EmETX-a5363

AMD Geode™ ETX® CPU Module

User's Manual

Version 1.2

2010.11

RoHS VERIFIED

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Contents

Chapter 1

Introduction

1.1 Copyright Notice

The information in this document is subject to change without prior notice in order to improve the reliability, design and function. It does not represent a commitment on the part of the manufacturer.
Under no circumstances will the manufacturer be liable for any direct, indirect, special, incidental, or consequential damages arising from the use or inability to use the product or documentation, even if advised of the possibility of such damages.

1.2 About this User's Manual

This User's Manual is intended for experienced users and integrators with hardware knowledge of personal computers. If you are not sure about any description in this User's Manual, please consult your vendor before further handling.

1.3 Warning

Single Board Computers and their components contain very delicate Integrated Circuits (IC). To protect the Single Board Computer and its components against damage from static electricity, you should always follow the following precautions when handling it :

1. Disconnect your Single Board Computer from the power source when you want to work on the inside.
2. Hold the board by the edges and try not to touch the IC chips, leads or circuitry.
3. Use a grounded wrist strap when handling computer components.
4. Place components on a grounded antistatic pad or on the bag that came with the Single Board Computer, whenever components are separated from the system.

1.4 Replacing the lithium battery

Incorrect replacement of the lithium battery may lead to a risk of explosion.
The lithium battery must be replaced with an identical battery or a battery type recommended by the manufacturer.
Do not throw lithium batteries into the trashcan. It must be disposed of in accordance with local regulations concerning special waste.

1.5 Technical Support

If you have any technical difficulties, please do not hesitate to call or e-mail our customer service.

http://www.arbor.com.tw
E-mail:info@arbor.com.tw

1.6 Warranty

This product is warranted to be in good working order for a period of two years from the date of purchase. Should this product fail to be in good working order at any time during this period, we will, at our option, replace or repair it at no additional charge except as set forth in the following terms. This warranty does not apply to products damaged by misuse, modifications, accident or disaster.

Vendor assumes no liability for any damages, lost profits, lost savings or any other incidental or consequential damage resulting from the use, misuse of, or inability to use this product. Vendor will not be liable for any claim made by any other related party.

Vendors disclaim all other warranties, either expressed or implied, including but not limited to implied warranties of merchantibility and fitness for a particular purpose, with respect to the hardware, the accompanying product's manual(s) and written materials, and any accompanying hardware. This limited warranty gives you specific legal rights.

Return authorization must be obtained from the vendor before returned merchandise will be accepted. Authorization can be obtained by calling or faxing the vendor and requesting a Return Merchandise Authorization (RMA) number. Returned goods should always be accompanied by a clear problem description.

1.7 Packing List

1 x EmETX-a5363 AMD Geode™ ETX® CPU Module

1 x Driver CD

1 x Quick Installation Guide

If any of the above items is damaged or missing, contact your vendor immediately.

1.8 Ordering Information

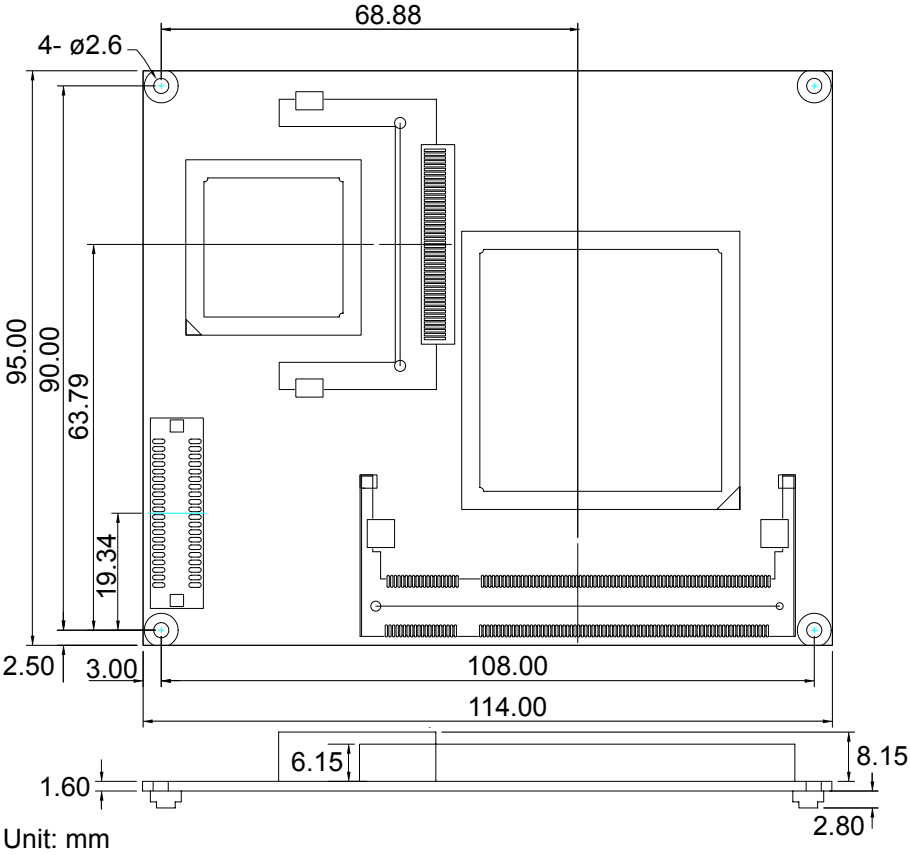
EmETX-a5363VL/ LX800	AMD Geode™ LX800 ETX® CPU module
EmETX-a5363VL/ LX800 w/ CF	AMD Geode™ LX800 ETX® CPU module with CompactFlash Type II Socket
HS-5363-W1	Heaskink (116 x 100 x 20mm)
HS-5363-F1	Heat spreader (114 x 96 x 9.2mm)
PBE-1000 R2.1	ETX® evaluation board in ATX form factor
CBK-05-1000-00	Cable kit for PBE-1000 R2.1

