ReadyBoard™ 850

Core™2 Duo EPIC Single Board Computer with
SUMIT™ Expansion and GM45/ICH9-M Chipset

User's Manual

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Revision History

Revision	Release Date	Description of Change(s)
2.00	2010/10/26	Initial Release
2.01	2014/01/21	Correct Power On Mode Jumper default (JP2)
2.02	2014/03/07	Correct CF Voltage Setup (JP4)

Preface

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Using this Manual

Audience and Scope

The ReadyBoard™ 850 User's Manual is intended for hardware technicians and systems operators with knowledge of installing, configuring and operating embedded single board computers.

Manual Organization

This manual is organized as follows:

Preface: Presents copyright notifications, disclaimers, trademarks, and associated information on the proper usage of this document and its associated product(s).

Chapter 1, Introduction: Introduces the ReadyBoard™ 850, its features, specifications and board layout.

Chapter 2, Hardware Information: Provides technical information on connectors, jumpers and pin assignments for configuring the ReadyBoard™ 850.

Chapter 3, BIOS Setup: Presents information on configuring the system BIOS.

Important Safety Instructions: Presents safety instructions all users must follow for the proper setup, installation and usage of equipment and/or software.

Getting Service: Contact information for ADLINK's worldwide offices.

Conventions

Take note of the following conventions used throughout this manual to make sure that users perform certain tasks and instructions properly.

NOTE:	Additional information, aids, and tips that help users perform tasks.

CAUTION:	Information to prevent *minor* physical injury, component damage, data loss, and/or program corruption when trying to complete a task.

WARNING:	Information to prevent *serious* physical injury, component damage, data loss, and/or program corruption when trying to complete a specific task.

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1   Introduction

This chapter will introduce the ReadyBoard™ 850, its features, specifications, and mechanical layout.

1.1   Overview

The Ampro by ADLINK™ ReadyBoard™ 850 is an EPIC form factor single board computer (SBC) supporting the Intel® Core™2 Duo and Celeron® processors (Socket P) with Intel® GM45 Express chipset for ultra high performance. The ReadyBoard™ 850 supports 45nm process CPUs at up to 2.26GHz and 1066 MHz Front Side Bus (FSB) and Dual Channel DDR3 800/1066 MHz memory up to 4GB in two SODIMM slots. Features include dual Gigabit Ethernet, USB 2.0, SATA and integrated graphics supporting dual independent display and dual channel 18/24-bit LVDS.

The ReadyBoard™ 850 supports stackable expansion with PCI-104 modules or SUMIT™ expansion modules (SUMIT-ISM™ Legacy Type 2). Please refer to the SUMIT™ and SUMIT-ISM™ specifications for detailed information on the SUMIT™ interface and stacking with SUMIT™ modules: http://www.sff-sig.org/sumit.html.

1.2　Features

▶ EPIC form factor (165.1 mm x 114.3 mm)

▶ Supports Intel® Core™2 Duo and Celeron® processors (Socket P)

▶ Integrated graphics supports VGA, LVDS

▶ Dual 10/100/1000Mbps Ethernet

▶ 4x USB 2.0 ports (2x front I/O, 2x onboard pin header)

▶ 2x SATA ports

▶ CompactFlash socket

▶ PCI-104 connector

▶ SUMIT AB connectors: One PCIe x4, two PCIe x1, 4x USB, LPC Bus, and SMBus

▶ Watchdog Timer, Hardware Monitor

▶ HD audio

▶ RoHS compliant

1.3   Specifications

System	
CPU	• Intel® Core™2 Duo P8400, 2.26GHz, 1066MHz FSB, 3MB L2 Cache, 45nm • Intel® Core™2 Duo T7500, 2.20GHz, 800MHz FSB, 4MB L2 Cache, 65nm • Intel® Celeron® T3100, 1.90GHz, 800MHz FSB, 1MB L2 Cache, 45nm
FSB	• 800/1066 MHz
Chipset	• Intel® GM45 Graphics Memory Controller Hub • Intel® ICH9M I/O Controller Hub
Memory	• Two SODIMM sockets support Dual Channel 800/1066MHz DDR3 (up to 4GB)
BIOS	• AMI BIOS with 16 Mb SPI flash memory
Audio	• Realtek ALC888 codec • Supports line-in, mic-in and speaker-out
Watchdog Timer	• 1-255 second/minute programmable
Hardware Monitor	• CPU temperature and supply voltages
Operating System	• Linux (Ubuntu) • Windows CE 6.0, XPe, XP Professional • VxWorks 6.6
I/O Interfaces	
Onboard I/O	• 2x SATA ports with 300 MB/s data transfer • 1x USB 2.0 pin header (2 ports) • 1x serial port pin header • CompactFlash socket
Rear I/O	• 2x RJ-45 LAN port • 2x USB 2.0 ports • 1x D-Sub VGA connector • 1x serial port connector • PS2 keyboard/mouse port (Mini-DIN 6-pin)
LEDs/Reset	• Power, IDE (CF) active , SATA active • Reset button
Expansion	• PCI-104 connector • SUMIT AB connectors

Display	
VGA	• GMA 4500MHD integrated in GM45 GMCH
CRT	• Dsub-15 connector, up to 2048x1536 (QXGA)
LVDS	• Single/dual channel 18/24-bit LVDS
Ethernet	
Controller	• Dual Intel® 82574L PCIe network controllers • 10/100/1000Base-T dual-Gigabit Ethernet • Wake on LAN supported
Ports	• 2x RJ-45 Ethernet port
Mechanical and Environment	
Form Factor	• EPIC size single board computer
Dimensions	• 165.1 mm x 114.3 mm (L x W)
Board Thickness	• 1.6mm (0.062")
Operating Temp.	• Standard: 0°C to 60°C • Extended: -20°C to 70°C
Storage Temp.	• -20ºC to 75ºC
Rel. Humidity	• 90% at 60°C
Shock	• 15G peak-to-peak, 11ms duration, non-operation
Vibration	• Non-operating : 1.88 Grms, 5-500 Hz, each axis • Operating : 0.5 Grms, 5-500 Hz, each axis
Certifications	• CE, FCC Class A

Table 1-1: ReadyBoard™ 850 General Specifications

1.4 Power Consumption

Intel® Core™2 Duo Processor P8400

Test Configuration	
CPU	Intel® Core™2 Duo Processor P8400, 2.26GHz
Memory	UNIGEN 2GB DDR3 1066MHz 204-pin UG12U6400M8SU-9B0002 x2
Graphics	GMA 4500MHD integrated in Intel® GM45 GMCH
SATA Channel 1	Seagate ST3160813AS Barracuda 7200.11 160GB
Power Supply	Zippy HP2-6460P 460W

DOS (idle)	
Power Req.	+12V
Current (A)	1.600
Watts (W)	19.20
Windows XP, Idle	
Power Req.	+12V
Current (A)	0.957
Watts (W)	11.48
Windows XP, KPower	
Power Req.	+12V
Current (A)	2.734
Watts (W)	32.81
Windows XP, 100% CPU Usage	
Power Req.	+12V
Current (A)	2.341
Watts (W)	28.09

Intel® Core™2 Duo Processor T7500

Test Configuration	
CPU	Intel® Core™2 Duo Processor T7500 , 2.20GHz
Memory	UNIGEN 2GB DDR3 1066MHz 204-pin UG12U6400M8SU-9B0002 x2
Graphics	GMA 4500MHD integrated in Intel® GM45 GMCH
SATA Channel 1	Seagate ST3160813AS Barracuda 7200.11 160GB
Power Supply	Zippy HP2-6460P 460W

DOS (idle)	
Power Req.	+12V
Current (A)	2.144
Watts (W)	25.73
Windows XP, Idle	
Power Req.	+12V
Current (A)	0.956
Watts (W)	11.47
Windows XP, KPower	
Power Req.	+12V
Current (A)	3.908
Watts (W)	46.90
Windows XP, 100% CPU Usage	
Power Req.	+12V
Current (A)	2.899
Watts (W)	34.79

Intel® Core™2 Duo Processor T3100

Test Configuration	
CPU	Intel® Celeron® Duo Processor T3100, 1.90GHz
Memory	UNIGEN 2GB DDR3 1066MHz 204-pin UG12U6400M8SU-9B0002 x2
Graphics	GMA 4500MHD integrated in Intel® GM45 GMCH
SATA Channel 1	Seagate ST3160813AS Barracuda 7200.11 160GB
Power Supply	Zippy HP2-6460P 460W

DOS (idle)	
Power Req.	+12V
Current (A)	1.570
Watts (W)	18.84
Windows XP, Idle	
Power Req.	+12V
Current (A)	0.997
Watts (W)	11.96
Windows XP, KPower	
Power Req.	+12V
Current (A)	2.489
Watts (W)	29.87
Windows XP, 100% CPU Usage	
Power Req.	+12V
Current (A)	2.093
Watts (W)	25.12

1.5 Cooling Requirements

The CPU, Graphics Memory Controller Hub (Northbridge), I/O Controller Hub (Southbridge), and voltage regulators are the main sources of heat on the board. The ReadyBoard 850 is designed to operate at its maximum CPU speed of 2.26GHz. The Northbridge and Southbridge require heatsinks, and the CPU requires a heatsink with a fan.

