USER'S MANUAL

BPC-8960

Intel® Core Atom D525
Book Size PC

BPC-8960 M4

BPC-8960
Intel® Atom D525
Book Size PC
With VGA/ Sound/ LAN

COPYRIGHT NOTICE

ACKNOWLEDGEMENTS

CE NOTICE

This is a class B product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

FCC NOTICE

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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

CAUTION

Danger of explosion if battery is incorrectly replaced.

Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Installation only by a trained electrician or only by an electrically trained person who knows all English Installation and Device Specifications which are to be applied.

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CHAPTER

1

INTRODUCTION

This chapter gives you the information for BPC-8960. It also outlines the system specification.

Sections included:

- About This Manual
- Case Illustration
- System Specifications
- Safety precautions

Experienced users can jump to chapter 2 on page 2-1 for quick start.

1-1. ABOUT THIS MANUAL

Thank you for purchasing our BPC-8960 Intel® Atom™ D525 Book-size PC enhanced with VGA / Sound / LAN, which is fully PC / AT compatible. BPC-8960 provides faster processing speed, greater expandability and can handle more task than before. This manual is designed to assist you how to install and set up the system. It contains four chapters. The user can apply this manual for configuration according to the following chapters:

Chapter 1 Introduction

This chapter introduces you to the background of this manual, illustration of the case, and the specifications for this system. The final page of this chapter indicates some safety reminders on how to take care of your system.

Chapter 2 Hardware Configuration

This chapter outlines the component location and their functions. In the end of this chapter, you will learn how to set jumper and how to configure this card to meet your own needs.

Chapter 3 Software Utilities

This chapter contains helpful information for proper installations of the Intel Utility, VGA utility, LAN utility, and sound utility.

Chapter 4 AMI BIOS Setup

This chapter indicates you how to set up the BIOS configurations.

Appendix A System Assembly

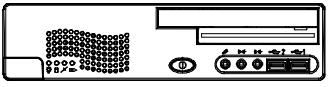
This appendix contain exploded diagram of the system

Appendix B Technical Summary

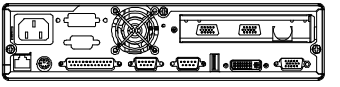
This appendix gives you the information about the Technical maps. It also describes the Watchdog timer configuration and Flash BIOS update.

1-2. CASE ILLUSTRATION

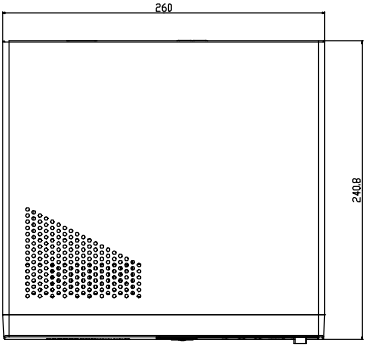
Front View



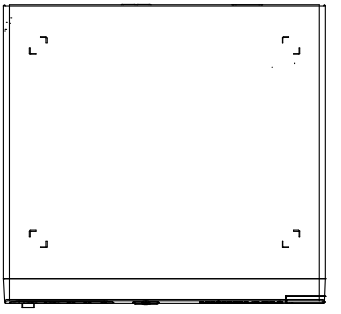
Rear View



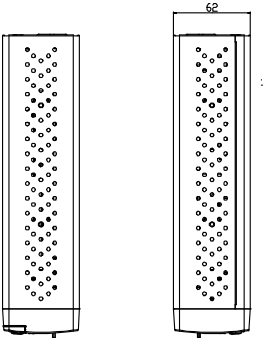
Top View



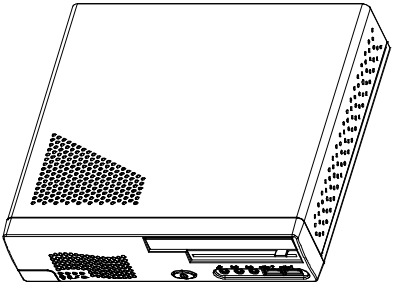
Bottom View



Side View



Quarter View



1-3. SYSTEM SPECIFICATION

- **PROCESSOR**
  Intel® Atom™ D525 (Dual-Core) (1.8GHz)

- **CHIPSET**
  Intel® ICH8M

- **MEMORY**
  2 x 204-pin DDR3 DIMM Socket

- **DRIVER BAY**
  1 x 2.5" SATA HDD & 1 x slim CD/ DVD-ROM (optional) or
  2 x 2.5" SATA HDD without CD/ DVD-ROM

- **POWER SUPPLY**
  ATX 110W (open frame)

- **I/O PORT**
  3 x USB2.0 (optional 2/4 with USB expansion card)
  4 x COM ports, COM 1/3/4 for RS232, COM2 for RS232/422/485 (+5V/+12V, optional set with jumper)
  1 x Parallel port (SPP/EPP/ECP)
  1 x PS/2 port with Y-cable
  1 x RJ45, 10/100/1000Mbps (Intel® 82567V)
  1 x DVI-I (resolution up to 1366 x 768)
  1 x VGA
  1 x Audio, Line-in/ Line-out/ MIC (Realtek ALC888S-VD2-GR)
  1 x PCI or 1 x PCI-E (optional) expansion bus
  1 x optional IrDA, supports v1.0 SIR protocol
  1 x optional CF type II slot (IDE interface)

- **CHASSIS DIMENSION**
  260mm x 62mm x 240mm / 10.24" x 2.44" x 9.45"

- **WEIGHT**
  3.3kg (7.26lb)

- **ENVIRONMENT TEST**
  Operating temperature 0°~40°C
  Storage temperature -20°~60°C
  Operating humidity 20~90%

- **CERTIFICATION**
  CE, FCC (Class B)

1-4. SAFETY PRECAUTIONS

Following messages are safety reminders on how to protect your systems from damages. And thus, helps you lengthen the life cycle of the system.

1. Check the Line Voltage

a. The operating voltage for the power supply should cover the range of 100VAC-240VAC; otherwise the system may be damaged.

2. Environmental Conditions

a. Place your BPC-8960 on a sturdy, level surface. Be sure to allow enough room on each side to have easy access.

b. Avoid extremely hot or cold places to install your BPC-8960 Book-sized PC.

c. Avoid exposure to sunlight for a long period of time (for example in a closed car in summer time. Also avoid the system from any heating device.). Or do not use BPC-8960 when it's been left outdoors in a cold winter day.

d. Bear in mind that the operating ambient temperature is from 0°C up to +40°C (32°F~104°F).

e. Avoid moving the system rapidly from a hot place to a cold place or vice versa because condensation may come from inside of the system.

f. Place BPC-8960 against strong vibrations, which may cause hard disk failure.

g. Do not place the system too close to any radio-active device. Radio-active device may cause interference.

3. Handling

a. Avoid putting heavy objects on top of the system.

b. Do not turn the system upside down. This may cause the floppy drive and hard drive to mal-function.

c. Do not remove the diskette from the Floppy drive while the light is still on. If you remove the diskette while the light is on, you may damage the information on the diskette.

d. Do not allow foreign objects to fall into this product.

e. If water or other liquid spills into this product, unplug the power cord immediately.

4. Good Care

a. When the outside of the case is stained, remove the stain with neutral washing agent with a dry cloth.

b. Never use strong agents such as benzene and thinner to clean the system.

c. If heavy stains are present, moisten a cloth with diluted neutral washing agent or with alcohol and then wipe thoroughly with a dry cloth.

d. If dust has been accumulated on the outside, remove it by using a special made vacuum cleaner for computers.

CHAPTER

2

HARDWARE CONFIGURATION

** QUICK START **

Helpful information describes the jumper & connector settings, and component locations.

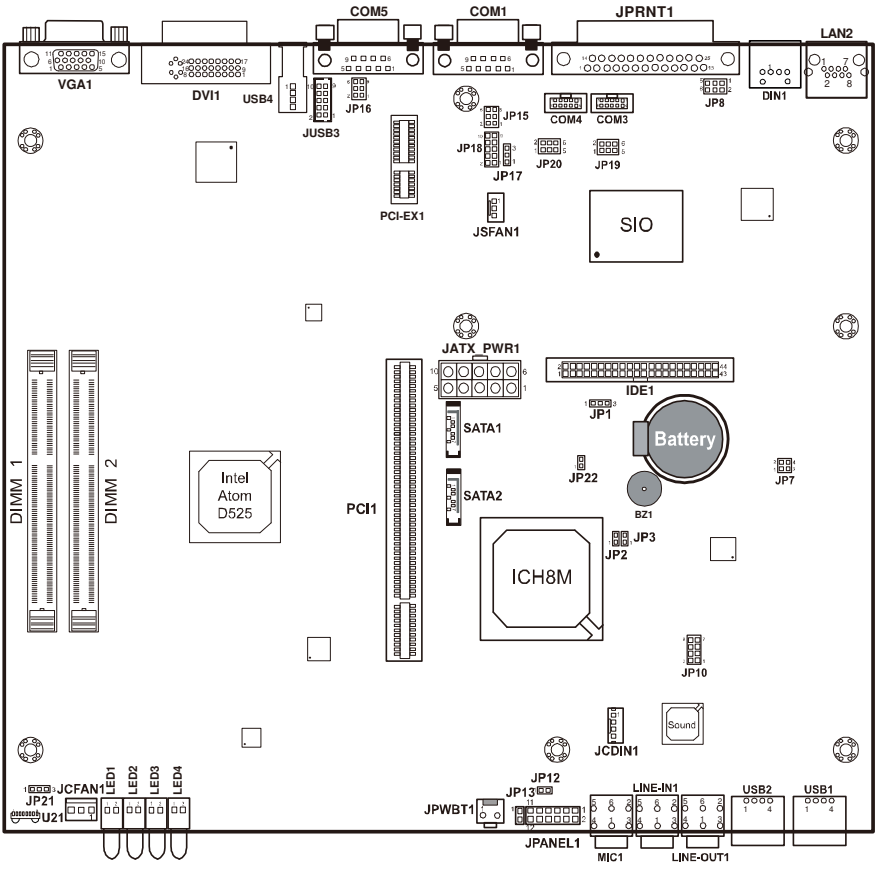
Sections included:

- Jumper & Connector Quick Reference Table
- Component Locations
- Configuration and Jumper settings
- Connector's Pin Assignments

2-1. JUMPER & CONNECTOR QUICK REFERENCE TABLE

COM1 Port RI/Voltage Selection ……	JP15
COM5 Port RI/Voltage Selection ……	JP16
COM3 Port RI/Voltage Selection ……	JP19
COM4 Port RI/Voltage Selection ……	JP20
RS232/422/485 (COM5) Selection …….	JP18
Keyboard/ Mouse Selection ……	JP8
Clear CMOS Data Selection ……	JP1
Reset/ NMI/ Clear Watchdog Selection ……..	JP7
RS485 Auto Direction Control Selection ……	JP17
COM Port Connector …….	COM1, COM5 COM3, COM4
Keyboard/ Mouse Connector ……..……..……..	DIN1
Power Button ……	JPWBT1
CPU Fan Connector …….	JCFAN1
System Fan Connector …….	JSFAN1
VGA Connector ……	VGA1
DVI Connector ……	DVI1
Hard Disk Drive Connector ……..…….	IDE1
Serial ATA Connector ……	SATA1, SATA2
Printer Connector ……..……..…….	JPRT1
Universal Serial Bus Connector …….....	JUSB3, USB1, USB2, USB4
LAN Connector ……	LAN1
ATX Power Connector …….	JATX_PWR1
Line-Out Connector ……	LINE-OUT1
Line-In Connector …….	LINE-IN1
MIC Connector …….	MIC1
External Speaker Connector …….	JPANEL(1-7)
Reset Button ……	JPANEL (9-11)
Power Button ……	JPANEL (10-12)
PCI Connector …….……	PCI1
IrDA Connector …….....	U21
IrDA Device Selection ……..……	JP22

2-2. COMPONENT LOCATIONS



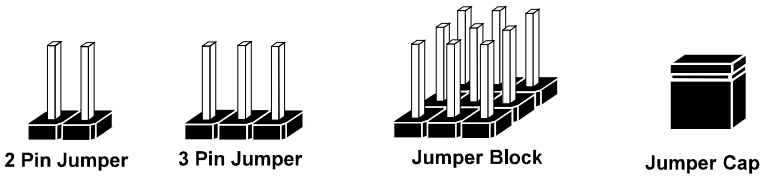
BPC-8960 Connector, Jumper and Component locations

2-3. HOW TO SET THE JUMPERS

You can configure your board by setting jumpers. Jumper is consists of two or three metal pins with a plastic base mounted on the card, and by using a small plastic "cap", Also known as the jumper cap (with a metal contact inside), you are able to connect the pins. So you can set-up your hardware configuration by "open" or "close" pins.

The jumper can be combined into sets that called jumper blocks. When the jumpers are all in the block, you have to put them together to set up the hardware configuration. The figure below shows how this looks like.

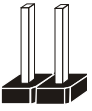
JUMPERS AND CAPS



If a jumper has three pins (for examples, labelled PIN1, PIN2, and PIN3), You can connect PIN1 & PIN2 to create one setting and shorting. You can either connect PIN2 & PIN3 to create another setting. The same jumper diagrams are applied all through this manual. The figure below shows what the manual diagrams look and what they represent.

