USER'S MANUAL

PMB-897LF

Intel® 3rd Gen. Core™ i7/i5/i3 & Pentium® Embedded Board With DIMM/Sound/2 LAN

PMB-897LF M1

PMB-897LF Intel® Core™ i7/i5/i3 & Pentium®
Embedded Board
With DIMM/Sound/2LAN

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DISCLAIMER

This operation manual is meant to assist both Embedded Computer manufacturers and end users in installing and setting up the system. The information contained in this document is subject to change without any notice.

CE NOTICE

This is a class A 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 A 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.

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INTRODUCTION

CHAPTER

1

This chapter gives you the information for PMB-897LF. It also outlines the system specifications.

Sections included:

- About This Manual
- System Specifications
- Safety Precautions

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

1-1. ABOUT THIS MANUAL

Thank you for purchasing our PMB-897LF Intel® Core™ i7/i5/i3 & Pentium® Embedded Board enhanced with DIMM/Audio/2LAN, which is fully PC / AT compatible. The PMB-897LF provides faster processing speed, greater expandability and can handle more tasks 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, and the specifications for this system. The final page of this chapter will indicate how to avoid damaging this board.

Chapter 2 Hardware Configuration

This chapter outlines the component locations 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 VGA utility, LAN utility, Sound utility, and Flash BIOS Update. It also describes the Watchdog-timer configuration.

Chapter 4 Award BIOS Setup

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

Appendix A Expansion Bus

This appendix introduces you the expansion bus for mini PCI-e connector.

Appendix B Technical Summary

This appendix gives you the information about the Technical maps.

1-2. SYSTEM SPECIFICATIONS

System

CPU	▪ Intel® Core™ i3-3220 Processor (3.3GHz, 3MB L3 cache), 95W ▪ Intel® Core™ i5-3550S Processor (3.0GHz, 6MB L3 cache), 65W ▪ Intel® Core™ i7-3770 Processor (3.4GHz, 8MB L3 cache), 65W ▪ Intel® Pentium® Processor G2120 (3.1GHz, 3MB L3 cache), 65W
Chipset	Intel® Q77
SIO	Winbond W83627UHG
Memory	▪ 2×240-pin DIMM ▪ Dual channel DDR3-1333/1600MHz up to 16GB
Power Supply	▪ ATX/ 12V & 5VSB, 24-pin connector ▪ 4-pin connector for CPU
Operation System	▪ Windows 7/XP SP3 ▪ WES 7/2009 ▪ POSReady 7/2009 ▪ Windows 2008 Server (Optional)
RAID Function	RAID 0, 1, 5
Speaker	Internal buzzer
LED Indicator	HDD LED & Power LED
BIOS	AMI
Watchdog	1~255 sec.
Hardware Monitor	Voltage, CPU temperature & cooling fan (CPU, System), smart FAN support, 4 pin pinheader
Dimension	170mm x 170mm (6.69” x 6.69”)
Certificate	FCC/CE

I/O Ports

Serial Port	2 ports for RS232 only, D-sub
USB	▪ 4 x USB 2.0 ▪ 4 x USB 3.0
SATA	▪ 1 x SATAII ▪ 2 x SATAIII
Keyboard/Mouse	PS/2
LAN	Dual Ports to support 10/100/1000Mbps, RJ45 ▪ LAN1: Intel® 82579V ▪ LAN2: Intel® 82583V
Sound	▪ Realtek ALC888S, high definition audio ▪ Triple Stack Audio Jack
Display	▪ 2 x DVI (1 x DVI-I & 1 x DVI-D) ▪ 1 x DP connector
Expansion slot	▪ 1 x PCIe x16 ▪ 1 x Mini-PCIe (with mSATA & USB signal)

Environment

Operation Temp.	0 ~ 60°C (32 ~ 140°F)
Storage Temp.	-40 ~ 80°C (-40 ~ 176°F)
Shock	15G peak–to-peak , 11ms duration, non-operation
Vibration	Non-operation: 2G, 5-200Hz,

1-3. SAFETY PRECAUTIONS

Follow the messages below to avoid your systems from damage:

1. Keep your system away from static electricity on all occasions.

2. Prevent electric shock. Don‘t touch any components of this card when the card is power-on. Always disconnect power when the system is not in use.

3. Disconnect power when you change any hardware devices.
   For instance, when you connect a jumper or install any cards, a surge of power may damage the electronic components or the whole system.

HARDWARE CONFIGURATION

CHAPTER

2

** *QUICK START* **

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

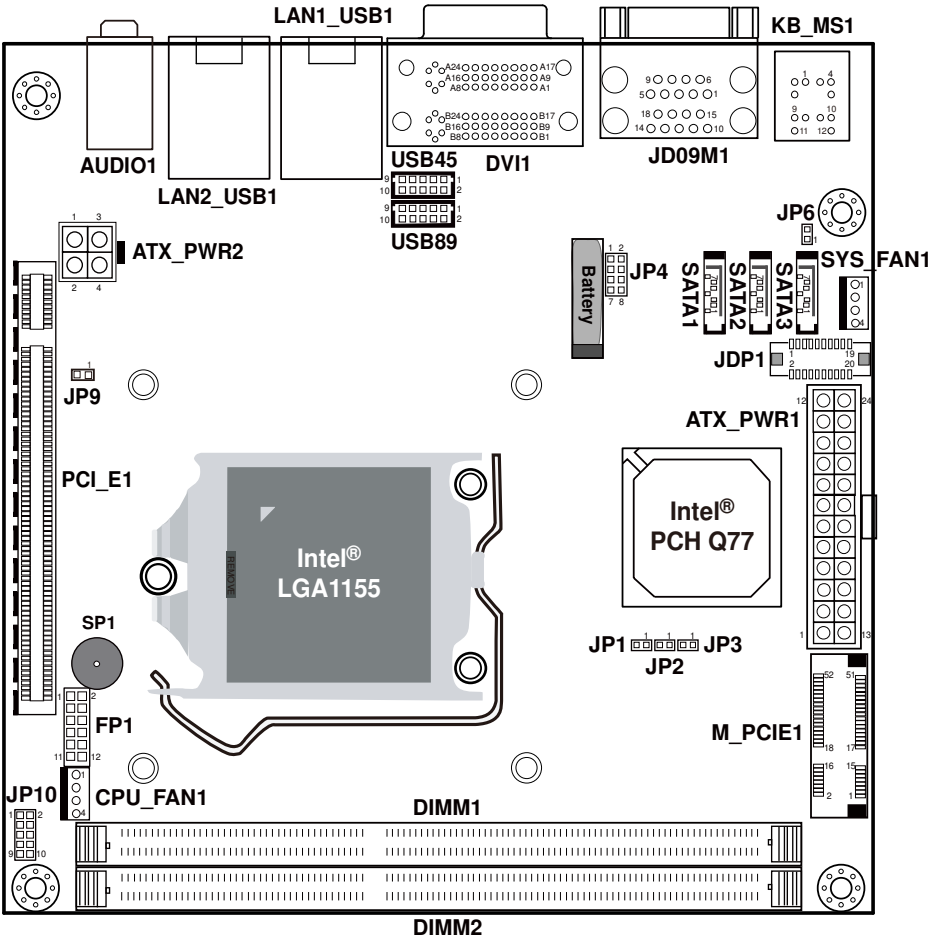
Sections included:

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

2-1. JUMPER & CONNECTOR QUICK REFERENCE TABLE

JUMPER / CONNECTOR	NAME
COM Port Connector	COM1, COM2
CPU Selection	JP9
Keyboard & Mouse Connector	KB_MS1
Reset Connector	FP1 (5, 7)
Hard Disk Drive LED Connector	FP1 (1, 3)
ATX Power Button	FP1 (9, 11)
External Speaker Connector	FP1 (6, 8, 10, 12)
PLED Connector	FP1 (2, 4)
Clear CMOS Data Selection	JP2
CPU Fan Connector	CPU_FAN1
System Fan Connector	SYS_FAN1
Serial ATA Connector	SATA1, SATA2, SATA3
Universal Serial Bus Connector	USB45, USB89
USB & LAN Connector	LAN1_USB1, LAN2_USB1
Display Port Connector	JDP1
ATX Power Connector	ATX_PWR1, ATX_PWR2
Sound Connector	AUDIO1
DVI-I & DVI-D Connector	DVI1

2-2. COMPONENT LOCATIONS



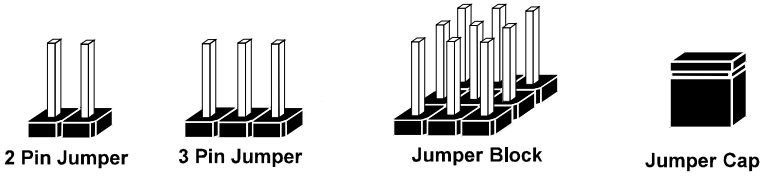
PMB-897LF Front Connector, Jumper and Component locations

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.

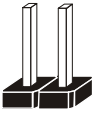
JUMPERS AND CAPS



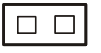
If a jumper has three pins (for examples, labelled PIN1, PIN2, and PIN3), You can connect PIN1 & PIN2 to create one setting by shorting. You can either connect PIN2 & PIN3 to create another setting. The same jumper diagrams are applied all through this manual. The figure below shows what the manual diagrams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

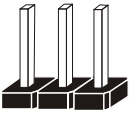
JUMPER DIAGRAMS

Jumper Cap looks like this



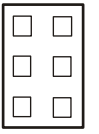
2 pin Jumper looks like this





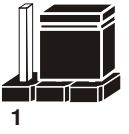
3 pin Jumper looks like this

Jumper Block looks like this



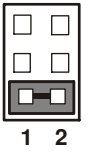
JUMPER SETTINGS

2 pin Jumper close(enabled) Looks like this



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

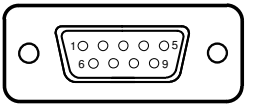
Jumper Block 1-2 pin close(enabled) Looks like this



2-4. COM PORT CONNECTOR

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

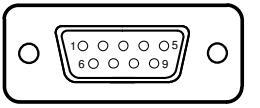
PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	COM1_DCD#	6	COM1_DSR#
2	COM1_RX	7	COM1_RTS#
3	COM1_TX	8	COM1_CTS#
4	COM1_DTR#	9	COM1_RI#
5	GND		



COM1

COM2: COM2 Connector
COM2 Is fixed as RS-232.
The pin assignments are as follows:

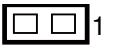
PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	COM2_DCD#	6	COM2_DSR#
2	COM2_RX	7	COM2_RTS#
3	COM2_TX	8	COM2_CTS#
4	COM2_DTR#	9	COM2_RI#
5	GND		



COM2

2-5. CPU SELECTION

JP9: CPU selection
The selections are as follows:

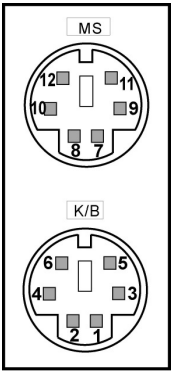
SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
Intel® 3rd Gen. Core™	1-2	 JP9
Intel® 2nd Gen. Core™	open	 JP9

Note: Manufacturing default – Intel® 3rd Gen. Core™

2-6. KEYBOARD & MOUSE CONNECTOR

KB_MS1: Keyboard and PS/2 Mouse Connector
The pin assignments are as follows:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	KBDATA	7	MSDATA
2	NC	8	NC
3	GND	9	GND
4	VCC5	10	VCC5
5	KBCLK	11	MSCLK
6	NC	12	NC

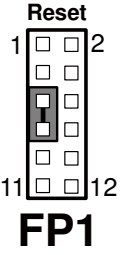


KB_MS1

2-7. RESET CONNECTOR

FP1 (5, 7): Reset Connector
The pin assignments are as follows:

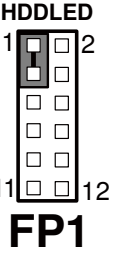
PIN	ASSIGNMENT
5	GND
7	RST_BTN



2-8. HARD DISK DRIVE LED CONNECTOR

FP1 (1, 3): Hard Disk Driver LED Connector
The pin assignments are as follows:

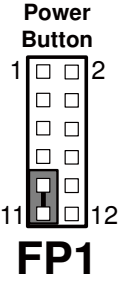
PIN	ASSIGNMENT
1	HD_LED+
3	HD_LED-



2-9. ATX POWER BUTTON

FP1 (9, 11): ATX Power Button
The pin assignments are as follows:

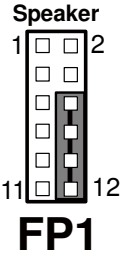
PIN	ASSIGNMENT
9	PWRBTNSW
11	GND



2-10. EXTERNAL SPEAKER CONNECTOR

FP1 (6, 8, 10, 12): ATX Power Button
The pin assignments are as follows:

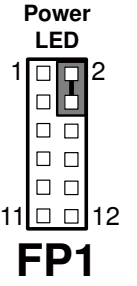
PIN	ASSIGNMENT
6	SPK_VCC
8	SPEAKER SIGNAL
10	SPEAKER SIGNAL
12	SPEAKER SIGNAL



2-11. PLED CONNECTOR

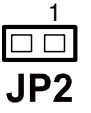
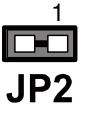
FP1 (2, 4): PLED Power Button
The pin assignments are as follows:

PIN	ASSIGNMENT
2	PW_LED+
4	PW_LED-



2-12. CLEAR CMOS DATA SELECTION

JP2: Clear CMOS Data Selection
The pin assignments are as follows:

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
Normal	Open	
Clear CMOS*	Close	

Note: Manufacturing default – Normal

*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.

2-13. CPU FAN CONNECTOR

CPY_FAN1: CPU Fan Connector
The pin assignments are as follows:

PIN	ASSIGNMENT
1	GND
2	VCC12
3	CPUFAN_TAC1
4	CPUFAN_CTL1

CPU_FAN1

2-14. SYSTEM FAN CONNECTOR

SYS_FAN1: System Fan Connector
The pin assignments are as follows:

PIN	ASSIGNMENT
1	GND
2	VCC12
3	SYSFAN_TAC1
4	SYSFAN_CTL1

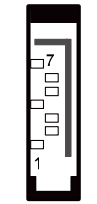
SYS_FAN1

2-15. SERIAL ATA CONNECTOR

SATA1, SATA2, SATA3: Three Serial ATA Connectors
The pin assignments are as follows:

SATA1:

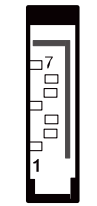
PIN	ASSIGNMENT
1	GND
2	SATA_TXPC0
3	SATA_TXNC0
4	GND
5	SATA_RXNC0
6	SATA_RXPC0
7	GND



SATA1

SATA2:

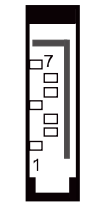
PIN	ASSIGNMENT
1	GND
2	SATA_TXPC1
3	SATA_TXNC1
4	GND
5	SATA_RXNC1
6	SATA_RXPC1
7	GND



SATA2

SATA3:

PIN	ASSIGNMENT
1	GND
2	SATA_TXPC4
3	SATA_TXNC4
4	GND
5	SATA_RXNC4
6	SATA_RXPC4
7	GND



SATA3

2-16. UNIVERSAL SERIAL BUS CONNECTOR

USB45: USB Connector

The pin assignments are as follows:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	USB_45_VCC5	6	USBP5
2	USB_45_VCC5	7	GND
3	USBN4	8	GND
4	USBN5	9	GND
5	USBP4	10	GND

USB45

USB89: USB Connector

The pin assignments are as follows:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	USB_89_VCC5	6	USBP9
2	USB_89_VCC5	7	GND
3	USBN8	8	GND
4	USBN9	9	GND
5	USBP8	10	GND

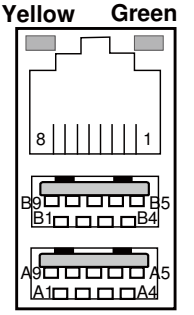
USB89

2-17. USB & LAN CONNECTOR

LAN1_USB1: USB & LAN Connector
The pin assignments are as follows:

LAN Signal:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	LAN1_MDI_0P	5	LAN1_MDI_2P
2	LAN1_MDI_0N	6	LAN1_MDI_2N
3	LAN1_MDI_1P	7	LAN1_MDI_3P
4	LAN1_MDI_1N	8	LAN1_MDI_3N



LAN1_USB1

LAN LED Indicator:

Left Side LED

RED Color On	Giga LAN Speed Indicator
Off	No LAN switch/ hub connected.

