 200.00 mm
- **Length**: 171.00 mm

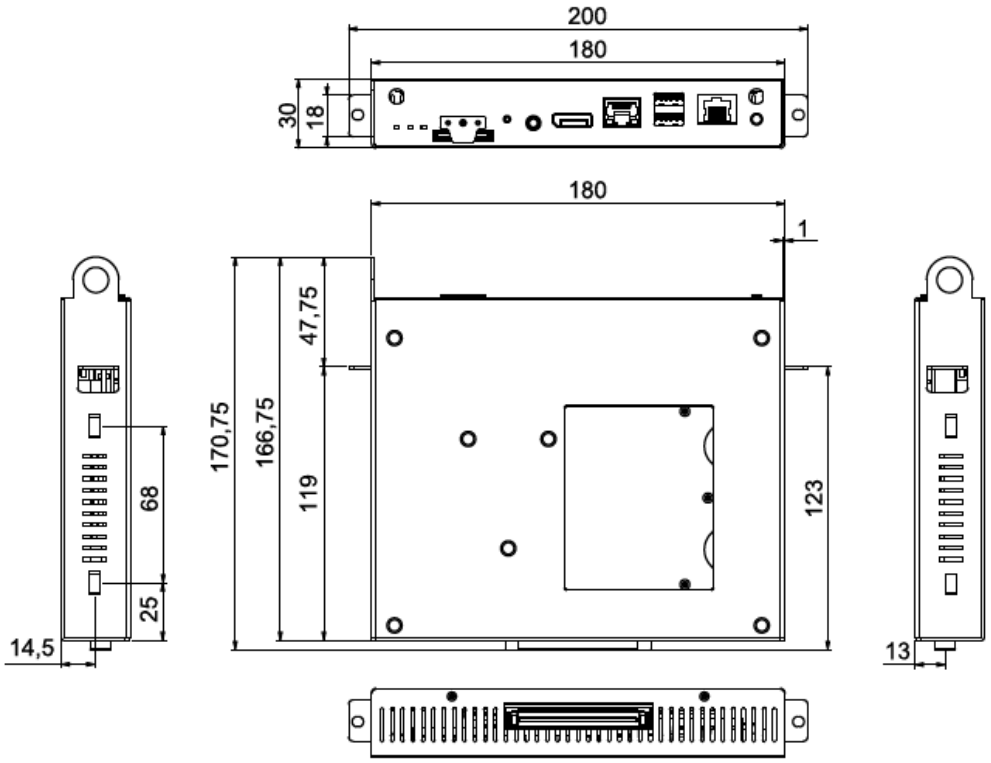


Figure 1-5: IOPS-Q67/H61 Dimensions (mm)

Chapter

2

Unpacking

2.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during installation may result in permanent damage to the IOPS-Q67/H61 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the IOPS-Q67/H61. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the IOPS-Q67/H61 or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***: Before handling the board, touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring the IOPS-Q67/H61, place it on an antic-static pad. This reduces the possibility of ESD damaging the IOPS-Q67/H61.

2.2 Unpacking Precautions

When the IOPS-Q67/H61 is unpacked, please do the following:

- Follow the anti-static precautions outlined in **Section 2.1**.
- Make sure the packing box is facing upwards so the IOPS-Q67/H61 does not fall out of the box.
- Make sure all the components shown in **Section 2.3** are present.

2.3 Unpacking Checklist

NOTE:

If some of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the IOPS-Q67/H61 from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

The IOPS-Q67/H61 is shipped with the following components:

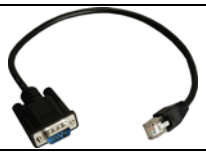
Quantity	Item	Image
1	IOPS-Q67/H61 pluggable module PC	
1	RS-232 cable (RJ-45 to DB-9)	
1	Driver and manual CD	

Table 2-1: Package List Contents

Chapter

3

Installation

3.1 Installation Precautions

During installation, be aware of the precautions below:

- **Read the user manual**: The user manual provides a complete description of the IOPS-Q67/H61, installation instructions and configuration options.
- **DANGER! Disconnect Power**: Power to the IOPS-Q67/H61 must be disconnected during the installation process, or before any attempt is made to access the rear panel. Electric shock and personal injury might occur if the rear panel of the IOPS-Q67/H61 is opened while the power cord is still connected to an electrical outlet.
- **Qualified Personnel**: The IOPS-Q67/H61 must be installed and operated only by trained and qualified personnel. Maintenance, upgrades, or repairs may only be carried out by qualified personnel who are familiar with the associated dangers.
- **Air Circulation**: Make sure there is sufficient air circulation when installing the IOPS-Q67/H61. The IOPS-Q67/H61's cooling vents must not be obstructed by any objects. Blocking the vents can cause overheating of the IOPS-Q67/H61. Leave at least 5 cm of clearance around the IOPS-Q67/H61 to prevent overheating.
- **Grounding**: The IOPS-Q67/H61 should be properly grounded. The voltage feeds must not be overloaded. Adjust the cabling and provide external overcharge protection per the electrical values indicated on the label attached to the back of the IOPS-Q67/H61.

3.1.1 High Surface Temperature

WARNING:

Some surfaces of the equipment may become hot during operation.

The surface temperature may be up to several tens of degrees hotter than the ambient temperature. Under these circumstances, the equipment needs to be protected against accidental contact.

The equipment is intended for installation in a RESTRICTED ACCESS LOCATION.

- Access can only be gained by SERVICE PERSONS or by USERS who have been instructed about the reasons for the restrictions applied to the location and about any precautions that shall be taken.
- Access is through the use of a TOOL or lock and key, or other means of security, and is controlled by the authority responsible for the location.

3.2 SD Card Installation

The IOPS-Q67/H61 series has a SDHC card slot on the front panel. To install the SDHC card into the system, please follow the steps below.

Step 1: Locate the SDHC card slot on the front panel. Remove the SDHC slot cover retention screw (**Figure 3-1**).

Figure 3-1: SDHC Slot Cover Retention Screw

Step 2: Open the slot cover and insert a SDHC card into the slot. (**Figure 3-2**)

Figure 3-2: SDHC Card Installation

Step 3: Secure the SDHC card with the slot cover by fastening the previously removed retention screw.

3.3 Pluggable Module Installation

To install the IOPS-Q67/H61 to an OPS compliant display, following the steps below.

Step 1: Align the IOPS-Q67/H61 pluggable module with the OPS slot of the display.

Step 2: Push the IOPS-Q67/H61 into the bottom (**Figure 3-3**).

Figure 3-3: Pluggable Module Installation

Step 3: The lock areas on both side panels of the IOPS-Q67/H61 are automatically fixed with the mechanical housing.

3.4 External Peripheral Interface Connection

The following external peripheral devices can be connected to the external peripheral interface connectors.

- Audio devices
- RJ-45 Ethernet cable connectors
- DisplayPort monitors
- Serial port devices (via RJ-45 to DB-9 cable)
- USB devices

To install these devices, connect the corresponding cable connector from the actual device to the corresponding IOPS-Q67/H61 external peripheral interface connector making sure the pins are properly aligned.

3.4.1 Audio Line-out Connector

CN Label: **Audio out**

CN Type: Audio jack

The audio line-out jack connects to a headphone or a speaker. With multi-channel configurations, this port can also connect to front speakers.

3.4.2 DisplayPort Connector

CN Label: **DisplayPort**

CN Type: DisplayPort 1.1

The DisplayPort connector transmits a digital signal to compatible DisplayPort display devices such as a TV or computer screen.

3.4.3 LAN Connector

CN Label: **LAN**

CN Type: RJ-45

CN Pinouts: See **Table 3-1**

The LAN connector allows connection to an external network.

Pin	Description	Pin	Description
1	TRD1P0	5	TRD1P2
2	TRD1N0	6	TRD1N2
3	TRD1P1	7	TRD1P3
4	TRD1N1	8	TRD1N3

Table 3-1: LAN Pinouts

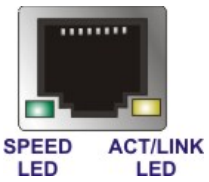


Figure 3-4: RJ-45 Ethernet Connector

The RJ-45 Ethernet connector has two status LEDs, one green and one yellow. The green LED indicates activity on the port and the yellow LED indicates the port is linked. See **Table 3-2**.