1.9 Specifications

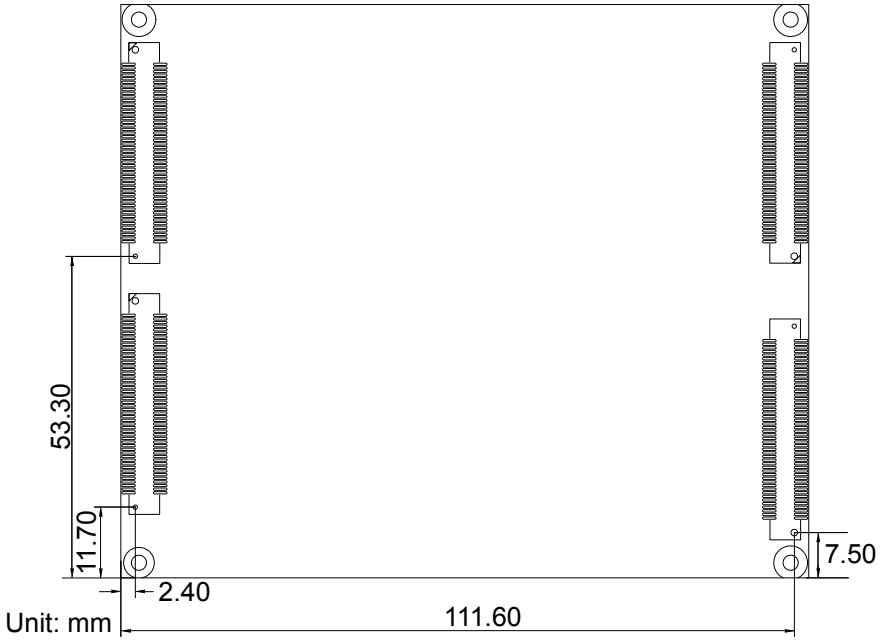
Form Factor	AMD Geode™ ETX® CPU Module
Processor	AMD Geode™ LX800@0.9W 500MHz
Chipset	AMD Geode™ CS5536
System Memory	1 x 200-pin SO-DIMM up to 1GB DDR SDRAM
VGA Controller	2D Graphics Controller integrated in AMD Geode™ LX800
Display	LCD: 24-bit TTL up to 1600 x 1200 (@60Hz) 18-bit LVDS up to 1600 x 1200 (@60Hz) Analog RGB: 1920 x 1440 (@85Hz)
Ethernet	Realtek RTL8100CL 10/100 Base-T Ethernet
BIOS	Phoenix-Award BIOS
Audio	ALC203 AC'97 Codec, MIC-in/Line-in/Line-out
Storage	1 x Ultra ATA, supports 2 IDE devices 1 x CompactFlash Type II socket (optional)
Serial Port	2 x COM ports
Parallel Port/ FDD	SPP/EPP/ECP mode shared with Floppy
KBMS	Standard PS/2 Keyboard and Mouse via PBE-1000
Universal Serial Bus	4 x USB 2.0 ports
Operation Temp.	-20°C ~ 70°C (-4°F ~ 158°F)
Watchdog Timer	1~255 levels Reset
Dimension (L x W)	114 x 95 mm (4.5" x 3.7")

