# WADE-8078

## Mini-ITX Board

## User's Manual

Version 1.0

# Table of Contents

## How to Use This Manual

# How to Use This Manual

The manual describes how to configure your WADE-8078 system board to meet various operating requirements. It is divided into five chapters, with each chapter addressing a basic concept and operation of Single Host Board.

**Chapter 1: System Overview.** Presents what you have in the box and give you an overview of the product specifications and basic system architecture for this series model of single host board.

**Chapter 2: Hardware Configuration.** Show the definitions and locations of Jumpers and Connectors that you can easily configure your system.

**Chapter 3: System Installation.** Describes how to properly mount the CPU, main memory and Compact Flash to get a safe installation and provides a programming guide of Watch Dog Timer function.

**Chapter 4: BIOS Setup Information.** Specifies the meaning of each setup parameters, how to get advanced BIOS performance and update new BIOS. In addition, POST checkpoint list will give users some guidelines of trouble-shooting.

**Chapter 5: Troubleshooting.** Provide various of useful tips to quickly get WADE-8078 running with success. As basic hardware installation has been addressed in Chapter 3, this chapter will basically focus on system integration issues, in terms of backplane setup, BIOS setting, and OS diagnostics.

The content of this manual is subject to change without prior notice. These changes will be incorporated in new editions of the document. The vendor may make supplement or change in the products described in this document at any time.

# Chapter 1
# System Overview

## 1.1 Introduction

Powell Inc., a world-leading innovator in the Industrial PC (IPC) market and a member of the Intel® Communications Alliance, has launched its new WADE-8078
series in response to market demand for a simplified embedded system board (ESB)
that combines a smaller footprint, lower power consumption, robust computing power and with longevity support.

Built with Intel's latest chipset, WADE-8078 series take advantage of the Intel® Atom™ Valleyview E38XX series processors.

WADE-8078 has lots of features, also features one SATA connectors (SATA 3Gb/s) storage specification , one DDR3 SO-DIMM memory slot for DDR3L ECC SDRAM up to 4GB, support total 3 USB ports (1x USB3.0 on REAR I/O,2x USB2.0 on board), VGA / HDMI display ,one Gigabit Ethernet, and one PCIe x4 slot (PCIe x2 signal) and support CFEX.

WADE-8078's ability to drive two displays simultaneously makes them particularly suitable for lottery and gaming applications. They are also ideal for applications such as point-of-sale (POS), digital signage, kiosks .

## 1.2 Check List

The WADE-8078 package should cover the following basic items

- ✓ One WADE-8078 Mini-ITX Main Board
- ✓ One 8 Pin Power Cable
- ✓ One SATA Cable
- ✓ One I/O Shield bracket
- ✓ One Installation Resources CD-Title

If any of these items is damaged or missing, please contact your vendor and keep all packing materials for future replacement and maintenance.

## 1.3 Product Specification

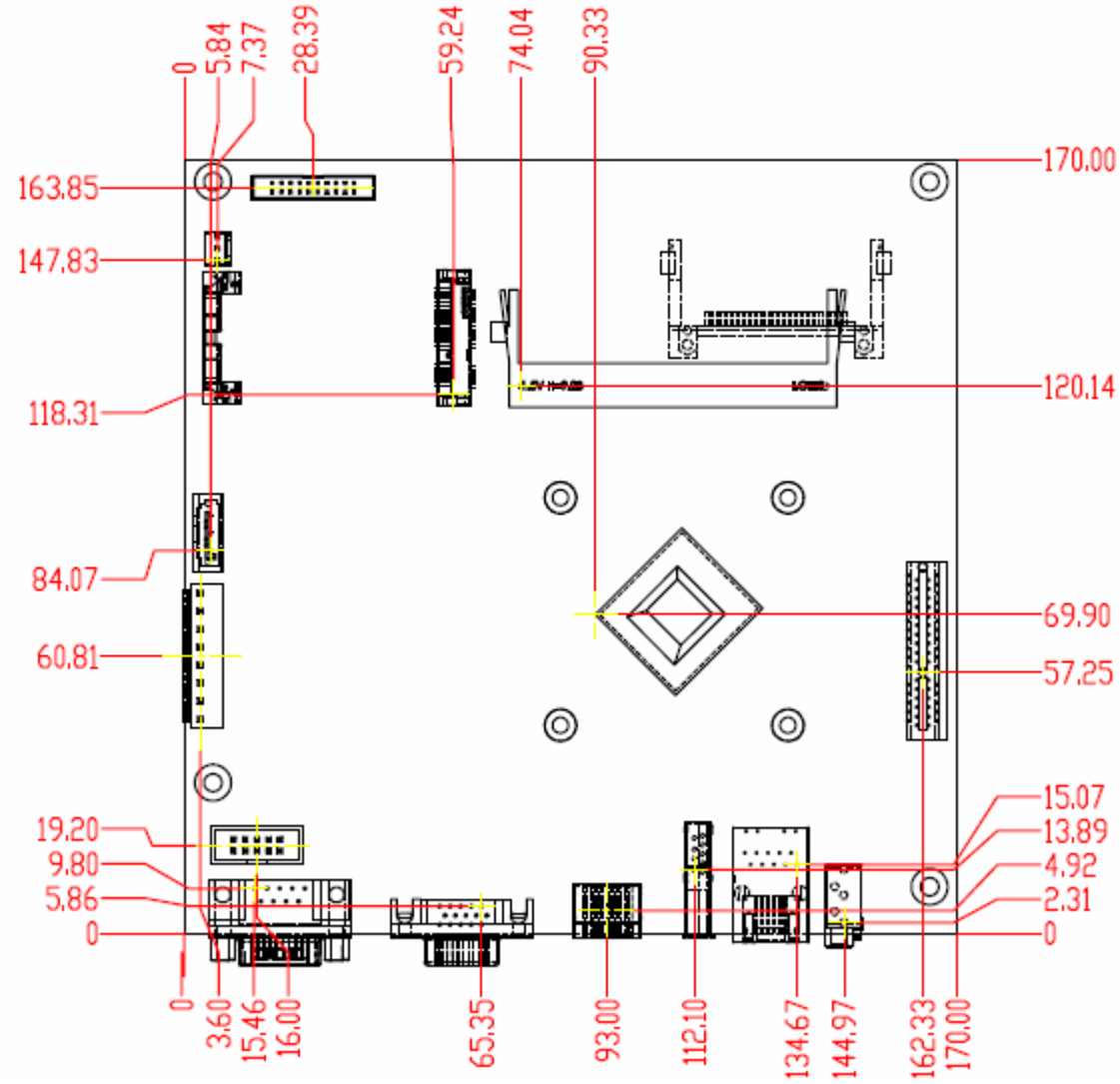
- Main Processor
  - Intel® Atom™ Valleyview E38XX series processor
- System BIOS
  Phoenix BIOS
- Main Memory
  One 204 - pin DDR3 SODIMM socket support up to 4GB 1066/1333 MHz ECC memory(only use ECC memory)
  - E3845 / E3827 support 1333MHz memory
  - E3826 / E3825 / E3815 support 1066MHz memory
- Expansion Interface
  One PCIex4(PCIex2 signal)
- SATA Interface
  One SATA ports(SATA 3Gb)
- Serial Port
  Support one RS232 / one RS232/422/485
- USB Interface
  Support three USB (Universal Serial Bus) ports, one USB3.0 on rear I/O and two USB2.0 on board header for internal devices
- Audio Interface
  Connector for Line-Out(Line in / Line out / Mic in on board 8 pin header)
- Real Time Clock/Calendar (RTC)
  Support Y2K Real Time Clock/Calendar
- Watch Dog Timer
  - Support WDT function through software programming for enable/disable and interval setting
  - General system reset
- On-board Ethernet LAN
  One Gigabit Ethernet (10/100/1000 Mbits/sec) LAN ports
- High Drive GPIO
  One pin-header for 8 bit GPIO
- System Monitoring Feature
  Monitor system temperature and major power sources.
- Outline Dimension (L x W)
  170mm(6.69'') x 170mm(6.69'')
- Power Requirements

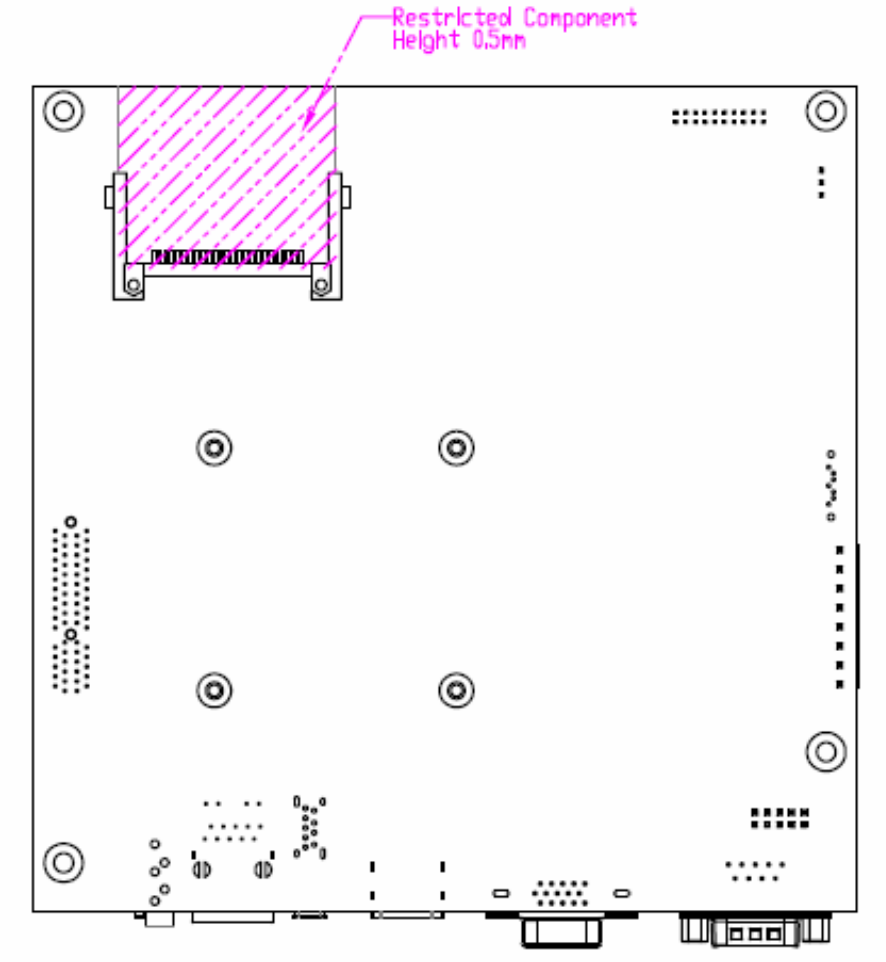
- Configuration

| | |
|---|---|
| **CPU Type** | Genuine Intel® CPU@ 1.91 GHz Atom L3：2M Bytes |
| **SBC BIOS** | Portwell, Inc. WADE-8078 BIOS ( 30903T00 ) EVALUATION COPY |
| **ECC Memory** | WARIS DDR3L SO-DIMM 1333 4GB*1 (hynix H5TC2G83EFR) |
| **VGA Card** | Onboard Intel(R) HD Graphics |
| **VGA Driver** | Intel(R) HD Graphics Version：10.18.10.3266 |
| **LAN Card** | Onboard Intel(R) I210 Gigabit Network Connection |
| **LAN Driver** | Intel(R) I210 Gigabit Network Connection Version：12.7.28.0 |
| **Audio Card** | Onboard Realtek High Definition Audio Controller |
| **Audio Driver** | Realtek High Definition Audio Version:6.0.1.6873 |
| **Chip Driver** | Intel (R) Chipset Device Software Version：9.4.4.1005 |
| **USB 3.0 Driver** | Intel (R) USB 3.0 eXtensible Host Controller Version： 6.2.9200.16384 |
| **3.5″ SATA-2 HDD** | Western Digital WD5002ABYS 500GB |
| **CFEX** | WARIS CFEX 4GB PWG B473D350-002 |
| **USB DVD-ROM** | Transcend TS8XDVDRW-K |
| **Power Supply** | Portwell, ORION-D4601 460W |

- Operating Temperature
  0 °C ~ 60 °C
- Storage temperature
  -20 ~ 80 °C
- Relative Humidity
  0% ~ 90%, non-condensing

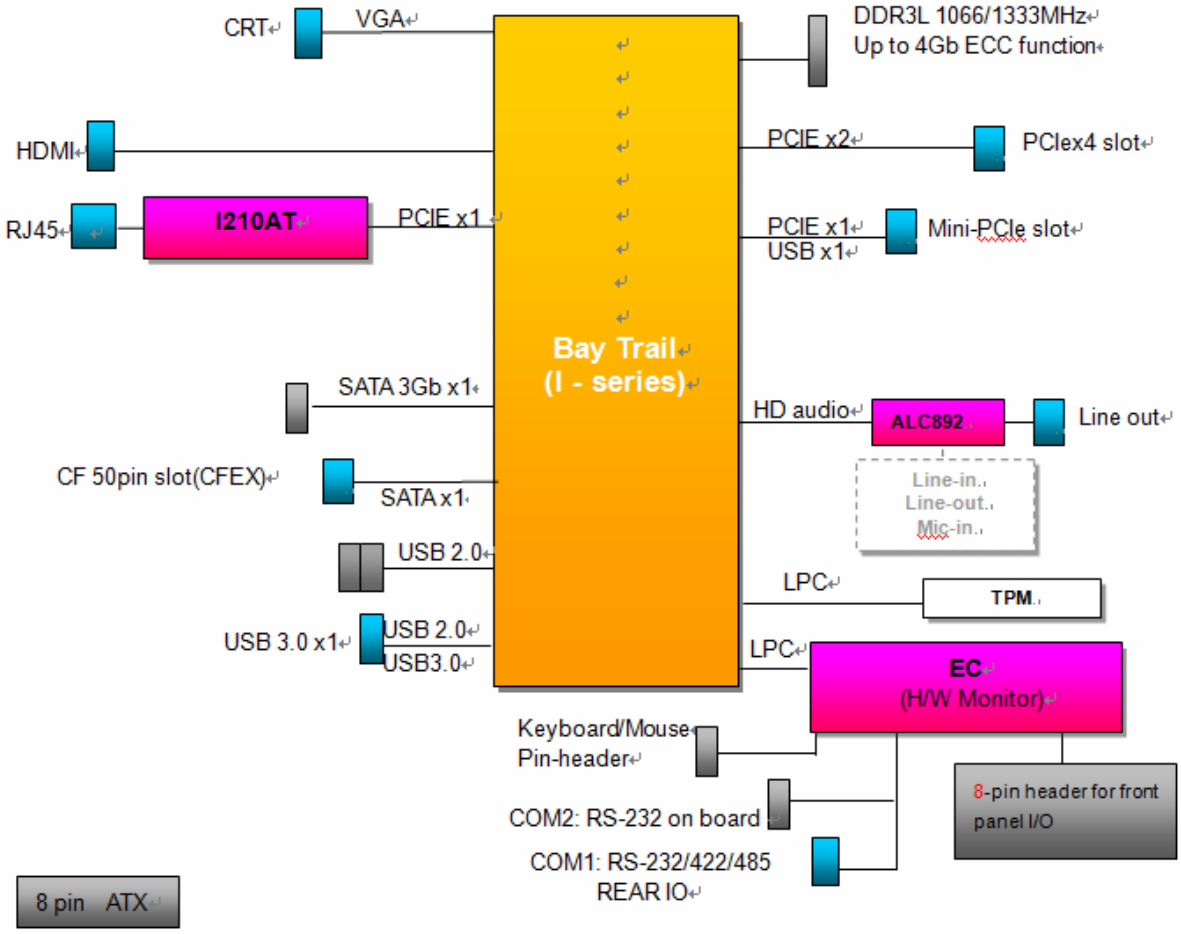
### 1.3.1 Mechanical Drawing




Restricted Component
Height 0.5mm

## 1.4 System Architecture

All of details operating relations are shown in WADE-8078 System Block Diagram.



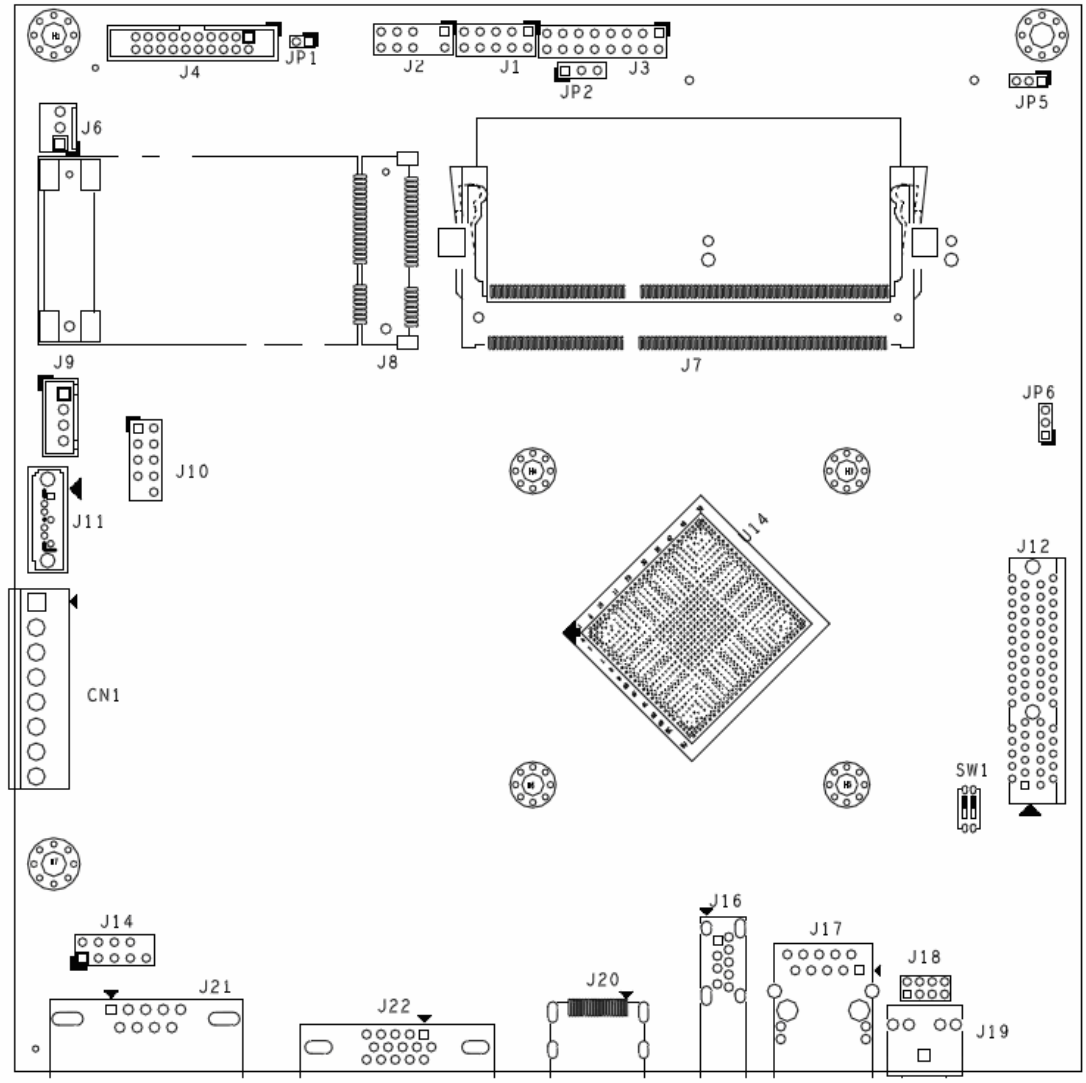

**WADE-8078 System Block Diagram**

# Chapter 2
# Hardware Configuration

This chapter gives the definitions and shows the positions of jumpers, headers and connectors. All of the configuration jumpers on WADE-8078 are in the proper position. The default settings shipped from factory are marked with an asterisk (♣).