Activity/Link LED		Speed LED	
STATUS	**DESCRIPTION**	**STATUS**	**DESCRIPTION**
Off	No link	Off	10 Mbps connection
Yellow	Linked	Green	100 Mbps connection
Blinking	TX/RX activity	Orange	1 Gbps connection

Table 3-2: RJ-45 Ethernet Connector LEDs

3.4.4 OPS Connector

CN Type: 80-pin JAE connector

CN Pinouts: See **Table 3-3**

The OPS connector allows connection to an OPS compliant display.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DDP_3N	41	NC
2	DDP_3P	42	GND
3	GND	43	SATA_TXP
4	DDP_2N	44	SATA_TXN
5	DDP_2P	45	GND
6	GND	46	SATA_RXN
7	DDP_1N	47	SATA_RXC
8	DDP_1P	48	GND
9	GND	49	SLP_S3
10	DDP_0N	50	FANOUT

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
11	DDP_0P	51	UART_RXD
12	GND	52	UART_TXD
13	DDP_AUXN	53	GND
14	DDP_AUXP	54	USB3_SSRX-
15	DDP_HPD	55	USB3_SSRX+
16	GND	56	GND
17	TMDS_CLK-	57	USB3_SSTX-
18	TMDS_CLK+	58	USB3_SSTX+
19	GND	59	GND
20	TMDS_0-	60	USB2_PN2
21	TMDS_0+	61	USB2_PP2
22	GND	62	GND
23	TMDS_1-	63	USB2_PN1
24	TMDS_1+	64	USB2_PP2
25	GND	65	GND
26	TMDS_2-	66	USB2_PN0
27	TMDS_2+	67	USB2_PP0
28	GND	68	GND
29	DDC_DATA	69	Lineout_L
30	DDC_CLK	70	Lineout_R
31	HDMI_HPD	71	HDMI_CEC
32	GND	72	PB_DET
33	+12V	73	PS_ON#
34	+12V	74	PWR_STATUS
35	+12V	75	GND
36	+12V	76	GND
37	+12V	77	GND
38	+12V	78	GND
39	+12V	79	GND
40	+12V	80	GND

Table 3-3: OPS Connector (JAE1) Pinouts

3.4.5 RS-232 Serial Port Connector

CN Label: **Serial Port**

CN Type: RJ-45

CN Pinouts: See **Table 3-4**

The RS-232 serial port connector allows connection to a serial device.

Pin	Description	Pin	Description
1	DCD	7	DT
2	DSR	8	RI
3	SIN	9	GND
4	RTS	10	GND
5	SOUT	11	N/C
6	CTS	12	N/C

Table 3-4: Serial Port Pinouts

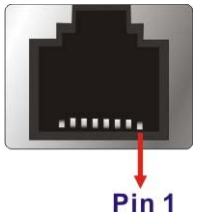


Figure 3-5: RJ-45 Serial Port Connector

Follow the steps below to connect a serial device to the RJ-45 serial port connector of the IOPS-Q67/H61.

Step 1: **Locate the RJ-45 serial port**. The location of the RJ-45 serial port is shown in **Chapter 1**.

Step 2: Connect the RJ-45 to COM port cable to the panel PC. Insert the RJ-45 connector end of cable into the RJ-45 serial port. See **Figure 3-6**.

Step 3: Connect the serial device. Connect a serial device to the DB-9 connector end of the cable. See **Figure 3-6**.

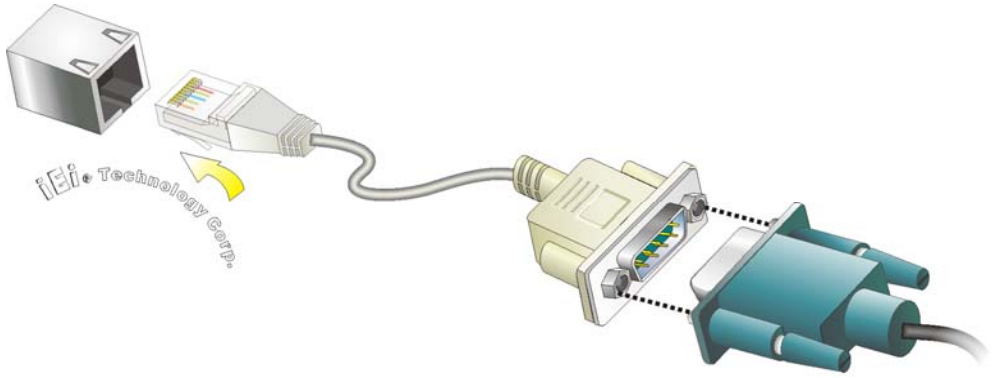


Figure 3-6: RJ-45 Serial Port Connection

Step 4: Secure the connector. Secure the serial device connector to the external interface by tightening the two retention screws on either side of the connector.

3.4.6 USB 2.0 Connectors

CN Label: **USB**

CN Type: USB 2.0 port

CN Pinouts: See **Table 3-5**

The USB ports are for connecting USB peripheral devices to the system.

Pin	Description	Pin	Description
1	VCC	5	VCC
2	DATA-	6	DATA-
3	DATA+	7	DATA+
4	GROUND	8	GROUND

Table 3-5: USB Port Pinouts

3.5 Driver Installation

NOTE:

The content of the CD may vary throughout the life cycle of the product and is subject to change without prior notice. Visit the IEI website or contact technical support for the latest updates.

The following drivers can be installed on the system:

- Intel AHCI
- Intel chipset
- Intel Ethernet
- Intel® HD Graphics
- Intel® MEI
- Realtek HD Audio

Double click the setup file in each driver folder and follow the step-by-step instruction of the installation wizard to install the drivers listed above.

Chapter

4

BIOS Screens

4.1 Introduction

The BIOS is programmed onto the BIOS chip. The BIOS setup program allows changes to certain system settings. This chapter outlines the options that can be changed.

4.1.1 Starting Setup

The UEFI BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. Press the **DEL** or **F2** key as soon as the system is turned on or
2. Press the **DEL** or **F2** key when the "**Press DEL or F2 to enter SETUP**" message appears on the screen.

If the message disappears before the **DEL or F2** key is pressed, restart the computer and try again.

4.1.2 Using Setup

Use the arrow keys to highlight items, press **ENTER** to select, use the PageUp and PageDown keys to change entries, press **F1** for help and press **ESC** to quit. Navigation keys are shown in.

Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
+	Increase the numeric value or make changes
-	Decrease the numeric value or make changes
Page Up key	Increase the numeric value or make changes
Page Dn key	Decrease the numeric value or make changes

Key	Function
Esc key	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
F1	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2	Previous values
F3	Load optimized defaults
F4	Save changes and Exit BIOS

Table 4-1: BIOS Navigation Keys

4.1.3 Getting Help

When **F1** is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window press **Esc** or the **F1** key again.

4.1.4 BIOS Menu Bar

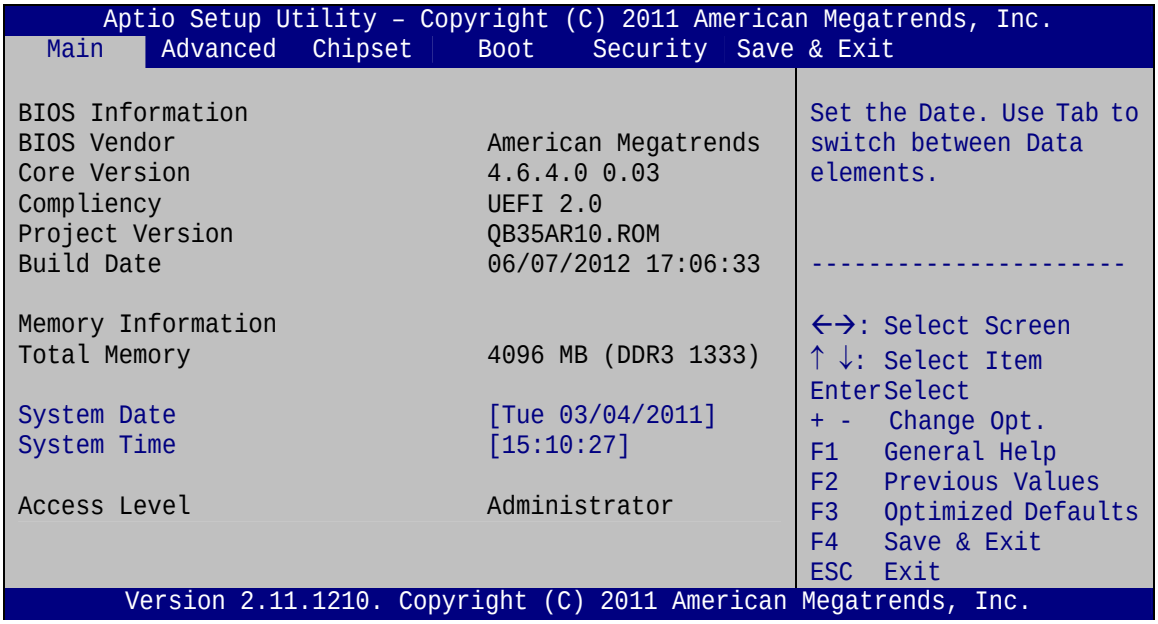
The **menu bar** on top of the BIOS screen has the following main items:

- Main – Changes the basic system configuration.
- Advanced – Changes the advanced system settings.
- Chipset – Changes the chipset settings.
- Boot – Changes the system boot configuration.
- Security – Sets User and Supervisor Passwords.
- Save & Exit – Selects exit options and loads default settings

The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

4.2 Main

The **Main** BIOS menu (**BIOS Menu 1**) appears when the **BIOS Setup** program is entered. The **Main** menu gives an overview of the basic system information.



BIOS Menu 1: Main

➔ System Overview

The **BIOS Information** lists a brief summary of the BIOS. The fields in **BIOS Information** cannot be changed. The items shown in the system overview include:

- **BIOS Vendor:** Installed BIOS vendor
- **Core Version:** Current BIOS version
- **Compliency:** Current compliant version
- **Project Version:** the board version
- **Build Date:** Date the current BIOS version was made

➔ Memory Information

The **Memory Information** lists a brief summary of the on-board memory. The fields in **Memory Information** cannot be changed.

- Total Memory: Displays the auto-detected system memory size and type.

The System Overview field also has two user configurable fields:

➔ **System Date [xx/xx/xx]**

Use the **System Date** option to set the system date. Manually enter the day, month and year.

➔ **System Time [xx:xx:xx]**

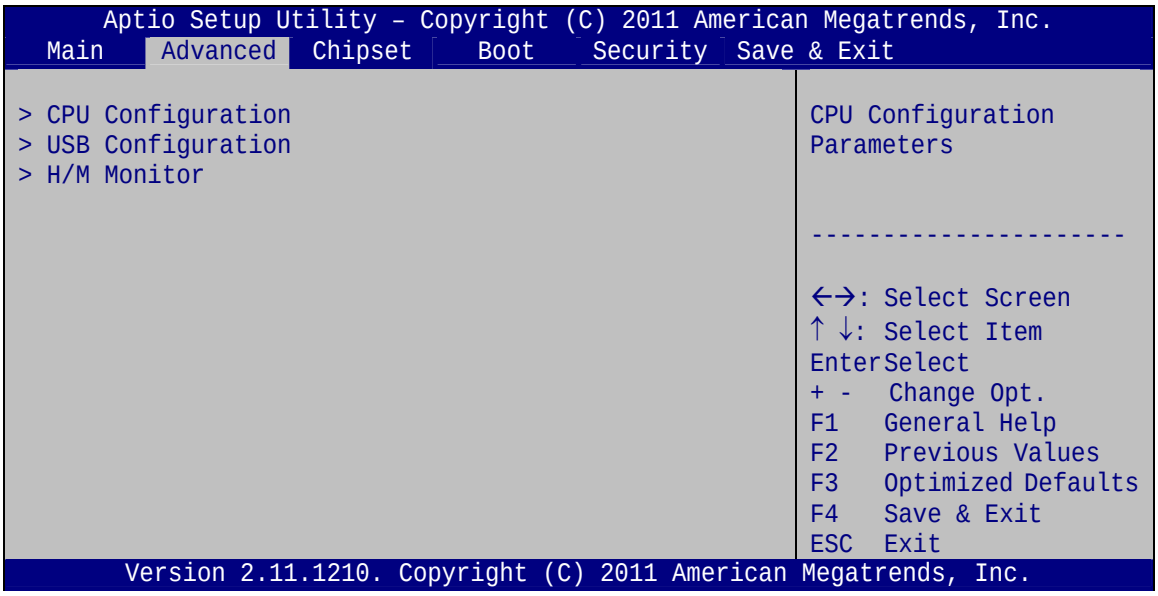
Use the **System Time** option to set the system time. Manually enter the hours, minutes and seconds.

4.3 Advanced

Use the **Advanced** menu (**BIOS Menu 2**) to configure the CPU and peripheral devices through the following sub-menus:

WARNING!

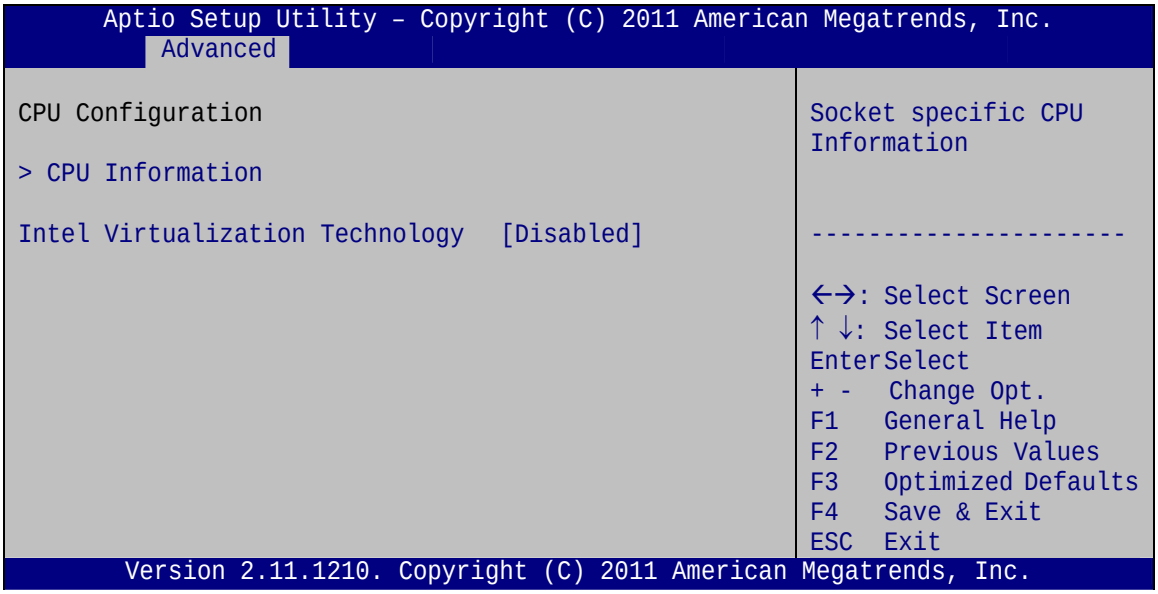
Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.



BIOS Menu 2: Advanced

4.3.1 CPU Configuration

Use the **CPU Configuration** menu (**BIOS Menu 3**) to enter the **CPU Information** submenu or enable Intel Virtualization Technology.



