FSB-960H

Intel® Core™ 2 Duo
LGA 775 Processor
Full-size CPU Card
With DDRII, Ethernet,
IDE/ PCI/ PCI-Express

FSB-960H   Manual Rev.A 2nd Ed.
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Packing List

Before you begin installing your card, please make sure that the following materials have been shipped:

- **1709070800**   SATA Cable
- **1701340704**   Flat Cable
- **1701400453**   ATA-100 Cable
- **1700060192**   Keyboard and Mouse Cable
- **1701260307**   Flat Cable
- **1701100305**   Flat Cable with bracket
- **1709100201**   USB Cable w/ Bracket
- **Quick Installation Guide**
- **CD-ROM for manual (in PDF format) and drivers**
- **FSB-960H CPU Card**

If any of these items should be missing or damaged, please contact your distributor or sales representative immediately.

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Chapter

1

General Information

1.1 Introduction

AAEON, a leading Industrial PC manufacturer, announces the debut of a high performance full-size Single Board Computer, the FSB-960H. AAEON has developed this full-size SBC based on the latest Intel® Q35 Express chipset and the Intel® Core™2 Duo processor, to fulfill the increasing demands of multi-core processing.

The FSB-960H adopts Intel's dual-core processor at current speeds up to 2.13 GHz with 1066MHz FSB to meet a wide range of performance requirements.   In a PICMG 1.3 SHB Express form factor the FSB-960H system host board takes full advantage of the Intel® Q35 Express chipset for enhanced system performance and generous expansion capabilities.   Considerable bandwidth is available with point-to-point serial PCI Express via 〔x16〕and〔x4〕interfaces. Maximizing the available PCI Express channels offers the greatest flexibility to today's demanding I/O requirements. Two DIMM slots of dual channel DDR II 800 RAM provide ample memory bus bandwidth for demanding applications.   The FSB-960H has been designed for users that require high performance and reliability for critical applications.

1.2 Features

- Intel Core™ 2 Duo/ Wolfdale LGA775 CPU up to 2.13GHz, FSB 800/1066/1333MHz
- DDR II 667/800 Memory Support Up to 4GB
- Integrated Intel Enhanced Graphics Core, VGA Support
- 10/100/1000Base-TX Ethernet x 2 (10/100 & GbE Optional)
- PCI-Express〔x16〕x1 and PCI-Express〔x4〕x1 Link to Backplane
- USB2.0 x 11/ RS-232/422/485 x 1/ RS-232 x 1/ Parallel x 1/ IrDA Port x 1
- SATA II Port x 2 (RAID), CompactFlash Type II
- Compliance with PICMG 1.3
- Intel AMT with Circuit Breaker

1.3 Specification

System

- CPU: Supports Intel® Core 2 Duo/ Wolfdale LGA775 Processor up to 2.13GHz (FSB 800/1066/1333MHz)

- Chipset: Intel® Q35 + Intel® ICH9R (ICH9DO)

- System Memory: 240-pin 1.8V DDRII DIMM Socket x 2, total up to 4GB Support Dual-Channel DDRII 667/800 Memory

- VGA Controller: Enhanced Integrated Graphics

- Ethernet: PCI-Express x 1 10/100Mb or 10/100/1000Mb LAN optional, RJ-45 Connector x 2, Intel 82566X/ 82562V/ 82573V/E Controller

- BIOS: Award Plug & Play SPI BIOS – 16Mb ROM

- Audio (Daughter board): Audio Codec, MIC-in/ Line-in/ Line-out/ CD-in

- IDE Interface: IDE Slot x 1 (SATA to IDE)

Full-size SBC	FSB-960H

- Expansion Interface: PCI x 3/ PCI-Express〔x4〕x 1 / PCI-Express〔x16〕Connector x 1
- SSD: Supports CompactFlash™ type II connector x 1
- IR Interface: Supports IrDA header x 1
- Universal Serial Bus: USB 2.0 Port on CPU Card x 7; 5x2 pin header for internal x 3; Type-A connector onboard x 1; USB2.0 Port to Backplane x 4
- Watchdog Timer: 1~255 Step, can be set with software on Super I/O
- RTC: Internal RTC
- Power Supply Voltage: ATX, ATX +12V
- Battery: Lithium battery
- Power Requirement: ATX12V connector, other from backplanes
- Board Size: 13.3" (L) x 4.98" (W) (3338.58mm x 126.39mm)
- Operation Temp.: 32°F~140°F (0°C ~60°C)