JUMPER DIAGRAMS

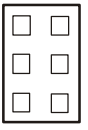
Jumper Cap looks like this



2 pin Jumper looks like this

3 pin Jumper looks like this

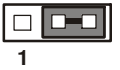
Jumper Block looks like this



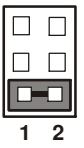
JUMPER SETTINGS

2 pin Jumper close(enabled) Looks like this

3 pin Jumper 2-3 pin close(enabled) Looks like this

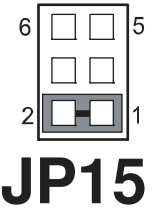
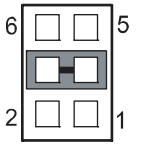
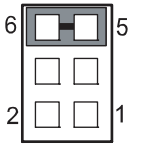


Jumper Block 1-2 pin close(enabled) Looks like this



2-4. COM1 PORT RI & VOLTAGE SELECTION

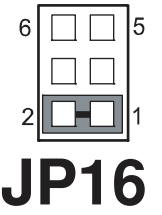
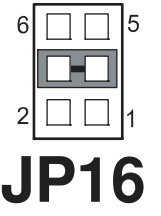
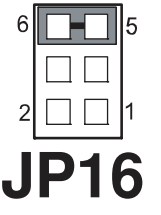
JP15: COM1 Port RI & Voltage Selection
The selections are as follows:

SELECTION	JUMPER SETTING (Pin Closed)	JUMPER ILLUSTRATION
RI1	1-2	 JP15
+12V	3-4	 JP15
+5V	5-6	 JP15

***Manufacturing Default – RI1

2-5. COM5 PORT RI & VOLTAGE SELECTION

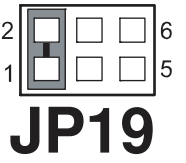
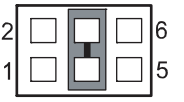
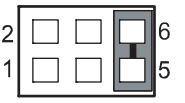
JP16: COM5 Port RI & Voltage Selection
The selections are as follows:

SELECTION	JUMPER SETTING (Pin Closed)	JUMPER ILLUSTRATION
RI2	1-2	 **JP16**
+12V	3-4	 **JP16**
+5V	5-6	 **JP16**

***Manufacturing Default – RI2

2-6. COM3 PORT RI & VOLTAGE SELECTION

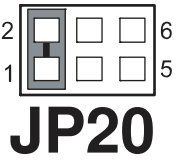
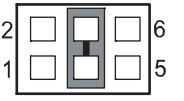
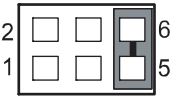
JP19: COM3 Port RI & Voltage Selection
The selections are as follows:

SELECTION	JUMPER SETTING (Pin Closed)	JUMPER ILLUSTRATION
RI3	1-2	 JP19
+12V	3-4	 JP19
+5V	5-6	 JP19

***Manufacturing Default – RI3

2-7. COM4 PORT RI & VOLTAGE SELECTION

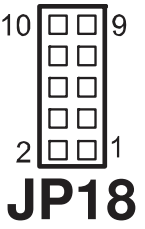
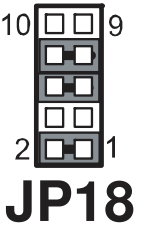
JP20: COM4 Port RI & Voltage Selection
The selections are as follows:

SELECTION	JUMPER SETTING (Pin Closed)	JUMPER ILLUSTRATION
RI4	1-2	 JP20
+12V	3-4	 JP20
+5V	5-6	 JP20

***Manufacturing Default – RI4

2-8. RS232/422/485 (COM5) SELECTION

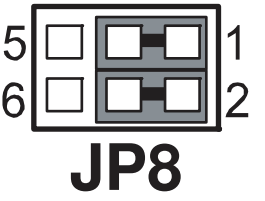
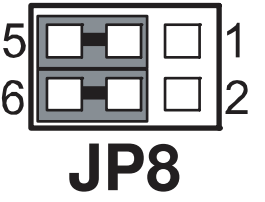
JP18: RS232/422/485 (COM5) Selection
The selections are as follows:

SELECTION	JUMPER SETTING (Pin Closed)	JUMPER ILLUSTRATION
RS232	Open	
RS422	1-2, 3-4, 9-10	
RS485	1-2, 5-6, 7-8	

***Manufacturing Default – RS232

2-9. KEYBOARD/ MOUSE SELECTION

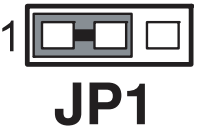
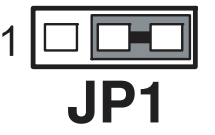
JP8: Keyboard/ Mouse Selection
The selections are as follows:

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
Mouse	1-3, 2-4	
Keyboard or Y-Cable	3-5, 4-6	

***Manufacturing Default – Keyboard

2-10. CLEAR CMOS DATA SELECTION

JP1: Clear CMOS Data Selection
The selections are as follows:

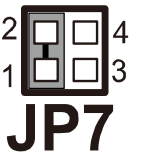
FUNCTION	JUMPER SETTING (pin closed)	JUMPER ILLUSTRATION
Normal	1-2	
Clear CMOS	2-3	

*** Manufacturing Default – Normal

Note: To clear CMOS data, user must power-off the computer and set the jumper to "Clear CMOS" as illustrated above. After five to six seconds, set the jumper back to "Normal" and power-on the computer.

2-11. RESET/ NMI/ WATCHDOG SELECTION

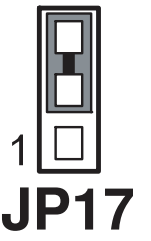
JP7: Reset/ NMI/ Watchdog Selection
The selections are as follows:

SELECTION	JUMPER SETTING (pin closed)	JUMPER ILLUSTRATION
RESET	1-2	
NMI	3-4	

*** Manufacturing Default – Reset

2-12. RS485 AUTO DIRECTION CONTROL SELECTION

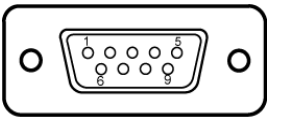
JP17: RS485 Auto Direction Control Selection
The selections are as follows:

SELECTION	JUMPER SETTING (pin closed)	JUMPER ILLUSTRATION
Auto Direction (default)	1-2	
Software Control (RTS)	2-3	

*** Manufacturing Default – Auto Direction

2-13. COM PORT CONNECTOR

COM1: COM1 Connector
COM1 is fixed as RS-232.
The pin assignments are as follows:

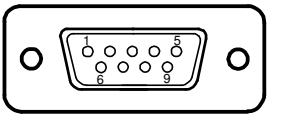


COM1

PIN	ASSIGNMENT
1	DCD
2	RX
3	TX
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI1

🕮 Pin 9 is selectable for RI, +5V or +12V. For more information, please refer to our "2-5 COM1 RI and Voltage Selection".

COM5: COM5 Connector
The COM5 is selectable as RS-232.
The pin assignments are as follows:

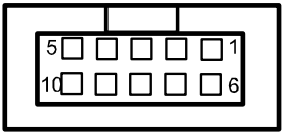


COM5

PIN	ASSIGNMENT
1	DCD
2	RX
3	TX
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI2

🕮 Pin 9 is selectable for RI, +5V or +12V. For more information, please refer to our "2-6 COM5 RI and Voltage Selection".

COM3: COM3 Connector
The pin assignments are as follows:

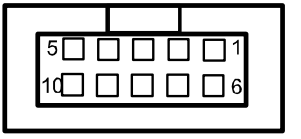


COM3

PIN	ASSIGNMENT
1	DCD
2	RX
3	TX
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI3

🕮 Pin 9 is selectable for RI, +5V or +12V. For more information, please refer to our "2-7 COM3 RI and Voltage Selection".

COM4: COM4 Connector
COM4 is fixed as RS-232.
The pin assignments are as follows:



COM4

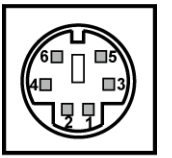
PIN	ASSIGNMENT
1	DCD
2	RX
3	TX
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI4

🕮 Pin 9 is selectable for RI, +5V or +12V. For more information, please refer to our "2-8 COM4 RI and Voltage Selection".

2-14. KEYBOARD/ MOUSE CONNECTOR

JDIN1: Keyboard/ Mouse Connector
The pin assignments are as follows:

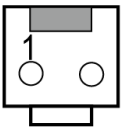
PIN	ASSIGNMENT
1	KBDATA
2	MSDATA
3	GND
4	5VSB
5	KBCLK
6	MSCLK



KB1

2-15. POWER BUTTON

JPWBT1: Power Button

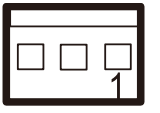


JPWBT1

2-16. CPU FAN CONNECTOR

JCFAN1: CPU Fan connector
The pin assignments are as follows:

PIN	ASSIGNMENT
1	GND
2	FAN POWER
3	LPC_FAN1IN

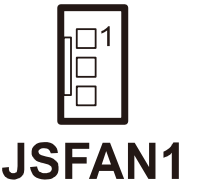


JCFAN1

2-17. SYSTEM FAN CONNECTOR

JSFAN1: System Fan connector
The pin assignments are as follows:

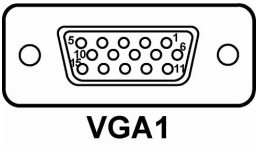
PIN	ASSIGNMENT
1	GND
2	VCC12
3	LPC_FAN2IN



2-18. VGA CONNECTOR

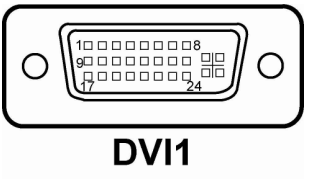
VGA1: VGA Connector
The pin assignments are as follows:

PIN	ASSIGNMENT
1	RED
2	GREEN
3	BLUE
4	NC
5	GND
6	GND
7	GND
8	GND
9	VGA_VCC5
10	GND
11	NC
12	DDC_DATA
13	HSYNC
14	VSYNC
15	DDC_CLK



2-19. DVI CONNECTOR

DVI1: DVI Connector
The pin assignments are as follows:

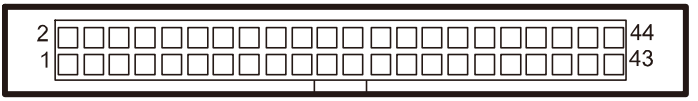


DVI1

PIN	ASSIGNMENT
1	TDC2J
2	TDC2
3	GND
4	NC
5	NC
6	SC_DDC
7	SD_DDC
8	A_VSYNC
9	TDC1J
10	TDC1
11	GND
12	NC
13	NC
14	VCC5
15	GND
16	Hot Plug Detect
17	TDC0J
18	TDC0
19	GND
20	NC
21	NC
22	GND
23	TLC
24	TLCJ

2-20. HARD DISK DRIVE CONNECTOR

IDE1: Hard Disk Drive Connector



IDE1

The pin assignments are as follows:

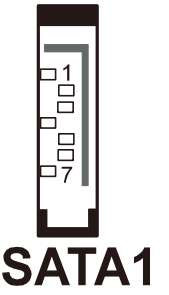
PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	IDERST#	23	P DIOW#
2	GND	24	GND
3	PDD7	25	P DIOR#
4	PDD8	26	GND
5	PDD6	27	PIORDY
6	PDD9	28	GND
7	PDD5	29	PDDACK#
8	PDD10	30	GND
9	PDD4	31	IRQ14
10	PDD11	32	NC
11	PDD3	33	PDA1
12	PDD12	34	P66DETECT
13	PDD2	35	PDA0
14	PDD13	36	PDA2
15	PDD1	37	PDCS#1
16	PDD14	38	PDCS#3
17	PDD0	39	IDEACTP#
18	PDD15	40	GND
19	GND	41	VCC
20	NC	42	VCC
21	PDREQ	43	GND
22	GND	44	NC

2-21. SERIAL ATA CONNECTOR

SATA1, SATA2: The BPC-8960 possesses two Serial ATA Connectors. The pin assignments are as follows:

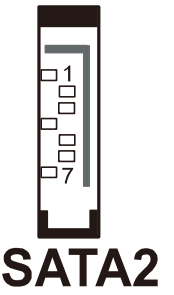
SATA1:

PIN	ASSIGNMENT
1	GND
2	SATAHDR_TXP0
3	SATAHDR_TXN0
4	GND
5	SATAHDR_RXN0
6	SATAHDR_RXP0
7	GND



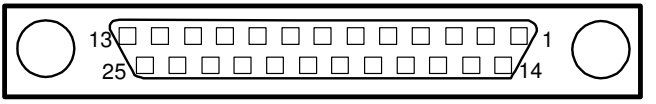
SATA2:

PIN	ASSIGNMENT
1	GND
2	SATAHDR_TXP1
3	SATAHDR_TXN1
4	GND
5	SATAHDR_RXN1
6	SATAHDR_RXP1
7	GND



2-22. PRINTER CONNECTOR

JPRNT1: Printer Connector
As to link the Printer to the card, you need a cable to connect both DB25 connector and parallel port.
The pin assignments are as follows:

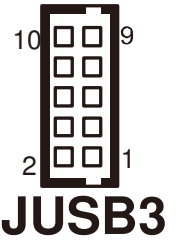


JPRNT1

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	STB	14	AUTFE
2	P0	15	ERROR
3	P1	16	INIT
4	P2	17	SLCTIN
5	P3	18	GND
6	P4	19	GND
7	P5	20	GND
8	P6	21	GND
9	P7	22	GND
10	ACK	23	GND
11	BUSY	24	GND
12	PE	25	GND
13	SLCT		

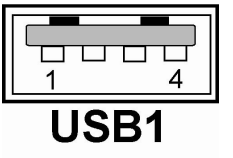
2-23. UNIVERSAL SERIAL BUS CONNECTOR

JUSB3: Universal Serial Bus Connector
The pin assignments are as follows:



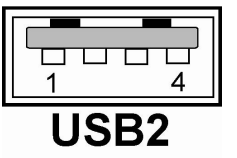
PIN	ASSIGNMENT
1	USB2_VCC5
2	USB3_VCC5
3	USB3N
4	USB2N
5	USB3P
6	USB2P
7	GND
8	GND
9	GND
10	GND

USB1: Universal Serial Bus Connector
The pin assignments are as follows:



PIN	ASSIGNMENT
1	VCC
2	USBP0-
3	USBP0+
4	GND

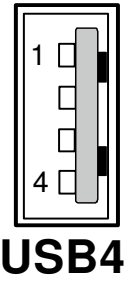
USB2: Universal Serial Bus Connector
The pin assignments are as follows:



PIN	ASSIGNMENT
1	VCC
2	USBP1-
3	USBP1+
4	GND

USB4: Universal Serial Bus Connector
The pin assignments are as follows:

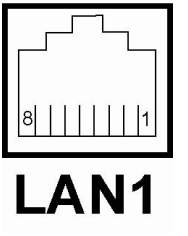
PIN	ASSIGNMENT
1	VCC
2	USBP4-
3	USBP4+
4	GND



2-24. LAN CONNECTOR

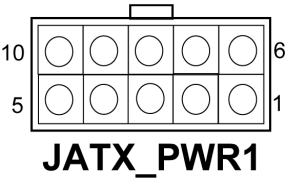
LAN1: LAN Connector
The pin assignments are as follows:

PIN	ASSIGNMENT
1	MDI_0P
2	MDI_0N
3	MDI_1P
4	MDI_2P
5	MDI_2N
6	MDI_1N
7	MDI_3P
8	MDI_3N



2-25. ATX POWER CONNECTOR

JATX_PWR1: ATX Power Connector
The pin assignments are as follows:



JATX_PWR1

PIN	ASSIGNMENT
1	VCC
2	VCC
3	GROUND
4	GROUND
5	+12V
6	VCC SBY
7	VCC
8	GROUND
9	PS_ON
10	-12V

2-26. LINE-OUT CONNECTOR

LINE-OUT1: Line-Out Connector


Line-Out

2-27. LINE-IN CONNECTOR

LINE-IN1: Line-In Connector


Line-In

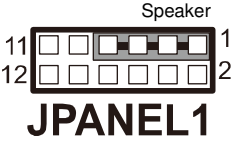
2-28. MIC CONNECTOR

MIC1: MIC Connector

2-29. EXTERNAL SPEAKER CONNECTOR

JPANEL1 (1-7): External Speaker Connector
The pin assignments are as follow:

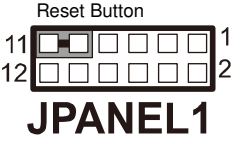
PIN	ASSIGNMENT
1	P_SPK
3	NC
5	NC
7	SPK_VCC



2-30. RESET BUTTON

JPANEL1 (9-11): Reset Button
The pin assignments are as follow:

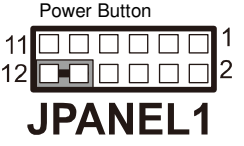
PIN	ASSIGNMENT
9	GND
11	HWRSTJ



2-31. POWER BUTTON

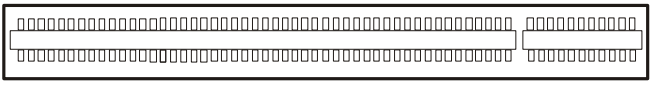
JPANEL1 (10-12): Power Button
The pin assignments are as follow:

PIN	ASSIGNMENT
10	PW_BN1
12	PW_BN2



2-32. PCI CONNECTOR

PCI1: PCI Connector
The pin assignments are as follow:

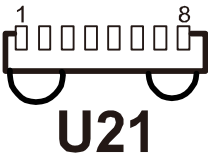


PCI1

B		A		B		A	
PIN	**ASSIGNMENT**	**PIN**	**ASSIGNMENT**	**PIN**	**ASSIGNMENT**	**PIN**	**ASSIGNMENT**
B1	-12V	A1	TRST#	B31	+3.3V	A31	AD18
B2	TCK	A2	+12V	B32	AD17	A32	AD16
B3	GND	A3	TMS	B33	C/BE2#	A33	+3.3V
B4	TDO	A4	TDI	B34	GND	A34	FRAME#
B5	+5V	A5	+5V	B35	IRDY#	A35	GND
B6	+5V	A6	INTA#	B36	+3.3V	A36	TRDY#
B7	INTB#	A7	INTC#	B37	DEVSEL#	A37	GND
B8	INTD#	A8	+5V	B38	GND	A38	STOP#
B9	REQ3#	A9	CLKC	B39	LOCK#	A39	+3.3V
B10	REQ1#	A10	+5V(I/O)	B40	PERR#	A40	SDONE
B11	GNT3#	A11	CLKD	B41	+3.3V	A41	SB0#
B12	GND	A12	GND	B42	SERR#	A42	GND
B13	GND	A13	GND	B43	+3.3V	A43	PAR
B14	CLKA	A14	GNT1#	B44	C/BE1#	A44	AD15
B15	GND	A15	RST#	B45	AD14	A45	+3.3V
B16	CLKB	A16	+5V(I/O)	B46	GND	A46	AD13
B17	GND	A17	GNT0#	B47	AD12	A47	AD11
B18	REQ0#	A18	GND	B48	AD10	A48	GND
B19	+5V(I/O)	A19	REQ2#	B49	GND	A49	AD09
B20	AD31	A20	AD30	B52	AD08	A52	C/BE0#
B21	AD29	A21	+3.3V	B53	AD07	A53	+3.3V
B22	GND	A22	AD28	B54	+3.3V	A54	AD06
B23	AD27	A23	AD26	B55	AD05	A55	AD04
B24	AD25	A24	GND	B56	AD03	A56	GND
B25	+3.3V	A25	AD24	B57	GND	A57	AD02
B26	C/BE3#	A26	GNT2#	B58	AD01	A58	AD00
B27	AD23	A27	+3.3V	B59	+5V(I/O)	A59	+5V(I/O)
B28	GND	A28	AD22	B60	ACK64#	A60	REQ64#
B29	AD21	A29	AD20	B61	+5V	A61	+5V
B30	AD19	A30	GND	B62	+5V	A62	+5V

2-33. IRDA CONNECTOR (OPTIONAL)

U21: IrDA Connector
The pin assignments are as follow:



PIN	ASSIGNMENT
1	GND
2	NC
3	VCC
4	AGND
5	PWDOWN
6	RXD
7	TXD
8	LEDA

2-34. IRDA DEVICE SELECTION (OPTIONAL)

JP22: IrDA Device Selection
The jumper settings are as follow:

SELECTION	JUMPER SETTING (pin closed)	JUMPER ILLUSTRATION
IrDA Device	Open	
No IrDA	Close	

SOFTWARE UTILITIES

CHAPTER

3

This chapter provides the detailed information users need to install drivers and utilities for the system.

Sections included:

- Intel® Chipset Software Installation Utility
- VGA Driver Utility
- LAN Driver Utility
- SOUND Driver Utility

3-1. INTRODUCTION

Enclosed with our BPC-8960 package, you will find a CD ROM disk containing all types of drivers we have. As a BPC-8960 user, you will only need the some of files contained in the CD ROM disk, please take note of the following chart:

File name (Assume that CD ROM drive is D:)	Purpose
D:\Driver\Chipsets	Intel® Chipset Device Software Installation Utility
D:\Driver\VGA	Intel® Graphics Media Accelerator 3150 for VGA driver installation
D:\Driver\LAN	Intel® 82567V-3 for LAN Driver installation
D:\Driver\Sound	Realtek ALC888 for Sound driver installation
D:\Driver\BIOS	For BIOS update utility

🔔 User should remember to install the Utility right after the OS fully installed.

3-2. INTEL® CHIPSET SOFTWARE INSTALLATION UTILITY

3-2-1. Introduction

The Intel® Chipset Device Software installs Windows* INF files to the target system. These files outline to the operating system how to configure the Intel® chipset components in order to ensure that the following features function properly:

- Core PCI and ISAPNP Services
- PCIe Support
- IDE/ATA33/ATA66/ATA100 Storage Support
- SATA Storage Support
- USB Support
- Identification of Intel® Chipset Components in the Device Manager

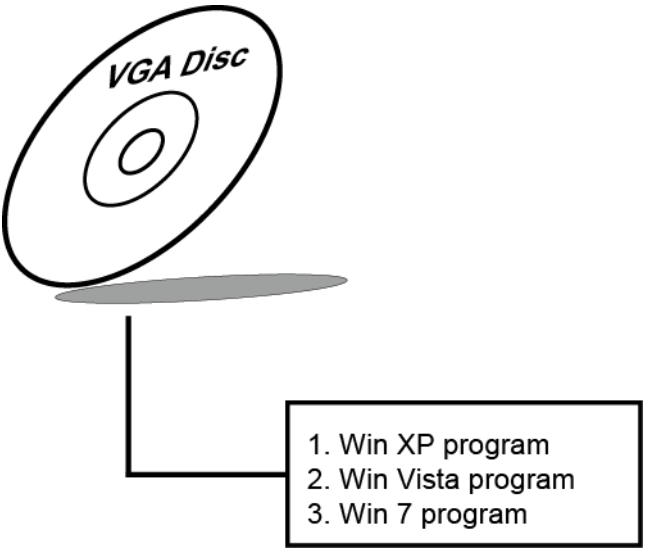
3-2-2. Installation of Utility for Windows XP/Vista/7

The Utility Pack is to be installed only for Windows XP, Vista and 7 programs.
It should be installed right after the OS installation, kindly follow the following steps:

1. Place insert the Utility Disk into Floppy Disk Drive A/B or CD ROM drive.
2. Under Windows XP/Vista/7 system, go to the directory where Utility Disc is located.
3. Click **infinst_autol.exe** file for utility installation.
4. Follow the instructions on the screen to complete the installation.
5. Once installation is completed, shut down the system and restart in order for the changes to take effect.

3-3. VGA DRIVER UTILITY

The VGA interface is embedded with our BPC-8960 system to support CRT display. The content of the VGA driver is found as follows:



3-3-1. Installation of VGA Driver

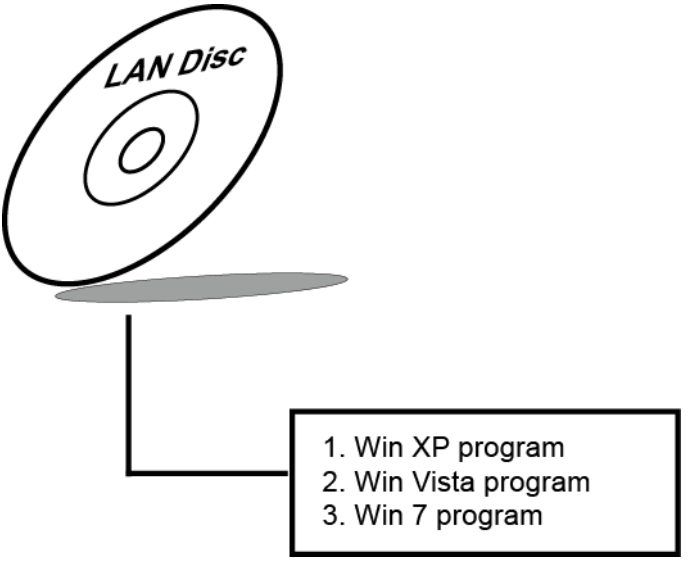
1. Start the computer (Win XP/Vista/7).
2. Insert the Utility Disk into the CD ROM drive.
3. Open the VGA folder, for your system to choose an appropriate folder, and double-click "exe" file to install, e.g. “D:\DRIVER\VGA\Your system***.exe”
   (If D is not your CD-ROM drive, substitute D with the correct drive letter.)
4. Follow the Wizard's on- screen instructions to complete the installation.

📖 For more information on VGA driver installation, please refer to the readme.txt found on the sub-directory of the VGA driver utility.

3-4. LAN DRIVER UTILITY

3-4-1. Introduction

The BPC-8960 is enhanced with LAN function that can support various network adapters. The content of the LAN driver is found as follows:

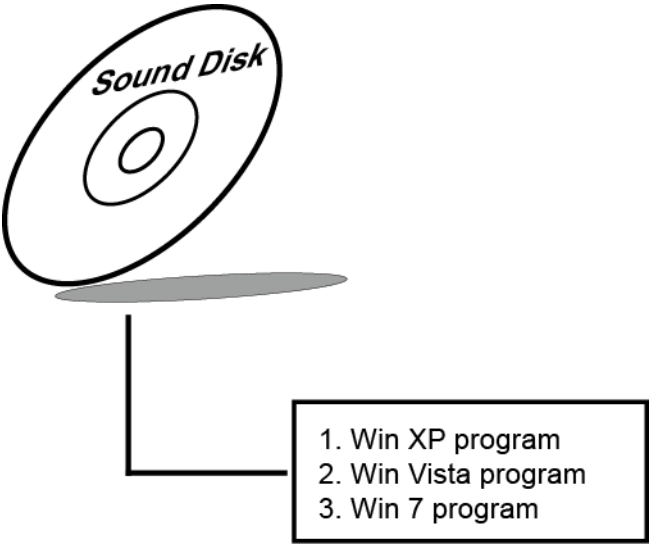


For more details on Installation procedure, please refer to Readme.txt file found on LAN DRIVER UTILITY.

3-5. SOUND DRIVER UTILITY

3-5-1. Introduction

The ALC888 sound function enhanced in this system is fully compatible with Windows XP, Windows Vista and Windows 7. Below, you will find the content of the Sound driver:



3-5-2. Installation Procedure for Windows XP/Vista/7

1. Open the SOUND folder. For your system to choose an appropriate folder, and Run the setup.exe program to start the installation, e.g. "D:\DRIVER\SOUND\Your system***.exe"
   (If D is not your CD-ROM drive, substitute D with the correct drive letter.)
2. Click on [Next] to continue the procedure. If the Windows popup "Windows can't verify the publisher of this driver software" message, press "Install this driver software anyway" to continue the installation.
3. Finally, select to restart the system and press [Finish] to complete the installation.

CHAPTER

4

AMI BIOS SETUP

This chapter shows how to set up the AMI BIOS.

Sections included:

- Introduction
- Entering Setup
- Main
- Advanced
- PCIPnP
- Boot
- Security
- Chipset
- Exit

4-1. INTRODUCTION

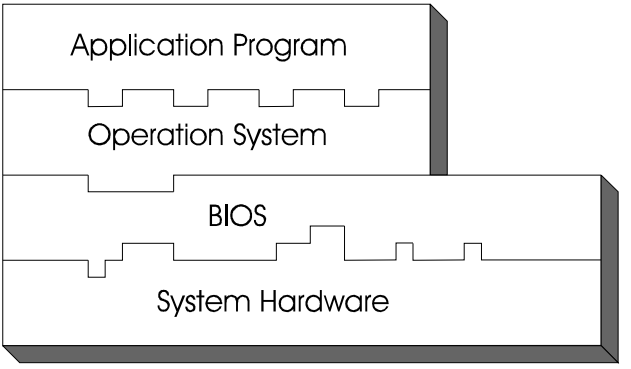
This chapter will illustrate functions of the BIOS (Basic Input/Output System) in managing the features of your system. The **8960LF** motherboard is equipped with the BIOS from AMI (American Megatrends Inc). Following pages describe how to use the BIOS in order to configure system hardware by BIOS setup menu.

When the PC starts up, its first job for the BIOS is to initialize and identify all system devices such as the video display card, keyboard and mouse, hard disk, CD/DVD drive and other hardware. The BIOS then locates operating system(s) saved on storage device (designated as a 'boot device'), be it a hard disk, USB flash disk or a CD/DVD, and loads and executes that operating system, giving it control over the PC.

BIOS code is stored on a non-volatile, ROM chip built into the system, on the mother board and the BIOS software is specifically designed to work with the particular type of system in question. That includes having understanding of principles for each devices included in the PC.