Right Side LED

Orange Color Blinking	LAN Message Active
Off	No LAN Message Active

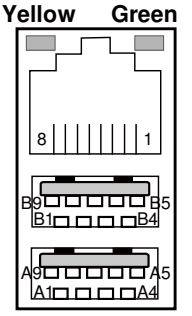
USB Signal:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
A1	VCCUSB1	B1	VCCUSB1
A2	USBP0N	B2	USBP1N
A3	USBP0P	B3	USBP1P
A4	GND	B4	GND
A5	USB3_RX1_DN	B5	USB3_RX2_DN
A6	USB3_RX1_DP	B6	USB3_RX2_DP
A7	GND	B7	GND
A8	USB3_TX1_DN	B8	USB3_TX2_DN
A9	USB3_TX1_DP	B9	USB3_TX2_DP

LAN2_USB1: USB & LAN Connector
The pin assignments are as follows:

LAN Signal:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	LAN2_MDI_0P	5	LAN2_MDI_2P
2	LAN2_MDI_0N	6	LAN2_MDI_2N
3	LAN2_MDI_1P	7	LAN2_MDI_3P
4	LAN2_MDI_1N	8	LAN2_MDI_3N



LAN2_USB1

LAN LED Indicator:
Left Side LED

RED Color On	Giga LAN Speed Indicator
Off	No LAN switch/ hub connected.

Right Side LED

Orange Color Blinking	LAN Message Active
Off	No LAN Message Active

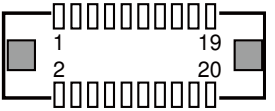
USB Signal:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
A1	VCCUSB2	B1	VCCUSB2
A2	USBP2N	B2	USBP3N
A3	USBP2P	B3	USBP3P
A4	GND	B4	GND
A5	USB3_RX3_DN	B5	USB3_RX4_DN
A6	USB3_RX3_DP	B6	USB3_RX4_DP
A7	GND	B7	GND
A8	USB3_TX3_DN	B8	USB3_TX4_DN
A9	USB3_TX3_DP	B9	USB3_TX4_DP

2-18. DISPLAY PORT CONNECTOR

JDP1 Display Port Connector
The pin assignments are as follows:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	DP_C_DATA0+	11	GND
2	GND	12	DP_C_DATA3-
3	DP_C_DATA0-	13	DP_C_AUX_ENJ
4	DP_C_DATA1+	14	GND
5	GND	15	DP_C_AUX+
6	DP_C_DATA1-	16	DP_C_HPD
7	DP_C_DATA2+	17	DP_C_AUX-
8	GND	18	DP_VCC3_3
9	DP_C_DATA2-	19	DP_VCC5
10	DP_C_DATA3+	20	DP_VCC3_3

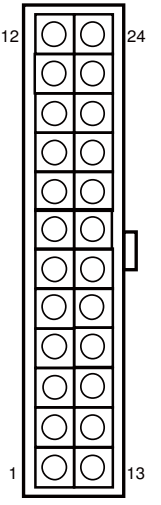


JDP1

2-19. ATX POWER CONNECTOR

ATX_PWR1: ATX Power Connector
The pin assignments are as follows:

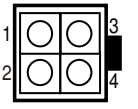
PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PSON
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	POK	20	-5V
9	5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	GND



ATX_PWR1

ATX_PWR2: ATX Power Connector
The pin assignments are as follows:

PIN	ASSIGNMENT
1	GND
2	GND
3	+12V
4	+12V



ATX_PWR2

2-20. SOUND CONNECTOR

AUDIO1: Sound Connector, including Line-In, Line-Out & Mic. ,Also can support only MIC connector.

The pin assignments are as follows:

Line-In

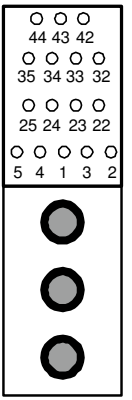
PIN	ASSIGNMENT
32	HD_LINE-L
33	GND
34	GND
35	HD_LINE-R

Line-Out

PIN	ASSIGNMENT
22	HD_OUT-L
23	NC
24	NC
25	HD_OUT-R

MIC-In

PIN	ASSIGNMENT
1	GND
2	HD_MIC1
3	HD_MIC_GND
4	NC
5	HD_MIC_VCC



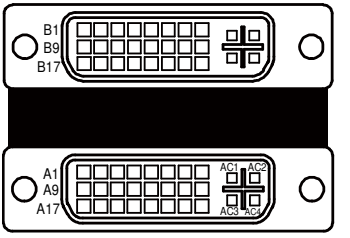
AUDIO1

2-21. DVI-I & DVI-D CONNECTOR

DVI1: DVI-I & DVI-D Connector

The pin assignments are as follows:

PIN	ASSIGNMENT
AC1	CRT_RED
AC2	CRT_GREEN
AC3	CRT_BLUE
AC4	CRT_HSYNC
A1 / B1	DP_Data2-
A2 / B2	DP_Data2+
A3 / B3	GND
A4 / B4	NC
A5 / B5	NC
A6 / B6	DP_Ctrl_Clock
A7 / B7	DP_Ctrl_ Data
A8 / B8	CRT_VSYNC
A9 / B9	DP_Data1-
A10 / B10	DP_Data1+
A11 / B11	GND
A12 / B12	NC
A13 / B13	NC
A14 / B14	+5V Power
A15 / B15	GND
A16 / B16	HOT Plug Detect
A17 / B17	DP_Data0-
A18 / B18	DP_Data0+
A19 / B19	GND
A20 / B20	NC
A21 / B21	NC
A22 / B22	GND
A23 / B23	DP_Clock+
A24 / B24	DP_Clock-



DVI1

SOFTWARE UTILITIES

CHAPTER

3

This chapter comprises the detailed information of VGA driver, LAN driver, and Sound driver.

Sections included:

- Introduction.
- Intel® Chipset Software Installation Utility
- VGA Driver Utility
- LAN Driver Utility
- Sound Driver Utility

3-1. INTRODUCTION

Enclosed with our PMB-897LF package are our driver utilities, which come in a format of CD ROM or floppy disk. Refer to the following table for driver locations:

FILENAME (Assume that CD ROM drive is D:)	**PURPOSE**
D:\Driver\FLASH	For BIOS update utility
D:\Driver\ME	For Intel® Management Engine Interface
D:\Driver\UTILITY	Intel® Chipset Device Software Installation Utility
D:\Driver\VGA	Intel® HD Graphics Family for VGA driver installation
D:\Driver\LAN	Intel® 82579LM & 82583V For LAN driver installation
D:\Driver\SOUND	Realtek ALC888S for Sound driver installation
D:\Driver\Intel® Rapid Storage	Intel® Matrix Storage Manager Utility.
D:\Driver\F6Floppy	Intel® F6 Floppy Utility.
D:\Driver\USB3.0	Intel® USB 3.0 eXtensible Host Controller

Note: Be sure 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, and this package contains the drivers for all the interfaces such as USB, SATA, I2C, SPI of the Intel® Platform Controller Hub EG20T with information about a piece of hardware on the 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:

- DMA Support
- GPIO Support
- I2C Support
- Packet HUB Support
- Serial Peripheral Interface (SPI) Support
- PCIe Support
- IDE/ATA33/ATA66/ATA100 Storage Support
- SATA Storage Support
- USB Support

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

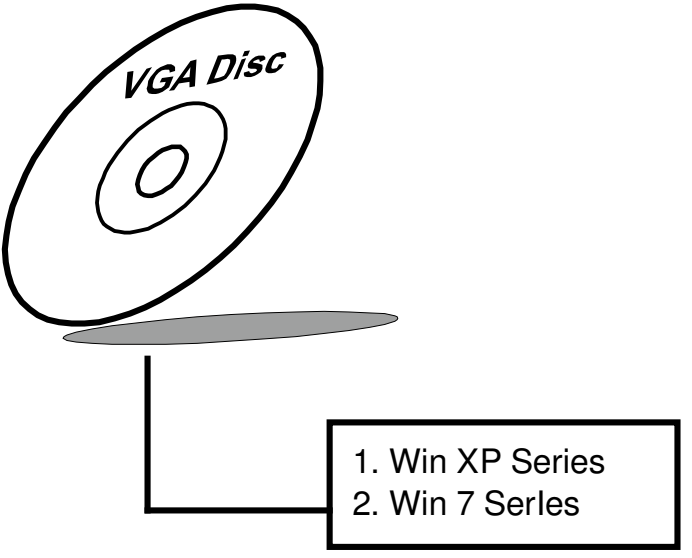
The Utility Pack is to be installed only for Windows XP/7 series, and it should be installed right after the OS installation. Please follow the steps below:

1. Insert the driver disk into a CD ROM device.
2. Under Windows system, go to the directory where the Utility driver is located.
3. Run the application with administrative privileges.

3-3. VGA DRIVER UTILITY

3-3-1. Introduction

The VGA interface embedded with our PMB-897LF can support a wide range of display. You can display CRT, LVDS simultaneously with the same mode.



3-3-2. Installation of VGA Driver

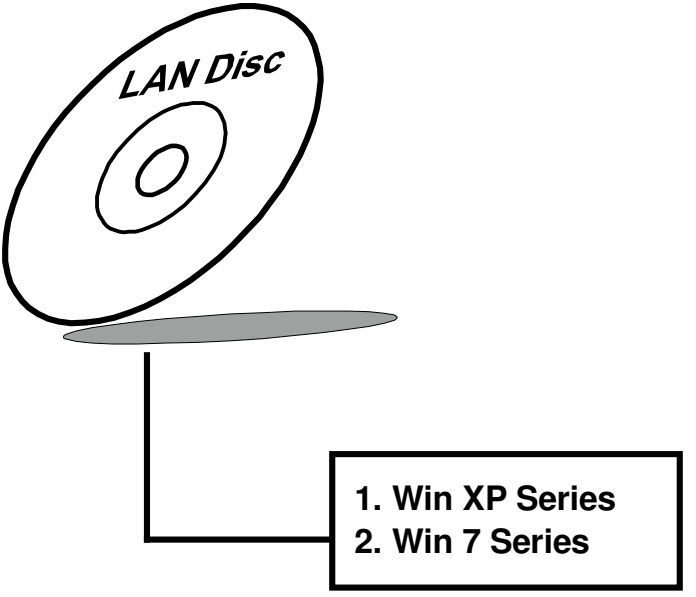
To install the VGA Driver, simply follow the following steps:

1. Insert the driver disk into a CD ROM device.
2. Under Windows system, go to the directory where the VGA driver is located.
3. Run the application with administrative privileges..

3-4. LAN DRIVER UTILITY

3-4-1. Introduction

PMB-897LF is enhanced with LAN function that can support various network adapters. Installation programs for LAN drivers are listed as follows:

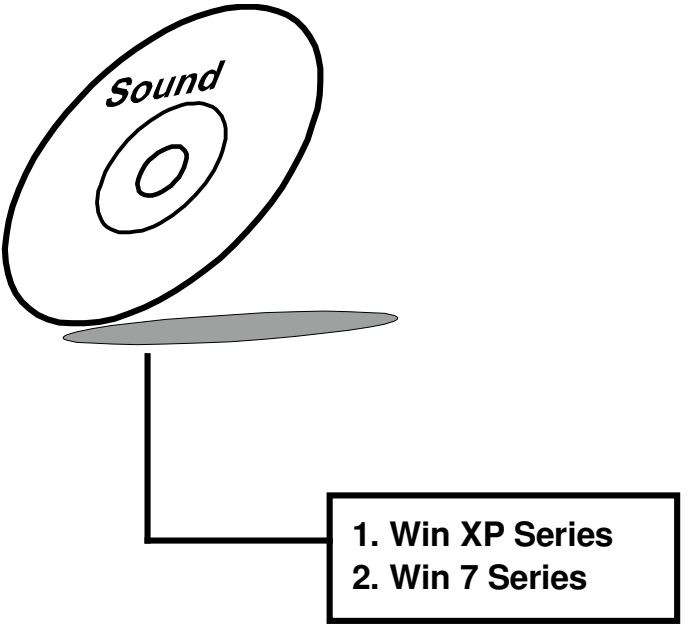


For more details on Installation procedure, please refer to Readme.txt file found on LAN Driver Utility.

3-5. SOUND DRIVER UTILITY

3-5-1. Introduction

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



3-5-2. Installation of Sound Driver

1. Insert the driver disk into a CD ROM device.
2. Under Windows system, go to the directory where the Sound driver is located.
3. Run the application with administrative privileges..
4. Follow the instructions on the screen to complete the installation.
5. Once the installation is completed, shut down the system and restart in order for the changes to take effect.

AMI BIOS SETUP

CHAPTER

4

This chapter shows how to set up the AMI BIOS.

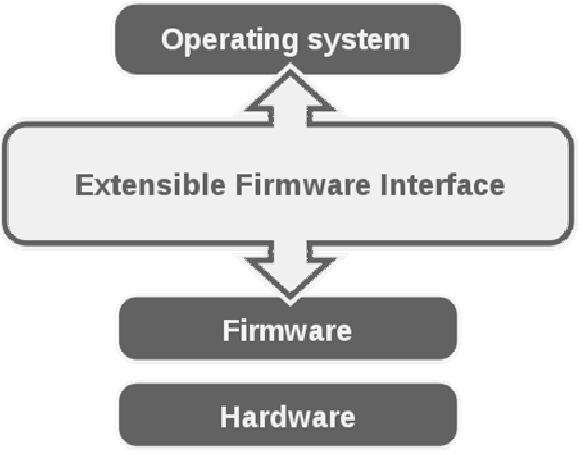
Sections included:

- Introduction
- Entering Setup
- Main
- Advanced
- Chipset
- Boot
- Security
- Save & Exit

4-1. INTRODUCTION

The board BM-0897 uses an AMI Aptio BIOS that is stored in the Serial Peripheral Interface Flash Memory (SPI Flash) and can be updated. The SPI Flash contains the BIOS Setup program, Power-on Self-Test (POST), the PCI auto-configuration utility, LAN EEPROM information, and Plug and Play support.

Aptio is AMI's BIOS firmware based on the UEFI (Unified Extensible Firmware Interface) Specifications and the Intel Platform Innovation Framework for EFI. The UEFI specification defines an interface between an operating system and platform firmware. The interface consists of data tables that contain platform-related information, boot service calls, and runtime service calls that are available to the operating system and its loader. These provide standard environment for booting an operating system and running pre-boot applications. Following illustration shows Extensible Firmware Interface's position in the software stack.



EFI BIOS provides an user interface allow users the ability to modify hardware configuration, e.g. change system date and time, enable or disable a system component, decide bootable device priorities, setup personal password, etc., which is convenient for modifications and customization of the computer system and allows technicians another method for finding solutions if hardware has any problems.

The BIOS Setup program can be used to view and change the BIOS settings for the computer. The BIOS Setup program is accessed by pressing the <Del> or <F2> key after the POST memory test begins and before the operating system boot begins. The settings are shown below.

