

FEB-9457

Intel 945GME with Atom N270

User's Manual

Rev.02, Nov. 2009

Statement

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Packing List

None

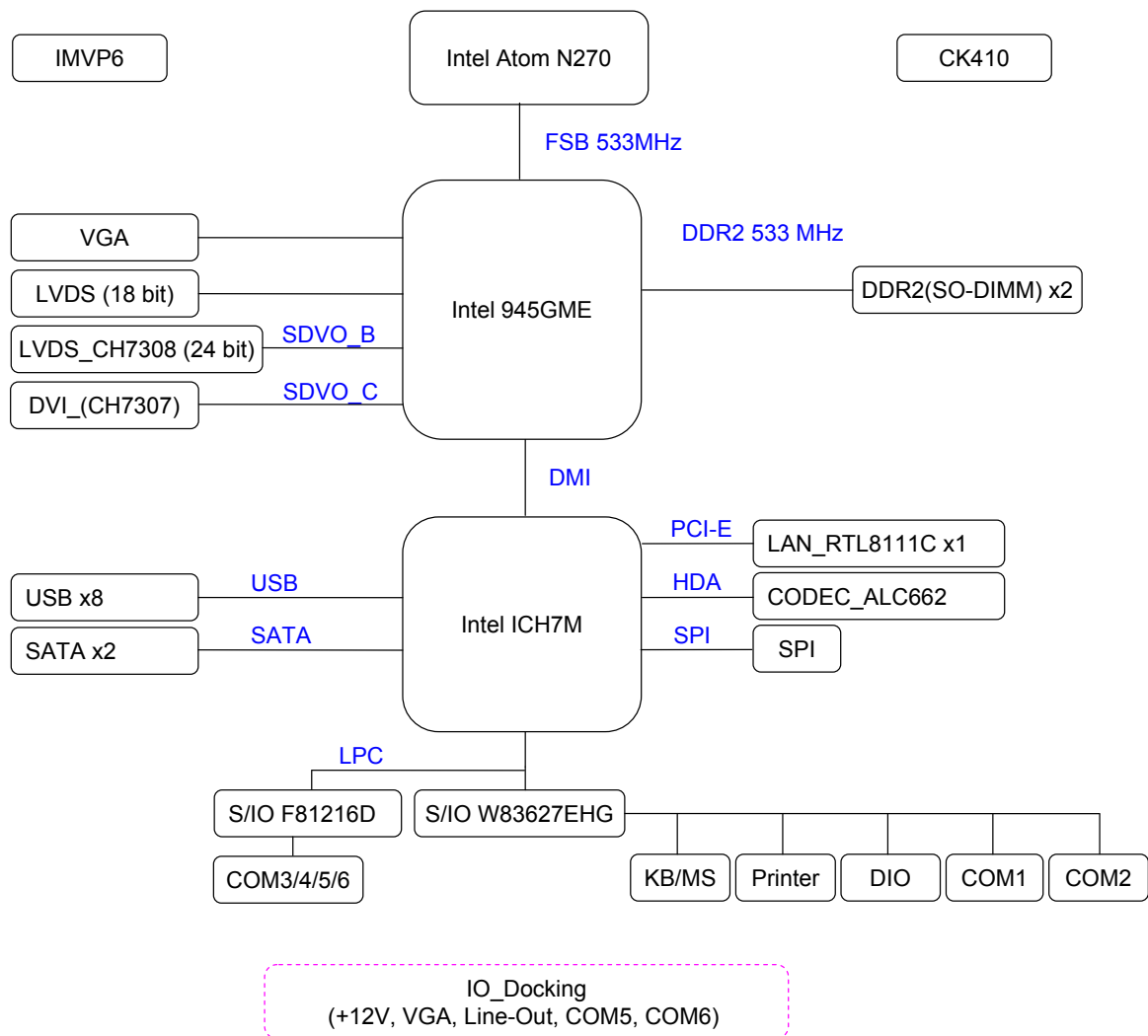
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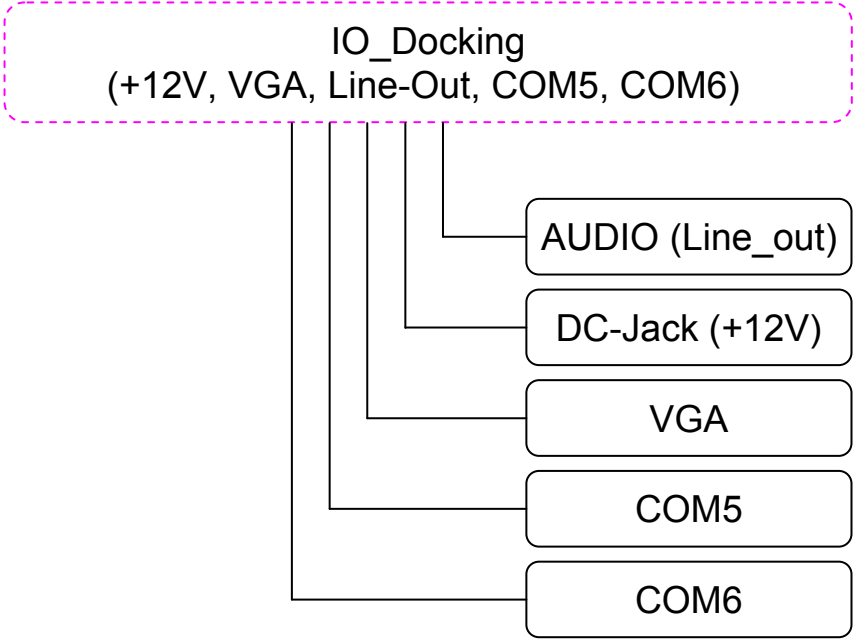
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Chapter 1 Product Information

This chapter introduces the product features, jumper and connector information.

1.1 Block Diagram



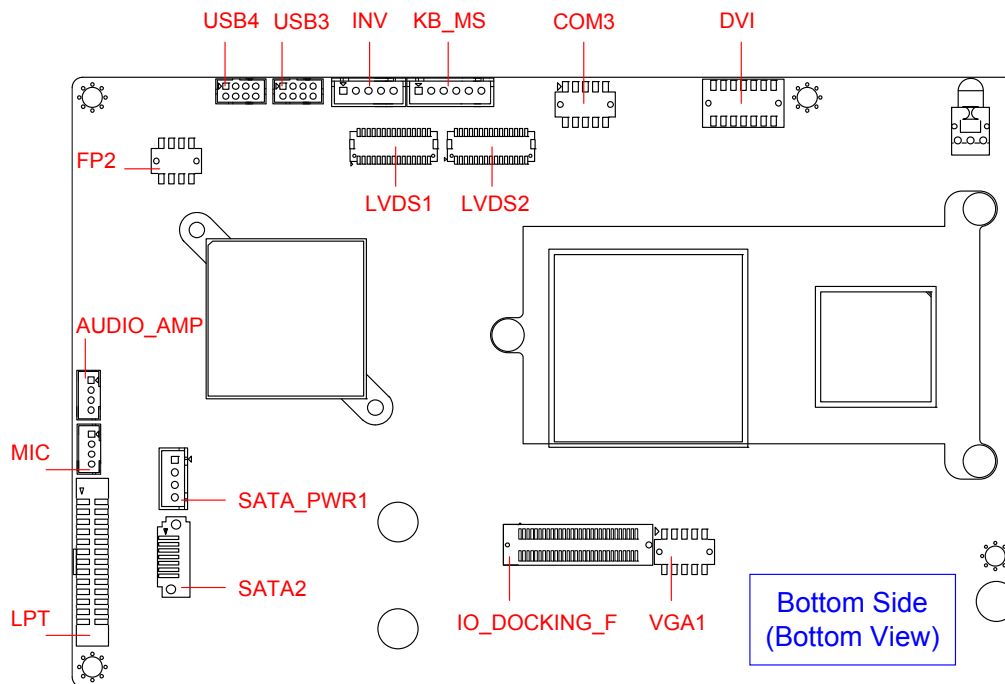
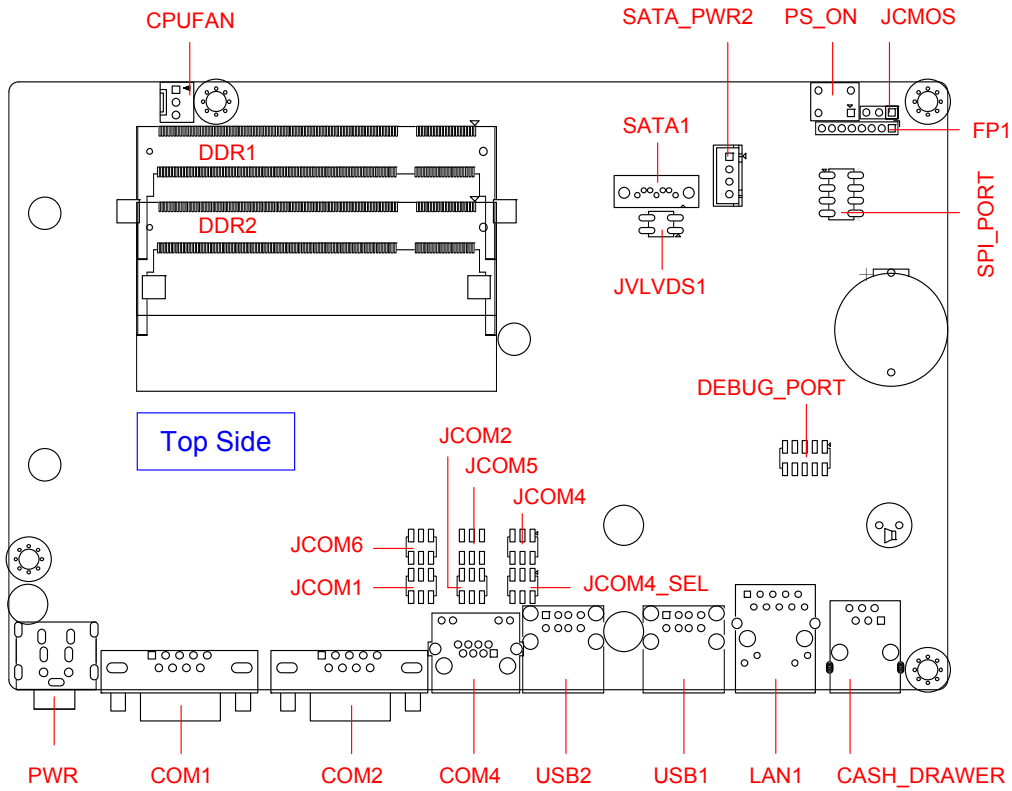


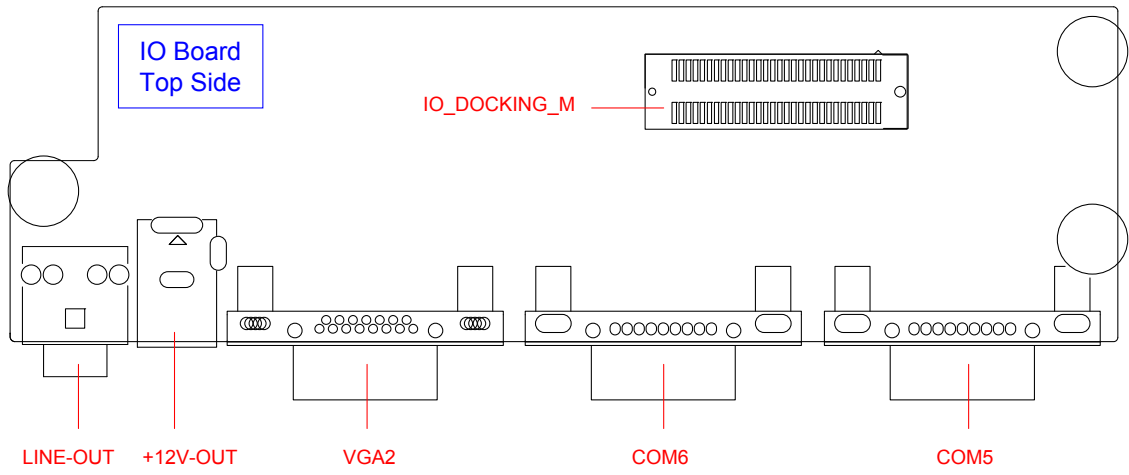
1.2 Features

System Processor / Chipset	Processor	Intel Atom N270 1.6GHz (2.5W) on board
	FSB	533 MHz
	Chipset	Intel 945GME + ICH7M
	BIOS	AWARD 16Mb SPI
Memory	Technology	Dual DDR2 533 MHz SDRAM
	Max. Capacity	Up to 4GB
	Socket	2 x SO-DIMM DDR2
Display	Chipset	Intel 945GME integrated GMA950
	VRAM	Shared with 224MB system memory
	Resolution	Analog Display: Up to 2048 x 1536 (QXGA)
	LVDS	Chrontel CH7308 18/24 bit, Dual Channel
	LVDS Resolution	Digital LVDS: Up to 1600 x 1200 (UXGA)
	DVI-D	Chrontel CH7307C, Up to 1600 x 1200 (UXGA)
	Dual Display	CRT + LVDS, DVI + LVDS, CRT + DVI
Ethernet	Interface	10/100/1000 Mbps
	Controller	Realtek RTL8111C
Audio	Interface	High Definition Audio
	Controller	Realtek ALC662 HD CODEC
SATA	Max. Data Transfer Rates	300 MB/s
	Port	2
Internal Connector	LVDS	2
	USB 2.0	4
	COM	3 (RS-232, supply 5V / 12V), (1 on board, 2 on IO Board)
	Parallel	1
	Audio Amplifier	1 [6W(4Ω) stereo]
	PS2	1
	VGA	1
	DVI	1