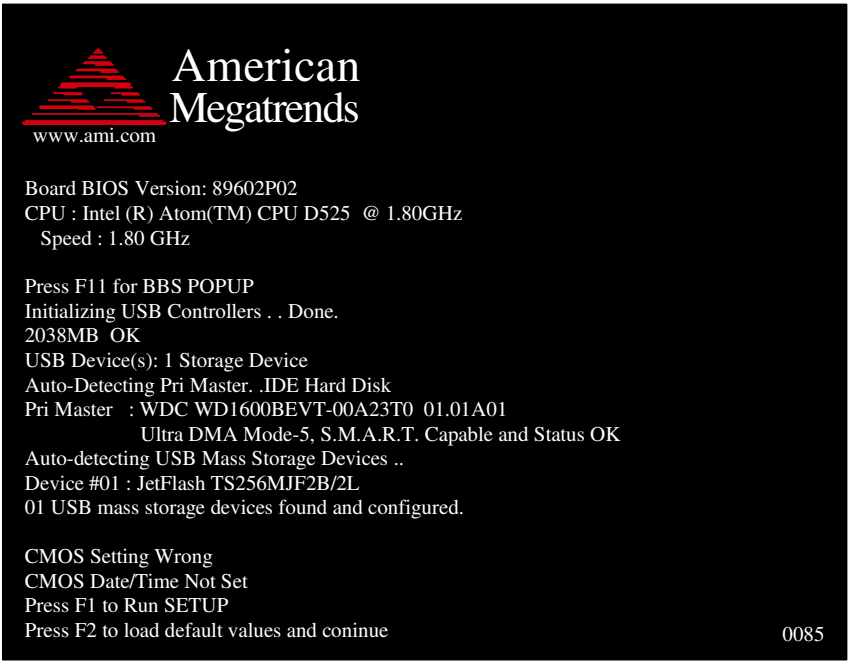
BIOS also provides an user interface—in this document referent to as setup menu—in a form of a menu system accessed by pressing a certain key on the keyboard when the PC starts. In the BIOS setup menu, a user can configure hardware, set the system clock, enable or disable system components, and most importantly, select which devices are eligible to be a potential boot device. It is also possible to set various password prompts, for instance a password for securing access to the BIOS setup menu functions itself and preventing unauthorized users from booting undesirable operating systems from peripheral devices.

Following diagram illustrates the relationships between system hardware, BIOS, operating system, and application program:

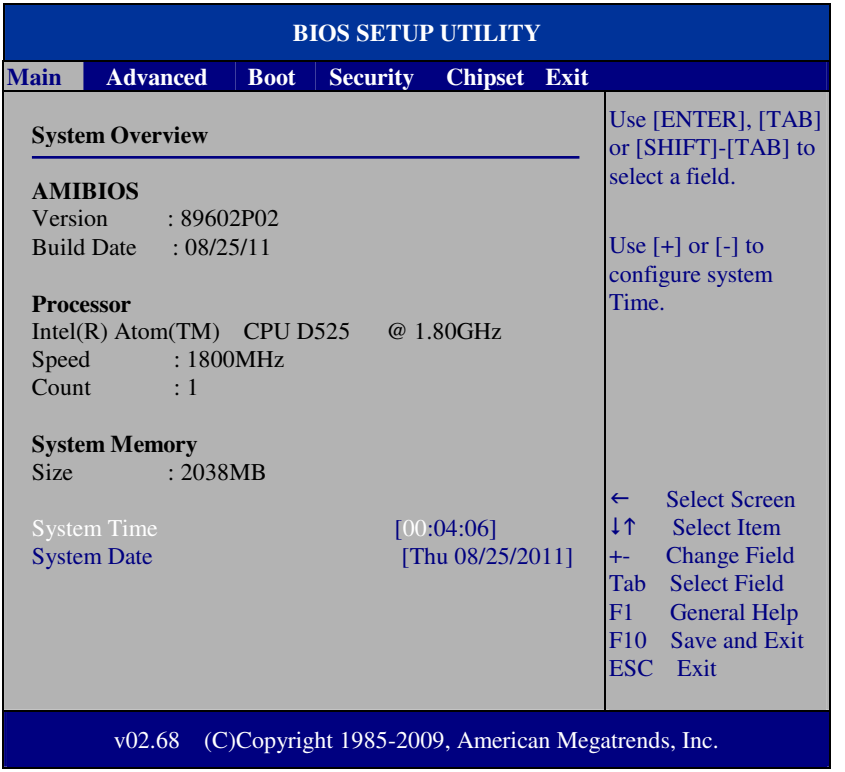


4-2. ENTERING SETUP

When system powered on, BIOS will enter the Power-On Self Test (POST) routines and displays below message on the screen:



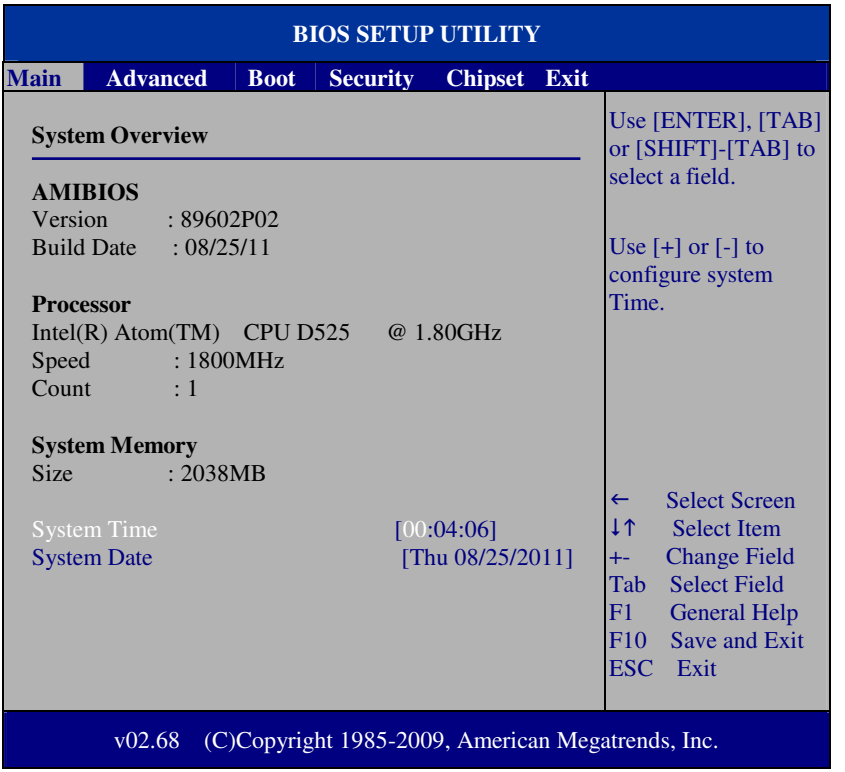
As long as this logo is present on the screen you may press the <Del> key (the one that shares the decimal point at the bottom of the number keypad) to enter the BIOS setup program. In a moment, the main menu of the AMI SETUP program will be shown on the screen:



Setup program initial screen

You may move the cursor by up/down keys to highlight the individual menu items. As you highlight each item, a brief description of the highlighted selection will appear at the right side of the screen.

4-3. Main



Main Screen

Use < ↑ > or < ↓ > arrow keys to highlight the item and key in the value you want in each item. This menu provides basic system configurations, such as time and date.

AMI BIOS, Processor, System Memory

This items show the BIOS version, BIOS build up date, processor and system memory information of your system.

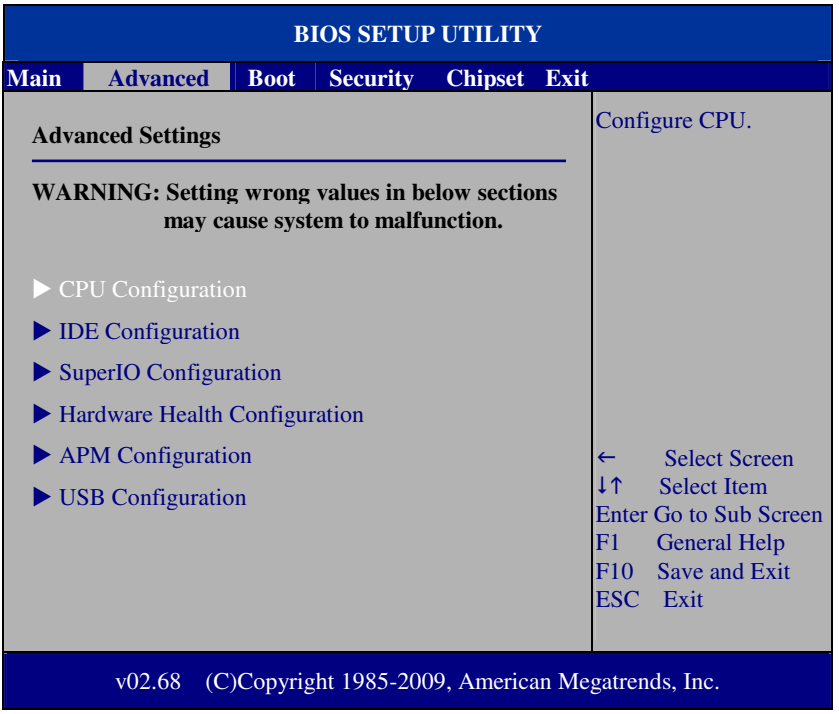
System Time

This setting allows you to set the system time. The format is [Hour: Minute: Second]. User can directly key-in value or use <+> or <-> arrow keys to increase/decrease it.

System Date

This setting allows you to set the system date. The format is [Day: Month: Date: Year]. User can directly key-in value or use <+> or <-> arrow keys to increase/decrease it.

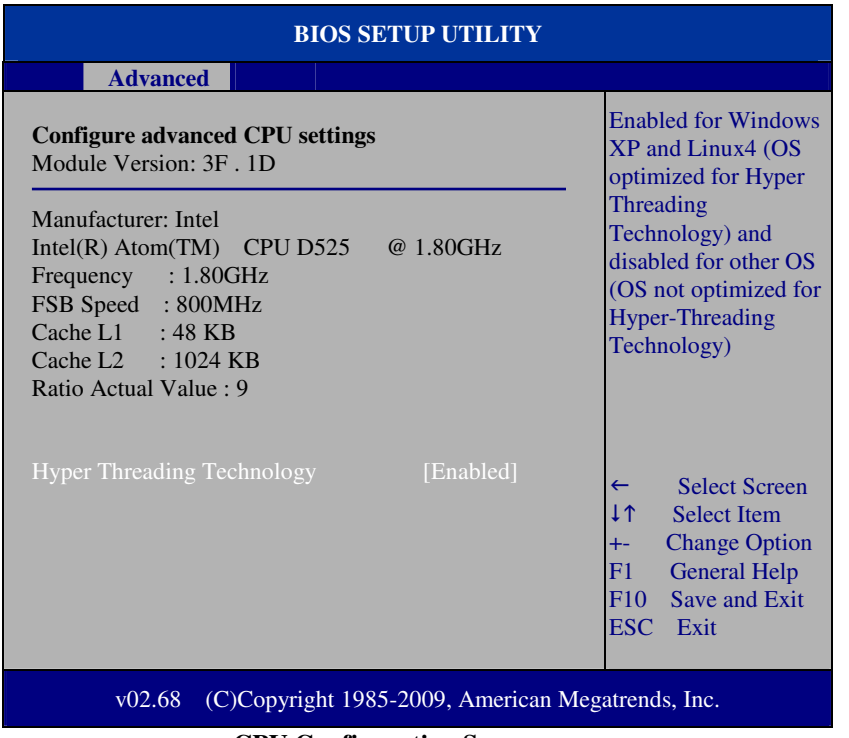
4-4. Advanced



Advanced Screen

This menu provides advanced configurations such as CPU Configuration, IDE Configuration, Super I/O Configuration, etc.

4-4.1 CPU Configuration



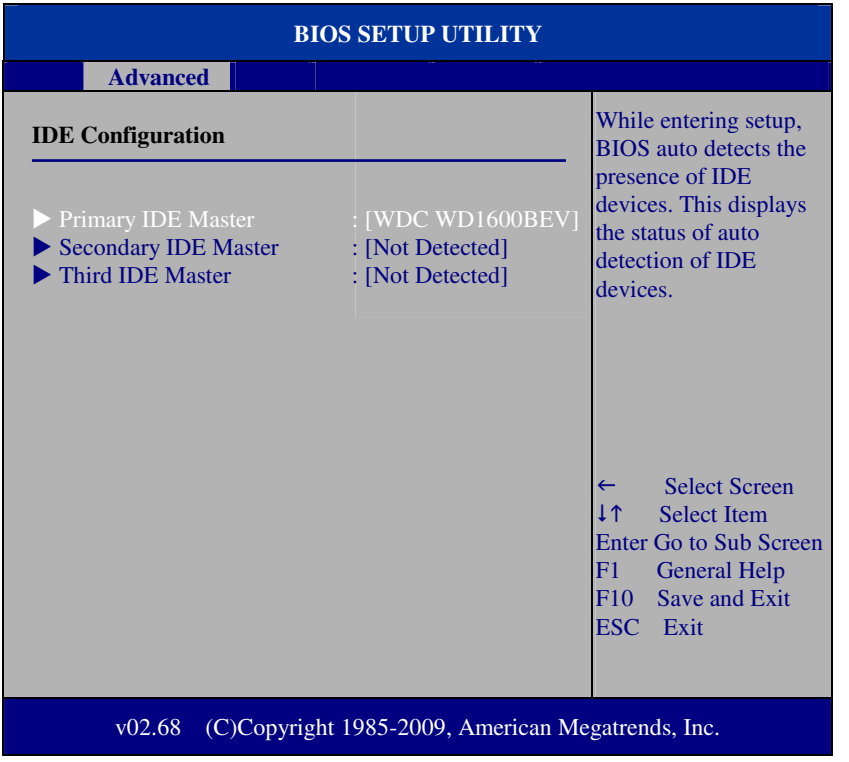
CPU Configuration Screen

This menu provides advanced CPU settings and some information about CPU.

Hyper Threading Technology

Hyper Threading is Intel's term for its simultaneous multithreading implementation in their CPUs. Enable this function will improve parallelization of computation performed on PC microprocessor. For each processor core that is physically present, the operation system addresses two virtual processors, and shares the workload between them when possible.