1.10 Board Dimensions

Top View



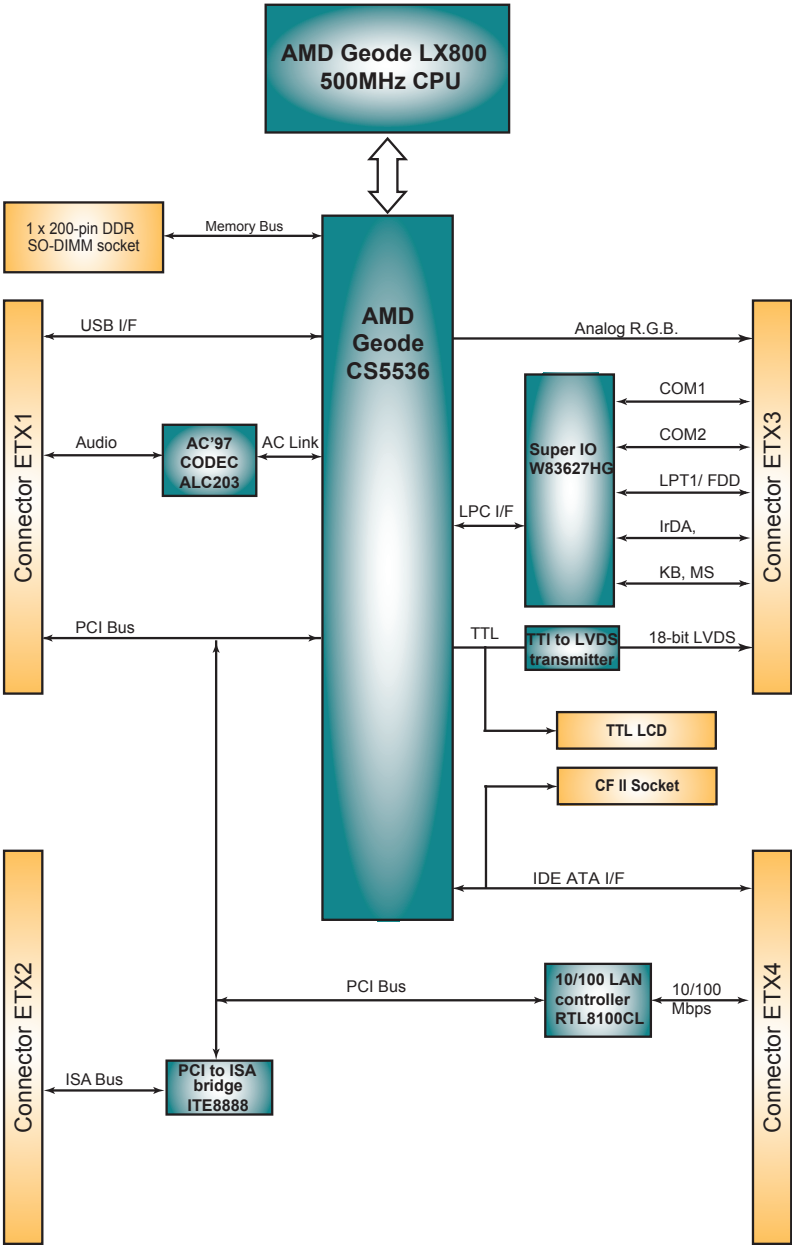
Bottom View



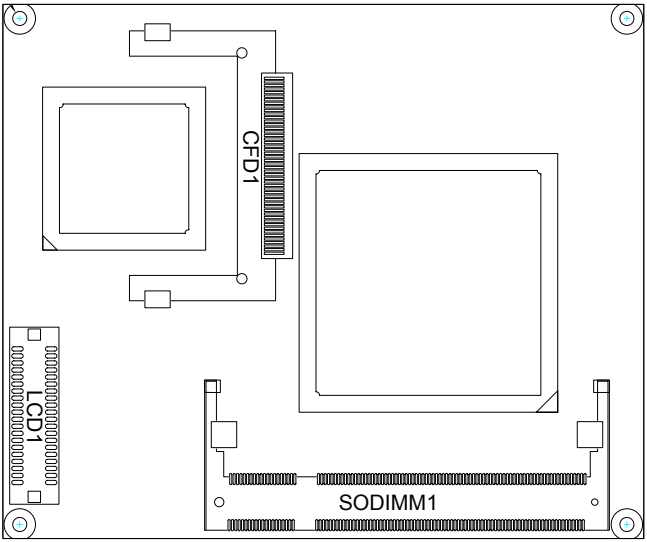
Chapter 2

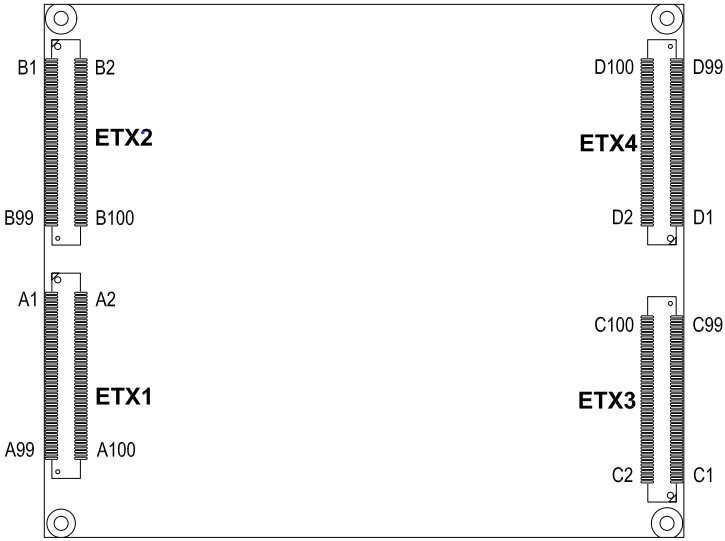
Installation

Block Diagram



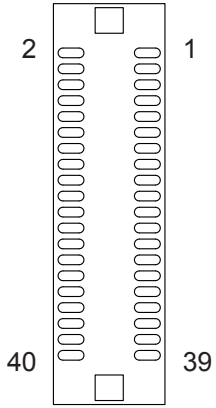
Connectors


CFD1
LCD1
SODIMM1

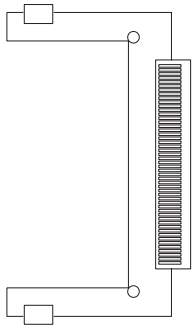

B1
B2
ETX2
B99
B100
A1
A2
ETX1
A99
A100
D100
D99
ETX4
D2
D1
C100
C99
ETX3
C2
C1

LCD1: TTL LCD Connector

Pin	Description	Pin	Description
2	VDD5	1	VDD5
4	GND	3	GND
6	VDD3	5	VDD3
8	GND	7	N.C.
10	LPD1	9	LPD0
12	LPD3	11	LPD2
14	LPD5	13	LPD4
16	LPD7	15	LPD6
18	LPD9	17	LPD8
20	LPD11	19	LPD10
22	LPD13	21	LPD12
24	LPD15	23	LPD14
26	LPD17	25	LPD16
28	LPD19	27	LPD18
30	LPD21	29	LPD20
32	LPD23	31	LPD22
34	GND	33	GND
36	FP_VS	35	DOTCLK
38	FP_HS	37	DE
40	ENVDD	39	BLON