BIOS Menu 3: CPU Configuration

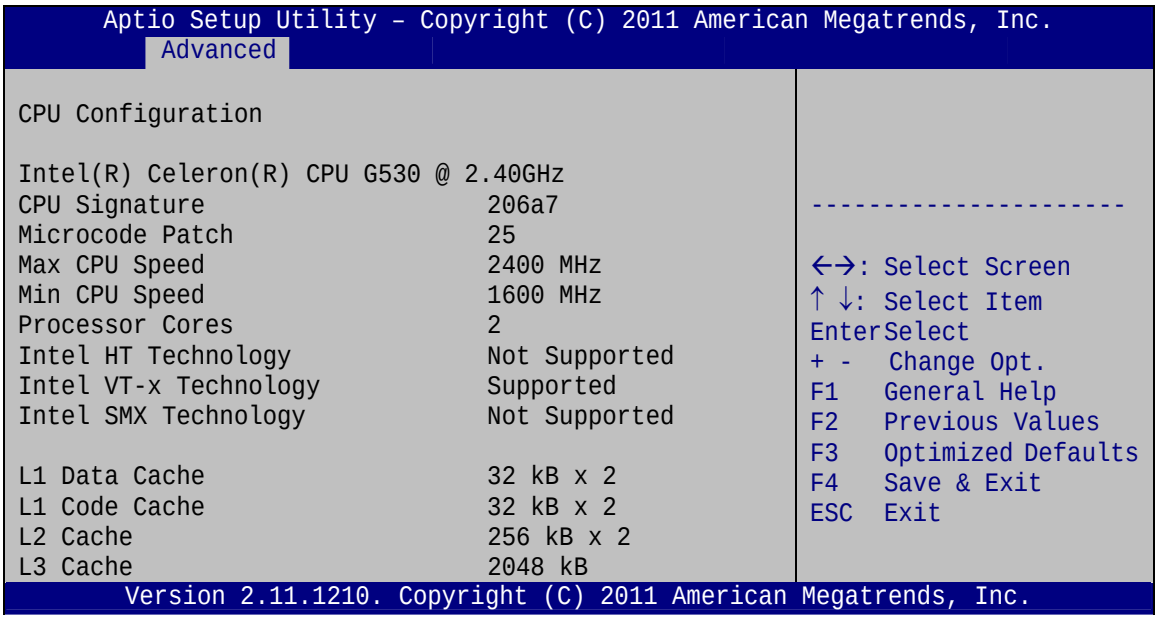
➔ **Intel Virtualization Technology [Disabled]**

Use the **Intel Virtualization Technology** option to enable or disable virtualization on the system. When combined with third party software, Intel® Virtualization technology allows several OSs to run on the same system at the same time.

➔ **Disabled**	**DEFAULT**	Disables Intel Virtualization Technology.
➔ **Enabled**		Enables Intel Virtualization Technology.

4.3.1.1 CPU Information

Use the **CPU Information** submenu (**BIOS Menu 4**) to view detailed CPU specifications and configure the CPU.



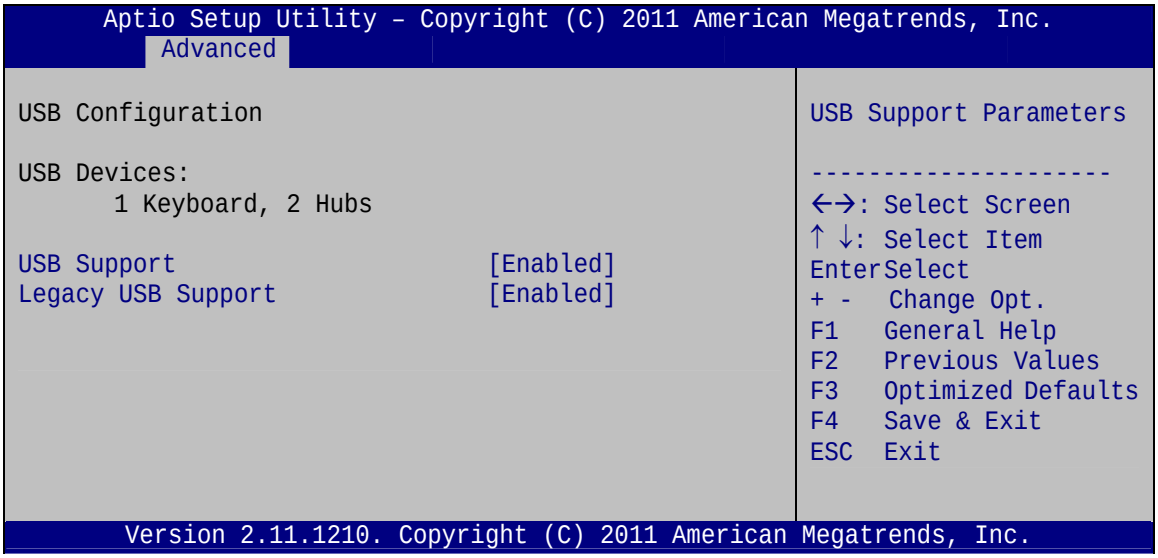
BIOS Menu 4: CPU Configuration

The CPU Configuration menu (**BIOS Menu 4**) lists the following CPU details:

- Processor Type: Lists the brand name of the CPU being used
- CPU Signature: Lists the CPU signature value.
- Microcode Patch: Lists the microcode patch being used.
- Max CPU Speed: Lists the maximum CPU processing speed.
- Min CPU Speed: Lists the minimum CPU processing speed.
- Processor Cores: Lists the number of the processor core
- Intel HT Technology: Indicates if Intel HT Technology is supported by the CPU.
- Intel VT-x Technology: Indicates if Intel VT-x Technology is supported by the CPU.
- Intel SMX Technology: Indicates if Intel SMX Technology is supported by the CPU.
- L1 Data Cache: Lists the amount of data storage space on the L1 cache.
- L1 Code Cache: Lists the amount of code storage space on the L1 cache.
- L2 Cache: Lists the amount of storage space on the L2 cache.
- L3 Cache: Lists the amount of storage space on the L3 cache.

4.3.2 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 5**) to read USB configuration information and configure the USB settings.



BIOS Menu 5: USB Configuration

➔ **USB Devices**

The **USB Devices Enabled** field lists the USB devices that are enabled on the system

➔ **USB Support [Enabled]**

Use the **USB Support** option to enable or disable USB support on the system.

➔ **Disabled**		USB support disabled
➔ **Enabled**	**DEFAULT**	USB support enabled

➔ **Legacy USB Support [Enabled]**

Use the **Legacy USB Support** BIOS option to enable USB mouse and USB keyboard support. Normally if this option is not enabled, any attached USB mouse or USB keyboard does not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB

keyboard can control the system even when there is no USB driver loaded onto the system.

➔	**Enabled**	**DEFAULT**	Legacy USB support enabled
➔	**Disabled**		Legacy USB support disabled
➔	**Auto**		Legacy USB support disabled if no USB devices are connected