## 2.1 Jumper Setting

In general, jumpers on the single board computer are used to select options for certain features. Some of the jumpers are designed to be user-configurable, allowing for system enhancement. The others are for testing purpose only and should not be altered. To select any option, cover the jumper cap over (SHORT) or remove (NC) it from the jumper pins according to the following instructions. Here NC stands for "Not Connect".



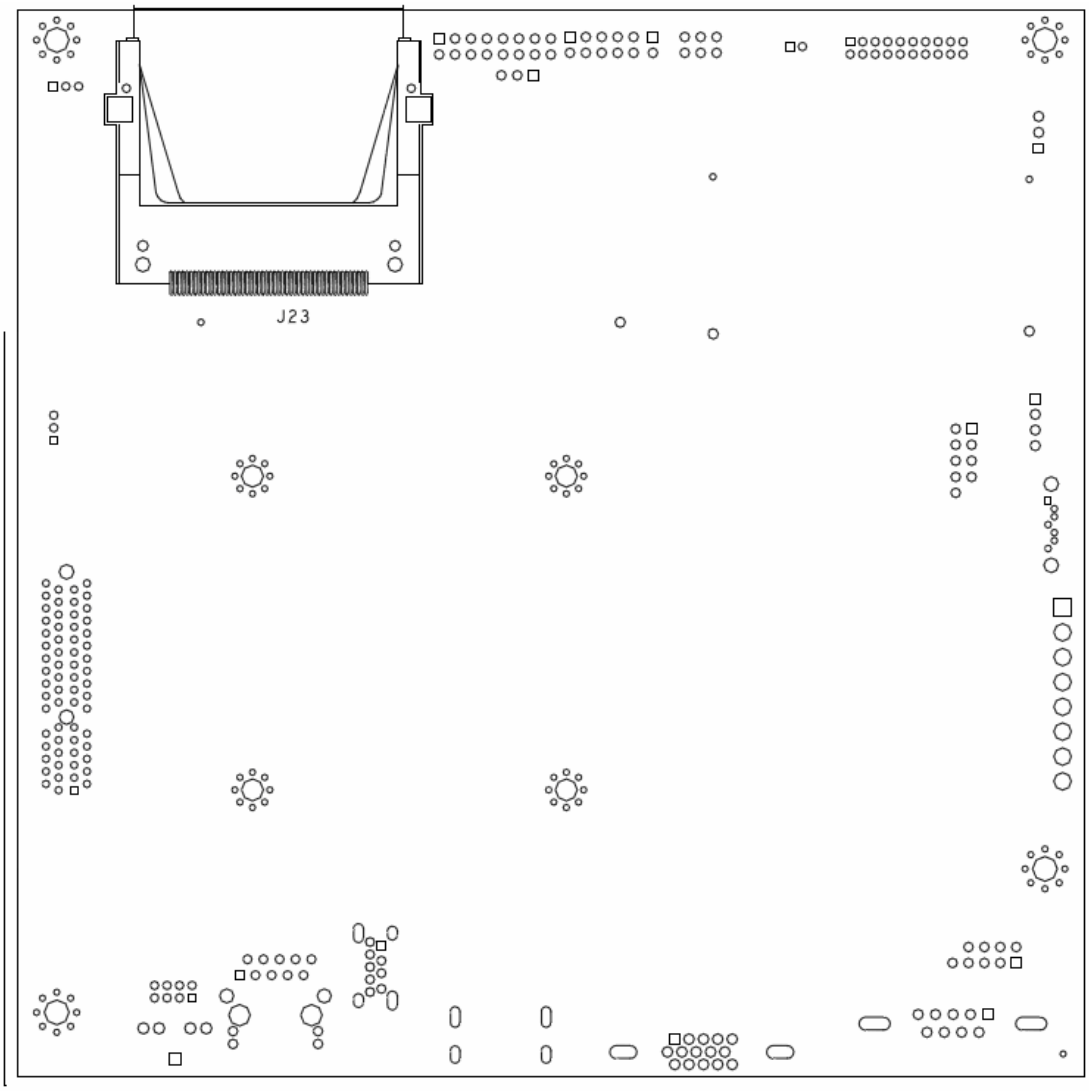


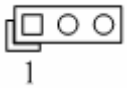

**Figure 2-1 WADE-8078 Jumper and Connector Locations**

The jumper settings are schematically depicted in this manual as follows:

**JP1: Watch Dog Timer Enable**

| PIN No | Signal Function |
|---|---|
| 1-2 open | Disable ★ |
| 1-2 short | Enable |

**JP2: GPO Voltage Select**

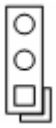



| PIN No | Signal Function |
|---|---|
| 1-2 short | +5V ★ |
| 2-3 short | +3.3V |

**JP5: BIOS Select**

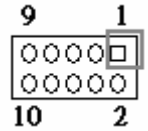

| PIN No | Signal Function |
|---|---|
| 1-2 short | SPI Flash ★ |
| 2-3 short | CFEX BIOS |

**JP6: Clear CMOS**



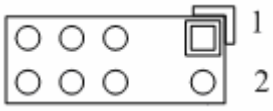
| PIN No | Signal Function Function |
|---|---|
| 1-2 short | Normal ★ |
| 2-3 short | Clear CMOS |

## J1: GPIO



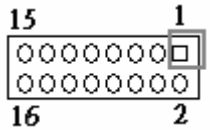

| Pin No. | Signal Description | Pin No. | Signal Description |
|---|---|---|---|
| 1 | LPC_GPIO0 (GPJ0) | 2 | EC_GPO4 (GPE0) |
| 3 | LPC_GPIO1 (GPJ1) | 4 | EC_GPO5 (GPE7) |
| 5 | LPC_GPIO2 (GPJ2) | 6 | EC_GPO6 (GPC0) |
| 7 | LPC_GPIO3 (GPJ3) | 8 | EC_GPO7 (GPG0) |
| 9 | GND | 10 | +5V |

## J2: Keyboard & Mouse Pin HDR



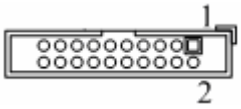

| Pin No. | Signal Description | Pin No. | Signal Description |
|---|---|---|---|
| 1 | Mouse Data | 2 | Keyboard Date |
| 3 | Key( no pin ) | 4 | Key( no pin ) |
| 5 | Ground | 6 | Ground |
| 7 | +5V_Dual | 8 | +5V_Dual |
| 9 | Mouse Clock | 10 | Keyboard Clock |

## J3:Front Panel System Connector



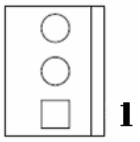

| Pin No. | Signal Description | Pin No. | Signal Description |
|---|---|---|---|
| 1 | PWR_LED(+) | 2 | Speaker(+) |
| 3 | PWR_LED(-) | 4 | N/C |
| 5 | J17 LAN_ACT(+) | 6 | N/C |
| 7 | J17 LAN_LINK(-) | 8 | Speaker(-) |
| 9 | N/C | 10 | GND |
| 11 | N/C | 12 | Power Button |
| 13 | HDD_LED(+) | 14 | Rest |
| 15 | HDD_LED(-) | 16 | GND |

## J4: TPM Connector



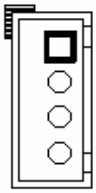

| Pin No. | Signal Description | Pin No. | Signal Description |
|---|---|---|---|
| 1 | TPM Clock | 2 | Ground |
| 3 | LFRAME# | 4 | N/C |
| 5 | PLTRST# | 6 | +5V |
| 7 | LAD3 | 8 | LAD2 |
| 9 | +3.3V | 10 | LAD1 |
| 11 | LAD0 | 12 | Ground |
| 13 | SMB_CLK | 14 | SMB_DATA |

## J6: System FAN Connector



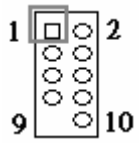

| PIN No | Signal Function |
|---|---|
| 1 | GND |
| 2 | +12V |
| 3 | SENSE |

## J9: SATA Power



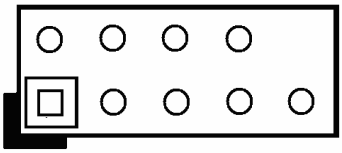
| PIN No | Signal Function |
|---|---|
| 1 | +12V |
| 2 | Ground |
| 3 | Ground |
| 4 | +5V |

## J10: External USB Connector



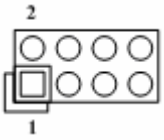

| Pin No. | Signal Description | Pin No. | Signal Description |
|---|---|---|---|
| 1 | 5V Dual | 2 | 5V Dual |
| 3 | USB- | 4 | USB- |
| 5 | USB+ | 6 | USB+ |
| 7 | Ground | 8 | Ground |
| 9 | | 10 | N/C |

## J14: COM2



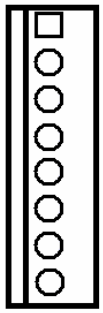
| Pin No. | Signal Description | Pin No. | Signal Description |
|---|---|---|---|
| 1 | Data Carrier Detect | 2 | Receive Data |
| 3 | Transmit Data | 4 | Data Terminal Ready |
| 5 | GND | 6 | Data Set Ready |
| 7 | Request To Send | 8 | Clear To Send |
| 9 | Ring Indicator | 10 | KEY |

## J18: Audio MIC/Line-in/Line-out Connector



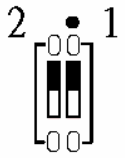

| Pin No. | Signal Description | Pin No. | Signal Description |
|---|---|---|---|
| 1 | MIC_L | 2 | Line_in_L |
| 3 | Ground | 4 | Line_in_R |
| 5 | Line_out_L | 6 | Ground |
| 7 | Line_out_R | 8 | MIC_R |

## CN1: 8 Pin ATX Connector

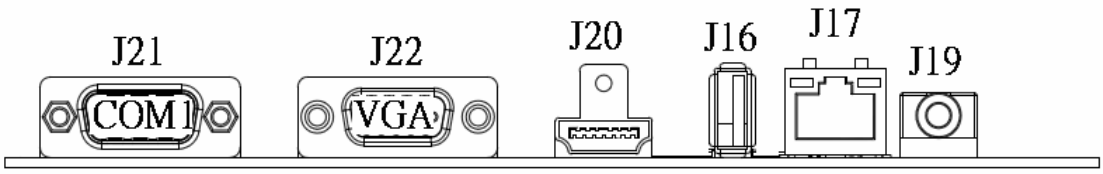


| PIN No | Signal Description |
|---|---|
| 1 | +5V |
| 2 | +5V |
| 3 | +5Vsb |
| 4 | +12V |
| 5 | PS_ON# |
| 6 | Ground |
| 7 | Ground |
| 8 | Ground |

## SW1: ATX Detect &BIOS Recovery Switch




| No. | Signal Description | On | Off |
|---|---|---|---|
| 1 | ATX Detect | AT Mode | ATX Mode |
| 3 | BIOS Recovery | Enable | Disable |



**J20: HDMI Connector**

| Pin No. | Signal Description | Pin No. | Signal Description |
|---|---|---|---|
| 1 | D_HDMI_D0+ | 2 | GND |
| 3 | D_HDMI_D0- | 4 | D_HDMI_D1+ |
| 5 | GND | 6 | D_HDMI_D1- |
| 7 | D_HDMI_D2+ | 8 | GND |
| 9 | D_HDMI_D2- | 10 | D_HDMI_D3+ |
| 11 | GND | 12 | D_HDMI_D3- |
| 13 | N/C | 14 | N/C |
| 15 | D_HDMI_DDC_CLK | 16 | D_HDMI_DDC_DATA |
| 17 | GND | 18 | VCC |
| 19 | D_HDMI_HPD_IN | 20 | |

**J19: Audio connector**

| PIN No | Signal Description |
|---|---|
| Green | Line-Out |

**J21: COM1 Serial Port Connector**

| Pin No. | Signal Description | | |
|---|---|---|---|
| | **RS-232** | **RS-422 (COM2)** | **RS-485 (COM2)** |
| 1 | DCD (Data Carrier Detect) | TX- | DATA- |
| 2 | DSR (Data Set Ready) | N/C | N/C |
| 3 | RXD (Receive Data) | TX+ | DATA+ |
| 4 | RTS (Request to Send) | N/C | N/C |
| 5 | TXD (Transmit Data) | RX+ | N/C |
| 6 | CTS (Clear to Send) | N/C | N/C |
| 7 | DTR (Data Terminal Ready) | RX- | N/C |
| 8 | RI (Ring Indicator) | N/C | N/C |
| 9 | GND (Ground) | GND | GND |
| 10 | N/C | N/C | N/C |

**J22: VGA Connector**

| Pin No. | Signal Description | Pin No. | Signal Description |
|---|---|---|---|
| 1 | CRT_R | 9 | VCC |
| 2 | CRT_G | 10 | GND |
| 3 | CRT_B | 11 | N/C |
| 4 | N/C | 12 | VGA_DDCDA |
| 5 | GND | 13 | CRT_HS |
| 6 | GND | 14 | CRT_VS |
| 7 | GND | 15 | VGA_DDCCL |
| 8 | GND | | |

## 2.2 Connector Allocation

I/O peripheral devices are connected to the interface connectors.

**Connector Function List**

| Connector | Function | Remark |
|---|---|---|
| J1 | GPIO | |
| J2 | Keyboard & Mouse Pin HDR | |
| J3 | Front Panel System Connector | |
| J4 | TPM Connector | |
| J6 | System FAN Connector | |
| J7 | DDR3L ECC SO-DIMM Connector | |
| J8 | Mini PCI-E | |
| J9 | SATA Power | |
| J10 | External USB Connector | |
| J11 | SATA Connector | |
| J12 | PCI-E X2 Connector (Only X2 Lan) | |
| J14 | COM 2 Serial Port Connector | Only Support RS-232 |
| J16 | USB 3.0 Connector | |
| J17 | LAN Connector | |
| J18 | Audio MIC/Line-in/Line-out Connector | |
| J19 | Audio Jack (Line-Out) | |
| J20 | HDMI Connector | |
| J21 | COM 1 Serial Port Connector | Support RS-232/422/485 |
| J22 | VGA Connector | |
| J23 | CFEX Connector | |
| JP1 | Watch Dog Timer Enable | |
| JP2 | GPIO Voltage Select | |
| JP5 | BIOS Select | |
| JP6 | Clear CMOS | |
| SW1 | ATX Detect &BIOS Recovery Switch | |
| U2 | EC EEPROM Socket | |
| U4 | BIOS Socket | |
| U14 | Bay Trail-I CPU | |

# Chapter 3
# System Installation

This chapter provides you with instructions to set up your system. The additional information is enclosed to help you set up onboard PCI device and handle Watch Dog Timer (WDT) and operation of GPIO in software programming.

## 3.1 Intel® Valleyview CPU

Intel® E3845 (4 core, 10W, 1.91GHz, 1333MT)

## 3.2 Main Memory

WADE-8078 provides 1 x 204-pin SO-DIMM sockets which supports DDR3L memory (support ECC function) as main memory, ECC (Error Checking and Correcting). The maximum memory can be up to 4GB. Memory clock and related settings can be detected by BIOS via SPD interface.

Watch out the contact and lock integrity of memory module with socket, it will impact on the system reliability. Follow normal procedures to install memory module into memory socket. Before locking, make sure that all modules have been fully inserted into the card slots.

## 3.3 Installing the Single Board Computer

To install your WADE-8078 into standard chassis or proprietary environment, please perform the following:

Step 1 : Check all jumpers setting on proper position
Step 2 : Install and configure CPU and memory module on right position
Step 3 : Place WADE-8078 into the dedicated position in the system
Step 4 : Attach cables to existing peripheral devices and secure it

**WARNING**
Please ensure that SBC is properly inserted and fixed by mechanism.

**Note:**
Please refer to section 3.3.1 to 3.3.6 to install INF/VGA/LAN/Audio/Sideband Fabric Device/Trusted Execution Engine drivers.

### 3.3.1 Chipset Component Driver

WADE-8078 uses state-of-art Intel® BayTrail-I chipset. It's a new chipset that some old operating systems might not be able to recognize. To overcome this compatibility issue, for Windows Operating Systems such as Windows 8, please install its INF before any of other Drivers are installed. You can find very easily this chipset component driver in WADE-8078 CD-title

### 3.3.2 Intel® HD Graphics 4600

WADE-8078 has integrated Intel® HD Graphics 4600 which supports DX11, OpenGL3.2. It is the most advanced design to gain an outstanding graphic performance. WADE-8078 supports VGA and dual display. This combination makes WADE-8078 an excellent piece of multimedia hardware.