CFD1: Compact Flash Tpe II Socket (Optional)



Note:
1. After hot-swapping CF II, you must restart your system for device detecting.
2. CF II and ATA channel are alternative.
3. CF II Socket supports up to 4GB.

ETX1 Connector

A1	GND	GND	A2
A3	PCICLK3	PCICLK4	A4
A5	GND	GND	A6
A7	PCICLK1	PCICLK2	A8
A9	REQ#3	GNT#3	A10
A11	GNT#2	VCC3	A12
A13	REQ#2	GNT#1	A14
A15	REQ#1	VCC3	A16
A17	GNT#0	N.C	A18
A19	VCC	VCC	A20
A21	SERIRQ	REQ#0	A22
A23	AD0	VCC3	A24
A25	AD1	AD2	A26
A27	AD4	AD3	A28
A29	AD6	AD5	A30
A31	CBE#0	AD7	A32
A33	AD8	AD9	A34
A35	GND	GND	A36
A37	AD10	AUXAL	A38
A39	AD11	MIC	A40
A41	AD12	AUXAR	A42
A43	AD13	ASVCC	A44
A45	AD14	SNDL	A46
A47	AD15	ASGND	A48
A49	CBE#1	SNDR	A50
A51	VCC	VCC	A52
A53	PAR	SERR#	A54
A55	PERR#	N.C	A56
A57	PME#	USB2-	A58
A59	LOCK#	DEVSEL#	A60
A61	TRDY#	USB3-	A62
A63	IRDY#	STOP#	A64
A65	FRAME#	USB2+	A66
A67	GND	GND	A68
A69	AD16	CBE#2	A70
A71	AD17	USB3+	A72
A73	AD19	AD18	A74
A75	AD20	USB0-	A76
A77	AD22	AD21	A78
A79	AD23	USB1-	A80
A81	AD24	CBE#3	A82
A83	VCC	VCC	A84
A85	AD25	AD26	A86
A87	AD28	USB0+	A88
A89	AD27	AD29	A90
A91	AD30	USB1+	A92
A93	PCIRST#	AD31	A94
A95	INTR#C	INTR#D	A96
A97	INTR#A	INTR#B	A98
A99	GND	GND	A100

ETX2 Connector

B1	GND	GND	B2
B3	SD14	SD15	B4
B5	SD13	MASTER#	B6
B7	SD12	DREQ7	B8
B9	SD11	DACK#7	B10
B11	SD10	DREQ6	B12
B13	SD9	DACK#6	B14
B15	SD8	DREQ5	B16
B17	MEMW#	DACK#5	B18
B19	MEMR#	DREQ0	B20
B21	LA17	DACK#0	B22
B23	LA18	IRQ14	B24
B25	LA19	IRQ15	B26
B27	LA20	IRQ12	B28
B29	LA21	IRQ11	B30
B31	LA22	IRQ10	B32
B33	LA23	IO16#	B34
B35	GND	GND	B36
B37	SBHE#	M16#	B38
B39	SA0	OSC	B40
B41	SA1	BALE	B42
B43	SA2	TC	B44
B45	SA3	DACK#2	B46
B47	SA4	IRQ3	B48
B49	SA5	IRQ4	B50
B51	VCC	VCC	B52
B53	SA6	IRQ5	B54
B55	SA7	IRQ6	B56
B57	SA8	IRQ7	B58
B59	SA9	SYSCLK	B60
B61	SA10	REFCH#	B62
B63	SA11	DREQ1	B64
B65	SA12	DACK#1	B66
B67	GND	GND	B68
B69	SA13	DREQ3	B70
B71	SA14	DACK#3	B72
B73	SA15	IOR#	B74
B75	SA16	IOW#	B76
B77	SA18	SA17	B78
B79	SA19	SMEMR#	B80
B81	IOCHRDY	AEN	B82
B83	VCC	VCC	B84
B85	SD0	SMEMW#	B86
B87	SD2	SD1	B88
B89	SD3	NOWS#	B90
B91	DREQ2	SD4	B92
B93	SD5	IRQ9	B94
B95	SD6	SD7	B96
B97	IOCHK#	RSTDRV	B98
B99	GND	GND	B100

