

Full-size SBC

FSB-960H

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 3rd Ed.
August 2013

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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
- **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)

- 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**

2.1 Safety Precautions

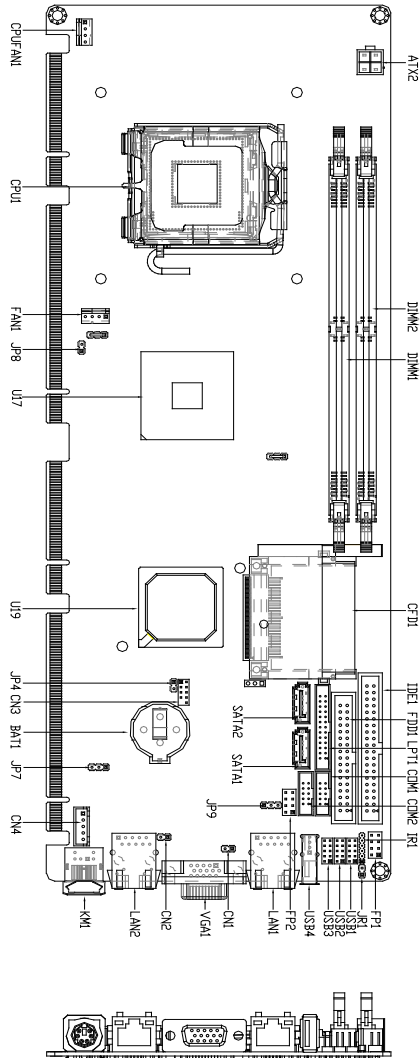
Warning!

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.

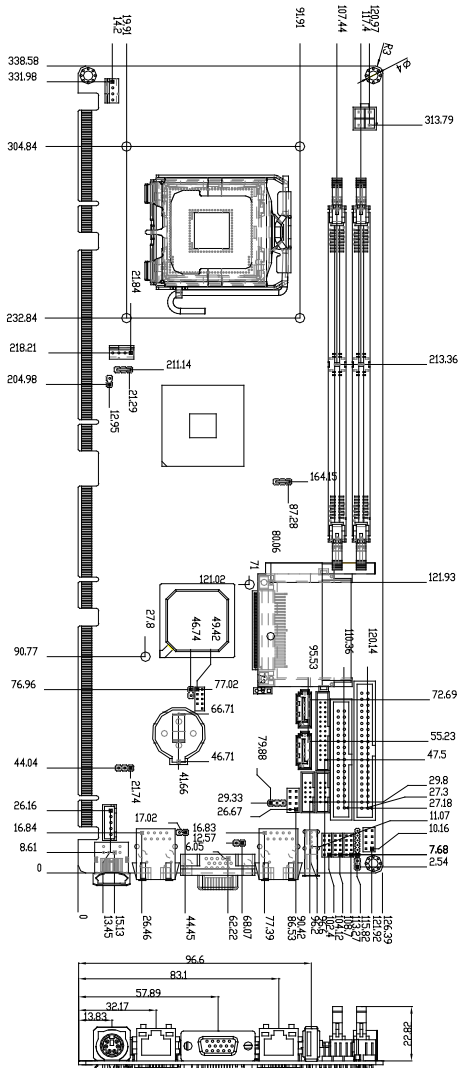
Caution!

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:

Label	Function
JP1	Intruder
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:

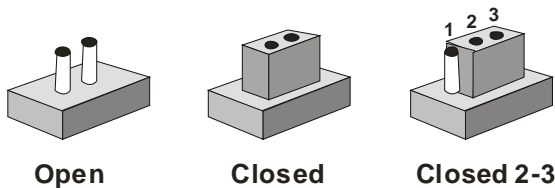
Label	Function
FP1	Front Panel Connector 1
FP2	Front Panel Connector 2
ATX2	ATX Power_12V Connector
VGA1	VGA Display Connector
FDD1	Floppy Connector
IDE1	EIDE Connector Note: Supports one IDE device only (master).
SATA1~4	Serial ATA Connector
CFD1	Compact Flash Slot

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.



