IMBI-QM57

Intel® Core™ i5/i7 Mobile Processor

Dual View VGA, DVI, HDMI, LVDS

Two 204-pin DDR3 800/1066 SODIMM

3 SATA2/ 1 PCI-Express[x4]/ 1 PCI

1 Mini PCI-Express

8 USB 2.0/ 3 RS-232/ 1 RS-232/422/485

IMBI-QM57 Manual Rev.A 3rd Ed.
December 2012

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Packing List

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

- 1 IMBI-QM57 Mini-ITX Main Board
- 1 SATA Signal Cable
- 1 COM Port Cable with DB-9
- 1 USB Cable
- 1 I/O Shield
- 1 CD-ROM for Manual (in PDF Format) and Drivers

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

The IMBI-QM57 supports Intel® Core™ i5/i7 Mobile processor. Moreover it supports DDR3 800/1066 memory up to 8GB. This model accommodates two Intel® PCI-Express Gigabit Ethernet controllers that those are controlled by Intel® 82577LM and Intel® 82574L/82583V. This configuration provides outstanding computing ability, fast network connections and multi-task data transmission.

The graphic controller is integrated on Intel® Gen 6.0 that support dual view with VGA, DVI, HDMI, and LVDS to meet the demand of the media and high definition. In addition, IMBI-QM57 deploys 8 USB 2.0, 4 COMs, Keyboard & Mouse, and multiple extended bus for a flexible expansion selection. The storage of IMBI-QM57 supports three SATA2 ports to support RAID 0, 1, 5, 10 function.

The IMBI-QM57 provides an ideal combination of high performance, widely expandable interfaces and compact size that is easy to apply for multiple applications. The IMBI-QM57 will be an ideal product for your requirement.

1.2 Features

- Intel® 32/45nm Core™ i7/i5 rPGA988 CPU Integrated
- Graphics & Memory Controller
- Intel® QM57
- Dual-Channel DDR3 800/1066 Memory up to 8 GB
- Intel® Gigabit Ethernet x 2 Support Intel® AMT 6.0
- Intel® Gen 6.0 Integrated Graphics Engine Supports Dual View With VGA, DVI, HDMI, LVDS
- HD Audio
- SATA2 x 3, RAID 0, 1, 5, 10
- USB 2.0 x 8, COM x 4
- PCI-Express [x4] x 1, Mini PCI-Express x 1, PCI x 1
- 24-Pin ATX Power Connector

1.3 Specifications

System

● Form Factor	Mini-ITX
● Processor	Intel® 32/45nm Core™ i5/i7 rPGA988 CPU, TDP: 35W Max.
● System Memory	Supports Dual Channel with 2 x 204-pin DDR3 800/1066 SODIMM, up to 8GB
● Chipset	Intel® QM57
● Ethernet	Intel® PCI-Express 10/100/ 1000Base-TX, RJ-45 x 2 LAN1: Intel® 82577LM (supports Intel® AMT 6.0); LAN2: Intel® 82574L/82583V
● Audio	HD Audio Codec with Realtek ALC892
● BIOS	AMI BIOS 64Mb SPI ROM
● I/O Chip	ITE IT8781F I/O controller
● Storage	SATA2 connector x 3, support RAID 0,1,5,10 by riser card
● DIO	Programmable 8-bit digital I/O interface (4 input/4 output)
● Watchdog Timer	Reset: 1 sec.~255 min. and 1 sec.

	or 1 min./step
● H/W Status Monitor	Monitoring system temperature, voltage, and cooling fan status
● Expansion Interface	PCI-Express[x4] x 1, PCI x 1, Mini PCI-Express x 1
● Power Requirement	Standard ATX 24-pin connector
● Board Size (L x W)	6.7" x 6.7" (170 x 170 mm)
● Gross Weight	0.88 lb (0.4 Kg)
● Operating Temperature	32°F ~140°F (0°C ~60°C)
● Storage Temperature	-4°F ~158°F (-20°C ~70°C)
● Storage Humidity	10~80%, non-condensing

Display

● Chipset	Intel® Core™ i5/i7
● Graphic Engine	Intel® Gen 6.0 integrated Graphics Engine
● Resolution	Analog up to 2048x1536 @ 75 Hz; Flat panels up to 1920x1080 @ 60 Hz
● Output Interface	VGA x 1, DVI-D x 1, HDMI x 1 (external), LVDS x 1 (internal)

I/O

● Serial Port	RS-232 x 1 (supports 5V/12V on the 9th pin); RS-232/422/485 box

	header x 3 support 5V/12V on the 9th pin
● Keyboard & Mouse	Keyboard x 1 & Mouse x 1
● Universal Serial Bus	USB 2.0 x 8 (four on the I/O side, four with header)
● Audio	Audio Jack x 3 with BTX Type (Mic-in, Line-in, Line-out)
● Ethernet	RJ-45 x 2
● Display	VGA x 1, DVI-D x 1, HDMI x 1 (external), LVDS x 1 (internal)

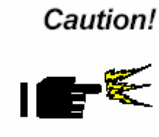
Chapter

2

Quick Installation Guide

2.1 Safety Precautions

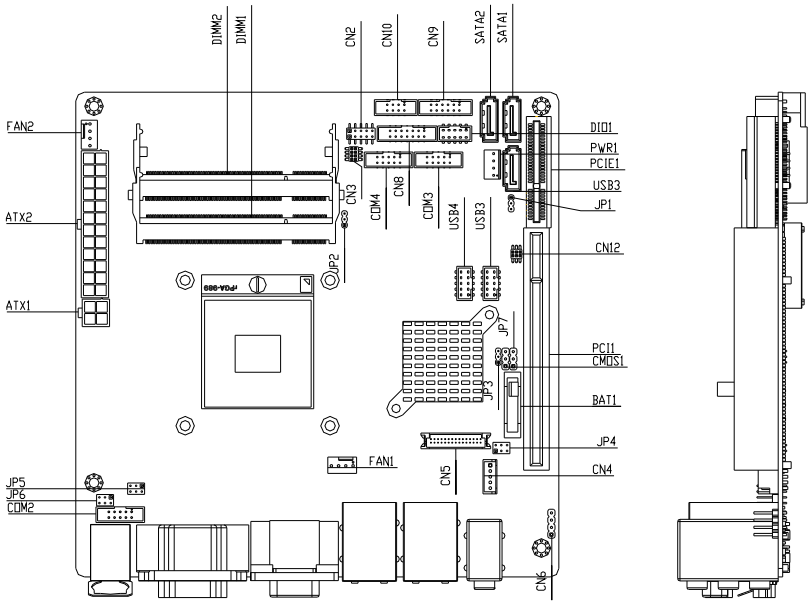
Always completely disconnect the power cord from your board whenever you are working on it. Do not make connections while the power is on, because a sudden rush of power can damage sensitive electronic components.

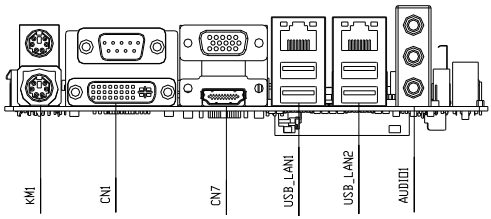


Always ground yourself to remove any static charge before touching the board. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not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