**Drivers Support**
Please find the Graphic driver in the WADE-8078 CD-title. The driver supports Windows 8

### 3.3.3 Intel LAN I210IT / I210IAT co-lay Gigabit Ethernet Controller

**Drivers Support**
Please find Intel LAN I210IT /I210AT co-lay LAN driver in /Ethernet directory of WADE-8078 CD-title. The driver supports Windows 8.

### 3.3.4 Realtek ALC892 HD Audio Controller

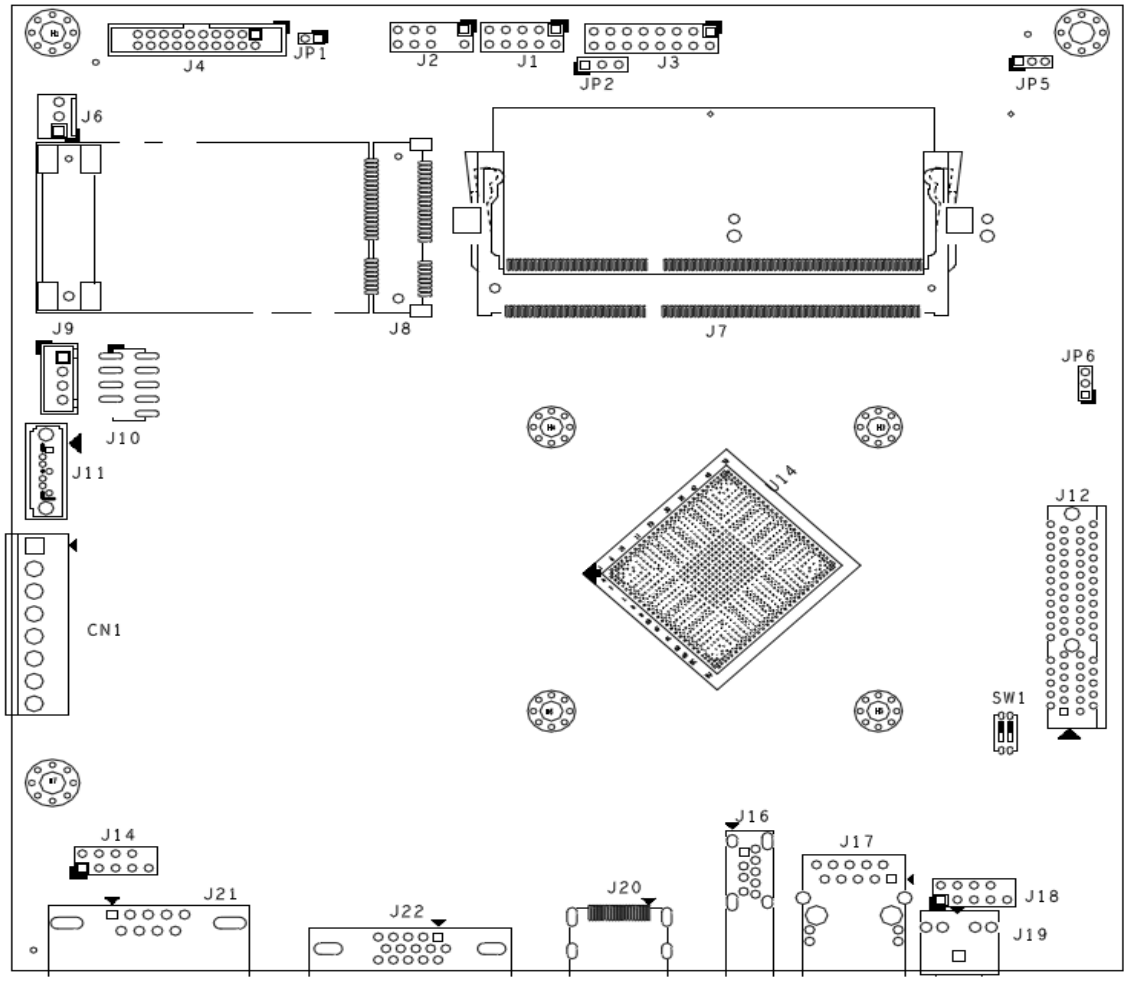
Please find Realtek ALC892 HD Audio driver form WADE-8078 CD-title. The driver supports Windows 8.

## 3.4 Clear CMOS Operation

The following table indicates how to enable/disable Clear CMOS Function hardware circuit by putting jumper in the board

**JP6: CMOS Setting**

| JP1 | Jumper Setting Describe |
|---|---|
| *1-2 | Normal |
| 2-3 | Clean CMOS |




## 3.5 WDT Function

```
#include <stdio.h>
#include <stdlib.h>
#include <conio.h>
#include <dos.h>

#define EC_DATA                 0x62
#define EC_CMD                  0x66
#define EC_CMD_READ   0x80
#define EC_CMD_WRITE  0x81

#define  WDT_MODE      0x06  // WDT Select mode.
#define  WDT_MIN       0x07  // Minute mode counter
#define  WDT_SEC       0x08  // Second mode counter

// Use port 62 and port 66 to access EC command / data.
static int IBF_Check()
{
```

```
        unsigned char IBF_status;
        do
        {
                pw_udelay (20);  // delay 20 us
                outportb (EC_CMD, &IBF_status);
        } while (IBF_status & 0x02);
        return 1;
}

static int OBF_Check ()
{
        unsigned char OBF_status;
        do
        {
                pw_udelay (20);  // delay 20 us
                OBP_status = inportb (EC_CMD);
        } while (!(OBF_status & 0x01));
        return 1;
}

static void Write_EC (unsigned char index, unsigned char data)
{
        IBF_Check ();
        outportb (EC_CMD, EC_CMD_WRITE);
        IBF_Check ();
        outportb (EC_DATA, index);
        IBF_Check ();
        outportb (EC_DATA, data);
}

static unsigned char Read_EC (unsigned char address)
{
        unsigned char data;
        IBF_Check ();
        outportb (EC_CMD, EC_CMD_READ);
        IBF_Check ();
        outportb (EC_DATA, address);
        OBF_Check();
        data = inportb (EC_DATA);
        return data;
}

void EC_WDT_Trigger ()
{
        /* WDT Counter */
        Write_EC (WDT_SEC, 0x05);
```

```
        /* if use minute mode */
        /* Write_EC (WDT_MIN, 0x05); */

        /* 0x01 is second mode */
        /* 0x03 is minute mode */
        Write_EC (WDT_MODE, 0x01);
}

Write_EC ((b->wdt.ec.count_m_addr & 0xFF), b->wdt.ec.timeout);
                        Write_EC ((b->wdt.ec.cfg_addr & 0xFF), 0x03); //
WDTCFG[1:0]=11
int main ()
{
   int i;
        EC_WDT_Trigger ();
        for (i = 0; i < 5; i++)
        {
                printf ("Reset counter .....%d\n", 5 - i);
                delay (1000);
        }
        return 0;
}
```

## 3.6 GPIO

```
#include <stdio.h>
#include <stdlib.h>
#include <conio.h>
#include <dos.h>

#define EC_DATA                 0x62
#define EC_CMD                  0x66
#define EC_CMD_READ   0x80
#define EC_CMD_WRITE  0x81

#define  GPIO_DIR       0x2B  // GPIO Direction (Input/Output) Reg.
#define  GPIO_DATA      0x2C  // GPIO High/Low Reg.

// Use port 62 and port 66 to access EC command / data.
static int IBF_Check()
{
        unsigned char IBF_status;
        do
        {
                pw_udelay (20);  // delay 20 us
```

```
                outportb (EC_CMD, &IBF_status);
        } while (IBF_status & 0x02);
        return 1;
}

static int OBF_Check ()
{
        unsigned char OBF_status;
        do
        {
                pw_udelay (20);  // delay 20 us
                OBP_status = inportb (EC_CMD);
        } while (!(OBF_status & 0x01));
        return 1;
}

static void Write_EC (unsigned char index, unsigned char data)
{
        IBF_Check ();
        outportb (EC_CMD, EC_CMD_WRITE);
        IBF_Check ();
        outportb (EC_DATA, index);
        IBF_Check ();
        outportb (EC_DATA, data);
}

static unsigned char Read_EC (unsigned char address)
{
        unsigned char data;
        IBF_Check ();
        outportb (EC_CMD, EC_CMD_READ);
        IBF_Check ();
        outportb (EC_DATA, address);
        OBF_Check();
        data = inportb (EC_DATA);
        return data;
}

int main ()
{
        unsigned char d2;
        printf("\n\n");
        printf("WADE-8078 GPIO TEST Program v1.0\n");
        printf("Please short the following pins with 2.54mm-pitched jumper on
JP8\n");
        printf("PIN 1,3,5,7 is output ; PIN 2,4,6,8 is input\n");
```

```
        printf("GPIO1 ---- GPIO5\n");
        printf("GPIO2 ---- GPIO6\n");
        printf("GPIO3 ---- GPIO7\n");
        printf("GPIO4 ---- GPIO8\n");
        printf("GND   xxxx Vcc  <==PWR/GND pins, DO NOT short them!\n\n");
        printf("Test Begins...\n");

        /* Set GPIO Port In/Out mode */
        /* Port 1 ~ 4 Out mode, 5 ~ 8 In mode*/
        Write_EC (GPIO_DIR, 0xF0);
        delay (5);

        /* Set Port 1 ~ 4 Low, 5 ~ 8 High */
        outportb (0x22E, 0xF0);
        Write_EC (GPIO_DATA, 0xF0);
        delay (5);

        d2 = Read_EC (GPIO_DIR);

        if ((d2 & 0x10) == 0)
                printf ("GPIO70->GPIO74 test ok !! (pull low)\n");
        else
                printf ("GPIO70->GPIO74 test fail (pull high) \n");

        if ((d2 & 0x20) == 0)
                printf ("GPIO71->GPIO75 test ok !! (pull low)\n");
        else
                printf ("GPIO71->GPIO75 test fail (pull high)\n");

        if ((d2 & 0x40) == 0)
                printf ("GPIO72->GPIO76 test ok !! (pull low)\n");
        else
                printf ("GPIO72->GPIO76 test fail (pull high)\n");

        if ((d2 & 0x80) == 0)
                printf ("GPIO73->GPIO77 test ok !! (pull low)\n");
        else
                printf ("GPIO73->GPIO77 test fail (pull high)\n");
        return 0;
}
```

# Chapter 4
# BIOS Setup Information

WADE-8078 is equipped with the Phoenix BIOS stored in Flash ROM. These BIOS has a built-in Setup program that allows users to modify the basic system configuration easily. This type of information is stored in CMOS RAM so that it is retained during power-off periods. When system is turned on, WADE-8078 communicates with peripheral devices and checks its hardware resources against the configuration information stored in the CMOS memory. If any error is detected, or the CMOS parameters need to be initially defined, the diagnostic program will prompt the user to enter the SETUP program. Some errors are significant enough to abort the start up.

## 4.1 Entering Setup -- Launch System Setup

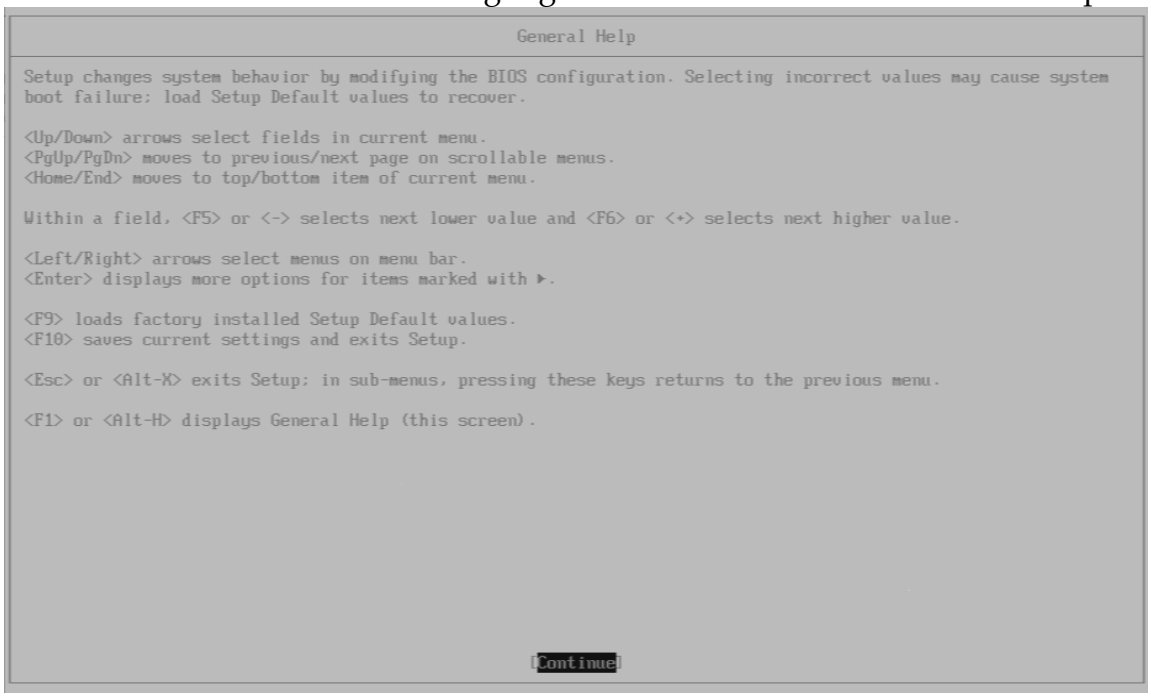
Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press <F2> key will enter BIOS setup screen.

**Press <F2> to enter SETUP**

If the message disappears before responding and still wish to enter Setup, please restart the system by turning it OFF and On or pressing the RESET button. It can be also restarted by pressing <Ctrl>, <Alt>, and <Delete> keys on keyboard simultaneously.

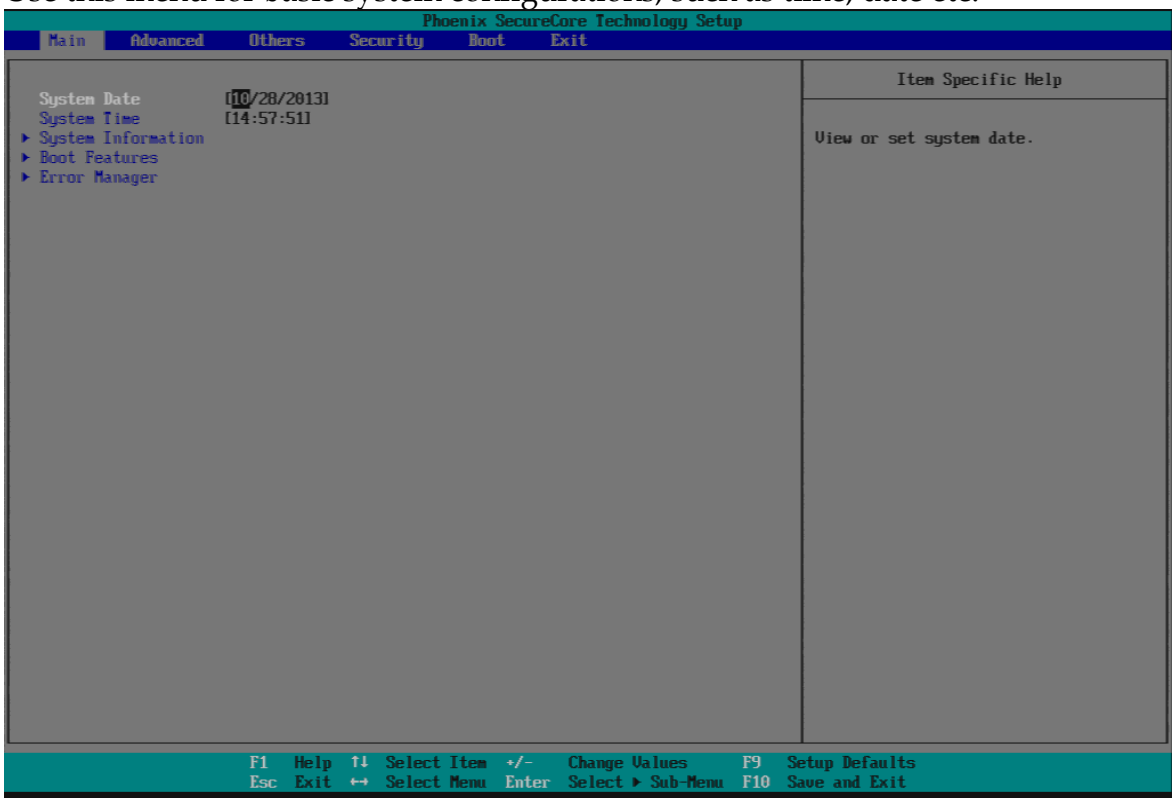
**Press <F1> to Run General Help or Resume**

The BIOS setup program provides a General Help screen. The menu can be easily called up from any menu by pressing <F1>. The Help screen lists all the possible keys to use and the selections for the highlighted item. Press <Esc> to exit the Help screen.



## 4.2 Main

Use this menu for basic system configurations, such as time, date etc.




**System Date**

View or set system date

The date format is <Day>, <Month> <Date> <Year>. Use [+] or [−] to configure system Date.