Display

- VGA Controller: Enhanced Integrated Graphics

- Memory: Shared memory up to 256M
- Resolutions: Up to 1920 x 1200 @85MNz for CRT; Up to 1600 x 1200 @60MHz for LCD

I/O

- FDD Interface: Standard FDD port x 1 (supports up to 1 floppy device)
- Serial Port: Two COM ports: (Internal pin header x 2) COM 1: RS-232 COM 2: RS-232/422/485
- Parallel Port: Supports SPP/EPP/ECP mode
- Keyboard & Mouse connector:

    Mini-DIN for PS/2 Keyboard and mouse connector x 1; Internal keyboard pin header x 1

Chapter

2

Quick Installation Guide

Notice:
The Quick Installation Guide is derived from Chapter 2 of user manual. For other chapters and further installation instructions, please refer to the user manual CD-ROM that came with the product.

OZONE SAFE

RECYCLABLE

2.1 Safety Precautions

Warning!

Always completely disconnect the power cord from your board whenever you are working on it. Do not make connections while the power is on, because a sudden rush of power can damage sensitive electronic components.

Caution!

Always ground yourself to remove any static charge before touching the board. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis

2.2 Location of Connectors and Jumpers

2.3 Mechanical Drawing
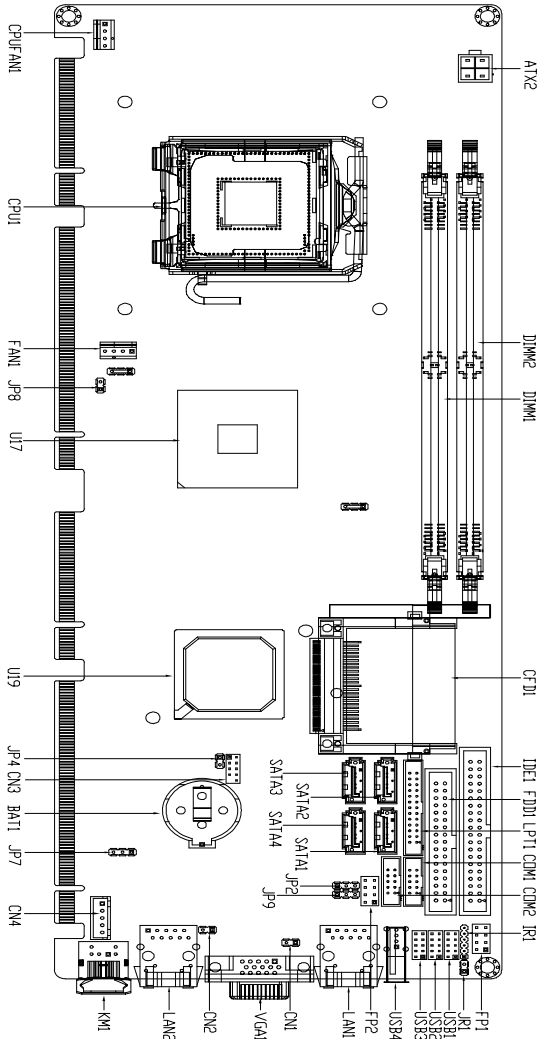
2.4 List of Jumpers

The board has a number of jumpers that allow you to configure your system to suit your application.

The table below shows the function of each of the board's jumpers:

Jumpers

Label	Function
JP1	Intruder
JP2	TPM
JP4	MFG
JP7	Clear CMOS
JP8	BIOS Boot Device
JP9	Reset Select For Future

2.5 List of Connectors

The board has a number of connectors that allow you to configure your system to suit your application. The table below shows the function of each board's connectors:

Label	Function
FP1	Front Panel Connector 1
FP2	Front Panel Connector 2
ATX2	ATX Power_12V Connector
VGA1	VGA Display Connector
FDD1	Floppy Connector
IDE1	EIDE Connector **Note:** Supports one IDE device only (master).
SATA1~4	Serial ATA Connector
CFD1	Compact Flash Slot
COM1	RS-232 Serial Port Connector
COM2	RS-232/422/485 Serial Port Connector
IR1	IrDA Connector
LPT1	LPT Port Connector
USB1~3	USB Connector
USB4	USB Connector
LAN1	10/100 or 100/1000 Base-TX Ethernet Connector
LAN2	10/100/1000 Base-TX Ethernet Connector
DIMM1~2	DDR2 DIMM Slot
FAN1	Fan Connector
CPUFAN1	Fan Connector
KM1	PS2 Keyboard/Mouse Connector

CN1	LAN 1 Active LED Connector
CN2	LAN 2 Active LED Connector
CN3	HDA Connector
CN4	Internal Keyboard Connector

2.6 Setting Jumpers

You configure your card to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To "close" a jumper you connect the pins with the clip.