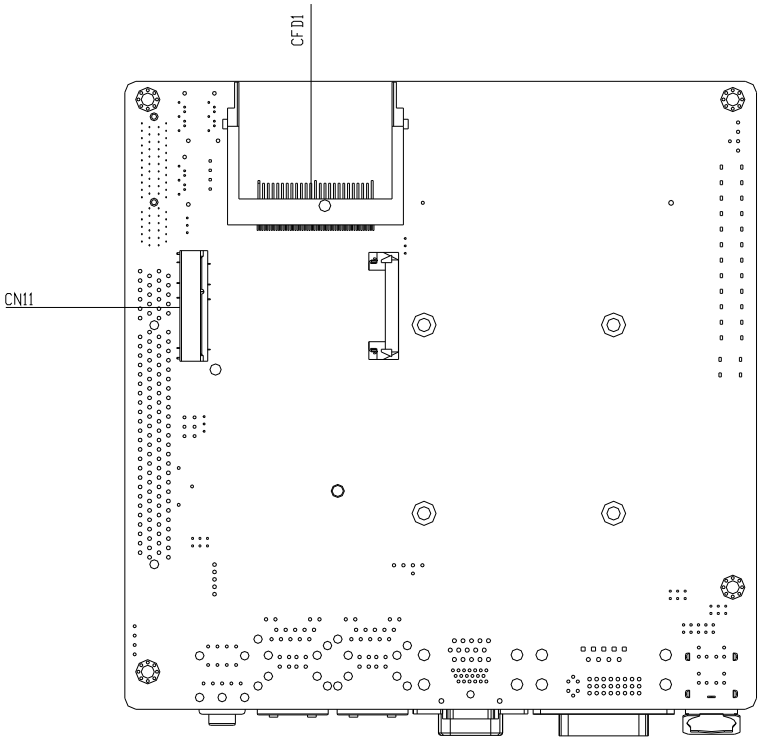
2.2 Location of Connectors and Jumpers

Component Side



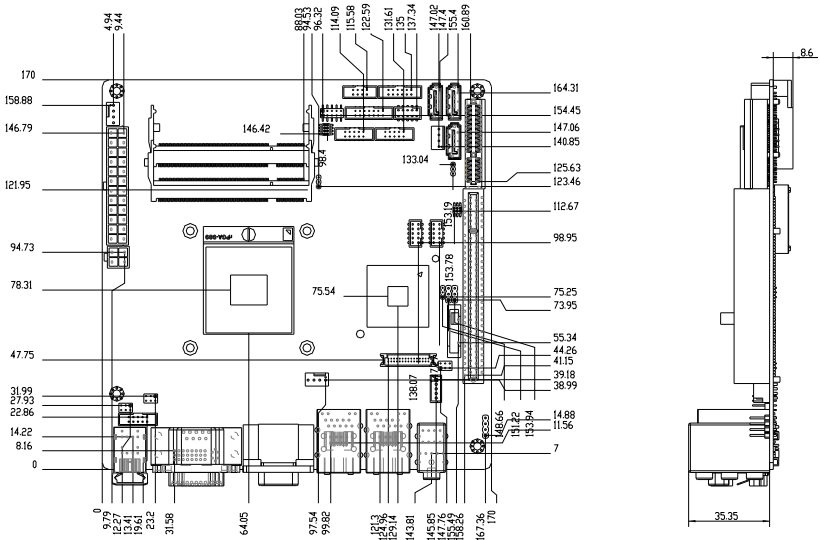


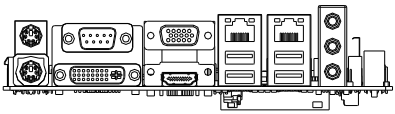
Solder Side



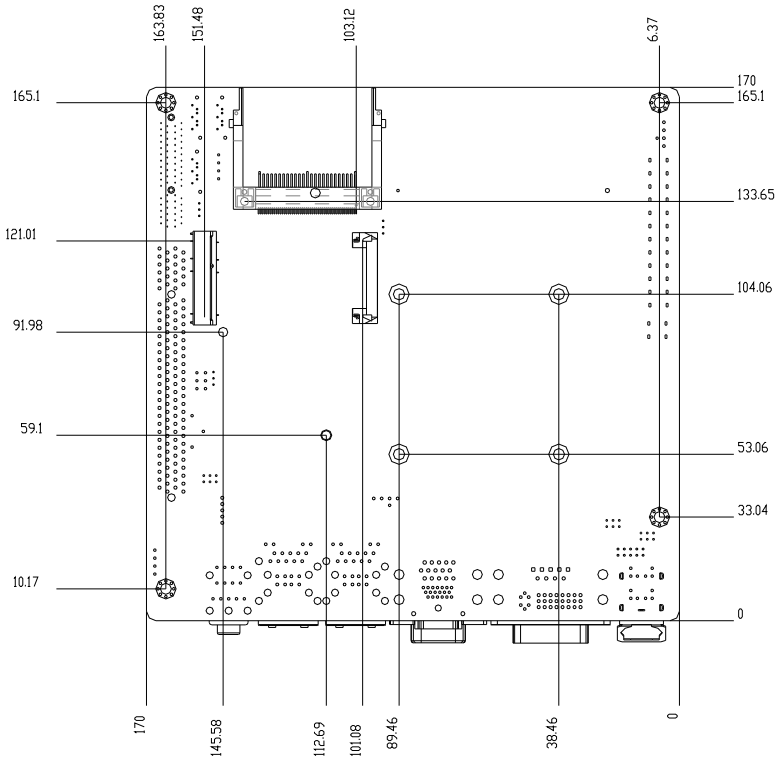
2.3 Mechanical Drawing

Component Side





Solder Side


163.83
151.48
103.12
6.37
165.1
121.01
91.98
59.1
10.17
170
165.1
133.65
104.06
53.06
33.04
0
170
145.58
112.69
101.08
89.46
38.46
0

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
CMOS1	CMOS Setting Selection
JP1	Auto PWRBTN Selection
JP2	CFD Voltage 3.3V/5V Selection
JP3	TPM Setting Selection
JP4	LCD Power and Inverter Power Selection
JP5	COM1 +12V/+5V/RING Selection
JP6	COM2 +12V/+5V/RING Selection

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:

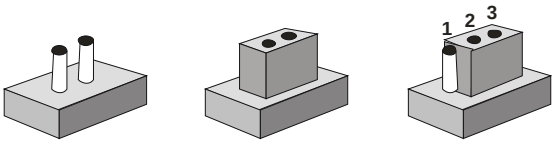
Label	Function
CN1	DVI-I & COM Port Connector
CN2	Front Panel Connector
CN3	SPI Programming Connector
CN4	LCD Inverter Power Connector
CN5	LVDS Connector
CN6	CD-IN
CN8	COM1~2 Port LED
CN9	COM3~4 Port LED
CN10	LAN Port LED
COM2	RS-232/422/485 Pin header

COM3~4	RS-232 Pin header
KM1	PS2 Keyboard/Mouse Connector
USB_LAN1	100/1000Base-TX Ethernet & Dual USB Connector
USB_LAN2	100/1000Base-TX Ethernet & Dual USB Connector
AUDIO1	Audio Lin-in/Lin-out/MIC
DIMM1,DIMM2	DDR3 DIMM Slot
USB3,USB4	USB Pin header
FAN1, FAN2	4-pin System Fan Connector
ATX1	4-pin ATX Power +12V Connector
ATX2	24-pin ATX Power
SATA1~SATA3	SATA Connector
DIO1	Digital I/O
PIC1	PCI Slot
PCIE1	PCIE Slot
CN11	Mini-PCIE Slot
PWR1	SATA Power 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 CMOS Setting (CMOS1)

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

2.8 Auto PWRBTN Selection (JP1)

JP1	Function
1-2	Don't use Auto PWRBTN (Default)
2-3	Use Auto PWRBTN

2.9 CFD Voltage 3.3V/5V Selection (JP2)

JP2	Function
1-2	+3.3V
2-3	+5V (Default)

2.10 TPM Setting (JP3)

JP3	Function
1-2	Save ME RTC Register (Default)
2-3	Clear ME RTC Register

2.11 LCD Power and Inverter Power Selection (JP4)

JP4	Function
1-3	Inverter Power +5V (Default)
3-5	Inverter Power +12V
4-6	LCD Power +3.3V (Default)
2-4	LCD Power +5V

2.12 COM1 +12V/+5V/RING Selection (JP5)

JP5	Function
1-2	+12V
3-4	Ring (Default)
5-6	+5V

2.13 COM2 +12V/+5V/RING Selection (JP6)

JP6	Function
1-2	+12V
3-4	Ring (Default)
5-6	+5V

2.14 Front Panel Connector (CN2)

Pin	Signal	Pin	Signal
1	Power On Button (-)	2	Power On Button (+)
3	HDD LED(-)	4	HDD LED(+)
5	External Speaker (-)	6	External Speaker (+)
7	Power LED (-)	8	Power LED (+)
9	Reset Switch (-)	10	Reset Switch (+)

2.15 SPI Programming Connector (CN3)

Pin	Signal	Pin	Signal
1	+3.3V_SPI	2	GND
3	SPI_CE#	4	SPI_CLK
5	SPI_SO	6	SPI_SI
7	NC	8	NC

2.16 LVDS Inverter (CN4)

Pin	Signal
1	12V / 5V
2	VCON
3	GND
4	GND
5	INV_EN

2.17 LVDS Connector (CN5)

Pin	Signal	Pin	Signal
1	BKL_EN	2	N.C.
3	VLCD	4	GND
5	LA_CLK#	6	LA_CLK
7	VLCD	8	GND
9	LA_DATA0#	10	LA_DATA0
11	LA_DATA1#	12	LA_DATA1
13	LA_DATA2#	14	LA_DATA2
15	LA_DATA3#	16	LA_DATA3
17	LVDS_DDC_DATA	18	LVDS_DDC_CLK
19	LB_DATA0#	20	LB_DATA0
21	LB_DATA1#	22	LB_DATA1
23	LB_DATA2#	24	LB_DATA2
25	LB_DATA3#	26	LB_DATA3
27	VLCD	28	GND
29	LB_CLK#	30	LB_CLK

2.18 CD-IN Pin Header (CN6)

Pin	Signal
1	CD-R
2	CD-GND
3	CD-GND
4	CD-L

2.19 COM1~2 Port LED Connector (CN8)

Pin	Signal	Pin	Signal
1	COM1_RS232_PWR	2	GND
3	TX_LED_COM1	4	GND
5	RX_LED_COM1	6	GND
7	COM2_RS232_PWR	8	GND
9	TX_LED_COM2	10	GND
11	RX_LED_COM2	12	GND
13	COM2_RS485_PWR	14	COM2_RS422_PWR