4-2. ENTERING SETUP

When the system is powered on, the BIOS will enter the Power-On Self Test (POST) routines and the following message will appear on the lower screen:

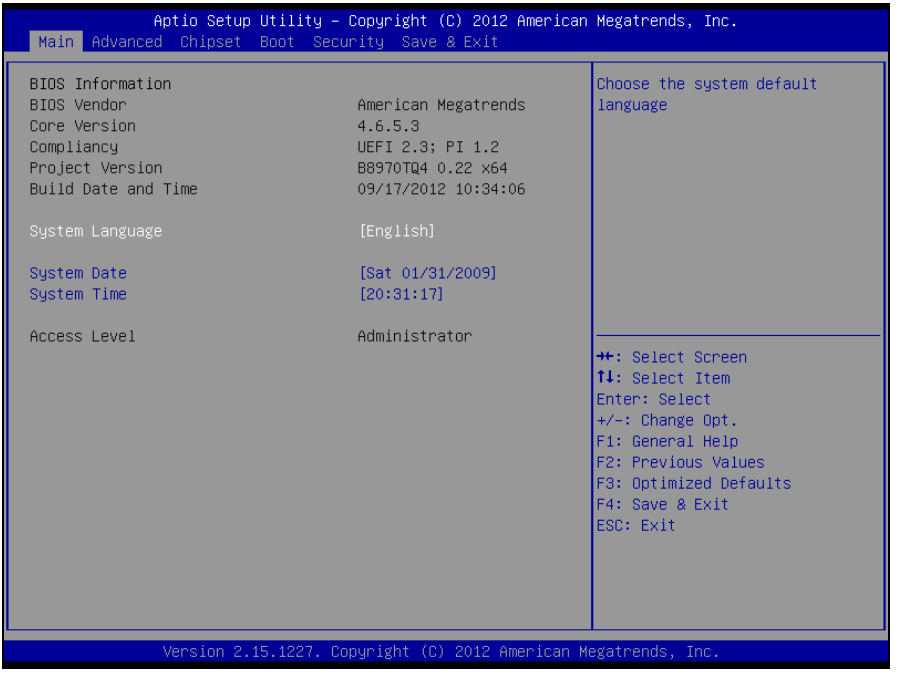
POST screen

As long as this message 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 access the Setup program. In a moment, the main menu of the Aptio Setup Utility will appear on the screen:

BIOS 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 bottom of the screen.

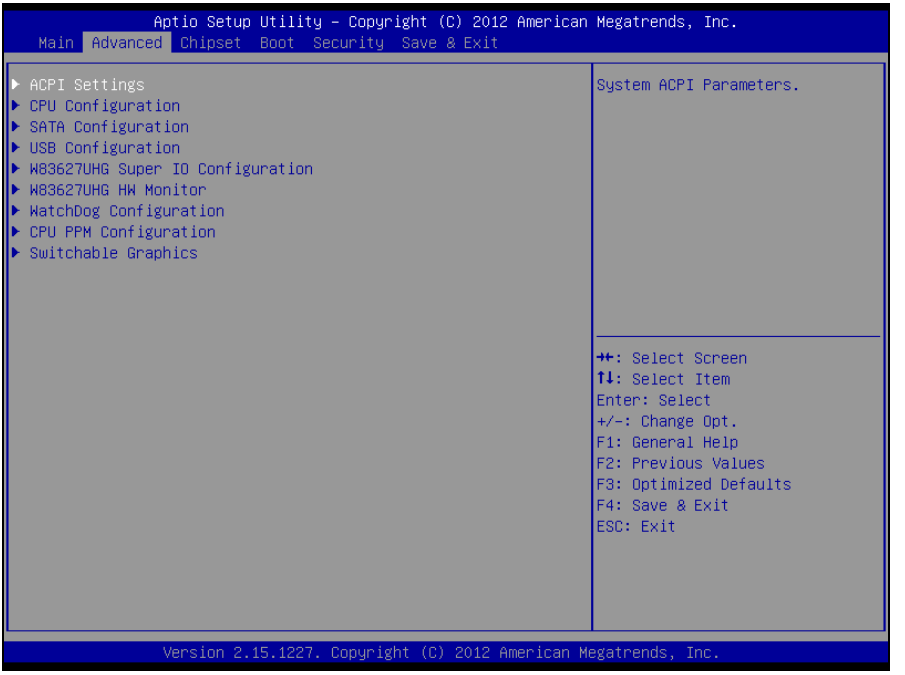
4-3. MAIN



Main screen

BIOS Setting	Options	Description/Purpose
BIOS Vendor	No changeable options	Displays the BIOS vendor.
Core Version	No changeable options	Displays the current BIOS core version.
Compliancy	No changeable options	Displays the current UEFI version.
Project Version	No changeable options	Displays the version of the BIOS currently installed on the platform.
Build Date and Time	No changeable options	Displays the date of current BIOS version.
System Date	Month, day, year	Specifies the current date.
System Time	Hour, minute, second	Specifies the current time.
Access Level	No changeable options	Displays the current user level.

4-4. ADVANCED

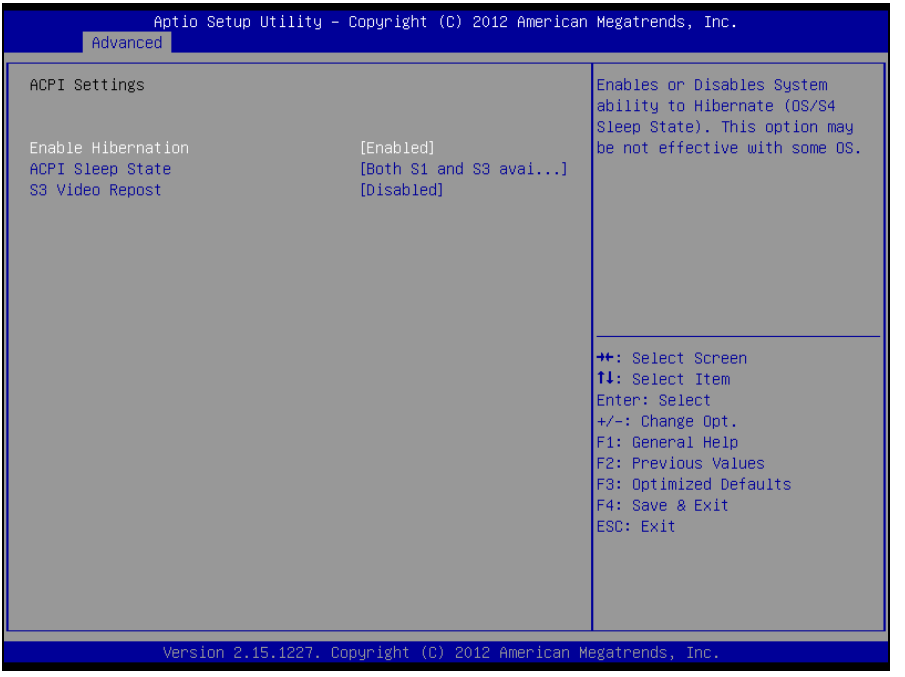


Advanced screen

BIOS Setting	Options	Description/Purpose
ACPI Settings	Sub-Menu	System ACPI Parameters.
CPU Configuration	Sub-Menu	CPU Configuration. Parameters.
SATA Configuration	Sub-Menu	SATA Configuration Parameters.
USB Configuration	Sub-Menu	USB Configuration Parameters.
W83627UHG Super IO Configuration	Sub-Menu	System Super IO Chip Parameters.
W83627UHG HW Monitor	Sub-Menu	Monitor hardware status
WatchDog Configuration	Sub-Menu	Set System WatchDog Parameters.

BIOS Setting	Options	Description/Purpose
CPU PPM Configuration	Sub-Menu	CPU PPM Configuration
Switchable Graphics	No changeable options	Switchable Graphics selections

4-4-1. ACPI SETTINGS

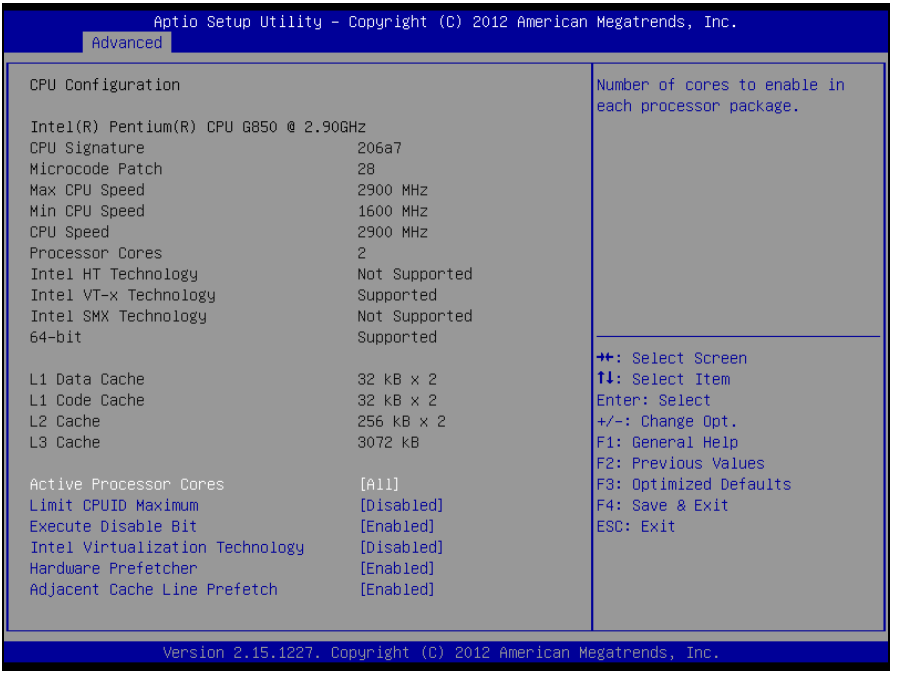


ACPI settings screen

BIOS Setting	Options	Description/Purpose
Enable Hibernation	- Disabled - Enabled	Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.
ACPI Sleep State	- Suspend Disabled - S1 (CPU Stop Clock) - S3 (Suspend to RAM) - Both S1 and S3 available for OS to choose from	Specifies the ACPI sleep state. **Suspend Disabled** disables ACPI sleep feature. **S1** mode allows the CPU enter Stop Clock mode to stop executing instructions. **S3** allows the platform to enter **Suspend to RAM mode.**

BIOS Setting	Options	Description/Purpose
		Both S1 and S3 available for OS to choose from allows the OS to choose the sleep state type.
S3 Video Repost	- Disabled - Enabled	Enable or Disable S3 video Repost

4-4-2. CPU CONFIGURATION

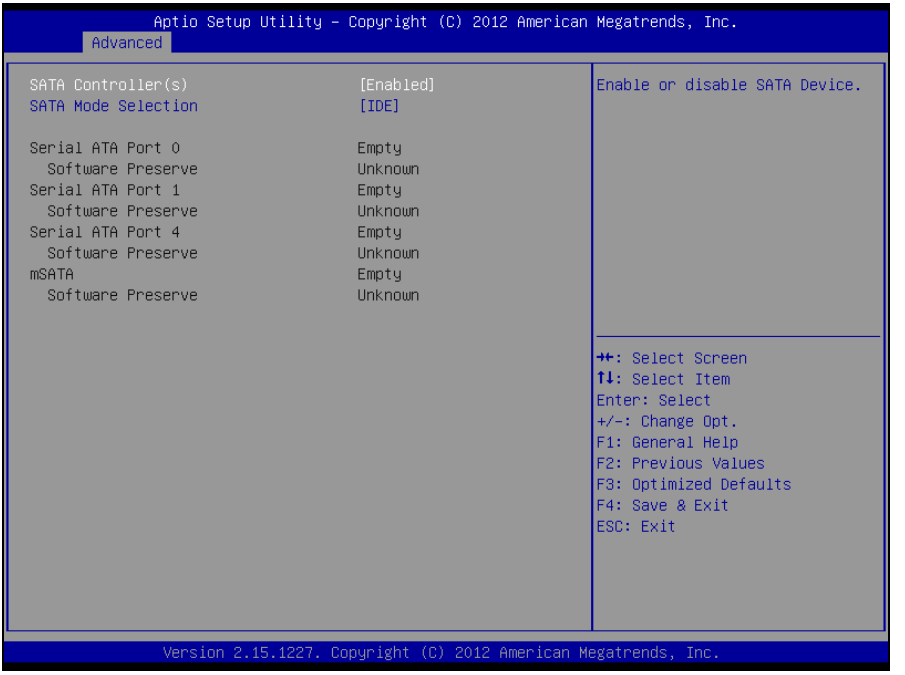


CPU configuration screen

BIOS Setting	Options	Description/Purpose
CPU Signature	No changeable options	Reports the CPU Signature
Microcode Patch	No changeable options	Reports the CPU Microcode Patch Version.
Max CPU Speed	No changeable options	Reports the Max CPU Speed.
Min CPU Speed	No changeable options	Reports the Min CPU Speed
Processor Cores	No changeable options	Displays number of physical cores in processor.
Intel HT Technology	No changeable options	Reports if Intel Hyper-Threading Technology is supported by processor

BIOS Setting	Options	Description/Purpose
Intel VT-x Technology	No changeable options	Reports if Intel VT-x Technology is supported by processor.
Intel SMX Technology	No changeable options	Reports if Intel SMX Technology is supported by processor.
L1 Data Cache	No changeable options	Displays size of L1 Data Cache
L1 Code Cache	No changeable options	Displays size of L1 Code Cache
L2 Cache	No changeable options	Displays size of L2 Cache.
L3 Cache	No changeable options	Displays size of L3 Cache.
Hyper-threading	- Disabled - Enabled	Enable or disable Hyper-Threading technology.
Active Processor Cores	- All - 1 - 2 - 3	Indicates the number of cores to enable in processor.
Limit CPUID Maximum	- Disabled - Enabled	Enables for legacy operating systems to boot processors with extended CPUID functions.
Execute Disable Bit	- Disabled - Enabled	XD can prevent certain classes of malicious buffer overflow attacks when combined with a supporting OS(Windows Server 2003 SP1 ,Windows XP Sp2, SuSE Linux 9.2, Redhat Enterprise 3 Update 3.)
Intel Virtualization Technology	-Disabled -Enabled	When enabled, a VMM can utilize the additional hardware capabilities provided by Vander pool Technology.
Hardware Prefetcher	-Disabled -Enabled	To turn on/off the Mid Level Cache (L2) streamer prefetcher.
Adjacent Cache Line Prefetch	-Disabled -Enabled	To Turn on/off prefetching of adjacent cache lines.

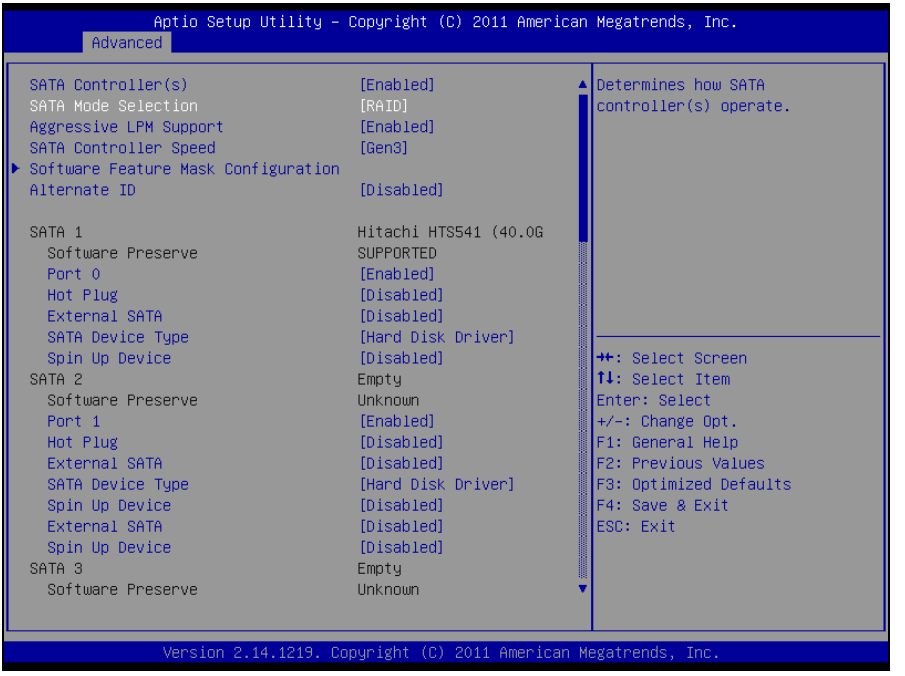
4-4-3. SATA CONFIGURATION



SATA Configuration screen

BIOS Setting	Options	Description/Purpose
SATA Controller(s)	- Disabled - Enabled	Enable or disable SATA Device.
SATA Mode Selection	- IDE - RAID	Configures SATA as IDE, AHCI or RAID mode.
SATA 0/1/4	[drive]	Displays the drive installed on this SATA port. Shows [Empty] if no drive is installed.
mSATA	[drive]	Displays the drive installed on this mSATA port. Shows [Empty] if no drive is installed. **Note:** Please configure the Mini PCI-E function as “mSATA” for this function.

