HSB-LN2I

Intel® Atom™ D525/N455 Processor

ISA Expansion Half-size SBC

Two 204-pin DDR3 667/800 SODIMM

3 SATA 3.0 Gb/s/ 1 IDE/ 1 CompactFlash™

5 USB2.0/ 2 COM/ 1 VGA/ 1 LVDS

HSB-LN2I Manual Rev.A 1st Ed.
March 20, 2014

Copyright Notice

Acknowledgments

Packing List

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

- 1 ATA100 Cable
- 1 USB Cable
- 1 Keyboard & Mouse Cable
- 1 Serial + Parallel Cable
- 1 Serial Cable
- 3 SATA Cables
- 1 Product CD (manual in PDF format and drivers)
- 1 HSB-LN2I CPU Card

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

Contents

Chapter

1

General Information

1.1 Introduction

The HSB-LN2I utilizes the Intel® Atom™ D525/N455 and ICH8M chipset, supporting Intel® Atom™ D525 processor with a FSB of 800MHz up to 1.8GHz and Intel® Atom™ N455 processor with a FSB of 533MHz up to 1.66GHz. The HSB-LN2I with D525 supports DDR3 800MT/s SODIMM system memory up to 4 GB. N455 supports DDR3 667MT/s SODIMM system memory up to 2 GB.

This model offers a multitude of I/O including two COM ports and five USB2.0 ports. To meet today's increasing storage demands it also supports three SATA 3.0 Gb/s, one Type 2 CompactFlash™ to share IDE channel, and one ATA100 sockets. The flexible expansion and storage makes the HSB-LN2I a great solution for your vital applications.

In addition to the comprehensive COM and USB offering the HSB-LN2I can also be configured with two Gigabit Ethernet ports to meet the needs of high bandwidth connectivity. Supporting CRT & LCD simultaneously along with the optional high definition audio board, the HSB-LN2I is an ideal solution for demanding multimedia based applications.

1.2 Features

- Intel® Atom™ D525/N455 Processor
- Intel® Atom™ D525/N455 + ICH8M
- 204-Pin DDR3 800 SODIMM, Up to 4 GB (D525); DDR3 667 SODIMM, Up to 2 GB (N455)
- Gigabit Ethernet x 2
- Intel® Atom™ D525/N455 Integrated VGA, Shared Memory Up To 324MB With DVMT4.0.
- Optional HD Codec Audio Daughter Board
- SATA 3.0Gb/s x 3, CompactFlash™ Type 2 x 1, ATA100 x 1
- USB2.0 x 5, RS-232/422/485 x 1, RS-232 x 1, Parallel x 1
- ISA Expansion
- +5V, +12V Operation, AT Power

Note: HSB-LN2I has to be operated with an ISA backplane to supply +5V, +12V, and -12V power inputs to make COM1 work functionally.

1.3 Specification

System

● Form Factor	ISA Half-size Board
● CPU	Onboard Intel® Atom™ D525 Processor up to 1.8GHz with a 1 MB L2 cache; Onboard Intel® Atom™ N455 Processor up to 1.66GHz with a 512KB L2 cache
● System Memory	Two 204-pin DDR3 800 SODIMM, up to 4GB (D525); DDR3 667 SODIMM, up to 2GB (N455)
● Chipset	Intel® Atom™D525/N455 + Intel® ICH8M
● Ethernet	Realtek RTL 8111E x 2, Gigabit Ethernet, RJ-45 x 2
● Audio (Optional Daughter Board)	HD Audio Codec with Realtek ALC888
● BIOS	AMI Plug & Play SPI BIOS – 4 MB ROM
● I/O Chip	Winbond 83627DHG-P
● Storage	40-pin IDE slot x 1 (Slave), SATA 3.0 Gb/s x 3,
● SSD	CompactFlash™ Type 2 connector, shares IDE channel

	(Master)
● Watchdog Timer	1~255 steps, can be set with software on Super I/O
● RTC	Internal RTC
● H/W Status Monitor	Monitoring system temperature, voltage, and cooling fan status
● Battery	Lithium battery
● Power Requirement	+5V, ±12V by ISA bus, onboard 4-pin power connector (+5V, +12V)

Note: HSB-LN2I has to be operated with an ISA backplane. Normally, onboard 4-pin power connector can supply power (+5V and +12V) to operate the board. But the COM1 will need +5V and ±12V power supplied through the ISA bus.

● Board Size	7.3”(L) x 4.8” (W) (185mm x 122mm)
● Gross Weight	0.71lb (0.3kg)
● Operating Temperature	32°F~140°F(0°C~60°C)
● Storage Temperature	-4°F~158°F(-20°C~70°C)
● Operating Humidity	10%~80%, non-condensing
● EMI	CE/FCC Class A

Display

● Chipset	Intel® Atom™ D525/ N455 + ICH8M
● Graphic Engine	Intel® Atom™ D525/ N455 with

	integrated Graphics Core
● Resolutions	D525: Up to 2048x1536 @ 60Hz for CRT; 1366x768 @ 60Hz for LCD N455: Up to 1400x1050 @ 60Hz for CRT; 1366x768 @ 60Hz for LCD
● Output Interface	VGA x 1, LVDS x 1

I/O

● Serial Port	COM1: RS-232 COM2: RS-232/422/485
● Parallel Port	Supports SPP/EPP/ECP mode
● Keyboard/Mouse	Keyboard/Mouse x 1
● Universal Serial Bus	USB2.0 x 5, 5x2-pin header x 2, Type A x 1
● Audio	Audio Jack x 2
● Ethernet	RJ-45 x 2
● Display	VGA x 1, LVDS x 1

Chapter

2

Quick Installation Guide

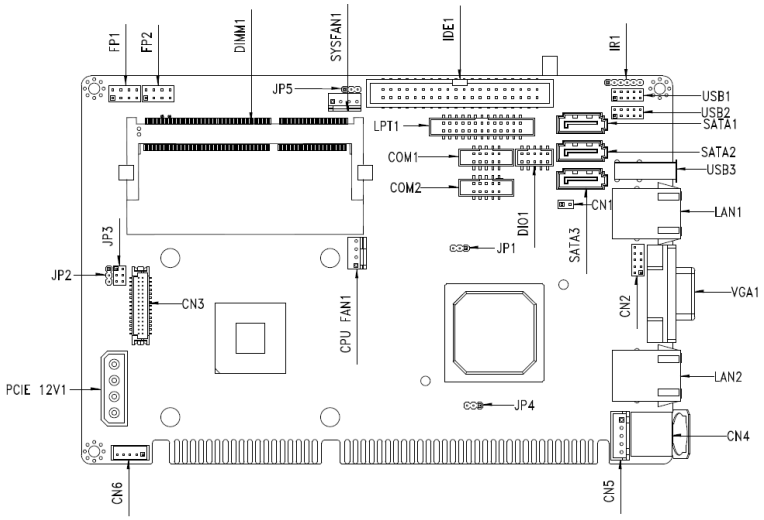
2.1 Safety Precautions

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.

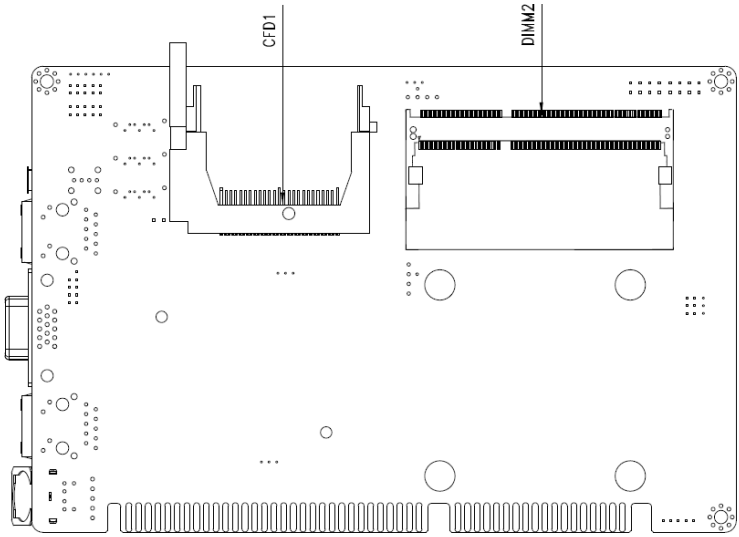
Always ground yourself to remove any static charge before touching the board. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not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

2.2 Location of Connectors and Jumpers

Component Side

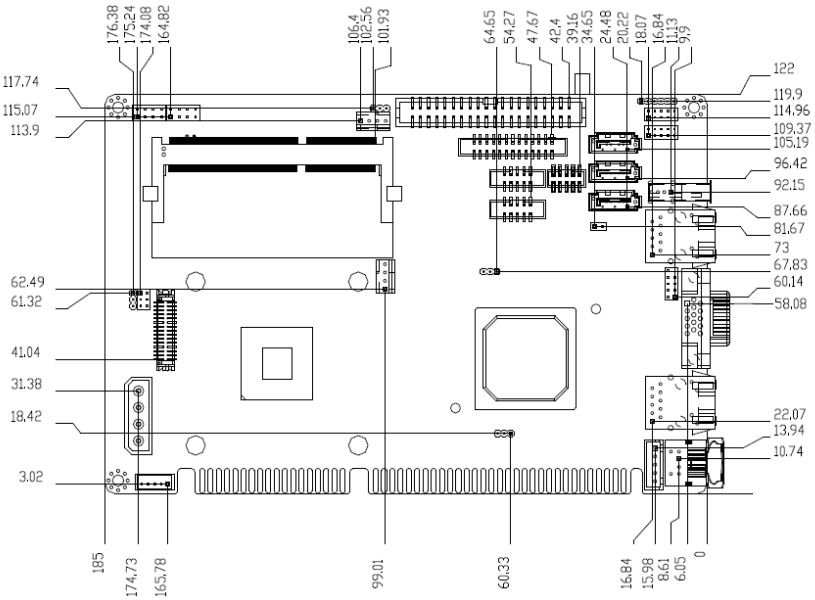


Solder Side

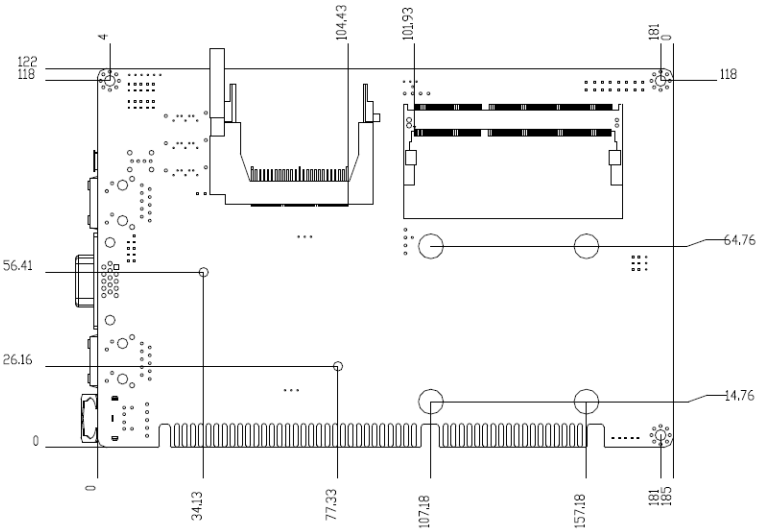


2.3 Mechanical Drawing

Component Side



Solder Side


4
104.43
101.93
181
0
122
118
118
64.76
56.41
26.16
14.76
0
0
34.13
77.33
107.18
157.18
181
185

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	CF Selection
JP2	LCD Panel Voltage Selection
JP3	LCD Backlight Voltage Selection LCD Backlight Inverter VCC Selection
JP4	Clear CMOS
JP5	Auto Power Button 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:

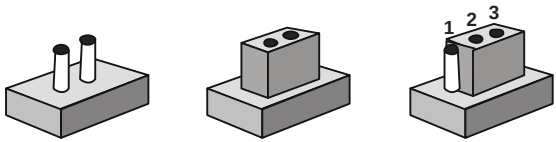
Label	Function
FP1	Front Panel Connector 1
FP2	Front Panel Connector 2
VGA1	VGA Port Connector
COM1	RS-232 Serial Connector
COM2	RS-232/485/422 Serial Connector
CN1	Caseopen Pin Header
CN2	HD Audio Codec with Realtek ALC888(Optional) Connector
CN3	LVDS Connector
CN4	PS2 Keyboard/Mouse Connector
CN5	Keyboard Connector
CN6	LVDS Backlight Connector
LAN1	100/1000Base-TX Ethernet Connector
LAN2	100/1000Base-TX Ethernet Connector
DIMM1	DDR3 SODIMM Slot
DIMM2	DDR3 SODIMM Slot
USB1	USB Connector
USB2	USB Connector
USB3	USB Connector
CPU_FAN1	4-Pin CPU Fan Connector