2.20 COM3~4 Port LED Connector (CN9)

Pin	Signal	Pin	Signal
1	COM3_RS232_PWR	2	GND
3	TX_LED_COM3	4	GND
5	RX_LED_COM3	6	GND
7	COM4_RS232_PWR	8	GND
9	TX_LED_COM4	10	GND
11	RX_LED_COM4	12	GND

2.21 LAN Port LED Connector (CN10)

Pin	Signal	Pin	Signal
1	LAN1_LED_D2	2	LAN1_LED_LNK#_ACT
3	LAN1_LED_1000#	4	LAN1_LED_100#
5	LAN2_LED_D2	6	ACT_2_LED
7	SPD1K_2_LED	8	SPD100_2_LED

2.22 RS-232/422/485 Pin Header (COM2)

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

2.23 RS-232 Pin Header (COM3~4)

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

2.24 Pin Header (USB3, USB4)

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

9	GND	10	+5V

2.25 FAN Connector (FAN1, FAN2)

Pin	Signal	Pin	Signal
1	GND	2	+12V
3	FAN_TAC	4	FAN_CTL

2.26 4-pin ATX Power Connector (ATX1)

Pin	Signal	Pin	Signal
1	GND	2	GND
3	+12V	4	+12V

2.27 24-pin ATX Power Connector (ATX2)

Pin	Signal	Pin	Signal
1	+3.3V	2	+3.3V
3	GND	4	+5V
5	GND	6	+5V
7	GND	8	PWROK
9	+5VSB	10	+12V
11	+12V	12	+3.3V
13	+3.3V	14	-12V
15	GND	16	PS_ON
17	GND	18	GND
19	GND	20	NC
21	+5V	22	+5V
23	+5V	24	GND

2.28 SATA Connector (SATA 1~3)

Pin	Signal	Pin	Signal
1	GND	2	TXP

3	TXN	4	GND
5	RXN	6	RXP
7	GND		

2.29 Digital I/O Pin Header (DIO1)

The Base Address are A40H, A42H, and A43H

Pin	Signal	Pin	Signal
1	IN0 (U5 Pin34)	2	IN1 (U5 Pin33)
3	IN2 (U5 Pin32)	4	IN3 (U5 Pin31)
5	OUT0 (U5 Pin12)	6	OUT1 (U5 Pin11)
7	OUT2 (U5 Pin70)	8	OUT3 (U5 Pin66)
9	+5V	10	GND

BIOS Setting	Connector Definition	Address	IT8781F GPIO Setting
DIO_P#1	BC3 Pin 1	Bit 1(A40H)	U5 Pin 34 (GPIO11)
DIO_P#2	BC3 Pin 2	Bit 2(A40H)	U5 Pin 33 (GPIO12)
DIO_P#3	BC3 Pin 3	Bit 3(A40H)	U5 Pin 32 (GPIO13)
DIO_P#4	BC3 Pin 4	Bit 4(A40H)	U5 Pin 31 (GPIO14)
DIO_P#5	BC3 Pin 5	Bit 6(A42H)	U5 Pin 12 (GPIO36)
DIO_P#6	BC3 Pin 6	Bit 7(A42H)	U5 Pin 11 (GPIO37)
DIO_P#7	BC3 Pin 7	Bit 6(A43H)	U5 Pin 70 (GPIO46)
DIO_P#8	BC3 Pin 8	Bit 7(A43H)	U5 Pin 66 (GPIO47)

Note:

1. DIO_P#1, DIO_P#2, DIO_P#3, DIO_P#4 use Base Address: A40H
2. DIO_P#5, DIO_P#6 use Base Address: A42H
3. DIO_P#7, DIO_P#8 use Base Address: A43H

2.30 SATA Power Connector (PWR1)

Pin	Signal	Pin	Signal
1	+12V	2	GND
3	GND	4	+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

AMI 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.

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 IMBI-QM57 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 AMI BIOS Setup

AMI 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> or <F2> immediately. This will allow you to enter Setup.

Main
Set the date, use tab to switch between date elements.

Advanced
Enable disable boot option for legacy network devices.

Chipset
Host bridge parameters.

Boot
Enables/disable quiet boot option.

Security
Set setup administrator password.

Save&Exit
Exit system setup after saving the changes.

Chapter

4

Driver Installation

The IMBI-QM57 comes with a CD-ROM that contains all drivers your need.

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 AUDIO Driver

Step 5 – Install ME Driver

Step 6 – Install RAID Driver

Please read following instructions for detailed installations.

4.1 Installation:

Insert the IMBI-QM57 CD-ROM into the CD-ROM Drive. And install the drivers from Step 1 to Step 6 in order.

Step 1 – Install INF Driver

1. Click on the ***Step1 - INF*** folder and then double click on the ***Setup.exe***
2. Follow the instructions that the window shows
3. The system will help you to install the driver automatically

Step 2 – Install VGA Driver

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

Step 3 – Install LAN Driver

1. Click on the ***Step3 - LAN*** folder and double click on ***Autorun.exe*** file
2. Follow the instructions that the window shows
3. The system will help you to install the driver automatically

Step 4 – Install AUDIO Driver

1. Click on the ***Step4 - AUDIO*** folder and select the OS your system is
2. Double click on ***.exe*** file located in each OS folder

3. Follow the instructions that the window shows
4. The system will help you to install the driver automatically

Step 5 – Install ME Driver

1. Click on the ***Step5 - ME*** folder and double click on ***Setup.exe*** file
2. Follow the instructions that the window shows
3. The system will help you to install the driver automatically

Step 6 – Install RAID Driver

Please refer to Appendix D RAID & AHCI Settings

Appendix

A

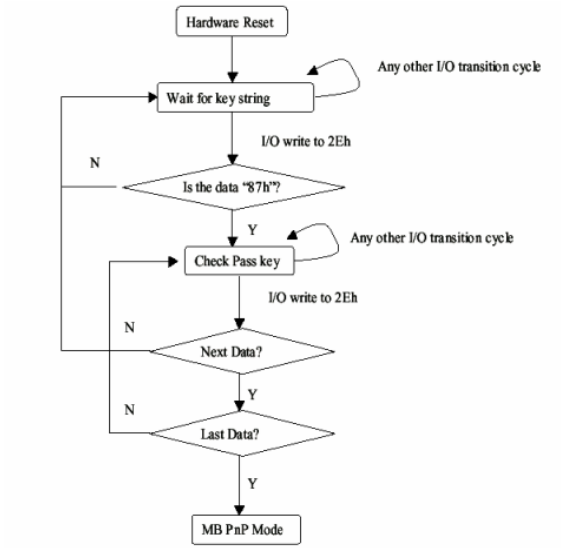
Programming the Watchdog Timer

A.1 Programming

IMBI-QM57 utilizes ITE 8781 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

After the hardware reset or power-on reset, the ITE 8781 enters the normal mode with all logical devices disabled except KBC. The initial state (enable bit) of this logical device (KBC) is determined by the state of pin 121 (DTR1#) at the falling edge of the system reset during power-on reset.



There are three steps to complete the configuration setup: (1) Enter the MB PnP Mode; (2) Modify the data of configuration registers; (3) Exit the MB PnP Mode. Undesired result may occur if the MB PnP Mode is not exited normally.

(1) Enter the MB PnP Mode

To enter the MB PnP Mode, four 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 four write opera-tions to the Special Address port (2EH). Two different enter keys are provided to select configuration ports (2Eh/2Fh) of the next step.

	Address Port	Data Port
87h, 01h, 55h, 55h:	2Eh	2Fh

(2) Modify the Data of the Registers

All configuration registers can be accessed after entering the MB PnP 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 MB PnP Mode

Set bit 1 of the configure control register (Index=02h) to 1 to exit the MB PnP Mode.

WatchDog Timer Configuration Registers

LDN	Index	R/W	Reset	Configuration Register or Action
All	02h	W	NA	Configure Control
07h	71h	R/W	00h	Watch Dog Timer Control Register
07h	72h	R/W	001s0000b	Watch Dog Timer Configuration Register
07h	73h	R/W	38h	Watch Dog Timer Time-out Value (LSB) Register
07h	74h	R/W	00h	Watch Dog Timer Time-out Value (MSB) Register

Configure Control (Index=02h)

This register is write only. Its values are not sticky; that is to say, a hardware reset will automatically clear the bits, and does not require the software to clear them.

Bit	Description
7-2	**Reserved**
1	Returns to the "Wait for Key" state. This bit is used when the configuration sequence is completed.
0	Resets all logical devices and restores configuration registers to their power-on states.