Select [RAID] mode it have some more items as below:

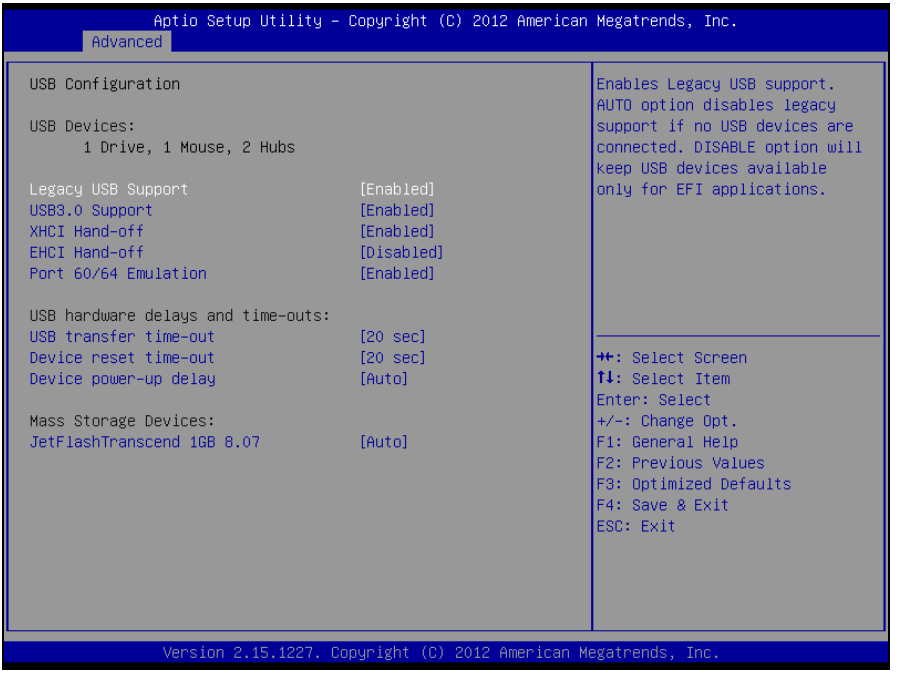


SATA mode selection screen

BIOS Setting	Options	Description/Purpose
Aggressive LPM Support	- Disabled - Enabled	Enable PCH to aggressively enter link power state.
SATA Controller Speed	- Gen1 - Gen2 - Gen3	Indicates the maximum speed the SATA controller can support.
Software Feature Mask Configuration	Sub-menu	RAID OROM/RST driver will refer to the SWFM configuration to enable or disable the storage features.
Alternate ID	- Disabled - Enabled	Report alternate Device ID

BIOS Setting	Options	Description/Purpose
Port 0/1/4/mSATA	- Disabled - Enabled	Enables or disable SATA port.
Hot Plug	- Disabled - Enabled	Designates this port as Hot Pluggable.
External SATA	- Disabled - Enabled	External SATA Support.
SATA Device Type	- Hard Disk Driver - Solid State Drive	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.
Spin Up Device	- Disabled - Enabled	On an edge detect from 0 to 1, the PCH starts a COMRESET initialization sequence to the device.

4-4-4. USB CONFIGURATION

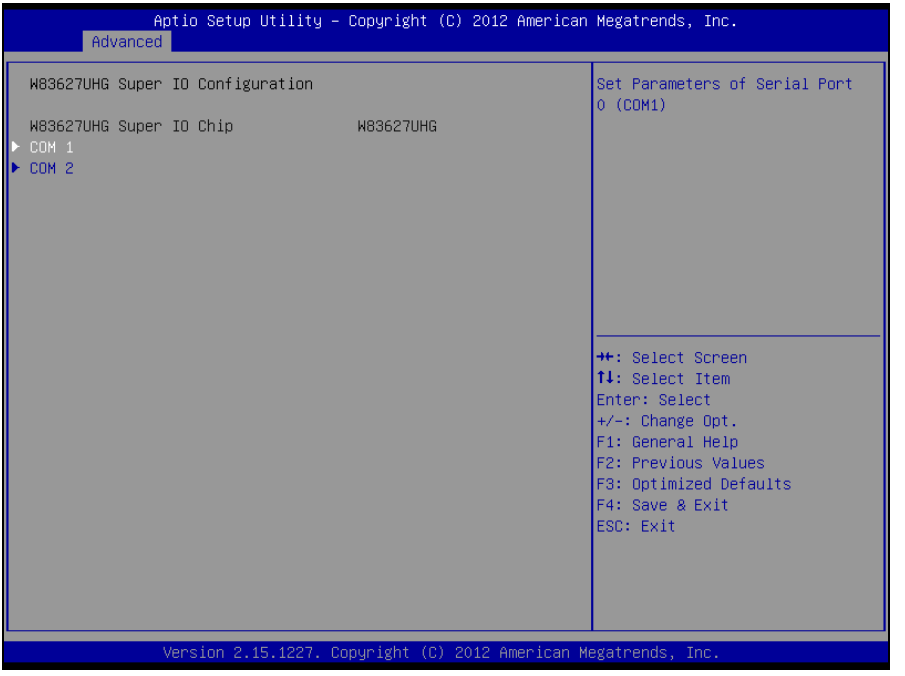


USB configuration screen

BIOS Setting	Options	Description/Purpose
USB Devices	No changeable options	Displays number of available USB devices.
Legacy USB Support	- Enabled - Disabled - Auto	Enables support for legacy USB.
USB 3.0 Support	- Enabled - Disabled	Enable/Disable USB3.0 (XHCI) controller support.
XHCI Hand-off	- Disabled - Enabled	This is a workaround for OSes without XHCI hand-off support.
EHCI Hand-off	- Disabled - Enabled	This is a workaround for OSes w/o EHCI hand-off support.

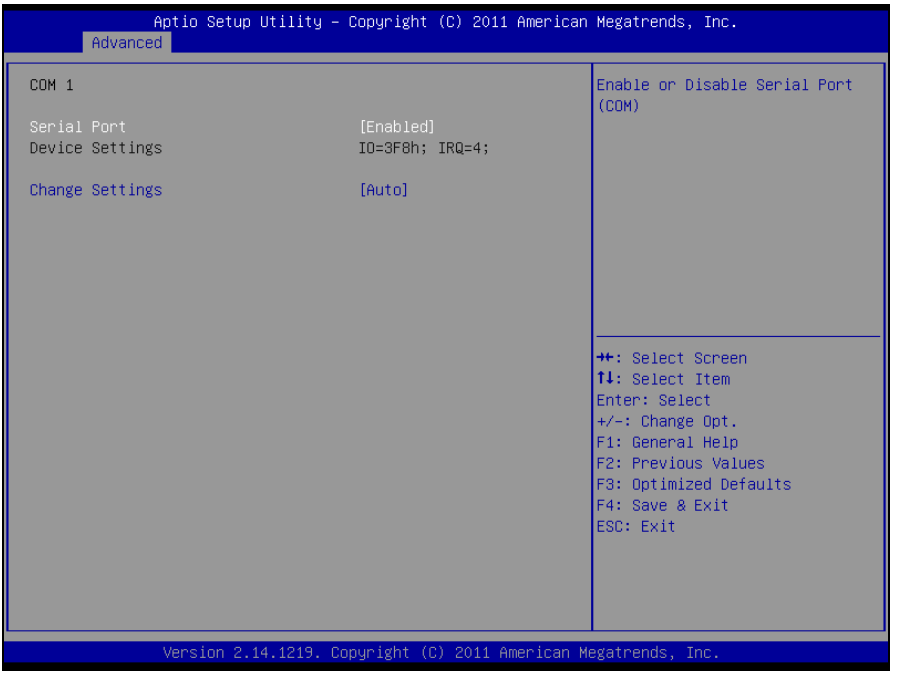
BIOS Setting	Options	Description/Purpose
Port 60/64 Emulation	- Disabled - Enabled	Enables I/O port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-USB aware OSes.
USB transfer time-out	1/5/10/20 sec	The time-out value for Control, Bulk, and Interrupt transfers.
Device reset time-out	10/20/30/40 sec	USB mass storage device Start Unit command time-out.
Device power-up delay	- Auto - Manual	Maximum time the device will take before it properly reports itself to the Host Controller. 'Auto' uses default value: for a Root port it is 100 ms, for a Hub port the delay is taken from Hub descriptor.

4-4-5. W83627UHG SUPER IO ONFIGURATION



W83627UHG Super IO Configuration screen

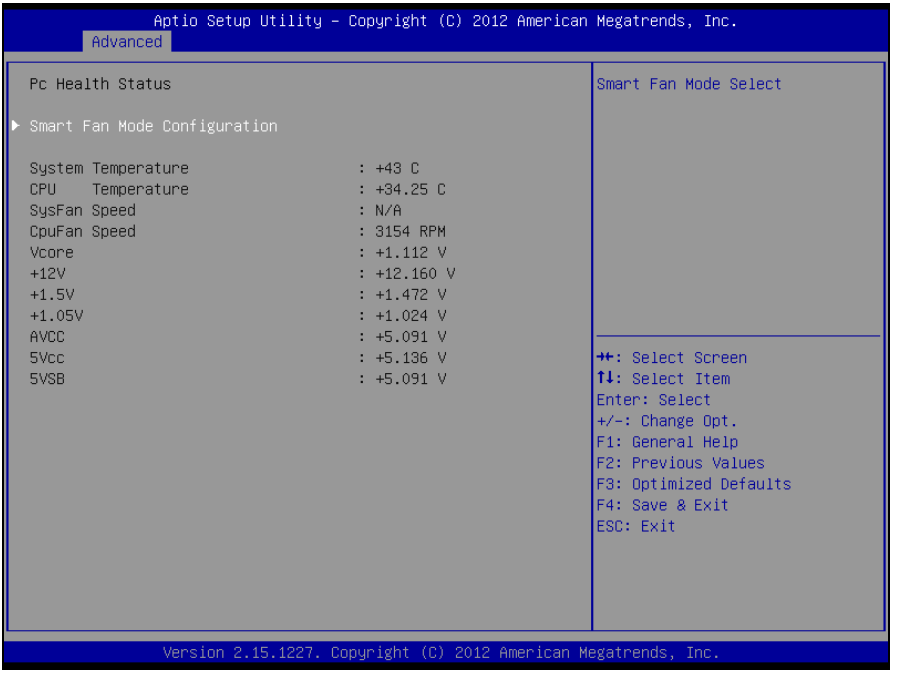
BIOS Setting	Options	Description/Purpose
W83627UHG Super IO Chip	No changeable options	Displays the super IO chip model and its manufacturer.
COM 1/2	Sub-menu	Set Parameters for COM 1/2



Serial Port 1/2 Configuration screen

BIOS Setting	Options	Description/Purpose
Serial Port	- Disabled - Enabled	Enable/Disable COM 1.
Device Settings	No changeable options	Reports the current COM 1 setting.
Change Settings	- Auto - IO=3F8h; IRQ=4 - IO=3F8h; IRQ=3,4,5,6,7,10,11,12 - IO=2F8h; IRQ=3,4,5,6,7,10,11,12 - IO=3E8h; IRQ=3,4,5,6,7,10,11,12 - IO=2E8h; IRQ=3,4,5,6,7,10,11,12	Specifies the base I/O address and interrupt request for the serial port 0 if enabled.

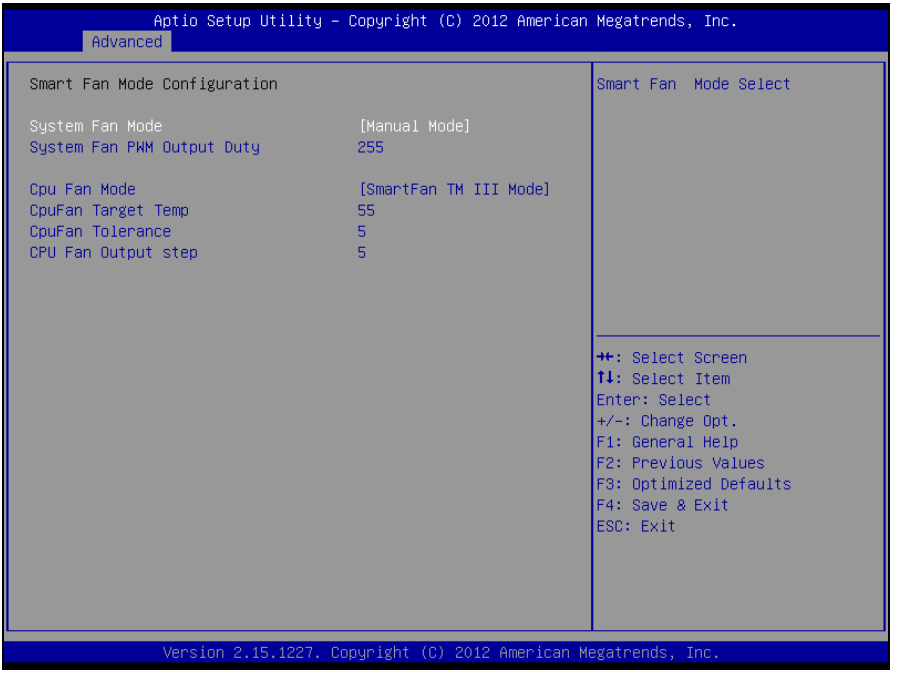
4-4-6. HARDWARE MONITOR



Hardware monitor screen

BIOS Setting	Options	Description/Purpose
Smart Fan Mode Configuration	Sub-menu	Smart Fan Mode select.
System Temperature	No changeable options	Displays temperature in the remote thermal sensor zone.
CPU Temperature	No changeable options	Displays processor's temperature.
SysFan Speed	No changeable options	Displays fan speed of the chassis fan.
CpuFan Speed	No changeable options	Displays fan speed of the CPU fan.
Vcore	No changeable options	Displays voltage level of the +Vcore in supply.

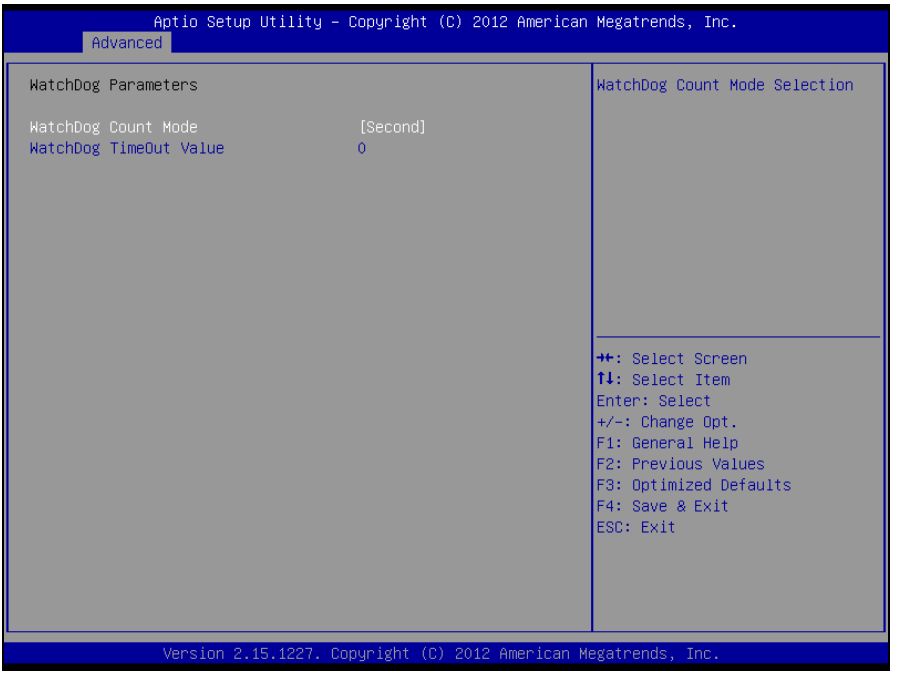
BIOS Setting	Options	Description/Purpose
+12V	No changeable options	Displays voltage level of the +12V in supply.
+1.5V	No changeable options	Displays voltage level of the +1.5V in supply.
+1.05V	No changeable options	Displays voltage level of the +1.05V in supply.
AVCC	No changeable options	Displays voltage level of the +5V in supply.
5Vcc	No changeable options	Displays voltage level of the +5V in supply.
5VSB	No changeable options	Displays voltage level of the +5V in supply.