1.6 Block Diagram
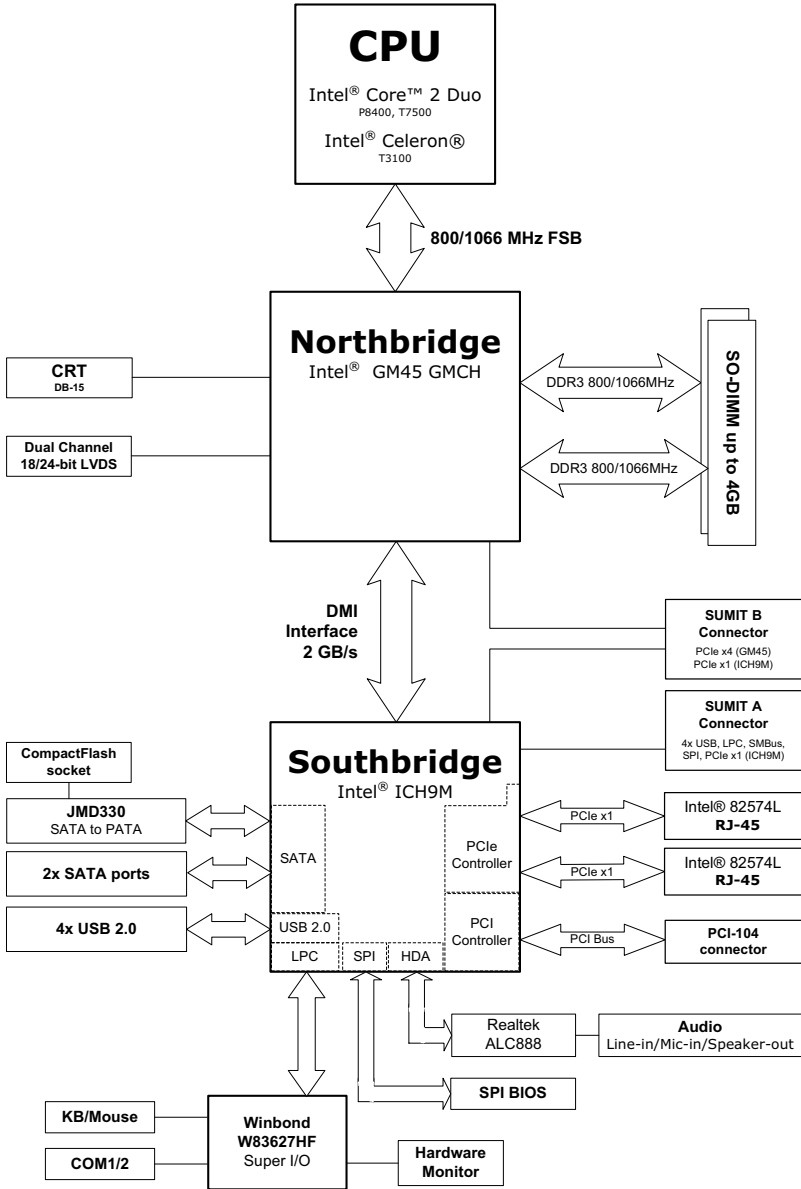
Figure 1-1: ReadyBoard™ 850 Block Diagram

1.7   Mechanical Drawing

Figure 1-2: ReadyBoard™ 850 Dimensions

1.8 Package Contents

Please check that your package contains the items below. If you discover damaged or missing items, please contact your vendor.

▶ ReadyBoard 850 EPIC SBC

▶ 1x active fansink

▶ 1x hardware kit

Optional Cable Kit:

▶ 2x SATA cable with power connector

▶ 1x GPIO cable

▶ 1x two-port USB cable

▶ 1x serial port cable

▶ 1x Y-cable for PS/2 Keyboard and Mouse

▶ 1x LVDS cable

▶ 1x audio cable

▶ 1x ATX power cable

▶ 1x power button / buzzer cable

WARNING:	**DO NOT** install or apply power to equipment that is damaged or if there is missing/incomplete equipment. Retain the shipping carton and packing materials for inspection. Please contact your ADLINK dealer/vendor immediately for assistance. Obtain authorization from your dealer before returning any product to ADLINK.

2   Hardware Information

2.1   Board Layout

J15   J27   J6   J26

J14

J21

JP3

SW1

JP2

JP5

J4

SATA2

J1

SATA1

J3

J5

J22

J19

J13

JP6   J11   J25   J8   JP4   J18   J16
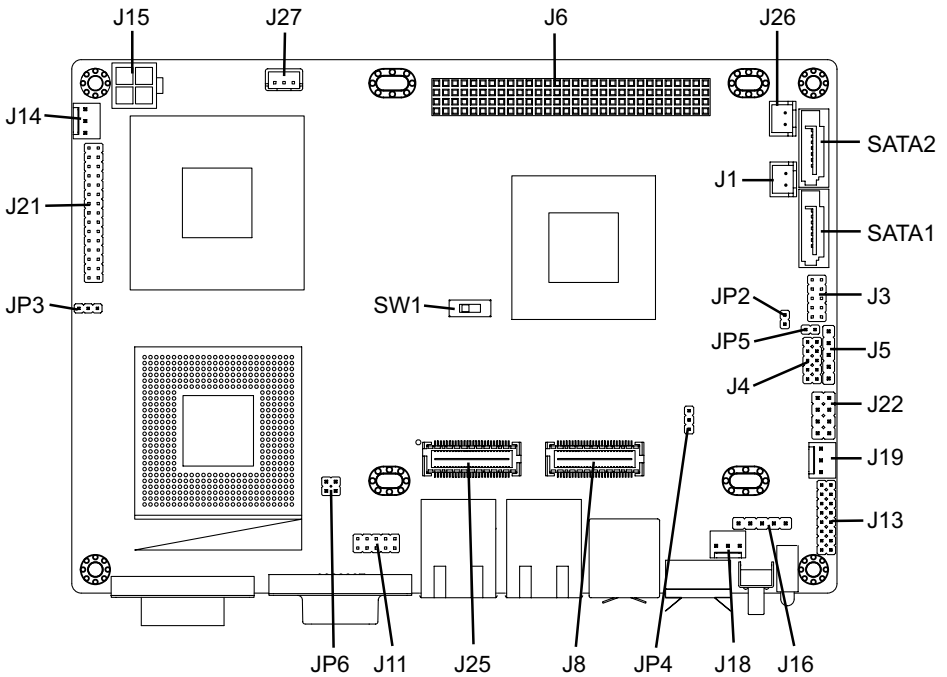
DIMM1/2, CF connectors on rear of board

Figure 2-1: ReadyBoard™ 850 Layout

J1, J26	SATA Power connector	J21	LCD LVDS pin header
J3	USB pin header	J22	SPI pin header
J4	GPIO pin header	J25	SUMIT-A connector
J5	IrDA pin header	J27	Vsb connector
J6	PCI-104 connector	JP2	Power On Mode jumper
J8	SUMIT-B connector	JP3	LCD voltage jumper
J11	COM2 pin header	JP4	CF voltage jumper
J13	Audio pin header	JP5	PC/104+ SERIRQ jumper
J14, J18, J19	Fan connectors	JP6	COM1-2 RS422/485 termination jumper
J15	ATX 12V connector	SATA1/2	SATA connectors
J16	System Panel pin header	SW1	Clear CMOS switch

Table 2-1: ReadyBoard™ 850 Board Layout Legend
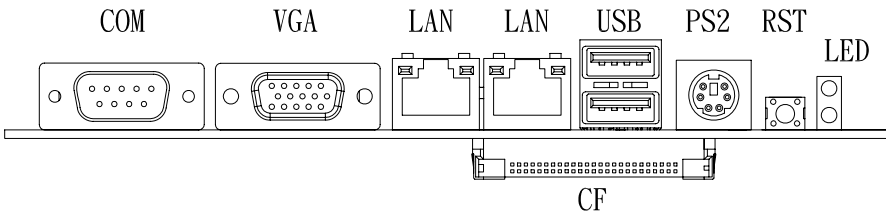
Figure 2-2: ReadyBoard™ 850 Rear I/O Layout

2.2   Rear I/O Connectors

COM DB-9 Serial Port Connector

Pin #	RS-232	RS-422/485
1	DCD	--
2	RXD	RX-
3	TXD	TX-
4	DTR	--
5	GND	--
6	DSR	--
7	RTS	TX+
8	CTS	RX+
9	RI	--
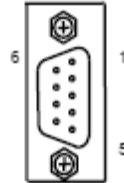
VGA Connector.

Signal Name	Pin #	Pin #	Signal Name
RED	1	9	NC
GREEN	2	10	GROUND
BLUE	3	11	NC
NC	4	12	DDCDAT
GROUND	5	13	HSYNC
GROUND	6	14	VSYNC
GROUND	7	15	DDCCLK
GROUND	8		
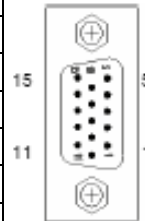
LAN (RJ-45) Ports

Pin #	10BASE-T/ 100BASE-TX	1000BASE-T
1	TX+	BI_DA+
2	TX-	BI_DA-
3	RX+	BI_DB+
4	--	BI_DC+
5	--	BI_DC-
6	RX-	BI_DB-
7	--	BI_DD+
8	--	BI_DD-
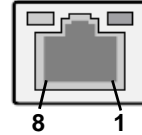
USB Connectors

Pin #	Signal Name
1	Vcc
2	USB-
3	USB+
4	GND
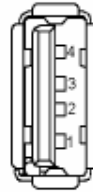
PS/2 Keyboard/Mouse Port

Pin #	Signal	Function
1	KBDAT	Keyboard Data
2	MSDAT	Mouse Data
3	GND	Ground
4	VCC5	Power
5	KBCLK	Keyboard Clock
6	MSCLK	Mouse Clock
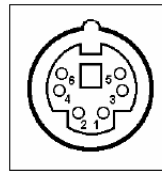
2.3 Onboard Connectors

SATA Power Connectors (J1, J26)

Pin #	Signal
1	VCC5
2	GND

USB Pin Header (J3)

Pin #	Signal	Pin #	Signal
1	+5V	2	+5V
3	USB0-	4	USB1-
5	USB0+	6	USB1+
7	GND	8	GND
9	NC	10	NC
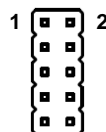
GPIO Pin Header (J4)

Pin #	Signal	Pin #	Signal
1	GND	2	VCC5
3	GPO0	4	GPO1
5	GPO2	6	GPO3
7	GPI0	8	GPI1
9	GPI2	10	GPI3
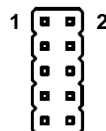
IrDA Pin Header (J5)

Pin #	Signal
1	VCC5
2	IRTX
3	CIR
4	IRRX
5	GND
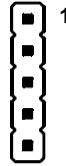
COM2 Pin Header (J11)

Pin #	RS-232	RS-422/485	Pin #	RS-232	RS-422/485
1	DCD	--	2	DSR	--
3	RX	RX-	4	RTS	TX+
5	TX	TX-	6	CTS	RX+
7	DTR	--	8	RI	--
9	GND	--	10	N/C	--
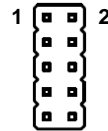
Audio Pin Header (J13)