Watch Dog Timer 1, 2, 3 Control Register (Index=71h,81h,91h Default=00h)

Bit	Description
7	**WDT Timeout Enable(WTE)** 1: Disable. 0: Enable.
6	**WDT Reset upon Mouse Interrupt(WRKMI)** 0: Disable. 1: Enable.
5	**WDT Reset upon Keyboard Interrupt(WRKBI)** 0: Disable. 1: Enable.
4	**Reserved**
3-2	**Reserved**
1	**Force Time-out(FTO)** This bit is self-clearing.
0	**WDT Status(WS)** 1: WDT value reaches 0. 0: WDT value is not 0.

Watch Dog Timer 1, 2, 3 Configuration Register (Index=72h, 82h, 92h Default=001s0000b)

Bit	Description
7	**WDT Time-out Value Select 1 (WTVS)** 1: Second 0: Minute
6	**WDT Output through KRST (Pulse) Enable(WOKE)** 1: Enable 0: Disable
5	**WDT Time-out value Extra select(WTVES)** 1: 64ms x WDT Timer-out value (default = 4s) 0: Determined by WDT Time-out value select 1 (bit 7 of this register)
4	**WDT Output through PWROK (Pulse) Enable(WOPE)** 1: Enable 0: Disable During LRESET#, this bit is selected by JP7 power-on strapping option
3-0	**Select interrupt level Note1 for WDT(SIL)**

Watch Dog Timer 1,2,3 Time-Out Value (LSB) Register (Index=73h,83h,93h, Default=38h)

Bit	Description
7-0	**WDT Time-out Value 7-0(WTV)**

Watch Dog Timer 1,2,3 Time-Out Value (MSB) Register (Index=74h,84h,94h Default=00h)

Bit	Description
7-0	**WDT Time-out Value 15-8(WTV)**

A.2 ITE8781 Watchdog Timer Initial Program

```
.MODEL SMALL
.CODE
Main:
CALL Enter_Configuration_mode
CALL Check_Chip
mov cl, 7
call Set_Logic_Device
;time setting
mov cl, 10 ; 10 Sec
dec al
Watch_Dog_Setting:
;Timer setting
mov al, cl
mov cl, 73h
call Superio_Set_Reg
;Clear by keyboard or mouse interrupt
mov al, 0f0h
mov cl, 71h
call Superio_Set_Reg
;unit is second.
mov al, 0C0H
mov cl, 72h
```

```
call Superio_Set_Reg
; game port enable
mov cl, 9
call Set_Logic_Device

Initial_OK:
CALL Exit_Configuration_mode
MOV AH,4Ch
INT 21h

Enter_Configuration_Mode PROC NEAR
MOV SI,WORD PTR CS:[Offset Cfg_Port]

MOV DX,02Eh
MOV CX,04h
Init_1:
MOV AL,BYTE PTR CS:[SI]
OUT DX,AL
INC SI
LOOP Init_1
RET
Enter_Configuration_Mode ENDP

Exit_Configuration_Mode PROC NEAR
MOV AX,0202h
```

```
CALL Write_Configuration_Data
RET
Exit_Configuration_Mode ENDP

Check_Chip PROC NEAR

MOV AL,20h
CALL Read_Configuration_Data
CMP AL,87h
JNE Not_Initial

MOV AL,21h
CALL Read_Configuration_Data
CMP AL,81h
JNE Not_Initial

Need_Initial:
STC
RET
Not_Initial:
CLC
RET
Check_Chip ENDP
Read_Configuration_Data PROC NEAR
MOV DX,WORD PTR CS:[Cfg_Port+04h]
```

```
OUT DX,AL
MOV DX,WORD PTR CS:[Cfg_Port+06h]
IN AL,DX
RET
Read_Configuration_Data ENDP

Write_Configuration_Data PROC NEAR
MOV DX,WORD PTR CS:[Cfg_Port+04h]
OUT DX,AL
XCHG AL,AH
MOV DX,WORD PTR CS:[Cfg_Port+06h]
OUT DX,AL
RET
Write_Configuration_Data ENDP

Superio_Set_Reg proc near
push ax
MOV DX,WORD PTR CS:[Cfg_Port+04h]
mov al,cl
out dx,al
pop ax
inc dx
out dx,al
ret
Superio_Set_Reg endp.Set_Logic_Device proc near
```

```
Set_Logic_Device      proc      near
push ax
push cx
xchg al,cl
mov cl,07h
call Superio_Set_Reg
pop cx
pop ax
ret
Set_Logic_Device endp

;Select 02Eh->Index Port, 02Fh->Data Port
Cfg_Port DB 087h,001h,055h,055h
DW 02Eh,02Fh
```

END Main

Note: Interrupt level mapping

0Fh-Dh: not valid

0Ch: IRQ12

.

.

03h: IRQ3

02h: not valid

01h: IRQ1

00h: no interrupt selected

Appendix

B

I/O Information

B.1 I/O Address Map

- Input/output (IO)
  - [00000000 - 00000CF7] PCI bus
    - [00000000 - 0000000F] Direct memory access controller
    - [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 - 00000071] System CMOS/real time clock
    - [00000072 - 0000007F] Motherboard resources
    - [00000080 - 00000080] Motherboard resources
    - [00000081 - 00000083] Direct memory access controller
    - [00000084 - 00000086] Motherboard resources
    - [00000087 - 00000087] Direct memory access controller
    - [00000088 - 00000088] Motherboard resources
    - [00000089 - 0000008B] Direct memory access controller
    - [0000008C - 0000008E] Motherboard resources
    - [0000008F - 0000008F] Direct memory access controller
    - [00000090 - 0000009F] Motherboard resources
    - [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
    - [000002E8 - 000002EF] Communications Port (COM4)
    - [000002F8 - 000002FF] Communications Port (COM2)
    - [000003B0 - 000003BB] NVIDIA GeForce2 MX/MX 400 (Microsoft Corporation)
    - [000003C0 - 000003DF] NVIDIA GeForce2 MX/MX 400 (Microsoft Corporation)
    - [000003E8 - 000003EF] Communications Port (COM3)
    - [000003F8 - 000003FF] Communications Port (COM1)

- [00000400 - 0000047F] System board
- [000004D0 - 000004D1] Motherboard resources
- [00000500 - 0000057F] System board
- [00000A00 - 00000A1F] Motherboard resources
- [00000A79 - 00000A79] ISAPNP Read Data Port
- [00000D00 - 0000FFFF] PCI bus
  - [00001180 - 0000119F] System board
  - [0000D000 - 0000DFFF] Intel(R) 5 Series/3400 Series Chipset Family PCI Express Root Port 8 - 3B50
  - [0000E000 - 0000EFFF] Intel(R) 5 Series/3400 Series Chipset Family PCI Express Root Port 6 - 3B4C
  - [0000F000 - 0000F01F] Intel(R) 5 Series/3400 Series Chipset Family SMBus Controller - 3B30
  - [0000F020 - 0000F03F] Intel(R) 82577LM Gigabit Network Connection
  - [0000F040 - 0000F04F] Intel(R) 5 Series/3400 Series Chipset Family 2 port Serial ATA Storage Controller - 3B2D
  - [0000F050 - 0000F05F] Intel(R) 5 Series/3400 Series Chipset Family 2 port Serial ATA Storage Controller - 3B2D
  - [0000F060 - 0000F063] Intel(R) 5 Series/3400 Series Chipset Family 2 port Serial ATA Storage Controller - 3B2D
  - [0000F070 - 0000F077] Intel(R) 5 Series/3400 Series Chipset Family 2 port Serial ATA Storage Controller - 3B2D
  - [0000F080 - 0000F083] Intel(R) 5 Series/3400 Series Chipset Family 2 port Serial ATA Storage Controller - 3B2D
  - [0000F090 - 0000F097] Intel(R) 5 Series/3400 Series Chipset Family 2 port Serial ATA Storage Controller - 3B2D
  - [0000F0A0 - 0000F0AF] Intel(R) 5 Series/3400 Series Chipset Family 4 port Serial ATA Storage Controller - 3B2E
  - [0000F0B0 - 0000F0BF] Intel(R) 5 Series/3400 Series Chipset Family 4 port Serial ATA Storage Controller - 3B2E
  - [0000F0C0 - 0000F0C3] Intel(R) 5 Series/3400 Series Chipset Family 4 port Serial ATA Storage Controller - 3B2E
  - [0000F0D0 - 0000F0D7] Intel(R) 5 Series/3400 Series Chipset Family 4 port Serial ATA Storage Controller - 3B2E
  - [0000F0E0 - 0000F0E3] Intel(R) 5 Series/3400 Series Chipset Family 4 port Serial ATA Storage Controller - 3B2E
  - [0000F0F0 - 0000F0F7] Intel(R) 5 Series/3400 Series Chipset Family 4 port Serial ATA Storage Controller - 3B2E