4-4.2 IDE Configuration



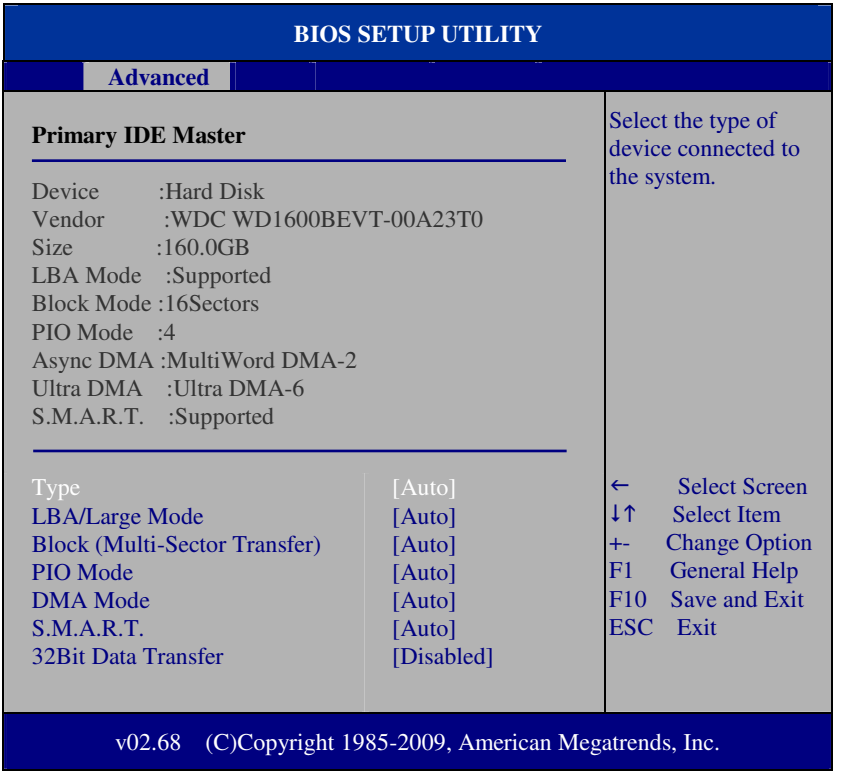
IDE Configuration Screen

This menu provides advanced IDE configuration for hard drive. The control items of Primary /Secondary /Third IDE Master are all the same and describe in next section.

Primary /Secondary /Third IDE Master

This setting displays the status of storages.

4-4.2.1 Primary /Secondary /Third IDE Master



Primary IDE Slave

Type

Select the type of device connected to the system.

LBA/Large Mode

Enabling LBA causes Logical Block Addressing to be used in place of Cylinders, Heads and Sectors.

Block (Multi-Sector Transfer)
Any selection except Disabled determines the number of sectors transferred per block.

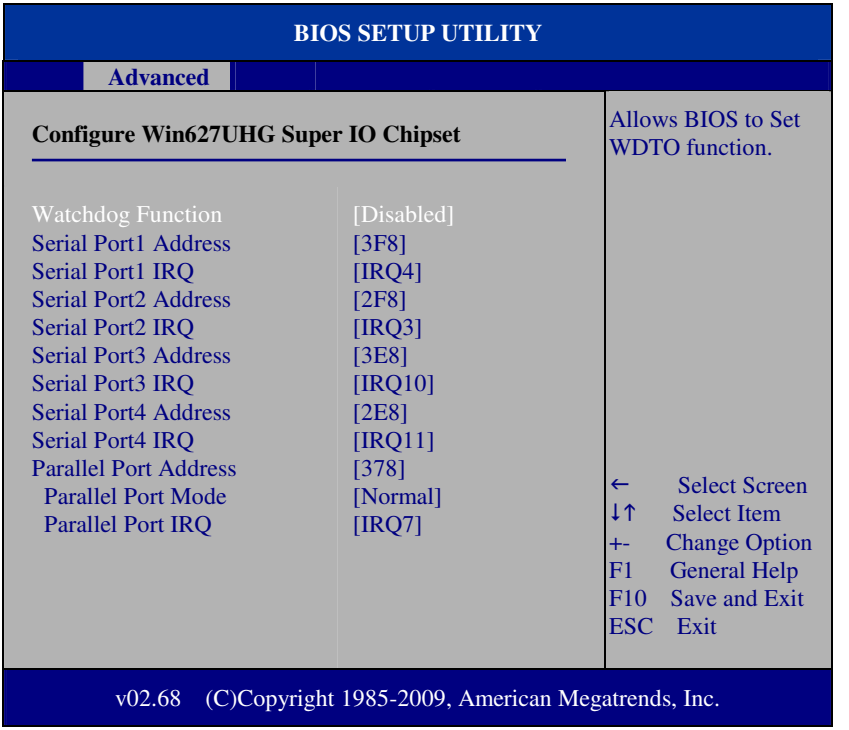
PIO Mode
Configure the type of PIO (Programmed Input/Output) mode 0-4 for IDE device. Mode 0 through 4 provides successively increased performance.

DMA Mode
Select the type of Ultra DMA mode on a hard drive.

S.M.A.R.T
This allows you to activate the S.M.A.R.T. (Self-Monitoring Analysis & Reporting Technology) capability for the hard disks. S.M.A.R.T is a utility that monitors your disk status to predict hard disk failure. This gives you an opportunity to move data from a hard disk that is going to fail to a safe place before the hard disk becomes offline.

32Bit Data Transfer
Enables/Disable 32-bit data transfer.

4-4.3 Super I/O Configuration



Super I/O Configuration Screen

WatchDog function
If system hang or not respond for user, enable watchdog function can triggers a system reset by an user given value count down to zero.

Serial Port1~4 Address
Select IO address as serial ports default resource.

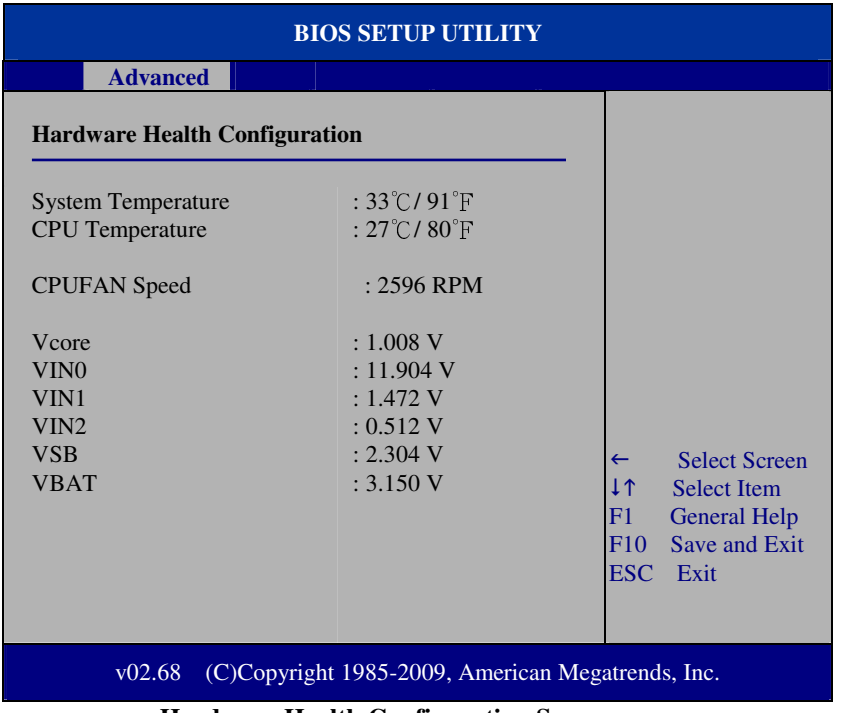
Serial Port1~4 IRQ
Select IO IRQ as serial ports default resource.

Parallel Port Address
Select IO address for parallel ports resource allocation.

Parallel Port Mode
Select the operation mode for parallel port.

Parallel Port IRQ
Select IRQ for parallel ports resource allocation.

4-4.4 Hardware Health Configuration

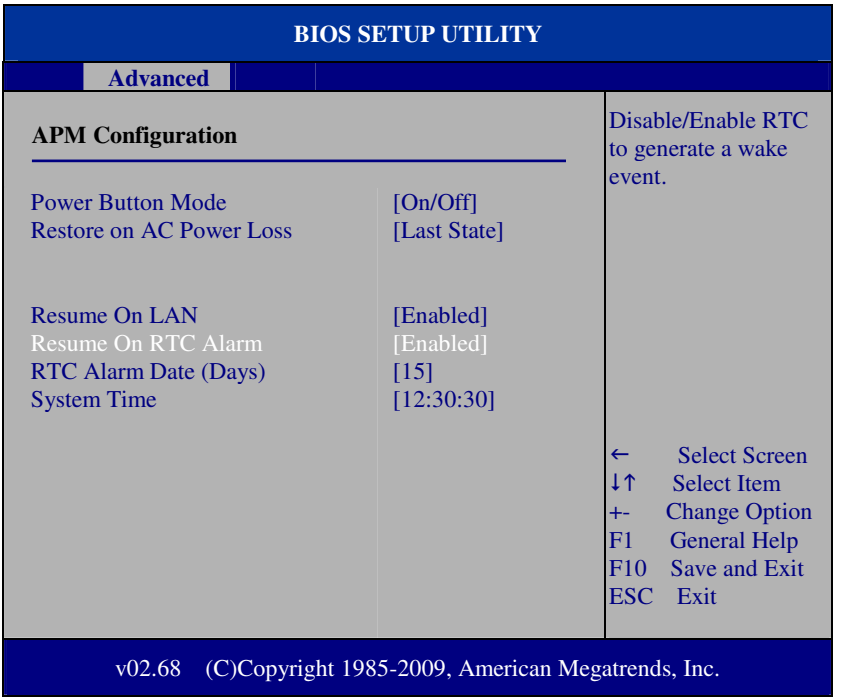


Hardware Health Configuration Screen

System Temperature / CPU Temperature
Both sections show System and CPU current temperature.

VCORE/VIN0 / VIN1 / VIN2 /VSB/VBAT
These items provide hardware health information.

4-4.5 APM Configuration



APM Configuration Screen

Power Management/APM

This is the main control item for enable/disable below APM functions.

Power Button Mode

This setting controls shutdown action by pressing power button. The system will be shutdown immediately after pressing power button when set to "On/Off". If set the power button mode to "Delay 4 seconds", system will be shutdown after pressing and hold the power button over 4 seconds.

Restore on AC/Power Loss

Once a power failure situation happens, this item decides the system power state after AC power restore back.

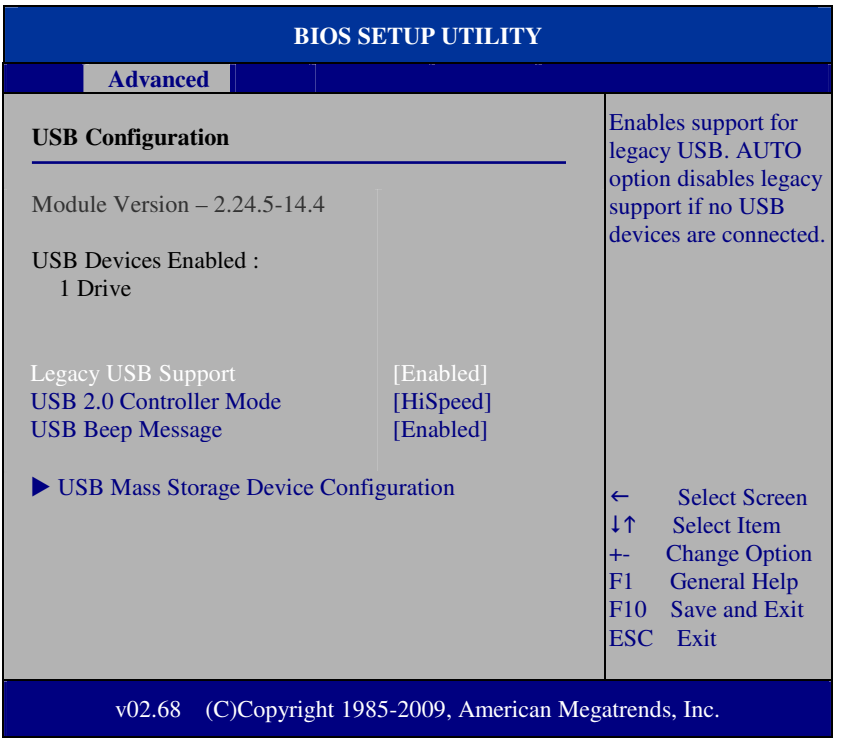
Resume On LAN
When user set this option to [Enable], System can be wake up from sleep state and boot into OS once received an incoming message from LAN device.

Resume On RTC Alarm
When user set this option to [Enable], it allows system to be wake up at specific date/time.

RTC Alarm Date (Days)
Set a specific date value for RTC alarm function to wakeup system from soft off state.

System Time
Set a specific time value for RTC alarm function to wakeup system from soft off state.

4-4.6 USB Configuration



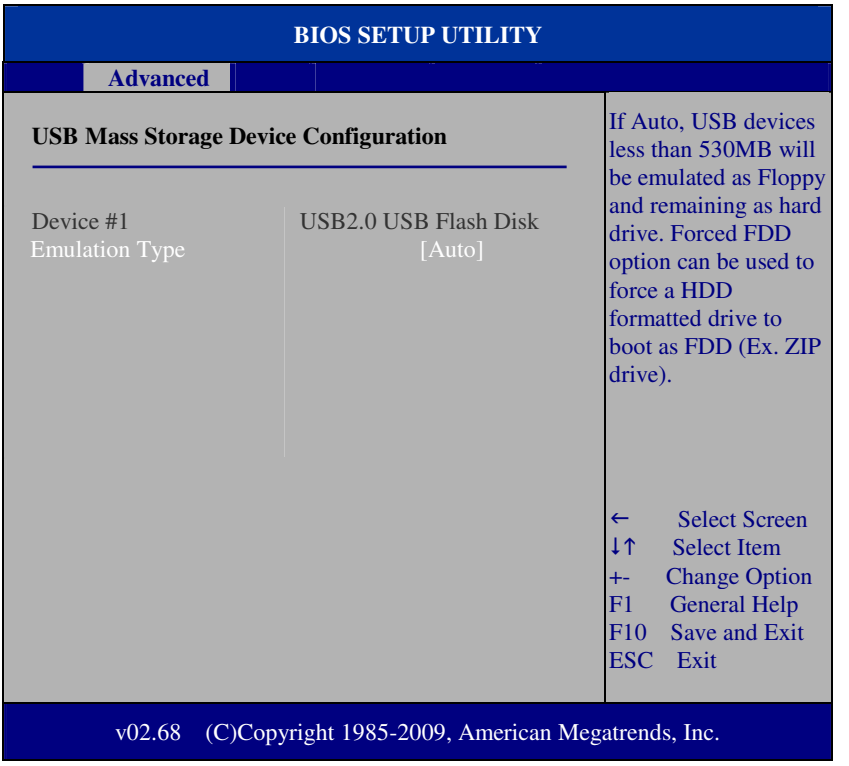
USB Configuration Screen

Legacy USB Support
Set to [Enabled] if you want to use USB device in the legacy operating system, such as MS-DOS or SCO Unix.