Pin #	Signal	Pin #	Signal
1	NC	2	GND
3	NC	4	GND
5	Line out L	6	Line out R
7	GND	8	GND
9	Line in L	10	Line in R
11	GND	12	GND
13	GND	14	GND
15	MIC in	16	GND
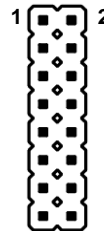
Fan Connectors (J14, J18, J19)

Pin #	Signal
1	Fan Speed Detect
2	Fan Power (+12V)
3	GND

ATX 12V Power Connector (J15)

Pin #	Signal
1	GND
2	GND
3	+12V
4	+12V
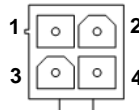
System Panel Pin Header (J16)

Pin #	Signal
1	PS_ON
2	GND
3	RESET
4	VCC5
5	SPEAKER
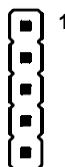
LVDS Pin Header (J21))

Pin #	Signal	Pin #	Signal
1	VCC12	2	VCCLCD
3	GND	4	GND
5	LVDSBCLK+	6	LVDSBCLK-
7	LVDSB3+	8	LVDSB3-
9	LVDSB2+	10	LVDSB2-
11	LVDSB1+	12	LVDSB1-
13	LVDSB0+	14	LVDSB0-
15	LCDBKTCT	16	LCDEN
17	LVDSACLK+	18	LVDSACLK-
19	LVDSA3+	20	LVDSA3-
21	LVDSA2+	22	LVDSA2-
23	LVDSA1+	24	LVDSA1-
25	LVDSA0+	26	LVDSA0-
27	DDCLK	28	DDCDATA
29	LCDBKLEN	30	NC
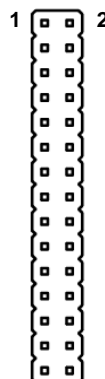
SPI Pin Header (J22)

Pin #	Signal	Pin #	Signal
1	SPI POWER	2	GND
3	SPI_CS#	4	SPI_CLK
5	SPI_SO	6	SPI_SI
7	NC	8	NC
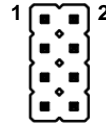
Vsb Connector (J27))

Pin #	Signal
1	5Vsb
2	GND
3	PS_ON#
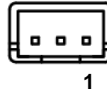
SATA Connectors (SATA1/2)

Pin #	Signal
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND
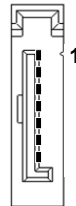
2.4   Jumpers

Power On Mode Setup (JP2)

Setting	Description
Short	ATX
Open	AT (default)

LCD Voltage Setup (JP3)

Setting	Description
1-2 Short	3.3V (default)
2-3 Short	5V

CF Voltage Setup (JP4)

Setting	Description
1-2 Short	3.3V
2-3 Short	5V (default)

PC/104+ SERIRQ (Serial IRQ) (JP5)

Setting	Description
Short	Enabled
Open	Disabled (default)

Use the SERIRQ jumper to enable ISA interrupts on pin B1 of the PCI-104 connector (e.g. when using the MiniModule™ ISA). For full PCI-104 compatibility, the jumper should be set "open" (default).

COM1/COM2 RS422/485 Termination (JP6)

Setting	Description
1-2 Short	COM1: Termination
1-2 Open	COM1: No Termination (default)
3-4 Short	COM2: Termination
3-4 Open	COM2: No Termination (default)

2 4

1 3

Clear CMOS Switch (SW1)

Setting	Description
1-2 Short	Normal (default)
2-3 Short	Clear CMOS

1

3 BIOS Setup

The following chapter describes basic navigation for the AMIBIOS®8 BIOS setup utility.

3.1 Starting the BIOS

To enter the setup screen, follow these steps:

1. Power on the motherboard

2. Press the < Delete > key on your keyboard when you see the following text prompt:
   < Press DEL to run Setup >

3. After you press the < Delete > key, the main BIOS setup menu displays. You can access the other setup screens from the main BIOS setup menu, such as Chipset and Power menus.

Note: In most cases, the < Delete > key is used to invoke the setup screen. There are several cases that use other keys, such as < F1 >, < F2 >, and so on.

Setup Menu

The main BIOS setup menu is the first screen that you can navigate. Each main BIOS setup menu option is described in this user's guide.

The Main BIOS setup menu screen has two main frames. The left frame displays all the options that can be configured. "Grayed" options cannot be configured, "Blue" options can be.

The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

```
                         BIOS SETUP UTILITY
 Main      Advanced     PCIPnP     Boot    Security    Chipset     Exit

  System Overview                              Use [ENTER], [TAB]
 ─────────────────────────────────────        or [SHIFT-TAB] to
  AMIBIOS                                      select a field.
  Version    :08.00.16
  Build Date:08/20/10                          Use [+] or [-] to
  ID         :RB850A11                         configure system Time.

  Processor

  Speed      :255MHz
  Count      :255

  System Memory                                ←     Select Screen
  Size       :2013MB                           ↑↓    Select Item
                                               +-    Change Field
  System Time          [22:00:46]              Tab   Select Field
  System Date          [Sun 01/06/2002]        F1    General Help
                                               F10   Save and Exit
                                               ESC   Exit


          v02.66 (C)Copyright 1985-2009, American Megatrends, Inc.
```

Navigation

The BIOS setup/utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process.

These keys include < F1 >, < F10 >, < Enter >, < ESC >, < Arrow > keys, and so on. .
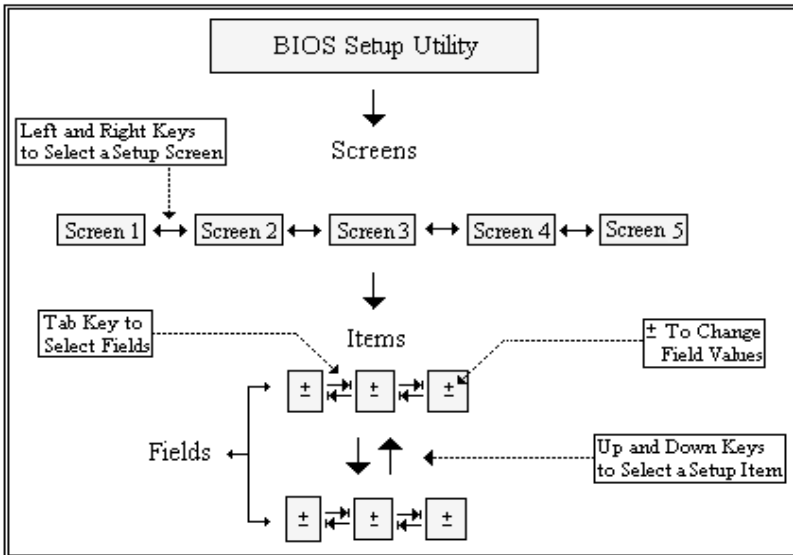
Note: There is a hot key legend located in the right frame on most setup screens.

The < F8 > key on your keyboard is the Fail-Safe key. It is not displayed on the key legend by default. To set the Fail-Safe settings of the BIOS, press the < F8 > key on your keyboard. It is located on the upper row of a standard 101 keyboard. The Fail-Safe settings allow the motherboard to boot up with the least amount of options set. This can lessen the probability of conflicting settings.

Hotkey Descriptions

F1 The < F1 > key allows you to display the General Help screen.

Press the < F1 > key to open the General Help screen.

```
General Help

↔       Select Screen            ↓↑      Select Item
+ –     Change Screen            Enter   Go to Sub Screen
PGDN    Next Page                PGUP    Previous Page
Home    Go to Top of the Screen  End     Go to Bottom of Screen
F2/F3   Change Colors            F7      Discard Changes
F8      Load Failsafe Defaults   F9      Load Optimal Defaults
F10     Save and Exit            ESC     Exit

                        [Ok]
```

F10   The < F10 > key allows you to save any changes you have made and exit Setup. Press the < F10 > key to save your changes. The following screen will appear:

```
              Save configuration changes and exit now?

                  [Ok]            [Cancel]
```

Press the < Enter > key to save the configuration and exit. You can also use the < Arrow > key to select Cancel and then press the < Enter > key to abort this function and return to the previous screen.

ESC   The < Esc > key allows you to discard any changes you have made and exit the Setup. Press the < Esc > key to exit the setup without saving your changes. The following screen will appear:

```
              Discard changes and exit setup now?

                  [Ok]            [Cancel]
```

Press the < Enter > key to discard changes and exit. You can also use the < Arrow > key to select Cancel and then press the < Enter > key to abort this function and return to the previous screen.

Enter   The < Enter > key allows you to display or change the setup option listed for a particular setup item. The < Enter > key can also allow you to display the setup sub-screens.

3.2 Main Setup

When you first enter the Setup Utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab. There are two Main Setup options. They are described in this section. The Main BIOS Setup screen is shown below.
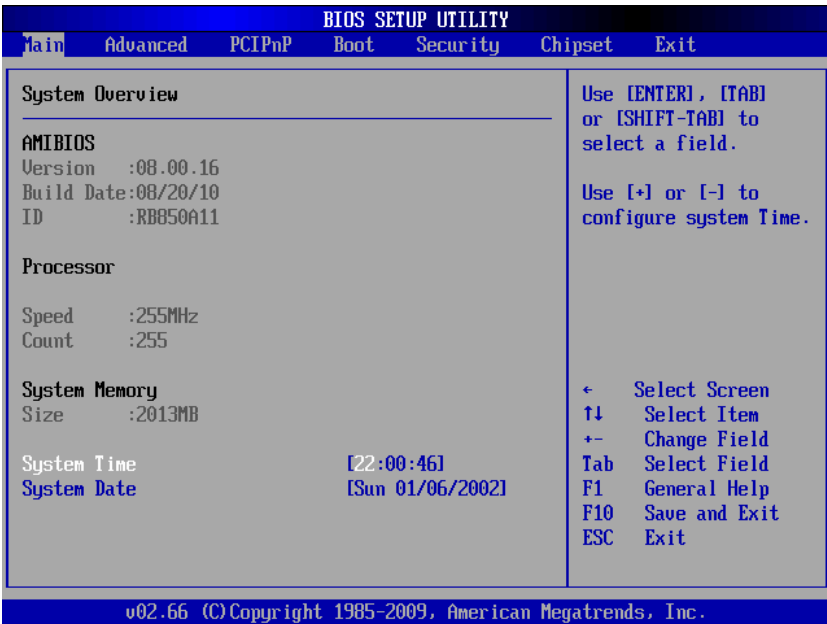
System Time/System Date

Use this option to change the system time and date. Highlight System Time or System Date using the < Arrow > keys. Enter new values using the keyboard. Press the < Tab > key or the < Arrow > keys to move between fields. The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format.