B.2 1st MB Memory Address Map

- Memory
  - [000A0000 - 000BFFFF] PCI bus
    - [000A0000 - 000BFFFF] NVIDIA GeForce2 MX/MX 400 (Microsoft Corporation)
  - [E0000000 - FFFFFFFF] PCI bus
    - [E0000000 - EFFFFFFF] System board
    - [F0000000 - F7FFFFFF] NVIDIA GeForce2 MX/MX 400 (Microsoft Corporation)
    - [FA000000 - FAFFFFFF] NVIDIA GeForce2 MX/MX 400 (Microsoft Corporation)
    - [FB100000 - FB1FFFFF] Intel(R) 5 Series/3400 Series Chipset Family PCI Express Root Port 8 - 3B50
    - [FB200000 - FB2FFFFF] Intel(R) 5 Series/3400 Series Chipset Family PCI Express Root Port 6 - 3B4C
    - [FB300000 - FB31FFFF] Intel(R) 82577LM Gigabit Network Connection
    - [FB320000 - FB323FFF] Microsoft UAA Bus Driver for High Definition Audio
    - [FB324000 - FB3240FF] Intel(R) 5 Series/3400 Series Chipset Family SMBus Controller - 3B30
    - [FB325000 - FB3253FF] Intel(R) 5 Series/3400 Series Chipset Family USB Enhanced Host Controller - 3B34
    - [FB326000 - FB3263FF] Intel(R) 5 Series/3400 Series Chipset Family USB Enhanced Host Controller - 3B3C
    - [FB327000 - FB327FFF] Intel(R) 82577LM Gigabit Network Connection
    - [FEC00000 - FECFFFFF] System board
    - [FED00000 - FED003FF] High precision event timer
    - [FED08000 - FED08FFF] System board
    - [FED14000 - FED19FFF] System board
    - [FED1C000 - FED1FFFF] System board
    - [FED20000 - FED3FFFF] System board
    - [FED90000 - FED93FFF] System board
    - [FEE00000 - FEE0FFFF] System board
    - [FF000000 - FFFFFFFF] System board

B.3 IRQ Mapping Chart

Interrupt request (IRQ)

- (ISA) 0 System timer
- (ISA) 1 Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
- (ISA) 3 Communications Port (COM2)
- (ISA) 4 Communications Port (COM1)
- (ISA) 8 System CMOS/real time clock
- (ISA) 9 Microsoft ACPI-Compliant System
- (ISA) 10 Communications Port (COM4)
- (ISA) 11 Communications Port (COM3)
- (ISA) 12 Microsoft PS/2 Mouse
- (ISA) 13 Numeric data processor
- (PCI) 5 Intel(R) 5 Series/3400 Series Chipset Family SMBus Controller - 3B30
- (PCI) 16 Intel(R) 5 Series/3400 Series Chipset Family PCI Express Root Port 6 - 3B4C
- (PCI) 16 Intel(R) 5 Series/3400 Series Chipset Family USB Enhanced Host Controller - 3B3C
- (PCI) 16 Intel(R) processor PCI Express Root Port 1 - D138
- (PCI) 17 Intel(R) 5 Series/3400 Series Chipset Family PCI Express Root Port 1 - 3B42
- (PCI) 17 Intel(R) Gigabit CT Desktop Adapter
- (PCI) 19 Intel(R) 5 Series/3400 Series Chipset Family 2 port Serial ATA Storage Controller - 3B2D
- (PCI) 19 Intel(R) 5 Series/3400 Series Chipset Family 4 port Serial ATA Storage Controller - 3B2E
- (PCI) 19 Intel(R) 5 Series/3400 Series Chipset Family PCI Express Root Port 8 - 3B50
- (PCI) 19 NVIDIA GeForce2 MX/MX 400 (Microsoft Corporation)
- (PCI) 19 Standard Dual Channel PCI IDE Controller
- (PCI) 20 Intel(R) 82577LM Gigabit Network Connection
- (PCI) 22 Microsoft UAA Bus Driver for High Definition Audio
- (PCI) 23 Intel(R) 5 Series/3400 Series Chipset Family USB Enhanced Host Controller - 3B34

B.4 DMA Channel Assignments

Direct memory access (DMA)

- 4 Direct memory access controller

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		
SATA1	SATA Connector	TECHBEST	161S01-025A	SATA Cable	1709070800
SATA2	SATA Connector	TECHBEST	161S01-025A	SATA Cable	1709070800
SATA3	SATA Connector	TECHBEST	161S01-025A	SATA Cable	1709070800
COM2	Serial Port Box Header	Catch Electronics	1147-000-10S	Serial Port Cable	1701100305
COM3	Serial Port Box Header	Catch Electronics	1147-000-10MP	Serial Port Cable	170110030A
COM4	Serial Port Box Header	Catch Electronics	1147-000-10MP	Serial Port Cable	170110030A
USB3	USB Pin Header	Catch Electronics	1147-000-10MSP	USB Cable	1709100201
USB4	USB Pin Header	Catch Electronics	1147-000-10MSP	USB Cable	1709100201
DIO1	Digital I/O Box Header	Catch Electronics	1147-000-10MSP	N/A	N/A
FAN1	FAN Connector	Catch Electronics	1190-700-042	N/A	N/A
FAN2	FAN Connector	Catch Electronics	1190-700-042	N/A	N/A
ATX1	4P Power Connnector	Catch Electronics	1121-700-04S	N/A	N/A
ATX2	24P Power Connector	Catch Electronics	1121-700-24S	N/A	N/A
LAN1	Ethernet Connector	FOXCONN	JFM38U1B-21U5-4F	N/A	N/A
LAN2	Ethernet Connector	FOXCONN	JFM38U1B-21U5-4F	N/A	N/A

KM1	Mini-Din PS/2 KB/MS Pin Header	Foxconn	MH11061-P36-4F	N/A	N/A
PWR1	WAFER.4P Connector	HO-BASE	P201-04	N/A	N/A
CN1	COM1+DVI Connector	TechBast Electronics	D205D1B01012PN	N/A	N/A
CN2	Front Panel Connector	Astron Electronics	27-24041-205-1G-TB1-R	N/A	N/A
CN4	LVDS Inverter Connector	Catch Electronics	1192-700-05S	N/A	N/A
CN5	LVDS Connector	E-call	0110-01-553-300	N/A	N/A
CN6	CD-I 2.54mm 4Pin Header	N/A	N/A	N/A	N/A
CN7	CRT+HDMI Connector	TechBast Electronics	D211HA3101012PN	N/A	N/A
CN8	COM1~2_LED Connector	Astron Electronics	26-4304-207-1G-TB1-R	N/A	N/A
CN9	COM3-4_LED Connector	Astron Electronics	26-4304-206-1G-TB1-R	N/A	N/A
CN10	LAN_LED Connector	Astron Electronics	26-4304-204-1G-TB1-R	N/A	N/A

Appendix

D

RAID & AHCI Settings

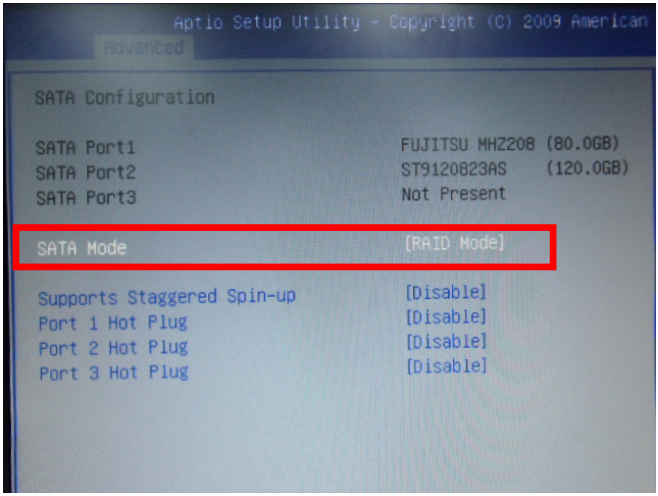
D.1 Setting RAID

OS installation to setup RAID Mode

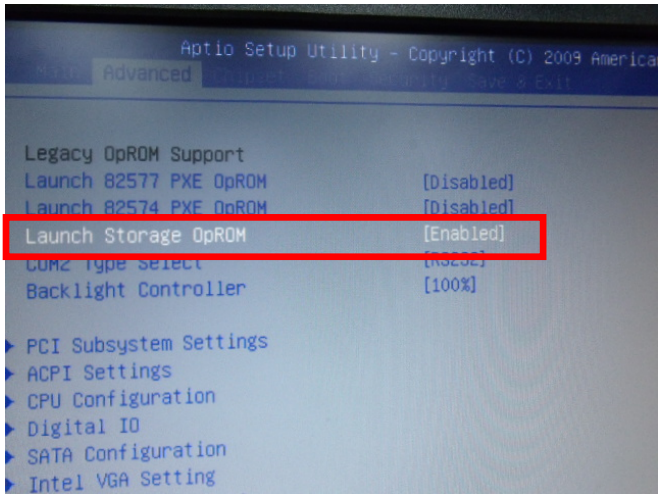
Step 1: Copy the files below from "***Driver CD -> Raid Driver -> F6 Floppy - x86***" to Disk