USB 2.0 Controller Mode
Configure the onboard USB 2.0 controller operation mode to high Speed or full speed mode.

USB Beep Message
System will generate beep sound during USB device enumeration.

4-4.6.1 USB Mass Storage Device Configuration

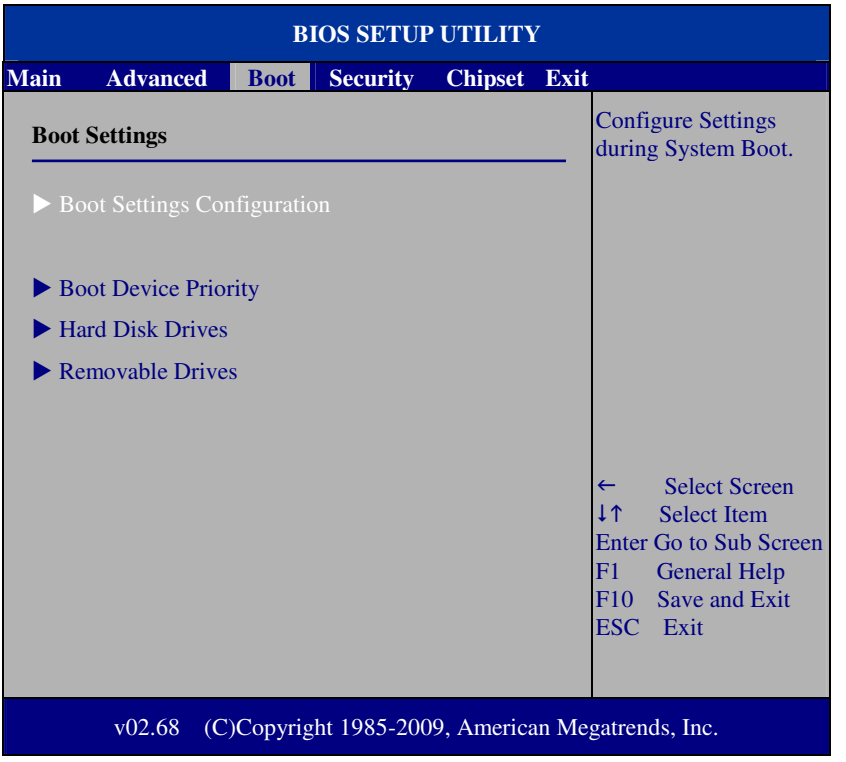


USB Mass Storage Device Configuration Screen

Emulation Type

Select which type of device that USB mass storage emulation. When user select to [Auto], the USB storage size less than 530MB will be emulated as floppy drive and remaining as hard drive.

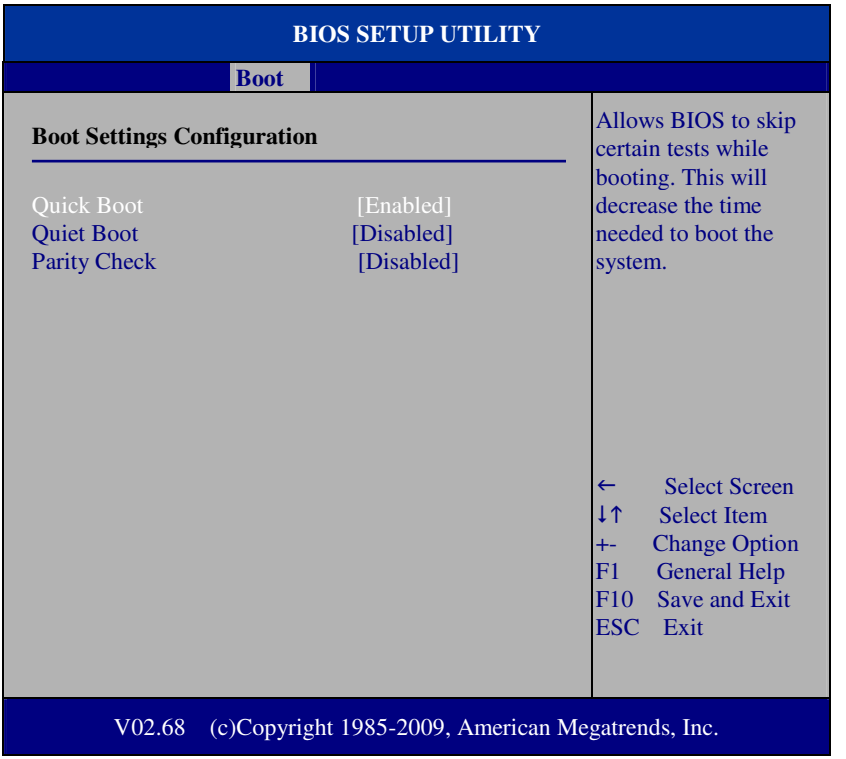
4-5. Boot



Boot Screen

This menu provides control items for system boot configuration.

4-5.1 Boot Settings Configuration



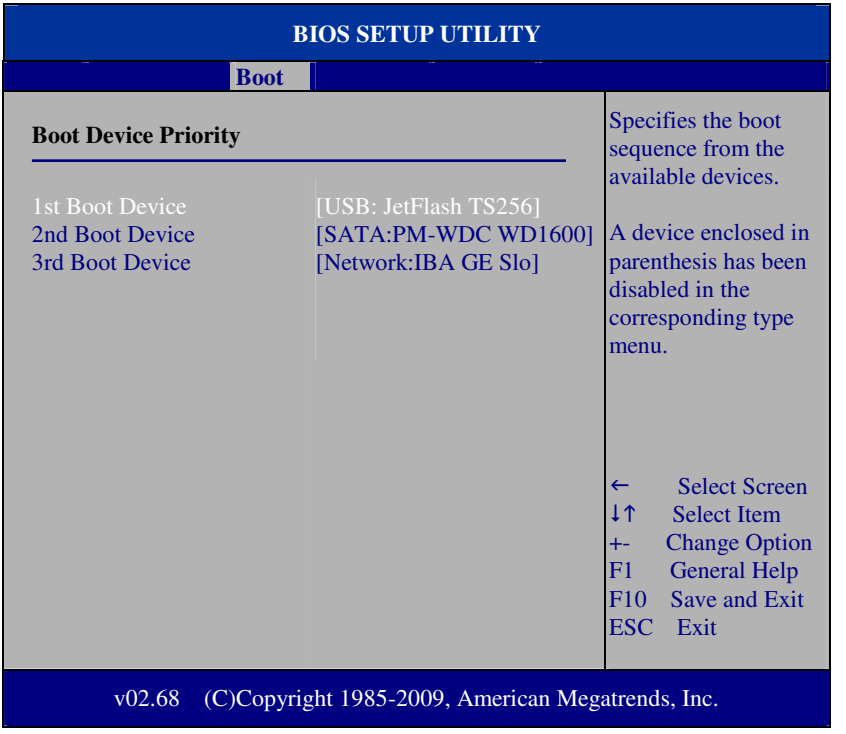
Boot Settings Configuration Screen

Quick Boot
Enable this item allows BIOS POST to skip some tests during boot-up for saving boot time.

Quiet Boot
When set this option to [disabled], BIOS will display normal POST messages.

Parity Check
This setting enables or disables memory or parity error check.

4-5.2 Boot Device Priority

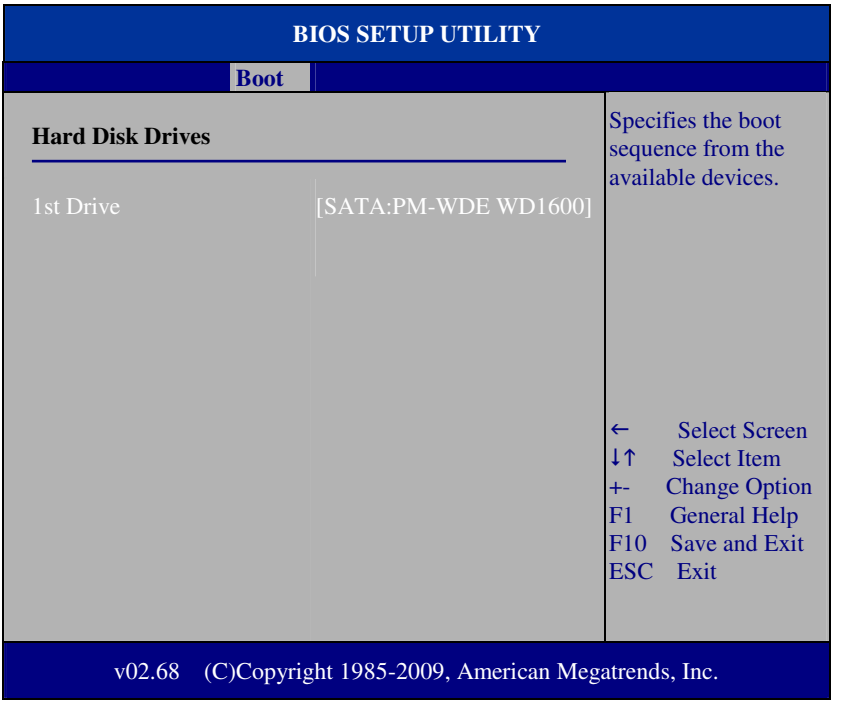


Boot Device Priority Screen

1st / 2nd / 3rd …Boot Device

Choose the boot sequence from the available devices.

4-5.3 Hard Disk Drives

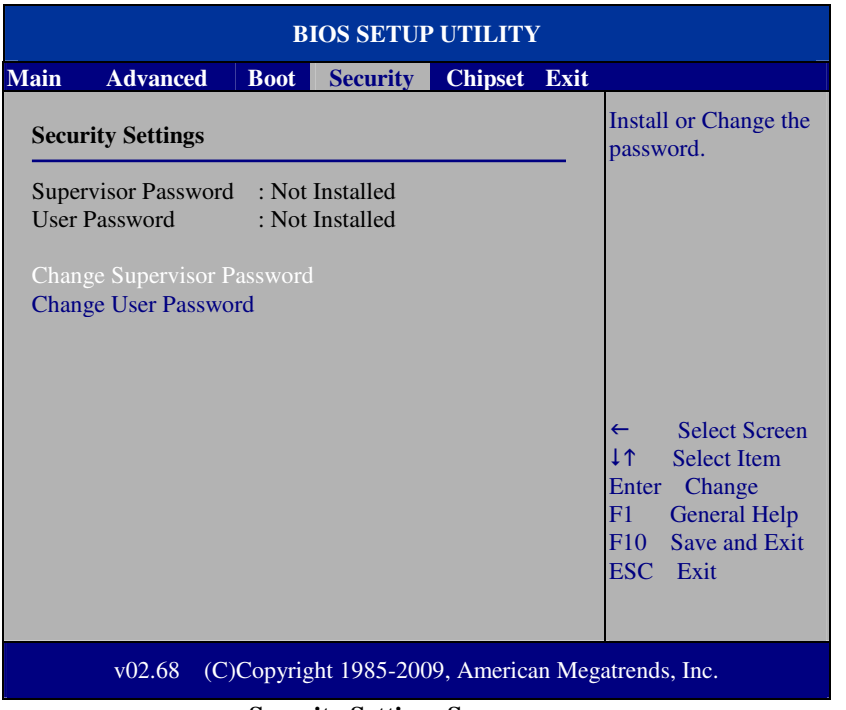


Hard Disk Drives Screen

1st / 2nd …Drive

This setting allows user to set the priority of hard drive or another bootable USB storages. Press <Enter> to enter the sub-menu and press < ↑ > or < ↓ > arrow keys to select the device. Another way is to press <+> or <-> to move it up/down in the priority list.

4-6. Security



Security Settings Screen

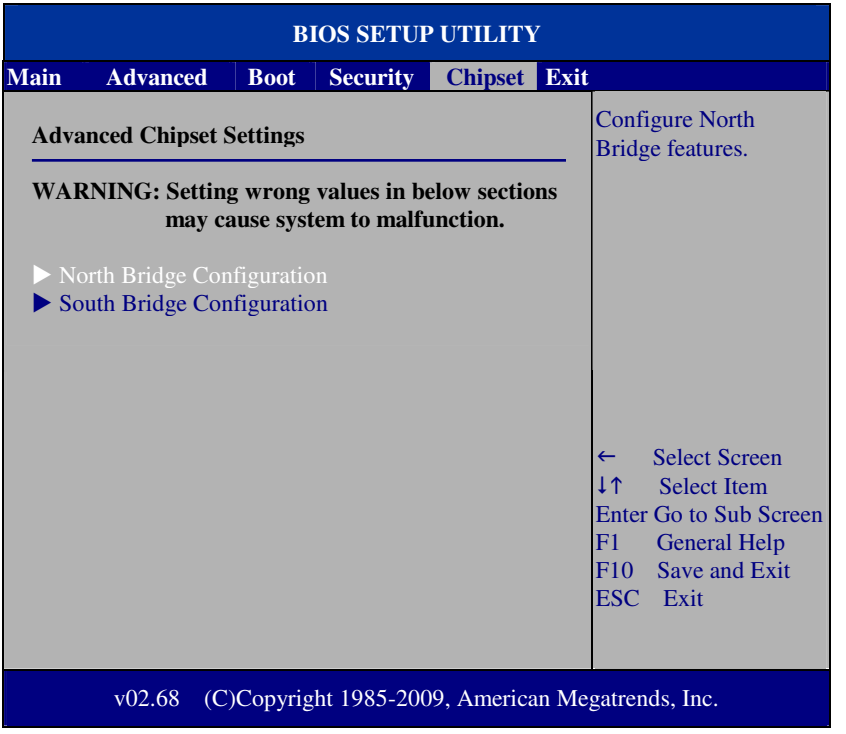
Change Supervisor Password

Supervisor Password controls the access right to the BIOS Setup utility. These settings allow user to set or change the supervisor password.