Hardware monitor manual mode screen

BIOS Setting	Options	Description/Purpose
System/Cpu Fan Mode	- Manual Mode - Thermal CruiseTM Mode - SmartFan TM III Mode	Smart Fan Mode select.
System/CpuFan Target Temp	Multiple options ranging from 0 to 100	CPU fan target temperature.
System/CpuFan Tolerance Temp	Multiple options ranging from 0 to 10.	CPU fan tolerance temperature.
CPU Fan Output step	Multiple options ranging from 0 to 5	CPU Fan output step.

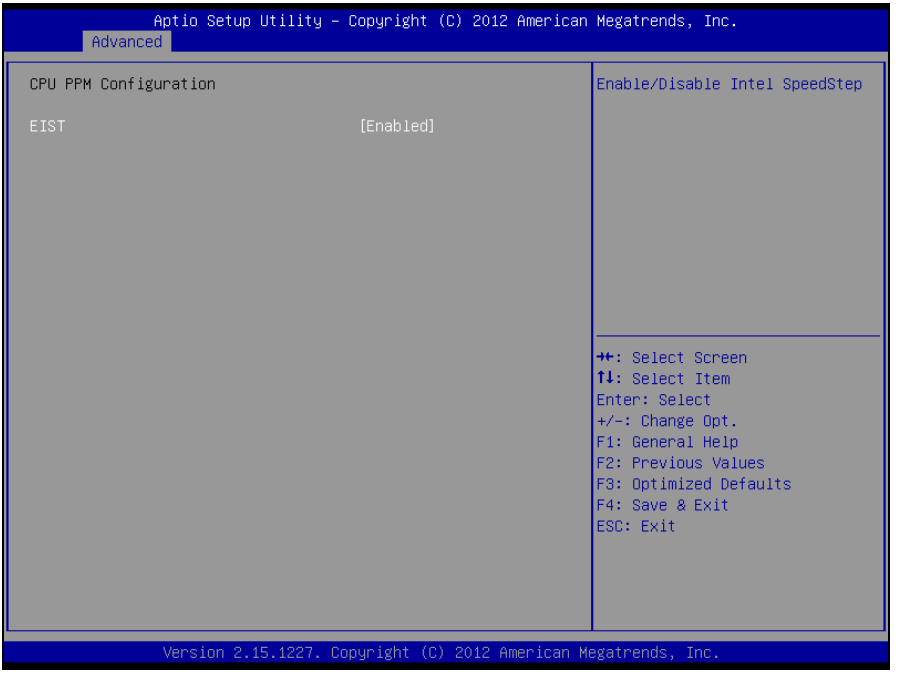
4-4-7. WATCHDOG CONFIGURATION



Watchdog configuration screen

BIOS Setting	Options	Description/Purpose
WatchDog Count Mode	- Second	Set the watchdog count mode.
WatchDog TimeOut Value	Multiple options ranging from 0 to 255	Sets the desired value (seconds) for watchdog timer.

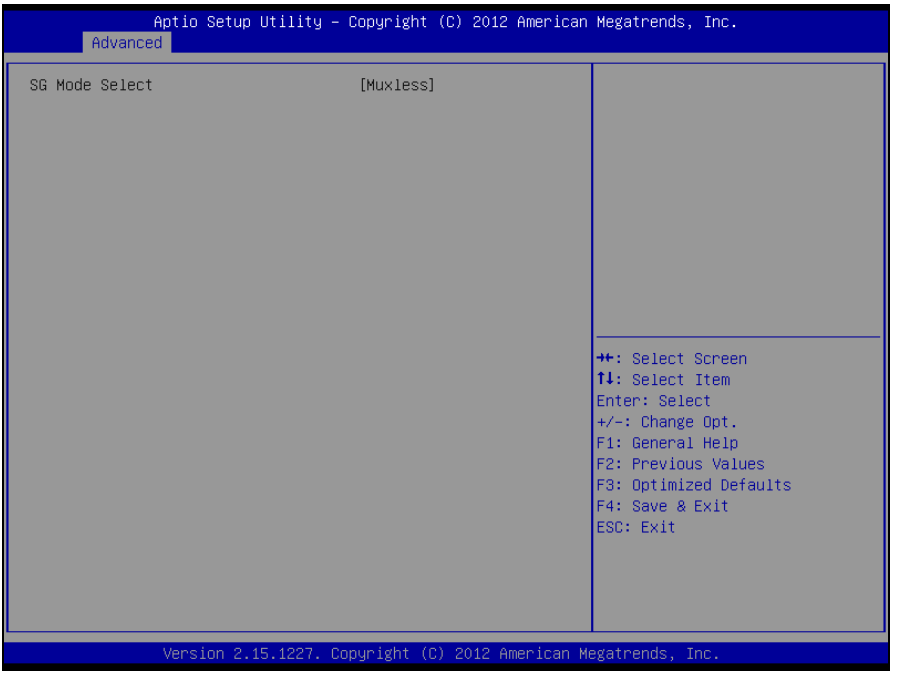
4-4-8. CPU PPM CONFIGURATION



CPU PPM configuration screen

BIOS Setting	Options	Description/Purpose
EIST	- Disabled - Enabled	Enable/Disable Intel Speedstep.
Turbo Mode	- Disabled - Enabled	Enable/Disable Turbo Mode.

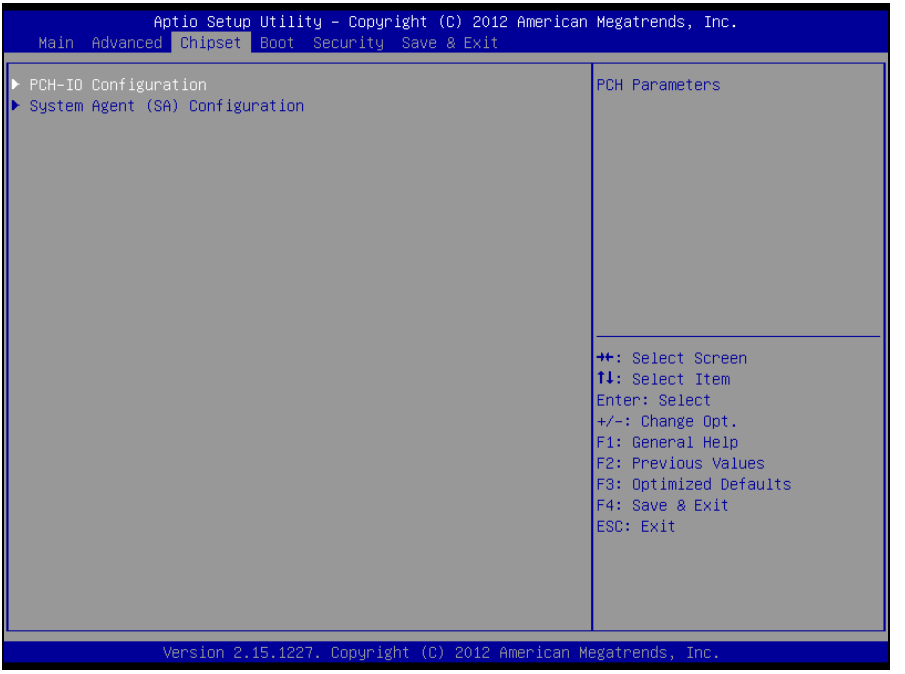
4-4-9. SWITCHABLE GRAPHICS



Switchable graphics screen

BIOS Setting	Options	Description/Purpose
SG Mode Select	- Muxless	Switchable Graphics selections

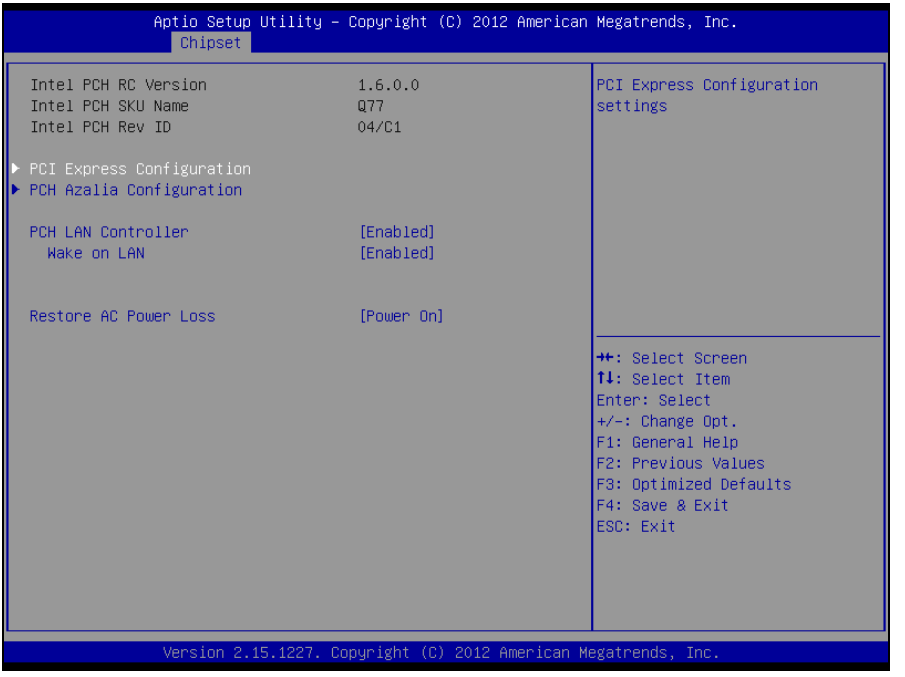
4-5. CHIPSET



Chipset screen

BIOS Setting	Options	Description/Purpose
PCH-IO Configuration	Sub-menu	Sets Parameter for Panther Point (South Bridge) configuration.
System Agent (SA) Configuration	Sub-menu	Sets Parameter for Ivy Bridge (North Bridge) configuration.

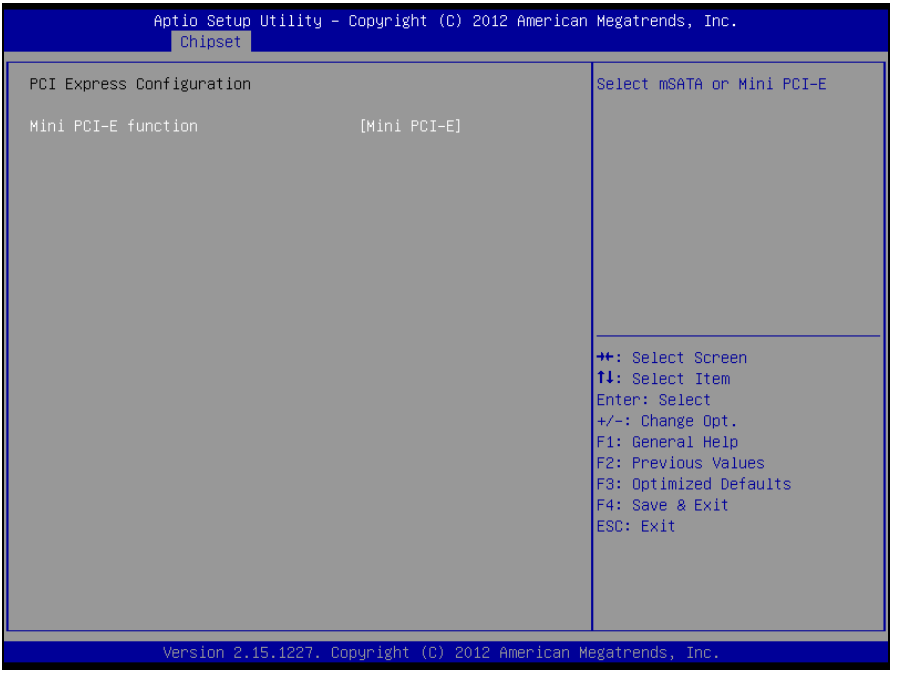
4-5-1. PCH – IO CONFIGURATION



PCH-IO configuration screen

BIOS Setting	Options	Description/Purpose
Intel PCH RC Version	No changeable options	Displays the PCH source code module version
Intel PCH SKU Name	No changeable options	Displays PCH product SKU name.
Intel PCH Rev ID	No changeable options	Displays onboard PCH chip revision.
PCI Express Configuration	Sub-menu	PCI Express Configuration settings.
PCH Azalia Configuration	Sub-menu	PCH Azalia Configuration settings.

BIOS Setting	Options	Description/Purpose
PCH LAN Controller	- Disabled - Enabled	Enable or disable onboard NIC
Wake on LAN	- Disabled - Enabled	Enable or disable integrated LAN to wake the system. (The Wake On LAN cannot be disabled if ME is on at Sx state.)
Restore AC Power Loss	- Power off - Power on	Select AC power state when power is re-applied after a power failure.



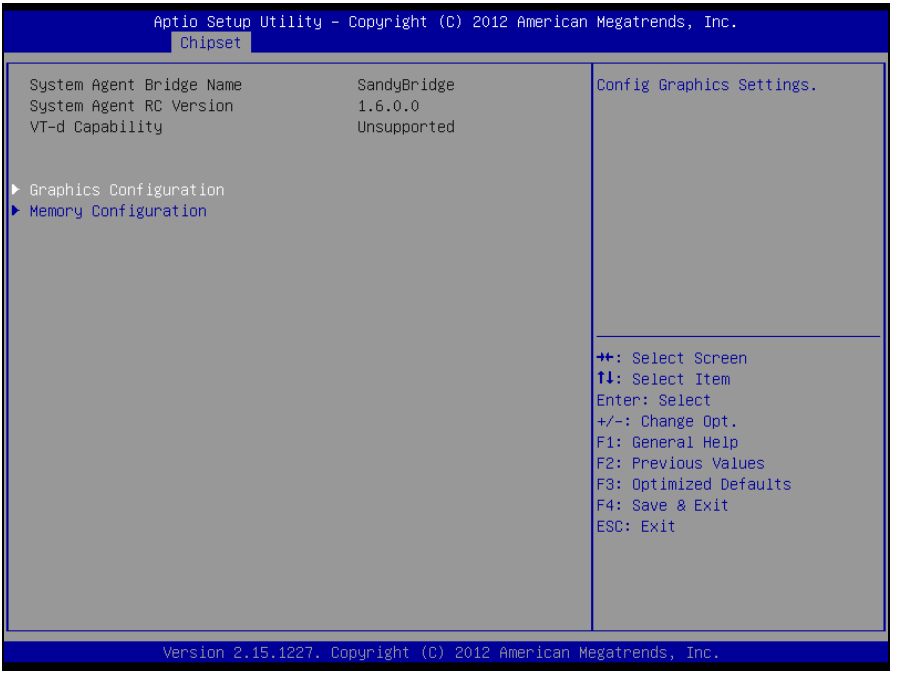
PCI express configuration screen

BIOS Setting	Options	Description/Purpose
Mini PCI-E function	- Mini PCI-E - mSATA	Set the mini PCI-E interface as Mini PCI-E or mSATA function.