Step 2: Connect the USB Floppy (disk with RAID files) to the board

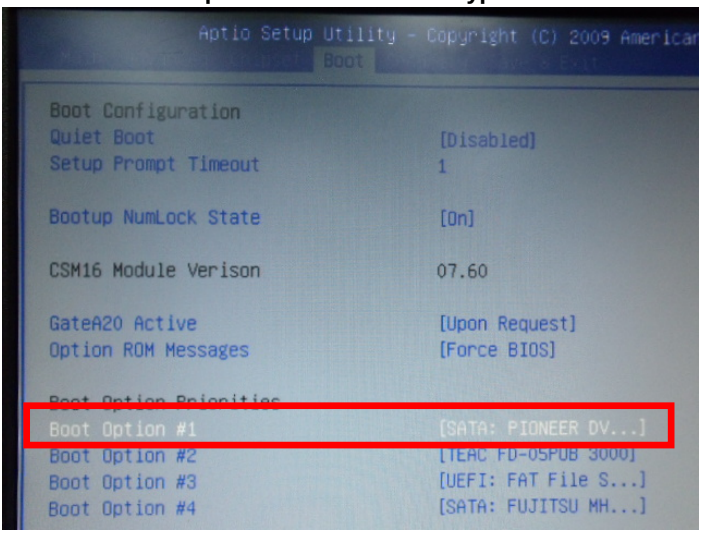
Step 3: The setting procedures " **In BIOS Setup Menu**"
A: Advanced -> SATA Configuration -> SATA Mode -> RAID Mode



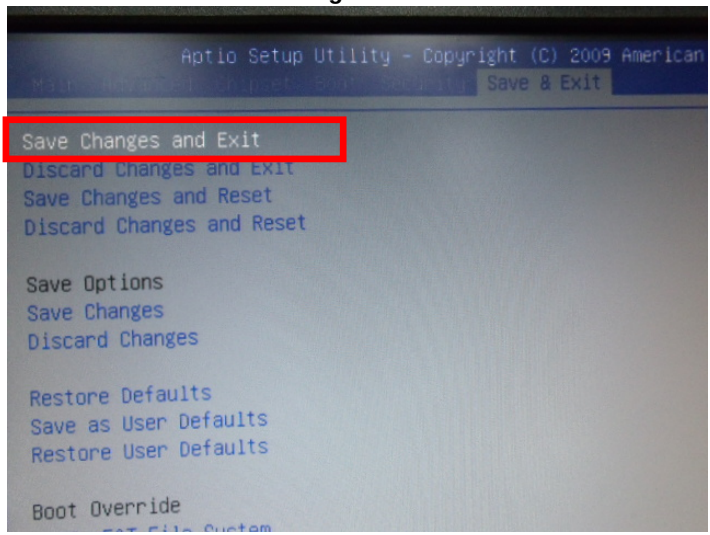
Step 4: The setting procedures "**In BIOS Setup Menu**"
B: Advanced -> Launch Storage OpROM -> Enabled



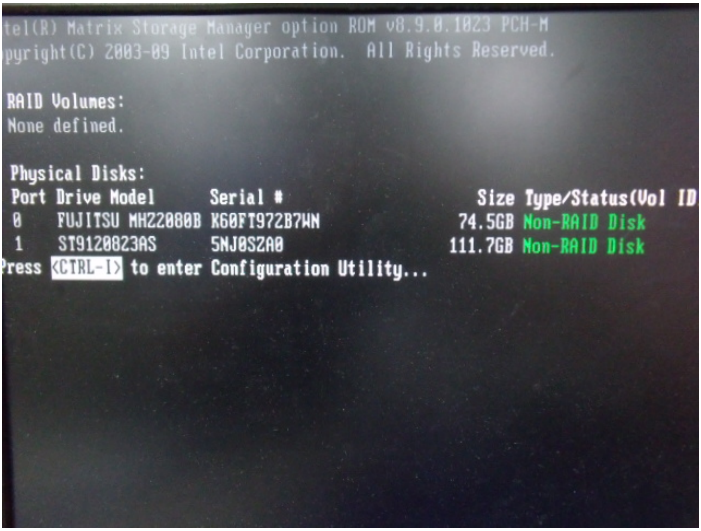
Step 5: The setting procedures "**In BIOS Setup Menu"**
C: Boot -> Boot Option #1 -> DVD-ROM Type



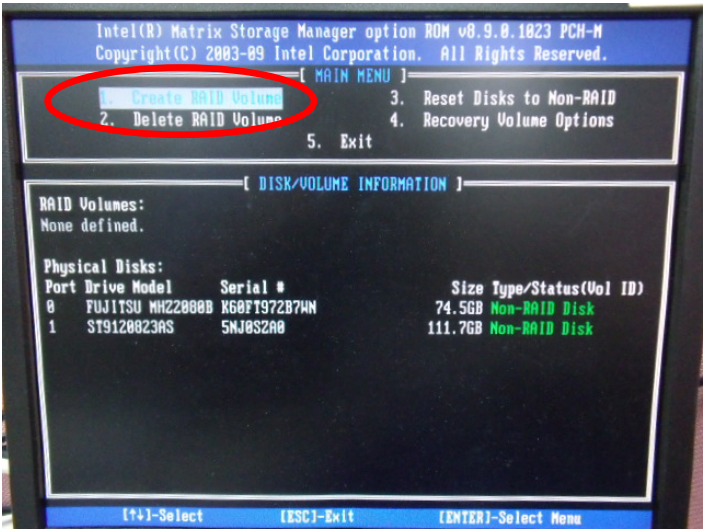
Step 6: The setting procedures "**In BIOS Setup Menu"**
D: Save & Exit -> Save Changes and Exit



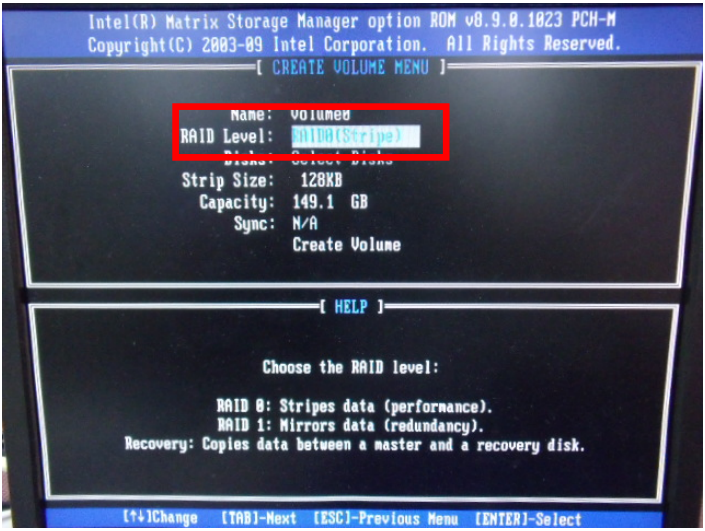
Step 7: Press **Ctrl-I** to enter **MAIN MENU**



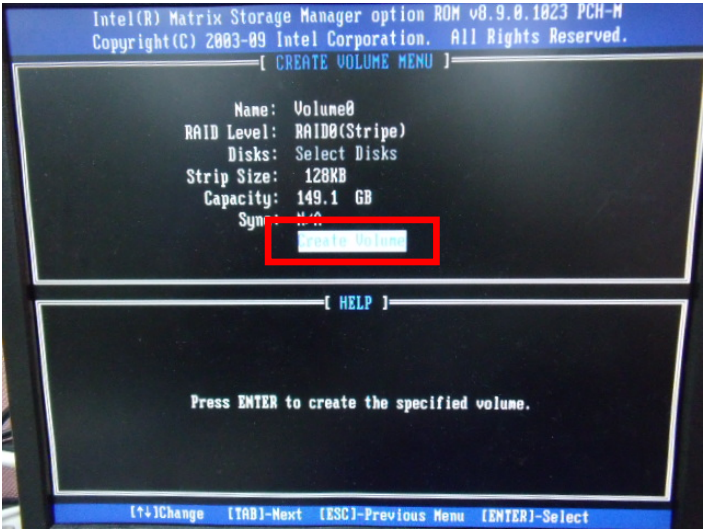
Step 8: Choose "**1.Create RAID Volume**"



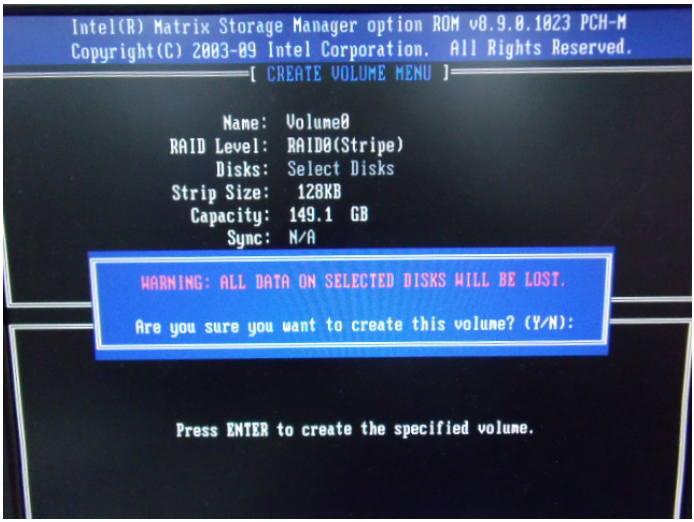
Step 9: RAID Level -> RAID0(Stripe)