Rear I/O	COM	2 (RS-232, supply 5V / 12V)
	LAN	1 (RJ-45)
	USB2.0	4
	Cash Drawer	RJ11, DIO: 3bit GPIO (1 In, 2 Out)
	Audio	3 (Mic.-In, Line-in, Line-out)
Power	Type	DC +12V Input
Watchdog Timer	Interval	Programmable 1~255 sec./min.
	Output	System reset
Environment	Operating Temp.	-5°C ~ 60°C (23°F ~ 140°F)
	Storage Temp.	-20°C ~ 80°C (-4°F ~ 176°F)
	Relative Humidity	0%~ 95% (non-condensing)
Form Factor	Dimension (L x W)	188mm x 122mm, (7.4" x 4.8")

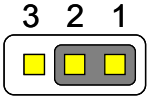
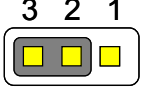
1.3 PCB Layout



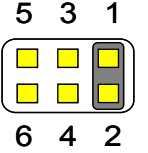
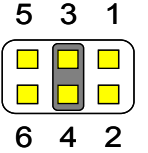
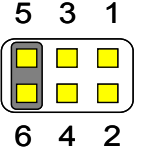


1.4 Jumper Setting

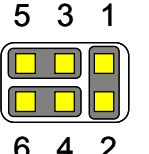
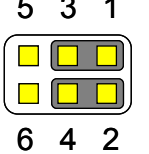
JCMOS : CMOS Clear

Pin No.	1-2	2-3
Function	Normal Operation (Default)	Clear CMOS Contents
Jumper Setting		

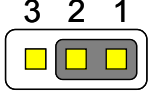
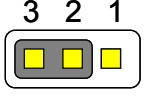
JCOM1/ JCOM2/ JCOM4/ JCOM5/ JCOM6 : COM1/ COM2/ COM4/ COM5 / COM6 (5V/12V/RI) Select

Pin No.	1-2	3-4	5-6
Function	+5V	Modem Ring In (Default)	+12V
Jumper Setting			

JCOM4_SEL : COM4 (VFD / RS232) Select

Pin No.	1-2, 3-5, 4-6	1-3, 2-4
Function	VFD (Default)	RS232
Jumper Setting		

JVLVDS1 : LCD Power (+3.3V / +5V) Select

Pin No.	1-2	2-3
Function	LCD Power: +3.3V (Default)	LCD Power: +5V
Jumper Setting	 <p>A diagram of a 3-pin jumper. The pins are labeled 3, 2, and 1 from left to right. The jumper is a grey rectangular component with three yellow square pads. The pads for pins 1 and 2 are connected by a grey bridge, while the pad for pin 3 is not connected.</p>	 <p>A diagram of a 3-pin jumper. The pins are labeled 3, 2, and 1 from left to right. The jumper is a grey rectangular component with three yellow square pads. The pads for pins 2 and 3 are connected by a grey bridge, while the pad for pin 1 is not connected.</p>

1.5 Connector Function List

Connector	Function	Note
+12V-OUT	+12v Output	IO Board
AUDIO_AMP	Audio Amplifier Out	
CASH_DRAWER	CASH DRAWER with RJ-11 Connector	
CPUFAN	CPUFAN 4-pin Connector	
COM1, COM2	Serial port Connector	
COM3	Serial port Connector with Box-header	
COM4	Serial port with RJ-45 Connector	
COM5, COM6	Serial port Connector	IO Board
DEBUG_PORT	Power On Self Test Card with Low Pin Count interface Connector	
DDR1, DDR2	DDR2 SO-DIMM Connector	
DVI	Digital Video Interface Connector with Box-header	
FP1, FP2	Front Panel Connector	
INV	Inverter Connector with Box-header	
IO_DOCKING_F	Docking Board to Board Connector	
IO_DOCKING_M	Docking Board to Board Connector	IO Board
KB_MS	Keyboard and Mouse Connector with Box-header	
LAN1	RJ-45 Connector	
LINE-OUT	Audio Line-Out Connector	IO Board
LPT	Printer Connector	
LVDS1	LVDS 18 bit Connector with Box-header	
LVDS2	LVDS 24 bit Connector with Box-header	
MIC	MIC-In Connector with Box-header	
PS_ON	Power On Button	
PWR	+12V Input Power Jack	
SATA1, SATA2	SATA Connector	
SATA_PWR1, SATA_PWR2	SATA Power Connector with Box-header	
SPI_PORT	Serial Peripheral Interface Connector	
USB1, USB2	USB A-Type x2 Connector	
USB3, USB4	USB x2 Connector with Box-header	

Connector	Function	Note
VGA1	VGA Connector	
VGA2	VGA Connector	IO Board

1.6 Internal Connector Pin Define

AUDIO AMP : Audio Amplifier Output with Pin-header (2.0 mm)

Pin No.	Signal
1	Amplifier Line-Out Right
2	Ground
3	Ground
4	Amplifier Line-Out Left

CASH DRAWER : CASH DRAWER with RJ-11 Connector

Pin No.	Signal	Pin No.	Signal
1	Ground	2	DIO_OUT1
3	+12V	4	DGP_IN0
5	DIO_OUT0	6	Ground

CPUFAN : 4Pin FAN Connector

Pin No.	Signal
1	Ground
2	Fan Power (+12V)
3	Speed Sense
4	Control

COM3 : Serial Port with Box-header (2.0 mm)

Pin No.	Signal	Pin No.	Signal
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTS
7	DTR	8	RI
9	Ground	10	NC

DEBUG PORT : Power On Self Test Card with Low Pin Count interface**Connector with Pin-header (2.0 mm)**

Pin No.	Signal	Pin No.	Signal
1	LAD0	2	Reset#
3	LAD1	4	LFRAME#
5	LAD2	6	+3.3V
7	LAD3	8	Ground
9	LPC Clock	10	NC

DVI : Digital Video Interface with Box-header (2.0 mm)

Pin No.	Signal	Pin No.	Signal
1	DVI_TD0	2	DVI_TD0#
3	DVI_TD1	4	DVI_TD1#
5	DVI_TD2	6	DVI_TD2#
7	DVI_TDC	8	DVI_TDC#
9	DVI_CLK	10	DVI_DATA
11	Ground	12	Ground
13	+5V	14	DVI_HPDET

FP1, FP2 : Front Panel Connector with Pin-header (2.0 mm)

Pin No.	Signal	Pin No.	Signal
1	HDD_LED#	2	+5V (470 Ohm)
3	Ground	4	PWR_LED
5	Ground	6	SBY_LED
7	Ground	8	SW_PWR#

INV : Inverter Connector with Box header (2.50 mm)

(Connector type: A2501WV-05P46G)

Pin No.	Signal
1	+12V
2	+12V
3	Ground
4	Inverter Brightness Control
5	Inverter Enable

KB MS : PS2 Keyboard, Mouse Connector with Box header (2.54 mm)

Pin No.	Signal
1	PS2 Power
2	Keyboard Clock
3	Keyboard Data
4	Mouse Clock
5	Mouse Data
6	Ground

LPT : Parallel Port Connector with Box-header (2.0 mm)

Pin No.	Signal	Pin No.	Signal
1	Strobe#	14	Auto Form Feed#
2	Data 0	15	Error#
3	Data 1	16	Initialization#
4	Data 2	17	Printer Select IN#
5	Data 3	18	Ground
6	Data 4	19	Ground
7	Data 5	20	Ground
8	Data 6	21	Ground
9	Data 7	22	Ground
10	Acknowledge#	23	Ground
11	Busy	24	Ground
12	Paper Empty	25	Ground
13	Printer Select	26	Ground

LVDS1 : 18 bit LVDS Panel Signal with Wafer Connector (1.0 mm)

Pin No.	Signal	Pin No.	Signal
1	Ground	2	Ground
3	NC	4	NC
5	A_CLK+	6	A_CLK-
7	A_DATA2+	8	A_DATA2-
9	A_DATA1+	10	A_DATA1-
11	A_DATA0+	12	A_DATA0-
13	Ground	14	Ground
15	NC	16	NC
17	B_CLK+	18	B_CLK-
19	B_DATA2+	20	B_DATA2-
21	B_DATA1+	22	B_DATA1-
23	B_DATA0+	24	B_DATA0-
25	Ground	26	Ground
27	LVDS Power	28	LVDS Power
29	LVDS Power	30	LVDS Power

Note : LVDS Power = +5V or +3.3V (Default)

LVDS2 : 24 bit LVDS Panel Signal with Wafer Connector (1.0 mm)

Pin No.	Signal	Pin No.	Signal
1	Ground	2	Ground
3	A_DATA3+	4	A_DATA3-
5	A_CLK+	6	A_CLK-
7	A_DATA2+	8	A_DATA2-
9	A_DATA1+	10	A_DATA1-
11	A_DATA0+	12	A_DATA0-
13	Ground	14	Ground
15	B_DATA3+	16	B_DATA3-
17	B_CLK+	18	B_CLK-
19	B_DATA2+	20	B_DATA2-
21	B_DATA1+	22	B_DATA1-
23	B_DATA0+	24	B_DATA0-
25	Ground	26	Ground
27	LVDS Power	28	LVDS Power
29	LVDS Power	30	LVDS Power

Note : LVDS Power = +5V or +3.3V (Default)

MIC : Micro Phone Input Connector with Box header (2.0 mm)

Pin No.	Signal
1	Micro Detect
2	Micro Phone In-Right
3	Micro Phone In-Left
4	Ground

SATA PWR1, SATA PWR2 : SATA Power Connector

Pin No.	Signal
1	+5V
2	+5V
3	Ground
4	Ground

SPI PORT : Serial Peripheral Interface Connector with Pin-header (2.54 mm)

Pin No.	Signal	Pin No.	Signal
1	SPI_CS#	2	3.3V Standby
3	SPI_SO	4	SPI_HOLD#
5	NC	6	SPI_CLK
7	Ground	8	SPI_SI

USB3 : USB6, USB7 Port Connector with Box-header (2.0mm)

Pin No.	Signal	Pin No.	Signal
1	USB Power (+5V)	2	USB Power (+5V)
3	USB DATA6-	4	USB DATA7-
5	USB DATA6+	6	USB DATA7+
7	Ground	8	Ground

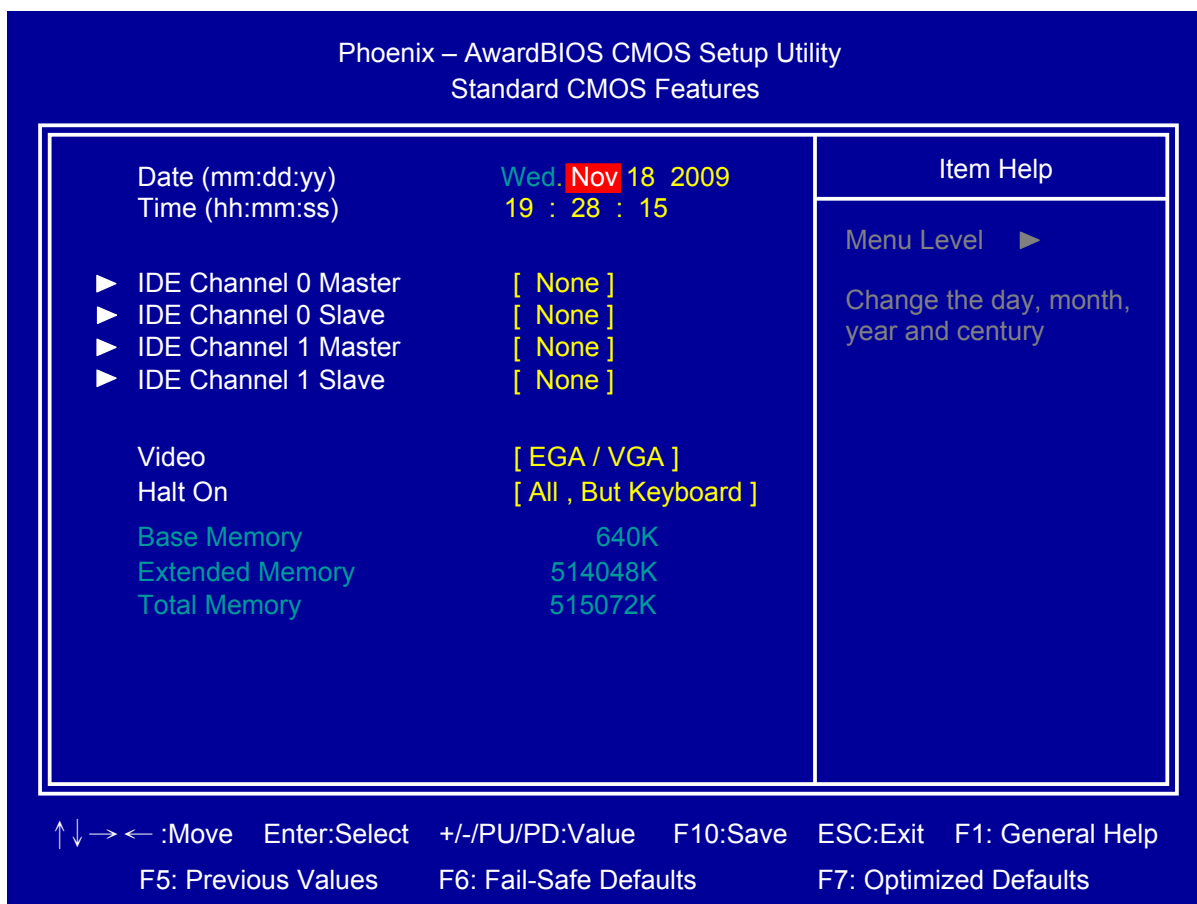
USB4 : USB4, USB5 Port Connector with Box-header (2.0mm)

Pin No.	Signal	Pin No.	Signal
1	USB Power (+5V)	2	USB Power (+5V)
3	USB DATA4-	4	USB DATA5-
5	USB DATA4+	6	USB DATA5+
7	Ground	8	Ground

VGA1 : VGA Connector with Box-header (2.0mm)

Pin No.	Signal	Pin No.	Signal
1	RED	2	DDC Data
3	GREEN	4	DDC Clock
5	BLUE	6	Ground
7	H-SYNC	8	Ground
9	V-SYNC	10	+5V

2.2 Standard CMOS Features



Date

Set system date.