4.3.3 H/W Monitor

The H/W Monitor menu (**BIOS Menu 6**) contains the fan configuration submenus and displays operating temperature, fan speeds and system voltages.

```
Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
        Advanced
H/W Monitor

CPU Temperature                 :+61 C
CPU FAN Speed                   :3006 RPM
VCC3V                           :+3.392 V
V_CORE                          :+1.200 V
V_1.05                          :+1.064 V
V_MEM                           :+1.616 V
VSB3                            :+3.392 V
VBAT                            :+3.008 V
5VSB                            :+4.920 V

CPU Smart Fan control           [Enabled]

                                ---------------------
                                ←→: Select Screen
                                ↑ ↓: Select Item
                                EnterSelect
                                + -   Change Opt.
                                F1    General Help
                                F2    Previous Values
                                F3    Optimized Defaults
                                F4    Save & Exit
                                ESC   Exit
Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 6: H/W Monitor

➔ **H/W Monitor**

The following system parameters and values are shown. The system parameters that are monitored are:

- CPU Temperature
- CPU Fan Speed
- Voltages:

- VCC3V
- V_CORE
- V_1.05
- V_MEM
- VSB3
- VBAT
- 5VSB

➔ **CPU Smart Fan control [Enabled]**

Use the **CPU Smart Fan control** option to disable or enable the CPU Smart Fan.

➔	**Enabled**	**DEFAULT**	The CPU smart fan is enabled.
➔	**Disabled**		The CPU smart fan is disabled.

4.4 Chipset

Use the **Chipset** menu (**BIOS Menu 7**) to configure the system chipset.

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

IGD Memory                      [128M]          IGD Share Memory Size
DVMT Memory                     [Maximum]
SATA Mode                       [IDE Mode]
Restore AC Power Loss           [Power On]      ---------------------
                                                ←→: Select Screen
                                                ↑ ↓: Select Item
                                                EnterSelect
                                                + -   Change Opt.
                                                F1    General Help
                                                F2    Previous Values
                                                F3    Optimized Defaults
                                                F4    Save & Exit
                                                ESC   Exit
      Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 7: Chipset

➔ **IGD Memory [128 M]**

Use the **IGD Memory** option to specify the amount of system memory that can be used by the Internal graphics device.

➔ **Disable**		
➔ **32 M**		32 MB of memory used by internal graphics device
➔ **64 M**		64 MB of memory used by internal graphics device
➔ **96 M**		96 MB of memory used by internal graphics device
➔ **128 M**	**DEFAULT**	128 MB of memory used by internal graphics device
➔ **160 M**		160 MB of memory used by internal graphics device
➔ **192 M**		192 MB of memory used by internal graphics device
➔ **224 M**		224 MB of memory used by internal graphics device
➔ **256 M**		256 MB of memory used by internal graphics device
➔ **288 M**		288 MB of memory used by internal graphics device
➔ **320 M**		320 MB of memory used by internal graphics device
➔ **352 M**		352 MB of memory used by internal graphics device
➔ **384 M**		384 MB of memory used by internal graphics device
➔ **416 M**		416 MB of memory used by internal graphics device
➔ **448 M**		448 MB of memory used by internal graphics device

➔ **480 M**	480 MB of memory used by internal graphics device
➔ **512 M**	512 MB of memory used by internal graphics device
➔ **1024 M**	1024 MB of memory used by internal graphics device

➔ **DVMT Memory [Maximum]**

Use the **DVMT Memory** option to specify the maximum amount of memory that can be allocated as graphics memory. Configuration options are listed below.

- 128 MB
- 256 MB
- Maximum **DEFAULT**

➔ **SATA Mode [IDE Mode]**

Use the **SATA Mode** option to configure SATA devices as normal IDE devices.

➔ **Disable**		Disables SATA devices.
➔ **IDE Mode**	**DEFAULT**	Configures SATA devices as normal IDE device.
➔ **AHCI Mode**		Configures SATA devices as AHCI device.
➔ **RAID Mode**		Configures SATA devices as RAID device.

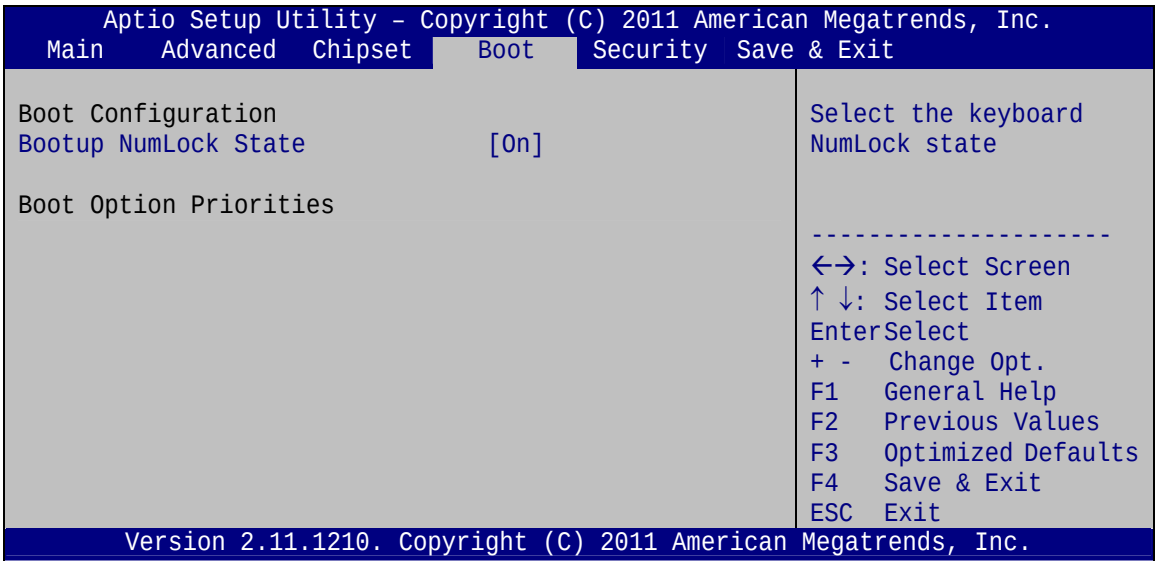
➔ **Restore on AC Power Loss [Power Off]**

Use the **Restore on AC Power Loss** BIOS option to specify what state the system returns to if there is a sudden loss of power to the system.

➔ **Power Off**		The system remains turned off
➔ **Power On**	**DEFAULT**	The system turns on
➔ **Last State**		The system returns to its previous state. If it was on, it turns itself on. If it was off, it remains off.

4.5 Boot