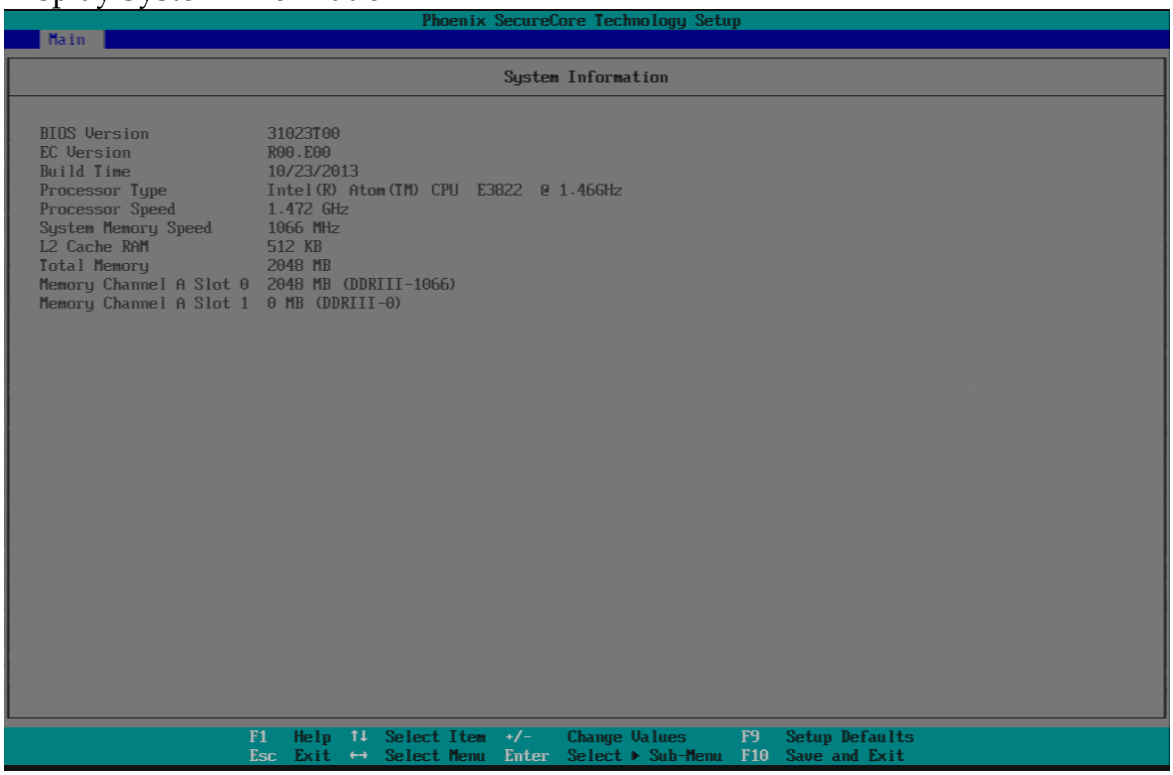
**System Time**

View or set system time

The time format is <Hour> <Minute> <Second>. Use [+] or [−] to configure system Time.

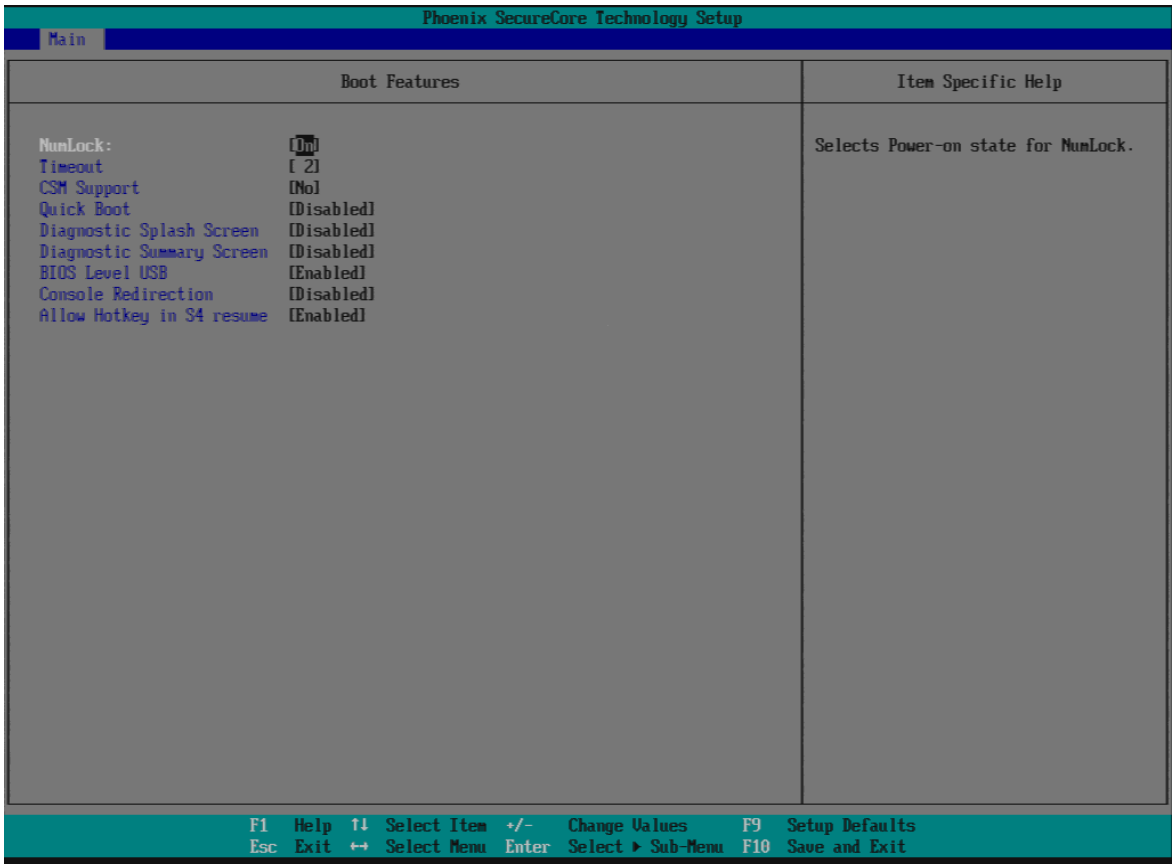
## System Information

Display System Information




## Boot Features

Select Boot features



**NumLock:**
Selects Power-on state for NumLock
Choices: On, Off.

**Timeout**
Number of seconds that P.O.S.T will wait for the user input before booting
Choices: 0-99 seconds.

**CSM Support**
Compatibility Support Module that provide backward compatibility services for legacy BIOS services, like int10/int13, dependent OS.

**Quick Boot**
Enable/Disable quick boot
Choices: Disable, Enable.

**Diagnostic Splash Screen**
If you select 'Enabled' the diagnostic splash screen always displays during boot. If you select 'Disabled' the diagnostic splash screen does not displays unless you press HOTKEY during boot
Choices: Disable, Enable.

**Diagnostic Summary Screen**
Display the Diagnostic summary screen during boot
Choices: Disable, Enable.

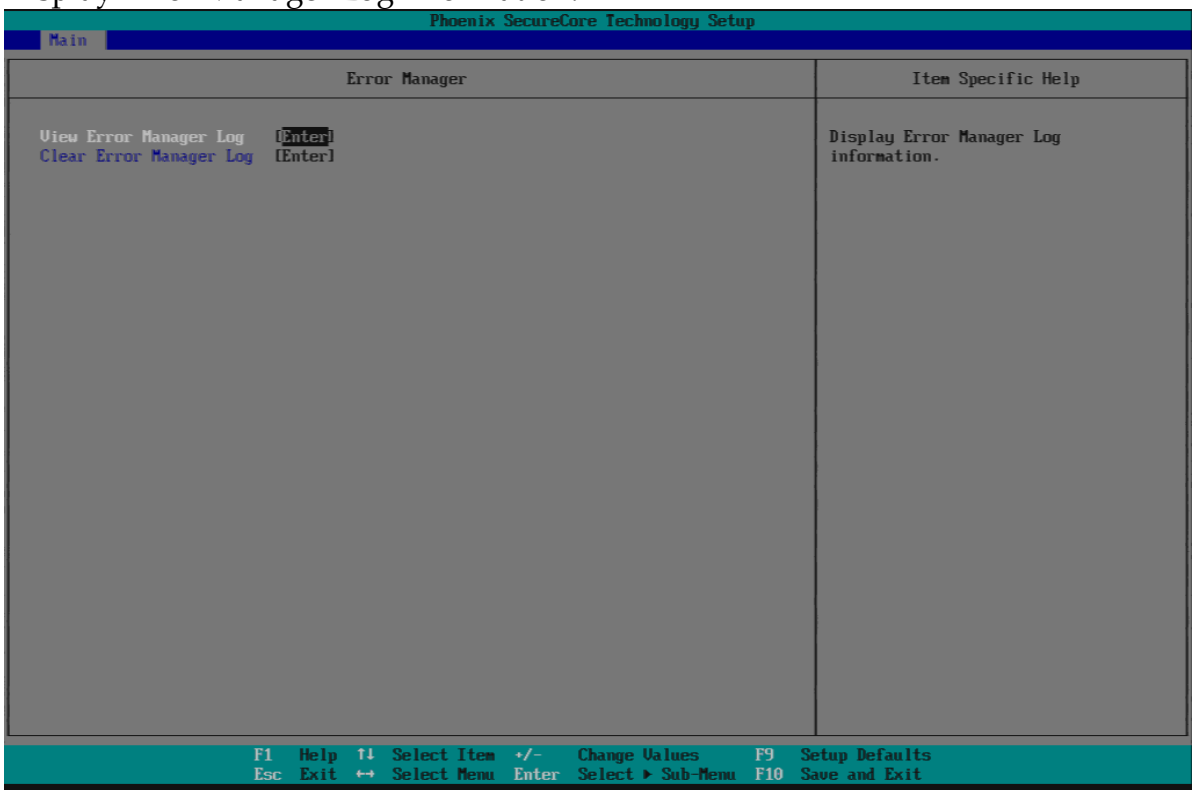
**BIOS Level USB**
Enable/Disable all BIOS support for USB in order to reduce boot time. Note that this will prevent using a USB keyboard in setup or a USB biometric scanner such as a finger print reader to control access to setup, but does not prevent the operating system from supporting such hardware
Choices: Disable, Enable.

**Console Redirection**
Enable/Disable Universal Console Redirection
Choices: Disable, Enable.

**Allow Hotkey in S4 Resume**
Enable hotkey detection when system resuming from Hibernate state
Choices: Disable, Enable.

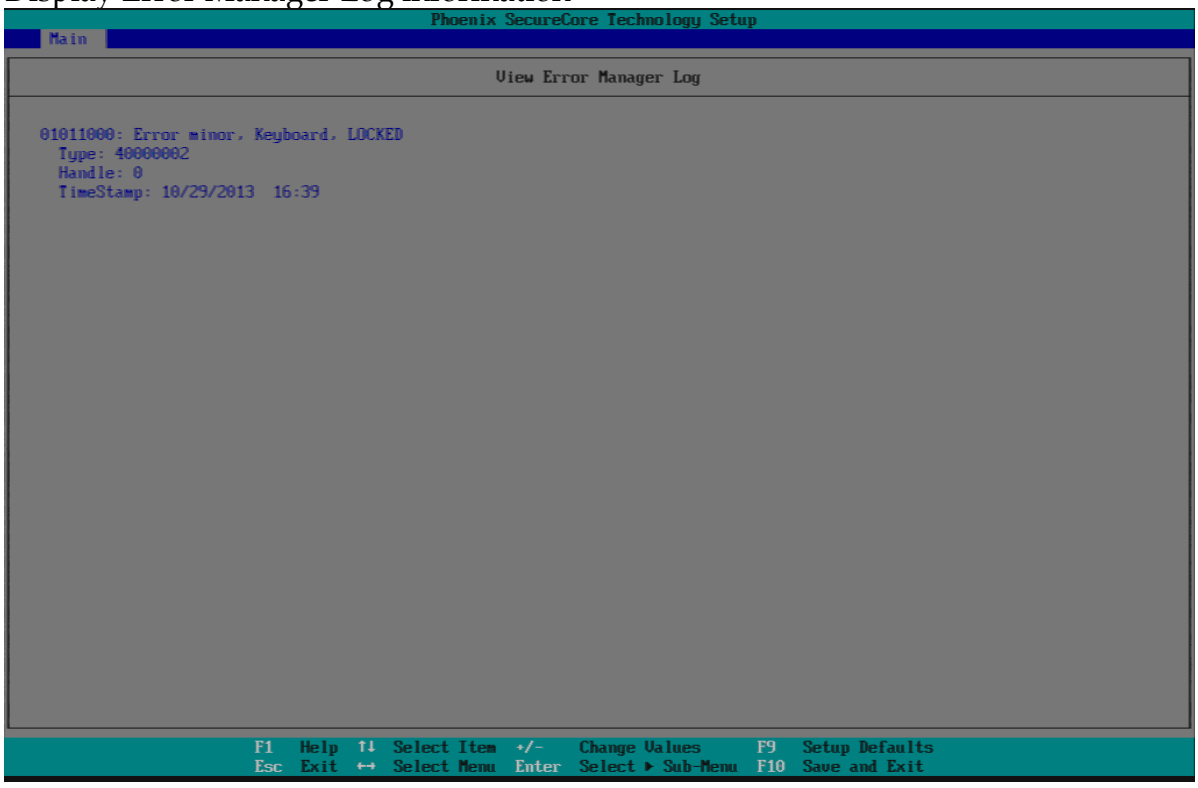
## Error Manager

Display Error Manager Log information.




## View Error Manager Log

Display Error Manager Log information



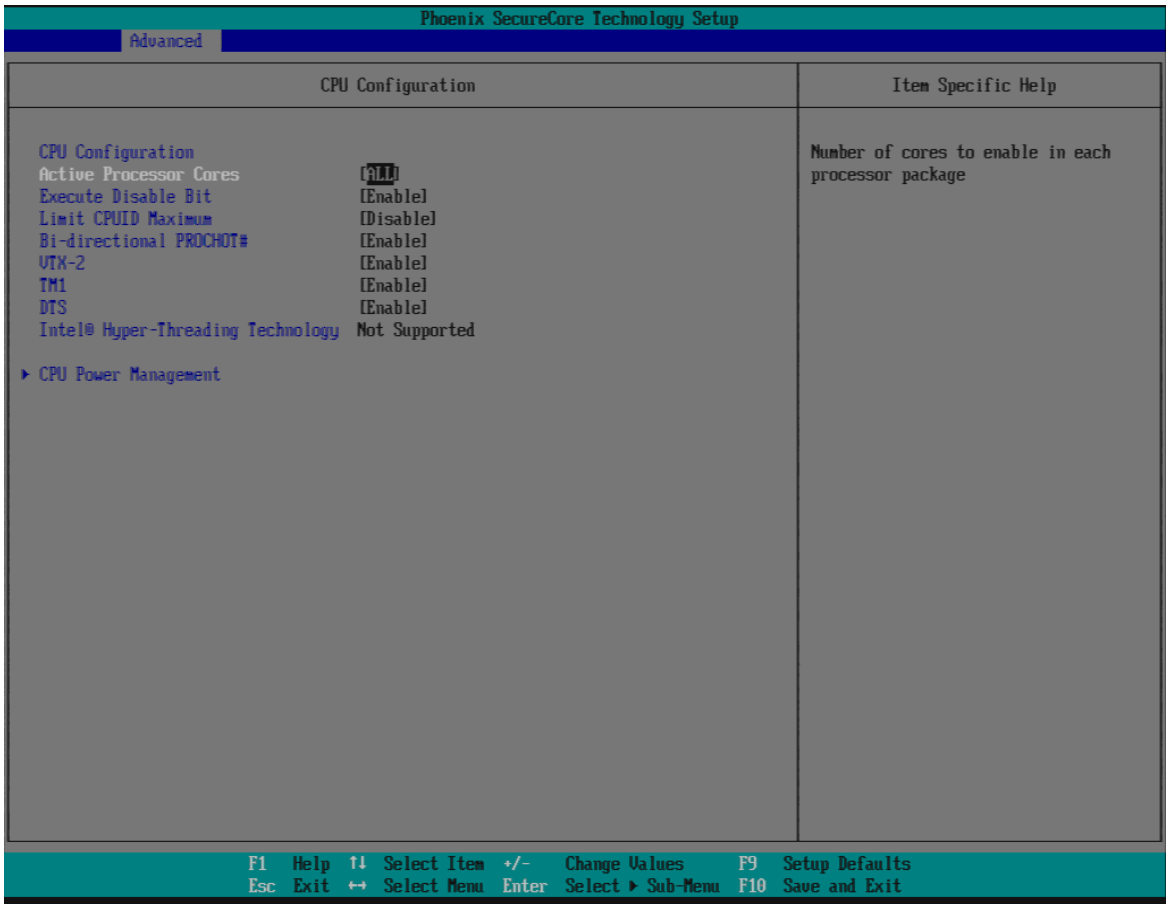

## Clear Error Manager Log

Clear Error Manager Log.

## 4.3 Advanced

**Setup Warning:**
Setting items on this screen to incorrect values may cause system to malfunction!

## CPU Configuration




### Active Processor Cores

Number of cores to enable in each processor package
Choices: All, 1.

### Execute Disabled Bit

Execute Disabled Bit prevent certain classes of malicious buffer overflow attacks when combined with a supporting OS
Choices: Disable, Enable.

### Limit CPUID Maximum

Disabled for Windows XP
Choices: Disable, Enable.