Note: The time is in 24-hour format. For example, 5:30 A.M. appears as 05:30:00, and 5:30 P.M. as 17:30:00.

3.3 Advanced BIOS Setup

Select the Advanced tab from the setup screen to enter the Advanced BIOS Setup screen. You can select any of the items in the left frame of the screen, such as SuperIO Configuration, to go to the sub menu for that item. You can display an Advanced BIOS Setup option by highlighting it using the < Arrow > keys. The Advanced BIOS Setup screen is shown below.

The sub menus are described on the following pages.

```
                         BIOS SETUP UTILITY
   Main    Advanced    PCIPnP    Boot    Security    Chipset    Exit

   Advanced Settings                                  Configure CPU.

   WARNING: Setting wrong values in below sections
            may cause system to malfunction.

   ▶ CPU Configuration
   ▶ IDE Configuration
   ▶ Video Function Configuration
   ▶ SuperIO Configuration
   ▶ Hardware Health Configuration
   ▶ USB Configuration
   ▶ ACPI Configuration                               ←     Select Screen
   ▶ AHCI Configuration                               ↑↓    Select Item
   ▶ Remote Access Configuration                      Enter Go to Sub Screen
                                                      F1    General Help
                                                      F10   Save and Exit
                                                      ESC   Exit

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```

CPU Configuration

You can use this screen to select options for the CPU Configuration Settings. Use the up and down < Arrow > keys to select an item. Use the < + > and < - > keys to change the value of the selected option. A description of the selected item appears on the right side of the screen. The settings are described on the following pages. An example of the CPU Configuration screen is shown below.

```
                        BIOS SETUP UTILITY
         Advanced

  Configure advanced CPU settings            For UP platforms,
  Module Version:3F.19                       leave it enabled.
                                             For DP/MP servers,
  Manufacturer:Intel                         it may use to tune
                                             performance to the
  Frequency    :255MHz                       specific application.
  FSB Speed    :800MHz
  Cache L1     :0 KB
  Cache L2     :0 KB
  Ratio Actual Value:12

  Hardware Prefetcher          [Enabled]
  Adjacent Cache Line Prefetch [Enabled]     ←    Select Screen
  Max CPUID Value Limit        [Disabled]    ↑↓   Select Item
  Intel(R) Virtualization Tech [Enabled]     +-   Change Option
  Execute-Disable Bit Capability [Enabled]   F1   General Help
  Core Multi-Processing        [Enabled]     F10  Save and Exit
  Intel(R) SpeedStep(tm) tech  [Enabled]     ESC  Exit
  Intel(R) C-STATE tech        [Enabled]
  Enhanced C-States            [Enabled]

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```

Hardware Prefetcher

When enabled, the processor's hardware prefetcher will be enabled and allowed to automatically prefetch data and code for the processor. When disabled, the processor's hardware prefetcher will be disabled.

Adjacent Cache Line Prefetch

When enabled, the processor will retrieve the currently requested cache line, as well as the subsequent cache line. When disabled, the processor will only retrieve the currently requested cache line.

Max CPUID Value Limit

When enabled, allows legacy operating systems to support processers with extended CPUID functions.

Intel(R) Virtualization Tech

Intel Virtualization Technology is a set of platform features that support virtualization of platform hardware and multiple software environmentss. When enabled, it offers data center managers the ability to consolidate multiple workloads on one physical server system.

Execute-Disable Bit Capability

Intel's Execute Disable Bit functionality can help prevent certain classes of malicious buffer overflow attacks when combined with a supporting operating system. Execute Disable Bit allows the processor to classify areas in memory by where application code can execute and where it cannot. When a malicious worm attempt to insert code in the buffer, the processor disables code execution, preventing damage and worm propagation.

Core Multi-Processing

This item enables/disables multi-core processing functionality for multi-core processors.

Intel Speedstep Tech

Intel SpeedStep technology allows the system to dynamically adjust processor voltage and core frequency, which can result in decreased average power consumption and decreased average heat production.

Intel C-State Technology

This function controls the availability of the CPU C-state power saving technology.

Enhanced C-States

This function controls the availability of the CPU Enhanced C-States.

IDE Configuration

You can use this screen to select options for the IDE Configuration Settings. Use the up and down < Arrow > keys to select an item. Use the < + > and < - > keys to change the value of the selected option. A description of the selected item appears on the right side of the screen. The settings are described on the following pages. An example of the IDE Configuration screen is shown below.

```
                      BIOS SETUP UTILITY
    Advanced

 IDE Configuration                              Options

 SATA#1 Configuration      [Compatible]     Disabled
    Configure SATA#1 as    [IDE]            Compatible
 SATA#2 Configuration      [Enhanced]       Enhanced

 ▶ Primary IDE Master      : [Not Detected]
 ▶ Primary IDE Slave       : [Not Detected]
 ▶ Secondary IDE Master    : [Not Detected]
 ▶ Secondary IDE Slave     : [Not Detected]
 ▶ Third IDE Master        : [Not Detected]
 ▶ Fourth IDE Master       : [Not Detected]
                                         ←    Select Screen
                                         ↑↓   Select Item
 Hard Disk Write Protect   [Disabled]     +-   Change Option
 IDE Detect Time Out (Sec) [35]           F1   General Help
                                          F10  Save and Exit
                                          ESC  Exit


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```

SATA#1 Configuration

This item specifies whether the SATA#1 is initialized in Compatible or Enhanced mode of operation. The settings are **Disabled**, **Compatible** and **Enhanced** (default: Compatible).

Configure SATA#1 as

This item specifies whether the SATA#1 support IDEs or AHCI operation. The settings are IDE and AHCI (default: IDE).

SATA#2 Configuration

This item specifies whether the SATA#2 is initialized in Enhanced mode or **Disabled** (default: Enhanced).

Hard Disk Write Protect

Set this option to protect the hard disk drive from being over-written. The Optimal and Fail-Safe default setting is Disabled.

IDE Detect Time Out (Sec)

Set this option to stop the AMIBIOS from searching for IDE devices within the specified number of seconds. Basically, this allows you to fine-tune the settings to allow for faster boot times. Adjust this setting until a suitable timing that can detect all IDE disk drives attached is found.

Video Function Configuration

You can use this screen to select options for the Video Function Configuration settings. Use the up and down < Arrow > keys to select an item. Use the < + > and < - > keys to change the value of the selected option. The settings are described on the following pages. The screen is shown below.

```
                        BIOS SETUP UTILITY
        Advanced

 Video Function Configuration                          Options

 Boot Display Device          [CRT]              CRT
 Flat Panel Type              [1024x768 1x18]    LVDS
                                                 CRT + LVDS




                                                 ←     Select Screen
                                                 ↑↓    Select Item
                                                 +-    Change Option
                                                 F1    General Help
                                                 F10   Save and Exit
                                                 ESC   Exit


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```
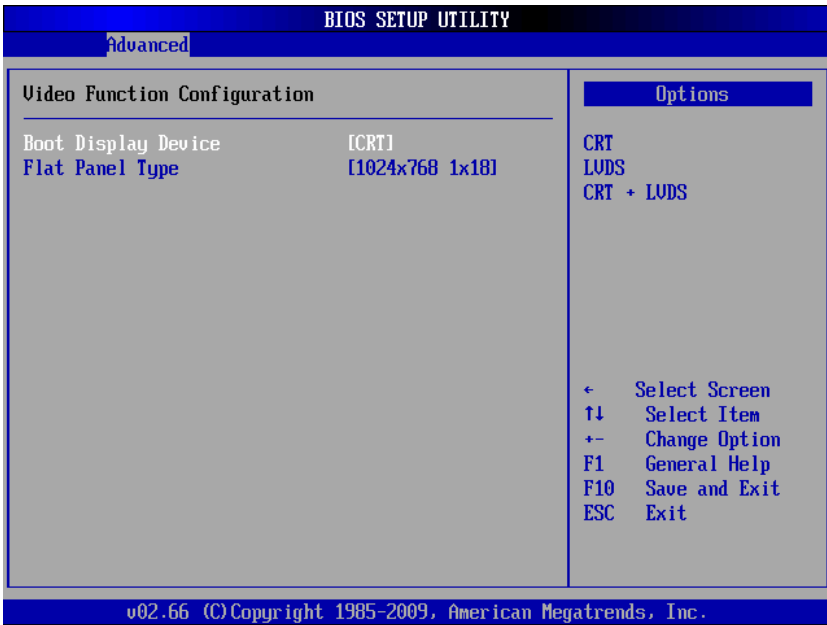
Boot Display Device

This item allows the user to configure the type of external display used. Options: CRT (default), LVDS, CRT+LVDS.

Flat Panel Type

When LVDS is selected in Boot Display Device, this option allows you to select resolution settings for correct timing to the LVDS interface you want to use. The supported resolutions are: 640x480 1x18-bit, 800x600 1x18-bit, 1024x768 1x18-bit, 1024x768 1x24-bit.