Use the **Boot** menu (**BIOS Menu 8**) to configure system boot options.



BIOS Menu 8: Boot

➔ **Bootup NumLock State [On]**

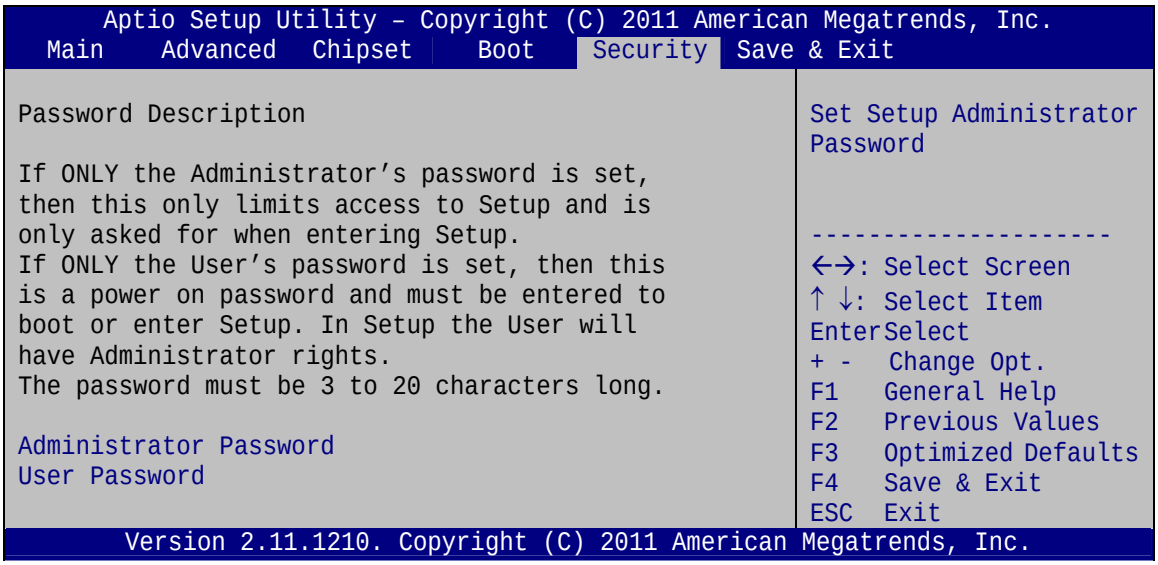
Use the **Bootup NumLock State** BIOS option to specify if the number lock setting must be modified during boot up.

➔ **On** **DEFAULT** Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit.

➔ **Off** Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged.

4.6 Security

Use the **Security** menu (**BIOS Menu 9**) to set system and user passwords.



BIOS Menu 9: Security

➔ **Administrator Password**

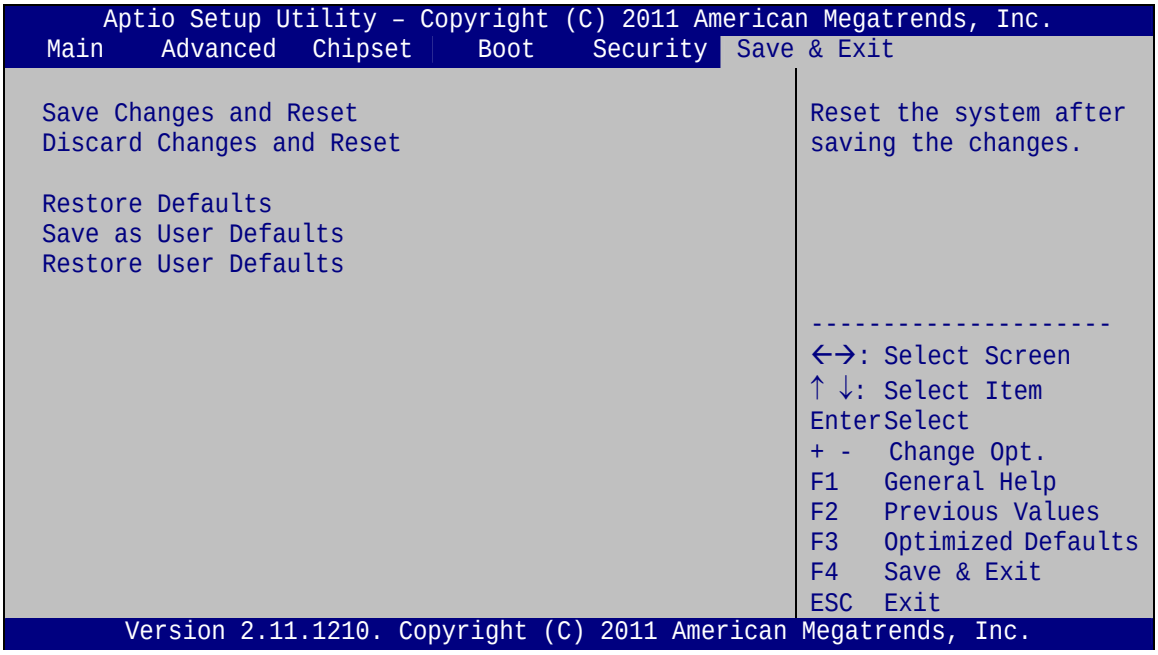
Use the **Administrator Password** to set or change a administrator password.

➔ **User Password**

Use the **User Password** to set or change a user password.

4.7 Exit

Use the **Exit** menu (**BIOS Menu 10**) to load default BIOS values, optimal failsafe values and to save configuration changes.



BIOS Menu 10:Exit

➔ **Save Changes and Reset**

Use the **Save Changes and Reset** option to save the changes made to the BIOS options and reset the system.

➔ **Discard Changes and Reset**

Use the **Discard Changes and Reset** option to exit the system without saving the changes made to the BIOS configuration setup program.

➔ **Restore Defaults**

Use the **Restore Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F3 key can be used for this operation.**

➔ **Save as User Defaults**

Use the **Save as User Defaults** option to save the changes done so far as user defaults.

➔ **Restore User Defaults**

Use the **Restore User Defaults** option to restore the user defaults to all the setup options.

Chapter

5

Maintenance

WARNING:

Take Anti-Static precautions whenever maintenance is being carried out on the system components. Failure to take anti-static precautions can cause permanent system damage. For more details on anti-static precautions, please refer to **Section 2.1**.

5.1 System Maintenance Overview

NOTE:

When doing maintenance operations on the system, please follow the instructions in this chapter. Failure to follow these instructions may lead to personal injury and system damage.

To preserve the working integrity of the IOPS-Q67/H61, the system must be properly maintained. If internal components need replacement, the proper maintenance procedures must be followed to ensure the system can continue to operate normally.

5.2 Component Replacement Procedure

WARNING!

Users are not advised to attempt to repair or replace any internal or external components of the IOPS-Q67/H61 embedded system other than those listed below. If any other components fail or need replacement, contact the IEI reseller or vendor you purchased the IOPS-Q67/H61 from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

The system components listed below can all be replaced if they fail:

- SO-DIMM module
- mSATA module (see **Section 5.2.1**)

5.2.1 mSATA Replacement

The IOPS-Q67/H61 is preinstalled with one mSATA module. To replace the mSATA module, please refer to the diagram and instructions below.

Step 1: **Open the system cover** by removing the retention screws shown on **Figure 5-1**.

Figure 5-1: System Cover Retention Screws

Step 2: Locate the full-size PCIe Mini card slot on the motherboard (**Figure 5-2**).

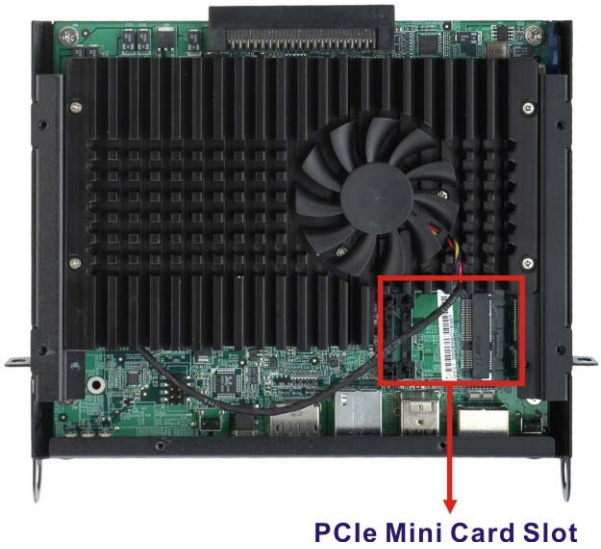


Figure 5-2: PCIe Mini Card Slot Location

Step 3: **Remove the mSATA module**. Push the two spring clips in to release the mSATA module.

Step 4: **Insert a new mSATA module into the socket at an angle**. Line up the notch on the card with the notch on the connector. Slide the mSATA module into the socket at an angle of about 20º (**Figure 5-3**).

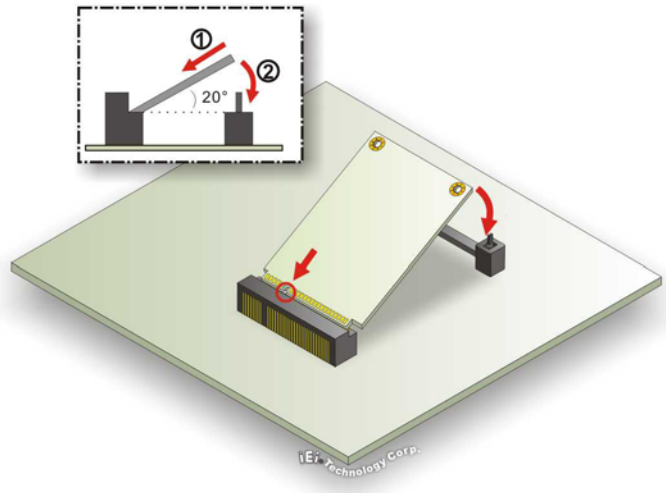


Figure 5-3: mSATA Module Installation

Step 5: **Push down until the card clips into place**. Push the other end of the card down until it clips into place on the plastic connector.

5.2.2 SO-DIMM Replacement

WARNING:

Using incorrectly specified SO-DIMM may cause permanently damage the IOPS-Q67/H61. Please make sure the purchased SO-DIMM complies with the memory specifications of the IOPS-Q67/H61.

To replace a SO-DIMM memory module into a SO-DIMM socket, please follow the steps below.

Step 1: **Remove the SO-DIMM access panel.** Place the IOPS-Q67/H61 on an anti-static pad with the bottom panel facing up. Remove the SO-DIMM access panel retention screw shown in **Figure 5-4**.

Figure 5-4: SO-DIMM Access Panel Retention Screw

Step 2: **Remove the SO-DIMM access panel** and locate the SO-DIMM.

Step 3: **Remove the SO-DIMM** by releasing the arms on the SO-DIMM socket. (**Figure 5-5**).

Figure 5-5: SO-DIMM Removal

Step 4: **Align the new SO-DIMM with the socket**. The SO-DIMM must be oriented in such a way that the notch in the middle of the SO-DIMM must be aligned with the plastic bridge in the socket (**Figure 5-6**).

Step 5: **Insert the SO-DIMM**. Push the SO-DIMM chip into the socket at an angle (**Figure 5-6**).

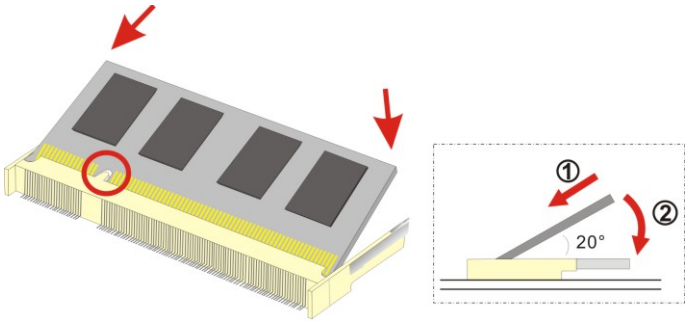