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 MFG Selection (JP4)

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

2.8 Clear CMOS (JP7)

JP7	Function
1-2	Clear CMOS
2-3	Normal (default)

2.9 BIOS Boot Device (JP8)

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

2.10 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 (-)

2.11 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

Note: Pin 5, 7 closed: Internal Buzzer Enable

2.12 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.

2.13 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.

2.14 IrDA Connector (IR1)

Pin	Signal
1	+5V
2	N.C.
3	IRRX
4	GND
5	IRTX
6	N.C.

2.15 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

2.16 USB Connector (USB1~3)

Pin	Signal	Pin	Signal
1	+5V	2	GND
3	USB1-	4	GND
5	USB1+	6	USB2+
7	GND	8	USB2-
9	GND	10	+5V

2.17 Fan Connector (FAN1, CPUFAN1)

Pin	Signal
1	GND

2	+12V
3	Speed Sense
4	PWM CTRL

2.18 PS2 Keyboard/ Mouse Connector (KM1)

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

2.19 LAN LED Connector (CN1~2)

Pin	Signal	Pin	Signal
1	Link_ACK LED (+)	2	Link_ACK LED (-)

2.20 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

2.21 Internal Keyboard Connector (CN4)

Pin	Signal
1	KB_CLK

Full-size SBC

FSB-960H

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	×	○	○	○	○	○
<p>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。</p> <p>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。</p> <p>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。</p>						

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 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 INF Driver
- Step 2 – Install VGA Driver
- Step 3 – Install LAN Driver
- Step 4 – Install RAID Driver
- Step 5 – Install iAMT Driver (Optional)

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 5 in order.

Step 1 – Install INF Driver

1. Click on the **Step1 - Intel INF** folder and select the OS folder your system is
2. Double click on the **.exe** file located in each OS folder
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 **Step2 - VGA** folder and select the OS folder your system is
2. Double click on the **.exe** file located in each OS folder
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

Step 3 – Install LAN Driver

1. Click on the **Step3 - Lan** folder and select the OS folder your system is
2. Double click on the **.exe** file located in each OS folder
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

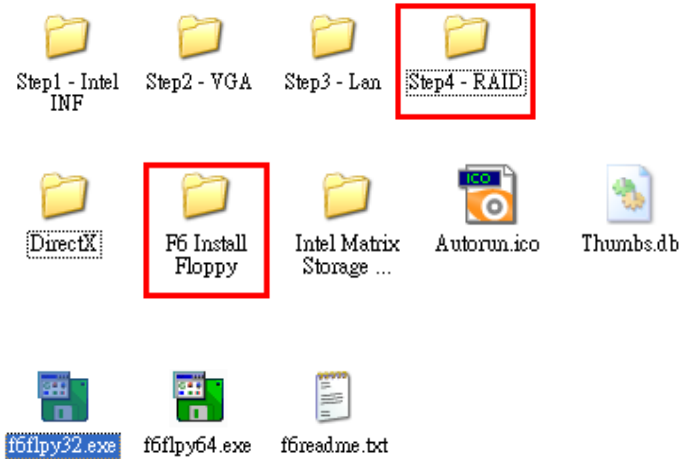
Step 4 – Install RAID Driver

1. Use Utility CD to create Raid controller driver disk.

Path: Driver\Step4 - RAID\F6 Install Floppy

f6flpy32.exe → for 32bit OS

f6flpy64.exe → for 64bit OS

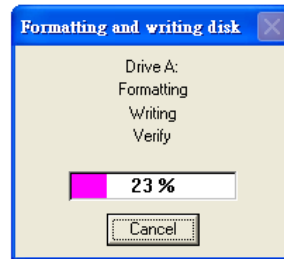
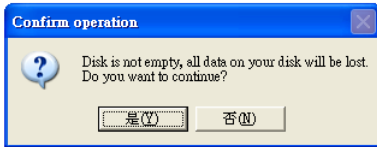


Here we use WinXP Pro 32bit as an example, using f6flpy32.exe to create driver disk.