SYS_FAN1	4-Pin System Fan Connector
PCIE_12V1	4-Pin ATX Power Connector
BT1	Battery Connector
SATA1	SATA Connector
SATA2	SATA Connector
SATA3	SATA Connector
SPI1	BIOS DEBUG PORT
IDE1	IDE Connector
LPT1	Parallel Port 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 CF Selection (JP1)

Master

Slave

JP1	Function
1-2	Master (Default)
2-3	Slave

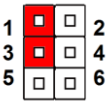
2.8 LCD Panel Voltage Selection (JP2)

+5V

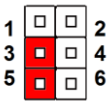
+3.3V (Default)

JP3	Function
1-2	+5V
2-3	+3.3V(Default)

2.9 LCD Backlight Voltage Selection (JP3)



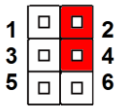
PWM Mode



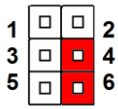
Bias Mode (Default)

JP3	Function
1-3	PWM Mode
3-5	Bias Mode (Default)

2.10 LCD Backlight Inverter VCC Selection (JP3)



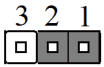
+5V



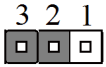
+12V (Default)

JP3	Function
2-4	+5V
4-6	+12V (Default)

2.11 Clear CMOS (JP4)



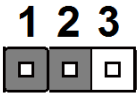
Normal (Default)



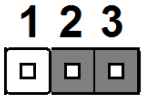
Clear CMOS

JP4	Function
1-2	Normal (Default)
2-3	Clear CMOS

2.12 Auto Power Button Selection (JP5)



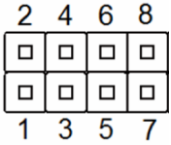
Disable



Enable (Default)

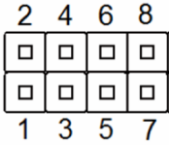
JP5	Function
1-2	Disable
2-3	Enable(Default)

2.13 Front Panel Connector (FP1)



Pin	Signal
1	PWR_BTN+
2	H/W RESET+
3	PWR_BTN-
4	H/W RESET-
5	HDD_LED+
6	PWR_LED+
7	HDD_LED-
8	PWR_LED-

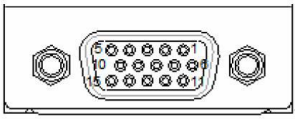
2.14 Front Panel Connector (FP2)



Pin	Signal
1	External Speaker (+)
2	Key Board Lock (+)
3	N.C.

4	GND
5	Internal Buzzer (-)
6	I2C Bus SMB Clock
7	External Speaker (-)
8	I2C Bus SMB Data

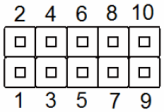
2.15 VGA Connector (VGA1)



Pin	Pin Name	Signal Type	Signal Level
1	RED	OUT	
2	GREEN	OUT	
3	BLUE	OUT	
4	NC		
5	GND	GND	
6	RED_GND_RTN	GND	
7	GREEN_GND_RTN	GND	
8	BLUE_GND_RTN	GND	
9	+5V	PWR	+5V
10	GND	GND	
11	NC		
12	DDC_DATA	I/O	+5V
13	HSYNC	OUT	
14	VSYNC	OUT	

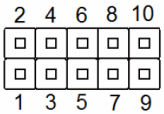
15	DDC_CLK	I/O	+5V

2.16 RS-232 Serial Connector (COM1)



Pin	Pin Name	Signal Type	Signal Level
1	DCD	IN	
2	RXD	IN	
3	TXD	OUT	±9V
4	DTR	OUT	±9V
5	GND	PWR	GND
6	DSR	IN	
7	RTS	OUT	±9V
8	CTS	IN	
9	RI/+5V/+12V	IN/ PWR	+5V/+12V
10	NC	NC	NC

2.17 RS-232/485/422 Serial Connector (COM2)



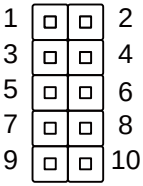
Pin	Pin Name	Signal Type	Signal Level
1	DCD(422TXD-/485DATA-)	IN	

2	RXD (422RXD+)	IN	
3	TXD(422TXD+/485DATA+)	OUT	±9V
4	DTR(422RXD-)	OUT	±9V
5	GND	PWR	GND
6	DSR	IN	
7	RTS	OUT	±9V
8	CTS	IN	
9	RI/+5V/+12V	IN/ PWR	+5V/+12V
10	NC	NC	NC

2.18 Caseopen Pin Header(CN1)

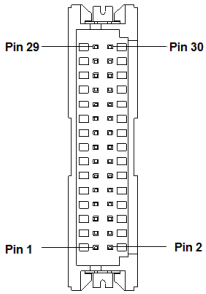
Pin	Pin Name	Signal Type	Signal Level
1	CASEOPEN#	IN	
2	GND	PWR	GND

2.19 HD Audio Codec with Realtek ALC888 (Optional) Connector (CN2)



Pin	Pin Name	Signal Type	Signal Level
1	RST	IN	
2	SYNC	IN	
3	SDIN	IN	
4	SDOUT	OUT	+3.3V
5	DET	IN	
6	BCLK	IN	
7	RTS	PWR	GND
8	+5V	PWR	+5V
9	NC	NC	NC
10	+3.3V	PWR	+3.3V

2.20 LVDS Connector (CN3)



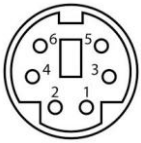
Pin	Pin Name	Signal Type	Signal Level
1	BKL_ENABLE	OUT	
2	BKL_CONTROL	OUT	
3	LCD_PWR	PWR	+3.3V/+5V
4	GND	GND	

5	LVDS_A_CLK-	DIFF	
6	LVDS_A_CLK+	DIFF	
7	LCD_PWR	PWR	+3.3V/+5V
8	GND	GND	
9	LVDS_DA0-	DIFF	
10	LVDS_DA0+	DIFF	
11	LVDS_DA1-	DIFF	
12	LVDS_DA1+	DIFF	
13	LVDS_DA2-	DIFF	
14	LVDS_DA2+	DIFF	
15	LVDS_DA3-	DIFF	
16	LVDS_DA3+	DIFF	
17	DDC_DATA	I/O	+3.3V
18	DDC_CLK	I/O	+3.3V
19	LVDS_DB0-	DIFF	
20	LVDS_DB0+	DIFF	
21	LVDS_DB1-	DIFF	
22	LVDS_DB1+	DIFF	
23	LVDS_DB2-	DIFF	
24	LVDS_DB2+	DIFF	
25	LVDS_DB3-	DIFF	
26	LVDS_DB3+	DIFF	
27	LCD_PWR	PWR	+3.3V/+5V
28	GND	GND	

29	LVDS_B_CLK-	DIFF	
30	LVDS_B_CLK+	DIFF	

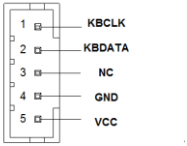
Note: LVDS LCD_PWR can be set to +3.3V or +5V by JP2.

2.21 PS2 Keyboard/Mouse Connector (CN4)



Pin	Pin Name	Signal Type	Signal Level
1	KBDATA	IN	
2	NC	NC	
3	GND	GND	
4	VCC	PWR	+5V
5	KBCLK	IN	
6	NC	NC	

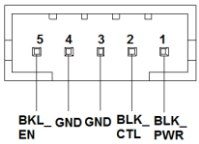
2.22 Keyboard Connector (CN5)



Pin	Pin Name	Signal Type	Signal Level
1	KBCLK	IN	

2	KBDATA	IN	
3	NC	NC	
4	GND	PWR	GND
5	VCC	PWR	+5V

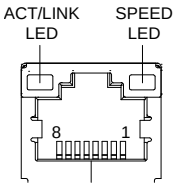
2.23 LVDS Inverter/ Backlight Connector (CN6)



Pin	Pin Name	Signal Type	Signal Level
1	BKL_PWR	PWR	+5V / +12V
2	BKL_CONTROL	IN	
3	GND	GND	
4	GND	GND	
5	BKL_ENABLE	OUT	+5V

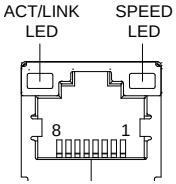
Note: LVDS1 BKL_PWR can be set to +5V or +12V by JP3.
LVDS1 BKL_CONTROL can be set by JP3.

2.24 Realtek LAN (RJ-45) Port (LAN1)



Pin	Pin Name	Signal Type	Signal Level
1	MDI0+	DIFF	
2	MDI0-	DIFF	
3	MDI1+	DIFF	
4	MDI2+	DIFF	
5	MDI2-	DIFF	
6	MDI1-	DIFF	
7	MDI3+	DIFF	
8	MDI3-	DIFF	

2.25 Realtek LAN (RJ-45) Port (LAN2)



Pin	Pin Name	Signal Type	Signal Level
1	MDI0+	DIFF	
2	MDI0-	DIFF	
3	MDI1+	DIFF	
4	MDI2+	DIFF	
5	MDI2-	DIFF	
6	MDI1-	DIFF	
7	MDI3+	DIFF	
8	MDI3-	DIFF	

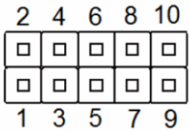
2.26 DDR3 SODIMM Slot (DIMM1)

Standard specification

2.27 DDR3 SODIMM Slot (DIMM2)

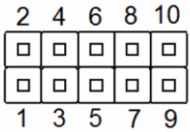
Standard specification

2.28 USB2.0 Port 4 and Port 5 (USB1)



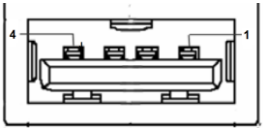
Pin	Pin Name	Signal Type	Signal Level
1	+5VSB	PWR	+5V
2	GND	PWR	GND
3	USB4_D-	DIFF	
4	GND	PWR	GND
5	USB4_D+	DIFF	
6	USB5_D+	DIFF	
7	GND	PWR	GND
8	USB5_D-	DIFF	
9	GND	PWR	GND
10	+5VSB	PWR	+5V

2.29 USB2.0 Port 2 and Port 3 (USB2)



Pin	Pin Name	Signal Type	Signal Level
1	+5VSB	PWR	+5V
2	GND	PWR	GND
3	USB2_D-	DIFF	
4	GND	PWR	GND
5	USB2_D+	DIFF	
6	USB3_D+	DIFF	
7	GND	PWR	GND
8	USB3_D-	DIFF	
9	GND	PWR	GND
10	+5VSB	PWR	+5V

2.30 USB2.0 Port 1 (USB3)



Pin	Pin Name	Signal Type	Signal Level
1	+5VSB	PWR	+5V

2	USB2_D-	DIFF	
3	USB2_D+	DIFF	
4	GND	PWR	GND

2.31 4-Pin CPU Fan Connector (CPU_FAN1)

Pin	Pin Name	Signal Type	Signal Level
1	GND	PWR	GND
2	+12V	PWR	
3	SENSE	IN	
4	CTRL	IN	

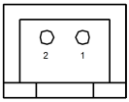
2.32 4-Pin SYS Fan Connector (SYS_FAN1)

Pin	Pin Name	Signal Type	Signal Level
1	GND	PWR	GND
2	+12V	PWR	
3	SENSE	IN	
4	CTRL	IN	

2.33 4-Pin ATX Power Connector (PCIE_12V1)

Pin	Pin Name	Signal Type	Signal Level
1	+12V	PWR	+12V
2	GND	PWR	GND
3	GND	PWR	GND
4	+5V_ATX	PWR	+5V

2.34 Battery Connector (BT1)



Pin	Pin Name	Signal Type	Signal Level
1	VBAT	PWR	+3V
2	GND	PWR	GND

2.35 SATA Port 1 (SATA1)

Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	

2	SATA_TX0+	DIFF
3	SATA_TX0-	DIFF
4	GND	GND
5	SATA_RX0-	DIFF
6	SATA_RX0+	DIFF
7	GND	GND

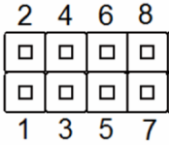
2.36 SATA Port 1 (SATA2)

Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	SATA_TX1+	DIFF	
3	SATA_TX1-	DIFF	
4	GND	GND	
5	SATA_RX1-	DIFF	
6	SATA_RX1+	DIFF	
7	GND	GND	

2.37 SATA Port 1 (SATA3)

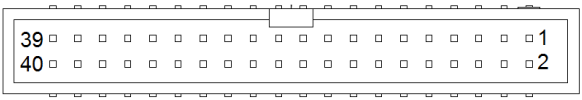
Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	SATA_TX2+	DIFF	
3	SATA_TX2-	DIFF	
4	GND	GND	
5	SATA_RX2-	DIFF	
6	SATA_RX2+	DIFF	
7	GND	GND	