PCH Azalia configuration screen

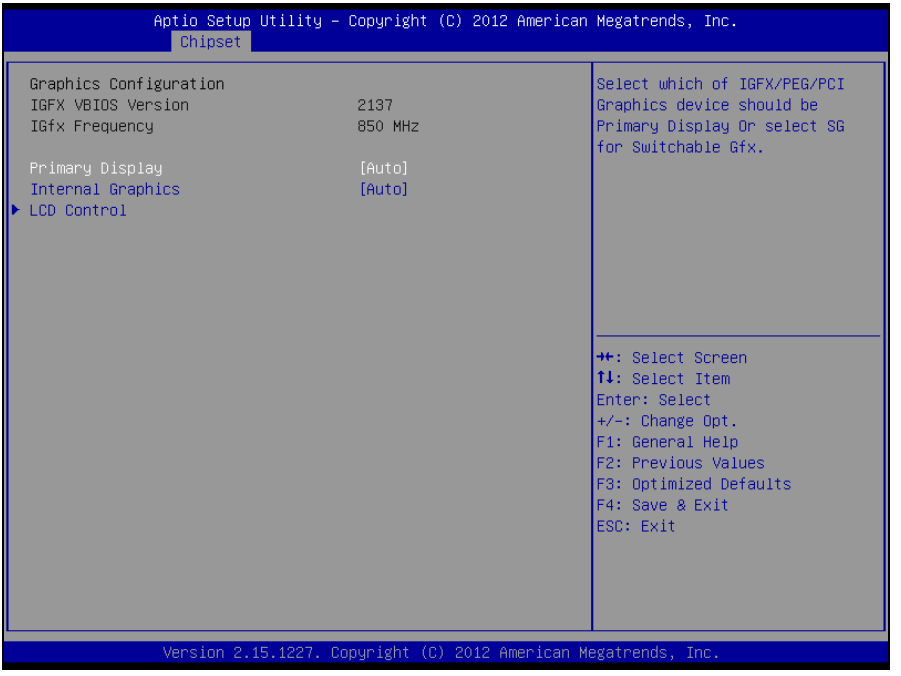
BIOS Setting	Options	Description/Purpose
Azalia Internal HDMI Codec	- Enabled - Disabled	Enable or disable internal HDMI codec for Azalia.
Azalia HDMI codec Port D	- Enabled - Disabled	Enable or disable internal HDMI codec Port for Azalia.

4-5-2. SYSTEM AGENT (SA) CONFIGURATION



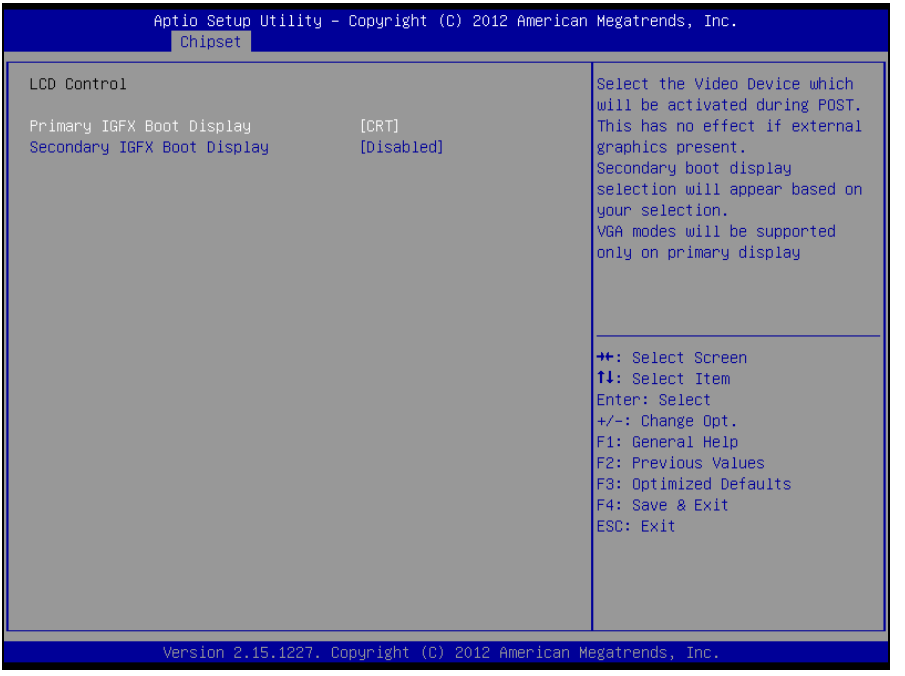
System agent (SA) configuration screen

BIOS Setting	Options	Description/Purpose
System Agent Bridge Name	No changeable options	Displays the system bridge name..
System Agent RC version	No changeable options	Displays the IVB source code module version
Graphics Configuration	Sub-menu	Configure Graphic Settings.
Memory Configuration	Sub-menu	Memory Configuration Parameters



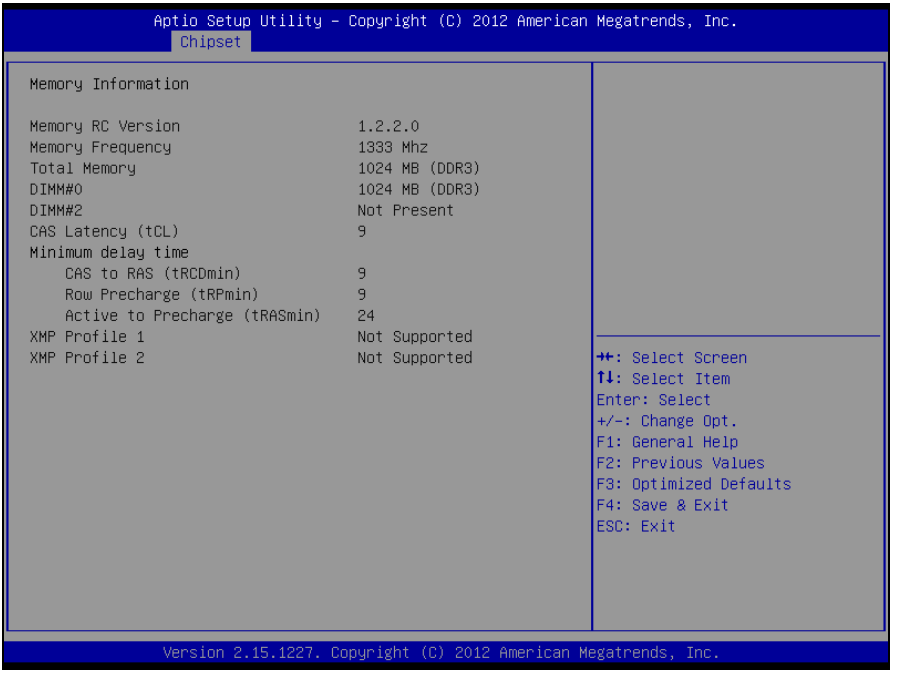
Graphics configuration screen

BIOS Setting	Options	Description/Purpose
IGFX VBIOS Version	No changeable options	Displays the VBIOS version of integrated graphic controller.
IGfx Frequency	No changeable options	Displays the frequency integrated graphic controller.
Primary Display	- AUTO - IGFX - PEG - SG	Select which of IGFX/PEG Graphics device should be Primary Display Or select SG for Switchable Gfx.
Internal Graphics	- AUTO - Disabled - Enabled	Keep IGD enabled based on the setup options.
LCD Control	Sub-menu	Display devices active selection



LCD control screen

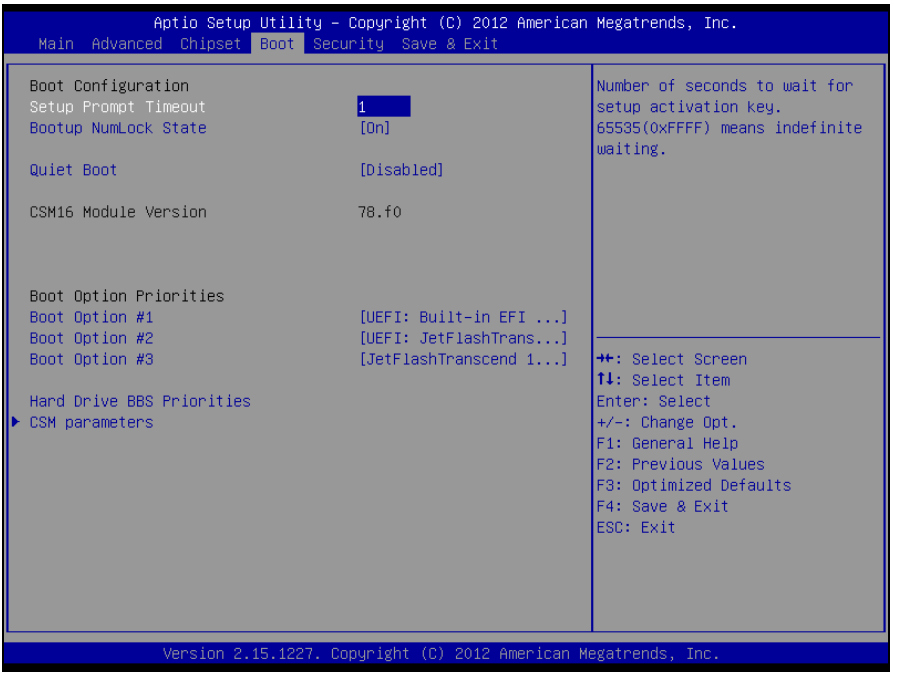
BIOS Setting	Options	Description/Purpose
Primary IGFX Boot Display	- CRT - DVI 1 - Onboard DP - DVI 2	"Select the Video Device which will be activated during POST. This has no effect if external graphics present. Secondary boot display selection will appear based on your selection. VGA modes will be supported only on primary display"
Secondary IGFX Boot Display	- Disabled - CRT -DVI 1 -Onboard DP - DVI 2	Select Secondary Display Device



Memory configuration screen

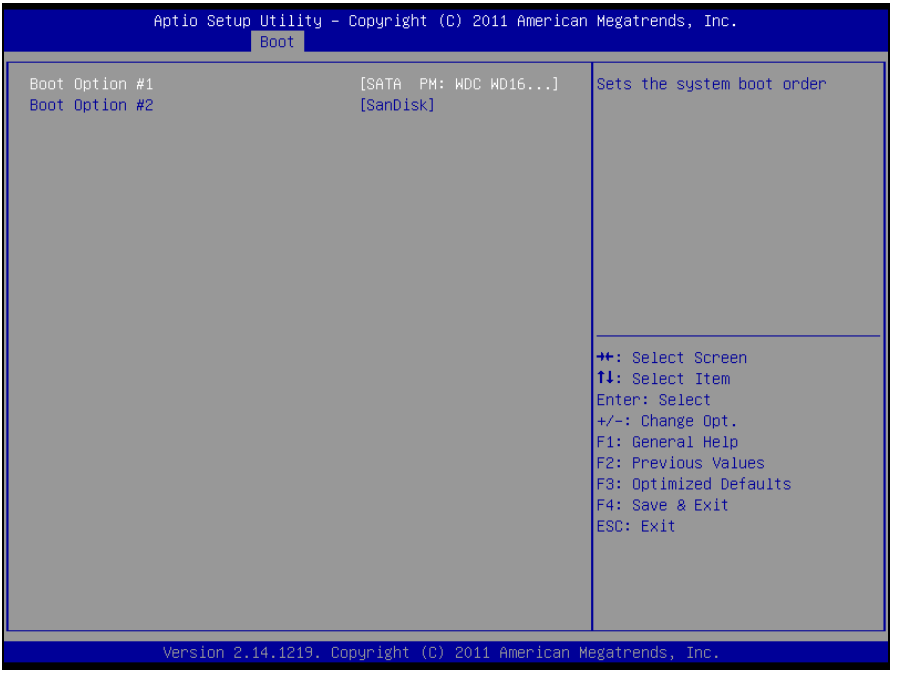
BIOS Setting	Options	Description/Purpose
Memory Information	No changeable option lists.	Displays the detail DRAM information on platform.

4-6. BOOT



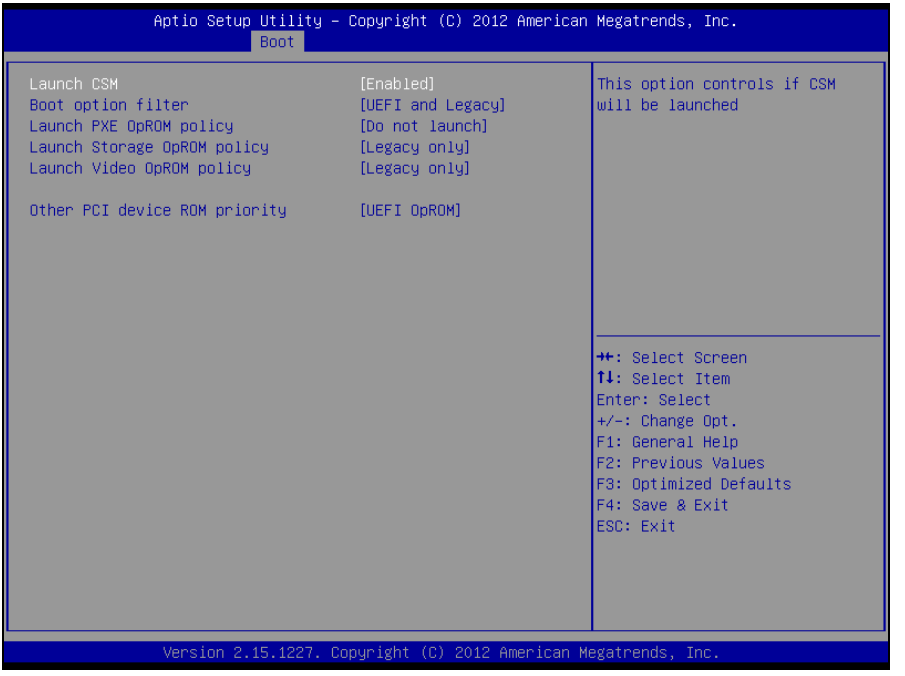
Boot screen

BIOS Setting	Options	Description/Purpose
Setup Prompt Timeout	Numeric	Number of seconds to wait for setup activation key.
Bootup NumLock Status	- On - Off	Specifies the power-on state of the NumLock Key.
Quiet Boot	- Disabled - Enabled	Enable/Disable Quiet Boot Options
CSM16 Module Version	No changeable options	Displays the current Compatibility Support Module version.
Boot Option #1~#3	- [Drive(s)] - Disabled	Allows setting boot option listed in Hard Drive BBS Priorities.



Hard drive BBS priorities screen

BIOS Setting	Options	Description/Purpose
Boot Option #1 - #3	- [Drive(s)] - Disabled	Allows setting the boot order of available drive(s).