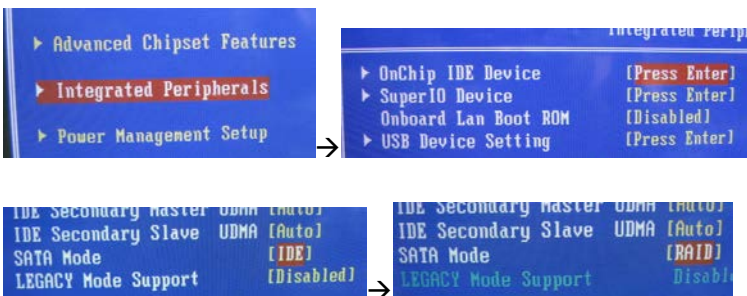
Run f6flpy32.exe, it will pop up a dialog box



If the disk is not empty, it will have an error message, just click yes.

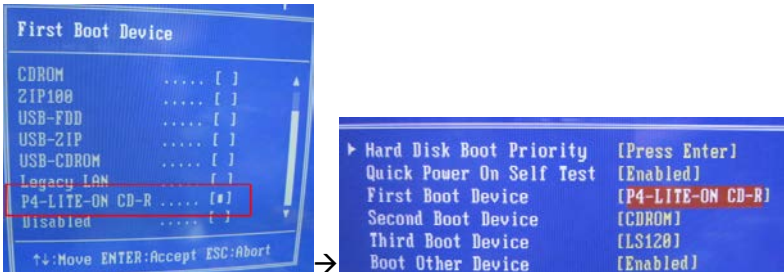
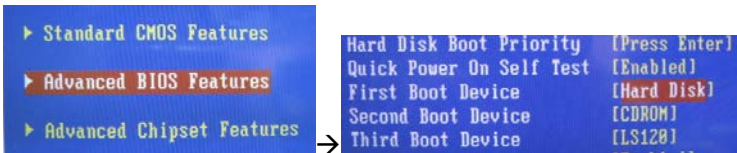


2. Connect SATA HDD to FSB-960H, if want to create Raid volume, you have to connect 2 SATA HDD at least.
3. Connect Floppy drive to FSB-960H, if no regular floppy drive, using USB Floppy disk drive instead.
4. Boot up FSB-960H, press "del" key to enter BIOS setup
 Enter Integrated Peripherals→OnChip IDE Device→SATA Mode
 Change SATA mode from IDE to RAID.



Save and exit BIOS setup to let change take effect.
 Board will reboot.

- Press “del” key to enter BIOS setup, enter Advanced BIOS Features to change boot priority, set optical drive to First boot Device then save and exit BIOS setup



Above is using IDE CDROM, cause ICH9 don't support IDE interface, FSB-960G using JMICROM chip as a SATA to IDE bridge, this is why when SATA mode set to Raid, you must choose P4-XXXX. If using USB CDROM you just need choose USB-CDROM.

- When CPU Board boot up and screen shown following message, press “ CTRL+I” to enter Raid configuration utility.

Follow the on screen message to create Raid Volume

```

Intel(R) Matrix Storage Manager option ROM v7.6.0.1011 ICH9R vRAID5
Copyright(C) 2003-07 Intel Corporation. All Rights Reserved.

RAID Volumes:
None defined.

Physical Disks:
Port Drive Model      Serial #      Size  Type/Status(Vol ID)
0  ST3160811AS         6PTZB6SS    149.1GB Non-RAID Disk
1  ST3160811AS         6PTZC2BE    149.1GB Non-RAID Disk
2  ST308015AS          6RAB251B    74.5GB  Non-RAID Disk

Press <CTRL>M to enter Configuration Utility..