2.38 BIOS DEBUG PORT (SPI1)



Pin	Pin Name	Signal Type	Signal Level
1	+3.3V_SPI	PWR	+3.3V
2	GND	PWR	GND
3	SPI_CE	IN	
4	SPI_CLK	IN	
5	SPI_SO	OUT	+3.3V
6	SPI_SI	IN	
7	SPI_HOLD	IN	
8	NC	NC	

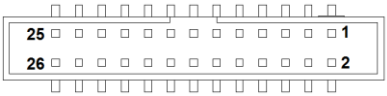
2.39 IDE Connector (IDE1)



Pin	Pin Name	Signal Type	Signal Level
1	/RESET	IN	
2	GND	PWR	GND
3	Data 7	I/O	
4	Data 8	I/O	
5	Data 6	I/O	
6	Data 9	I/O	
7	Data 5	I/O	
8	Data 10	I/O	
9	Data 4	I/O	
10	Data 11	I/O	
11	Data 3	I/O	
12	Data 12	I/O	
13	Data 2	I/O	
14	Data 13	I/O	
15	Data 1	I/O	
16	Data 14	I/O	
17	Data 0	I/O	
18	Data 15	I/O	

19	GND	PWR	GND
20	NC	NC	
21	DMA Request	I	
22	GND	PWR	GND
23	Write Strobe	IN	
24	GND	PWR	GND
25	Read Strobe	IN	
26	GND	PWR	GND
27	I/O Ready	OUT	
28	Spindle Sync or Cable Select	IN	
29	DMA Acknowledge		
30	GND	PWR	GND
31	Interrupt Request	OUT	
32	NC		
33	Address 1	IN	
34	Passed Diagnostics		
35	Address 0	IN	
36	Address 2	IN	
37	/IDE_CS0		
38	/IDE_CS1		
39	/ACTIVE	IN	
40	GND	PWR	GND

2.40 Parallel Port Connector (LPT1)



Pin	Pin Name	Signal Type	Signal Level
1	STROBE#	IN	
2	AFD#	I/O	
3	PD0	I/O	
4	ERROR#	IN	
5	PD1	I/O	
6	PRINT#	I/O	
7	PD2	I/O	
8	SLIN#	I/O	
9	PD3	I/O	
10	GND	GND	
11	PD4	I/O	
12	GND	GND	
13	PD5	I/O	
14	GND	GND	
15	PD6	I/O	
16	GND	GND	
17	PD7	I/O	
18	GND	GND	

19	ACK#	IN
20	GND	GND
21	BUSY	IN
22	GND	GND
23	PE	IN
24	GND	GND
25	SLCT	IN
26	NC	

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 HSB-LN2I 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.

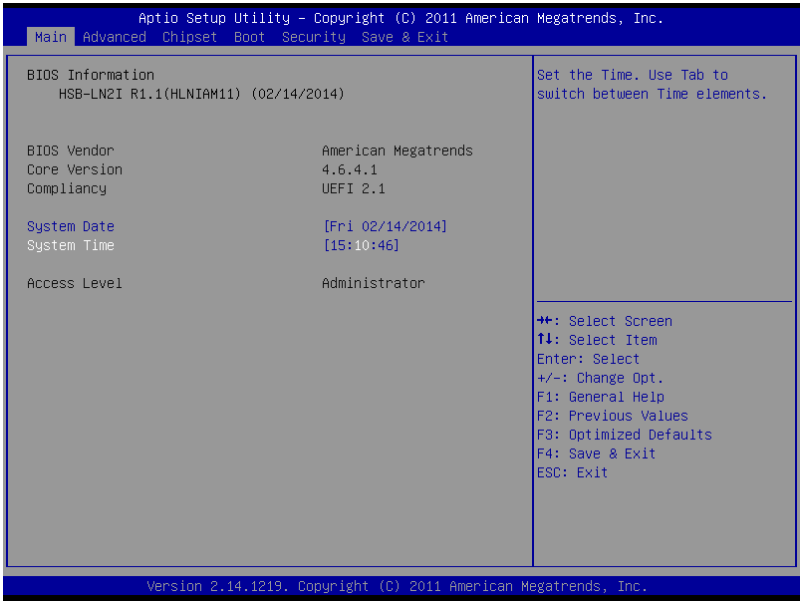
Security

Set setup administrator password.

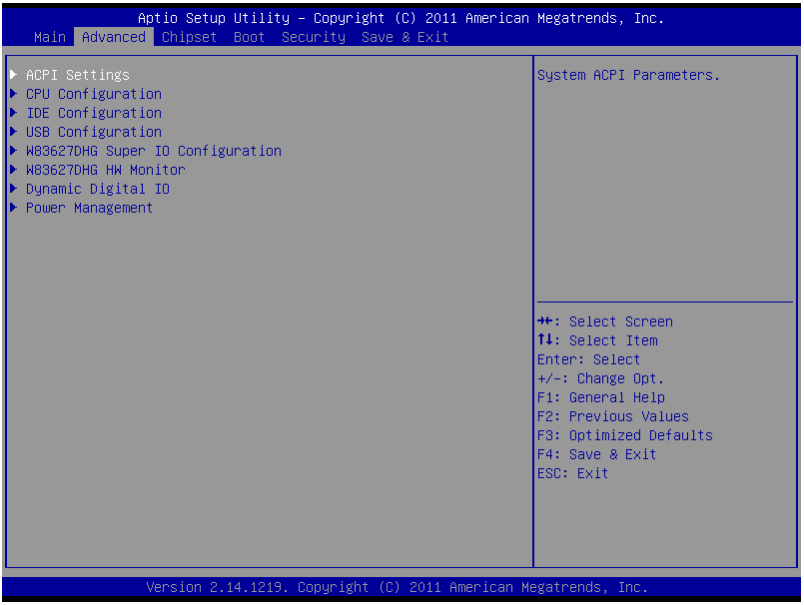
Save&Exit

Exit system setup after saving the changes.

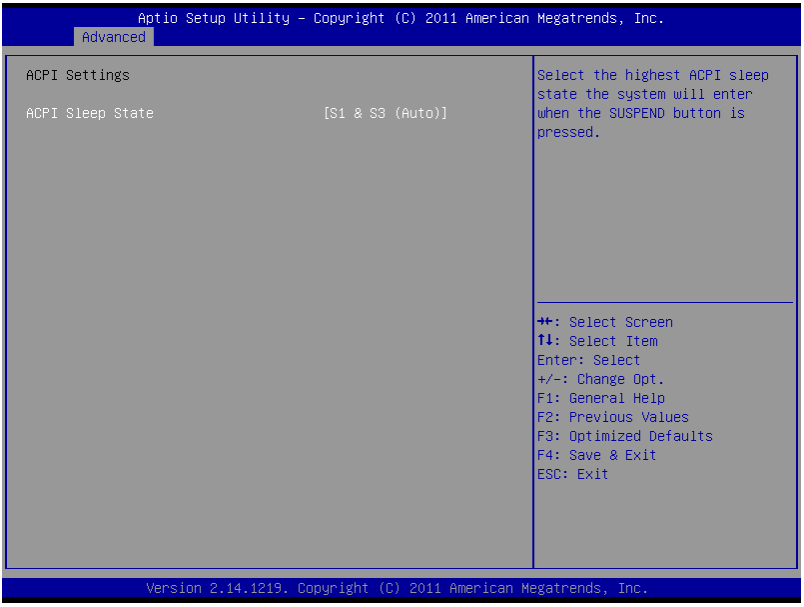
Setup submenu: Main



Setup submenu: Advanced



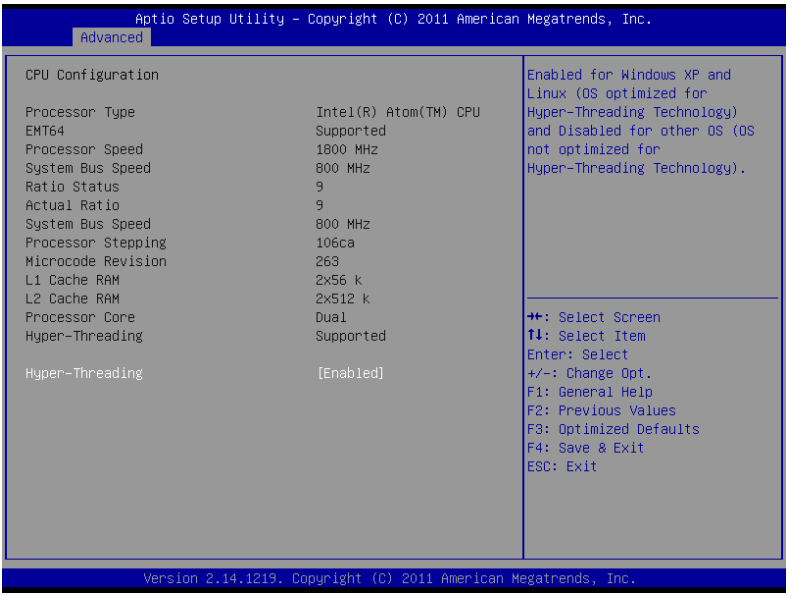
ACPI Settings



Options Summary :

ACPI Sleep State	S1 Only (CPU Stop Clock)	
	S3 Only (Suspend to RAM)	
	S1 & S3 (Auto)	Default
Select ACPI sleep state the system will enter when the SUSPEND button is pressed.		

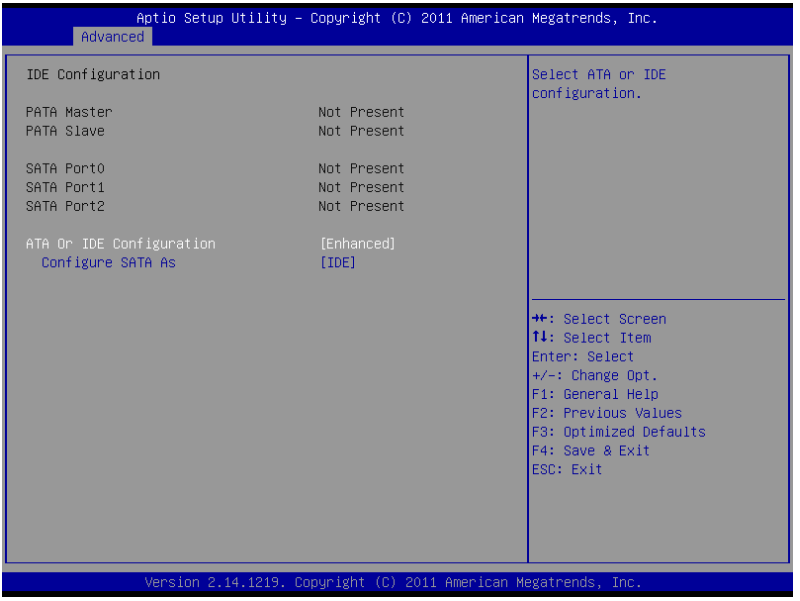
CPU Configuration



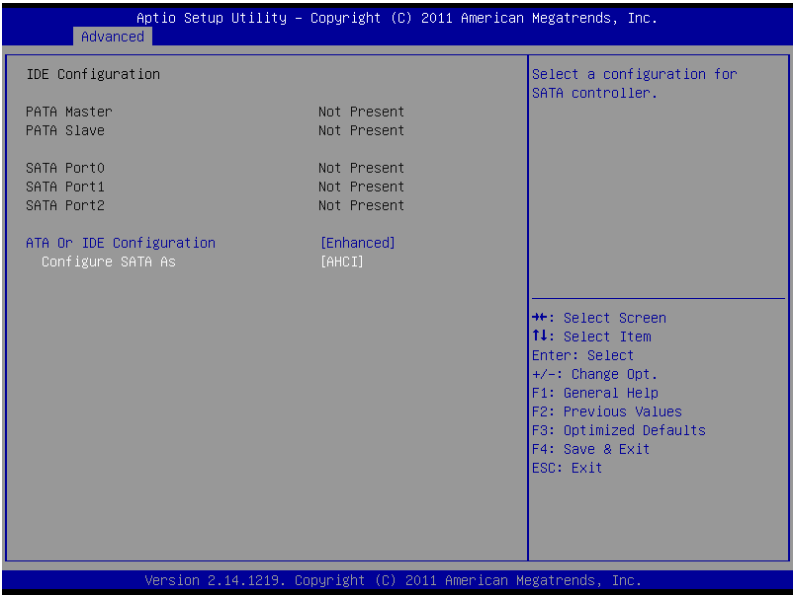
Options Summary :

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

SATA Configuration (IDE)



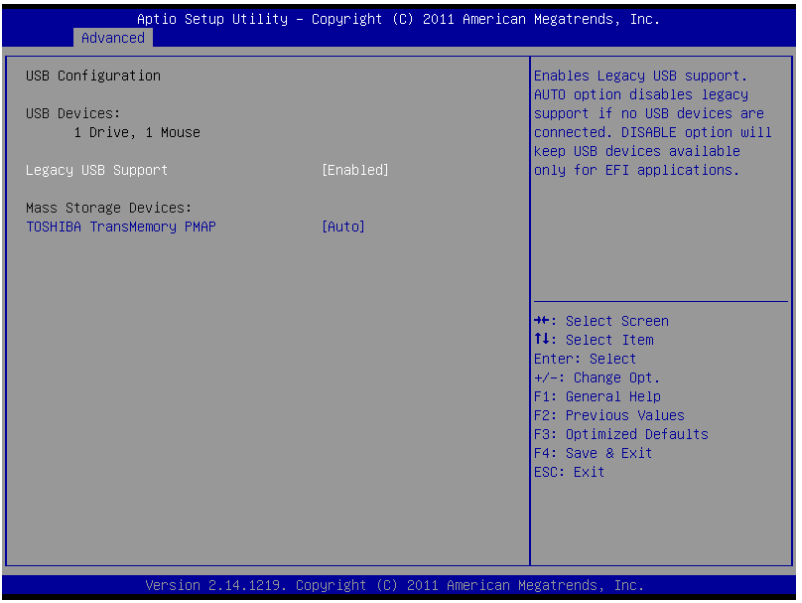
SATA Configuration (AHCI)



Options summary :

SATA Controller(s)	Enabled	Default
	Disabled	
Enable or disable SATA device.		
SATA Mode Selection	IDE	Default
	AHCI	
Determines how SATA controller(s) operate.		