Time

Set system time.

IDE Channel 0 Master/Slave

Press <Enter> for IDE device automatic detection.

IDE Channel 1 Master/Slave

Press <Enter> for IDE device automatic detection.

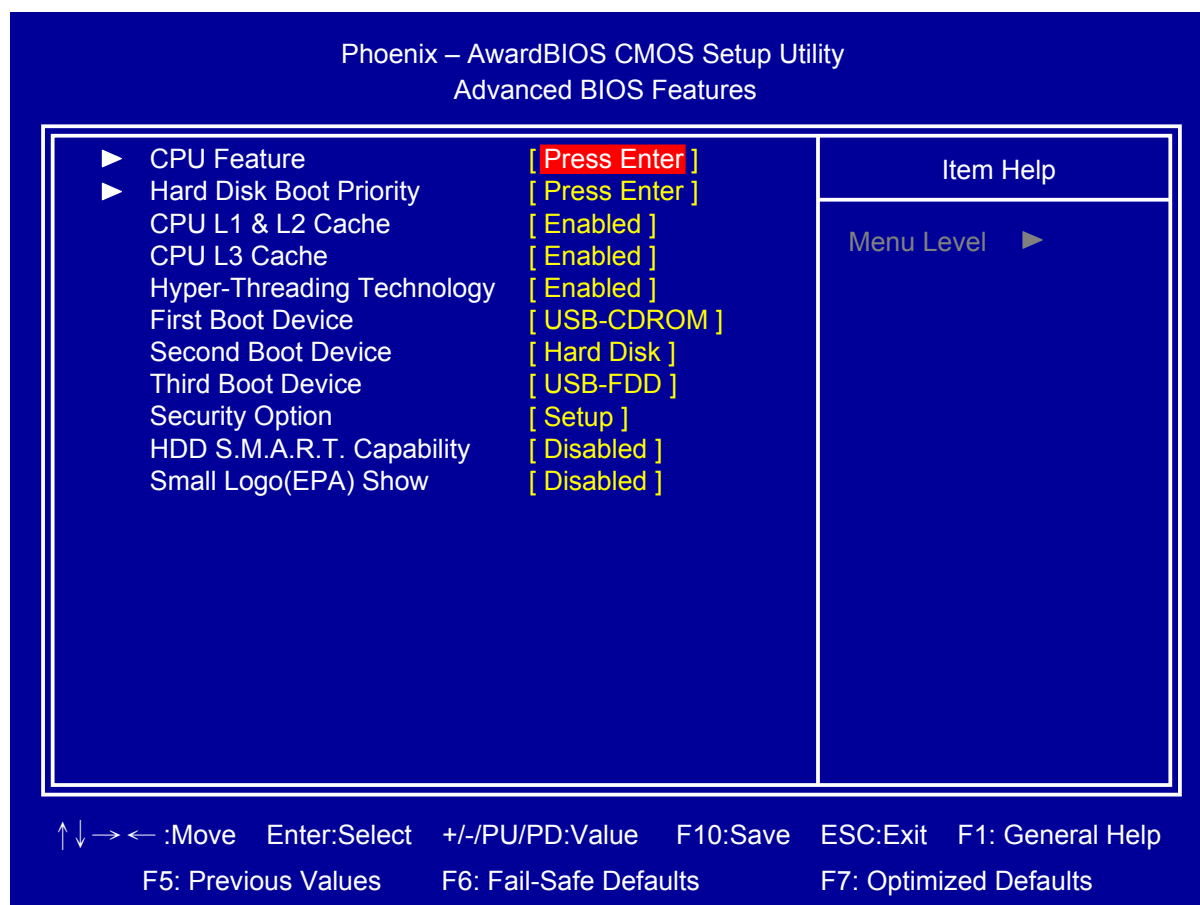
Video

Select Video device type

Halt on

Select stop procedure or ignore when error detected during POST (Power On Self Test).

2.3 Advanced BIOS Features



CPU Feature

Press <Enter> to select CPU parameter.

Hard Disk Boot Priority

Press <Enter> to select Hard Disk boot device priority.

CPU L1 & L2 Cache

Select "CPU L1 & L2 Cache" Enabled/Disabled.

CPU L3 Cache

Select "CPU L3 Cache" Enabled/Disabled.

Hyper-Threading Technology

Select "Hyper-Threading Technology" Enabled/Disabled.

First/Second/Third Boot Device

Select boot device priority.

Security Option

Select security mode,

Setup: Require password to permit BIOS setup utility.

System: Require password to permit boot-up and BIOS setup utility.

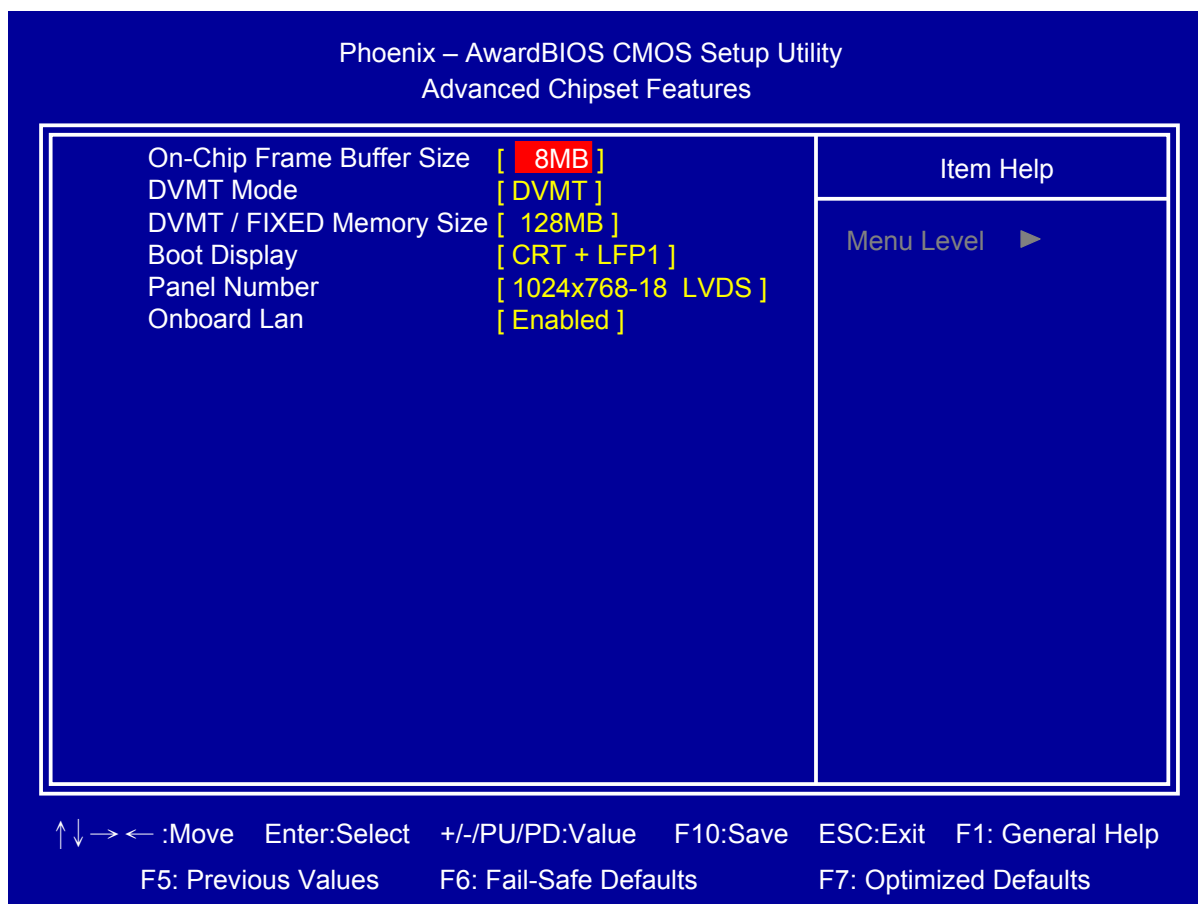
HDD S.M.A.R.T. Capability

Select "HDD S.M.A.R.T. (Self Monitoring Analysis And Reporting Technology) Capability" Enabled/Disabled.

Small Logo(EPA) Show

Select EPA (Environmental Protection Agency) Energy Star logo appears during the system boot-up process.

2.4 Advanced Chipset Features



On-Chip Frame Buffer Size

Select share system memory 1MB or 8MB

DVMT Mode

DVMT (Dynamic Video Memory Technology) allowing the system to dynamically allocate memory resources according to the demands of the system at any point in time, that improve efficiency of the memory allocated to either system or graphics processor.

DVMT/Fixed Memory Size

Select DVMT/Fixed Memory Size 64MB/128MB/224MB

Boot Display

Select which device to display

Panel Number

Select LCD panel type

Onboard Lan

Select "Onboard Lan" Enabled/Disabled

2.5 Integrated Peripherals

The screenshot shows the 'Integrated Peripherals' menu in the Phoenix - AwardBIOS CMOS Setup Utility. The menu is displayed on a blue background with white text. The items are listed in a table-like format with their current values in yellow. The 'Press Enter' option is highlighted in red. A 'Menu Level' indicator is visible on the right side of the menu.

Phoenix – AwardBIOS CMOS Setup Utility		Item Help
Integrated Peripherals		Menu Level ▶
▶ OnChip IDE Device	[Press Enter]	
▶ Onboard Device	[Press Enter]	
▶ Super IO Device	[Press Enter]	
Onboard Lan Boot ROM	[Disabled]	
Watch Dog Timer Select	[Disabled]	
Onboard Serial Port 3	[3E8]	
Serial Port 3 Use IRQ	[IRQ10]	
Onboard Serial Port 4	[2E8]	
Serial Port 4 Use IRQ	[IRQ11]	
Onboard Serial Port 5	[4F8]	
Serial Port 5 Use IRQ	[IRQ5]	
Onboard Serial Port 6	[4E8]	
Serial Port 6 Use IRQ	[IRQ11]	
▶ USB Device Setting	[Press Enter]	

↑↓→← :Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

OnChip IDE Device

Set IDE and SATA device configuration

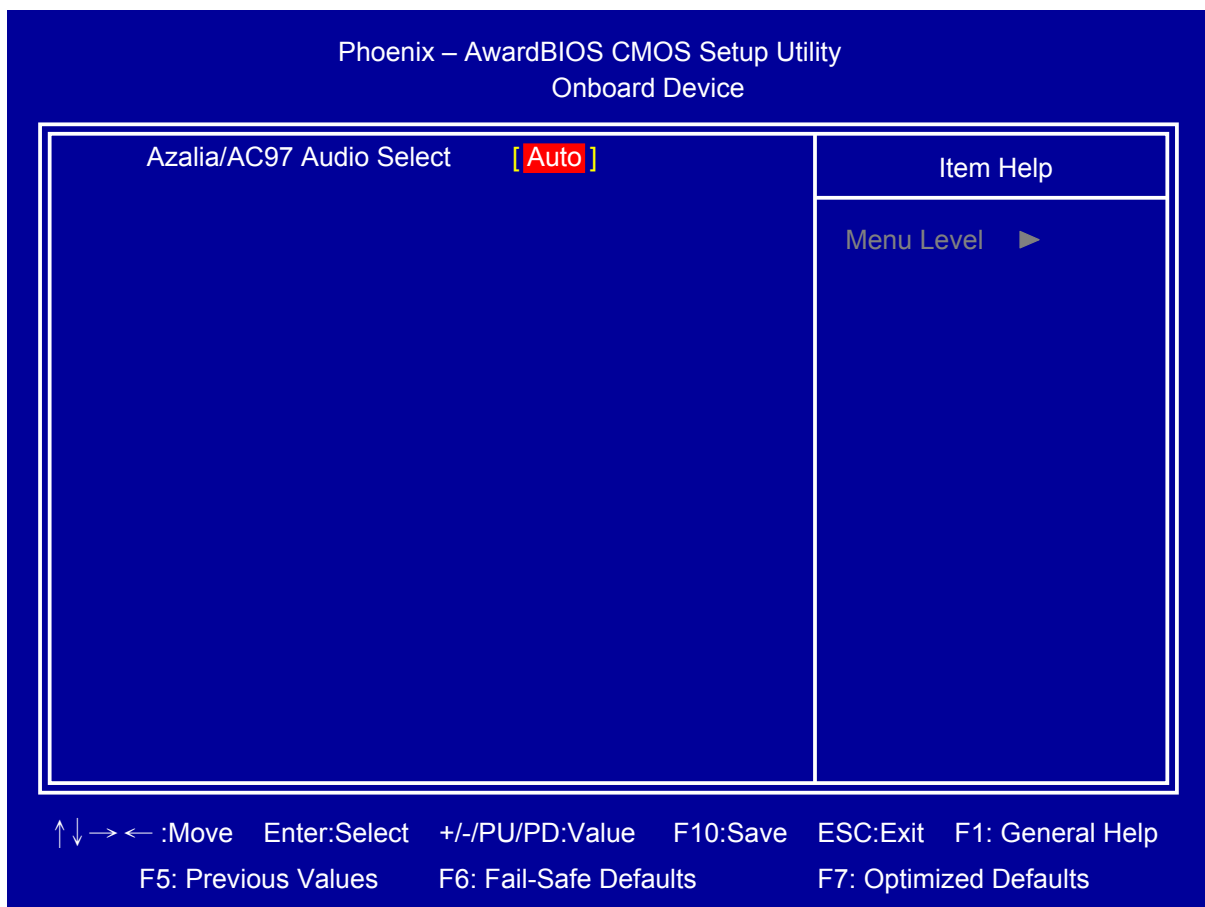
Phoenix – AwardBIOS CMOS Setup Utility
OnChip IDE Device