```

```

Intel(R) Matrix Storage Manager option ROM v7.6.0.1011 ICH9R vRAID5
Copyright(C) 2003-07 Intel Corporation. All Rights Reserved.

1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Exit

RAID Volumes:
None defined.

Physical Disks:
Port Drive Model      Serial #      Size  Type/Status(Vol ID)
0  ST3160811AS         6PTZB6SS    149.1GB Non-RAID Disk
1  ST3160811AS         6PTZC2BE    149.1GB Non-RAID Disk
2  ST308015AS          6RAB251B    74.5GB  Non-RAID Disk

```

```

(C) 2003-07 Intel Corporation. All R
[ CREATE VOLUME MENU ]

Name: Volume0
RAID Level: RAID5(Parity)
Disks: Select Disks
Strip Size: 64KB
Capacity: 149.1 GB

Create Volume

```

```

Disks: Select Disks
Strip Size: 64KB
Capacity: 149.1 GB

WARNING: ALL DATA ON SELECTED DISKS WILL BE LOST.
Are you sure you want to create this volume? (Y/N):

```

```

1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID

RAID Volumes:
Level: RAID5(Parity)
Strip Size: 64KB
Volume0: 149.1GB Normal Yes

Physical Disks:
Port Drive Model      Serial #      Size  Type/Status(Vol ID)
0  ST3160811AS         6PTZB6SS    149.1GB Member Disk(0)
1  ST3160811AS         6PTZC2BE    149.1GB Member Disk(0)
2  ST308015AS          6RAB251B    74.5GB  Member Disk(0)

```

```

[ DISK/VOLUME INFORMATION ]

Volumes:
[ CONFIRM EXIT ]
Are you sure you want to exit? (Y/N):

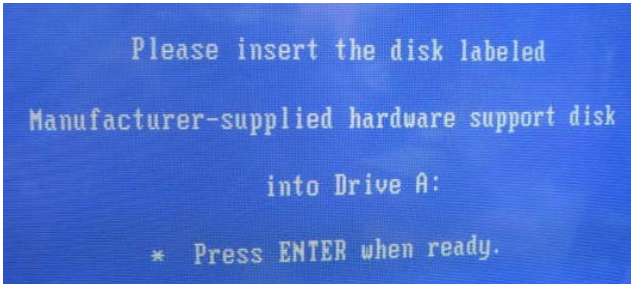
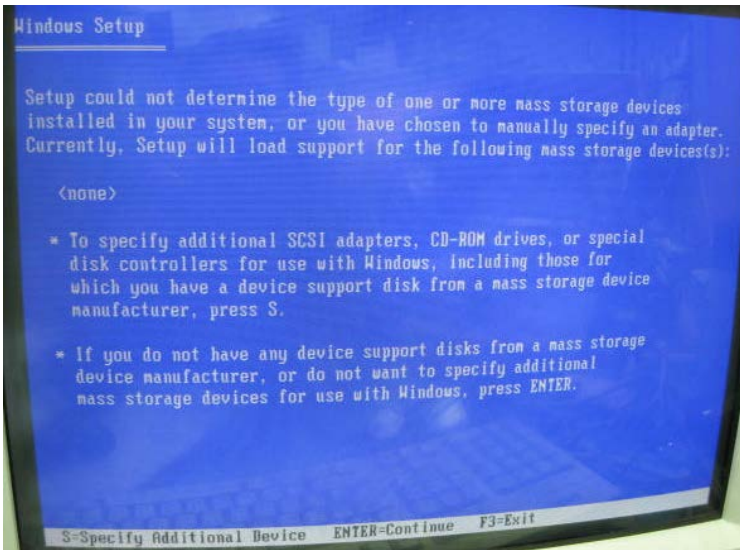
0  ST3160811AS         6PTZB6SS    149.1GB Member Disk(0)
1  ST3160811AS         6PTZC2BE    149.1GB Member Disk(0)
2  ST308015AS          6RAB251B    74.5GB  Member Disk(0)

```

- Begin install XP Pro, when screen show "press F6 to install...." just press "F6" to load thirty party Raid driver.