ETX3 Connector

C1	GND	GND	C2
C3	R	B	C4
C5	HSY	G	C6
C7	VSY	DDCK	C8
C9	N.C	DDDA	C10
C11	N.C	N.C	C12
C13	N.C	N.C	C14
C15	GND	GND	C16
C17	N.C	N.C	C18
C19	N.C	N.C	C20
C21	GND	GND	C22
C23	TX1D3-	N.C	C24
C25	TX1D3+	N.C	C26
C27	GND	GND	C28
C29	TX1D2-	TX1CLK+	C30
C31	TX1D2+	TX1CLK-	C32
C33	GND	GND	C34
C35	TX1D0-	TX1D1+	C36
C37	TX1D0+	TX1D1-	C38
C39	VCC	VCC	C40
C41	N.C	N.C	C42
C43	N.C	BLON#	C44
C45	BIASON	ENVDD	C46
C47	COMP	Y	C48
C49	SYNC	C	C50
C51	N.C	N.C	C52
C53	VCC	GND	C54
C55	STB#	AFD#	C56
C57	N.C	PD7	C58
C59	IRRX	ERR#	C60
C61	IRTX	PD6	C62
C63	RXD2	INIT#	C64
C65	GND	GND	C66
C67	RTS#2	PD5	C68
C69	DTR#2	SLIN#	C70
C71	DCD#2	PD4	C72
C73	DSR#2	PD3	C74
C75	CTS#2	PD2	C76
C77	TXD#2	PD1	C78
C79	RI#2	PD0	C80
C81	VCC	VCC	C82
C83	RXD1	ACK#	C84
C85	RTS#1	BUSY#	C86
C87	DTR#1	PE	C88
C89	DCD#1	SLCT#	C90
C91	DSR#1	MSCLK	C92
C93	CTS#1	MSDAT	C94
C95	TXD#1	KBCLK	C96
C97	RI#1	KBDAT	C98
C99	GND	GND	C100

ETX4 Connector

D1	GND	GND	D2
D3	5V_SB	PWGIN	D4
D5	PS_ON	SPEAKER	D6
D7	PWERBTN#	BATT	D8
D9	N.C	LILED	D10
D11	RSMRST#	ACTLED	D12
D13	N.C	SPEEDLED	D14
D15	N.C	I2CLK	D16
D17	VCC	VCC	D18
D19	OVCR#	N.C	D20
D21	N.C	I2DAT	D22
D23	SMBCLK	SMBDAT	D24
D25	N.C	SMBALRT#	D26
D27	N.C	SATALED#	D28
D29	N.C	PIDE_CS3#	D30
D31	N.C	PIDE_CS1#	D32
D33	GND	GND	D34
D35	PDIAG_S	PIDE_A2	D36
D37	N.C	PIDE_A0	D38
D39	N.C	PIDE_A1	D40
D41	N.C	N.C	D42
D43	N.C	PIDE_INTRQ	D44
D45	N.C	PIDE_ACK#	D46
D47	N.C	PIDE_RDY	D48
D49	VCC	VCC	D50
D51	N.C	PIDE_IOR#	D52
D53	N.C	PIDE_IOW#	D54
D55	N.C	PIDE_DRQ	D56
D57	N.C	PIDE_D15	D58
D59	N.C	PIDE_D0	D60
D61	N.C	PIDE_D14	D62
D63	N.C	PIDE_D1	D64
D65	GND	GND	D66
D67	N.C	PIDE_D13	D68
D69	N.C	PIDE_D2	D70
D71	N.C	PIDE_D12	D72
D73	N.C	PIDE_D3	D74
D75	N.C	PIDE_D11	D76
D77	N.C	PIDE_D4	D78
D79	N.C	PIDE_D10	D80
D81	VCC	VCC	D82
D83	N.C	PIDE_D5	D84
D85	N.C	PIDE_D9	D86
D87	N.C	PIDE_D6	D88
D89	GPE2#	CBLID_P#	D90
D91	RXD-	PIDE_D8	D92
D93	RXD+	N.C	D94
D95	TXD-	PIDE_D7	D96
D97	TXD+	HDRST#	D98
D99	GND	GND	D100

The Installation Paths of CD Driver

Driver	Path
CHIPSET	\CHIPSET\AMD\LX
VGA	\GRAPHICS\AMD\LX
AUDIO	\AUDIO\AMD\LX
LAN	\Ethernet\REALTEK\8100C\9x.2K.XP

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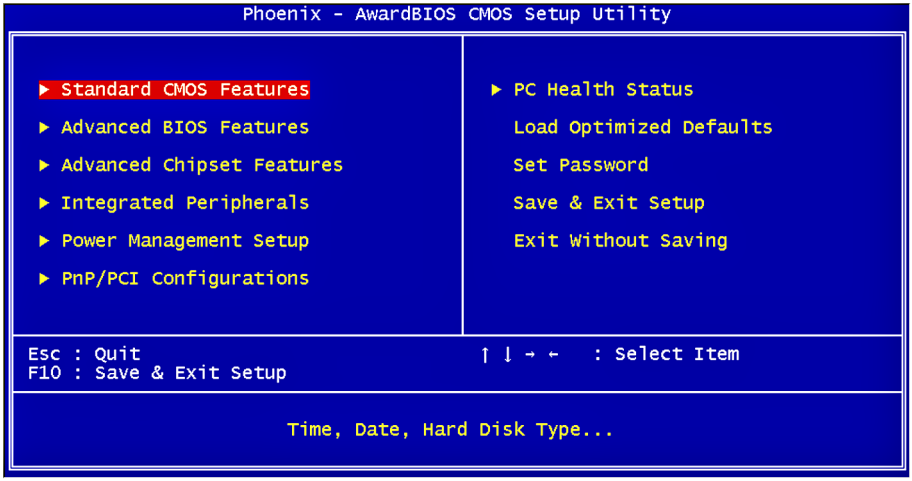
Chapter 3

BIOS

3.1 BIOS Introduction

The Award BIOS (Basic Input/Output System) installed in your computer system's. The BIOS provides for a standard device such as disk drives, serial ports and parallel ports. It also adds password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system.