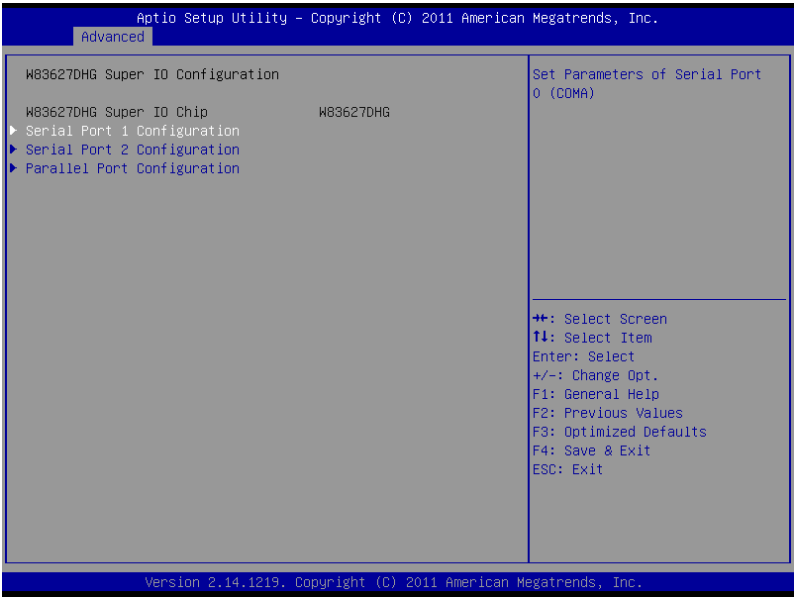
USB Configuration



Options summary :

Legacy USB Support	Enabled	Default
	Disabled	
	Auto	
Enable Legacy USB support. Auto option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.		

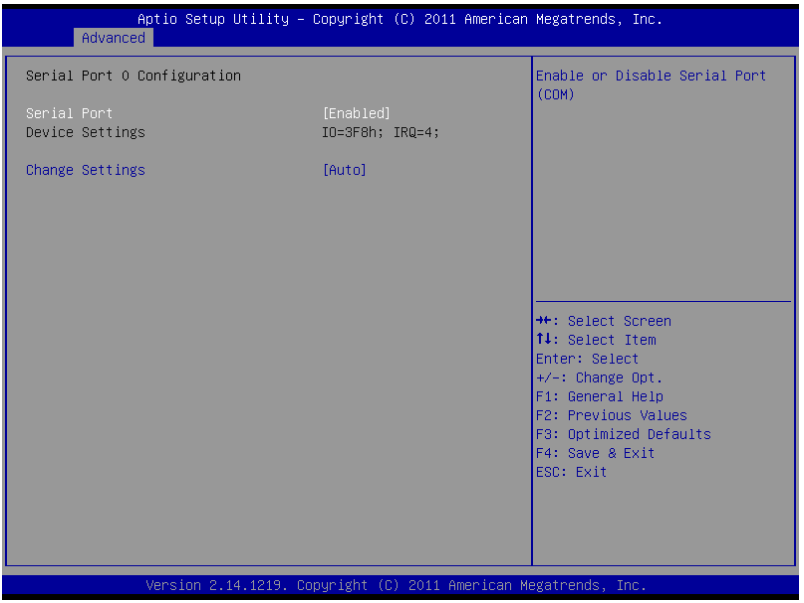
W83627DHG Super IO Configuration



Options Summary :

Serial Port 1 Configuration	Set Parameters of Serial Port 1 (COMA)
Serial Port 2 Configuration	Set Parameters of Serial Port 2 (COMB)
Parallel Port Configuration	Set Parameters of Parallel Port (LPT/LPTE)

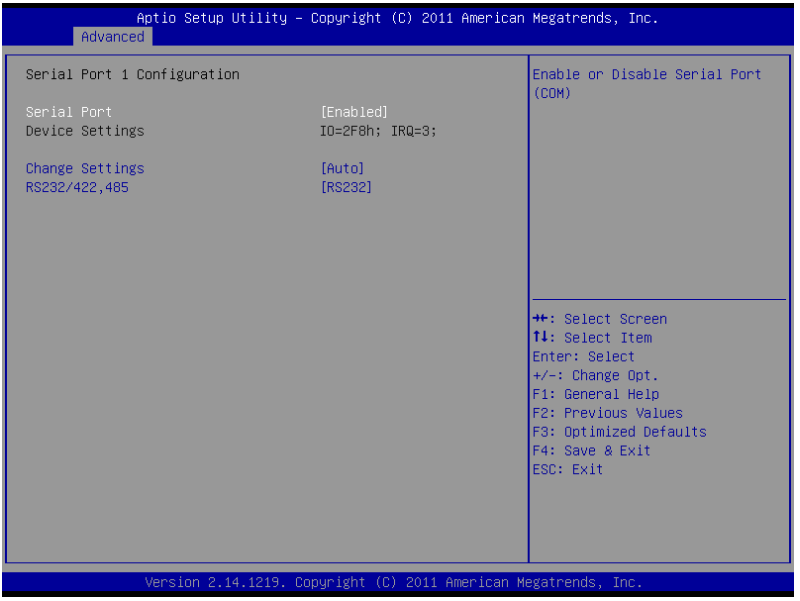
-Serial Port 1 Configuration



Options Summary :

Serial Port	Disabled	
	Enabled	Default
Enable or Disable Serial Port (COM)		
Change Settings	Auto	Default
	IO=3F8h; IRQ=4	
	IO=2F8h; IRQ=3	
Select an optimal setting for Super IO device.		

-Serial Port 2 Configuration

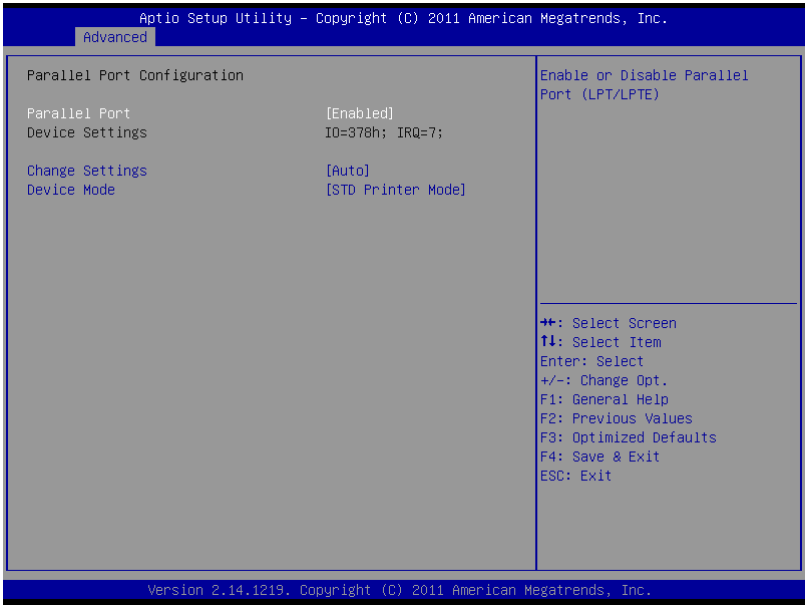


Options Summary :

Serial Port	Disabled	
	Enabled	Default
Enable or Disable Serial Port (COM)		
Change Settings	Auto	Default
	IO=2F8h; IRQ=3	
	IO=3F8h; IRQ=4	
Select an optimal setting for Super IO device.		

RS232/422,485	RS232	Default
	RS422	
	RS485	
RS232/422,485 switch		

-Parallel Port Configuration

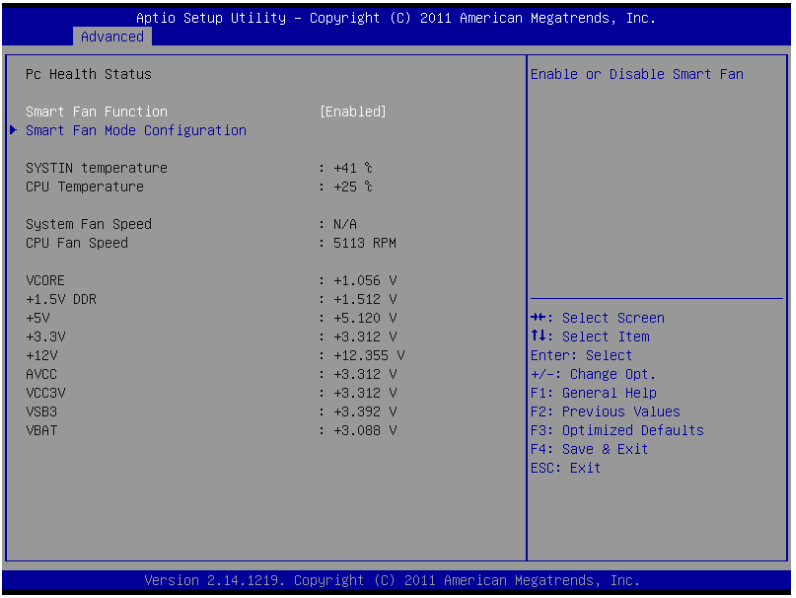


Options Summary :

Parallel Port	Disabled	
	Enabled	Default
Enable or Disable Parallel Port (LPT/LPTE)		
Change Settings	Auto	Default

	IO=378h; IRQ=7	
	IO=378h; IRQ=5, 7	
	IO=278h; IRQ=5, 7	
	IO=3BCh; IRQ=5, 7	
Select an optimal setting for Super IO device.		
Device Mode	STD Printer Mode	Default
	SPP Mode	
	EPP-1.9 and SPP Mode	
	EPP-1.7 and SPP Mode	
	ECP Mode	
	ECP and EPP 1.9 Mode	
	ECP and EPP 1.7 Mode	
Change the Printer Port mode.		