### Bi-directional PROCHOT#

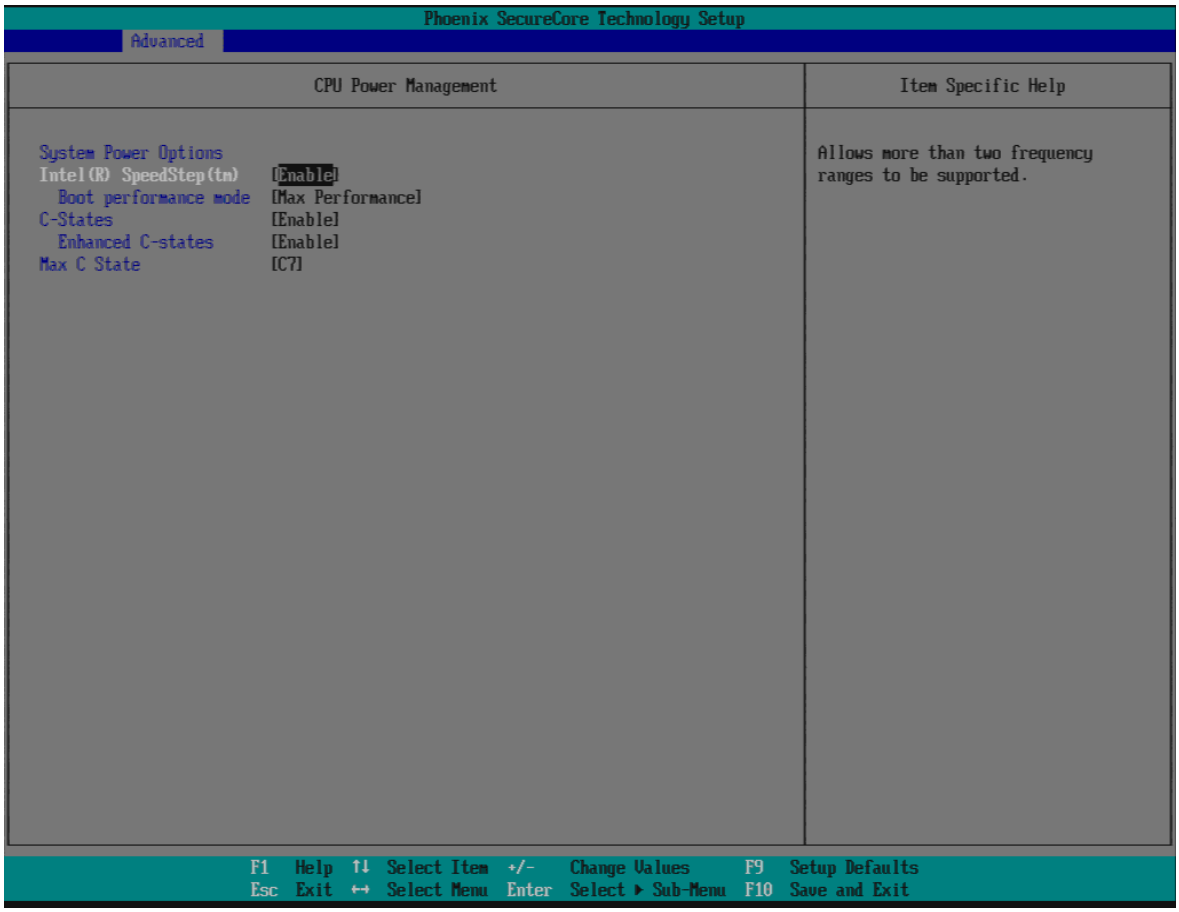
When a processor thermal sensor trips (either core), the PROCHOT# will be driven
If bi-direction is enabled, external agents can drive PROCHOT# to throttle the processor
Choices: Disable, Enable.

**VTX-2**
To enable or disable the VTX-2 Mode support
Choices: Disable, Enable.

**TM1**
Enable/Disable TM1
Choices: Disable, Enable.

**DTS**
Enabled/Disable Digital Thermal Sensor
Choices: Disable, Enable.

**CPU Power Management**
System Power Options




**Intel® SpeedStep™**
Allows more than two frequency ranges to be supported
Choices: Disabled, Enabled.

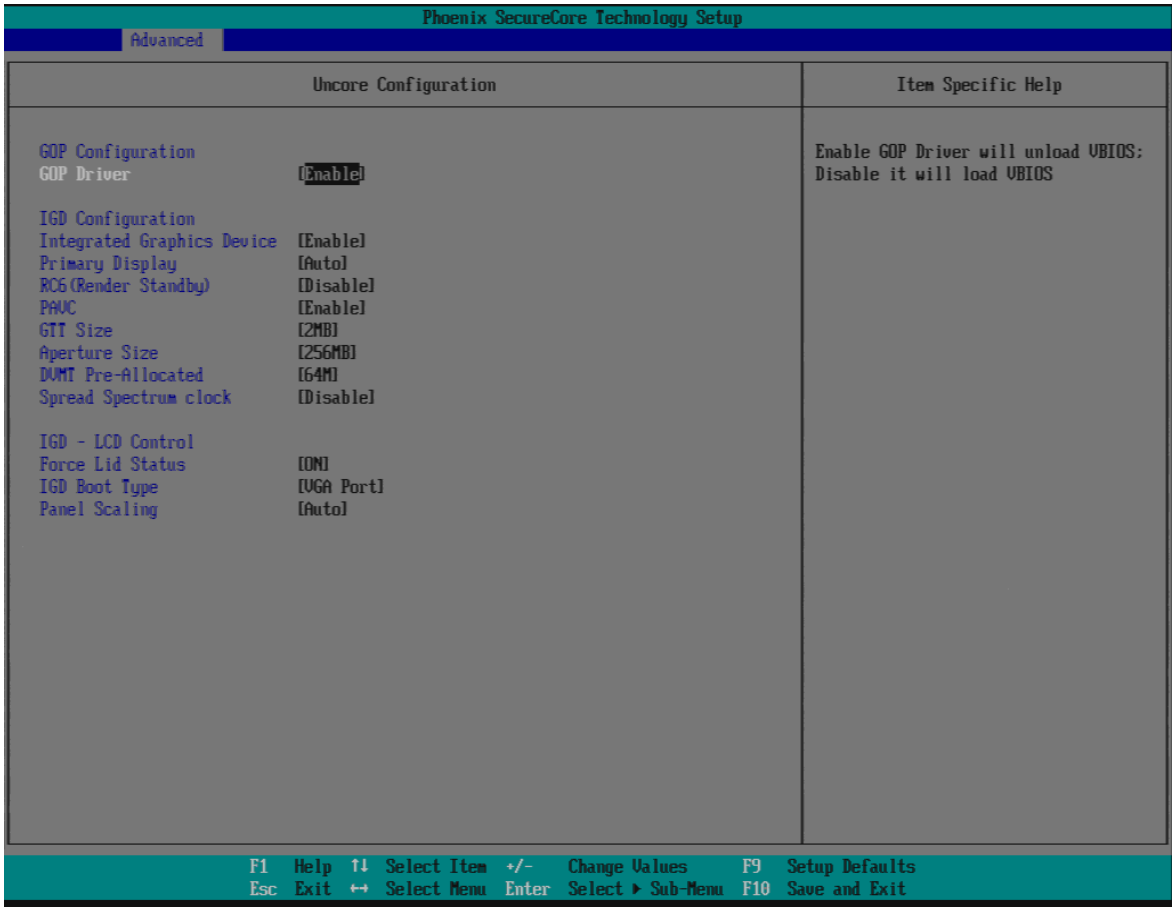
**Boot performance mode**
Select the performance state that the BIOS will set before OS handoff
Choices: Max Performance, Max Battery.

**C-States**
Enable/Disable C States
Choices: Disable, Enable.

**Enhanced C-States**
Enable/Disable C1E, C2E and C4E. When enabled, CPU will switch to minimum speed when all cores enter C-State
Choices: Disable, Enable.

**Max C State**
This option controls the Max C State that the processor will support
Choices: C7, C6, C4, C1.

**Uncore Configuration**




**GOP Configuration**

**GOP Driver**
Enable GOP Driver will unload VBIOS; Disable it will load VBIOS
Choices: Enable, Disable.

## IGD Configuration

### Integrated Graphic Device
Enable: Enable Integrated Graphics Device (IGD) when selected as the Primary Video Adapter. Disable: Always disable IGD
Choices: Disable, Enable.

### Primary Display
Select which of IGD/PCI Graphics device should be Primary Display.
Choices: Auto, IGD, PCIe.

### RC6 (Rander Standby)
Check to enable render standby support
Choices: Enable, Disable.

### PAVC
Enable/Disable Protected Audio Video control.
Choices: Enable, Disable.

### GTT Size
Select the GTT Size
Choices: 1MB, 2MB.

### Aperture Size
Select the Aperture Size
Choices: 128MB, 256MB, 512MB.

### DVMT Pre-Allocated
Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory sized used by the Internal Graphic Device
Choices: 32M, 64M, 96M, 128M, 160M, 192M, 224M, 256M, 288M, 320M, 352M, 384M,416M, 448M, 480M, 512M.

### Spread Spectrum clock
Enable clock chip Spread Spectrum feature
Choices: Disable, Enable.

## IGD – LCD Control

### Force Lid States
For test: Force to set lid status as on or off
Choices: OFF, ON.

## IGD Boot Type

Select preference for Integrated Graphics Device (IGD) display interface used when system boots

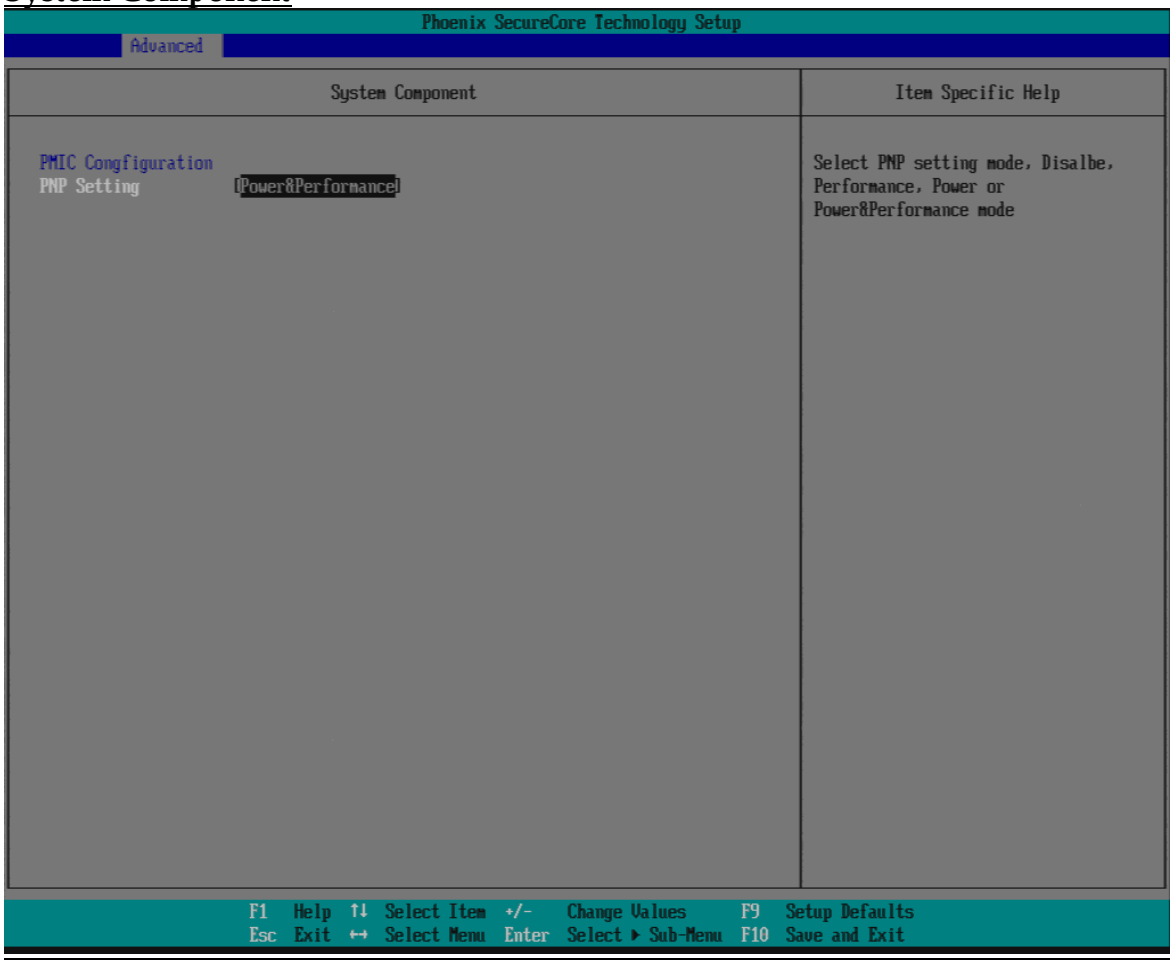
Choices: Auto, VGA Port, HDMI Port B, DP Port B, DP Port C, eDP, DSI PORT A, DSI PORT C.

## Panel Scaling

Select the LCD Panel scaling option used by Internal Graphic device

Choices: Auto, Centering, Stretching.

## System Component



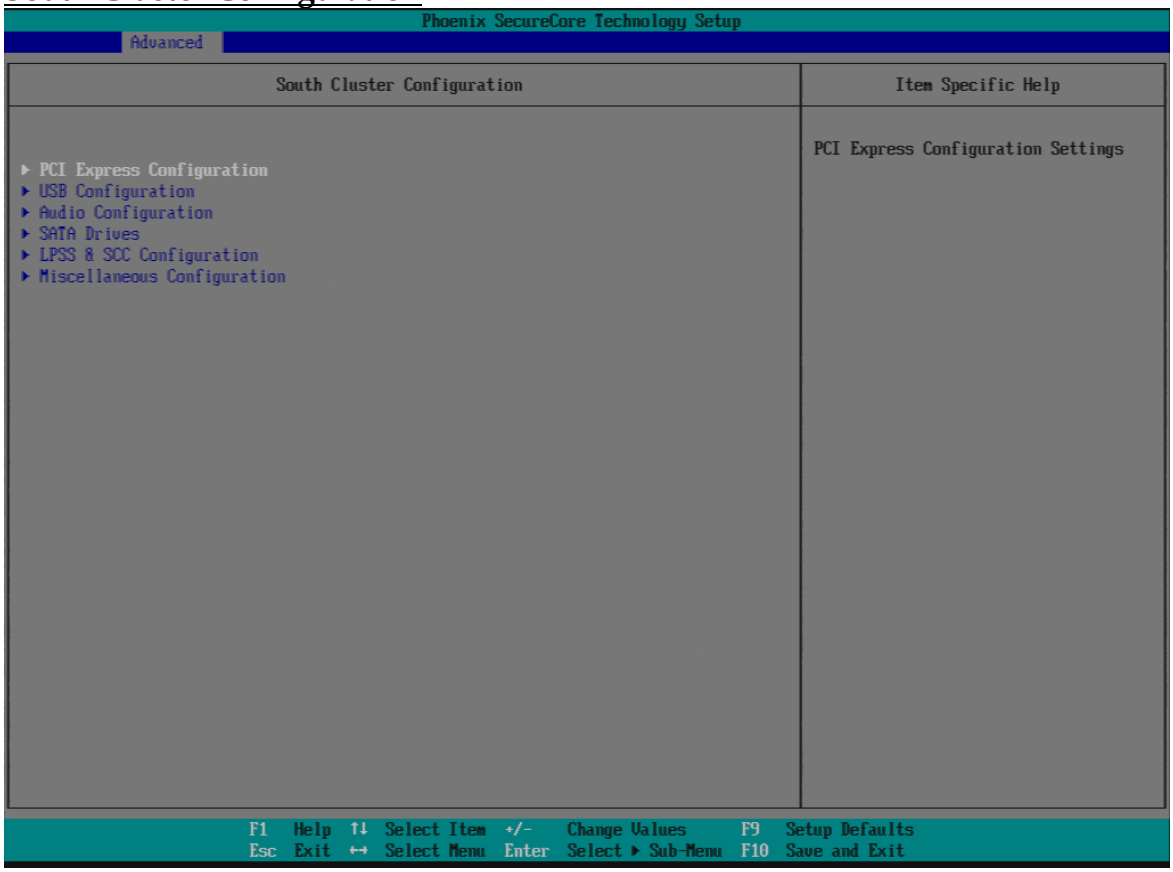

## PMIC Congfiguration

## PNP Setting

Select PNP setting mode, Disable, Performance, Power or Power&Performance mode.

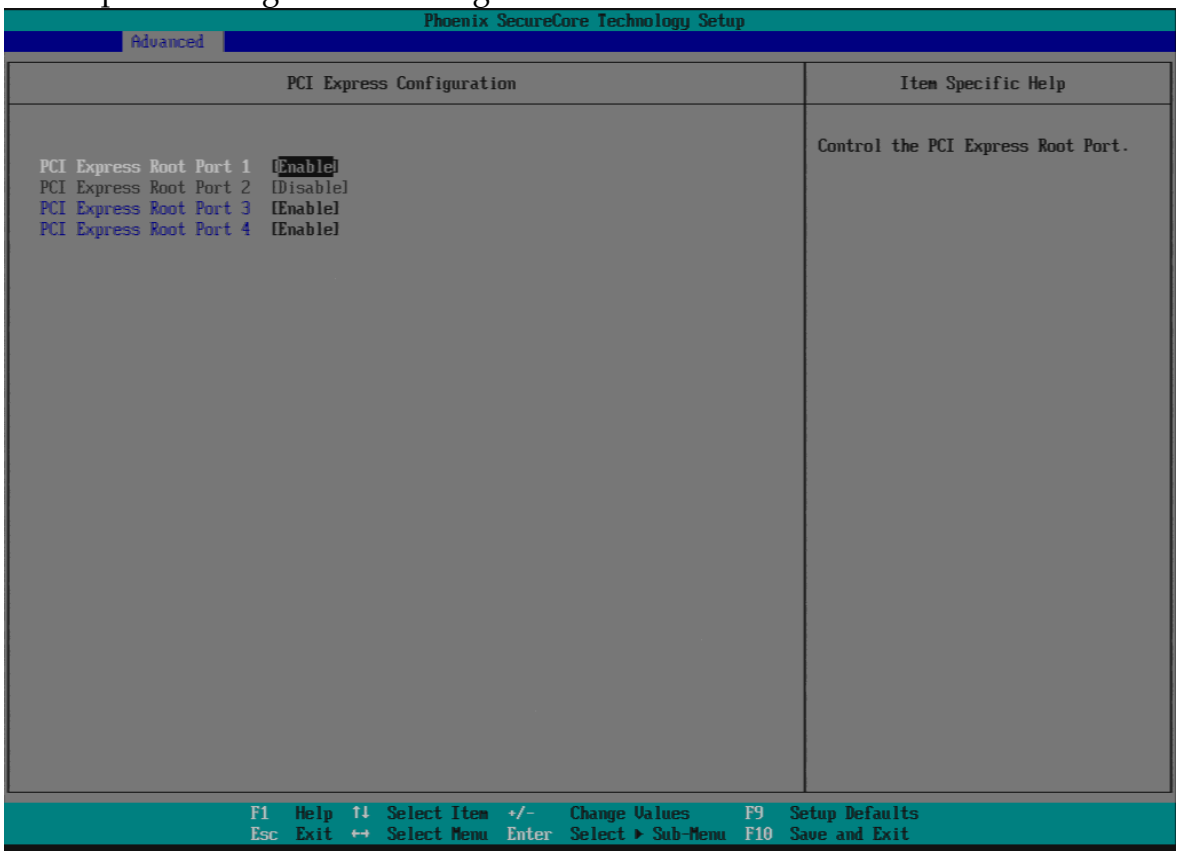
Choices: Disable, Performance, Power, Power&Performance