To "open" a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2 and 3. In this case you would connect either pins 1 and 2 or 2 and 3.

Open　　　　**Closed**　　　　**Closed 2-3**
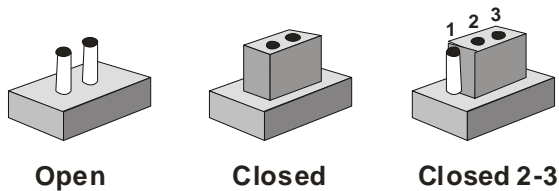
A pair of needle-nose pliers may be helpful when working with jumpers.

If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any change.

Generally, you simply need a standard cable to make most connections.

2.7 Clear CMOS (JP1)

JP1	Function
1-2	Clear CMOS
2-3	Normal (default)

2.8 TPM Selection (JP2)

JP2	Function
1-2	Special Commands
2-3	Normal (default)

2.9 MFG Selection (JP4)

JP4	Function
Close	Un-update BIOS/MAC
Open	Normal (default)

2.10 BIOS Boot Device (JP8)

JP8	Function
Close	Normal (SPI) (default)
Open	FWH

2.11 Front Panel Connector (FP1)

Pin	Signal	Pin	Signal
1	Power On Button (+)	2	Reset Switch (+)
3	Power On Button (-)	4	Reset Switch (-)
5	IDE LED (+)	6	Power LED (+)
7	IDE LED (-)	8	Power LED (-)

2.12 Front Panel Connector (FP2)

Pin	Signal	Pin	Signal
1	External Speaker (+)	2	Key Board Lock (+)
3	NC	4	GND
5	Internal Buzzer (-)	6	I2C Bus SMB Clock
7	External Speaker (-)	8	I2C Bus SMB Data

<u>Note:</u> Pin 5, 7 closed: Internal Buzzer Enable

2.13 RS-232 Serial Port Connector (COM1)

Pin	Signal	Pin	Signal
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI	10	N.C.

2.14 RS-232/422/485 Serial Port Connector (COM2)

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	10	N.C

2.15 IrDA Connector (IR1)

Pin	Signal
1	+5V
2	N.C.

3	IRRX
4	GND
5	IRTX
6	N.C.

2.16 LPT Port Connector (LPT1)

Pin	Signal	Pin	Signal
1	#STROBE	2	#AFD
3	DATA0	4	#ERROR
5	DATA1	6	#INIT
7	DATA2	8	#SLIN
9	DATA3	10	GND
11	DATA4	12	GND
13	DATA5	14	GND
15	DATA6	16	GND
17	DATA7	18	GND
19	#ACK	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SELECT	26	GND

2.17 USB Connector (USB1~3)

Pin	Signal	Pin	Signal
1	+5V	2	GND
3	USBD1-	4	GND
5	USBD1+	6	USBD2+
7	GND	8	USBD2-
9	GND	10	+5V

2.18 Fan Connector (FAN1, CPUFAN1)

Pin	Signal
1	GND
2	+12V
3	Speed Sense
4	PWM CTRL

2.19 PS2 Keyboard/ Mouse Connector (KM1)

Pin	Signal
1	KB_DATA
2	MS-DATA
3	GND
4	+5V
5	KB_CLK
6	MS_CLK

2.20 LAN LED Connector (CN1~2)

Pin	Signal	Pin	Signal
1	Link _ACK LED (+)	2	Link _ACK LED (-)

2.21 HDA Connector (CN3)

Pin	Signal	Pin	Signal
1	AC_RST-	2	AC_SYNC
3	AC_DAIN2	4	AC_DAOUT
5	GND	6	AC_BCLK
7	AUDIO_DET#	8	+5V
9	Lock	10	+3.3V

2.22 Internal Keyboard Connector (CN4)

Pin	Signal
1	KB_CLK
2	KB_DATA
3	N.C
4	GND
5	+5V

Below Table for China RoHS Requirements
产品中有毒有害物质或元素名称及含量

AAEON Main Board/ Daughter Board/ Backplane

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷电路板 及其电子组件	×	○	○	○	○	○
外部信号 连接器及线材	×	○	○	○	○	○

O：表示该有毒有害物质在该部件所有均质材料中的含量均在
  SJ/T 11363-2006 标准规定的限量要求以下。

X：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出
  SJ/T 11363-2006 标准规定的限量要求。

备注：此产品所标示之环保使用期限，系指在一般正常使用状况下。

Chapter

3

Award BIOS Setup

3.1   System Test and Initialization

These routines test and initialize board hardware. If the routines encounter an error during the tests, you will either hear a few short beeps or see an error message on the screen. There are two kinds of errors: fatal and non-fatal. The system can usually continue the boot up sequence with non-fatal errors. Non-fatal error messages usually appear on the screen along with the following instructions:

Press <F1> to RESUME

Write down the message and press the F1 key to continue the boot up sequence.