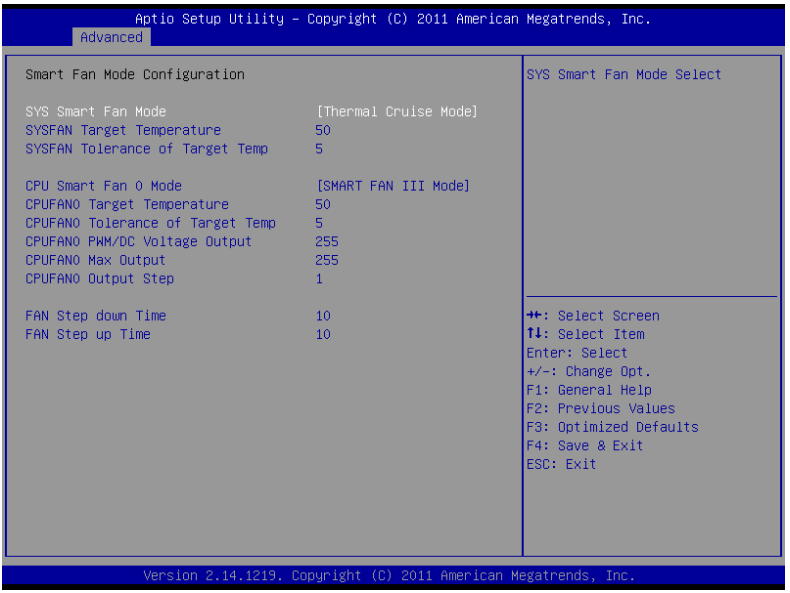
W83627DHG HW Monitor



Options Summary :

Smart Fan Function	Disabled	
	Enabled	Default
Enable or Disable Smart Fan		
Smart Fan Mode Configuration	Smart Fan Mode Select	

-Smart Fan Mode Configuration

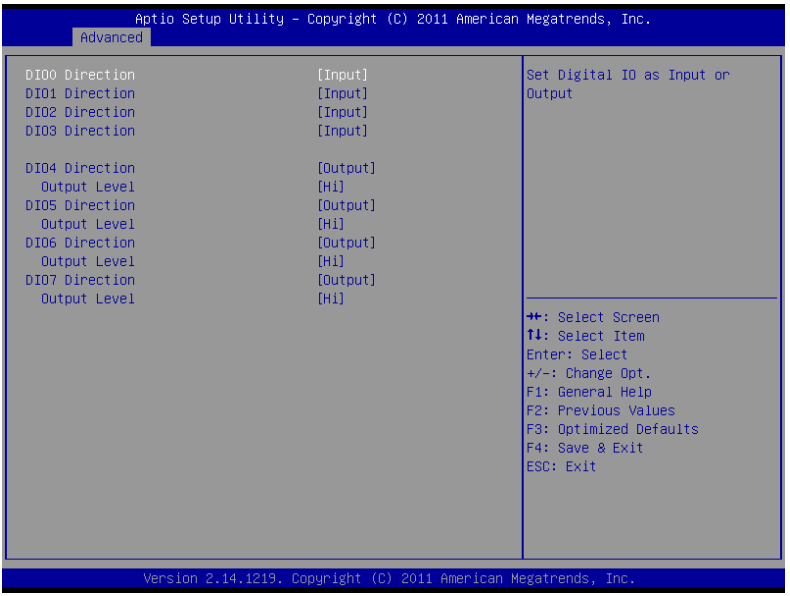


Options Summary :

SYS Smart Fan Mode	Manual Mode	Default
	Thermal Cruise Mode	
	Fan Speed Cruise Mode	
SYS Smart Fan Mode Select		
SYSFAN PWM/DC Voltage Output	0~255	Default : 255
Input expect PWM Output Value(Range:0 – 255)		

CPU Smart Fan 0 Mode	Manual Mode	Default
	Thermal Cruise Mode	
	Fan Speed Cruise Mode	
	SMART FAN III Mode	
CPU Smart Fan 0 Mode Select		
CPUFAN0 PWM/DC Voltage Output	0~255	Default : 255
Input expect PWM Output Value(Range: 0 – 255) It's also the Fan Output initial value in Smart Fan III Mode		
FAN Step down Time	Time	Default : 10
FAN Step down time value, unit is 0.1, default is 1 second		
FAN Step up Time	Time	Default: 10
FAN Step up time		

Dynamic Digital IO Configuration

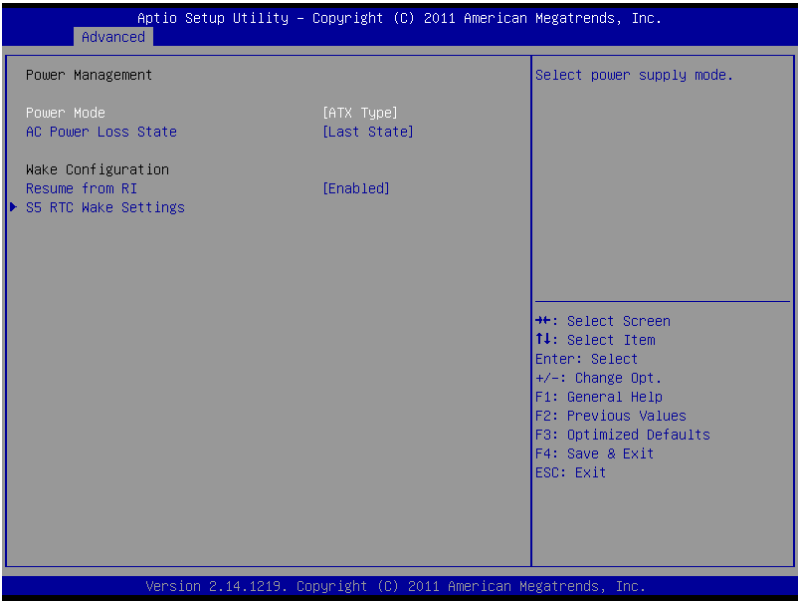


Options Summary :

DIO0 Direction	Input	Default
	Output	
Set Digital IO as Input or Output		
DIO1 Direction	Input	Default
	Output	
Set Digital IO as Input or Output		
DIO2 Direction	Input	Default
	Output	
Set Digital IO as Input or Output		

DIO3 Direction	Input	Default
	Output	
Set Digital IO as Input or Output		
DIO4 Direction	Input	
	Output	Default
Set Digital IO as Input or Output		
DIO5 Direction	Input	
	Output	Default
Set Digital IO as Input or Output		
DIO6 Direction	Input	
	Output	Default
Set Digital IO as Input or Output		
DIO7 Direction	Input	
	Output	Default
Set Digital IO as Input or Output		
Output Level	Hi	Default
	Low	
Set Digital IO Output as Hi or Low		

Power Management



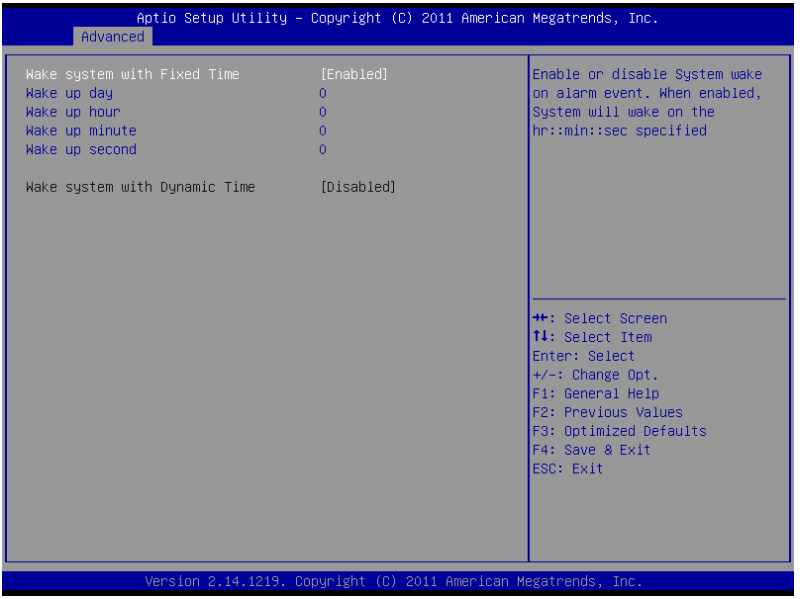
Options Summary :

Power Mode	ATX Type	Default
	AT Type	
Select power supply mode.		
AC Power Loss State	Always OFF	
	Always ON	
	Last State	Default
Select AC power state when power is re-applied after a power failure.		
RI# Wake	Disabled	
	Enabled	Default

For En/Disable Ring In wake up function.

Attention please, when this function is enabled, some devices which connect to Serial Port may cause the system auto wake up from sleep mode.

-S5 RTC Wake Settings

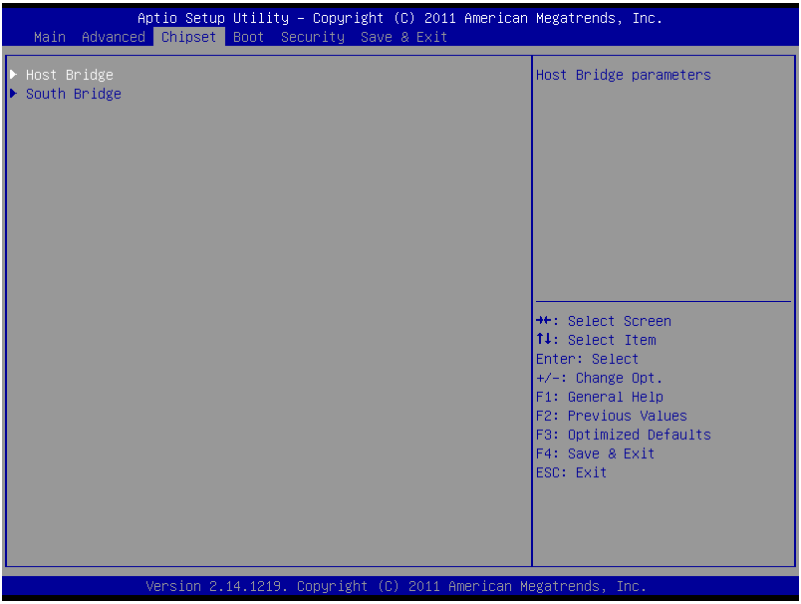


Options Summary :

Wake system with Fixed Time	Disabled	Default
	Enabled	
Enable or disable System wake on alarm event. When enabled, System will wake on the hr::min::sec specified		

Wake system with Dynamic Time	Disabled	Default
	Enabled	
Enable or disable System wake on alarm event. When enabled, System will wake on the hr::min::sec specified		

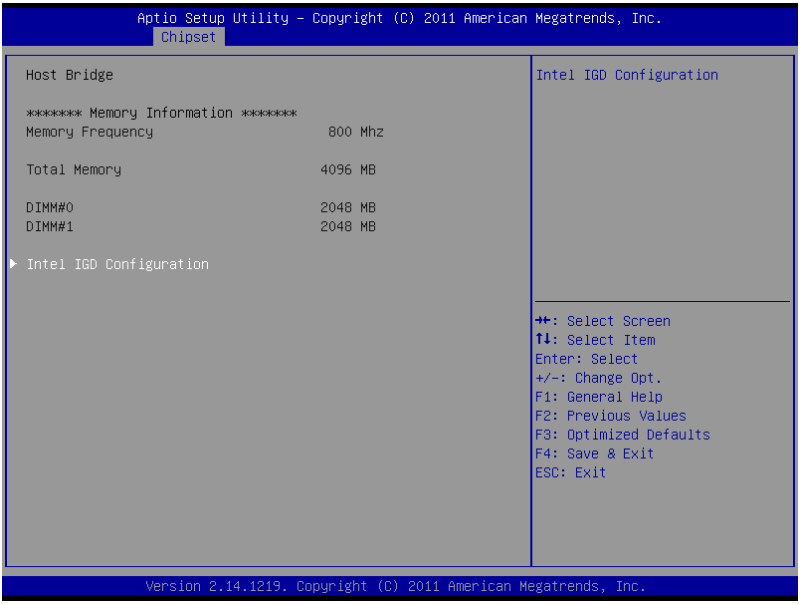
Setup submenu: Chipset



Options Summary :

Host Bridge	System Agent (SA) Parameters
Sourth Bridge	I/O Controller Hub Parameters

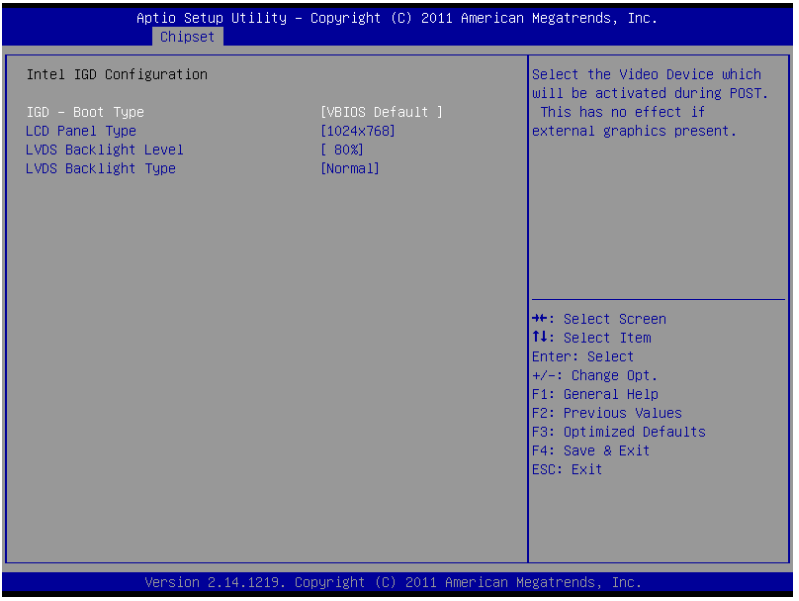
Host Bridge



Options Summary :