## South Cluster Configuration



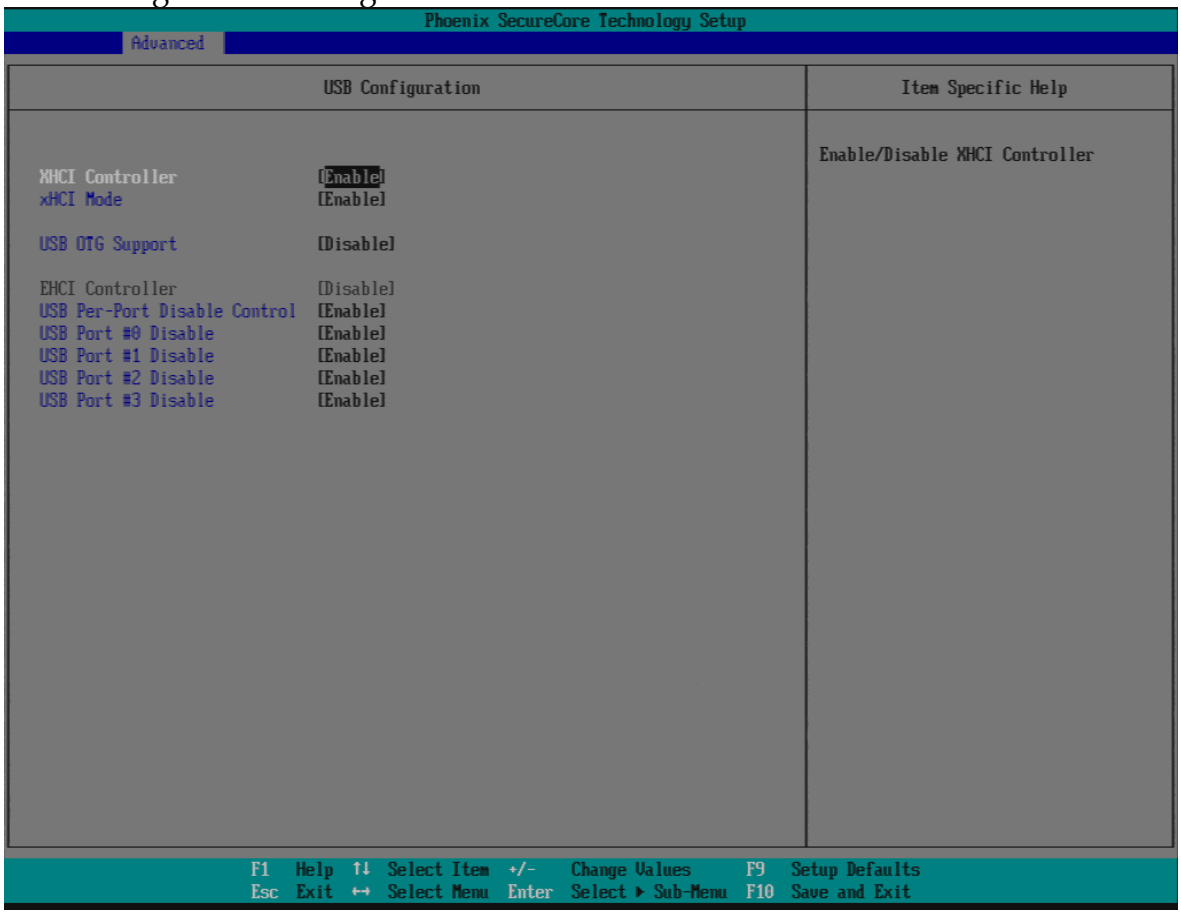

## PCI Express Configuration

PCI Express Configuration Settings



**PCI Express Root Port 1-4**
Control PCI Express root port
Choices: Enable, Disable.

**USB Configuration**
USB Configuration settings




**XHCI Controller**
Enable/Disable XHCI Controller
Choices: Enable, Disable.

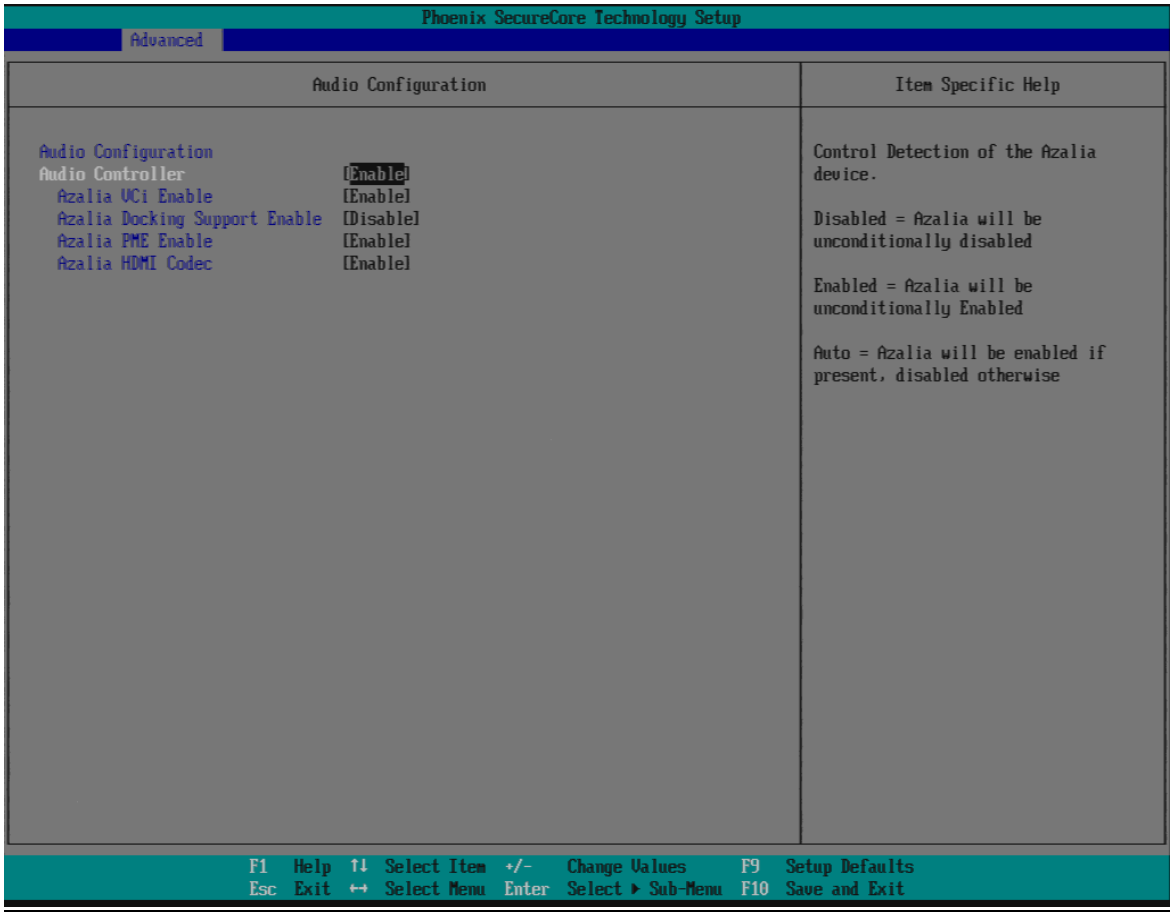
**xHCI Mode**
Mode of operation of xHCI controller
Choices: Smart Auto, Auto, Enable, Disable.

**USB OTG Support**
Enable/Disable USB OTG Support
Choices: Disable, PCI Mode, ACPI Mode.

**EHCI Controller**
Control each of the USB ports (0~9) disabling
Choices: Enable, Disable.

**USB Per-Port #0~#3 Disable**
Disable USB port
Choices: Disable, Enable.

**Audio Configuration**
Audio Configuration Settings




**Audio Controller**
Control Detection of the Azalia device
Disabled = Azalia will be unconditionally disabled.
Enabled = Azalia will be unconditionally enabled.
Auto = Azalia will be enabled if present. Disable otherwise
Choices: Disable, Enable.

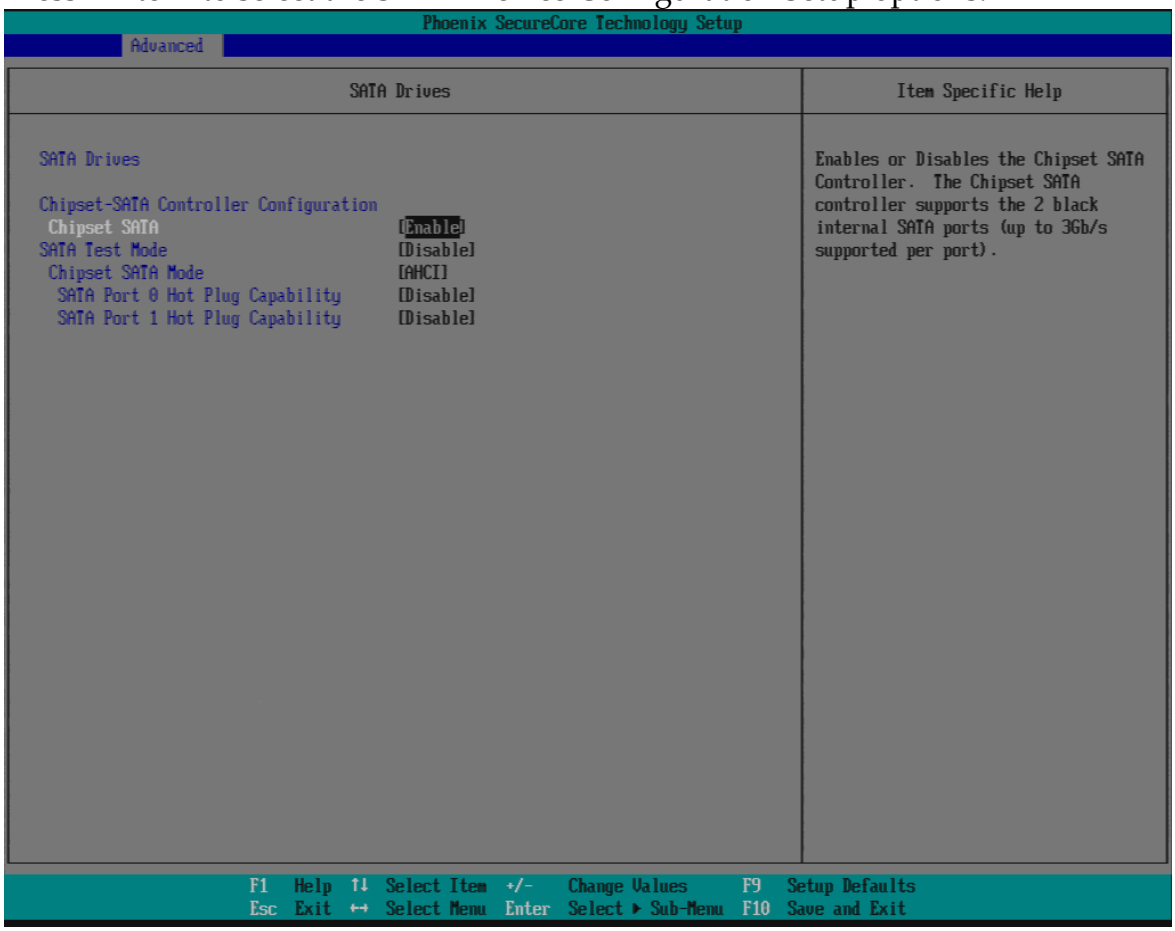
**Azalia VCi Enable**
Enable/ Disable Virtual Channel 1 of Audio Controller
Choices: Disable, Enable.

**Azalia Docking Support Enable**
Enable/ Disable Virtual Channel 1 of Audio Controller
Choices: Disable, Enable.

**Azalia PME Enable**
Enable/ Disable Power Management capability of Audio Controller
Choices: Disable, Enable.

**Azalia HDMI Codec**
Enable/ Disable internal HDMI codec for Azalia.
Choices: Disable, Enable.

**SATA Drives**
Press<Enter> to select the SATA Device Configuration Setup options.




**Chipset SATA**
Enables or Disables the Chipset SATA Controller. The Chipset SATA controller supports the 2 black internal SATA ports (up to 3Gb/s supported per port).
Choices: Enable, Disable.

**SATA Test Mode**
Test Mode Enable/Disable
Choices: Enable, Disable.

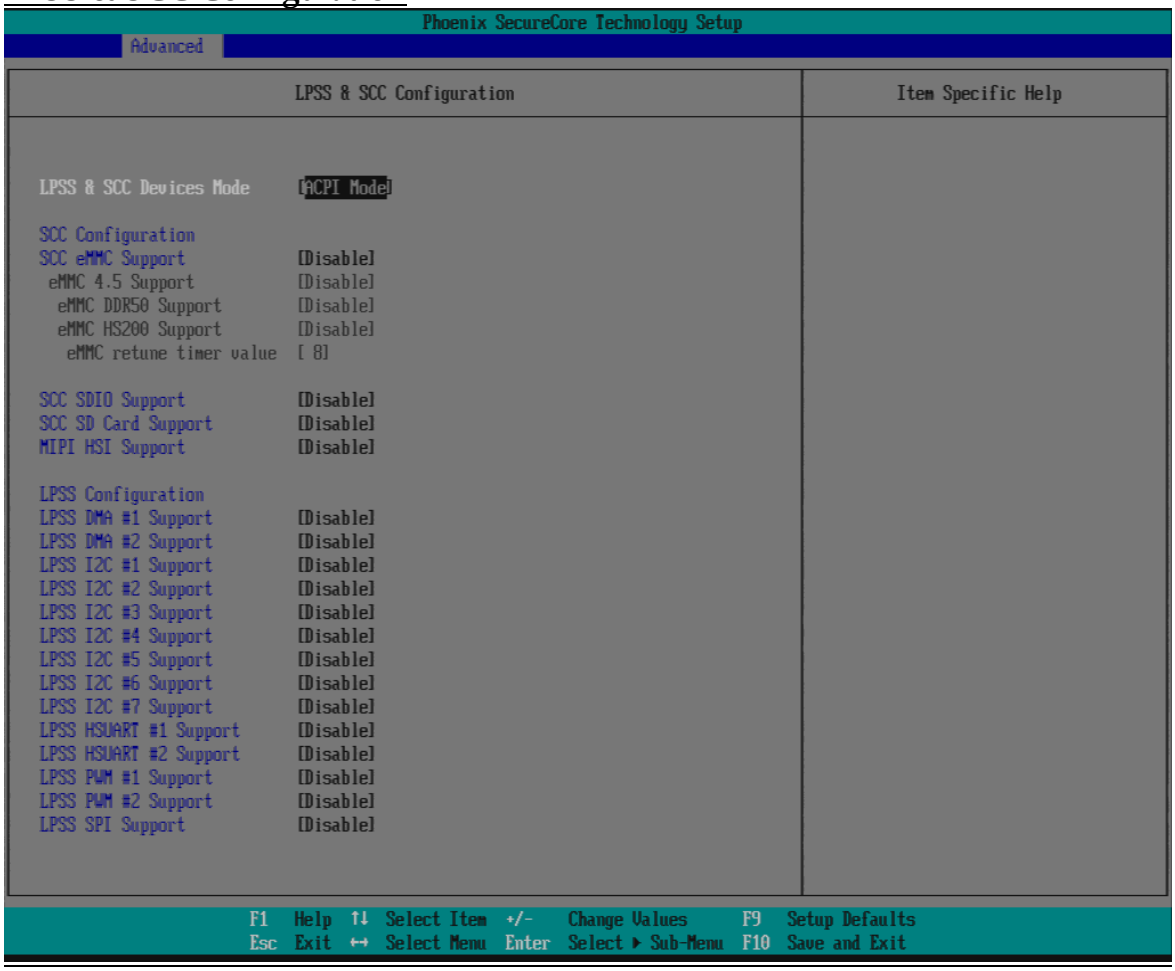
## Chipset SATA Mode

IDE: Compatibility mode disables
AHCI support: Supports advanced SATA features such as Native Command Queuing.
Warning: OS may not boot if this setting is changed after OS install.
Choices: IDE, AHCI.

## Serial Port 0/1 Hot Plug Capability

If enabled, SATA port 0/1 will be reported as Hot Plug capable.
Choices: Enable, Disable.

## LPSS & SCC Configuration




## LPSS & SCC Mode

Choices: ACPI Mode, PCI Mode.

## SCC eMMC Support

Choices: Disable, Enable.

## SCC SDIO Support

Choices: Disable, Enable.