Change User Password

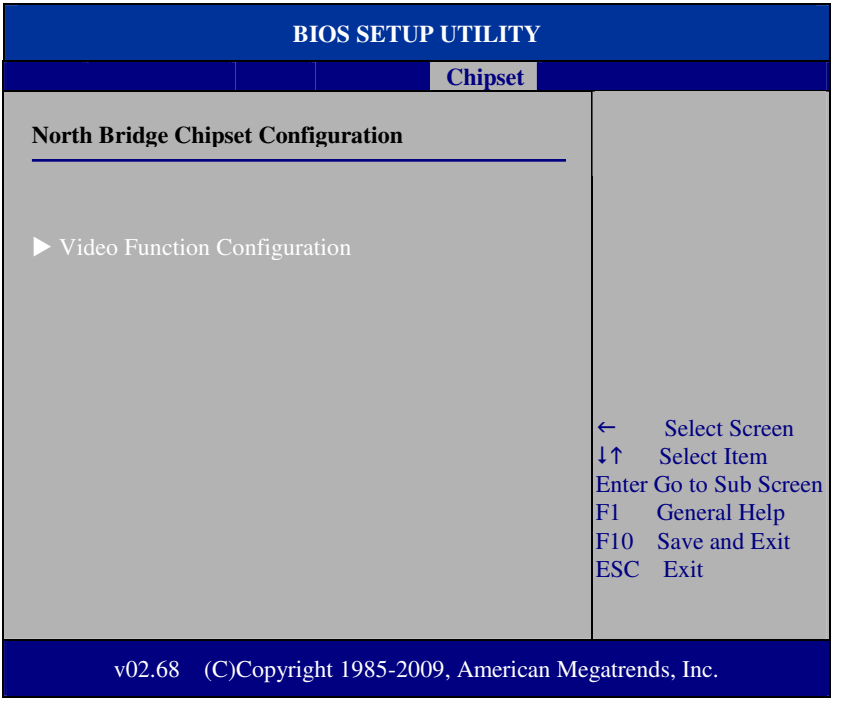
User Password controls system access right when power on. These settings allow user to set or change the user password.

4-7. Chipset



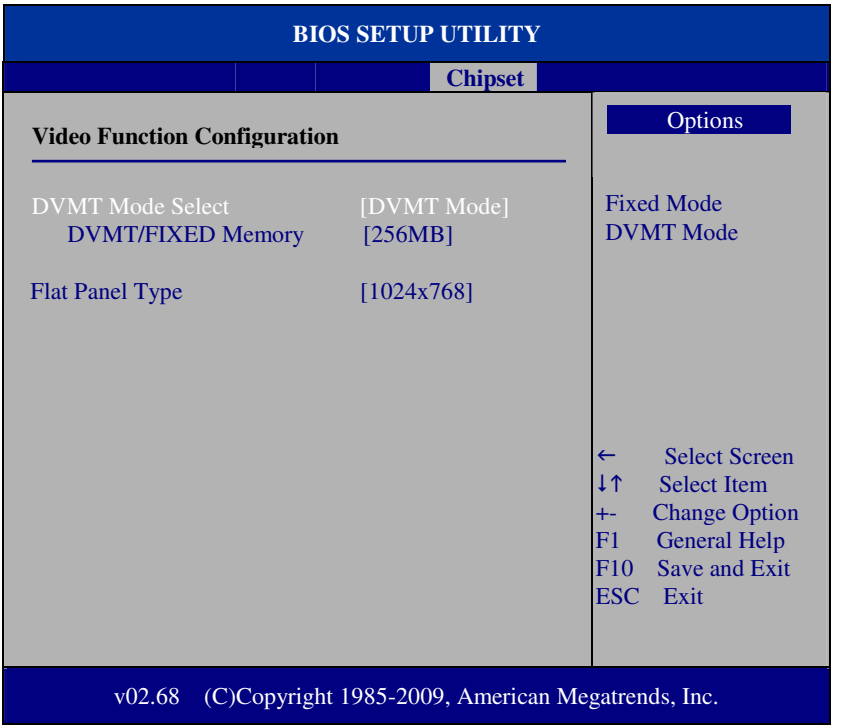
Advanced Chipset Settings Screen

4-7.1 North Bridge Chipset Configuration



North Bridge Chipset Screen

4-7.1.1 Video Function Configuration



Video Function Configuration Screen

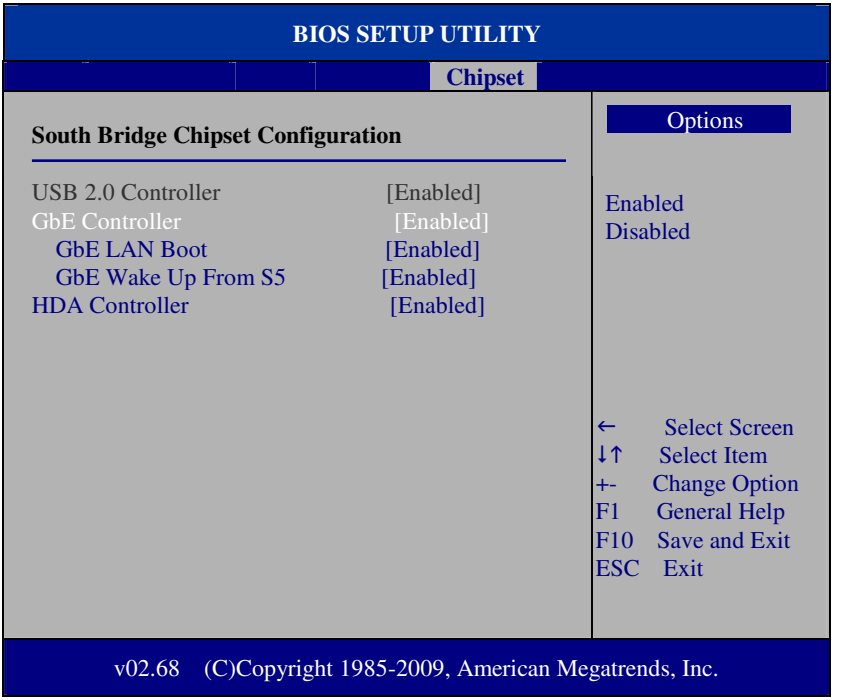
DVMT Mode Select / DVMT/FIXED Memory

Intel's Dynamic Video Memory Technology (DVMT) allows the system to dynamically allocated memory resources according to the demands of the system at any point in time. The key idea in DVMT is to improve the efficiency of the memory allocated to either system or graphics processor. It is recommended that user select this option to DVMT Mode that system memory is dynamically allocated for optimal balance between graphics and system performance.

Flat Panel Type

Select the resolution for the connected LVDS panel such as [800x600] [1024x768] and [1366 x768].

4-7.2 South Bridge Chipset Configuration



South Bridge Chipset Configuration Screen

USB 2.0 Controller
Enable the USB 2.0 Controller.

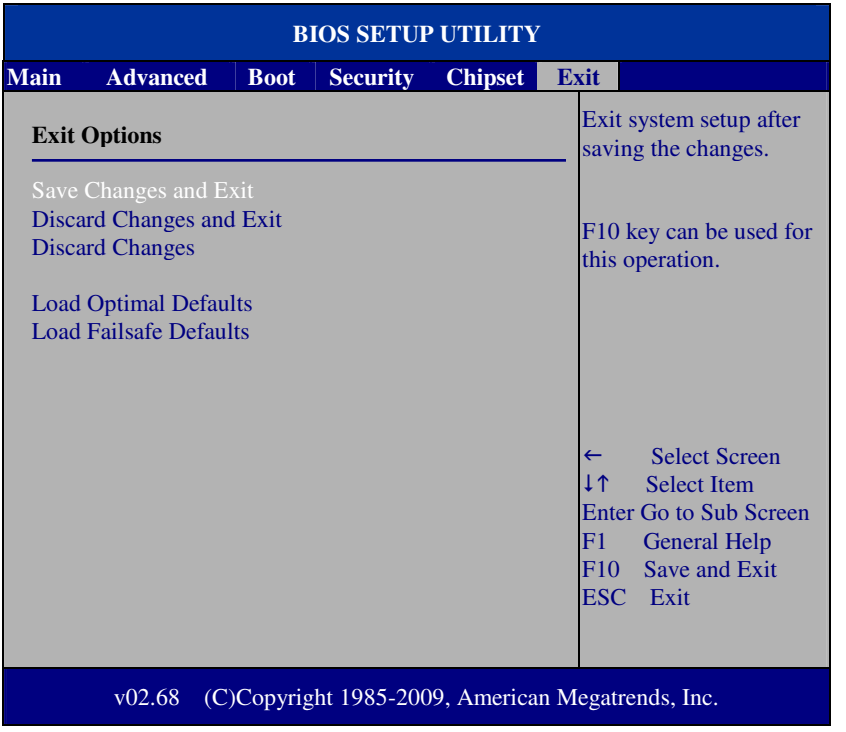
GbE Controller
Enables or disables the GbE (onboard LAN) controller.

GbE LAN Boot
Enables or disables internal LAN1 boot.

GbE Wake Up From S5
Enables or disables LAN1 wake up from S5 function.

HDA Controller
Enable or disable the onboard High-definition Audio controller.

4-8. Exit



Exit Screen

Save Changes and Exit

Save changes to CMOS and then exit the BIOS setup screen. User can also press the [F10] key for this operation.

Discard Changes and Exit

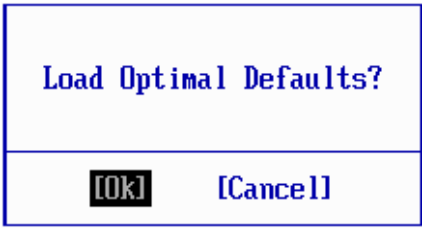
Abandon all changes and exit the BIOS setup screen. User can also press the [ESC] key for this operation.

Discard Changes

Discard all changes done so far to the setup items. User can press the [F7] key for this operation.

Load Optimal Defaults

Press <Enter> on this item, it will show a confirmation dialog box with a message like below:



Pressing "Ok" to loads the factory recommended optimal setting for system operations. User can also press the [F9] key for this operation.

Load Failsafe Defaults

Press <Enter> on this item, it will show a confirmation dialog box with a message like below:

To use the BIOS failsafe default values, change the prompt to "Ok" and press the <Enter > key. User can also press the [F8] key for this operation.

SYSTEM ASSEMBLY

APPENDIX

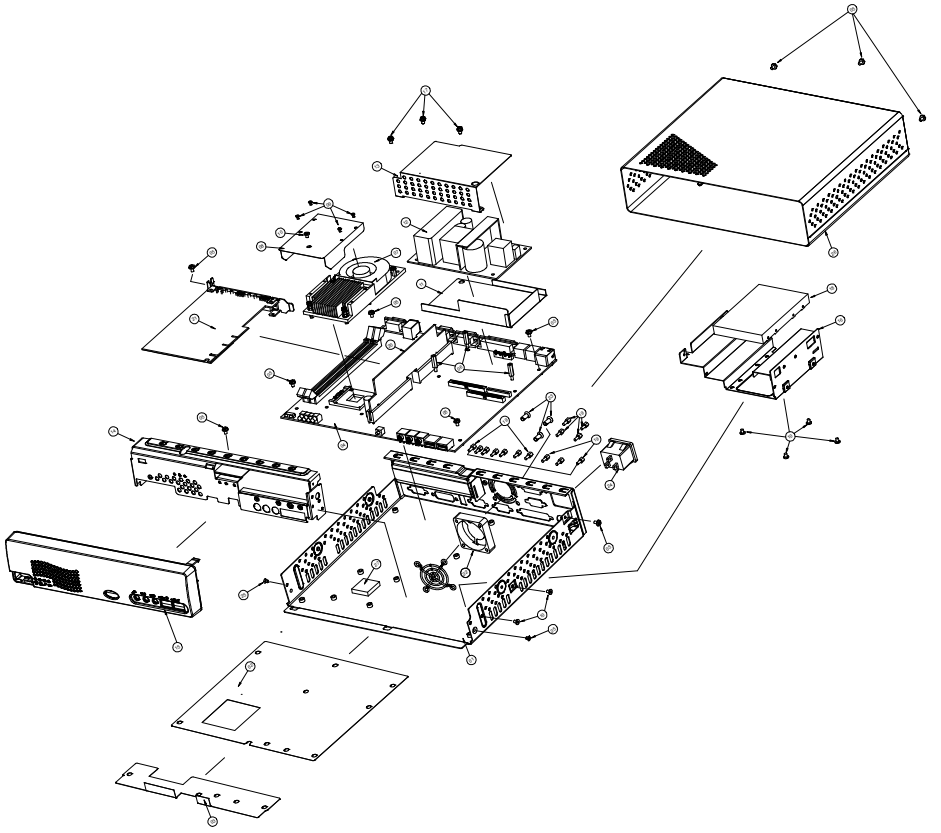
A

This appendix contain exploded diagram of the system.