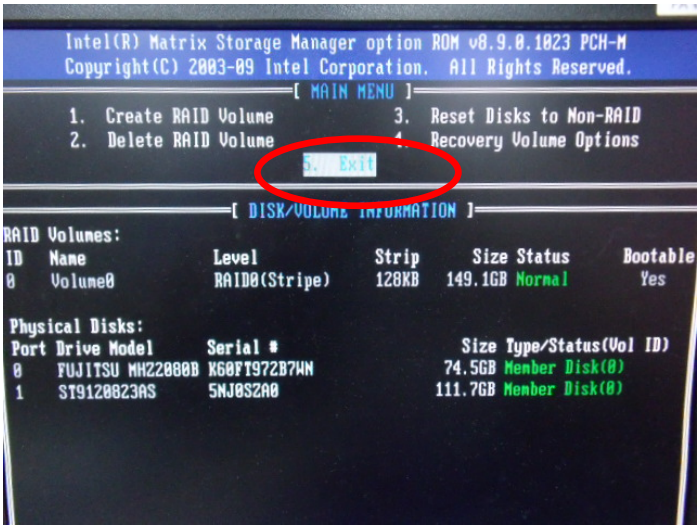
Step 10: Choose "**Create Volume**"



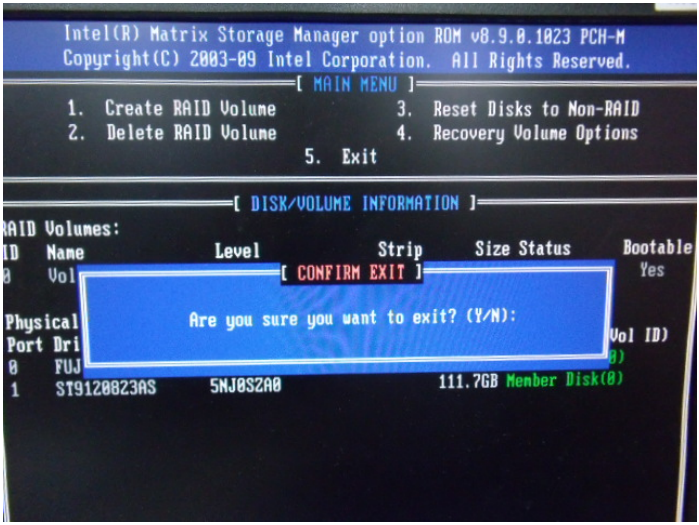
Step 11: Choose "**Y**"



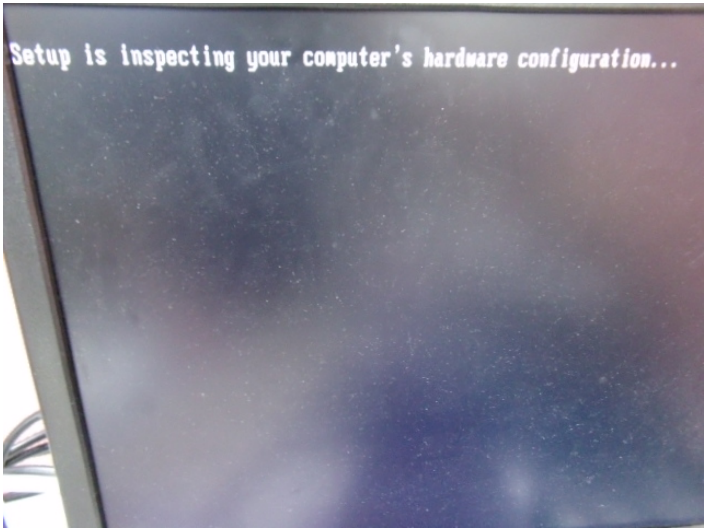
Step 12: Choose "**5. Exit**"



Step 13: Choose "**Y**"

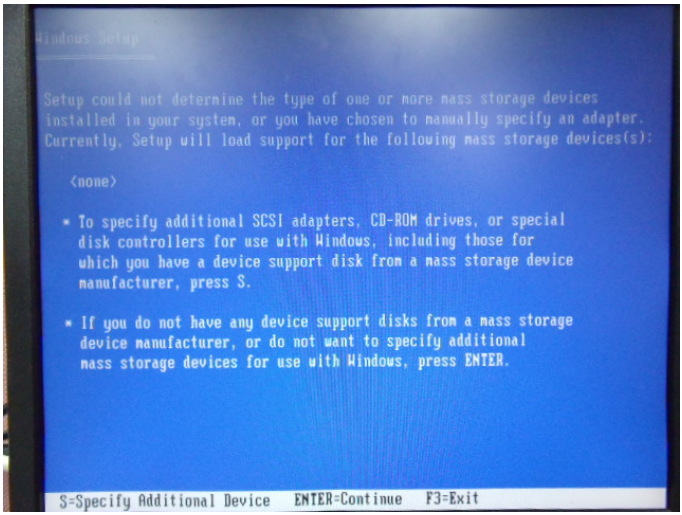


Step 14: Setup OS

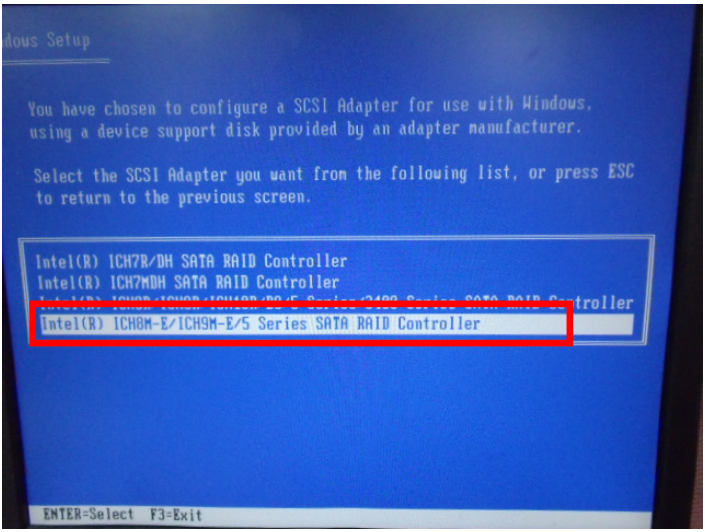


Step 15: Press “**F6**”

Step 16: Choose “**S**”

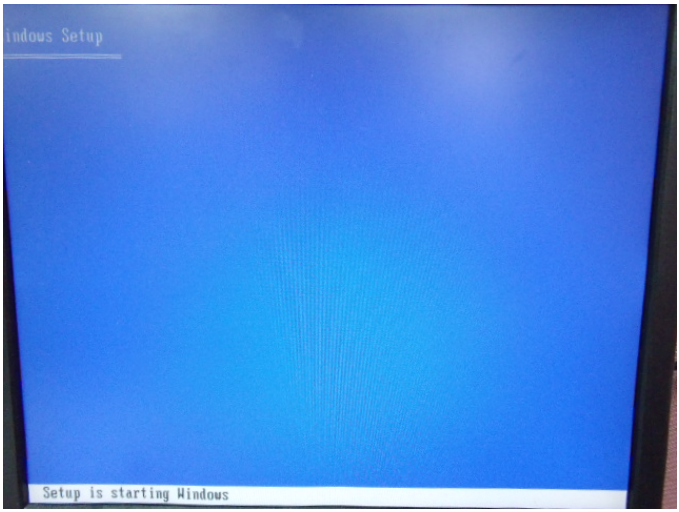


Step 17: Choose "**Intel(R) ICH8M-E/ICH9M-E/5 Series SATA RAID Controller**"



Step 18: It will show the model number you select and then press "**ENTER**"