<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">IDE HDD Block Mode</td> <td style="text-align: right;">[Enabled]</td> </tr> <tr> <td>On-Chip Primary PCI IDE</td> <td style="text-align: right;">[Enabled]</td> </tr> <tr> <td>IDE Primary Master PIO</td> <td style="text-align: right;">[Auto]</td> </tr> <tr> <td>IDE Primary Slave PIO</td> <td style="text-align: right;">[Auto]</td> </tr> <tr> <td>IDE Primary Master UDMA</td> <td style="text-align: right;">[Auto]</td> </tr> <tr> <td>IDE Primary Slave UDMA</td> <td style="text-align: right;">[Auto]</td> </tr> <tr> <td>On-Chip Secondary PCI IDE</td> <td style="text-align: right;">[Enabled]</td> </tr> <tr> <td>IDE Secondary Master PIO</td> <td style="text-align: right;">[Auto]</td> </tr> <tr> <td>IDE Secondary Slave PIO</td> <td style="text-align: right;">[Auto]</td> </tr> <tr> <td>IDE Secondary Master UDMA</td> <td style="text-align: right;">[Auto]</td> </tr> <tr> <td>IDE Secondary Slave UDMA</td> <td style="text-align: right;">[Auto]</td> </tr> <tr> <td colspan="2" style="text-align: center; color: cyan;">*** On-Chip Serial ATA Setting ***</td> </tr> <tr> <td style="color: cyan;">x SATA Mode</td> <td style="text-align: right; color: cyan;">IDE</td> </tr> <tr> <td>On-Chip Serial ATA</td> <td style="text-align: right;">[Auto]</td> </tr> <tr> <td style="color: cyan;">x SATA PORT Speed Settings</td> <td style="text-align: right; color: cyan;">Disabled</td> </tr> <tr> <td style="color: cyan;">x PATA IDE Mode</td> <td style="text-align: right; color: cyan;">Secondary</td> </tr> <tr> <td>SATA Port</td> <td style="text-align: right; color: cyan;">P0,P2 is Primary</td> </tr> </table>	IDE HDD Block Mode	[Enabled]	On-Chip Primary PCI IDE	[Enabled]	IDE Primary Master PIO	[Auto]	IDE Primary Slave PIO	[Auto]	IDE Primary Master UDMA	[Auto]	IDE Primary Slave UDMA	[Auto]	On-Chip Secondary PCI IDE	[Enabled]	IDE Secondary Master PIO	[Auto]	IDE Secondary Slave PIO	[Auto]	IDE Secondary Master UDMA	[Auto]	IDE Secondary Slave UDMA	[Auto]	*** On-Chip Serial ATA Setting ***		x SATA Mode	IDE	On-Chip Serial ATA	[Auto]	x SATA PORT Speed Settings	Disabled	x PATA IDE Mode	Secondary	SATA Port	P0,P2 is Primary	<p style="text-align: center;">Item Help</p> <hr/> <p>Menu Level ▶</p> <p>If your IDE hard drive supports block mode select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support</p>
IDE HDD Block Mode	[Enabled]																																		
On-Chip Primary PCI IDE	[Enabled]																																		
IDE Primary Master PIO	[Auto]																																		
IDE Primary Slave PIO	[Auto]																																		
IDE Primary Master UDMA	[Auto]																																		
IDE Primary Slave UDMA	[Auto]																																		
On-Chip Secondary PCI IDE	[Enabled]																																		
IDE Secondary Master PIO	[Auto]																																		
IDE Secondary Slave PIO	[Auto]																																		
IDE Secondary Master UDMA	[Auto]																																		
IDE Secondary Slave UDMA	[Auto]																																		
*** On-Chip Serial ATA Setting ***																																			
x SATA Mode	IDE																																		
On-Chip Serial ATA	[Auto]																																		
x SATA PORT Speed Settings	Disabled																																		
x PATA IDE Mode	Secondary																																		
SATA Port	P0,P2 is Primary																																		

↑↓→← :Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1: General Help
 F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

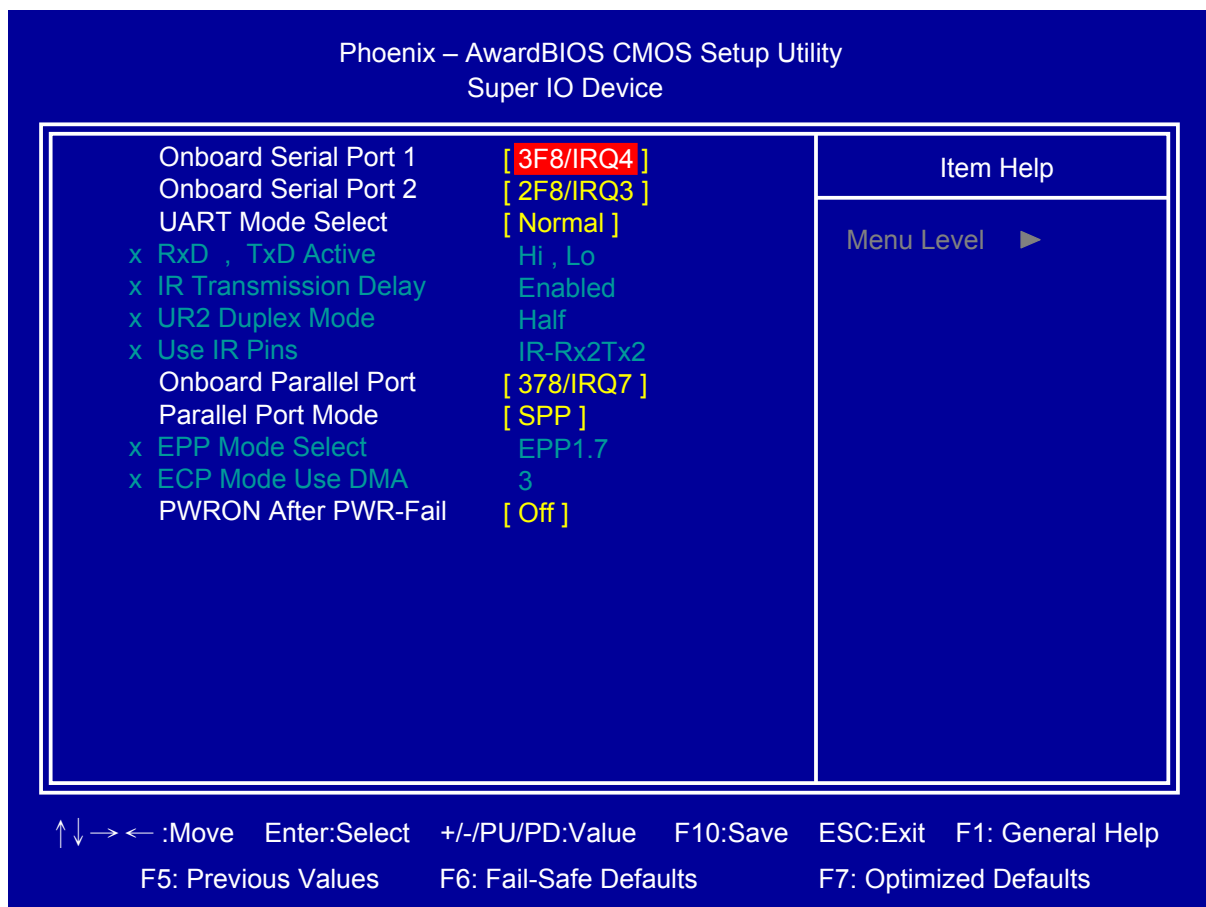
Onboard Device

Press <Enter> to select Azalia/AC97 Auto/All Disabled



Super IO Device

Press <Enter> to select Serial, Parallel and “PWRON After PWR-Fail” configuration.



Onboard Lan Boot ROM

Decide whether to invoke the boot ROM of the onboard LAN chip.

Watch Dog Timer Select

Select Watch dog Disabled or setting timer value.

Onboard Serial Port 3/4/5/6

Select serial port address

Serial Port 3/4/5/6 Use IRQ

Select serial port IRQ

USB Device Setting

Press <Enter> to select USB device configuration.

The screenshot displays the Phoenix BIOS CMOS Setup Utility interface. At the top, it reads "Phoenix – Award WorkstationBIOS CMOS Setup Utility" and "USB Device Setting". The main menu is enclosed in a double-line border and contains the following items:

USB 1.0 Controller	[Enabled]	Item Help Menu Level ► [Enable] or [Disable] Universal Host Controller Interface for Universal Serial Bus.
USB 2.0 Controller	[Enabled]	
USB Operation Mode	[High Speed]	
USB Keyboard Function	[Enabled]	
USB Mouse Function	[Enabled]	
USB Storage Function	[Enabled]	

Below the menu items, there is a cyan-colored text prompt: ***** USB Mass Storage Device Boot Setting *****.

At the bottom of the screen, a legend defines the navigation keys:

↑↓→← :Move	Enter:Select	+/-/PU/PD:Value	F10:Save	ESC:Exit	F1: General Help
F5: Previous Values	F6: Fail-Safe Defaults	F7: Optimized Defaults			

2.6 Power Management Setup

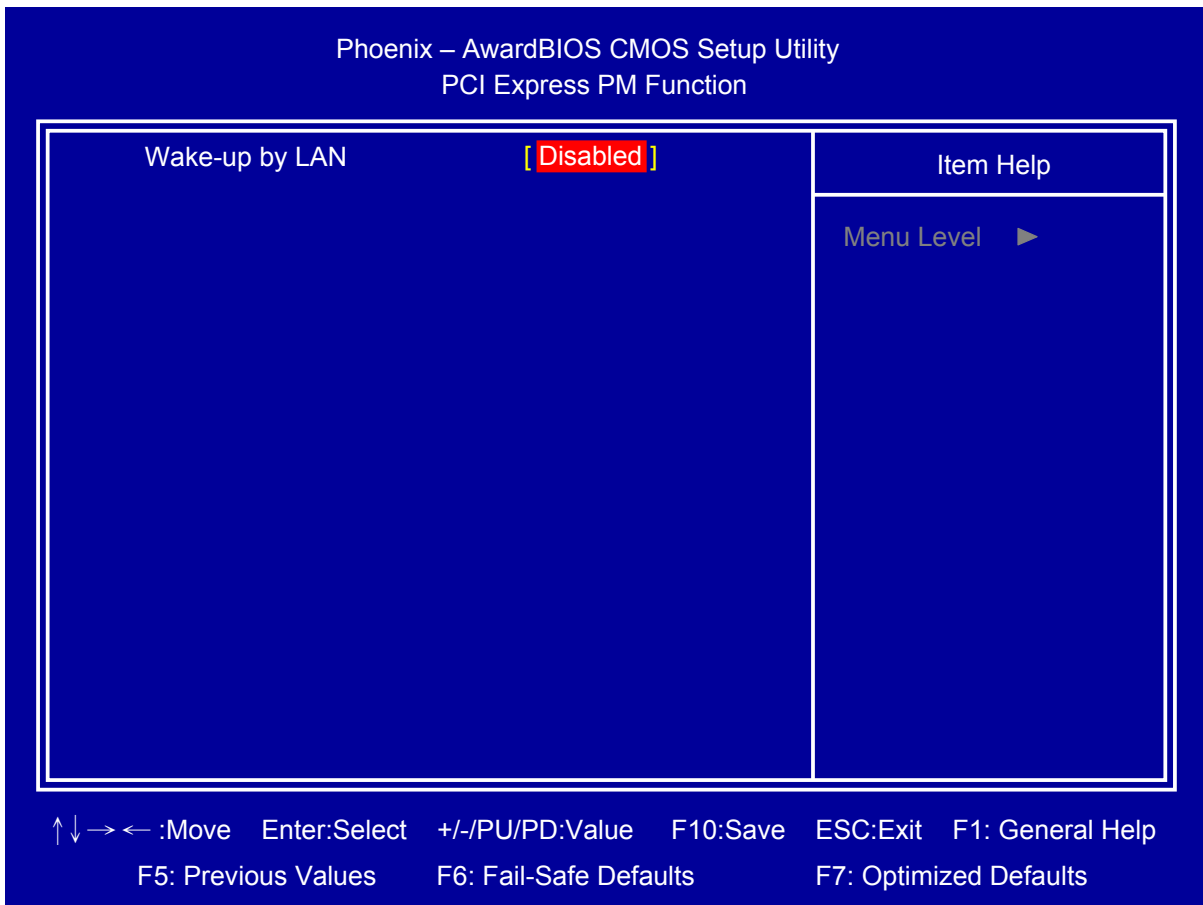
Phoenix – AwardBIOS CMOS Setup Utility
Power Management Setup

<ul style="list-style-type: none"> ▶ PCI Express PM Function [Press Enter] ACPI Function [Enabled] ACPI Suspend Type S1(POS) x Run VGABIOS if S3 Resume Auto Soft-Off by PWR-BTTN [Instant-Off] Power On by Ring [Disabled] Resume by Alarm [Disabled] x Date(of Month) Alarm 0 x Time(hh:mm:ss) Alarm 0 : 0 : 0 	<p style="text-align: center;">Item Help</p> <hr/> <p>Menu Level ▶</p>
---	--

↑↓→← :Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1: General Help
 F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

PCI Express PM Function

Press <Enter> to select “Wake-up by LAN” Enabled/Disabled.