Intel IGD Configuration	Configure Integrated Graphic Settings

-Intel IGD Configuration

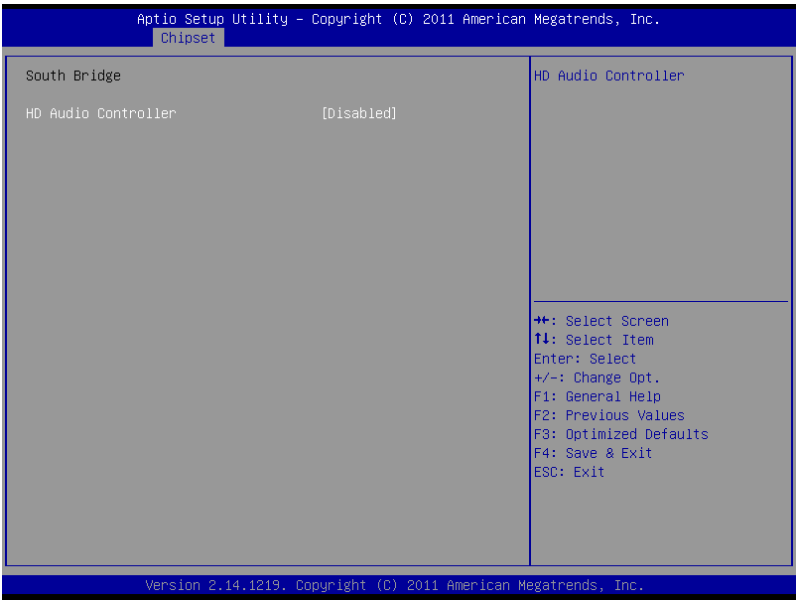


Options Summary :

IGD – Boot Type	VBIOS Default	Default
	CRT	
	LFP	
	CRT + LFP	
Select the Video Device which will be activated during POST.		
LVDS Panel Type	640x480	
	800x600	
	1024x768	Default
	800x480	

	1280x1024	
	1280x768	
	1366x768	
	1280x800	
Select LCD panel used by Internal Graphics Device by selecting the appropriate setup item.		
LVDS Backlight Level	100%	
	90%	
	80%	Default
	70%	
	60%	
	50%	
	40%	
	30%	
	20%	
	10%	
	0%	
Select Backlight brightness of LVDS		
LVDS Backlight Type	Normal	Default
	Inverted	
Select Backlight Control Type		

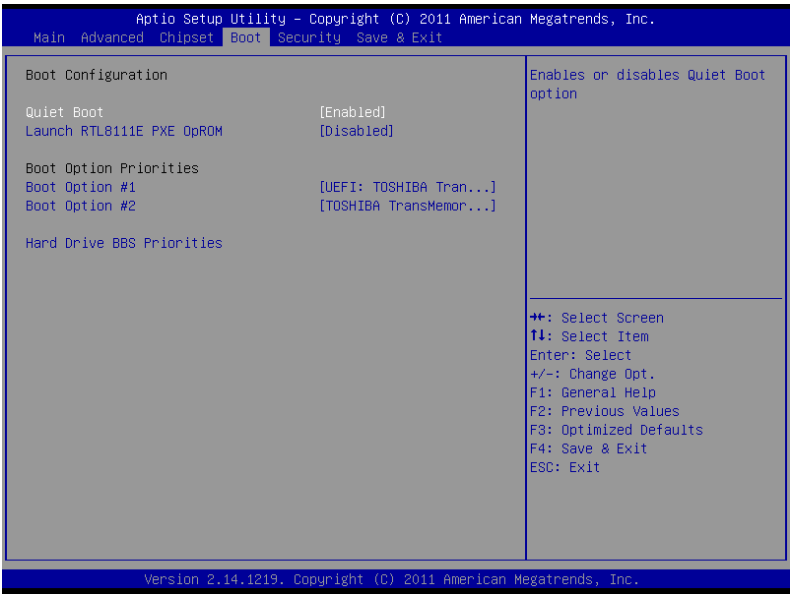
South Bridge



Options Summary :

HD Audio Controller	Enabled	
	Disabled	Default
For En/Disable HD Audio Controller.		

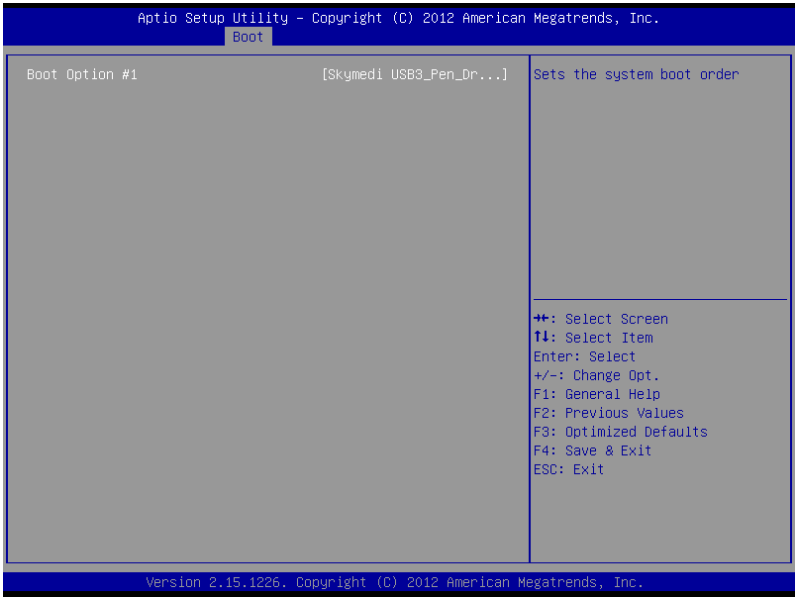
Setup submenu: Boot



Options summary :

Quiet Boot	Disabled	
	Enabled	Default
Enables or disables Quiet Boot option		
Launch RTL8111E PXE OpROM	Disabled	Default
	Enabled	
En/Disable PXE boot for RTL8111E LAN		

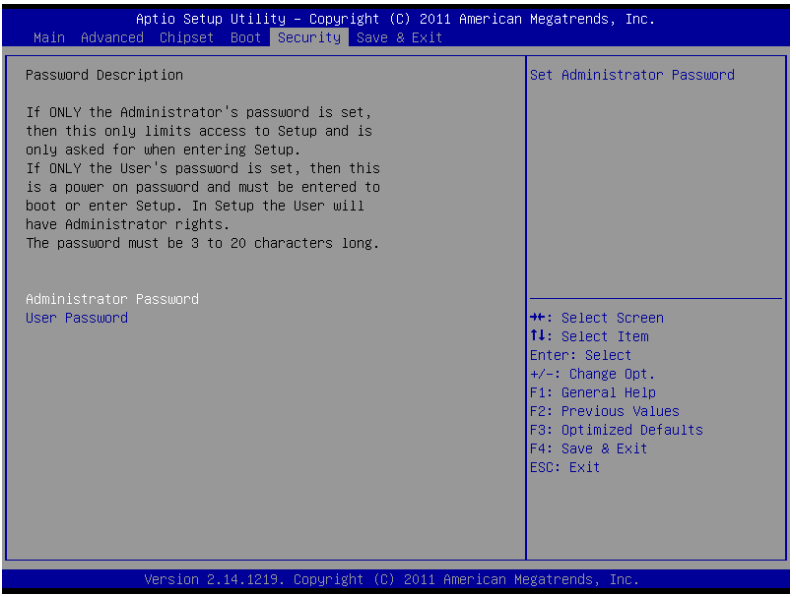
Boot Option Priorities



Options Summary :

Boot Option #X	Your device	
	Your device	
Sets the system boot order		

Setup submenu: Security



Change User/Supervisor Password

You can install a Supervisor password, and if you install a supervisor password, you can then install a user password. A user password does not provide access to many of the features in the Setup utility.

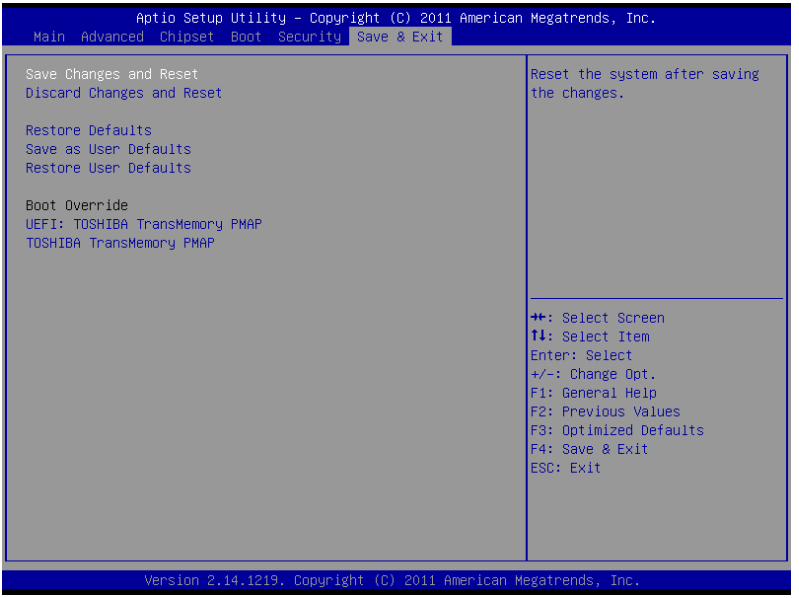
If you highlight these items and press Enter, a dialog box appears which lets you enter a password. You can enter no more than six letters or numbers. Press Enter after you have typed in the password. A second dialog box asks you to retype the password for confirmation. Press Enter after you have retyped it correctly. The password is required at boot time, or when the user enters the

Setup utility.

Removing the Password

Highlight this item and type in the current password. At the next dialog box press Enter to disable password protection.

Setup submenu: Exit



Chapter

4

Driver Installation

The HSB-LN2I comes with a CD-ROM that contains all drivers your need.

Follow the sequence below to install the drivers:

Step 1 – Install Chipset Driver

Step 2 – Install VGA Driver

Step 3 – Install LAN Driver

Step 4 – Install AHCI Driver

Step 5 – Install Audio Driver

Please read following instructions for detailed installations.

4.1 Installation:

Insert the HSB-LN2I CD-ROM into the CD-ROM Drive. And install the drivers from Step 1 to Step 5 in order.

Step 1 – Install Chipset Driver

1. Click on the ***Step 1 - Chipset*** folder and then double click on the ***infinst_autol.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 ***Step 2 - VGA*** folder and select the OS 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 to install the driver automatically

Step 3 – Install LAN Driver

1. Click on the ***Step 3 - LAN*** 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 4 – Install AHCI Driver

Please refer to Appendix D AHCI Setting

Step 5 – Install Audio Driver

1. Click on the ***Step 5 - 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

Appendix

A

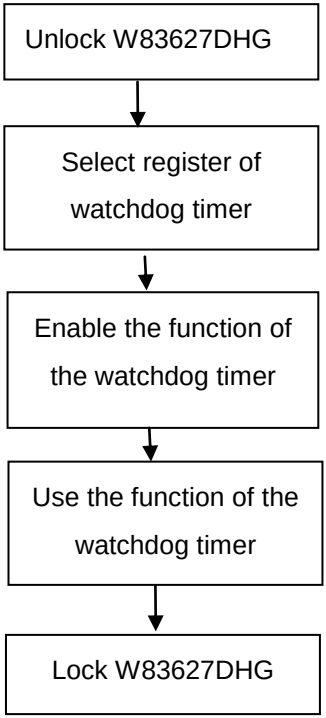
Programming the Watchdog Timer

A.1 Programming

HSB-LN2I utilizes W83627DHG-P 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



There are three steps to complete the configuration setup:

(1) Enter the W83627DHG config Mode

(2) Modify the data of configuration registers

(3) Exit the W83627DHG config Mode. Undesired result may occur if the config Mode is not exited normally.

(1) Enter the W83627DHG config Mode

To enter the W83627DHG 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 W83627DHG 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 and KBC P20 Control Mode Register)

Bit 7-5 : select PLED mode

= 000 Power LED pin is driven high.

= 001 Power LED pin outputs 0.5Hz pulse with 50% duty cycle.

= 010 Power LED pin is driven low.

= 011 Power LED pin outputs 2Hz pulse with 50% duty cycle.

= 100 Power LED pin outputs 1Hz pulse with 50% duty cycle.

= 101 Power LED pin outputs 4Hz pulse with 50% duty cycle.

= 110 Power LED pin outputs 0.25Hz pulse with 50% duty cycle.