Super IO Configuration

You can use this screen to select options for the Super IO settings. Use the up and down < Arrow > keys to select an item. Use the < + > and < - > keys to change the value of the selected option. The settings are described on the following pages. The screen is shown below.

```
                         BIOS SETUP UTILITY
       Advanced

 Configure Win627 Super IO Chipset             Allows BIOS to Select
 ─────────────────────────────────             Serial Port1 Base
 Serial Port1 Address        [3F8/IRQ4]        Addresses.
 Serial Port2 Address        [Disabled]

 COM Port RS485 Support      [By each setting]
 Serial Port1 Communicatioin [RS232]
 Serial Port2 Communicatioin [RS232]


                                               ←     Select Screen
                                               ↑↓    Select Item
                                               +-    Change Option
                                               F1    General Help
                                               F10   Save and Exit
                                               ESC   Exit


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```

Serial Port1/2 Address

This option specifies the base I/O port address and Interrupt Request address of serial ports 1 and 2. Options: 3F8/IRQ4, 3E8/IRQ4, 2F8/IRQ3, 2E8/IRQ3, Disabled.

COM Port RS485 Support

Set this value to "All enabled" to allow all serial ports to use RS485. Set to "By each setting" for RS232/422 mode according to the options below.

Serial Port1/2 Communication

Set this value to allow serial ports 1 and 2 to use RS422 or RS232 mode. Default setting is RS232.

Hardware Health Configuration

This option displays the current status of all of the monitored hardware devices/components such as voltages and temperatures. The options are Enabled and Disabled.

```
                      BIOS SETUP UTILITY
   Advanced

Hardware Health Configuration                      Enables Hardware
                                                   Health Monitoring
H/W Health Function            [Enabled]           Device.

Hardware Health Event Monitoring

System Temperature            :39°C/102°F
CPU Temperature               :52°C/125°F

Fan1 Speed                    :8881 RPM

Vcore                         :1.258 V
+1.5V                         :1.516 V
+3.3Vin                       :3.387 V            ←    Select Screen
+12Vin                        :12.099 V           ↑↓   Select Item
VBAT                          :3.274 V            +-   Change Option
                                                   F1   General Help
                                                   F10  Save and Exit
                                                   ESC  Exit


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```

USB Configuration

You can use this screen to select options for the USB Configuration. Use the up and down < Arrow > keys to select an item. Use the < + > and < - > keys to change the value of the selected option. The settings are described on the following pages. The screen is shown below.

```
                         BIOS SETUP UTILITY
    Advanced

   USB Configuration                                Enables support for
                                                    legacy USB. AUTO
   Module Version - 2.24.3-13.4                     option disables
                                                    legacy support if
   USB Devices Enabled :                            no USB devices are
     1 Drive                                        connected.

   Legacy USB Support            [Enabled]
   Port 64/60 Emulation          [Disabled]
   USB 2.0 Controller Mode       [HiSpeed]
   BIOS EHCI Hand-Off            [Enabled]

   ▶ USB Mass Storage Device Configuration          ←    Select Screen
                                                    ↑↓    Select Item
                                                    +-    Change Option
                                                    F1    General Help
                                                    F10   Save and Exit
                                                    ESC   Exit

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```
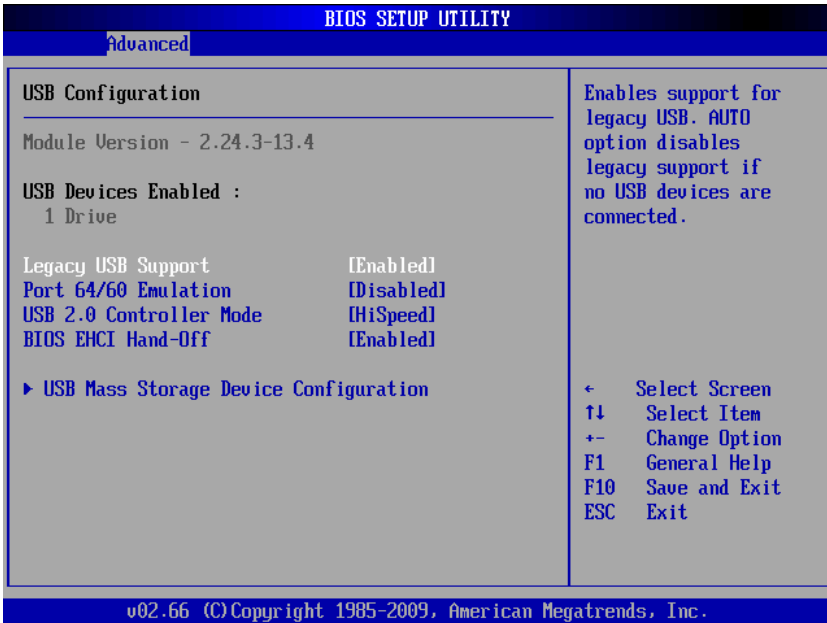
Legacy USB Support

Legacy USB Support refers to USB mouse and keyboard support. Normally if this option is not enabled, any attached USB mouse or USB keyboard will not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there are no USB drivers loaded on the system. Set this value to enable or disable the Legacy USB Support.

- ▶ **Disabled:** Set this value to prevent the use of any USB device in DOS or during system boot.
- ▶ **Enabled:** Set this value to allow the use of USB devices during boot and while using DOS.
- ▶ **Auto:** This option auto detects USB Keyboards or Mice and if found, allows them to be utilized during boot and while using DOS.

Port 64/60 Emulation

This option uses USB to receive the IO port 64/60 trap to emulate the legacy keyboard controller.

USB 2.0 Controller Mode

The USB 2.0 Controller Mode configures the data rate of the USB port. The options are FullSpeed (12 Mbps) and HiSpeed (480 Mbps).

BIOS EHCI hand-off

This option provides a workaround for operating systems without ECHI hand-off support. The EHCI ownership change should claim by EHCI driver.

USB Mass Storage Device Configuration

This is a submenu for configuring the USB Mass Storage Class Devices when BIOS finds they are in use on the USB ports. Emulation Type can be set according to the type of attached USB mass storage device(s). If set to Auto, USB devices less than 530MB will be emulated as Floppy and those greater than 530MB will remain as hard drive. The Forced FDD option can be used to force a hard disk type drive (such as a Zip drive) to boot as FDD.

```
                      BIOS SETUP UTILITY
        Advanced

 USB Mass Storage Device Configuration       Number of seconds
 ───────────────────────────────────         POST waits for the
 USB Mass Storage Reset Delay   [20 Sec]      USB mass storage
                                              device after start
    Device #1          Generic- Multi-Card  MΦ  unit command.
    Emulation Type              [Auto]


                                              ←    Select Screen
                                              ↑↓   Select Item
                                              +-   Change Option
                                              F1   General Help
                                              F10  Save and Exit
                                              ESC  Exit


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```

ACPI Configuration

You can use this screen to select options for the ACPI Configuration settings. Use the up and down < Arrow > keys to select an item. Use the < + > and < - > keys to change the value of the selected option. The settings are described on the following pages. The screen is shown below.
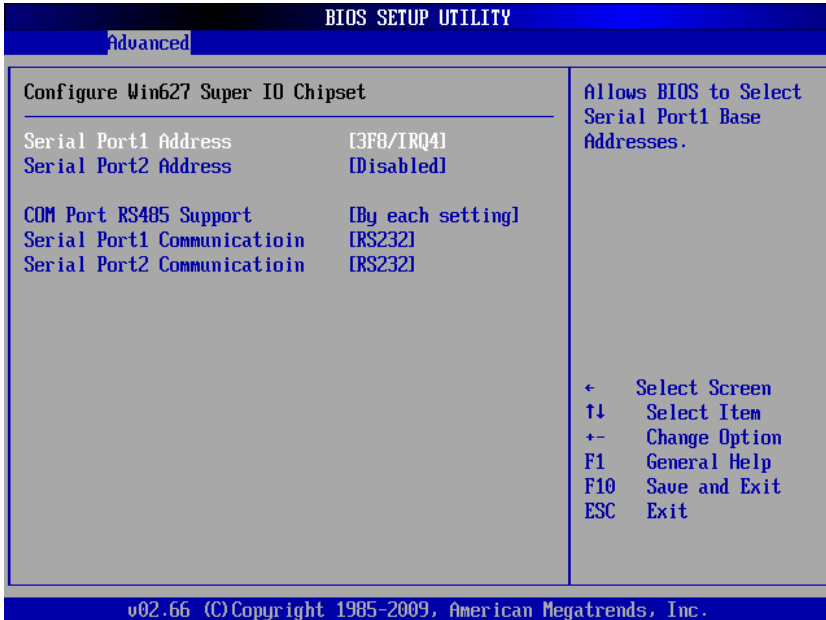
```
                        BIOS SETUP UTILITY
   Advanced

 ACPI Settings                                    General ACPI
                                                  Configuration settings
 ▶ General ACPI Configuration
   USB Device Wakeup From S3/S4    [Disabled]
   Restore on AC Power Loss        [Power Off]




                                                  ←    Select Screen
                                                  ↑↓   Select Item
                                                  Enter Go to Sub Screen
                                                  F1   General Help
                                                  F10  Save and Exit
                                                  ESC  Exit


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```
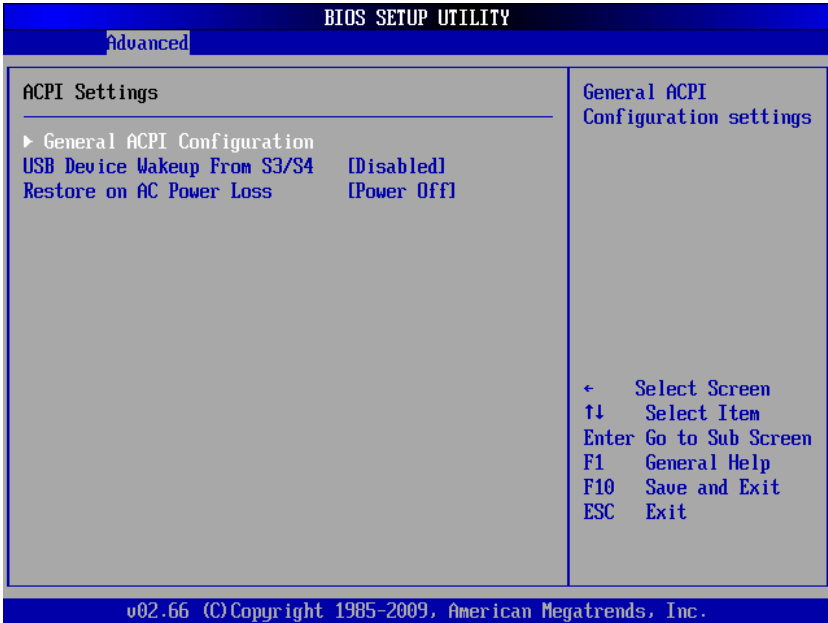
USB Device Wakeup From S3/S4

This item allows you to enable or disable the "USB Device Wakeup From S3/S4" function. Default setting is disabled.

Restore on AC Power Loss

Determines which state the computer enters when AC power is restored after a power loss. The options for this value are Last State, Power On and Power Off.

▶ **Power Off:** Set this value to always power off the system while AC power is restored.

▶ **Power On:** Set this value to always power on the system while AC power is restored.

▶ **Last State:** Set this value to power off/on the system depending on the last system power state while AC power is restored.

General ACPI Configuration