System configuration verification

These routines check the current system configuration against the values stored in the CMOS memory. If they do not match, the program outputs an error message. You will then need to run the BIOS setup program to set the configuration information in memory.

There are three situations in which you will need to change the CMOS settings:

1. You are starting your system for the first time

2. You have changed the hardware attached to your system

3. The CMOS memory has lost power and the configuration information has been erased.

The FSB-960H CMOS memory has an integral lithium battery backup for data retention. However, you will need to replace the complete unit when it finally runs down.

3.2   Award BIOS Setup

Awards BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed CMOS RAM so that it retains the Setup information when the power is turned off.

Entering Setup

Power on the computer and press <Del> immediately. This will allow you to enter Setup.
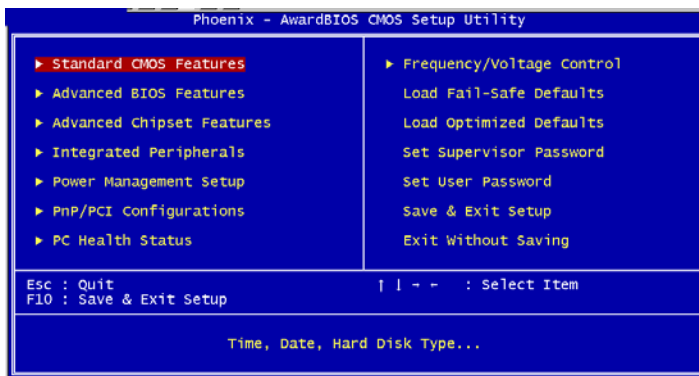
Standard CMOS Features

Use this menu for basic system configuration. (Date, time, IDE, etc.)

Advanced BIOS Features

Use this menu to set the advanced features available on your system.

Advanced Chipset Features

Use this menu to change the values in the chipset registers and optimize your system performance.

Integrated Peripherals

Use this menu to specify your settings for integrated peripherals. (Primary slave, secondary slave, keyboard, mouse etc.)

Power Management Setup

Use this menu to specify your settings for power management. (HDD power down, power on by ring, KB wake up, etc.)

PnP/PCI Configurations

This entry appears if your system supports PnP/PCI.

PC Health Status

This menu allows you to set the shutdown temperature for your system.

Frequency/Voltage Control

Use this menu to specify your settings for auto detect DIMM/PCI clock and spread spectrum.

Load Fail-Safe Defaults

Use this menu to load the BIOS default values for the minimal/stable performance for your system to operate.

Load Optimized Defaults

Use this menu to load the BIOS default values that are factory settings for optimal performance system operations. While AWARD has designated the custom BIOS to maximize performance, the factory has the right to change these defaults to meet their needs.

Set Supervisor/User Password

Use this menu to set Supervisor/User Passwords.

Save and Exit Setup

Save CMOS value changes to CMOS and exit setup.

Exit Without Saving

Abandon all CMOS value changes and exit setup.

You can refer to the " AAEON BIOS Item Description.pdf" file in the CD for the meaning of each setting in this chapter.

Chapter

4

Driver
Installation

The FSB-960H comes with a CD-ROM that contains all drivers your need.

In addition, you can activate the installation items through Autorun program which will install each driver directly. If your system do not support Autorun program or you cannot install drivers successfully, please read instructions below for further detailed installations.

Follow the sequence below to install the drivers:

Step 1 – Install Intel INF Driver

Step 2 – Install VGA Driver

Step 3 – Install LAN Driver

Step 4 – Install RAID Driver

Please read following instructions for detailed installations.

4.1 Installation:

Insert the FSB-960H CD-ROM into the CD-ROM Drive. And install the drivers from Step 1 to Step 4 in order.