3.2 BIOS Setup

The Award BIOS provides a Setup utility program for specifying the system configurations and settings. The BIOS ROM of the system stores the Setup utility.

When you turn on the computer, the Award BIOS is immediately activated. Pressing the <Del> key immediately allows you to enter the Setup utility. If you a little bit late press the <Del> key, POST (Power On Self Test) will continue with its test routines, thus preventing you from invoking the Setup. If you still wish to enter Setup, restart the system by pressing the "Reset" button or simultaneously pressing the <Ctrl>, <Alt> and <Delete> keys. You can also restart by turning the system Off and back On again.

The following message will appear on the screen:

Press <DEL> to Enter Setup

In general, you press the arrow keys to highlight items, <Enter> to select, the <PgUp> and <PgDn> keys to change entries, <F1> for help and <Esc> to quit. When you enter the Setup utility, the Main Menu screen will appear on the screen. The Main Menu allows you to select from various setup functions and exit choices.

3.3 Standard CMOS Features

```
Phoenix - AwardBIOS CMOS Setup Utility
Standard CMOS Features

Date (mm:dd:yy)              Wed, Jun  6 2007          Item Help
Time (hh:mm:ss)              17 : 48 : 41
                                                       Menu Level  ▶
▶ IDE Primary Master         [ None]                   Change the day, month,
▶ IDE Primary Slave          [ None]                   year and century

Drive A                      [1.44M, 3.5 in.]

Video                        [EGA/VGA]
Halt On                      [All , But Keyboard]

Base Memory                        1K
Extended Memory                    1K
Total Memory                     512K

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

“Standard CMOS Features” allows you to record some basic hardware configurations in your computer system and set the system clock and error handling. If the CPU card is already installed in a working system, you will not need to select this option.
You will need to run the Standard CMOS option, however, if you change your system hardware configurations, such as onboard battery fails, or the configuration stored in the CMOS memory was lost or damaged.

Date

The date format is:

Day : Sun to Sat
Month : 1 to 12
Date : 1 to 31
Year : 1999 to 2099

Time

The time format is:

Hour : 00 to 23
Minute : 00 to 59
Second : 00 to 59

To set the date & time, highlight the “Date” & “Time” and use the <PgUp>/ <PgDn> or +/- keys to set the current time.

IDE Primary HDDs

The onboard PCI IDE connectors provide Primary channel for connecting up to two IDE hard disks or other IDE devices.
Each channel can support up to two hard disks; the first is the “Master” and the second is the “Slave”.
Press <Enter> to configure the hard disk. The selections include Auto, Manual, and None. Select ‘Manual’ to define the drive information manually. You will be asked to enter the following items.

Cylinder:	Number of cylinders
Head:	Number of read/write heads
Precomp:	Write precompensation
Landing Zone:	Landing zone
Sector:	Number of sectors

The Access Mode selections are as follows:

CHS	(HD < 528MB)
LBA	(HD > 528MB and supports Logical Block Addressing)
Large	(for MS-DOS only)
Auto	

Drive A

It identifies the type of floppy disk drive A that has been installed in the computer. The available specifications are:

None	360K, 5.25 in.	1.2M, 5.25 in.
720K, 3.5 in.	1.44M, 3.5 in.	2.88M, 3.5 in.

Video

This field selects the type of video display card installed in your system. You can choose the following video display cards:

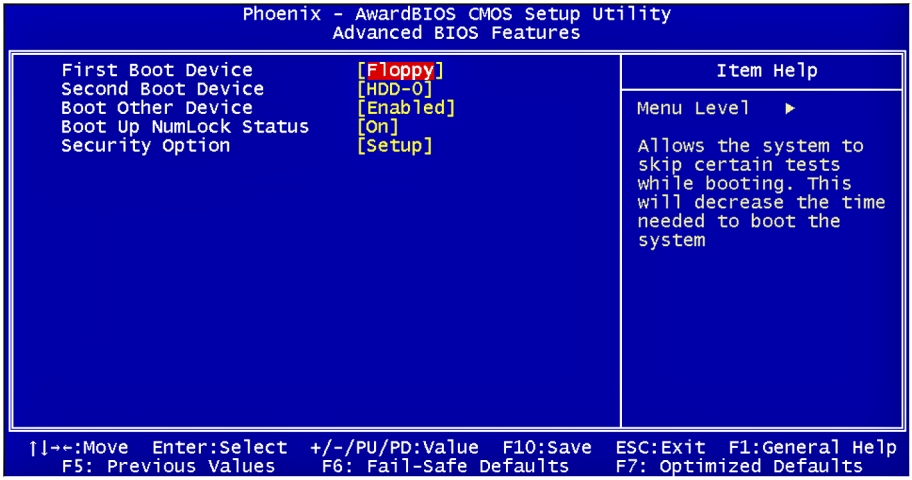
EGA/VGA	For EGA, VGA, SEGA, SVGA or PGA monitor adapters. (default)
CGA 40	Power up in 40 column mode.
CGA 80	Power up in 80 column mode.
MONO	For Hercules or MDA adapters.

Halt On

This field determines whether or not the system will halt if an error is detected during power up.

All errors (default)	Whenever the BIOS detects a non-fatal error, the system will stop and you will be prompted.
No errors	The system boot will not be halted for any error that may be detected.
All, But Keyboard	The system boot will not be halted for a keyboard error; it will stop for all other errors.
All, But Diskette	The system boot will not be halted for a disk error; it will stop for all other errors.
All, But Disk/Key	The system boot will not be halted for a keyboard or disk error; it will stop for all others.

3.4 Advance BIOS Features



First/ Second Boot Device

These fields determine the drive that the system searches first for an operating system. The options available include
Setting: Floppy, HDD-0, SCSI, CDROM, HDD-1, USB-FDD, USB-ZIP, USB-CDROM, USB-HDD, LAN and Disabled.

Boot Other Device

It allows the system to search for an OS from other devices other than the ones selected in the First/ Second/ Third Boot Device.
Setting: Disabled, Enabled (Default).

Boot Up NumLock Status

It allows you to activate the NumLock function after you power up the system.
Setting: Off, On (Default).

Security Option

It allows you to limit access to the System and Setup.
When you select System, the system prompts for the User Password every time you boot up.
When you select Setup, the system always boots up and prompts for the Supervisor Password only when the Setup utility is called up.
Setting: Setup (Default), System.

3.5 Advanced Chipset Features