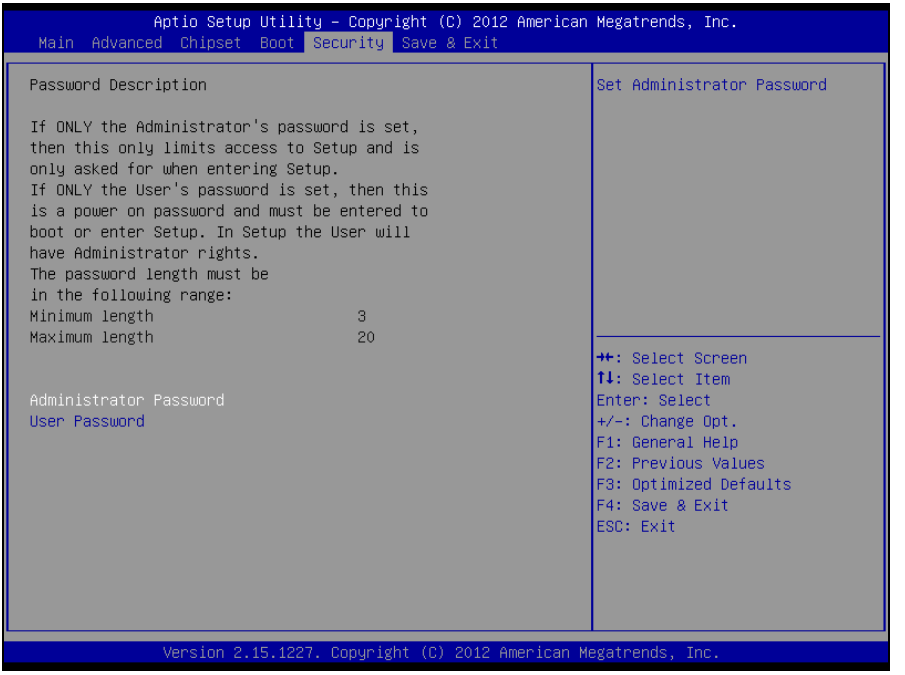


CSM parameters screen

BIOS Setting	Options	Description/Purpose
Launch CSM	- Enabled - Disabled	This option controls if CSM will be launched
Boot option filter	- UEFI and Legacy - Legacy only - UEFI only	Allows the system run the boot option rom type.
Launch PXE OpROM policy	- Do not launch - UEFI only - Legacy only	Controls the execution of UEFI and Legacy PXE OpROM
Launch Storage OpROM policy	- Do not launch - UEFI only - Legacy only	Controls the execution of UEFI and Legacy Storage OpROM

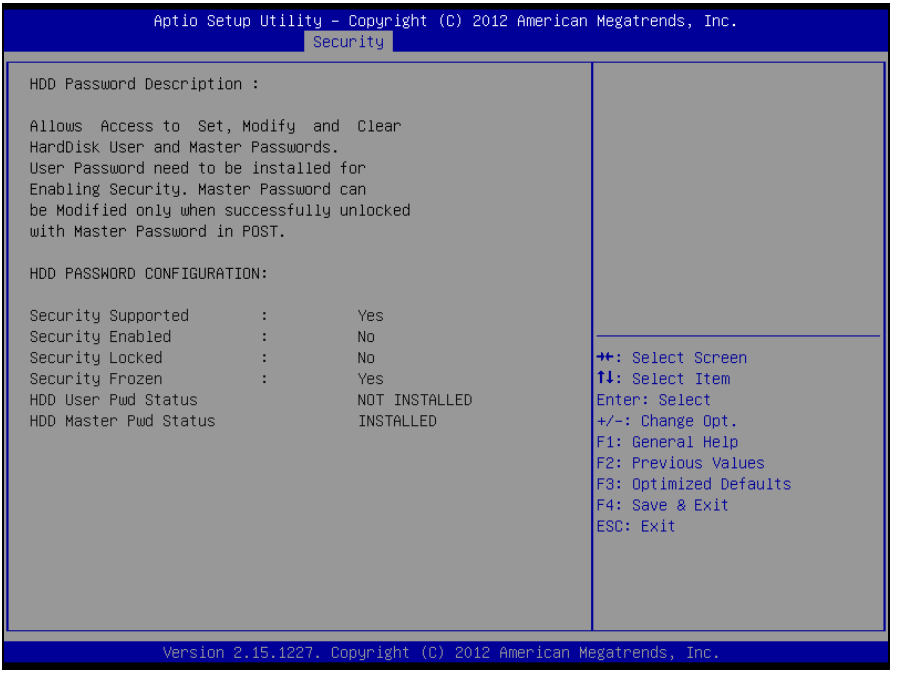
BIOS Setting	Options	Description/Purpose
Launch Video OpROM policy	- Do not launch - UEFI only - Legacy only - Legacy first - UEFI first	Controls the execution of UEFI and Legacy Video OpROM
Other PCI device ROM priority	- UEFI OpROM - Legacy OpROM	For PCI devices other than Network, Mass storage or Video defines which OpROM to launch

4-7. SECURITY



Security screen

BIOS Setting	Options	Description/Purpose
Administrator Password	Password can be 3-20 alphanumeric characters.	Specifies the administrator password.
User Password	Password can be 3-20 alphanumeric characters.	Specifies the user password.
HDD Security Configuration:	Sub-menu	Set HDD password.

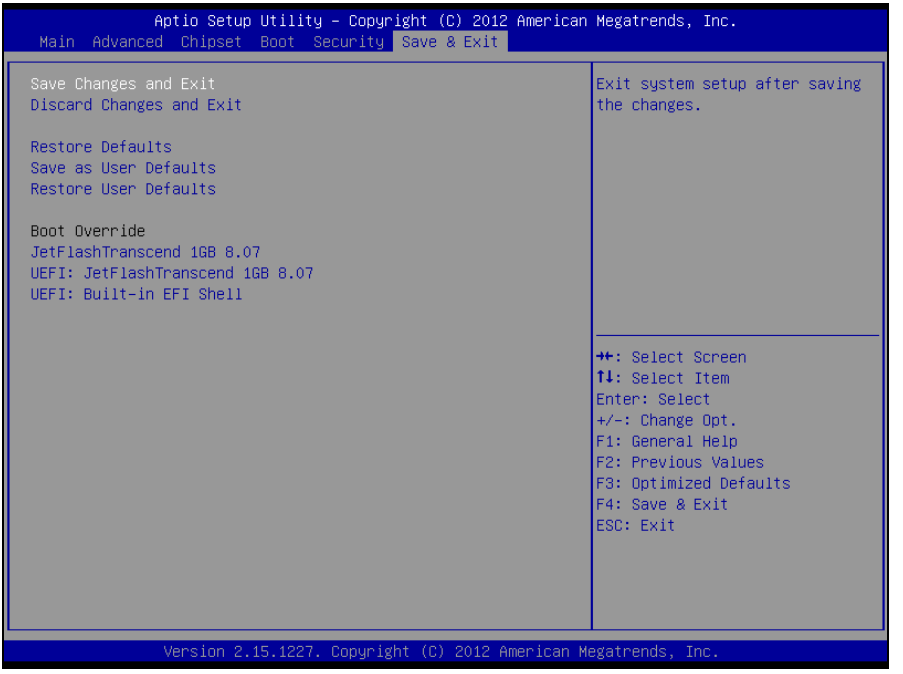


HDD security configuration – HDD 0: [drive] screen

BIOS Setting	Options	Description/Purpose
Security Supported	No changeable options	Reports if there is security feature available.
Security Enabled	No changeable options	Reports if there is security feature enabled.
Security Locked	No changeable options	Reports if there is security feature locked.
Security Frozen	No changeable options	Reports if there is security feature frozen.
HDD User Pwd Status	No changeable options	Reports if there is HDD User Password installed.
HDD Master Pwd Status	No changeable options	Reports if there is HDD Master Password installed.

BIOS Setting	Options	Description/Purpose
Set User Password	Password can be up to 32 alphanumeric characters.	Specifies the user password. (Need TPM module)
Set Master Password	Password can be up to 32 alphanumeric characters.	Specifies the master password.

4-8. SAVE & EXIT



Save & Exit screen

BIOS Setting	Options	Description/Purpose
Save Changes and Exit	No changeable options	Exits and saves the changes in NVRAM.
Discard Changes and Exit	No changeable options	Exits without saving any changes made in BIOS settings.
Restore Defaults	No changeable options	Loads the optimized defaults for BIOS settings.
Save as User Defaults	No changeable options	Save the changes done so far as User Defaults
Restore User Defaults	No changeable options	Restore the User Defaults to all the setup options

BIOS Setting	Options	Description/Purpose
Boot Override	- [Drive(s)]	Forces to boot from selected [drive(s)].

EXPANSION BUS

APPENDIX

A

This appendix indicates the pin assignments.

Sections included:

- Mini PCI-E Bus Connector Pin Assignment

MINI PCI-E BUS CONNECTOR PIN ASSIGNMENT

You will find a Mini PCI-e connector on PMB-897LF.
The pin assignments are as follows:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	WAKE#	27	GND
2	+3.3V	28	+1.5V
3	Reserved	29	GND
4	GND	30	SMB_CLK
5	Reserved	31	PETn0
6	+1.5V	32	SMB_DATA
7	CLKREQ#	33	PETp0
8	Reserved	34	GND
9	GND	35	GND
10	Reserved	36	USB_D-
11	REFCLK-	37	GND
12	Reserved	38	USB_D+
13	REFCLK+	39	+3.3V
14	Reserved	40	GND
15	GND	41	+3.3V
16	Reserved	42	Reserved
17	Reserved	43	GND
18	GND	44	Reserved
19	Reserved	45	Reserved
20	Reserved	46	Reserved
21	GND	47	Reserved
22	PERST#	48	+1.5V
23	PERn0	49	Reserved
24	+3.3Vaux	50	GND
25	PERp0	51	Reserved
26	GND	52	+3.3V

TECHNICAL SUMMARY

APPENDIX

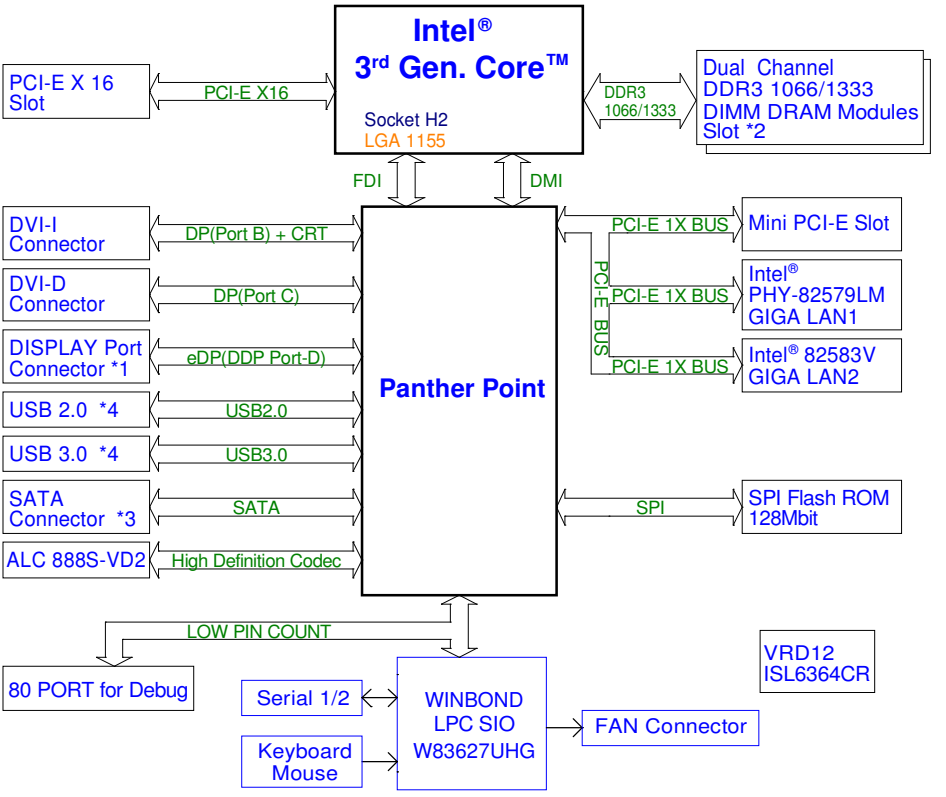
B

This section introduce you the maps concisely.

Sections included:

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

BLOCK DIAGRAM



INTERRUPT MAP

IRQ	ASSIGNMENT
0	System timer
1	Standard PS/2 Keyboard
3	Communications Port (COM2)
4	Communications Port (COM1)
8	System CMOS/real time clock
11	Intel® 7 Series/C216 Chipset Family SMBus Host Controller - 1E22
13	Numeric data processor
16	Intel® Management Engine Interface
16	Intel® 7 Series/C216 Chipset Family PCI Express Root Port 1 - 1E10
16	Intel® 7 Series/C216 Chipset Family USB Enhanced Host Controller - 1E2D
17	Intel® 7 Series/C216 Chipset Family PCI Express Root Port 2 - 1E12
19	Intel® 7 Series/C216 Chipset Family 4 port Serial ATA Storage Controller - 1E00
19	Intel® 7 Series/C216 Chipset Family 2 port Serial ATA Storage Controller - 1E08
19	Intel® Active Management Technology - SOL (COM3)
22	High Definition Audio Controller
23	Intel® 7 Series/C216 Chipset Family USB Enhanced Host Controller - 1E26
81	Microsoft ACPI-Compliant System
82	Microsoft ACPI-Compliant System
83	Microsoft ACPI-Compliant System
84	Microsoft ACPI-Compliant System
85	Microsoft ACPI-Compliant System
86	Microsoft ACPI-Compliant System
87	Microsoft ACPI-Compliant System
88	Microsoft ACPI-Compliant System
89	Microsoft ACPI-Compliant System
90	Microsoft ACPI-Compliant System
91	Microsoft ACPI-Compliant System

IRQ	ASSIGNMENT
92	Microsoft ACPI-Compliant System
93	Microsoft ACPI-Compliant System
94	Microsoft ACPI-Compliant System
95	Microsoft ACPI-Compliant System
96	Microsoft ACPI-Compliant System
97	Microsoft ACPI-Compliant System
98	Microsoft ACPI-Compliant System
99	Microsoft ACPI-Compliant System
100	Microsoft ACPI-Compliant System
101	Microsoft ACPI-Compliant System
102	Microsoft ACPI-Compliant System
103	Microsoft ACPI-Compliant System
104	Microsoft ACPI-Compliant System
105	Microsoft ACPI-Compliant System
106	Microsoft ACPI-Compliant System
107	Microsoft ACPI-Compliant System
108	Microsoft ACPI-Compliant System
109	Microsoft ACPI-Compliant System
110	Microsoft ACPI-Compliant System
111	Microsoft ACPI-Compliant System
112	Microsoft ACPI-Compliant System
113	Microsoft ACPI-Compliant System
114	Microsoft ACPI-Compliant System
115	Microsoft ACPI-Compliant System
116	Microsoft ACPI-Compliant System
117	Microsoft ACPI-Compliant System
118	Microsoft ACPI-Compliant System
119	Microsoft ACPI-Compliant System
120	Microsoft ACPI-Compliant System
121	Microsoft ACPI-Compliant System
122	Microsoft ACPI-Compliant System
123	Microsoft ACPI-Compliant System
124	Microsoft ACPI-Compliant System
125	Microsoft ACPI-Compliant System

IRQ	ASSIGNMENT
126	Microsoft ACPI-Compliant System
127	Microsoft ACPI-Compliant System
128	Microsoft ACPI-Compliant System
129	Microsoft ACPI-Compliant System
130	Microsoft ACPI-Compliant System
131	Microsoft ACPI-Compliant System
132	Microsoft ACPI-Compliant System
133	Microsoft ACPI-Compliant System
134	Microsoft ACPI-Compliant System
135	Microsoft ACPI-Compliant System
136	Microsoft ACPI-Compliant System
137	Microsoft ACPI-Compliant System
138	Microsoft ACPI-Compliant System
139	Microsoft ACPI-Compliant System
140	Microsoft ACPI-Compliant System
141	Microsoft ACPI-Compliant System
142	Microsoft ACPI-Compliant System
143	Microsoft ACPI-Compliant System
144	Microsoft ACPI-Compliant System
145	Microsoft ACPI-Compliant System
146	Microsoft ACPI-Compliant System
147	Microsoft ACPI-Compliant System
148	Microsoft ACPI-Compliant System
149	Microsoft ACPI-Compliant System
150	Microsoft ACPI-Compliant System
151	Microsoft ACPI-Compliant System
152	Microsoft ACPI-Compliant System
153	Microsoft ACPI-Compliant System
154	Microsoft ACPI-Compliant System
155	Microsoft ACPI-Compliant System
156	Microsoft ACPI-Compliant System
157	Microsoft ACPI-Compliant System
158	Microsoft ACPI-Compliant System
159	Microsoft ACPI-Compliant System

IRQ	ASSIGNMENT
160	Microsoft ACPI-Compliant System
161	Microsoft ACPI-Compliant System
162	Microsoft ACPI-Compliant System
163	Microsoft ACPI-Compliant System
164	Microsoft ACPI-Compliant System
165	Microsoft ACPI-Compliant System
166	Microsoft ACPI-Compliant System
167	Microsoft ACPI-Compliant System
168	Microsoft ACPI-Compliant System
169	Microsoft ACPI-Compliant System
170	Microsoft ACPI-Compliant System
171	Microsoft ACPI-Compliant System
172	Microsoft ACPI-Compliant System
173	Microsoft ACPI-Compliant System
174	Microsoft ACPI-Compliant System
175	Microsoft ACPI-Compliant System
176	Microsoft ACPI-Compliant System
177	Microsoft ACPI-Compliant System
178	Microsoft ACPI-Compliant System
179	Microsoft ACPI-Compliant System
180	Microsoft ACPI-Compliant System
181	Microsoft ACPI-Compliant System
182	Microsoft ACPI-Compliant System
183	Microsoft ACPI-Compliant System
184	Microsoft ACPI-Compliant System
185	Microsoft ACPI-Compliant System
186	Microsoft ACPI-Compliant System
187	Microsoft ACPI-Compliant System
188	Microsoft ACPI-Compliant System
189	Microsoft ACPI-Compliant System
190	Microsoft ACPI-Compliant System
4294967288	Intel® 82574L Gigabit Network Connection
4294967289	Intel® 82574L Gigabit Network Connection
4294967290	Intel® 82574L Gigabit Network Connection

IRQ	ASSIGNMENT
4294967291	Intel® 82574L Gigabit Network Connection
4294967292	Intel® 82579LM Gigabit Network Connection
4294967293	Intel® USB 3.0 eXtensible Host Controller
4294967294	Intel® HD Graphics

Note: These resource information was gathered by Windows 7. (The IRQ could be assigned differently depending on OS.)