ACPI Function

Select ACPI (Advanced Configuration and Power Management) Enabled/Disabled.

Soft-Off by PWR-BTTN

Select power button function,

Instant-off: Press power button will power off instantly.

Delay 4 Sec: Press power button 4 second to power off.

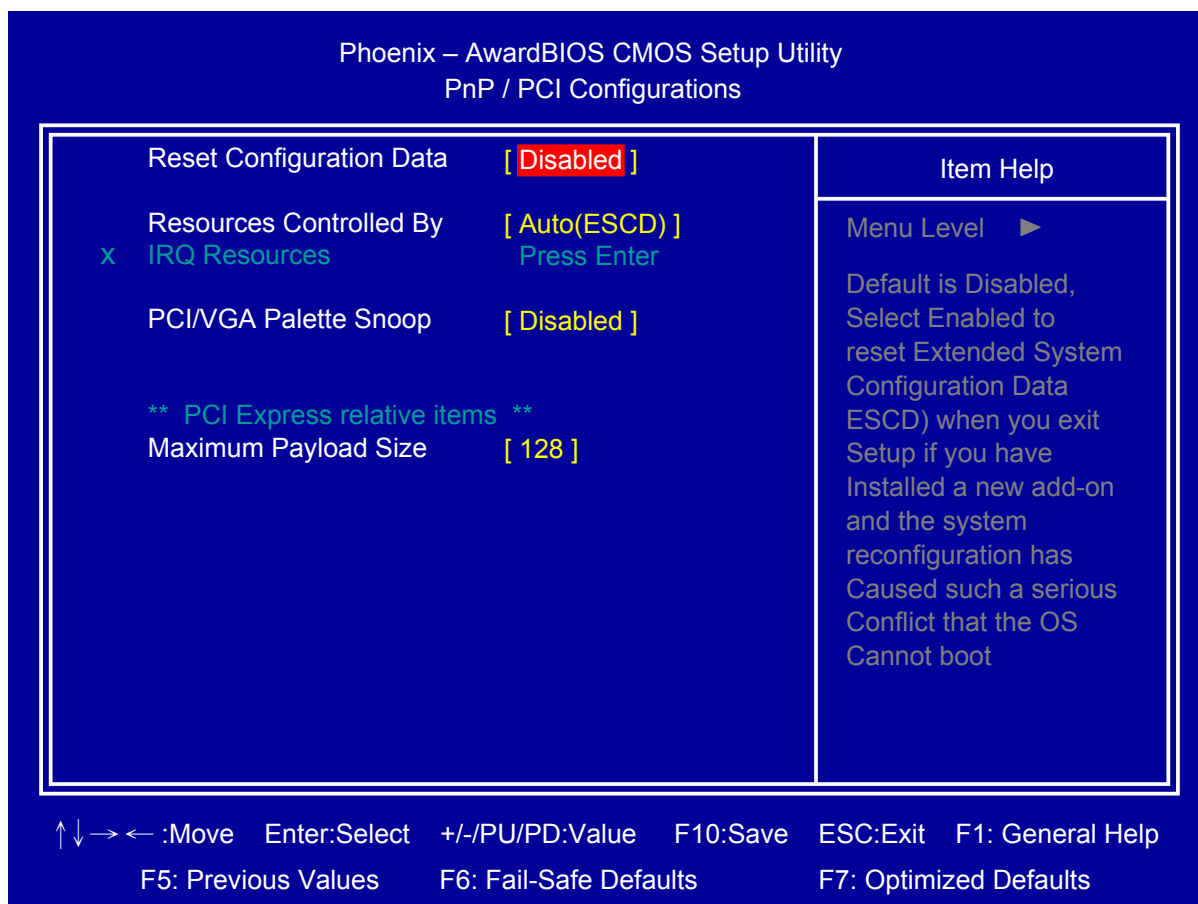
Power On by Ring

Select Power on by Ring Indicator signal from Modem.

Resume by Alarm

Set date and time to power on system from soft-off state.

2.7 PnP/PCI Configurations



Reset Configuration Data

Select Enabled to reset Extended System Configuration Data (ESCD) when you exit BIOS setup utility, if you have installed new add-on card and the system reconfiguration has caused such a serious conflict that the OS cannot boot.

Resources Controlled By

BIOS can automatically configure all the boot and Plug and Play compatible devices. If you choose Auto, you cannot select IRQ DMA and memory base address fields, since BIOS automatically assigns them.

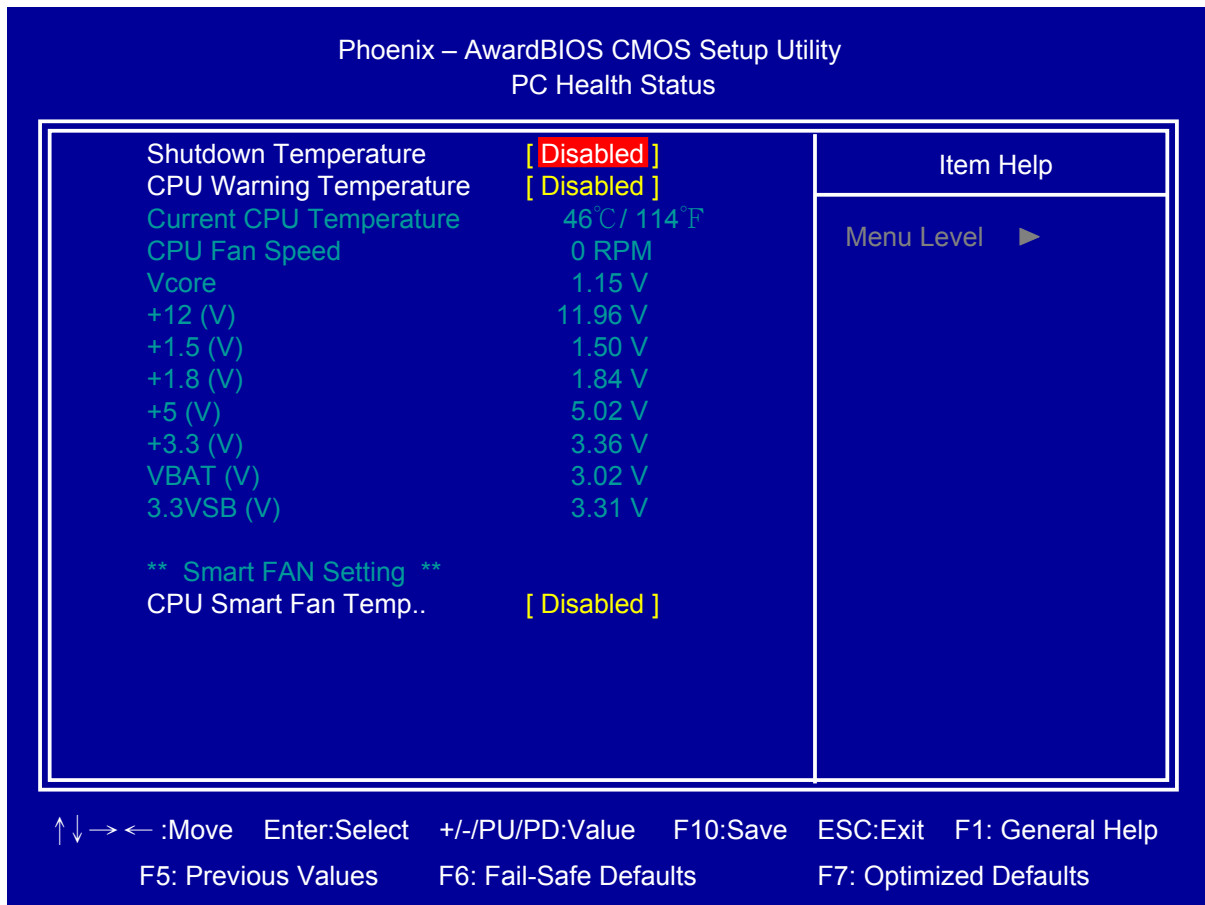
PCI/VGA Palette Snoop

Select PCI/VGA Palette Snoop Enabled/Disabled.

Maximum Payload Size

Set maximum TLP payload size for the PCI Express devices. The unit is byte.

2.8 PC Health Status



Shutdown Temperature

If CPU temperature reaches the setting value will automatic shutdown system.

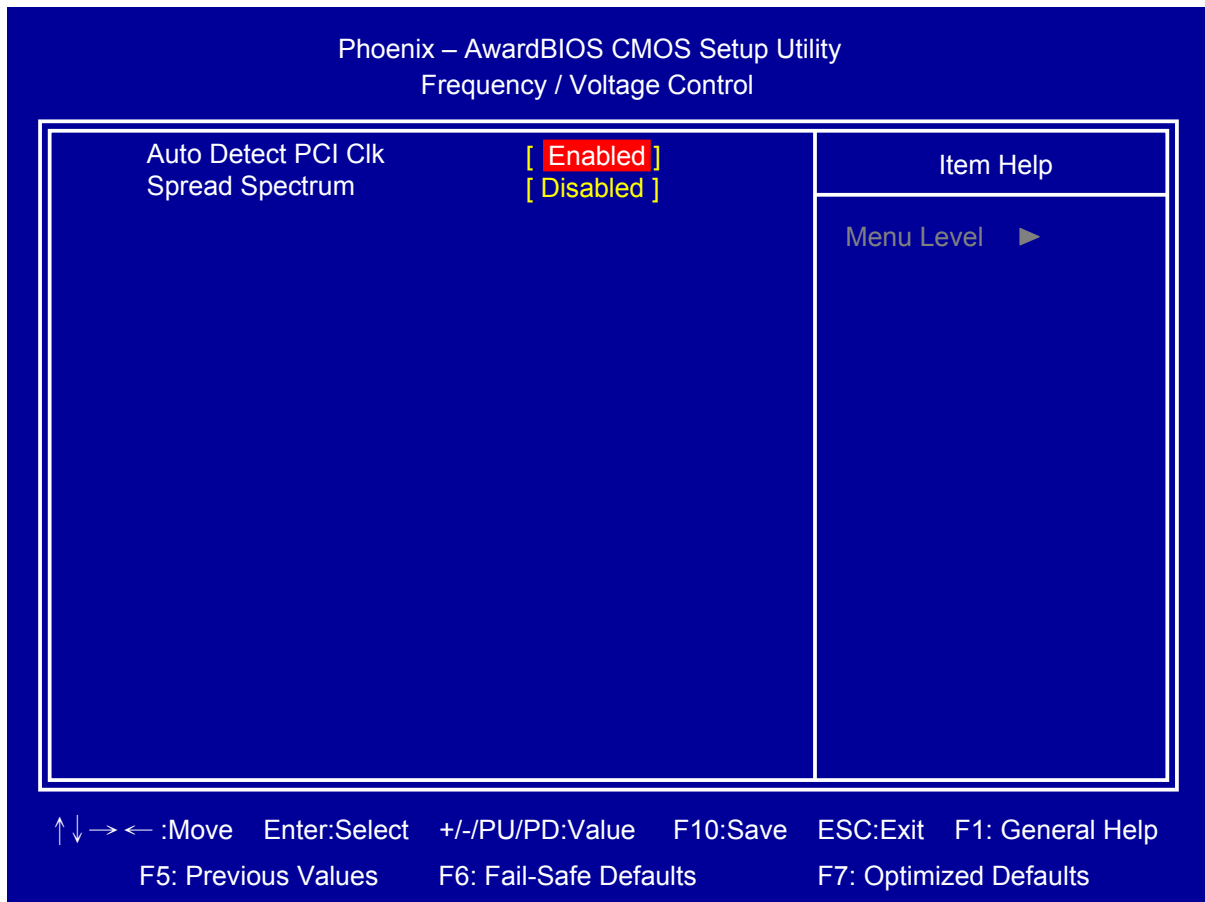
CPU Warning Temperature

If CPU temperature reaches the setting value will beep in DOS mode.

CPU Smart Fan Temp.

Setup CPU Smart FAN temperature.