Step 1 – Install Intel®INF Driver

1. Click on the ***Step 1 –Intel® INF*** folder

2. Double click on the ***Setup*** file

3. Follow the instructions that the window shows

4. The system will help you install the driver automatically

Step 2 – Install VGA Driver

1. Click on the ***Step 2 –VGA*** folder

2. Choose the OS your system is

3. Double click on the ***Setup*** file located in each OS folder

4. Follow the instructions that the window shows

5. The system will help you install the driver automatically

Step 3 – Install LAN Driver

1. Click on the ***Step 3 – LAN*** folder

2. Choose the OS your system is

3. Double click on the ***.exe*** file located in each OS folder

4. Follow the instructions that the window shows

5. The system will help you install the driver automatically

Step 4 – Install RAID Driver

1. Click on the *Step 4—RAID* folder

2. Double click on the *Autorun* file

3. Follow the instructions that the window shows

4. The system will help you install the driver automatically

Appendix

A

Programming the Watchdog Timer

A.1 Programming

FSB-960H utilizes W83627EHG chipset as its watchdog timer controller.

Below are the procedures to complete its configuration and the AAEON intial watchdog timer program is also attached based on which you can develop customized program to fit your application.

Configuring Sequence Description

Unlock W83627EHG

↓

Select register of

watchdog timer

↓

Enable the function of

the watchdog timer

↓

Use the function of the

watchdog timer

↓
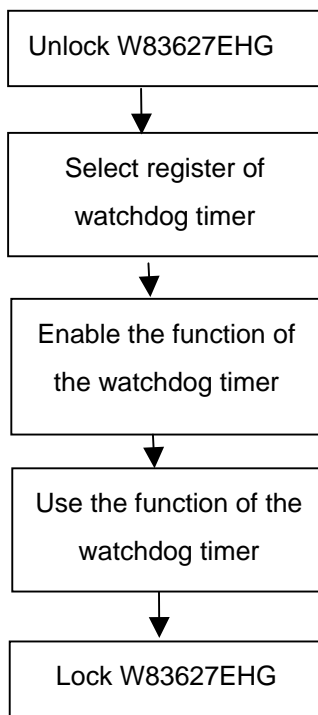
Lock W83627EHG

There are three steps to complete the configuration setup:

(1) Enter the W83627EHG config Mode

(2) Modify the data of configuration registers

(3) Exit the W83627EHG config Mode. Undesired result may occur if the config Mode is not exited normally.

(1) Enter the W83627EHG config Mode

To enter the W83627EHG config Mode, two special I/O write operations are to be performed during Wait for Key state. To ensure the initial state of the key-check logic, it is necessary to perform two write operations to the Special Address port (2EH). The different enter keys are provided to select configuration ports (2Eh/2Fh) of the next step.

	Address Port	Data Port
87h,87h:	2Eh	2Fh

(2) Modify the Data of the Registers

All configuration registers can be accessed after entering the config Mode. Before accessing a selected register, the content of Index 07h must be changed to the LDN to which the register belongs, except some Global registers.

(3) Exit the W83627EHG config Mode

The exit key is provided to select configuration ports (2Eh/2Fh) of the next step.

	Address Port	Data Port
0aah:	2Eh	2Fh

WatchDog Timer Register I (Index=F5h, Default=00h)

    CRF5 (PLED mode register. Default 0 x 00)

      Bit 7-6　　: select PLED mode

          = 00　Power LED pin is tri-stated.

= 01　Power LED pin is drived low.

= 10　Power LED pin is a 1Hz toggle pulse with 50 duty cycle.

= 11　Power LED pin is a 1/4Hz toggle pulse with 50 duty cycle.

Bit 5-4　: Reserved

Bit 3　　: select WDTO count mode.

= 0　　second

= 1　　minute

Bit 2　　: Enable the rising edge of keyboard Reset (P20) to force Time-out event.

= 0 Disable

= 1 Enable

Bit 1-0　: Reserved

WatchDog Timer Register II (Index=F6h, Default=00h)

Bit 7-0　　= 0 x 00 Time-out Disable

= 0 x 01 Time-out occurs after 1

second/minute

= 0 x 02 Time-out occurs after 2

second/minutes

= 0 x 03 Time-out occurs after 3

second/minutes

………………………………..

= 0 x FF Time-out occurs after 255

second/minutes

WatchDog Timer Register III (Index=F7h, Default=00h)

Bit 7 : Mouse interrupt reset Enable or Disable

= 1   Watchdog Timer is reset upon a Mouse interrupt

= 0   Watchdog Timer is not affected by Mouse interrupt

Bit 6 : Keyboard interrupt reset Enable or Disable

= 1   Watchdog Timer is reset upon a Keyboard interrupt

= 0   Watchdog Timer is not affected by Keyboard interrupt

Bit 5 : Force Watchdog Timer Time-out. Write Only

= 1   Force Watchdog Timer time-out event: this bit is self-clearing

Bit 4 : Watchdog Timer Status. R/W

= 1   Watchdog Timer time-out occurred

= 0   Watchdog Timer counting

Bit 3-0 : These bits select IRQ resource for Watchdog. Setting of 2 selects SMI.