```
                      BIOS SETUP UTILITY
      Advanced

 General ACPI Configuration                          Select the ACPI
 ─────────────────────────────────────────           state used for
 Suspend mode                  [Auto]                 System Suspend.
 Repost Video on S3 Resume     [No]




                                                 ←    Select Screen
                                                 ↑↓   Select Item
                                                 +-   Change Option
                                                 F1   General Help
                                                 F10  Save and Exit
                                                 ESC  Exit


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```
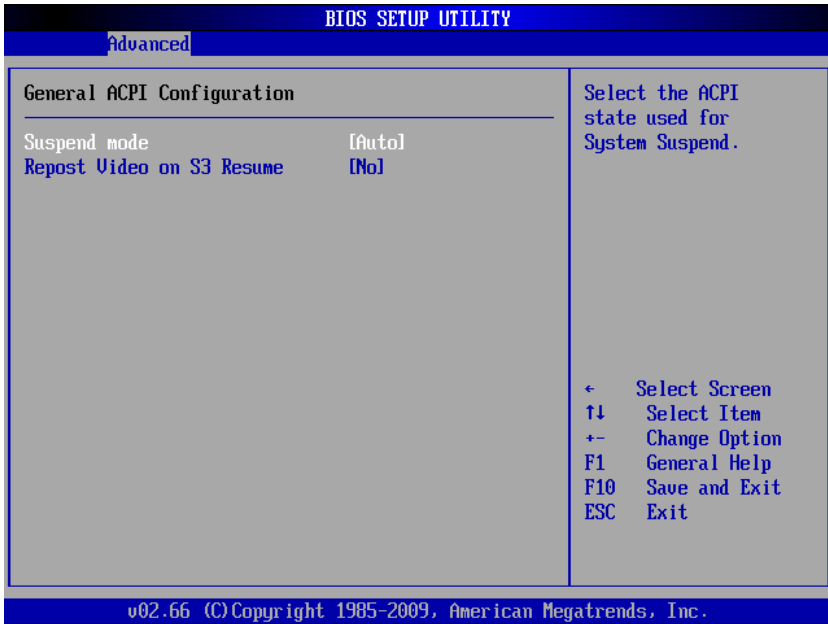
Suspend Mode

Select this value to allow ACPI state support. Auto will decide by OS. Select S1(POS) to force the system to enter Power on Suspend. Select S3(STR) to force the system to enter Suspend to RAM. Default setting is Auto.

Repost Video on S3 Resume

Set this value to allow video repost support. The default setting is Yes.

AHCI Configuration

You can use this screen to select options for the AHCI Configuration settings. Use the up and down < Arrow > keys to select an item. Use the < + > and < - > keys to change the value of the selected option. The settings are described on the following pages. The screen is shown below.

```
                        BIOS SETUP UTILITY
        Advanced

 AHCI Settings                                    Enables for supporting
                                                  AHCI controller
 AHCI BIOS Support          [Enabled]             operates in AHCI mode
                                                  during BIOS control
                                                  otherwise operates in
 ▶ AHCI Port0 [Not Detected]                      IDE mode.
 ▶ AHCI Port1 [Not Detected]
 ▶ AHCI Port2 [Not Detected]
 ▶ AHCI Port3 [Not Detected]
 ▶ AHCI Port4 [Not Detected]
 ▶ AHCI Port5 [Not Detected]

                                                  ←    Select Screen
                                                  ↑↓   Select Item
                                                  +-   Change Option
                                                  F1   General Help
                                                  F10  Save and Exit
                                                  ESC  Exit

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```
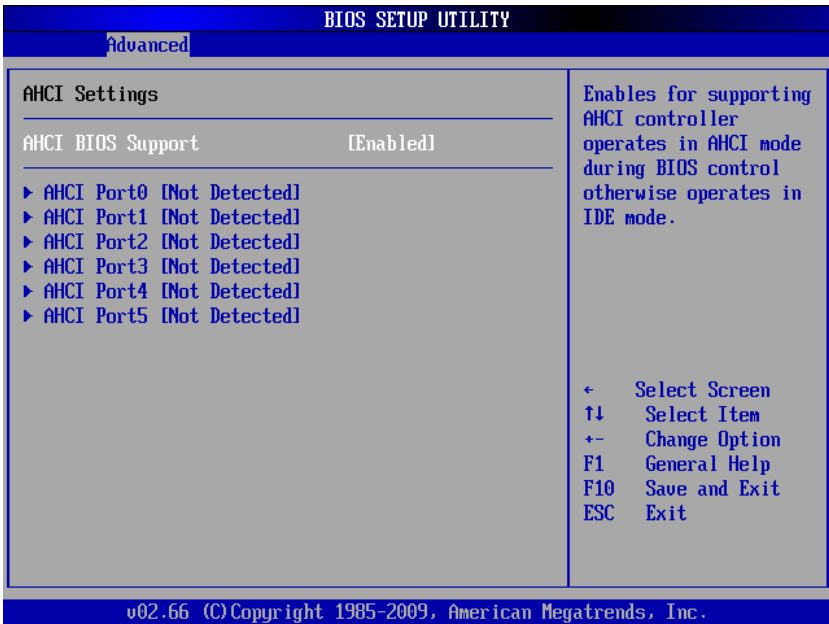
AHCI BIOS Support

Allows the AHCI controller to operate in AHCI mode during BIOS control. Otherwise operates in IDE mode.

AHCI Port 0/1/2/3/4/5

Displays the SATA drives installed on AHCI channels. Shows None if no drive installed.

Remote Access Configuration

Remote access configuration provides the settings to allow remote access by another computer to get POST messages and send commands through serial port access.

```
                          BIOS SETUP UTILITY
        Advanced

 Configure Remote Access type and parameters          Select Remote Access
                                                       type.
 Remote Access                 [Enabled]

 Serial port number            [COM1]
     Base Address, IRQ         [3F8h, 4]
 Serial Port Mode              [115200 8,n,1]
 Flow Control                  [None]
 Redirection After BIOS POST   [Always]
 Terminal Type                 [ANSI]
 VT-UTF8 Combo Key Support     [Enabled]
 Sredir Memory Display Delay   [No Delay]
                                                   ←    Select Screen
                                                   ↑↓   Select Item
                                                   +-   Change Option
                                                   F1   General Help
                                                   F10  Save and Exit
                                                   ESC  Exit

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```

Remote Access

Select this option to **Enable** or **Disable** the BIOS remote access feature.

> **NOTE:** Enabling Remote Access requires a dedicated serial port connection. Once both serial ports are configured to disabled, you should set this value to Disabled or it may cause abnormal boot.

Serial Port Number

Select the serial port you want to use for the remote access interface. You can set the value for this option to **COM1** or **COM2**.

> **NOTE:** If you have changed the resource assignment of the serial ports in Advanced> SuperIO Configuration, you must Save Changes and Exit, reboot the system, and enter the setup menu again in order to see those changes reflected in the Remote Access options.

Serial Port Mode

Select the baud rate you want the serial port to use for console redirection. The options are **115200 8,n,1**; **57600 8,n,1**; **19200 8,n,1**; and **09600 8,n,1**.

Flow Control

Set this option to select Flow Control for console redirection. The settings for this value are **None**, **Hardware**, or **Software**.

Redirection After BIOS POST

This option allows you to set Redirection configuration after BIOS POST. The settings for this value are **Disabled**, **Boot Loader**, or **Always**.

▶ **Disabled:** Set this value to turn off the redirection after POST

▶ **Boot Loader:** Set this value to allow the redirection to be active during POST and Boot Loader.

▶ **Always:** Set this value to allow the redirection to be always active.

Terminal Type

This option is used to select either VT100/VT-UTF8 or ANSI terminal type. The settings for this value are **ANSI**, **VT100**, or **VT-UTF8**.

VT-UTF8 Combo Key Support

This option enables VT-UTF8 Combination Key Support for ANSI/VT100 terminals. The settings for this value are **Enabled** and **Disabled**.

Sredir Memory Display Delay

This option gives the delay in seconds to display memory information. The options for this value are **No Delay**, **Delay 1 Sec**, **Delay 2 Sec**, or **Delay 4 Sec**.