2.9 Frequency/Voltage Control



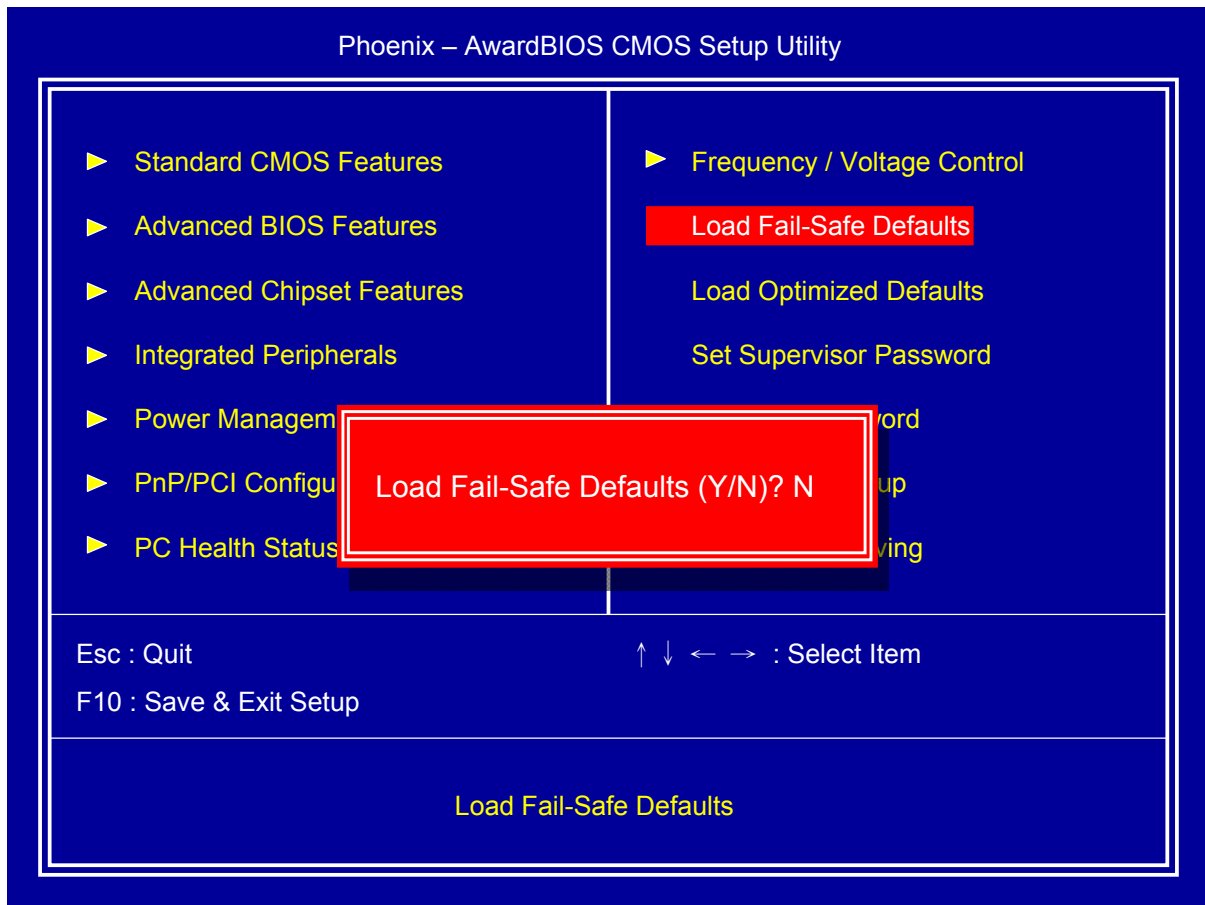
Auto Detect PCI Clk

Select "Auto Detect PCI Clk" Enabled/Disabled

Spread Spectrum

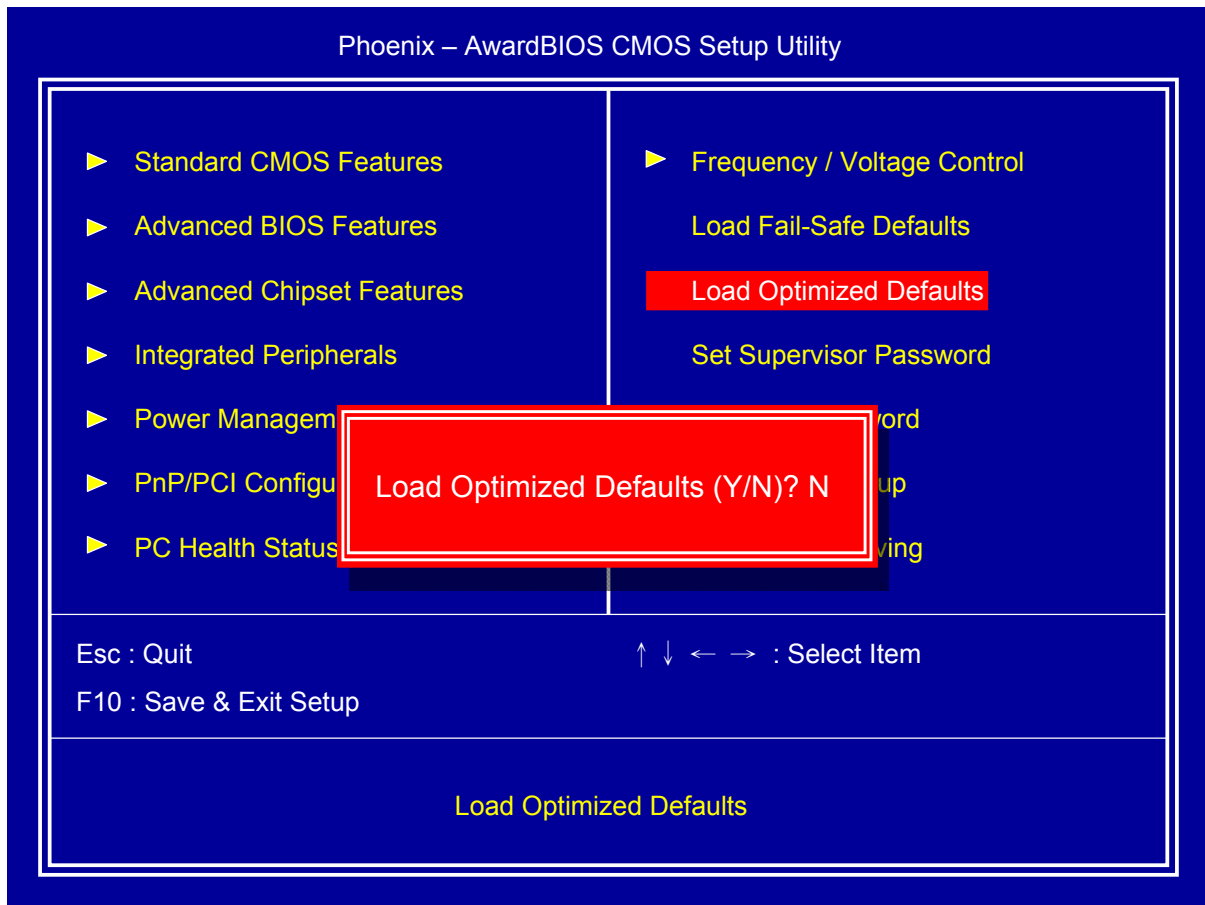
Select "Spread Spectrum" Enabled/Disabled.

2.10 Load Fail-Safe Defaults



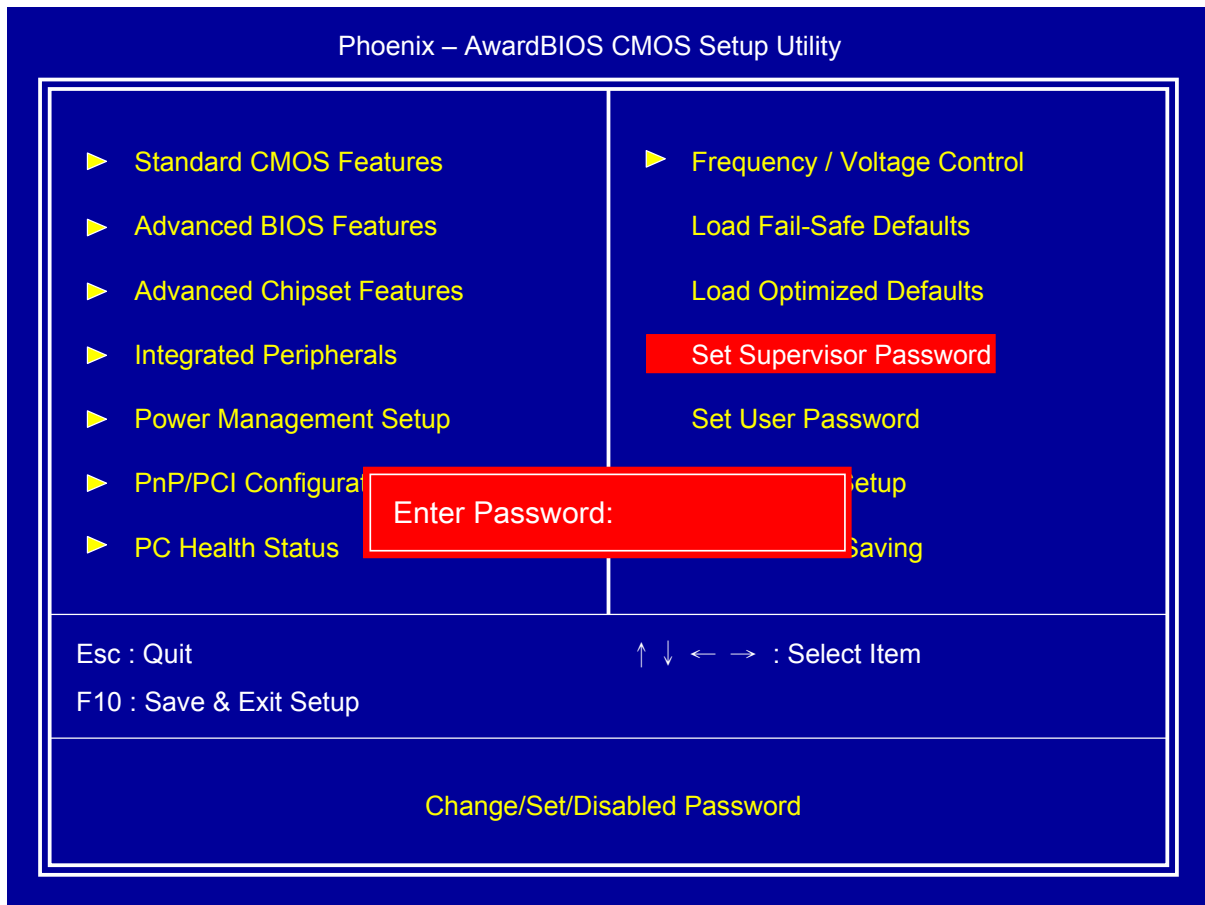
This item will set configuration for non optimized system operation.

2.11 Load Optimized Defaults



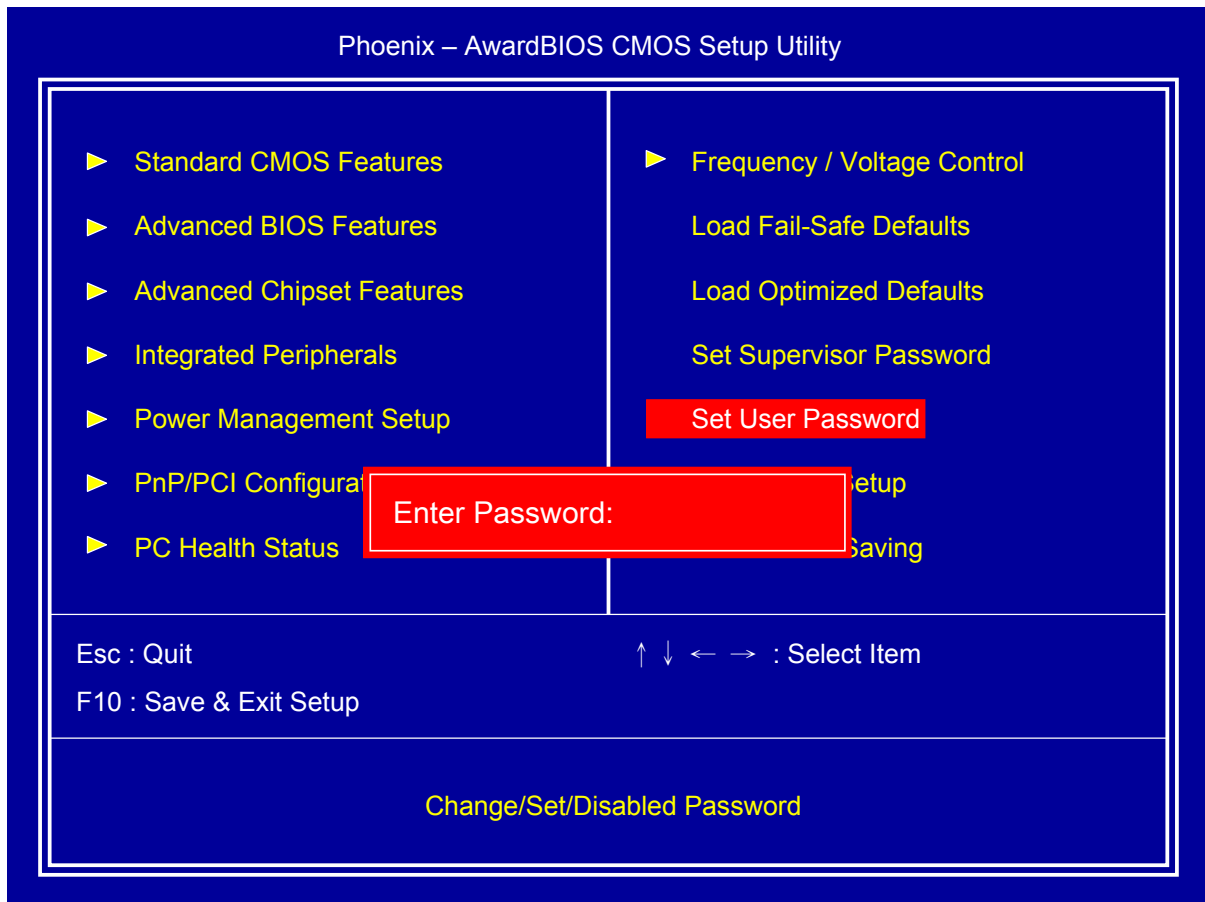
This item will restore factory default setting for optimized system operation.