=111 Power LED pin outputs 0.25Hz pulse with 50% duty cycle..

Bit 4 : WDTO# count mode is 1000 times faster.

= 0 Disable.

= 1 Enable.

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 : Disable / Enable the WDTO# output low pulse to the KBRST# pin (PIN60)

= 0 Disable

= 1 Enable

Bit 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 W83627DHG Watchdog Timer Initial Program

Example: Setting 10 sec. as Watchdog timeout interval

```
;////////////////////////////////////////////////////////////////////////////////
Mov dx,2eh              ;Enter W83627DHG 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 W83627DHG config mode
Mov al,0aah                     (out 0aah to 2eh once)
Out dx,al
;////////////////////////////////////////////////////////////////////////////////////////
```

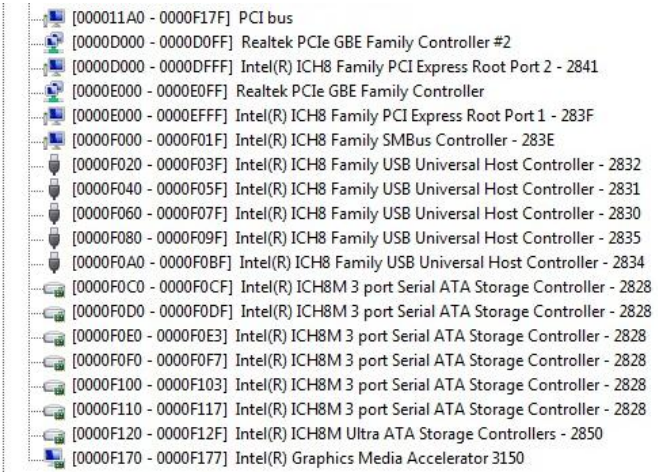
Appendix

B

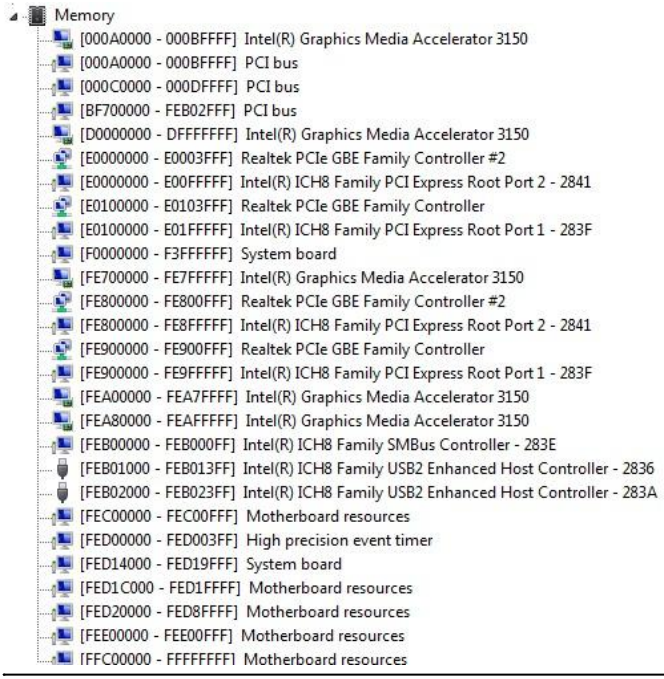
I/O Information

B.1 I/O Address Map

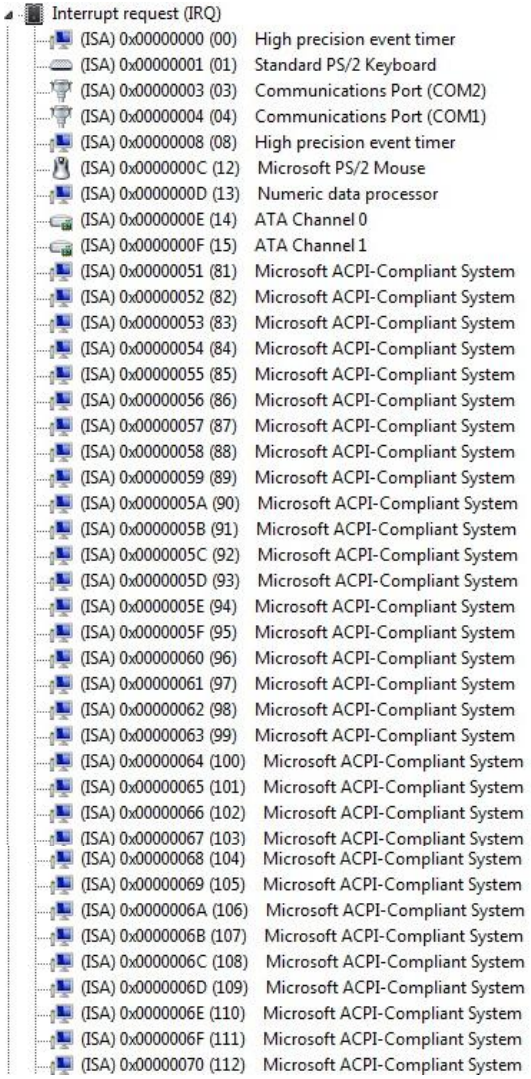
- Input/output (IO)
  - [00000000 - 0000000F] Direct memory access controller
  - [00000000 - 000003AF] PCI bus
  - [00000010 - 0000001F] Motherboard resources
  - [00000020 - 00000021] Programmable interrupt controller
  - [00000022 - 0000003F] Motherboard resources
  - [00000040 - 00000043] System timer
  - [00000044 - 0000005F] Motherboard resources
  - [00000060 - 00000060] Standard PS/2 Keyboard
  - [00000061 - 00000061] System speaker
  - [00000062 - 00000063] Motherboard resources
  - [00000064 - 00000064] Standard 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
  - [00000170 - 00000177] ATA Channel 1
  - [000001F0 - 000001F7] ATA Channel 0
  - [000002F8 - 000002FF] Communications Port (COM2)
  - [00000376 - 00000376] ATA Channel 1
  - [00000378 - 0000037F] Printer Port (LPT1)
  - [000003B0 - 000003BB] Intel(R) Graphics Media Accelerator 3150
  - [000003B0 - 000003DF] PCI bus
  - [000003C0 - 000003DF] Intel(R) Graphics Media Accelerator 3150
  - [000003E0 - 00000CF7] PCI bus
  - [000003F6 - 000003F6] ATA Channel 0
  - [000003F8 - 000003FF] Communications Port (COM1)
  - [00000480 - 000004BF] Motherboard resources
  - [000004D0 - 000004D1] Motherboard resources
  - [00000800 - 0000087F] Motherboard resources
  - [00000A00 - 00000A0F] Motherboard resources



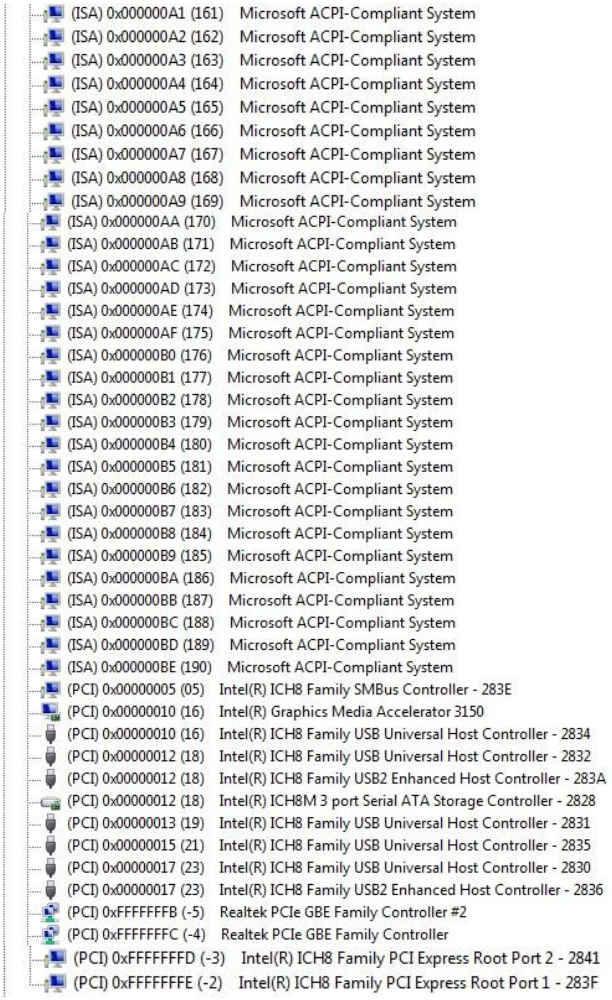
B.2 Memory Address Map



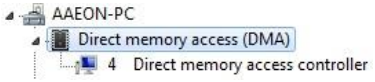
B.3 IRQ Mapping Chart



(ISA) 0x00000071 (113) Microsoft ACPI-Compliant System
(ISA) 0x00000072 (114) Microsoft ACPI-Compliant System
(ISA) 0x00000073 (115) Microsoft ACPI-Compliant System
(ISA) 0x00000074 (116) Microsoft ACPI-Compliant System
(ISA) 0x00000075 (117) Microsoft ACPI-Compliant System
(ISA) 0x00000076 (118) Microsoft ACPI-Compliant System
(ISA) 0x00000077 (119) Microsoft ACPI-Compliant System
(ISA) 0x00000078 (120) Microsoft ACPI-Compliant System
(ISA) 0x00000079 (121) Microsoft ACPI-Compliant System
(ISA) 0x0000007A (122) Microsoft ACPI-Compliant System
(ISA) 0x0000007B (123) Microsoft ACPI-Compliant System
(ISA) 0x0000007C (124) Microsoft ACPI-Compliant System
(ISA) 0x0000007D (125) Microsoft ACPI-Compliant System
(ISA) 0x0000007E (126) Microsoft ACPI-Compliant System
(ISA) 0x0000007F (127) Microsoft ACPI-Compliant System
(ISA) 0x00000080 (128) Microsoft ACPI-Compliant System
(ISA) 0x00000081 (129) Microsoft ACPI-Compliant System
(ISA) 0x00000082 (130) Microsoft ACPI-Compliant System
(ISA) 0x00000083 (131) Microsoft ACPI-Compliant System
(ISA) 0x00000084 (132) Microsoft ACPI-Compliant System
(ISA) 0x00000085 (133) Microsoft ACPI-Compliant System
(ISA) 0x00000086 (134) Microsoft ACPI-Compliant System
(ISA) 0x00000087 (135) Microsoft ACPI-Compliant System
(ISA) 0x00000088 (136) Microsoft ACPI-Compliant System
(ISA) 0x00000089 (137) Microsoft ACPI-Compliant System
(ISA) 0x0000008A (138) Microsoft ACPI-Compliant System
(ISA) 0x0000008B (139) Microsoft ACPI-Compliant System
(ISA) 0x0000008C (140) Microsoft ACPI-Compliant System
(ISA) 0x0000008D (141) Microsoft ACPI-Compliant System
(ISA) 0x0000008E (142) Microsoft ACPI-Compliant System
(ISA) 0x0000008F (143) Microsoft ACPI-Compliant System
(ISA) 0x00000090 (144) Microsoft ACPI-Compliant System
(ISA) 0x00000091 (145) Microsoft ACPI-Compliant System
(ISA) 0x00000092 (146) Microsoft ACPI-Compliant System
(ISA) 0x00000093 (147) Microsoft ACPI-Compliant System
(ISA) 0x00000094 (148) Microsoft ACPI-Compliant System
(ISA) 0x00000095 (149) Microsoft ACPI-Compliant System
(ISA) 0x00000096 (150) Microsoft ACPI-Compliant System
(ISA) 0x00000097 (151) Microsoft ACPI-Compliant System
(ISA) 0x00000098 (152) Microsoft ACPI-Compliant System
(ISA) 0x00000099 (153) Microsoft ACPI-Compliant System
(ISA) 0x0000009A (154) Microsoft ACPI-Compliant System
(ISA) 0x0000009B (155) Microsoft ACPI-Compliant System
(ISA) 0x0000009C (156) Microsoft ACPI-Compliant System
(ISA) 0x0000009D (157) Microsoft ACPI-Compliant System
(ISA) 0x0000009E (158) Microsoft ACPI-Compliant System
(ISA) 0x0000009F (159) Microsoft ACPI-Compliant System
(ISA) 0x000000A0 (160) Microsoft ACPI-Compliant System