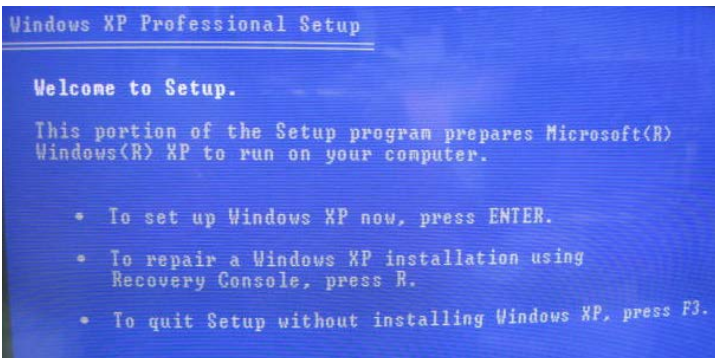
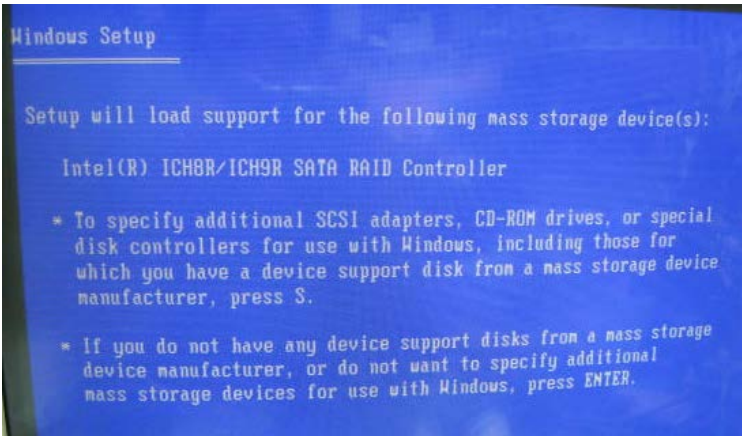
Press F6 if you need to install a third party

Follow the on screen message and insert the driver disk (created at step 1) into floppy disk drive



Choose Intel ICH9R SATA RAID Controller





Now follow on screen message and begin to install.

Step 5 – Install iAMT Driver (Optional)

1. Click on the **Step5 - IAMT (option)** folder and select the folder of **LMS_SOL**
2. Double click on the **Setup.exe** file
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

Appendix

A

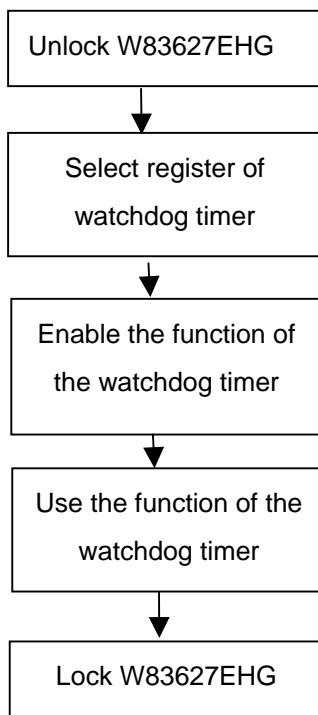
Programming the Watchdog Timer

A.1 Programming

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

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

Configuring Sequence Description



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 driven 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