2.12 Set Supervisor Password



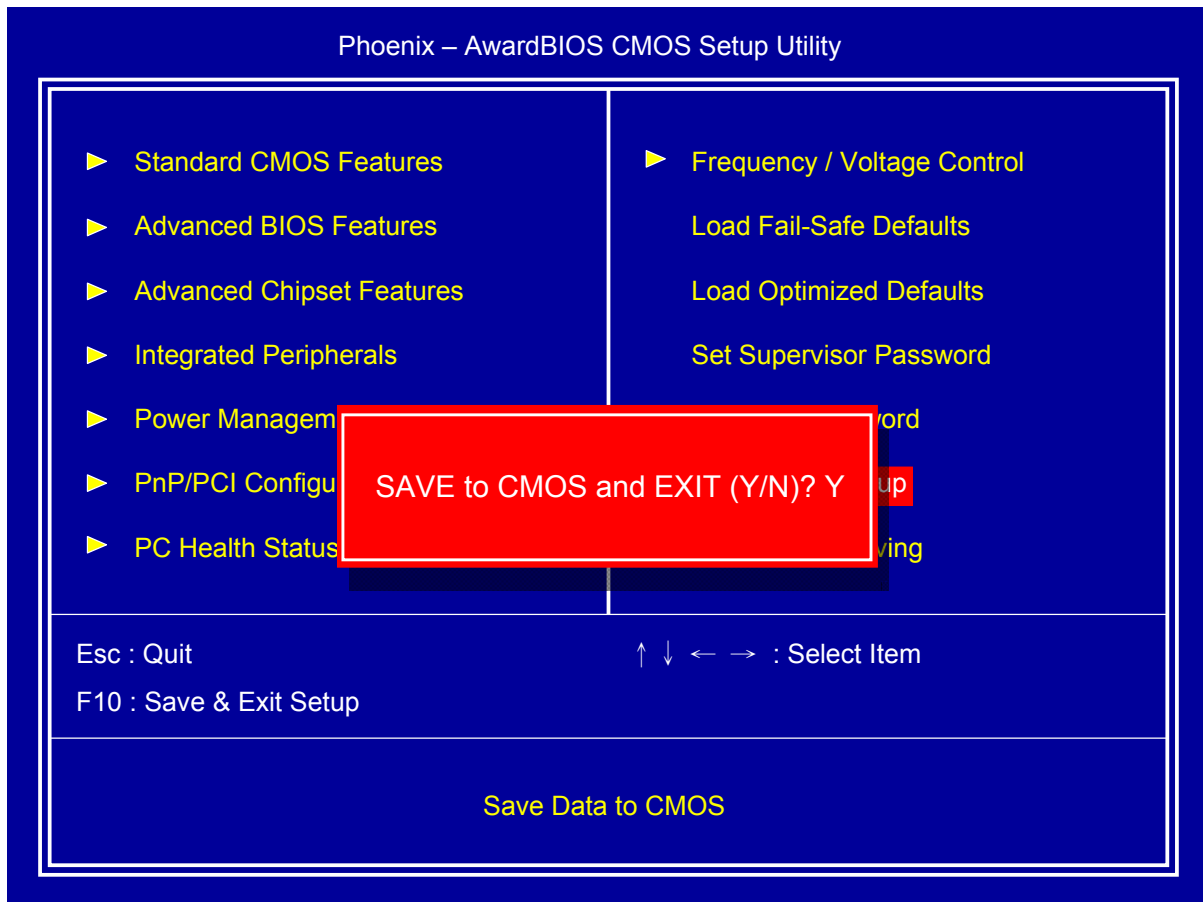
If set supervisor password, it will request typing password before entering BIOS setup utility.

2.13 Set User Password



If set user password will request typing password to enter BIOS setup utility, and does not allow modifying configuration.

2.14 Save & Exit Setup



This item confirm save configuration or not before exit BIOS setup utility, Press <Y> and <Enter> to save configuration, then reboot system. Press <N> and <Enter> will back to BIOS setup utility.

Chapter 3 Drivers Installation

This chapter introduces driver installation information.

Please insert the utility CD to CD-ROM drive, the install menu will appear automatically, if the install menu did not list suitable driver of Operate System or did not appear automatically, please select corresponding driver of utility CD to install.

The Windows XP driver installation steps are as below.

3.1 Intel Chipset Device Software

Step 1. Click “Next” to continue



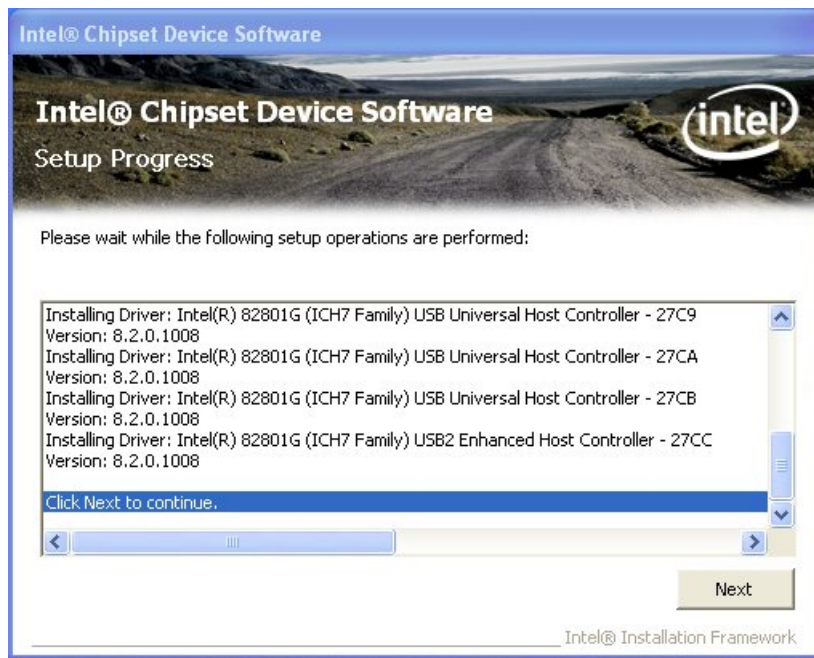
Step 2. Read the License Agreement and click “Yes” to continue



Step 3. Click “Next” to continue



Step 4. Click “Next” to continue

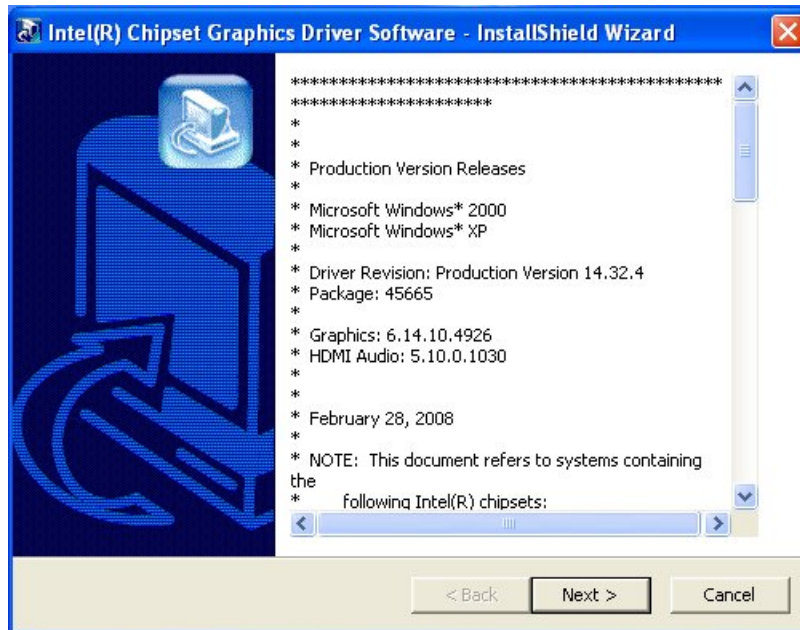


Step 5. Click “Finish” to complete setup



3.2 Intel Graphic Media Accelerator Driver

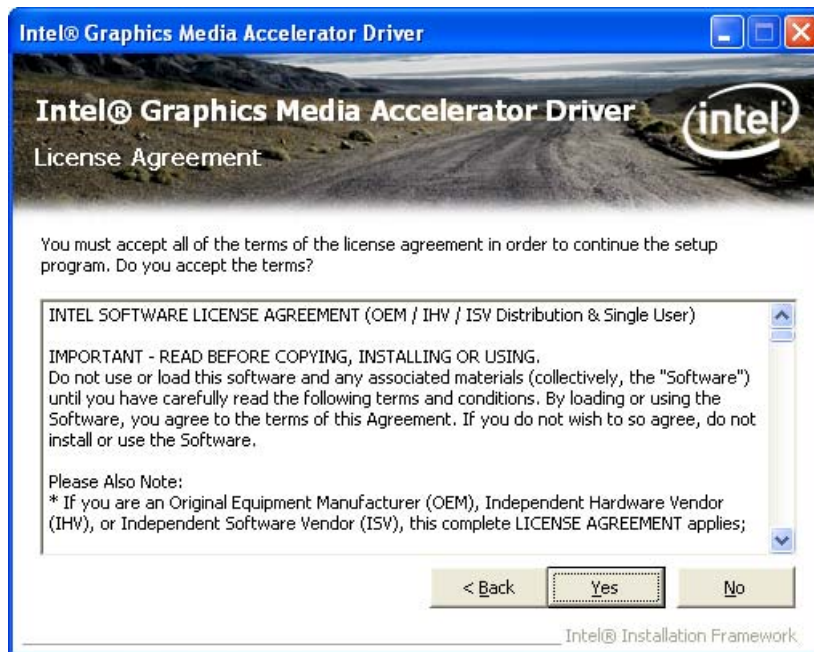
Step 1. Click “Next” to continue



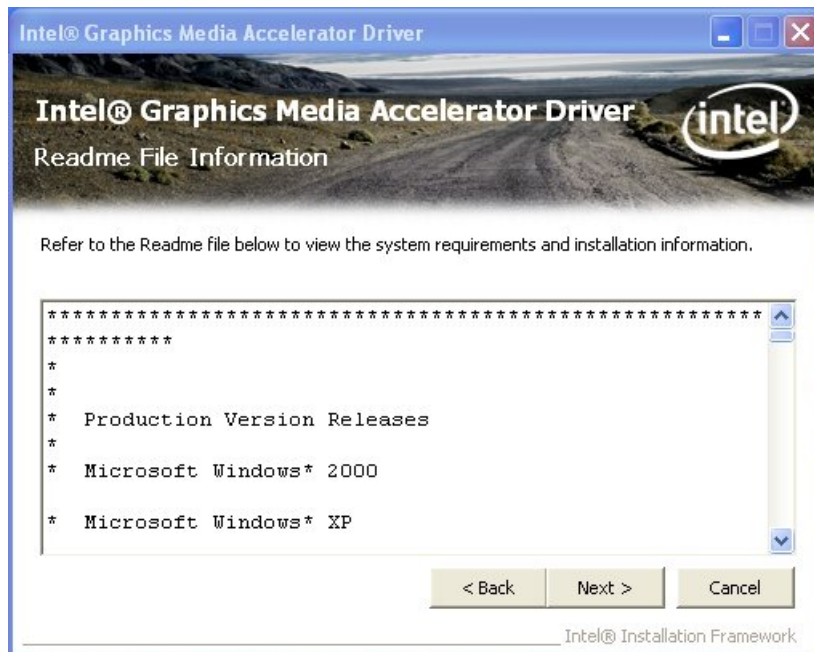
Step 2. Click “Next” to continue



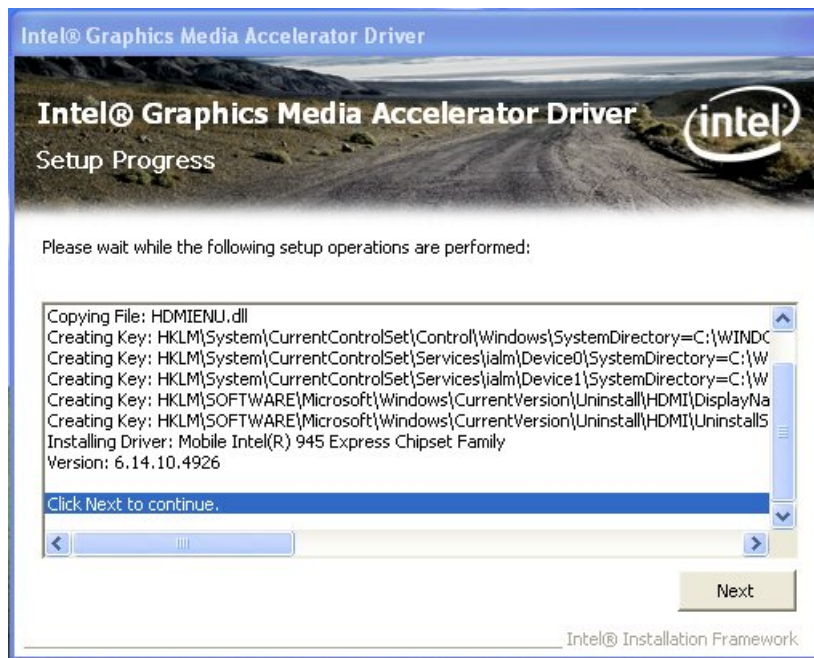
Step 3. Read the License Agreement and click “Yes” to continue