```
Phoenix - AwardBIOS CMOS Setup Utility
Advanced Chipset Features

  CAS Latency                [Auto]          Item Help
  Interleave Select          [LOI]
  XOR BA0                    [Disabled]      Menu Level  ►
  XOR BA1                    [Disabled]
  XOR MB0                    [Disabled]
  XOR Bit Select             [18]
  Video Memory Size          [   8 M]

  Output display             [CRT]
x Flat Panel Configuration    Press Enter
  Memory Hole At 15M-16M     [Disabled]

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

CAS Latency

It allows CAS latency time in HCLKs. The system board designer should set the values in this field, depending on the DRAM installed. Do not change the values in this field unless you change specifications of the installed DRAM or CPU.
Setting: Auto (Default), 1.5, 2.0, 2.5, 3.0, 3.5.

Interleave Select

It allows you to Use the Interleave Select option to specify how the cache memory is interleaved.
Setting: LOI (Default), HOI.

XOR BA0

Setting: Disabled (Default), Enabled.

XOR BA1

Setting: Disabled (Default), Enabled.

XOR MB0

Setting: Disabled (Default), Enabled.

XOR Bit Select

Setting: 18 (Default), 19, 20, 21.

Video Memory Size

In order to determine how much memory is allocated to the video graphics device.
Setting: None, 8M (Default), 16M, 32M, 64M, 128M, 254M.

Output display

In order to specify the display devices the system is connected to.
Setting: Flat Panel, CRT (Default), Panel & CRT.

Flat Panel Configuration

It allows you to open the Flat Panel Configuration menu.

Memory Hole At 15M-16M

In order to improve performance, certain space in memory can be reserved for ISA cards. This memory must be mapped into the memory space below 16MB.
Setting: Disabled (Default), Enabled.

3.6 Integrated Peripherals

```
Phoenix - AwardBIOS CMOS Setup Utility
Integrated Peripherals

▶ OnChip IDE Device          [Press Enter]        Item Help
▶ SuperIO Device             [Press Enter]
▶ IT8888 ISA Decode IO       [Press Enter]        Menu Level ▶
▶ IT8888 ISA Decode Memory   [Press Enter]
  Onboard Lan Boot ROM       [Disabled]

  Onboard Audio              [Enabled]

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

On-Chip IDE Device >>>