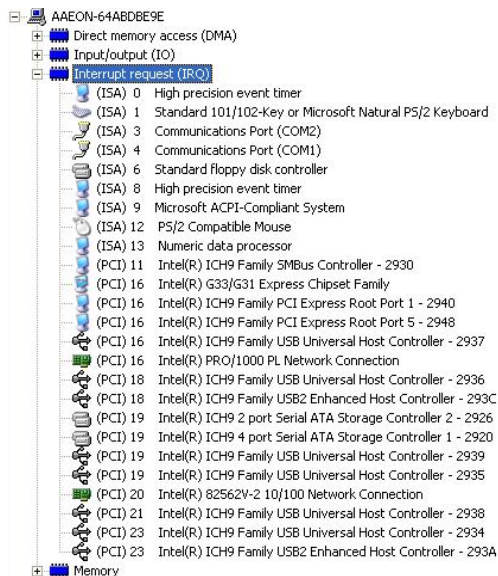
B.1 I/O Address Map

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)
	[00000380 - 0000038B] 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 - 0000BFFF] Intel(R) PRC/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 - 0000FFF7] 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 - 1F50FFFF]	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 - FDFFF0FF]	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
	[FFB80000 - FFB7FFFF]	System board
	[FFB80000 - FFB7FFFF]	Intel(R) 82802 Firmware Hub Device
	[FFF00000 - FFFFFFFF]	System board

B.3 IRQ Mapping Chart



B.4 DMA Channel Assignments



Appendix

C

Mating Connector

C.1 List of Mating Connectors and Cables

The table notes mating connectors and available cables.

Connector Label	Function	Mating Connector		Available Cable	Cable P/N
		Vendor	Model no		
IDE1	IDE Connector	Catch Electronics	1137-020-40SA	IDE Cable	1701400453
SATA1	SATA Connector	TECHBEST	161S01-025A	SATA Cable	1709070800
SATA2	SATA Connector	TECHBEST	161S01-025A	SATA Cable	1709070800
FDD1	Floppy Connector	Catch Electronics	1137-000-34SA	Floppy Disk Drive Cable	1701340704
LPT1	Parallel Port Connector	Catch Electronics	1147-000-26S	LPT Cable	1701260307
FP1	Front Panel Connector	JIH VEI Electronics	21B22564-XXS 10B-01G-6/3-V XX		N/A
FP2	Front Panel Connector	JIH VEI Electronics	21B22564-XXS 10B-01G-6/3-V XX		N/A
USB1	USB Pin Header	JIH VEI Electronics	21B22050-XXS 10B-01G-4/2.8	USB Cable	1709100201
USB2	USB Pin Header	JIH VEI Electronics	21B22050-XXS 10B-01G-4/2.8	USB Cable	1709100201
USB3	USB Pin Header	JIH VEI Electronics	21B22050-XXS 10B-01G-4/2.8	USB Cable	1709100201
CN3	Audio Pin Header	JIH VEI Electronics	21N22050-10S1 0B-01G-4/2 .8-V 1-G		N/A
ATX2	4P Power Connector	Catch Electronics	1121-700-04S		N/A
CUPFAN	FAN Connector	Catch Electronics	1190-700-042		N/A

Full-size SBC

FSB-960H

FAN1	FAN Connector	Catch Electronics	1190-700-042		N/A
USB4	USB Connector	HO-BASE	KS-001V-ANW		N/A
LAN1	Ethernet Connector	BOTHHAND	LA1T109D-A-D 43 LF		N/A
LAN2(-G2)	Ethernet Connector	BOTHHAND	LA1T109D-A-D 43 LF		N/A
LAN2 (-EG)	Ethernet Connector	BOTHHAND	LU1T516-43 LF		N/A
IR1	IrDA Connector	JIH VEI Electronics	21B12050-XXS 10B-01G-4/2.8		N/A
KM1	Mini-Din PS/2 Connector	CONTEK	MAN3061F1G4 01	KB/MS Cable	1700060192
CN4	KB Pin Header	HO-BASE	2503-WS-5		N/A
COM1	Serial Port Box Header	Catch Electronics	1147-000-10S	Serial Port Cable	1701260307
COM2	Serial Port Box Header	Catch Electronics	1147-000-10S	Serial Port Cable	1701100305
VGA1	CRT Display Connector	Catch Electronics	3125-000-15SB		N/A