3.4 Advanced PCI/PnP Settings

Select the PCI/PnP tab from the setup screen to enter the Plug and Play BIOS Setup screen. You can display a Plug and Play BIOS Setup option by highlighting it using the < Arrow > keys. The Plug and Play BIOS Setup screen is shown below.

```
                         BIOS SETUP UTILITY
   Main    Advanced   PCIPnP    Boot    Security   Chipset    Exit

  Advanced PCI/PnP Settings                        ▲   Clear NVRAM during
                                                       System Boot.
  WARNING: Setting wrong values in below sections
           may cause system to malfunction.

  Clear NVRAM                    [No]
  Plug & Play O/S                [No]
  PCI Latency Timer              [64]
  Allocate IRQ to PCI VGA        [Yes]
  Palette Snooping               [Disabled]
  PCI IDE BusMaster              [Enabled]
  OffBoard PCI/ISA IDE Card      [Auto]

  IRQ3                           [Available]
  IRQ4                           [Available]
  IRQ5                           [Available]
  IRQ7                           [Available]
  IRQ9                           [Available]
  IRQ10                          [Available]
  IRQ11                          [Available]   ▼
  IRQ14                          [Available]
  IRQ15                          [Available]

  DMA Channel 0                  [Available]   ←     Select Screen
  DMA Channel 1                  [Available]   ↑↓    Select Item
  DMA Channel 3                  [Available]   +-    Change Option
  DMA Channel 5                  [Available]   F1    General Help
  DMA Channel 6                  [Available]   F10   Save and Exit
  DMA Channel 7                  [Available]   ESC   Exit

  Reserved Memory Size           [Disabled]    ▼

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```

Clear NVRAM

Set this to enable/disable Clear NVRAM during system boot. The default setting is *No*.

Plug & Play O/S

▶ **No:** Let the BIOS configure all the devices in the system (default).

▶ **Yes:** Let the operating system configure Plug and Play (PnP) devices not required for boot if your system has a Plug and Play operating system.

PCI Latency Timer

Value in units of PCI clocks for the PCI device latency timer register. The default setting is *64*.

Allocate IRQ to VGA

Set this value to allow or restrict the system from giving the VGA adapter card an interrupt address. The default setting is Yes.

Palette Snooping

Set this value to allow the system to modify the Palette Snooping settings. The default setting is Disabled.

PCI IDE BusMaster

Set this value to allow or prevent the use of PCI IDE bus mastering. The default setting is Disabled.

OffBoard PCI/ISA IDE Card

Set this value to allow the OffBoard PCI/ISA IDE Card to be selected. The default setting is Auto.

IRQ/DMA Channel

Set this value to allow the IRQ/DMA channel settings to be modified.

▶ **Available:** This setting allows the specified IRQ/DMA channel to be used by a PCI/PnP device.

▶ **Reserved:** This setting allows the specified IRQ/DMA channel to be used by a legacy ISA device.

Reserved Memory Size

Set this value to allow the system to reserve memory that is used by ISA devices. The default setting is Disabled.

3.5 Boot Settings

Select the Boot tab from the setup screen to enter the Boot BIOS Setup screen. You can select any of the items in the left frame of the screen, such as Boot Device Priority, to go to the sub menu for that item. You can display a Boot BIOS Setup option by highlighting it using the < Arrow > keys.

The Boot Settings screen is shown below:

```
                      BIOS SETUP UTILITY
 Main     Advanced     PCIPnP    Boot    Security    Chipset     Exit

 Boot Settings                                     Configure Settings
                                                   during System Boot.
 ▶ Boot Settings Configuration

 ▶ Boot Device Priority
 ▶ Removable Drives

                                                   ←     Select Screen
                                                   ↑↓    Select Item
                                                   Enter Go to Sub Screen
                                                   F1    General Help
                                                   F10   Save and Exit
                                                   ESC   Exit

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```
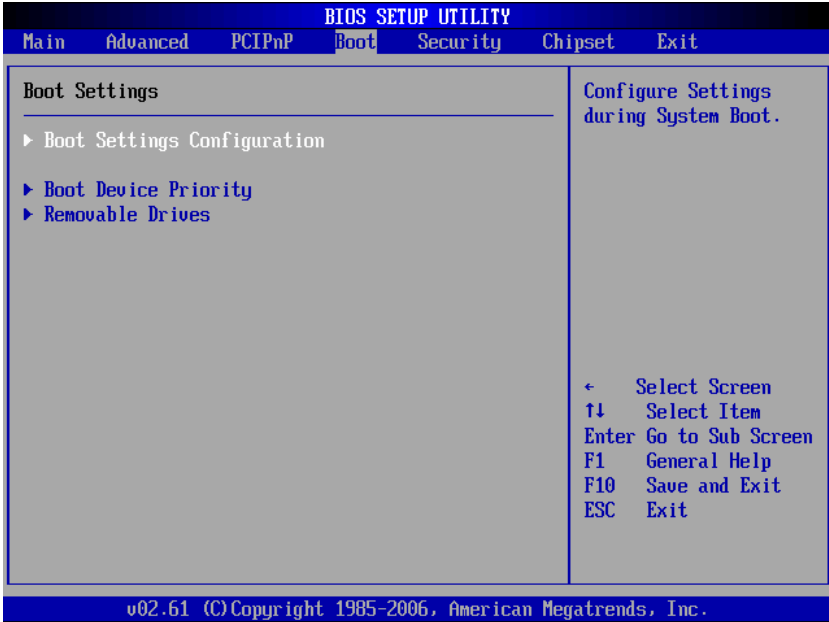
Boot Settings Configuration

Use this screen to select options for the Boot Settings Configuration. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option. The settings are described on the following pages. The screen is shown below.

```
                          BIOS SETUP UTILITY
                          Boot

 Boot Settings Configuration                    Allows BIOS to skip
 ──────────────────────────                     certain tests while
 Quick Boot                  [Enabled]          booting. This will
 Quiet Boot                  [Disabled]         decrease the time
 AddOn ROM Display Mode      [Force BIOS]       needed to boot the
 Bootup Num-Lock             [On]               system.
 PS/2 Mouse Support          [Auto]
 Wait For 'F1' If Error      [Enabled]
 Hit 'DEL' Message Display   [Enabled]
 Interrupt 19 Capture        [Disabled]

                                                ←    Select Screen
                                                ↑↓   Select Item
                                                +-   Change Option
                                                F1   General Help
                                                F10  Save and Exit
                                                ESC  Exit

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```
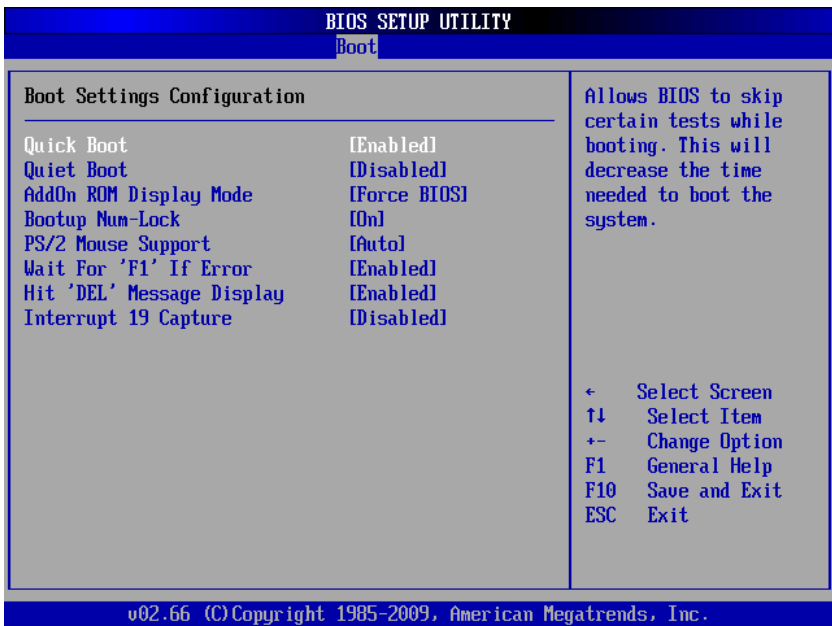
Quick Boot

Enabling this setting will cause the BIOS Power-On Self Test routine to skip some of its tests during bootup for faster system boot.

Quiet Boot

When this feature is **enabled**, the BIOS will display the OEM logo during the boot-up sequence, hiding normal POST messages. When it is **disabled**, the BIOS will display the normal POST messages, instead of the OEM logo.

Add-On ROM Display Mode

Set this option to display add-on ROM (read-only memory) messages. The default setting is *Force BIOS.* An example of this is a SCSI BIOS or VGA BIOS.

Bootup Num-Lock

This option sets the Num Lock status when the system is powered on. Setting it to On will turn on the Num Lock key when the system is booted up. Setting it to Off will not enable the Num Lock key on bootup.

PS/2 Mouse Support

Set this value to allow the PS/2 mouse support to be adjusted. The default setting is Enabled.

Wait for 'F1' If Error

Set this value to allow the Wait for 'F1' Error setting to be modified. The default setting is Enabled.

Hit 'DEL' Message Display

Set this value to allow the Hit "DEL" to enter Setup Message Display to be modified. The default setting is Enabled.

Interrupt 19 Capture

Set this value to allow option ROMs such as network controllers to trap BIOS interrupt 19.

Boot Device Priority

The items allow you to set the sequence of boot devices where BIOS attempts to load the disk operating system. First press <Enter> to enter the sub-menu. Then you may use the arrow keys to select the desired device, then press <+>, <-> or <PageUp>, <PageDown> key to move it up/down in the priority list.

Boot Device Groups

The Boot devices are listed in groups by device type. First press <Enter> to enter the sub-menu. Then you may use the arrow keys to select the desired device, then press <+>, <-> or <PageUp>, <PageDown> key to move it up/down in the priority list. Only the first device in each device group will be available for selection in the Boot Device Priority option.

3.6 Security Setup

```
                    BIOS SETUP UTILITY
  Main    Advanced   PCIPnP    Boot   Security   Chipset    Exit

  Security Settings                        Install or Change the
  ─────────────────────────────────       password.
  Supervisor Password :Not Installed
  User Password       :Not Installed

  Change Supervisor Password
  Change User Password
  Clear User Password

                                           ←     Select Screen
                                           ↑↓    Select Item
                                           Enter Change
                                           F1    General Help
                                           F10   Save and Exit
                                           ESC   Exit

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```

Password Support

Two Levels of Password Protection

Provides both a Supervisor and a User password. If you use both passwords, the Supervisor password must be set first.

The system can be configured so that all users must enter a password every time the system boots or when Setup is executed, using either or either the Supervisor password or User password.

The Supervisor and User passwords activate two different levels of password security. If you select password support, you are prompted for a one to six character password. Type the password on the keyboard. The password does not appear on the screen when typed. Make sure you write it down. If you forget it, you must drain NVRAM and re-configure.

Remember the Password

Keep a record of the new password when the password is changed. If you forget the password, you must erase the system configuration information in NVRAM.

To access the sub menu for the following items, select the item and press < Enter >:

▶ Change Supervisor Password
▶ Change User Password
▶ Clear User Password

Supervisor Password

Indicates whether a supervisor password has been set.

User Password

Indicates whether a user password has been set.

Change Supervisor Password

Select this option and press < Enter > to access the sub menu. You can use the sub menu to change the supervisor password.

Change User Password

Select this option and press < Enter > to access the sub menu. You can use the sub menu to change the user password.

Clear User Password

Select this option and press < Enter > to access the sub menu. You can use the sub menu to clear the user password.

Change Supervisor Password

Select Change Supervisor Password from the Security Setup menu and press < Enter >.