**SCC SD Card Support**
Choices: Disable, Enable.

**MIPI HSI Support**
Choices: Disable, Enable.

**LPSS Configuration**

**LPSS DMA #1/#2 Support**
Choices: Disable, Enable.

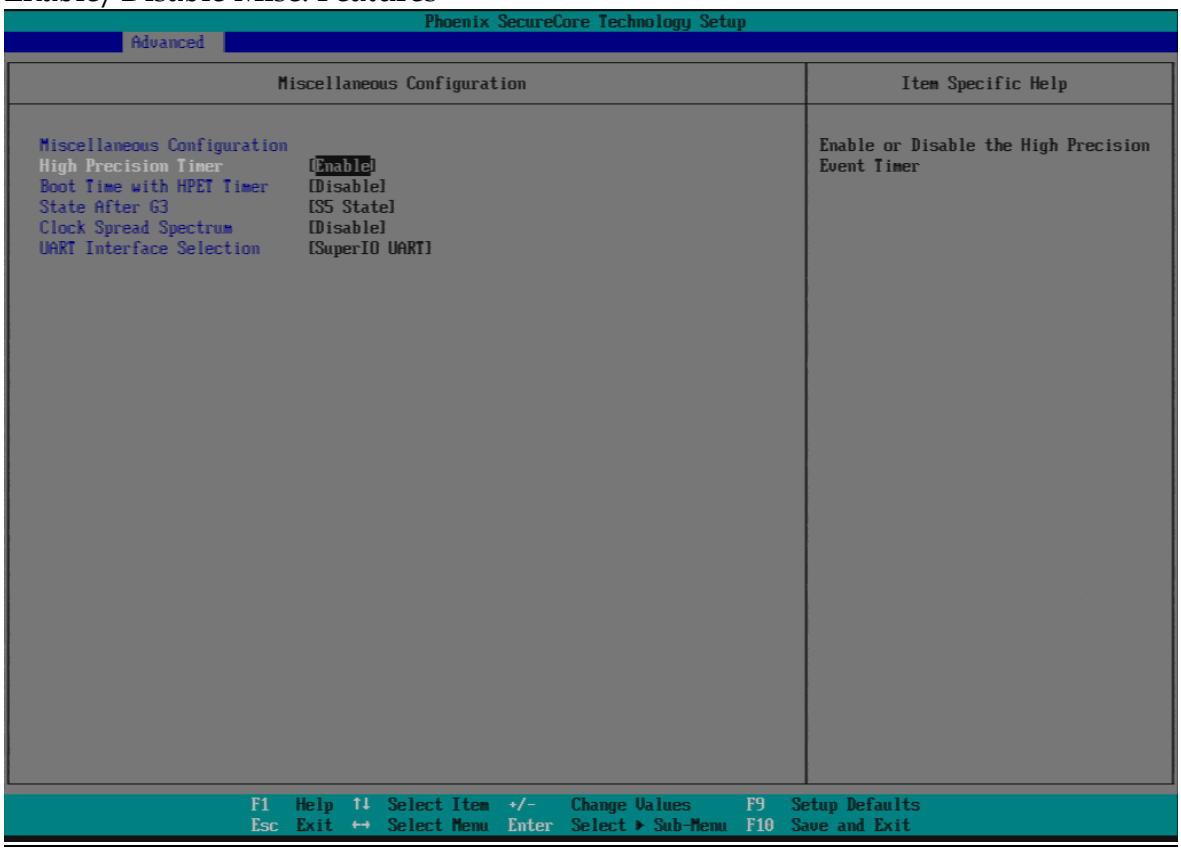
**LPSS I2C #1~7 Support**
Choices: Disable, Enable.

**LPSS HSUART #1/#2 Support**
Choices: Disable, Enable.

**LPSS PWM #1/#2 Support**
Choices: Disable, Enable.

**LPSS SPI Support**
Choices: Disable, Enable.

**Miscellaneous Configuration**
Enable/Disable Misc. Features



**High Precision Timer**
Enable or Disable the High Precision Event Timer.
Choices: Disable, Enable.

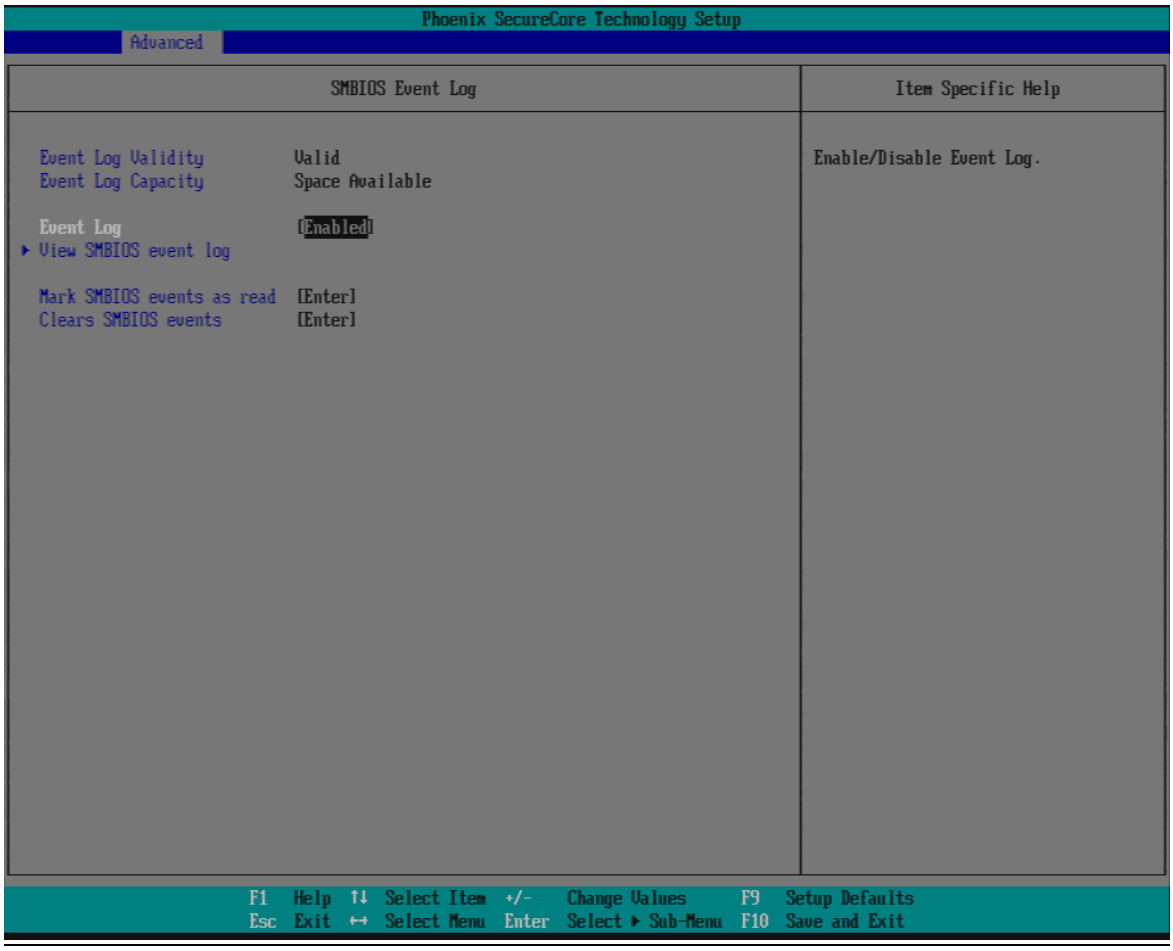
**Boot Time with HPET Timer**
Boot time calculation with High Precision Event Timer enable.
Choices: Disable, Enable.

**State After G3**
Specify what state to go to when power is re-applied after a power failure (G3 state)
Choices: S0 State, S5 State.

**Clock Spread Spectrum**
Enable Clock Chip's Spread Spectrum feature.
Choices: Disable, Enable.

**UART Interface Selection**
Select which UART interface to use.
Choices: Intermal UART, SuperIO UART.

**SMBIOS Event Log**
Manage SMBIOS Event Log.



**Event Log**
Enable/Disable Event Log.
Choices: Disable, Enable.

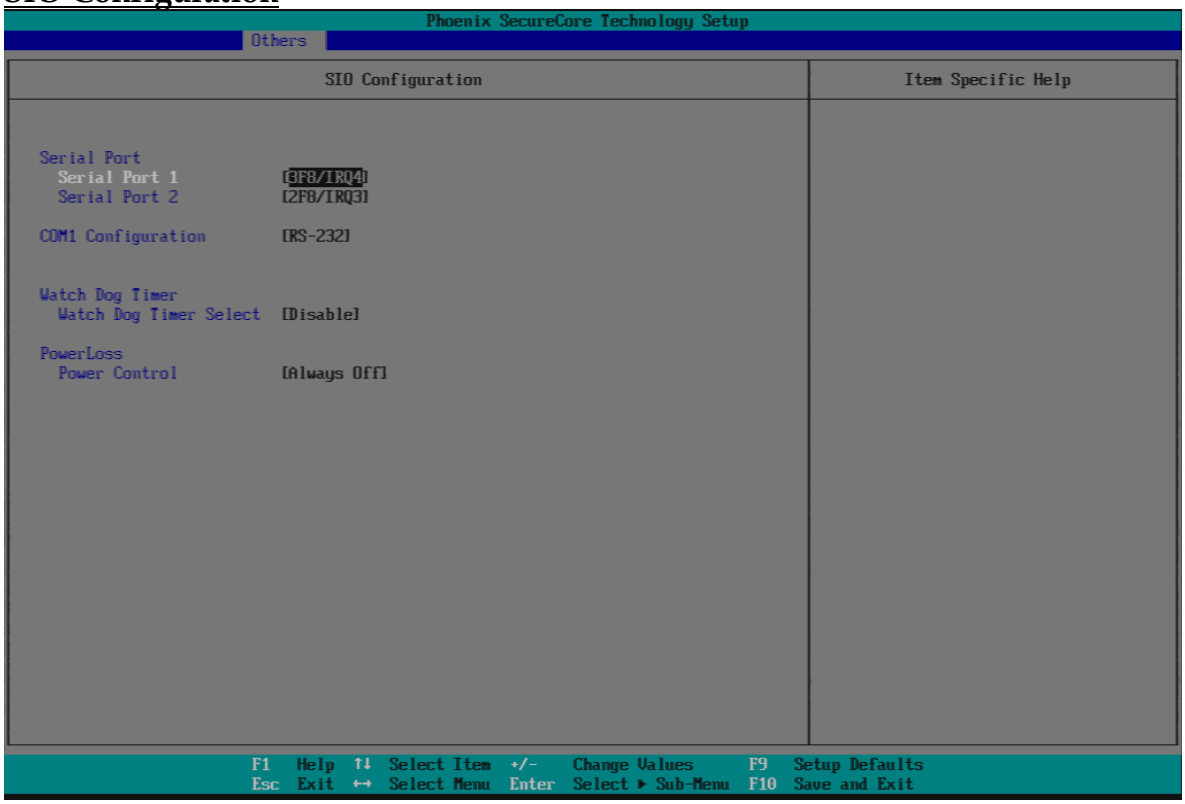
**View SMBIOS event log**
View SMBIOS event log


**Mark SMBIOS events as read**
Mark SMBIOS events as read. Marked SMBIOS events won't bedisplayed.

**Clears SMBIOS events**
Clears SMBIOS events.

## 4.4 Others


### SIO Configuration



**Serial Port 1**
Choices: Disable 3F8/IRQ4.

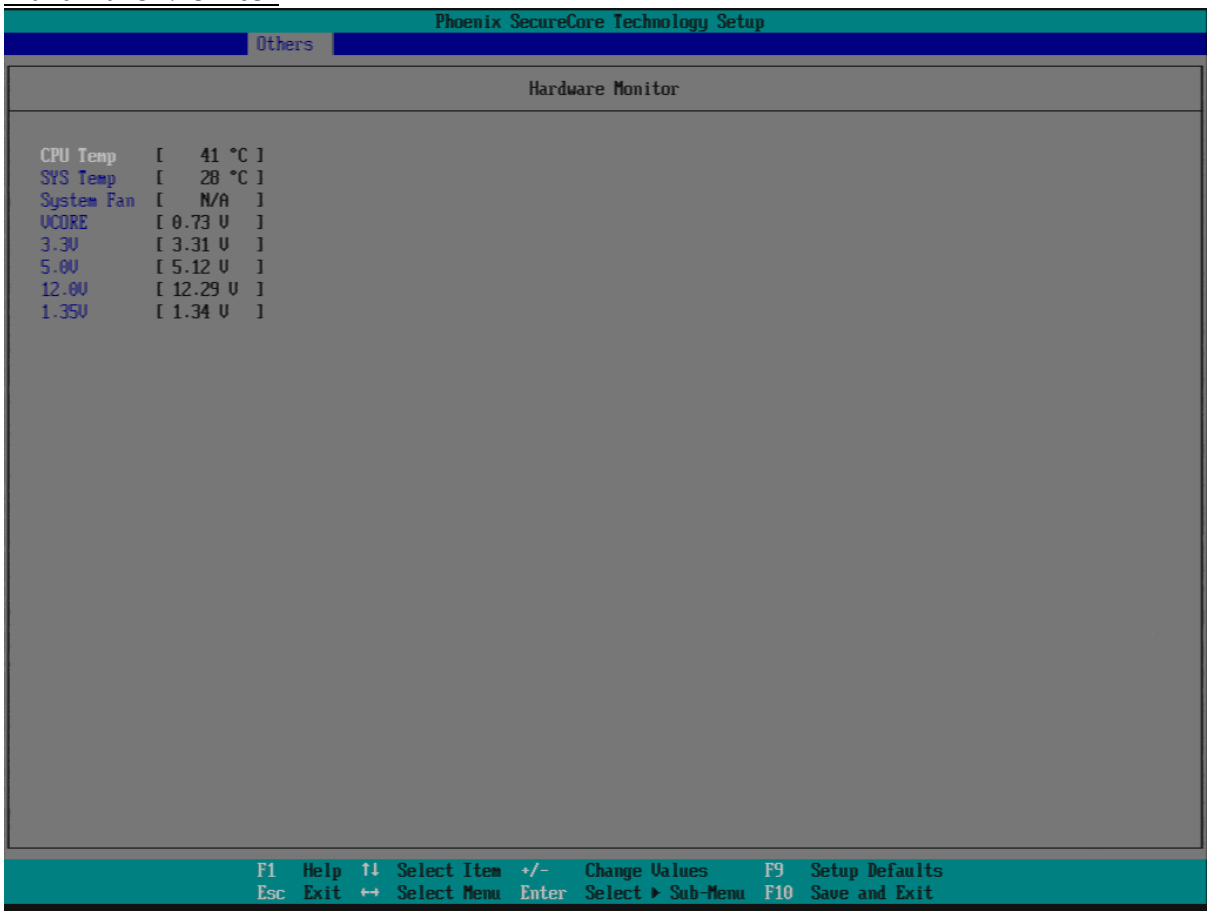
**Serial Port 2**
Choices: Disable 2F8/IRQ3.

**COM1 Configuration**
Select COM1 Configuration.
Choices: RS-232, RS-422, RS-285.

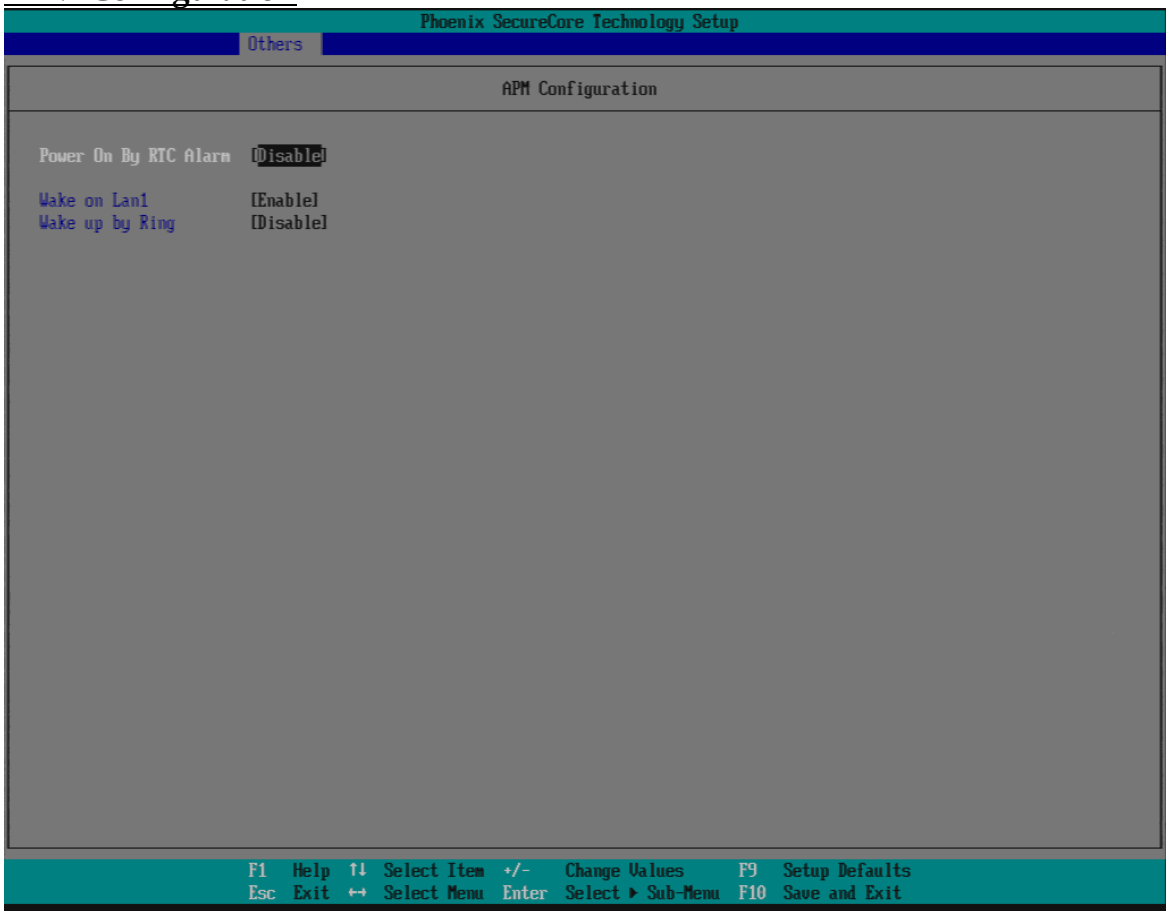
**Watch Dog Timer Select**
Choices: Disable, 15 secs, 30 secs, 1 min, 2 mins, 3 mins.