Step 19: Setup is starting Windows



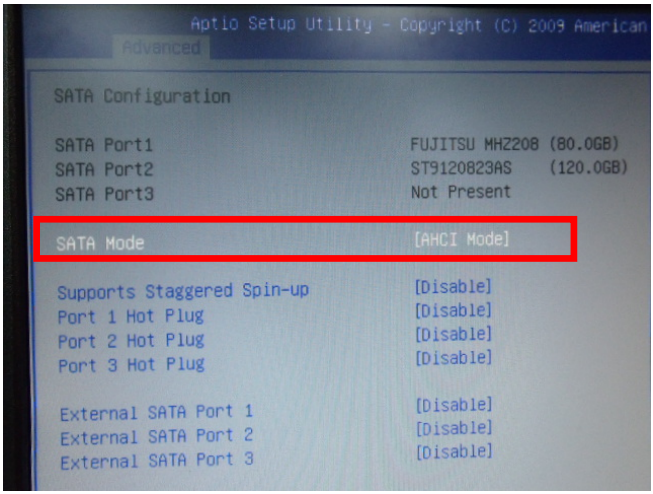
D.2 Setting AHCI

OS installation to setup AHCI Mode

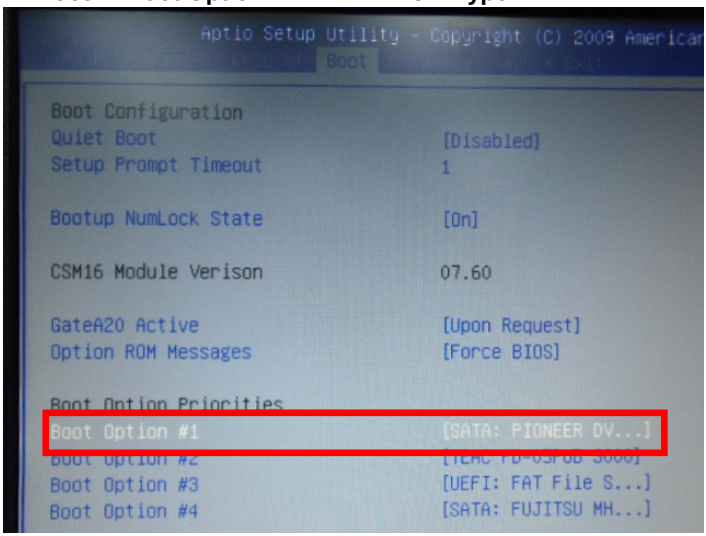
Step 1: Copy the files below from "***Driver CD -> Raid Driver -> F6 Floppy - x86***" to Disk

Step 2: Connect the USB Floppy (disk with RAID files) to the board

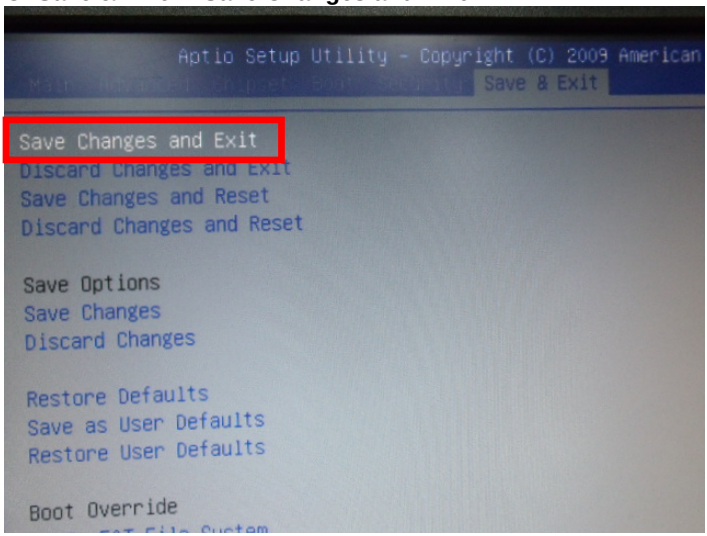
Step 3: The setting procedures " **In BIOS Setup Menu**"
A: Advanced -> SATA Configuration -> SATA Configuration -> SATA Mode -> AHCI Mode



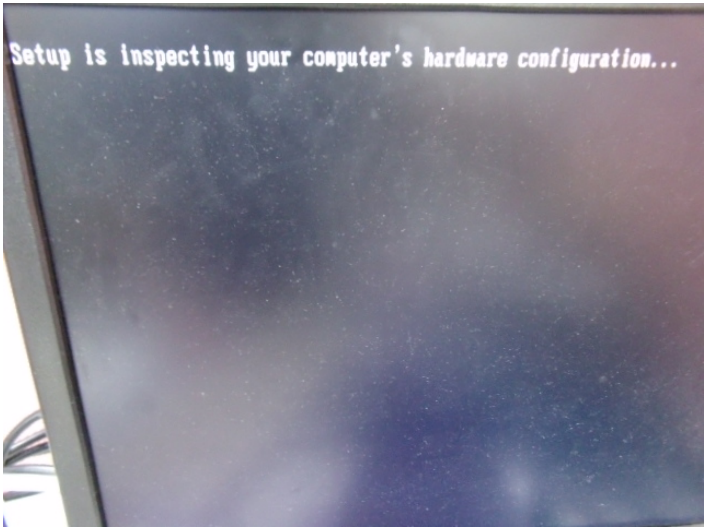
Step 4: The setting procedures "**In BIOS Setup Menu"**
B: Boot -> Boot Option #1 -> DVD-ROM Type



Step 5: The setting procedures "**In BIOS Setup Menu"**
C: Save & Exit -> Save Changes and Exit

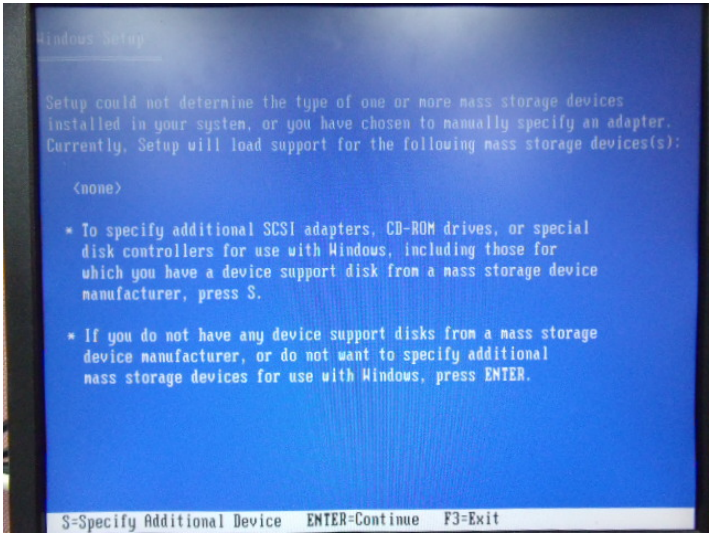


Step 6: Setup OS

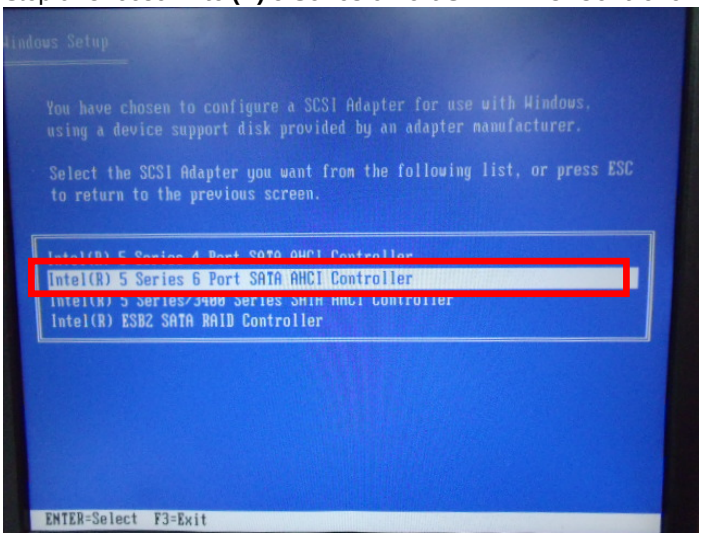


Step 7: Press "**F6**"

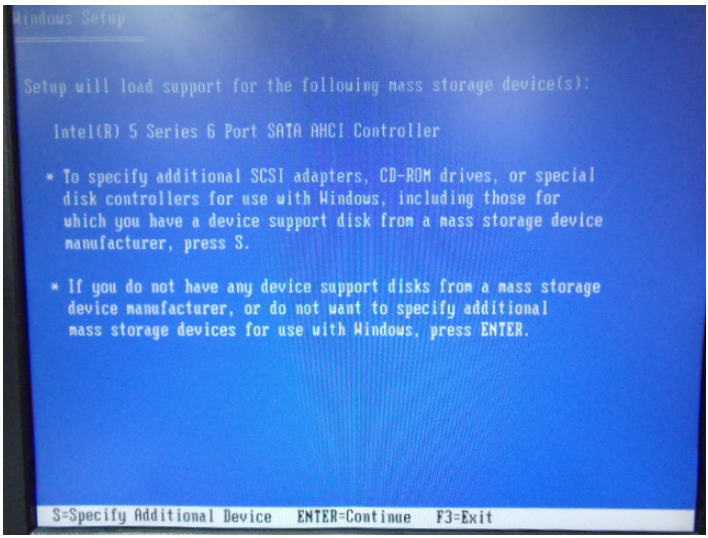
Step 8: Choose "**S**"



Step 9: Choose "**Intel(R) 5 Series 6 Port SATA AHCI Controller**"



Step 10: It will show the model number you select and then press "**ENTER**"



Step 11: Setup is loading files