Enter New Password:

Type the password and press < Enter >. The screen does not display the characters entered. Retype the password as prompted and press < Enter >. If the password confirmation is incorrect, an

error message appears. The password is stored in NVRAM after completes.

Change User Password

Select Change User Password from the Security Setup menu and press < Enter >.

Enter New Password:

Type the password and press < Enter >. The screen does not display the characters entered. Retype the password as prompted and press < Enter >. If the password confirmation is incorrect, an error message appears. The password is stored in NVRAM after completes.

3.7 Chipset Setup

Select the Chipset tab from the setup screen to enter the Chipset BIOS Setup screen. You can select any of the items in the left frame of the screen to go to the sub menu for that item. The Chipset BIOS Setup screen is shown below.

```
                        BIOS SETUP UTILITY
   Main     Advanced    PCIPnP    Boot    Security   Chipset    Exit

  Advanced Chipset Settings                         Configure South Bridge
                                                    features.
  WARNING: Setting wrong values in below sections
           may cause system to malfunction.

  ▶ South Bridge Configuration
  LAN 82574L PXE ROM Init          [All Disabled]


                                                    ←    Select Screen
                                                    ↑↓   Select Item
                                                    Enter Go to Sub Screen
                                                    F1   General Help
                                                    F10  Save and Exit
                                                    ESC  Exit


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```
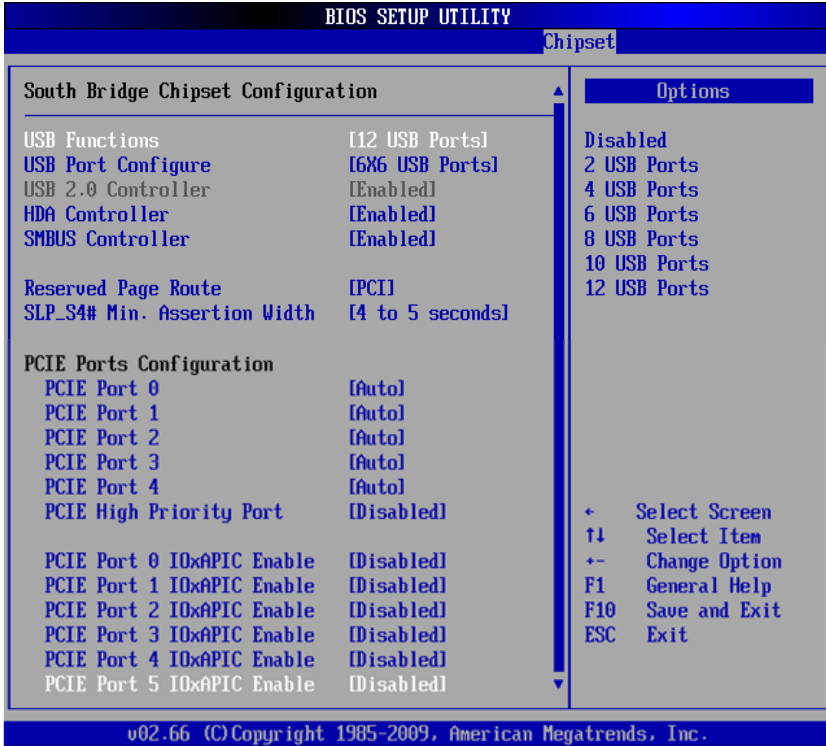
LAN 82574L PXE ROM Init

This option disables or enables 82574L LAN PXE Boot ROM initialization. All Disabled by default.

South Bridge Configuration

You can use this screen to select options for the South Bridge Configuration. Use the up and down < Arrow > keys to select an item. Use the < Plus > and < Minus > keys to change the value of the selected option.

```
                          BIOS SETUP UTILITY
                                            Chipset

 South Bridge Chipset Configuration       ▲          Options

 USB Functions              [12 USB Ports]      Disabled
 USB Port Configure         [6X6 USB Ports]     2 USB Ports
 USB 2.0 Controller         [Enabled]           4 USB Ports
 HDA Controller             [Enabled]           6 USB Ports
 SMBUS Controller           [Enabled]           8 USB Ports
                                                10 USB Ports
 Reserved Page Route        [PCI]               12 USB Ports
 SLP_S4# Min. Assertion Width  [4 to 5 seconds]

 PCIE Ports Configuration
  PCIE Port 0               [Auto]
  PCIE Port 1               [Auto]
  PCIE Port 2               [Auto]
  PCIE Port 3               [Auto]
  PCIE Port 4               [Auto]
  PCIE High Priority Port   [Disabled]          ←    Select Screen
                                                ↑↓   Select Item
  PCIE Port 0 IOxAPIC Enable [Disabled]         +-   Change Option
  PCIE Port 1 IOxAPIC Enable [Disabled]         F1   General Help
  PCIE Port 2 IOxAPIC Enable [Disabled]         F10  Save and Exit
  PCIE Port 3 IOxAPIC Enable [Disabled]         ESC  Exit
  PCIE Port 4 IOxAPIC Enable [Disabled]
  PCIE Port 5 IOxAPIC Enable [Disabled]  ▼

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```

USB Functions

Set this value to allow the system to disable, enable, and select a set number of onboard USB ports.

USB Port Configure

Set this value to select USB ports configuration as 6x6 USB ports or 8x4 USB ports. Default is 6x6.

USB 2.0 Controller

This option takes effect only when USB Functions are enabled. Enabling will allow USB 2.0 functionality to all USB ports.

HDA Controller

Set this value to Enable/Disable the HDA Controller.

SMBus Controller

Set this value to enable/disable the SMBus Controller

Reserved Page Route

Set this value to select reserved page route to PCI or LPC. Default setting is PCI.

SLP_S4# Min. Assert Width

Set this value to select SLP_S4 Minimal Assert Width. Default setting is *4 to 5 Seconds*.

PCIE Port 0/1/2/3/4

Set this value to Enable/Disable the PCIE ports. Default setting is Auto.

PCIE High Priority Port

Set this value to Enable/Disable PCI-E High Priority Port.

PCIE Port 0~5 IOxAPIC Enable

Set this value to Enable/Disable PCI-E Port IOxAPIC support. Default setting is Disabled.

3.8 Exit Menu

Select the Exit tab from the setup screen to enter the Exit BIOS Setup screen. You can display an Exit BIOS Setup option by highlighting it using the < Arrow > keys. The Exit BIOS Setup screen is shown below.

```
                        BIOS SETUP UTILITY
  Main    Advanced    PCIPnP    Boot    Security    Chipset    Exit

  Exit Options                                  Exit system setup
  ─────────────────────────                     after saving the
  Save Changes and Exit                         changes.
  Discard Changes and Exit
  Discard Changes                               F10 key can be used
                                                for this operation.
  Load Optimal Defaults
  Load Failsafe Defaults




                                                ←     Select Screen
                                                ↑↓    Select Item
                                                Enter Go to Sub Screen
                                                F1    General Help
                                                F10   Save and Exit
                                                ESC   Exit


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```

Save Changes and Exit

When you have completed the system configuration changes, select this option to leave Setup and reboot the computer so the new system configuration parameters can take effect.

Save Configuration Changes and Exit Now?

[Ok] [Cancel]

appears in the window. Select Ok to save changes and exit.

Discard Changes and Exit

Select this option to quit Setup without making any permanent changes to the system configuration.

Discard Changes and Exit Setup Now?

[Ok] [Cancel]

appears in the window. Select Ok to discard changes and exit.

Discard Changes

Select Discard Changes from the Exit menu and press < Enter >.

Select Ok to discard changes.

Load Optimal Defaults

Automatically sets all Setup options to a complete set of default settings when you select this option. The Optimal settings are designed for maximum system performance, but may not work best for all computer applications. In particular, do not use the Optimal Setup options if your computer is experiencing system configuration problems.

Select Load Optimal Defaults from the Exit menu and press < Enter >.

Select Ok to load optimal defaults.

Load Failsafe Defaults

Automatically sets all Setup options to a complete set of default settings when you select this option. The Failsafe settings are designed for maximum system stability, but not maximum performance. Select the FailSafe Setup options if your computer is experiencing system configuration problems.

Select Load Fail-Safe Defaults from the Exit menu and press < Enter >.

Load FailSafe Defaults?

[Ok] [Cancel]

appears in the window. Select Ok to load FailSafe defaults.

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Important Safety Instructions

For user safety, please read and follow all **instructions**, **WARNINGS**, **CAUTIONS,** and **NOTES** marked in this manual and on the associated equipment before handling/operating the equipment.

- ▶ Read these safety instructions carefully.
- ▶ Keep this user's manual for future reference.
- ▶ Read the specifications section of this manual for detailed information on the operating environment of this equipment.
- ▶ When installing/mounting or uninstalling/removing equipment:
  - ▷ Turn off power and unplug any power cords/cables.
- ▶ To avoid electrical shock and/or damage to equipment:
  - ▷ Keep equipment away from water or liquid sources;
  - ▷ Keep equipment away from high heat or high humidity;
  - ▷ Keep equipment properly ventilated (do not block or cover ventilation openings);
  - ▷ Make sure to use recommended voltage and power source settings;
  - ▷ Always install and operate equipment near an easily accessible electrical socket-outlet;
  - ▷ Secure the power cord (do not place any object on/over the power cord);
  - ▷ Only install/attach and operate equipment on stable surfaces and/or recommended mountings; and,
  - ▷ If the equipment will not be used for long periods of time, turn off and unplug the equipment from its power source.

▶ Never attempt to fix the equipment. Equipment should only be serviced by qualified personnel.

A Lithium-type battery may be provided for uninterrupted, backup or emergency power.

![WARNING:] Risk of explosion if battery is replaced with one of an incorrect type. Dispose of used batteries appropriately.

▶ Equipment must be serviced by authorized technicians when:
  ▷ The power cord or plug is damaged;
  ▷ Liquid has penetrated the equipment;
  ▷ It has been exposed to high humidity/moisture;
  ▷ It is not functioning or does not function according to the user's manual;
  ▷ It has been dropped and/or damaged; and/or,
  ▷ It has an obvious sign of breakage.

Getting Service

Contact us should you require any service or assistance.

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