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	Astron	26-03-220-1G-ATB1-R	IDE Cable	1701400453
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
LPT1	Parallel Port Connector	Catch Electronics	1147-000-26M	LPT Cable	1701260307
COM1	Serial Port Pin Header	Astron	27-24041-210-1G-TB1-R	Serial Port Cable	1701100305
COM2	Serial Port Pin Header	Astron	27-24041-210-1G-TB1-R	Serial Port Cable	1701100305
USB1	USB Pin Header	JIH VEI Electronics	21B22050-XX S10B-01G-4/2 .8	USB Cable	1709100201
USB2	USB Pin Header	JIH VEI Electronics	21B22050-XX S10B-01G-4/2 .8	USB Cable	1709100201
USB3	USB Connector	HO-BASE	KS-001V-ANW		N/A
LAN1	Ethernet Connector	BOTHHAND	LA1T109D-A-D43 LF		N/A
LAN2	Ethernet Connector	BOTHHAND	LA1T109D-A-D43 LF		N/A
VGA1	CRT Display Connector	Catch Electronics	3125-000-15SB		N/A

CFD1	CF Card Connector	Comweal	60328226		N/A
FP1	Front Panel Connector	JIH VEI Electronics	21B22564-XX S10B-01G-6/3 -VXX		N/A
FP2	Front Panel Connector	JIH VEI Electronics	21B22564-XX S10B-01G-6/3 -VXX		N/A
CN1	Caseopen Connector	JIH VEI Electronics	21B12564-XX S10B-01G-6/3		
CN2	Audio Pin Header	JIH VEI Electronics	21N22050-10 S10B-01G-4/2 .8-V1-G		N/A
CN3	LVDS Channel Connector	ECALL	0110-01-553-3 00		
CN4	PS2 Keyboard/ Mouse Connector	TECHBEST	DN-508BS1-6-L	KB/MS Cable	1700060192
CN5	KB Pin Header	JIH VEI Electronics	2503-H-5		N/A
CN6	LVDS BKT Ctrl Connector	Catch Electronics	1192-000-05S		N/A
BT1	BAT Connector	Catch Electronics	120170002S		N/A

Appendix

D

AHCI Setting

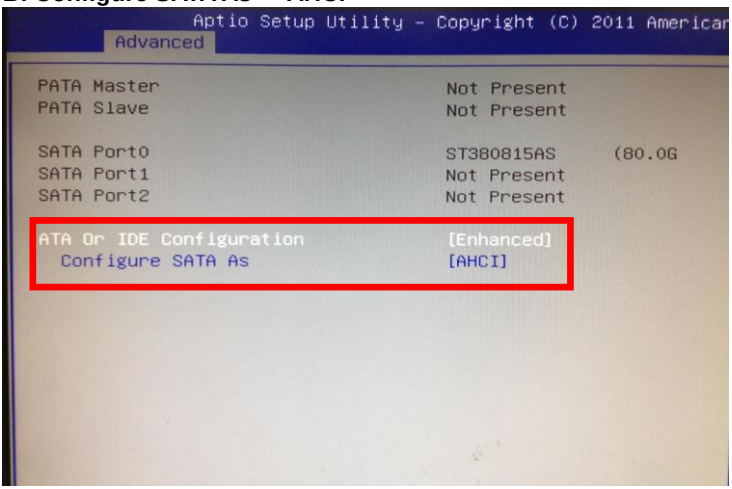
D.1 Setting AHCI

OS installation to setup AHCI Mode

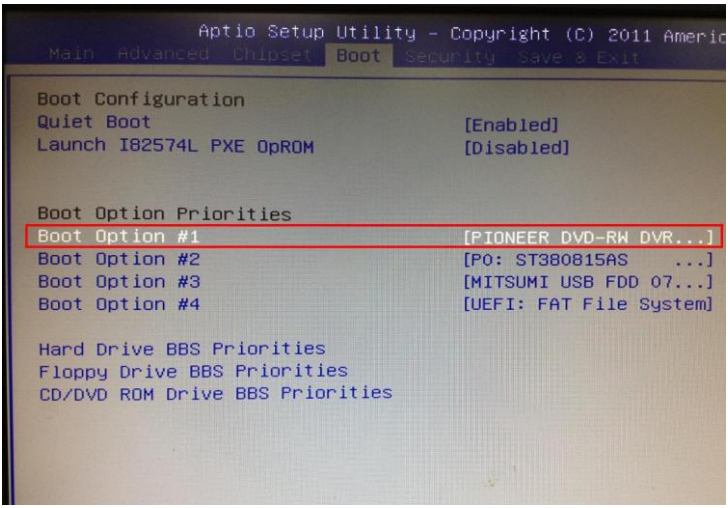
Step 1: Copy the files below from "***Driver CD -> Step 4 - AHCI-> winxp_32 or winxp_64*** to Disk

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

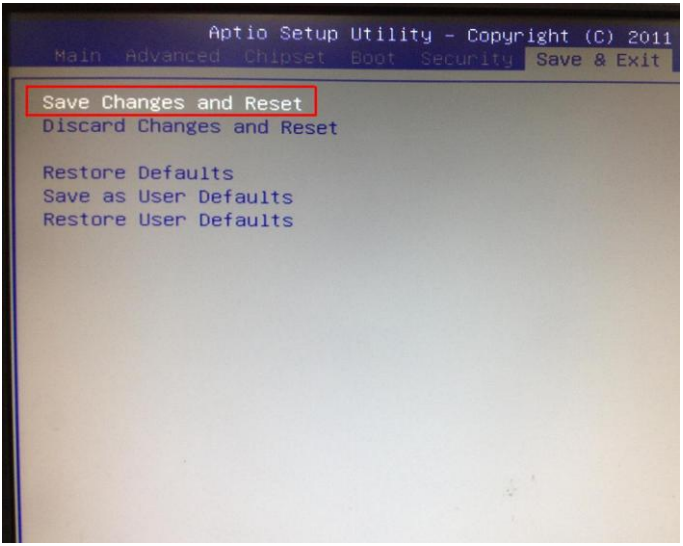
Step 3: The setting procedures " **In BIOS Setup Menu**"
A: Advanced -> IDE Configuration -> ATA Or IDE Configuration -> Enhanced
B: Configure SATA As -> AHCI



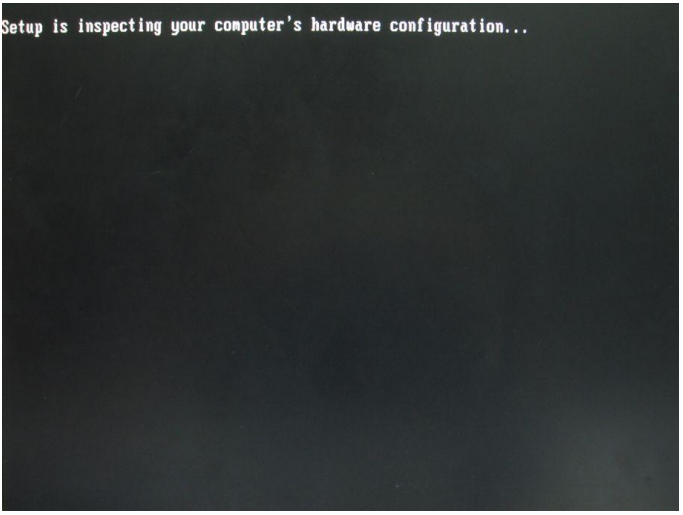
Step 4: The setting procedures "**In BIOS Setup Menu"**
B: Boot -> Boot Option #1 -> DVD-ROM Type



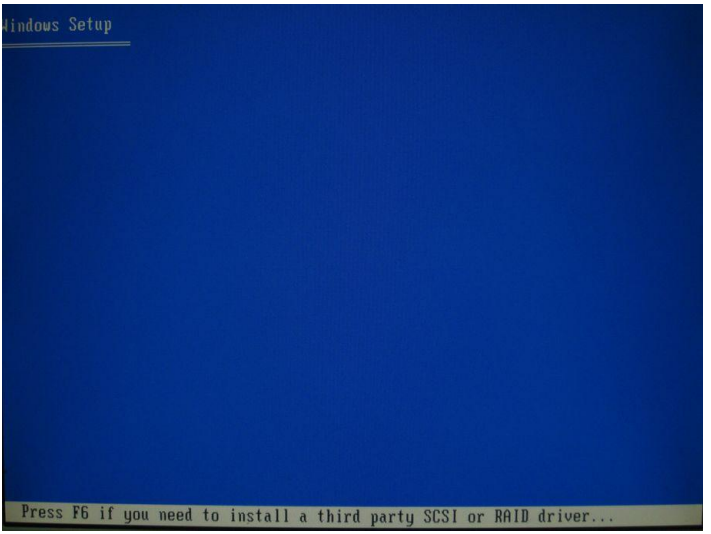
Step 5: The setting procedures "**In BIOS Setup Menu"**
C: Save & Exit -> Save Changes and Exit



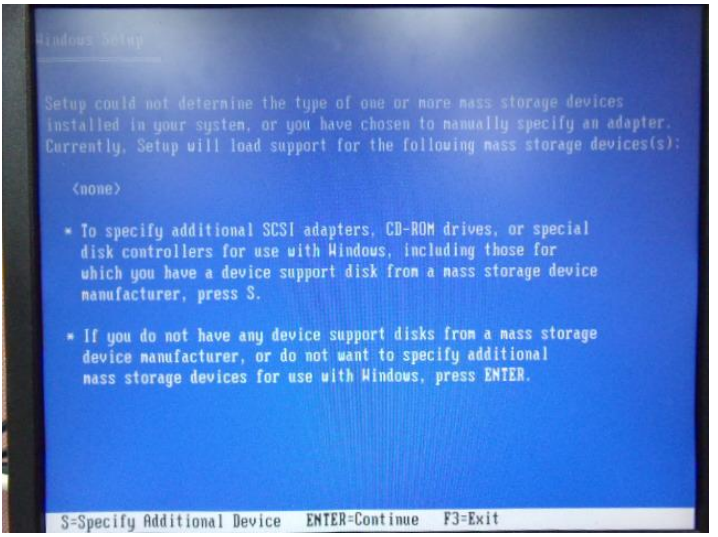
Step 6: Setup OS



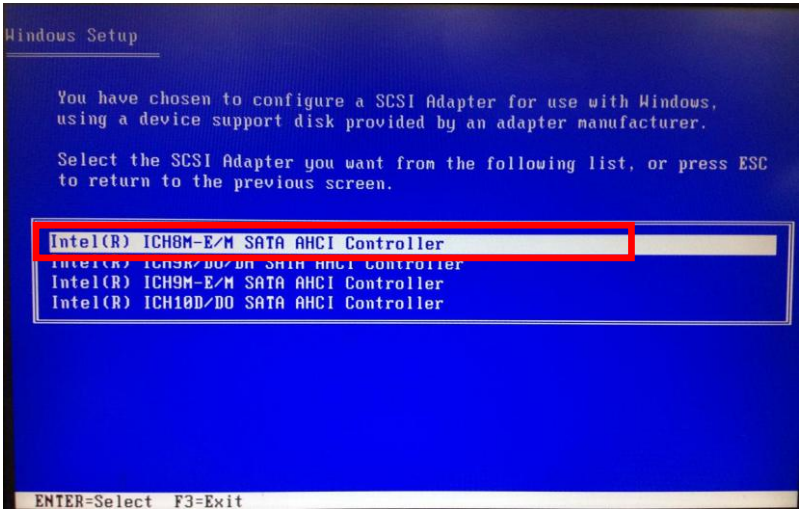
Step 7: Press "**F6**"



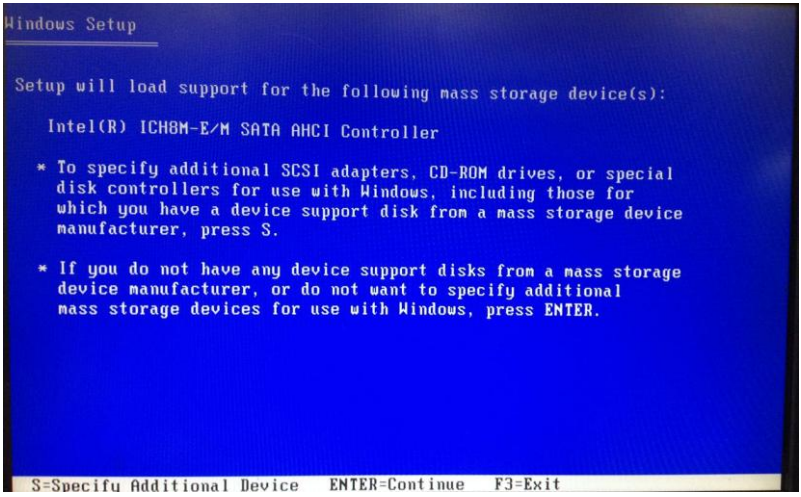
Step 8: Choose "**S**"



Step 9: Choose “Intel(R) ICH8-M-E/M SATA AHCI Controller”



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



Step 11: Setup is loading files