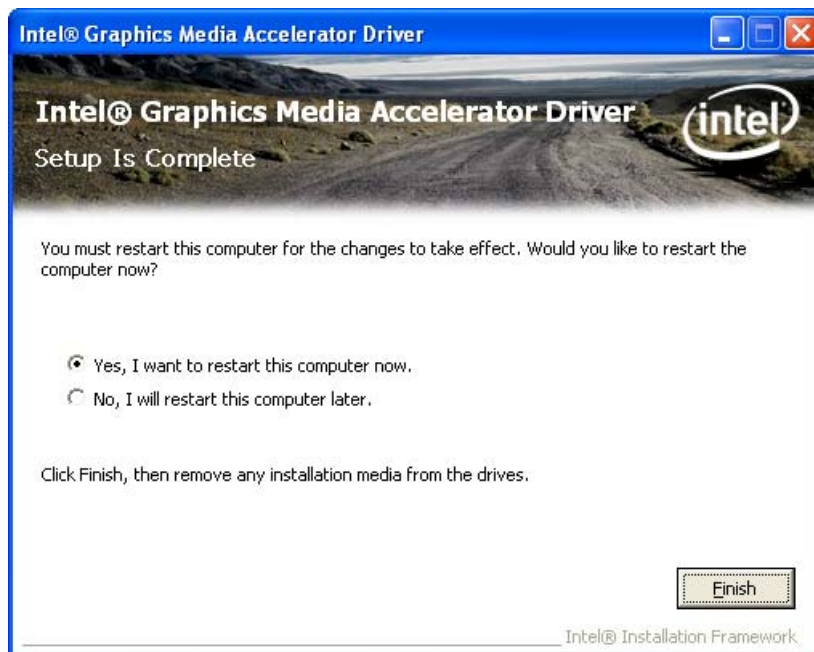
Step 4. Click “Next” to continue



Step 5. Click “Next” to continue

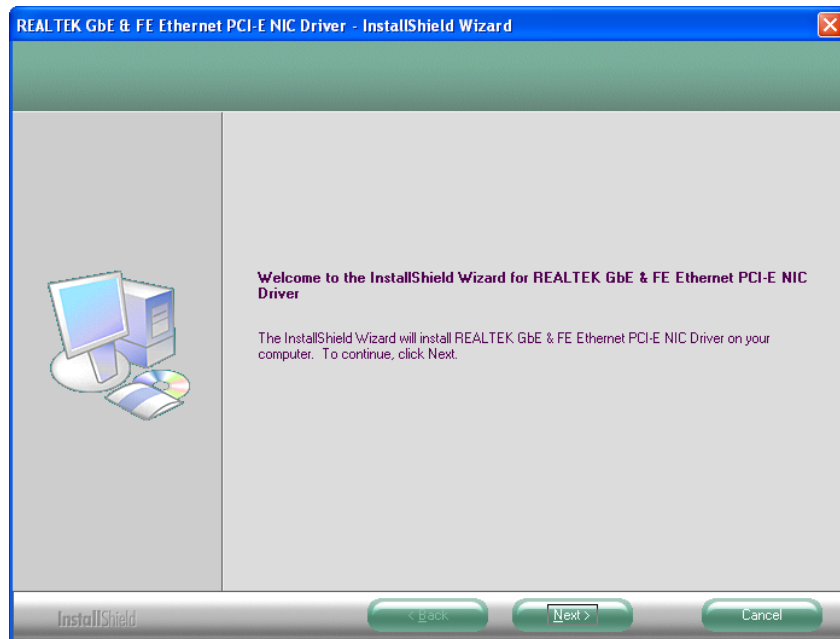


Step 6. Click “Finish” to complete setup

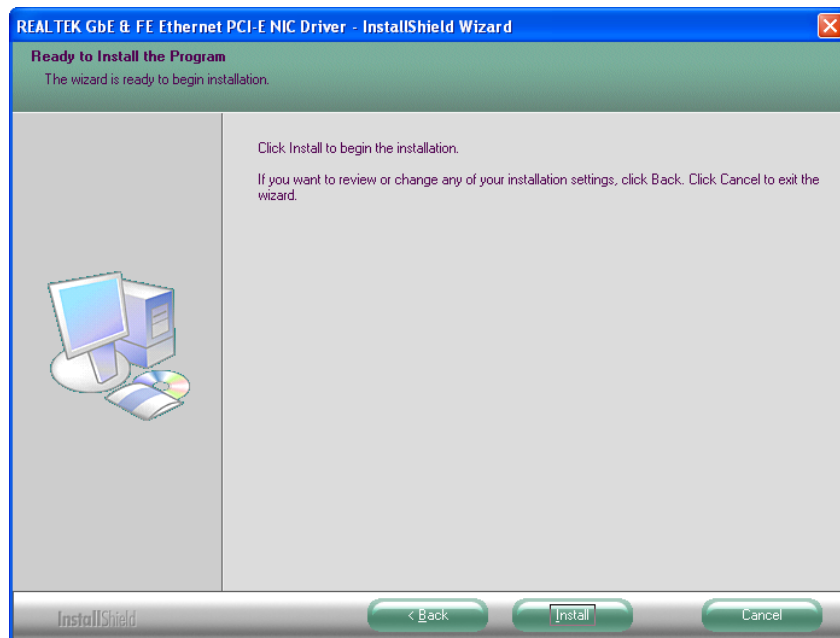


3.3 LAN Driver

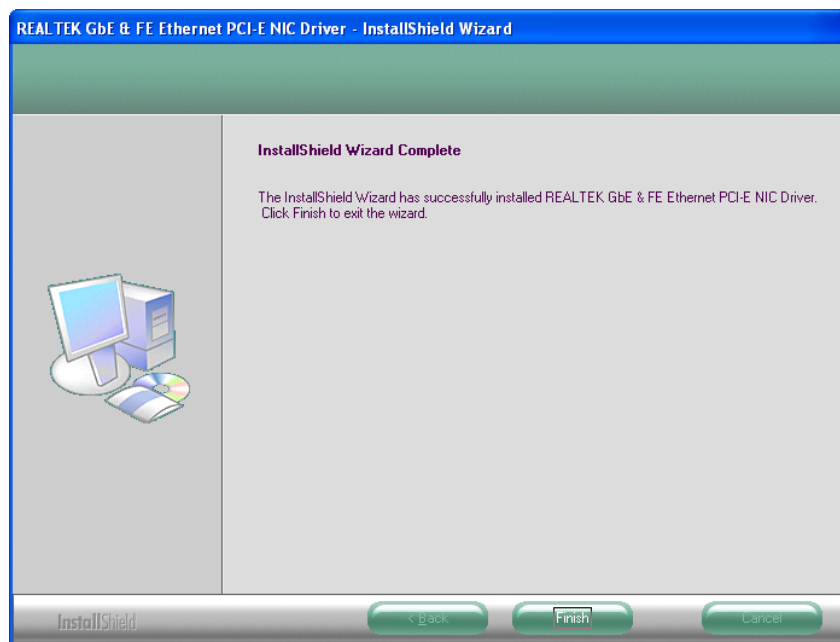
Step 1. Click “Next” to continue



Step 2. Click “Install” to continue

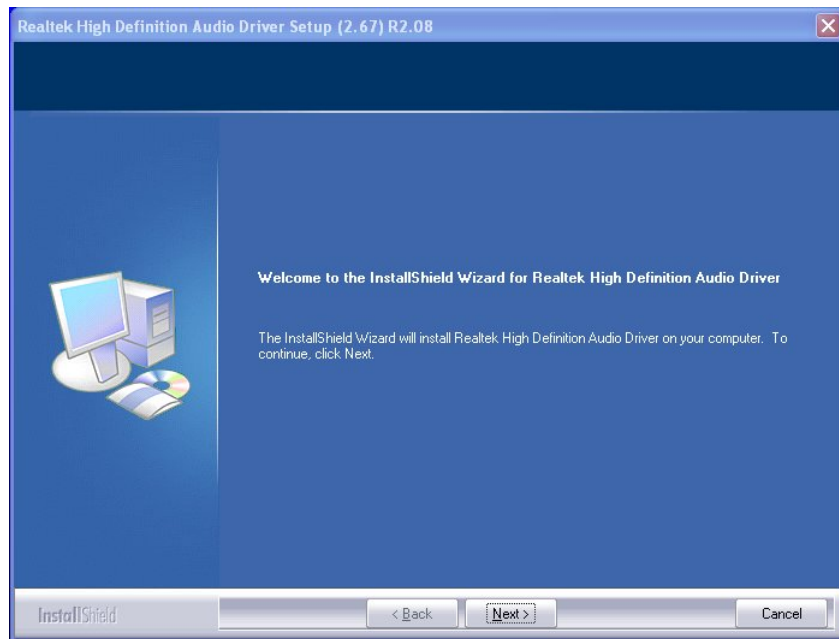


Step 3. Click “Finish” to complete setup

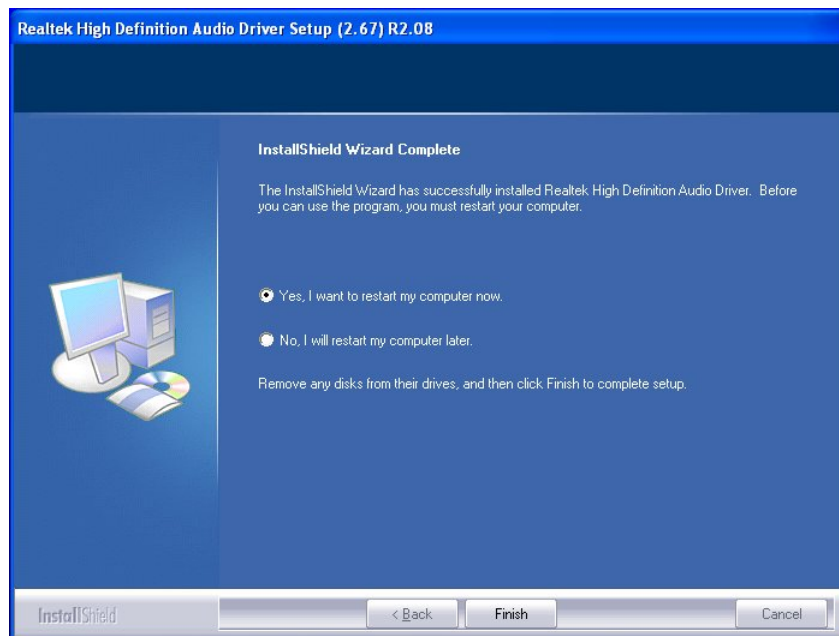


3.4 Audio Driver

Step 1. Click “Next” to continue



Step 2. Click “Finish” to complete setup



Appendix-A Watchdog

The system board provides Watchdog function, the Super I/O setting step as below.

Step 1: CR2D, Bit0→0 (select pin77 to WDTO#)

Step 2: LD8, CR30, Bit0→1 (Active WDTO#)

Step 3: LD8, CRF7, Bit4→Write 0 to clear WDTO# status.

Step 4: LD8, CRF5, Bit3→0: Second mode, 1: Minute mode

Step 5: LD8, CRF6, Bit [7:0] →Set WDTO# Time out value. (WDTO# startup after setting the system time, or setup from step 3 ~ step 5 to restart WDT.)

Appendix-B GPIO

The system board provides input and output ports that can be individually configured to perform a simple basic I/O function. Users can configure each individual port to become an input or output port by programming register bit of I/O selection. To invert port value, the setting of Inversion Register has to be made. Port values can be set to read or write through Data Register.

Please refer previous chapter for pin define description.

Access Cash Drawer GPIO Programming Guide

There are two PNP I/O port addresses that can be used to configure GPIO ports,

(1). 0x2E - **EFER** (Extended Function Enable Register, for entering Extended Function Mode)

- **EFIR** (Extended Function Index Register, for identifying CR index number)

(2). 0x2F - **EFDR** (Extended Function Data Register, for accessing desired CR)

Below are some example codes for demonstrate GPIO function.

// Enter Extended Function Mode

```
outp(0x002E, 0x87);  
outp(0x002E, 0x87);
```

// Assign Pin121-128 to be GPIO port 1

```
outp(0x002E, 0x29);  
outp(0x002F, inp(0x002F) | 0x01);
```

// Select Logic Device 7

```
outp(0x002E, 0x07);  
outp(0x002F, 0x07);
```

// Active Logic Device 7

```
outp(0x002E, 0x30);  
outp(0x002F, 0x01);
```

// Select Inversion Mode

```
outp(0x002E, 0xF2);  
outp(0x002F, 0x83);
```

// Select I/O Mode

// Bit0~bit3 output and bit4~bit7 input

```
outp(0x002E, 0xF1);  
outp(0x002F, 0x00);
```

// Access GPIO ports

```
outp(0x002E, 0xF0);  
outp(0x002F, 0x7C);
```

// Exit Extended Function Mode

```
outp(0x002E, 0xAA);
```

Definitions of Variables:

Each bit in the lower nibble of each Register represents the setting of a GPIO port.

Bit0 vs. GPIO DIO-Out 0

Bit1 vs. GPIO DIO-Out 1

Bit7 vs. GPIO DIO-Out 3

Bit4 vs. GPIO DIO-In 0

Bit3 vs. GPIO DIO-In 3

Value of Inversion Register:

Only lower nibble is available for this function.

When set to a '1', the incoming/outgoing port value is inverted.

When set to a '0', the incoming/outgoing port value is the same as in Data Register.

Value of I/O Selection Register:

Only lower nibble is available for this function.

When set to a '1', respective GPIO port is programmed as an input port.

When set to a '0', respective GPIO port is programmed as an output port.

Value of Output Data / Input Data:

Only lower nibble is available for this function.

If a port is assigned to be an output port, then its respective bit can be read/write.

If a port is assigned to be an input port, then its respective bit can be read only.

Note:

Some other functions may occupy the high nibble of the registers. Altering any content in high nibble will be undesired.