Sections included:

- Exploded Diagram for Whole System Unit

EXPLODED DIAGRAM FOR WHOLE SYSTEM UNIT



No.	Part No.	Description	Q y
01	20-032-03002192	Base Bracket Assy 8960	1
02	90-056-39100192	MB Insulator 8960 (247.3x210.3x0.25mm)	1
03	30-056-34100118	PS-8590 Mylar for Insulator EMI (249.5x48.6x0.35mm)	1
04	M/B	M/B	1
05	22-252-30004011	Screw (3x4)	10
06	22-290-30015051	Pillar 3x15x6 (W/NUT3x6)	3
07	21-003-14064001	BPC-8960 Heatsink (with Fan)	1
08	90-056-39200192	Mylar Heatsink 8960	1
09	22-272-20002011	Screw (M2x0.4px2.5L)	4
10	22-272-30004011	Screw (M3xP0.5x4L)	7
11	30-056-02100080	PS-8380 Mylar (128.5x79x0.5)	1
12	52-001-03858005	110W Open Frame power supply	1
13	30-056-02100038	PS-8580 Mylar for power	1
14	32-006-03800101	PS-8580 Sub Front Bracket	1
15	31-003-03800201	PS-8580 Sub Front Panel-W (No CD-ROM & FDD)	1
16	20-029-03002080	PS8380 CDROM/HDD/FDD Supporter	1
17	22-232-30060211	Screw (QSTUDE-3-0.5-6-SP-W)	3
18	2.5 inch HDD	2.5 inch HDD for SATA	1
19	22-692-40048051	CU_BOSS Pillar (UNF N04x4.8x11.8mm)	14
20	Riser Card	Riser Card	1
21	Expansion Card	Expansion Card	1
22	21-004-04040012	ADDA Fan 40x40x10mm 4200rpm (AD0412LB-G73)	1
23	22-122-40080011	Screw 4x8mm (Same as QSTUD-H)	3
24	27-012-08002071	PS-8380 Power Cable (AC-IN) L=48mm	1
25	22-212-30004011	Screw M3x0.5Px4mm	2
26	20-001-03061080	PS-8380 Top Case (White)	1
27	21-006-04545001	PS-8590 Thermal Pads, 45x45x5mm	1

TECHNICAL SUMMARY

APPENDIX

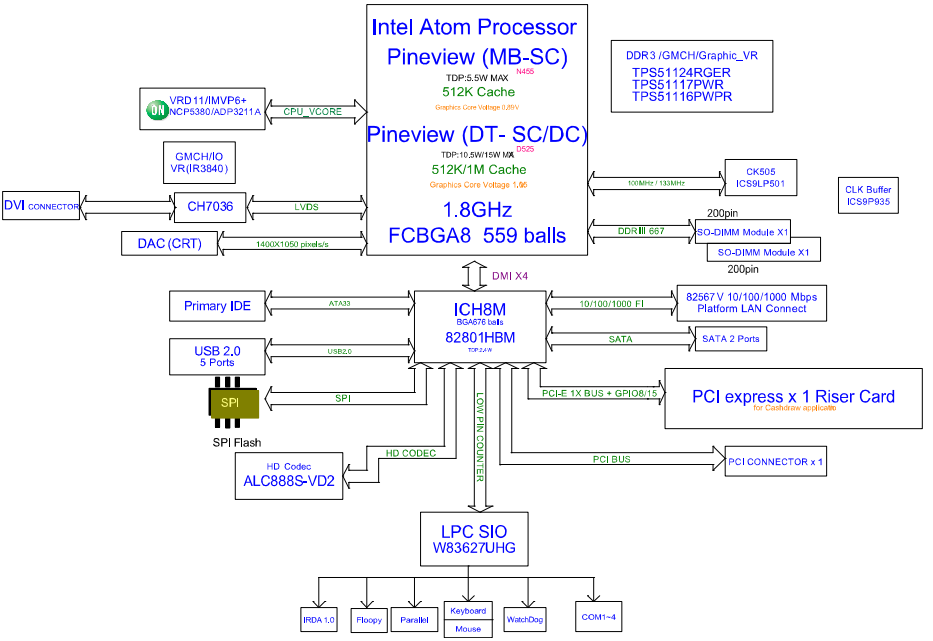
B

This appendix introduce you the maps concisely.

Sections included:

- Block Diagram
- Interrupt Map
- DMA Channels Map
- I/O Map
- Watchdog Timer Configuration
- Flash BIOS Update

BLOCK DIAGRAM



INTERRUPT MAP

IRQ	ASSIGNMENT
IRQ 0	System timer
IRQ 1	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
IRQ 3	Communications Port (COM2)
IRQ 4	Communications Port (COM1)
IRQ 8	System CMOS/real time clock
IRQ 9	Microsoft ACPI-Compliant System
IRQ 10	Communications Port (COM3)
IRQ 11	Communications Port (COM4)
IRQ 12	Microsoft PS/2 Mouse
IRQ 13	Numeric data processor
IRQ 14	Primary IDE Channel
IRQ 15	Intel(R) ICH8 Family SMBus Controller – 283E
IRQ 16	Intel(R) Graphics Media Accelerator 3150
IRQ 16	Intel(R) ICH8 Family USB Universal Host Controller - 2834
IRQ 18	Intel(R) ICH8 Family USB2 Enhanced Host Controller – 283A
IRQ 18	Intel(R) ICH8 Family USB Universal Host Controller - 2832
IRQ 18	Intel(R) ICH8M 3 port Serial ATA Storage Controller - 2828
IRQ 19	Intel(R) ICH8 Family USB Universal Host Controller - 2831
IRQ 21	Intel(R) ICH8 Family USB Universal Host Controller - 2835
IRQ 21	Microsoft UAA Bus Driver for High Definition Audio
IRQ 23	Intel(R) 82567V-3 Gigabit Network Connection
IRQ 23	Intel(R) ICH8 Family USB Universal Host Controller - 2830
IRQ 23	Intel(R) ICH8 Family USB2 Enhanced Host Controller - 2836

DMA CHANNELS MAP

Timer Channel	Assignment
Channel 4	Direct memory access controller

I/O MAP

I/O MAP	ASSIGNMENT
00000000 – 00000CF7	PCI bus
00000000 – 00000CF7	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
000001F0 – 000001F7	Primary IDE Channel
00000274 – 00000277	ISAPNP Read Data Port
00000279 – 00000279	ISAPNP Read Data Port
000002E8 – 000002EF	Communications Port (COM4)
000002F8 – 000002FF	Communications Port (COM2)
00000378 – 0000037F	Printer Port (LPT1)

I/O MAP	ASSIGNMENT
000003B0 – 000003BB	Intel (R) Graphics Media Accelerator 3150
000003C0 – 000003DF	Intel (R) Graphics Media Accelerator 3150
000003E8 – 000003EF	Communications Port (COM3)
000003F6 – 000003F6	Primary IDE Channel
000003F8 – 000003FF	Communications Port (COM1)
0x00000400-0x0000041F	Intel(R) ICH8 Family SMBus Controller - 283E
000004D0 – 000004D1	Motherboard resources
00000500 – 0000053F	Motherboard resources
00000800 – 0000087F	Motherboard resources
00000A00 – 00000A0F	Motherboard resources
00000D00 – 0000FFFF	PCI bus
0x0000D000-0x0000D007	Intel(R) Graphics Media Accelerator 3150
0x0000D080-0x0000D09F	Intel(R) 82567V-3 Gigabit Network Connection
0x0000D400-0x0000D41F	Intel(R) ICH8 Family USB Universal Host Controller - 2835
0x0000D480-0x0000D49F	Intel(R) ICH8 Family USB Universal Host Controller - 2834
0x0000D800-0x0000D81F	Intel(R) ICH8 Family USB Universal Host Controller - 2832
0x0000D880-0x0000D89F	Intel(R) ICH8 Family USB Universal Host Controller - 2831
0x0000DC00-0x0000DC1F	Intel(R) ICH8 Family USB Universal Host Controller - 2830
0x0000E080-0x0000E08F	Intel(R) ICH8M 3 port Serial ATA Storage Controller - 2828
0x0000E400-0x0000E40F	Intel(R) ICH8M 3 port Serial ATA Storage Controller - 2828
0x0000E480-0x0000E483	Intel(R) ICH8M 3 port Serial ATA Storage Controller - 2828
0x0000E800-0x0000E807	Intel(R) ICH8M 3 port Serial ATA Storage Controller – 2828
0x0000E880-0x0000E883	Intel(R) ICH8M 3 port Serial ATA Storage Controller – 2828
0x0000EC00-0x0000EC07	Intel(R) ICH8M 3 port Serial ATA Storage Controller – 2828
0x0000FFA0-0x0000FFAF	Intel(R) ICH8M Ultra ATA Storage Controllers - 2850

WATCHDOG TIMER CONFIGURATION

Watchdog timer can be configured via I/O port address 2E (hex) and 2F (hex). 2E (hex) is the address port. 2F (hex) is the data port. User can assign the target offset by writing value into address port 2E (hex) and then write/read data to/from the target offset by data port 2F (hex).

Configuration Sequence

Please follow the following steps to program W83627UHG configuration registers.
(1) Enter the extended function mode.
(2) Configure the configuration registers.
(3) Exit the extended function mode

(1) Enter the extended function mode

To place W83627UHG into the Extended Function Mode, two successive writes of 0x87 must be applied to Extended Function Enable Registers (EFERs, i.e. 2Eh or 4Eh).

(2) Configure the configuration registers

User must select to the desired Logical Device number and activates the desired Logical Devices through Extended Function Index Register (EFIR) and Extended Function Data Register (EFDR). The EFIR is located at the same address as the EFER, and the EFDR is located at address (EFIR+1). First, write the Logical Device Number (i.e. 0x07) to the EFIR and then write the number of the desired Logical Device to the EFDR. If accessing the Chip (Global) Control Registers, this step is not required. Secondly, write the address of the desired configuration register within the Logical Device to the EFIR and then write (or read) the desired configuration register through the EFDR.

(3) Exit the extended function mode

To exit the Extended Function Mode, writing 0xAA to the EFER is required. Once SuperIO exits the Extended Function Mode, it goes back to the normal running mode.

Code Example for Watchdog Timer

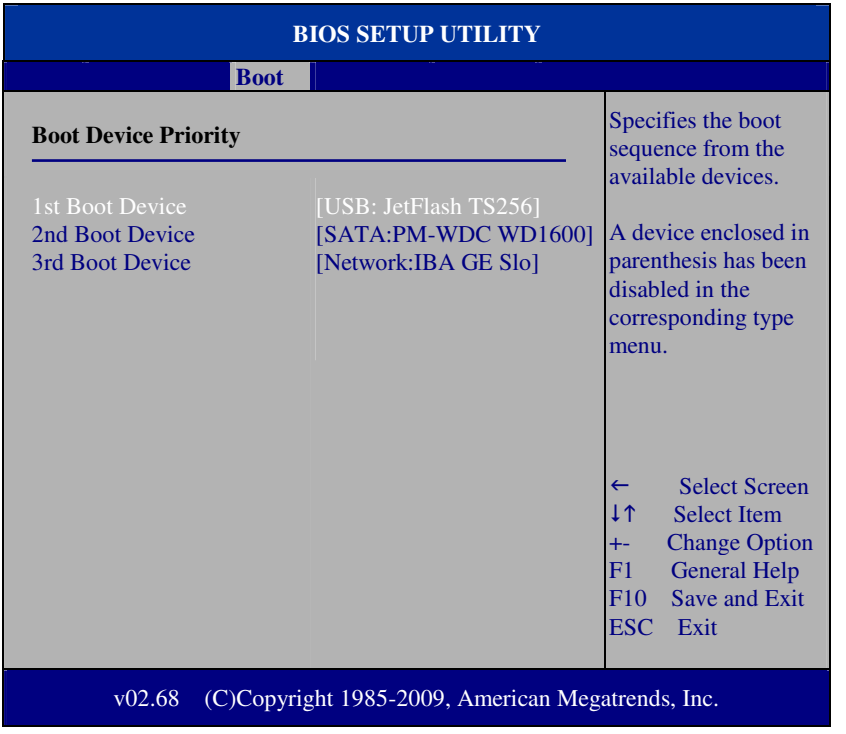
Enable watchdog timer and set timeout interval to 30 seconds.

```
;------ Enter to extended function mode ------------------------------------------------------
mov     dx,     2Eh
mov     al,     87h
out     dx,     al
out     dx,     al
;------ Select Logical Device 8 of watchdog timer ---------------------------------------
mov     al,     07h
out     dx,     al
inc     dx
mov     al,     08h
out     dx,     al
;------ Logic device activation for watch dog timer ---------------------------------------
dec     dx
mov     al,     030h
out     dx,     al
inc     dx
mov     al,     01h
out     dx,     al
;------ Set second as counting unit ------------------------------------------------------
dec     dx
mov     al,     0F5h
out     dx,     al
inc     dx
in      al,     dx
and     al,     not 08h
out     dx,     al
;------ Set timeout interval as 30seconds and start counting ----------------------------
dec     dx
mov     al,     0F6h
out     dx,     al
inc     dx
mov     al,     30
out     dx,     al
;------ Exit the extended function mode ------------------------------------------------
dec     dx
mov     al,     0AAh
out     dx,     al
```

Flash BIOS Update

I. Before System BIOS Update

1. Prepare a bootable media (ex. USB storage device) which can boot system to DOS prompt.
2. Get flash utility (AFUDOS.exe) and BIOS file (ex. 89602P03.BIN) from CD then save them to a bootable device.
3. Make sure the target system can first boot to the bootable device.
   (1) Connect the bootable USB device.
   (2) Turn on the system and press <Del> key during BIOS POST procedure.
   (3) System will go into the BIOS setup menu.
   (4) Select [Boot] menu.
   (5) Select [Boot Devices Priority] sub-menu, set the USB bootable device to be the 1st boot device.
   (6) Press <F10> key to save configuration and exit the BIOS setup menu.



II. AFUDOS Command for System BIOS Update

AFUDOS.exe is the AMI firmware update utility; the command line is shown as below:

AFUDOS <ROM File Name> [option1] [option2]….

User can type "AFUDOS/?" to see all the definition of each control options. The recommended options for BIOS ROM update include following parameters:

/P: Program main BIOS image.
/B: Program Boot Block.
/N: Program NVRAM.
/C: Destroy CMOS checksum.
/X: Don't check ROM ID.

III. BIOS Update Procedure

1. Use the bootable USB storage to boot up system into the DOS command prompt.
2. Type "**AFUDOS 8960xxxx.BIN /p /b /n /c /x** " and press enter to start the flash procedure.
   (Note that xxxx means the BIOS revision part, ex. 2P01…)
3. During the update procedure, you will see the BIOS update process status and its percentage. Beware! Do not turn off system power or reset your computer if the whole procedure are not complete yet, or it may crash the BIOS ROM and make system unable to boot up next time.
4. After BIOS update procedures is complete, the messages should be like the figure shown below.

```
A:\AFUDOS>AFUDOS 89602P03.BIN /P /B /N /C /X
 +-------------------------------------------------------------------------+
 |                    AMI Firmware Update Utility  v4.38                   |
 |      Copyright (C)2010 American Megatrends Inc. All Rights Reserved.    |
 +-------------------------------------------------------------------------+
- Bootblock checksum .... ok
- Module checksums ..... ok
- Erasing flash ......... done
- Writing flash ......... done
- Verifying flash ....... done
- Erasing NVRAM ......... done
- Writing NVRAM ......... done
- Verifying NVRAM ....... done
- Erasing Bootblock ..... done
- Writing Bootblock ..... done
- Verifying Bootblock ... done
- CMOS checksum destroyed
- Program ended normally.
```

5. User can restart the system and boot up with new BIOS now.