DMA CHANNELS MAP

TIMER CHANNEL	ASSIGNMENT
Channel 4	Direct memory access controller

I/O MAP

I/O MAP	ASSIGNMENT
0x00000000-0x0000001F	Direct memory access controller
0x00000000-0x0000001F	PCI bus
0x00000010-0x0000001F	Motherboard resources
0x00000020-0x00000021	Programmable interrupt controller
0x00000022-0x0000003F	Motherboard resources
0x00000024-0x00000025	Programmable interrupt controller
0x00000028-0x00000029	Programmable interrupt controller
0x0000002C-0x0000002D	Programmable interrupt controller
0x0000002E-0x0000002F	Motherboard resources
0x00000030-0x00000031	Programmable interrupt controller
0x00000034-0x00000035	Programmable interrupt controller
0x00000038-0x00000039	Programmable interrupt controller
0x0000003C-0x0000003D	Programmable interrupt controller
0x00000040-0x00000043	System timer
0x00000044-0x0000005F	Motherboard resources
0x0000004E-0x0000004F	Motherboard resources
0x00000050-0x00000053	System timer
0x00000060-0x00000060	Standard PS/2 Keyboard
0x00000061-0x00000061	Motherboard resources
0x00000062-0x00000063	Motherboard resources
0x00000063-0x00000063	Motherboard resources
0x00000064-0x00000064	Standard PS/2 Keyboard

I/O MAP	ASSIGNMENT
0x00000065-0x0000006F	Motherboard resources
0x00000065-0x0000006F	Motherboard resources
0x00000067-0x00000067	Motherboard resources
0x00000070-0x00000077	System CMOS/real time clock
0x00000070-0x00000077	Motherboard resources
0x00000072-0x0000007F	Motherboard resources
0x00000080-0x00000080	Motherboard resources
0x00000080-0x00000080	Motherboard resources
0x00000081-0x00000091	Direct memory access controller
0x00000084-0x00000086	Motherboard resources
0x00000088-0x00000088	Motherboard resources
0x0000008C-0x0000008E	Motherboard resources
0x00000090-0x0000009F	Motherboard resources
0x00000092-0x00000092	Motherboard resources
0x00000093-0x0000009F	Direct memory access controller
0x000000A0-0x000000A1	Programmable interrupt controller
0x000000A2-0x000000BF	Motherboard resources
0x000000A4-0x000000A5	Programmable interrupt controller
0x000000A8-0x000000A9	Programmable interrupt controller
0x000000AC- 0x000000AD	Programmable interrupt controller
0x000000B0-0x000000B1	Programmable interrupt controller
0x000000B2-0x000000B3	Motherboard resources
0x000000B4-0x000000B5	Programmable interrupt controller

I/O MAP	ASSIGNMENT
0x000000B8-0x000000B9	Programmable interrupt controller
0x000000BC-0x000000BD	Programmable interrupt controller
0x000000C0-0x000000DF	Direct memory access controller
0x000000E0-0x000000EF	Motherboard resources
0x000000F0-0x000000FF	Numeric data processor
0x00000290-0x00000297	Motherboard resources
0x000002F8-0x000002FF	Communications Port (COM2)
0x000003B0-0x000003BB	Intel® HD Graphics
0x000003C0-0x000003DF	Intel® HD Graphics
0x000003F8-0x000003FF	Communications Port (COM1)
0x00000400-0x00000453	Motherboard resources
0x00000454-0x00000457	Motherboard resources
0x00000458-0x0000047F	Motherboard resources
0x000004D0-0x000004D1	Programmable interrupt controller
0x000004D0-0x000004D1	Motherboard resources
0x00000500-0x0000057F	Motherboard resources
0x00000680-0x0000069F	Motherboard resources
0x00000D00-0x0000FFFF	PCI bus
0x00001000-0x0000100F	Motherboard resources
0x0000164E-0x0000164F	Motherboard resources
0x0000E000-0x0000EFFF	Intel® 7 Series/C216 Chipset Family PCI Express Root Port 2 - 1E12
0x0000F000-0x0000F03F	Intel® HD Graphics

I/O MAP	ASSIGNMENT
0x0000F040-0x0000F05F	Intel® 7 Series/C216 Chipset Family SMBus Host Controller - 1E22
0x0000F080-0x0000F08F	Intel® 7 Series/C216 Chipset Family 2 port Serial ATA Storage Controller - 1E08
0x0000F090-0x0000F09F	Intel® 7 Series/C216 Chipset Family 2 port Serial ATA Storage Controller - 1E08
0x0000F0A0-0x0000F0A3	Intel® 7 Series/C216 Chipset Family 2 port Serial ATA Storage Controller - 1E08
0x0000F0B0-0x0000F0B7	Intel® 7 Series/C216 Chipset Family 2 port Serial ATA Storage Controller - 1E08
0x0000F0C0-0x0000F0C3	Intel® 7 Series/C216 Chipset Family 2 port Serial ATA Storage Controller - 1E08
0x0000F0D0-0x0000F0D7	Intel® 7 Series/C216 Chipset Family 2 port Serial ATA Storage Controller - 1E08
0x0000F0E0-0x0000F0EF	Intel® 7 Series/C216 Chipset Family 4 port Serial ATA Storage Controller - 1E00
0x0000F0F0-0x0000F0FF	Intel® 7 Series/C216 Chipset Family 4 port Serial ATA Storage Controller - 1E00
0x0000F100-0x0000F103	Intel® 7 Series/C216 Chipset Family 4 port Serial ATA Storage Controller - 1E00
0x0000F110-0x0000F117	Intel® 7 Series/C216 Chipset Family 4 port Serial ATA Storage Controller - 1E00
0x0000F120-0x0000F123	Intel® 7 Series/C216 Chipset Family 4 port Serial ATA Storage Controller - 1E00
0x0000F130-0x0000F137	Intel® 7 Series/C216 Chipset Family 4 port Serial ATA Storage Controller - 1E00
0x0000F140-0x0000F147	Intel® Active Management Technology - SOL (COM3)
0x0000FFFF-0x0000FFFF	Motherboard resources
0x0000FFFF-0x0000FFFF	Motherboard resources

MEMORY MAP

MEMORY MAP	ASSIGNMENT
0xFF000000-0xFFFFFFFF	Intel® 82802 Firmware Hub Device
0xFF000000-0xFFFFFFFF	Motherboard resources
0xF7D20000-0xF7D2FFFF	Intel® USB 3.0 eXtensible Host Controller
0xF7D3B000-0xF7D3B00F	Intel® Management Engine Interface
0xFED00000-0xFED003FF	High precision event timer
0xF7D39000-0xF7D39FFF	Intel® Active Management Technology - SOL (COM3)
0xF7C00000-0xF7CFFFFF	Intel® 7 Series/C216 Chipset Family PCI Express Root Port 2 - 1E12
0xF7C00000-0xF7CFFFFF	Intel® 82574L Gigabit Network Connection
0xFED40000-0xFED44FFF	System board
0xF7D30000-0xF7D33FFF	High Definition Audio Controller
0xFED1C000-0xFED1FFFF	Motherboard resources
0xFED10000-0xFED17FFF	Motherboard resources
0xFED18000-0xFED18FFF	Motherboard resources
0xFED19000-0xFED19FFF	Motherboard resources
0xF8000000-0xFBFFFFFF	Motherboard resources
0xFED20000-0xFED3FFFF	Motherboard resources
0xFED90000-0xFED93FFF	Motherboard resources
0xFED45000-0xFED8FFFF	Motherboard resources
0xFEE00000-0xFEEFFFFF	Motherboard resources
0xF7C20000-0xF7C23FFF	Intel® 82574L Gigabit Network Connection
0xF7D35000-0xF7D350FF	Intel® 7 Series/C216 Chipset Family SMBus Host

MEMORY MAP	ASSIGNMENT
	Controller - 1E22
0xF7D00000-0xF7D1FFFF	Intel® 82579LM Gigabit Network Connection
0xF7D38000-0xF7D38FFF	Intel® 82579LM Gigabit Network Connection
0xF7D36000-0xF7D363FF	Intel® 7 Series/C216 Chipset Family USB Enhanced Host Controller - 1E26
0xF7800000-0xF7BFFFFF	Intel® HD Graphics
0xE0000000-0xEFFFFFFF	Intel® HD Graphics
0xF7D37000-0xF7D373FF	Intel® 7 Series/C216 Chipset Family USB Enhanced Host Controller - 1E2D
0xA0000-0xBFFFF	PCI bus
0xA0000-0xBFFFF	Intel® HD Graphics
0xD0000-0xD3FFF	PCI bus
0xD4000-0xD7FFF	PCI bus
0xD8000-0xDBFFF	PCI bus
0xDC000-0xDFFFF	PCI bus
0xE0000-0xE3FFF	PCI bus
0xE4000-0xE7FFF	PCI bus
0x20000000-0x201FFFFF	System board
0x3DA00000-0xFEAFFFFF	PCI bus
0x3DA00000-0xFEAFFFFF	Motherboard resources
0x40000000-0x401FFFFF	System board

WATCHDOG TIMER CONFIGURATION

The I/O port address of the watchdog timer is 2E (hex) and 2F (hex). 2E (hex) is the address port. 2F (hex) is the data port. User must first assign the address of register by writing address value into address port 2E (hex), then write/read data to/from the assigned register through data port 2F (hex).

Configuration Sequence

To program W83627UHG configuration registers, the following configuration sequence must be followed:

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 the chip 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

The chip selects the Logical Device 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 the chip exits the Extended Function Mode, it is in the normal running mode and is ready to enter the configuration mode.

Example Program

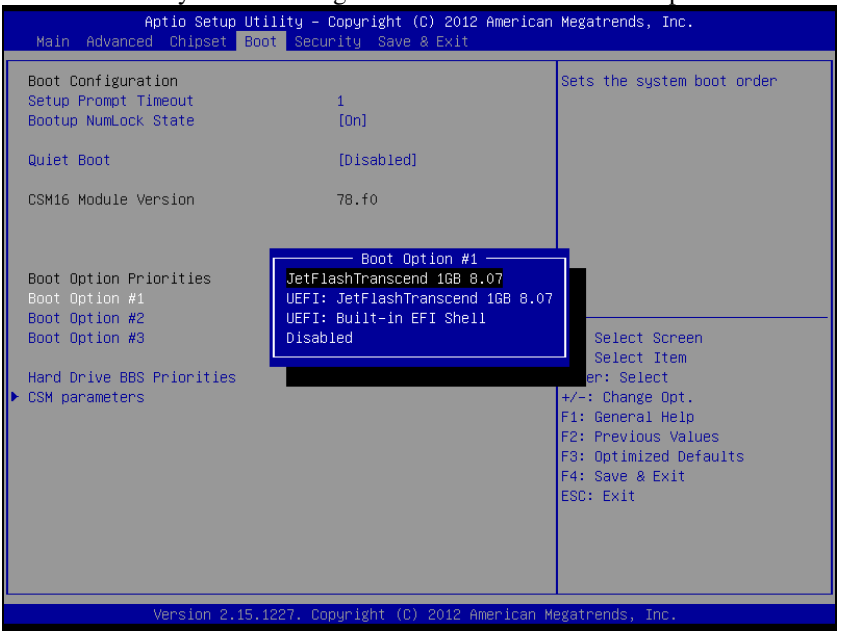
Enable watchdog timer and set 30 sec. as timeout interval

```
;------ 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
;------ 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. Download and save the BIOS file (ex. B8970TQ4.bin) to the bootable device.
3. Copy AMI flash utility – AFUDOS.exe (v3.02) into bootable device.
4. Make sure the target system can first boot to the bootable device.
   a. Make sure the target system can first boot to the bootable device. Connect the bootable USB device.
   b. Turn on the computer and press <F2> or <Del> key during boot to enter BIOS Setup.
   c. System will go into the BIOS setup menu.
   d. Select [Boot] menu.
   e. Select [Hard Drive BBS Priorities], set the USB bootable device to be the 1st boot device.
   f. Press <F4> 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:

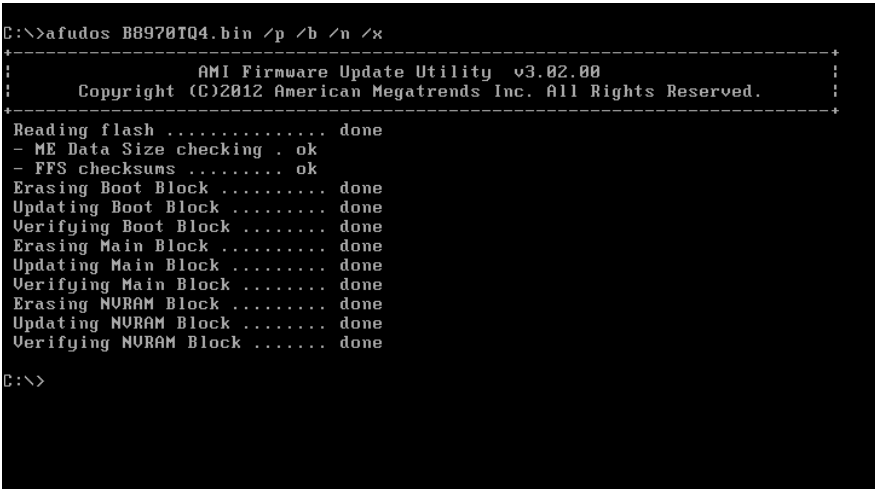
AFUDOS <ROM File Name> [option1] [option2]…

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

/P: program main BIOS image
/B: program Boot Block
/N: program NVRAM
/X: don't check ROM ID

III. BIOS update procedure

1. Use the bootable USB device to boot up system into the MS-DOS command prompt.
2. Type in AFUDOS B897xxxx.bin/p/b/n/x and press enter to start the flash procedure. (Note that xxxx means the BIOS revision part, i.e. 0P01)
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:



5. You can restart the system and boot up with new BIOS now.
6. Update is complete after restart.

7. Verify during following boot that the BIOS version displayed at initialization screen has changed.