Figure 5-6: SO-DIMM Installation

Step 6: **Secure the SO-DIMM**. Press the SO-DIMM down until the arms of the SO-DIMM socket clip into place and secure the SO-DIMM in the socket.

Chapter

6

Interface Connectors

6.1 Peripheral Interface Connectors

The IOPS-Q67/H61 series' motherboard comes with a number of peripheral interface connectors and configuration jumpers. The connector locations are shown in **Figure 6-1** and **Figure 6-2**. The Pin 1 locations of the on-board connectors are also indicated in the diagrams below. The connector pinouts for these connectors are listed in the following sections.

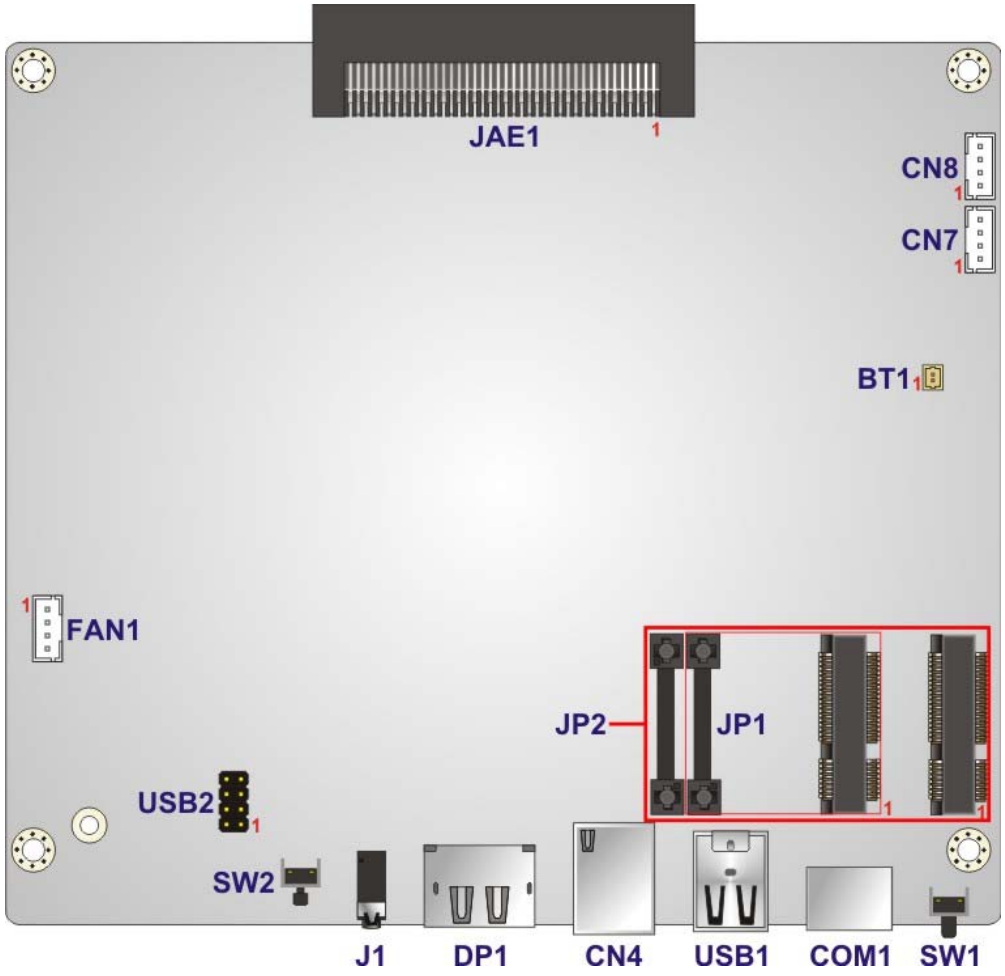


Figure 6-1: Main Board Layout Diagram (Front Side)

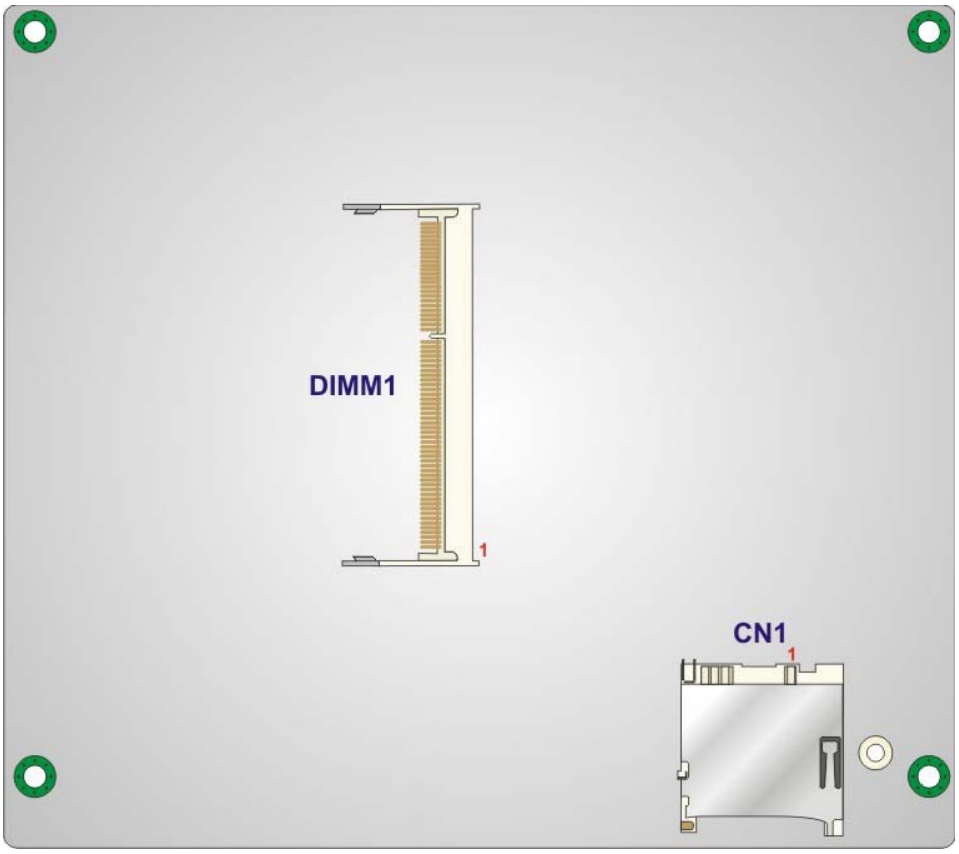


Figure 6-2: Main Board Layout Diagram (Solder Side)

6.2 Internal Peripheral Connectors

Internal peripheral connectors are found on the motherboard and are only accessible when the motherboard is outside of the chassis. The table below shows a list of the peripheral interface connectors on the IOPS-Q67/H61 motherboard. Pinouts of these connectors can be found in the following sections.

Connector	Type	Label
Battery connector	2-pin wafer	BT1
Debug connector	4-pin wafer	CN7, CN8
Fan connector	4-pin wafer	FAN1
GPIO87 to SIO connector	Push button	SW2
PCIe Mini card slots	Half-size PCIe Mini card slot	JP1

Connector	Type	Label
PCIe Mini card slots	Full-size PCIe Mini card slot	JP2
SD card slot	SD card slot	CN1
SO-DIMM connector	SO-DIMM connector	DIMM1
USB DOM connector	8-pin header	USB2

Table 6-1: Peripheral Interface Connectors

6.2.1 Battery Connector (BT1)

PIN NO.	DESCRIPTION
1	BATT
2	GND

Table 6-2: Battery Connector (BT1) Pinouts

6.2.2 Fan Connector (FAN1)

PIN NO.	DESCRIPTION
1	GND
2	+12V
3	FB
4	PWM

Table 6-3: Fan Connector (FAN1) Pinouts

6.2.3 GPIO87 to SIO Connector (SW2)

PIN NO.	DESCRIPTION
1	NC
2	GPIO
3	GND
4	NC

Table 6-4: GPIO87 to SIO Connector (SW2) Pinouts

6.2.4 Half-Size PCIe Mini Slot (JP1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	PCIE-WAKE	2	+3.3V
3	N/C	4	GND
5	N/C	6	+1.5V
7	N/C	8	N/C
9	GND	10	N/C
11	PCIE_CLK-	12	N/C
13	PCIE_CLK+	14	N/C
15	GND	16	N/C
17	RESET	18	GND
19	N/C	20	+3.3V
21	GND	22	RESET
23	PCIE_RN4	24	+3.3V
25	PCIE_RP4	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PCIE_TN4	32	SMB_DATA
33	PCIE_TP4	34	GND
35	GND	36	-USBP
37	GND	38	+USBP
39	+3.3V	40	GND
41	+3.3V	42	N/C
43	GND	44	N/C
45	N/C	46	N/C
47	N/C	48	+1.5V
49	N/C	50	GND
51	N/C	52	+3.3V

Table 6-5: Half-Size PCIe Mini Card Slot (JP1) Pinouts

6.2.5 Full-Size PCIe Mini Slot (JP2)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	N/C	2	+3.3V
3	N/C	4	GND
5	N/C	6	N/C
7	N/C	8	N/C
9	GND	10	N/C
11	N/C	12	N/C
13	N/C	14	N/C
15	GND	16	N/C
17	N/C	18	GND
19	N/C	20	N/C
21	GND	22	N/C
23	SATA_RXP	24	+3.3V
25	SATA_TXP	26	GND
27	GND	28	N/C
29	GND	30	N/C
31	SATA_TXN	32	N/C
33	SATA_TXP	34	GND
35	GND	36	N/C
37	GND	38	N/C
39	+3.3V	40	GND
41	+3.3V	42	N/C
43	GND	44	N/C
45	N/C	46	N/C
47	N/C	48	N/C
49	N/C	50	GND
51	N/C	52	+3.3V

Table 6-6: Full-Size PCIe Mini Card Slot (JP2) Pinouts

6.2.6 USB DOM Connector (USB2)

PIN NO.	DESCRIPTION
1	+5V
2	DATA-
3	DATA+
4	GND
5	N/C
6	N/C
7	N/C
8	N/C

Table 6-7: USB DOM Connector (USB2) Pinouts

Appendix

A

Safety Precautions

WARNING:

The precautions outlined in this chapter should be strictly followed. Failure to follow these precautions may result in permanent damage to the IOPS-Q67/H61.

A.1 Safety Precautions

Please follow the safety precautions outlined in the sections that follow:

A.1.1 General Safety Precautions

Please ensure the following safety precautions are adhered to at all times.

- ***Follow the electrostatic precautions*** outlined below whenever the IOPS-Q67/H61 is opened.
- ***Make sure the power is turned off and the power cord is disconnected*** whenever the IOPS-Q67/H61 is being installed, moved or modified.
- ***Do not apply voltage levels that exceed the specified voltage range***. Doing so may cause fire and/or an electrical shock.
- ***Electric shocks can occur*** if the IOPS-Q67/H61 chassis is opened when the IOPS-Q67/H61 is running.
- ***Do not drop or insert any objects*** into the ventilation openings of the IOPS-Q67/H61.
- ***If considerable amounts of dust, water, or fluids enter the IOPS-Q67/H61***, turn off the power supply immediately, unplug the power cord, and contact the IOPS-Q67/H61 vendor.
- **DO NOT**:
  - Drop the IOPS-Q67/H61 against a hard surface.
  - In a site where the ambient temperature exceeds the rated temperature

A.1.2 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the IOPS-Q67/H61 may result in permanent damage to the IOPS-Q67/H61 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the IOPS-Q67/H61. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the IOPS-Q67/H61 is opened and any of the electrical components are handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: Wearing a simple anti-static wristband can help to prevent ESD from damaging any electrical component.