A.2 W83627EHG Watchdog Timer Initial Program

Example: Setting 10 sec. as Watchdog timeout interval

;//

Mov dx,2eh   ;Enter W83627EHG config mode

Mov al,87h   (out 87h to 2eh twice)

Out dx,al

Out dx,al

;//

Mov al,07h

Out dx,al

Inc dx

Mov al,08h   ;Select Logical Device 8 (GPIO Port 2)

Out dx,al

;//

Dec dx

Mov al,30h   ;CR30 (GP20~GP27)

Out dx,al

Inc dx

Mov al,01h   ;Activate GPIO2

Out dx,al

```
;////////////////////////////////////////////////////////////////////////////////////

Dec dx

Mov al,0f5h              ;CRF5 (PLED mode register)

Out dx,al

Inc dx

In al,dx

And al,not 08h           ;Set second as counting unit

Out dx,al

;////////////////////////////////////////////////////////////////////////////////////

Dec dx

Mov al,0f6h              ; CRF6

Out dx,al

Inc dx

Mov al,10               ;Set timeout interval as 10 sec.

Out dx,al

;////////////////////////////////////////////////////////////////////////////////////

Dec dx                  ;Exit W83627EHG config mode

Mov al,0aah                 (out 0aah to 2eh once)

Out dx,al

;////////////////////////////////////////////////////////////////////////////////////
```
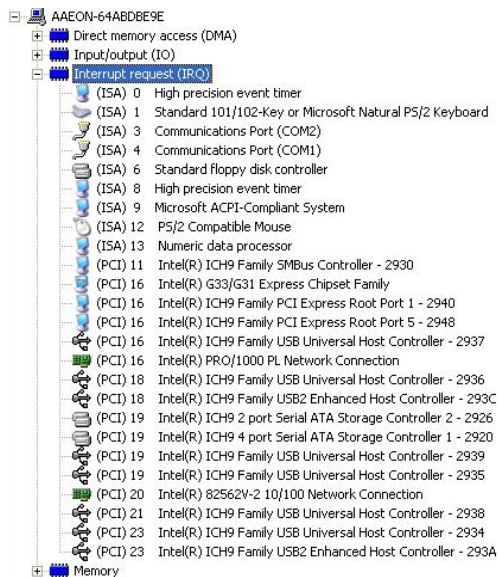
Appendix