**Power Control**
Choices: Former State, Always On, Always Off.

**Hardware Monitor**



## APM Configuration




### Power On By RTC Alarm
Choices: Disable, Enable.

### Wake on LAN1
Choices: Disable, Enable.

### Wake up by Ring
Choices: Disable, Enable.

### PCI Subsystems Settings
PCI, PCI-X and PCI Express Settings.

## 4.5 Security


**Set Supervisor Password**
Set or clear the Supervisor account' password.

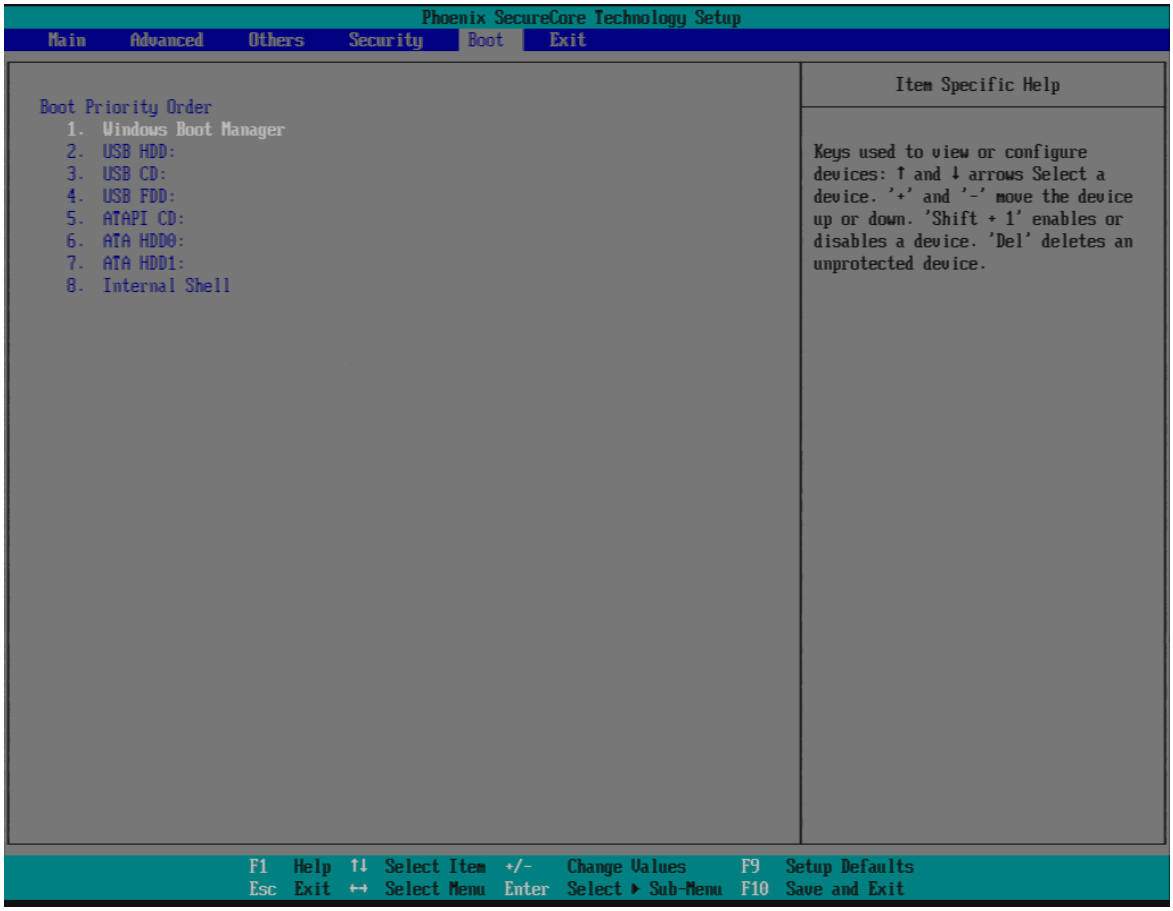
**Supervisor Hint String**
Press Enter to type Supervisor Hint String.

**Set User Password**
Set or clear the User account' password.

**Supervisor Hint String**
Press Enter to type User Hint String.

**Min. password length**
Set the minimum number of characters for password (1-20).

## 4.6 Boots




**Boot Priority Order**

Keys used to view or configure devices: ↑ and ↓ arrows Select a device. '+' and '-'move the device up or down. 'Shift + 1' enabled or disables a device. 'Del' deletes an unprotected device.

## 4.7 Security


**Exit Saving Changes**
Equal to F10, save all changes of all menus, then exit setup configure driver. Finally resets the system automatically.

**Exit Discarding Changes**
Equal to ESC, never save changes, then exit setup configure driver.

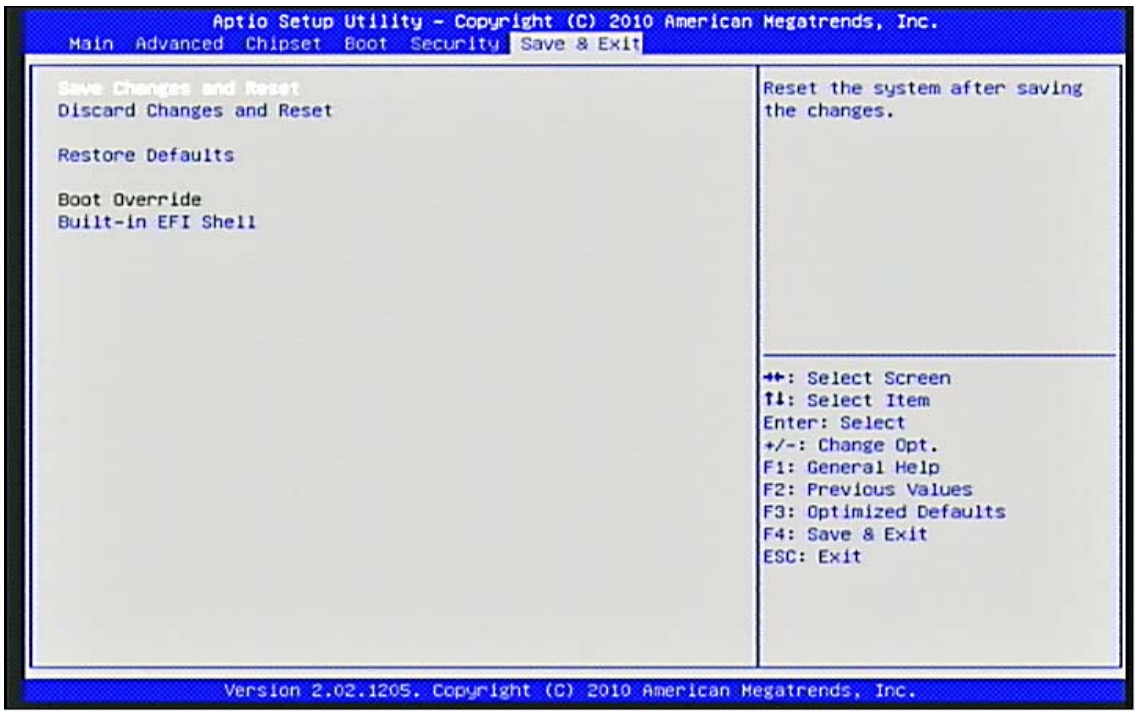
**Load Setup Defaults**
Equal to F9. Load standard default values.

**Discard Changes**
Load the original value of this boot time. Not the default Setup value.

**Save Changes**
Save all changes of all menus, but do not reset system.

## 4.8 Save & Exit

This menu allows you to load the BIOS default values or factory default settings into the BIOS and exit the BIOS setup utility with or without changes.




**Save Changes and Reset**
Reset the system after saving the changes.
Pressing <Enter> on this item asks for confirmation: Save configuration and reset.

**Discard Changes and Reset**
Reset system setup without saving any changes.

**Restore Defaults**
Restore/Load Default values for all the setup options.

**Built-in EFI Shell**
Boot into the initial shell environment, it can debug and dump the PCI Resource or jump to next bootable device. If it doesn't have boot device, it will return to BIOS setup menu. If you want to know the shell command, you can visit the Intel official hyperlink as below.

http://software.intel.com/en-us/articles/uefi-shell/#Internal_EFI_Shell_Commands

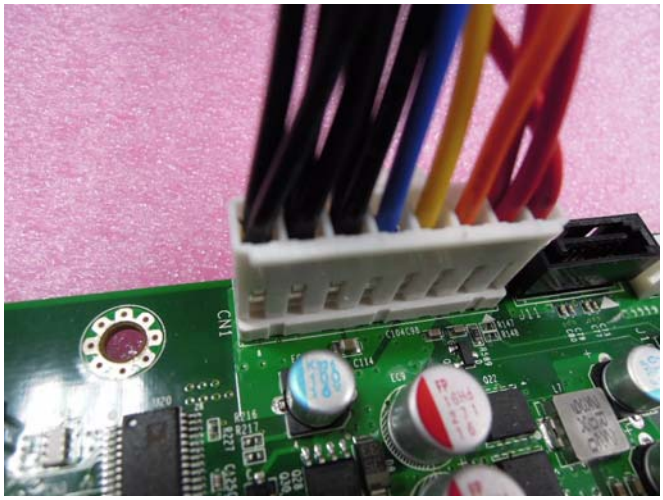
# Chapter 5
# Troubleshooting

This chapter provides a few useful tips to quickly get WADE-8078 running with success. As basic hardware installation has been addressed in Chapter 2, this chapter will primarily focus on system integration issues, in terms of BIOS setting, and OS diagnostics.

## 5.1 Hardware Quick Installation

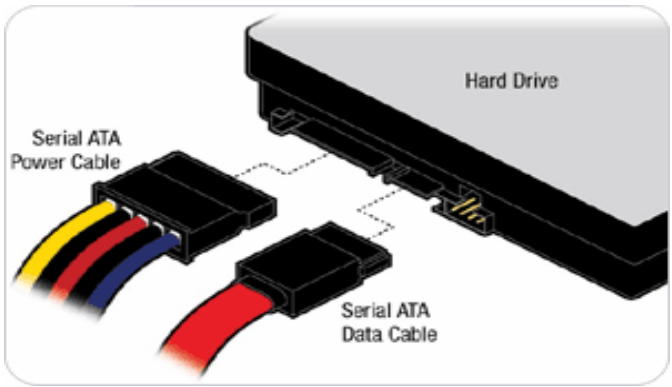
**ATX Power Setting**

Unlike other Single board computer, WADE-8078 supports ATX only. Therefore, there is no other setting that really needs to be set up. However, there is 8 Pin ATX Connector—CN1 in the WADE-8078 board.




**Serial ATA**

Unlike IDE bus, each Serial ATA channel can only connect to one SATA hard disk at a time; The installation of Serial ATA is simpler and easier than IDE, because SATA hard disk doesn't require setting up Master and Slave, which can reduce mistake of hardware installation.



The WADE-8078 can support two SATA interface (SATAII, 3.0Gb/s) with AHCI or IDE mode. It has two J11 SATA ports in the board.

## 5.2 BIOS Setting

It is assumed that users have correctly adopted modules and connected all the devices cables required before turning on ATX power. 204-pin DDR3 Memory, keyboard, mouse, SATA hard disk, VGA connector, power cable of the device, ATX accessories are good examples that deserve attention. With no assurance of properly and correctly accommodating these modules and devices, it is very possible to encounter system failures that result in malfunction of any device.

To make sure that you have a successful start with WADE-8078, it is recommended, when going with the boot-up sequence, to hit "F2" key and enter the BIOS setup menu to tune up a stable BIOS configuration so that you can wake up your system far well.

**Loading the default optimal setting**

When prompted with the main setup menu, please scroll down to "**Load Setup Defaults**", press **"Enter"** and select **"Yes"** to load in default optimal BIOS setup. This will force your BIOS setting back to the initial factory configuration. It is recommended to do this so you can be sure the system is running with the BIOS setting that Portwell has highly endorsed. As a matter of fact, users can load the default BIOS setting any time when system appears to be unstable in boot up sequence.

## 5.3 Q&A

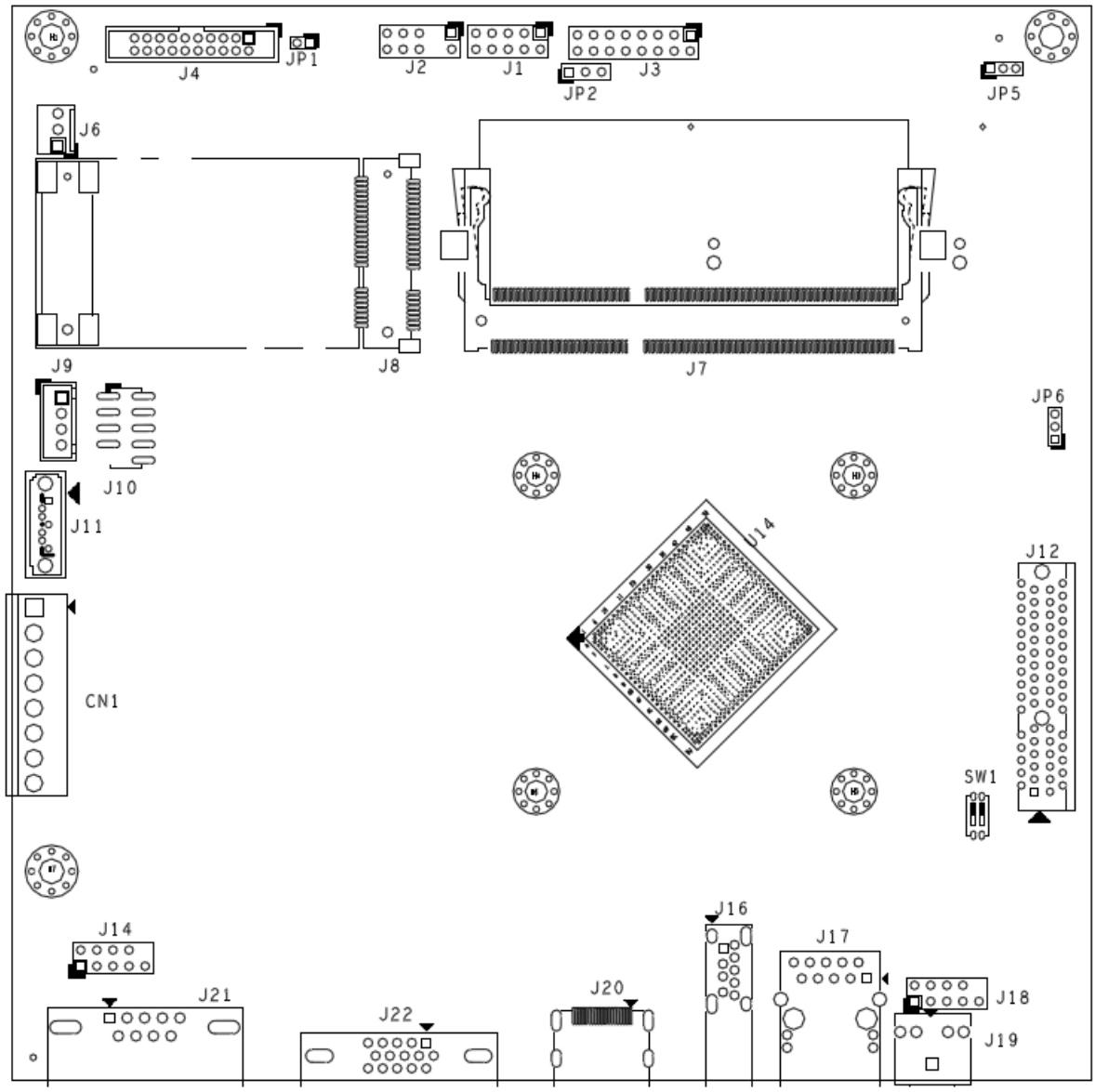
**Information & Support**

**Question: I forget my password of system BIOS, what am I supposed to do?**

**Answer:** You can switch off your power supply then find the JP6 to set it from 1-2 short to 2-3 short and wait 5 seconds to clean your password then set it back to 1-2 short to switch on your power supply.

**JP6：CMOS Setting**

| | Jumper Setting Describe |
|---|---|
| *1-2 | Normal |
| 2-3 | Clean CMOS |




**Question: How to update the BIOS file of the WADE-8078?**

**Answer:** 1. Please visit web site of the **Portwell download center** as below hyperlink
**http://www.portwell.com.tw/support/download_center.php**
But you must register an account first. **(The E-Mail box should be an existing Company email address that you check regularly.)**
**http://www.portwell.com.tw/member/newmember.php**
2. Input your User name and password to log in the download center.

3. Select the **"Search download"** to input the keyword **"WADE-8078"**.

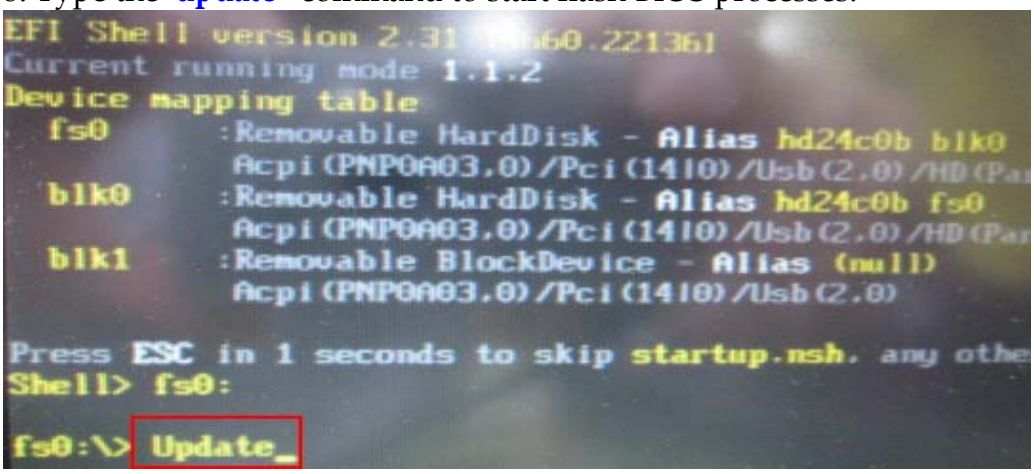
4. Find the **"BIOS "**page to download the ROM file and flash utility.

5. Execute the zip file to root of the bootable USB pen drive. You can get the**"ShellFlash32.efi","temp.bin","Update.nsh"** three files.

6. Insert your USB pen drive in USB port of the WADE-8078 board and power-on.

7. Boot to EFI-Shell mode then input the **"fs0:"** command to switch to the root of the USB pen drive.


8. Type the"**update**" command to start flash BIOS processes.




9. When it finished all update processes, it will reboot in 5 seconds automatically.

10. Please press the **"F2"** key to BIOS setup menu to select **"Load Setup Defaults"** and then select **"Exit Saving Changes"** option to finish all BIOS flash processes.

**Note:**
Please visit our Download Center to get the Catalog, User manual, BIOS, and driver files.
http://www.portwell.com.tw/support/download_center.php
If you have other additional technical information or request which is not covered in this manual, please fill in the technical request form as below hyperlink.
http://www.portwell.com.tw/support/problem_report.php
We will do our best to provide a suggestion or solution for you.
Thanks