- ***Self-grounding***: Before handling any electrical component, touch any grounded conducting material. During the time the electrical component is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring or working with an electrical component, place it on an antic-static pad. This reduces the possibility of ESD damage.
- ***Only handle the edges of the electrical component***: When handling the electrical component, hold the electrical component by its edges.

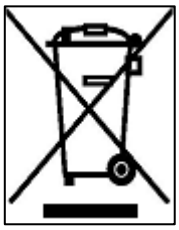
A.1.3 Product Disposal

CAUTION:

Risk of explosion if battery is replaced by and incorrect type. Only certified engineers should replace the on-board battery.

Dispose of used batteries according to instructions and local regulations.

- Outside the European Union - If you wish to dispose of used electrical and electronic products outside the European Union, please contact your local authority so as to comply with the correct disposal method.
- Within the European Union:



EU-wide legislation, as implemented in each Member State, requires that waste electrical and electronic products carrying the mark (left) must be disposed of separately from normal household waste. This includes monitors and electrical accessories, such as signal cables or power cords. When you need to dispose of your display products, please follow the guidance of your local authority, or ask the shop where you purchased the product. The mark on electrical and electronic products only applies to the current European Union Member States.

Please follow the national guidelines for electrical and electronic product disposal.

A.2 Maintenance and Cleaning Precautions

When maintaining or cleaning the IOPS-Q67/H61, please follow the guidelines below.

A.2.1 Maintenance and Cleaning

Prior to cleaning any part or component of the IOPS-Q67/H61, please read the details below.

- The interior of the IOPS-Q67/H61 does not require cleaning. Keep fluids away from the IOPS-Q67/H61 interior.
- Be cautious of all small removable components when vacuuming the IOPS-Q67/H61.
- Turn the IOPS-Q67/H61 off before cleaning the IOPS-Q67/H61.
- Never drop any objects or liquids through the openings of the IOPS-Q67/H61.
- Be cautious of any possible allergic reactions to solvents or chemicals used when cleaning the IOPS-Q67/H61.
- Avoid eating, drinking and smoking within vicinity of the IOPS-Q67/H61.

A.2.2 Cleaning Tools

Some components in the IOPS-Q67/H61 may only be cleaned using a product specifically designed for the purpose. In such case, the product will be explicitly mentioned in the cleaning tips. Below is a list of items to use when cleaning the IOPS-Q67/H61.

- ***Cloth*** – Although paper towels or tissues can be used, a soft, clean piece of cloth is recommended when cleaning the IOPS-Q67/H61.
- ***Water or rubbing alcohol*** – A cloth moistened with water or rubbing alcohol can be used to clean the IOPS-Q67/H61.
- ***Using solvents*** – The use of solvents is not recommended when cleaning the IOPS-Q67/H61 as they may damage the plastic parts.
- ***Vacuum cleaner*** – Using a vacuum specifically designed for computers is one of the best methods of cleaning the IOPS-Q67/H61. Dust and dirt can restrict the airflow in the IOPS-Q67/H61 and cause its circuitry to corrode.
- **Cotton swabs** - Cotton swaps moistened with rubbing alcohol or water are excellent tools for wiping hard to reach areas.
- **Foam swabs** - Whenever possible, it is best to use lint free swabs such as foam swabs for cleaning.

Appendix

B

BIOS Menu Options

B.1 BIOS Configuration Options

Below is a list of BIOS configuration options described in **Chapter 5**.

Appendix

C

Watchdog Timer

NOTE:

The following discussion applies to DOS environment. IEI support is contacted or the IEI website visited for specific drivers for more sophisticated operating systems, e.g., Windows and Linux.

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMI or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer:

INT 15H:

AH – 6FH Sub-function:	
AL – 2:	Sets the Watchdog Timer's period.
BL:	Time-out value (Its unit-second is dependent on the item "Watchdog Timer unit select" in CMOS setup).

Table C-1: AH-6FH Sub-function

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. While the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the Watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

NOTE:

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system resets.

Example program:

```
; INITIAL TIMER PERIOD COUNTER
;
W_LOOP:

        MOV     AX, 6F02H       ;setting the time-out value
        MOV     BL, 30          ;time-out value is 48 seconds
        INT      15H
 ;
; ADD THE APPLICATION PROGRAM HERE
;
        CMP      EXIT_AP, 1     ;is the application over?
        JNE      W_LOOP         ;No, restart the application

        MOV     AX, 6F02H       ;disable Watchdog Timer
        MOV     BL, 0           ;
        INT      15H
;
; EXIT ;
```