B

I/O Information

B.1 I/O Address Map

```
AAEON-64ABDBE9E
 ├ Direct memory access (DMA)
 ├ Input/output (IO)
 │   [00000000 - 0000000F]  Direct memory access controller
 │   [00000000 - 00000CF7]  PCI bus
 │   [00000010 - 0000001F]  Motherboard resources
 │   [00000020 - 00000021]  Programmable interrupt controller
 │   [00000022 - 0000003F]  Motherboard resources
 │   [00000040 - 00000043]  System timer
 │   [00000044 - 0000005F]  Motherboard resources
 │   [00000060 - 00000060]  Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
 │   [00000061 - 00000061]  System speaker
 │   [00000062 - 00000063]  Motherboard resources
 │   [00000064 - 00000064]  Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
 │   [00000065 - 0000006F]  Motherboard resources
 │   [00000070 - 00000073]  System CMOS/real time clock
 │   [00000074 - 0000007F]  Motherboard resources
 │   [00000080 - 00000090]  Direct memory access controller
 │   [00000091 - 00000093]  Motherboard resources
 │   [00000094 - 0000009F]  Direct memory access controller
 │   [000000A0 - 000000A1]  Programmable interrupt controller
 │   [000000A2 - 000000BF]  Motherboard resources
 │   [000000C0 - 000000DF]  Direct memory access controller
 │   [000000E0 - 000000EF]  Motherboard resources
 │   [000000F0 - 000000FF]  Numeric data processor
 │   [00000274 - 00000277]  ISAPNP Read Data Port
 │   [00000279 - 00000279]  ISAPNP Read Data Port
 │   [000002F8 - 000002FF]  Communications Port (COM2)
 │   [00000378 - 0000037F]  Printer Port (LPT1)
 │   [000003B0 - 000003BB]  Intel(R) G33/G31 Express Chipset Family
 │   [000003C0 - 000003DF]  Intel(R) G33/G31 Express Chipset Family
 │   [000003F0 - 000003F5]  Standard floppy disk controller
 │   [000003F7 - 000003F7]  Standard floppy disk controller
 │   [000003F8 - 000003FF]  Communications Port (COM1)
 │   [00000400 - 000004BF]  Motherboard resources
 │   [000004D0 - 000004D1]  Motherboard resources
 │   [00000500 - 0000051F]  Intel(R) ICH9 Family SMBus Controller - 2930
 │   [00000778 - 0000077B]  Printer Port (LPT1)
 │   [00000800 - 0000087F]  Motherboard resources
 │   [00000880 - 0000088F]  Motherboard resources
 │   [00000A79 - 00000A79]  ISAPNP Read Data Port
 │   [00000D00 - 0000FFFF]  PCI bus
 │   [0000B000 - 0000BFFF]  Intel(R) ICH9 Family PCI Express Root Port 5 - 2948
 │   [0000BF00 - 0000BF1F]  Intel(R) PRO/1000 PL Network Connection
 │   [0000D000 - 0000DFFF]  Intel(R) ICH9 Family PCI Express Root Port 1 - 2940
 │   [0000EB00 - 0000EB0F]  Intel(R) ICH9 2 port Serial ATA Storage Controller 2 - 2926
 │   [0000EC00 - 0000EC0F]  Intel(R) ICH9 2 port Serial ATA Storage Controller 2 - 2926
 │   [0000ED00 - 0000ED03]  Intel(R) ICH9 2 port Serial ATA Storage Controller 2 - 2926
 │   [0000EE00 - 0000EE07]  Intel(R) ICH9 2 port Serial ATA Storage Controller 2 - 2926
 │   [0000EF00 - 0000EF03]  Intel(R) ICH9 2 port Serial ATA Storage Controller 2 - 2926
 │   [0000F000 - 0000F007]  Intel(R) ICH9 2 port Serial ATA Storage Controller 2 - 2926
 │   [0000F200 - 0000F20F]  Intel(R) ICH9 4 port Serial ATA Storage Controller 1 - 2920
 │   [0000F300 - 0000F30F]  Intel(R) ICH9 4 port Serial ATA Storage Controller 1 - 2920
 │   [0000F400 - 0000F403]  Intel(R) ICH9 4 port Serial ATA Storage Controller 1 - 2920
 │   [0000F500 - 0000F507]  Intel(R) ICH9 4 port Serial ATA Storage Controller 1 - 2920
 │   [0000F600 - 0000F603]  Intel(R) ICH9 4 port Serial ATA Storage Controller 1 - 2920
 │   [0000F700 - 0000F707]  Intel(R) ICH9 4 port Serial ATA Storage Controller 1 - 2920
 │   [0000F800 - 0000F81F]  Intel(R) ICH9 Family USB Universal Host Controller - 2936
 │   [0000F900 - 0000F91F]  Intel(R) ICH9 Family USB Universal Host Controller - 2935
 │   [0000FA00 - 0000FA1F]  Intel(R) ICH9 Family USB Universal Host Controller - 2934
 │   [0000FB00 - 0000FB1F]  Intel(R) ICH9 Family USB Universal Host Controller - 2939
 │   [0000FC00 - 0000FC1F]  Intel(R) ICH9 Family USB Universal Host Controller - 2938
 │   [0000FD00 - 0000FD1F]  Intel(R) ICH9 Family USB Universal Host Controller - 2937
 │   [0000FE00 - 0000FE1F]  Intel(R) 82562V-2 10/100 Network Connection
 │   [0000FF00 - 0000FF07]  Intel(R) G33/G31 Express Chipset Family
 ├ Interrupt request (IRQ)
 └ Memory
```

B.2 1st MB Memory Address Map

```
AAEON-64ABDBE9E
  Direct memory access (DMA)
  Input/output (IO)
  Interrupt request (IRQ)
  Memory
      [00000000 - 0009FFFF]  System board
      [0000046E - 0000056D]  System board
      [000A0000 - 000BFFFF]  Intel(R) G33/G31 Express Chipset Family
      [000A0000 - 000BFFFF]  PCI bus
      [000C0000 - 000DFFFF]  PCI bus
      [000E0000 - 000EFFFF]  System board
      [000F0000 - 000FFFFF]  System board
      [00100000 - 1F5DFFFF]  System board
      [1F5E0000 - 1F5FFFFF]  System board
      [1F600000 - 1F6FFFFF]  System board
      [1F650000 - FEBFFFFF]  PCI bus
      [D0000000 - DFFFFFFF]  Intel(R) G33/G31 Express Chipset Family
      [E0000000 - EFFFFFFF]  Motherboard resources
      [FD800000 - FD8FFFFF]  Intel(R) ICH9 Family PCI Express Root Port 1 - 2940
      [FD900000 - FD9FFFFF]  Intel(R) ICH9 Family PCI Express Root Port 1 - 2940
      [FDC00000 - FDCFFFFF]  Intel(R) G33/G31 Express Chipset Family
      [FDD00000 - FDDFFFFF]  Intel(R) ICH9 Family PCI Express Root Port 5 - 2948
      [FDE00000 - FDEFFFFF]  Intel(R) ICH9 Family PCI Express Root Port 5 - 2948
      [FDEE0000 - FDEFFFFF]  Intel(R) PRO/1000 PL Network Connection
      [FDF00000 - FDF7FFFF]  Intel(R) G33/G31 Express Chipset Family
      [FDFC0000 - FDFDFFFF]  Intel(R) 82562V-2 10/100 Network Connection
      [FDFFC000 - FDFFC0FF]  Intel(R) ICH9 Family SMBus Controller - 2930
      [FDFFD000 - FDFFD3FF]  Intel(R) ICH9 Family USB2 Enhanced Host Controller - 293A
      [FDFFE000 - FDFFE3FF]  Intel(R) ICH9 Family USB2 Enhanced Host Controller - 293C
      [FDFFF000 - FDFFFFFF]  Intel(R) 82562V-2 10/100 Network Connection
      [FEC00000 - FEC00FFF]  System board
      [FED00000 - FED000FF]  System board
      [FED00000 - FED003FF]  High precision event timer
      [FED13000 - FED1FFFF]  System board
      [FED20000 - FED9FFFF]  System board
      [FEE00000 - FEE00FFF]  System board
      [FFB00000 - FFB7FFFF]  System board
      [FFB80000 - FFBFFFFF]  Intel(R) 82802 Firmware Hub Device
      [FFF00000 - FFFFFFFF]  System board
```

B.3 IRQ Mapping Chart

```
─ AAEON-64ABDBE9E
  ├─ Direct memory access (DMA)
  ├─ Input/output (IO)
  └─ Interrupt request (IRQ)
     ├─ (ISA)  0   High precision event timer
     ├─ (ISA)  1   Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
     ├─ (ISA)  3   Communications Port (COM2)
     ├─ (ISA)  4   Communications Port (COM1)
     ├─ (ISA)  6   Standard floppy disk controller
     ├─ (ISA)  8   High precision event timer
     ├─ (ISA)  9   Microsoft ACPI-Compliant System
     ├─ (ISA) 12   PS/2 Compatible Mouse
     ├─ (ISA) 13   Numeric data processor
     ├─ (PCI) 11   Intel(R) ICH9 Family SMBus Controller - 2930
     ├─ (PCI) 16   Intel(R) G33/G31 Express Chipset Family
     ├─ (PCI) 16   Intel(R) ICH9 Family PCI Express Root Port 1 - 2940
     ├─ (PCI) 16   Intel(R) ICH9 Family PCI Express Root Port 5 - 2948
     ├─ (PCI) 16   Intel(R) ICH9 Family USB Universal Host Controller - 2937
     ├─ (PCI) 16   Intel(R) PRO/1000 PL Network Connection
     ├─ (PCI) 18   Intel(R) ICH9 Family USB Universal Host Controller - 2936
     ├─ (PCI) 18   Intel(R) ICH9 Family USB2 Enhanced Host Controller - 293C
     ├─ (PCI) 19   Intel(R) ICH9 2 port Serial ATA Storage Controller 2 - 2926
     ├─ (PCI) 19   Intel(R) ICH9 4 port Serial ATA Storage Controller 1 - 2920
     ├─ (PCI) 19   Intel(R) ICH9 Family USB Universal Host Controller - 2939
     ├─ (PCI) 19   Intel(R) ICH9 Family USB Universal Host Controller - 2935
     ├─ (PCI) 20   Intel(R) 82562V-2 10/100 Network Connection
     ├─ (PCI) 21   Intel(R) ICH9 Family USB Universal Host Controller - 2938
     ├─ (PCI) 23   Intel(R) ICH9 Family USB Universal Host Controller - 2934
     └─ (PCI) 23   Intel(R) ICH9 Family USB2 Enhanced Host Controller - 293A
  ├─ Memory
```

B.4 DMA Channel Assignments

```
─ AAEON-64ABDBE9E
  ├─ Direct memory access (DMA)
  │    ├─ 2   Standard floppy disk controller
  │    └─ 4   Direct memory access controller
  ├─ Input/output (IO)
  ├─ Interrupt request (IRQ)
  └─ Memory
```