```
OnChip IDE Device

On-Chip IDE Channel 1      [Enabled]
Master Drive PIO Mode      [Auto]
Slave  Drive PIO Mode      [Auto]
IDE Primary Master UDMA    [Auto]
IDE Primary Slave  UDMA    [Auto]
IDE DMA transfer access    [Enabled]
IDE HDD Block Mode         [Enabled]
```

On-Chip IDE Channel 1

The integrated peripheral controller contains an IDE interface with support for two IDE channels. Select Enabled to activate each channel separately.
Setting: Disabled, Enabled (Default).

Master/Slave Drive PIO Mode

It allows your system HDD controller to run faster.
Rather than having the BIOS issue with a series of commands that transferring to or from the disk drive, PIO (Programmed Input/Output) allows the BIOS to communicate with the controller and CPU directly.
When Auto is selected, the BIOS will select the best available mode.
Setting: Auto (Default), Mode 0, Mode 1, Mode 2, Mode 3, Mode 4.

IDE Primary Master/Slave UDMA

It allows your system to improve disk I/O throughput to 33MB/sec with the Ultra DMA33 feature.
Setting: Disabled, Auto.

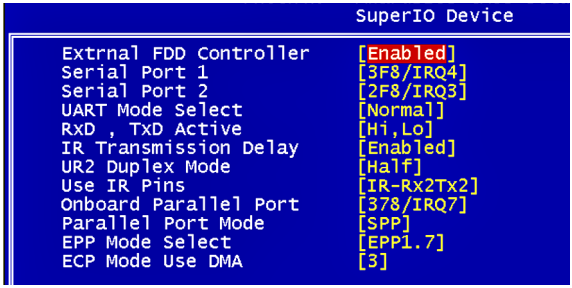
IDE DMA Transfer Access

Setting: Disabled, Enabled (Default).

IDE HDD Block Mode

It allows HDD controller to use the fast block mode to transfer data to and from HDD.
Setting: Disabled, Enabled (Default).

SuperIO Device >>>



External FDD Controller

Select “Enabled” if your system has a floppy disk controller (FDC) installed and you wish to use it. Select “Disabled” if your system has an add-in FDC or has no floppy drive.
Setting: Disabled, Enabled (Default).

Onboard Serial/Parallel Port

It allows you to select the onboard serial and parallel ports with their addresses.

Setting:	Serial Port 1	3F8/IRQ4 (Default)
	Serial Port 2	2F8/IRQ3 (Default)
	Parallel Port	378/IRQ7 (Default)

UART Mode Select

It determines the UART2 mode in your computer.
Setting: IrDA, ASKIR, Normal (Default).

RxD, TxD Active

Setting: Hi,Hi , Hi,Lo (Default) , Lo,Hi , Lo,Lo.

IR Transmission Delay

Setting: Disabled, Enabled (Default).

UR2 Duplex Mode

Setting: Full, Half (Default).

Use IR Pins

Setting: RxD2,TxD2 , IR-Rx2Tx2 (Default).

Parallel Port Mode

Setting:
SPP (Default)
EPP
ECP
ECP+EPP
Normal

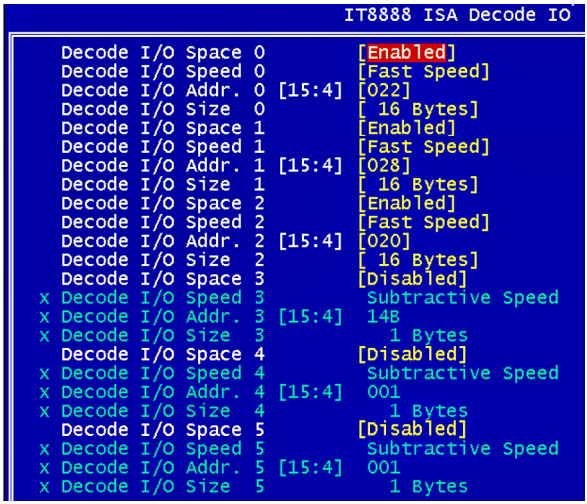
EPP Mode Select

Setting: EPP1.9, EPP1.7 (Default)

ECP Mode Use DMA

Setting: 1, 3 (Default).

IT8888 ISA Decode IO >>>



It allows you to use the IT8888 ISA Decode IO menu to set the IO memory range for the onboard ISA.

Decode I/O Space 0/ 1/ 2/ 3/ 4/ 5

It allows you to allocate system resources to the ISA bridge and to enable the function correctly.
Setting: Disabled, Enabled (Default).

Decode I/O Speed 0/ 1/ 2/ 3/ 4/ 5

It allows you to specify the speed of the ISA bus.
Setting: Subtractive Speed, Slow Speed, Medium Speed, Fast Speed.

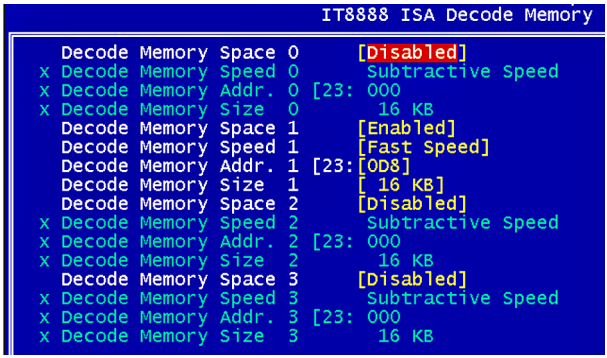
Decode I/O Address 0/ 1/ 2/ 3/ 4/ 5 [15:4]

It allows you to allocate an address to the ISA bus. The address may range from 0001 to 0FFF.

Decode I/O Size 0/ 1/ 2/ 3/ 4/ 5

It allows you to specify the size of the ISA bus.
Setting: 1 Byte, 2 Bytes, 4 Bytes, 8 Bytes, 16 Bytes, 32 Bytes, 64 Bytes, 128 Bytes.

IT8888 ISA Decode Memory >>>



It allows you to use the IT8888 ISA Decode Memory to set the resources for the onboard ISA bus.

Decode Memory Space 0/ 1/ 2/ 3

It allows you to allocate memory resources to the ISA bridge and to enable the function correctly.
Setting: Disabled (Default), Enabled.

Decode Memory Speed 0/ 1/ 2/ 3

It allows you to specify the memory speed of the ISA bus.
Setting: Subtractive Speed, Slow Speed, Medium Speed, Fast Speed.

Decode Memory Addr. 0/ 1/ 2/ 3 [23:

It allows you to allocate a memory address to the ISA bus. The address may range from 0001 to 0FFF.

Decode Memory Size 0/ 1/ 2/ 3

It allows you to specify the memory size of the ISA bus.
Setting: 16KB, 32KB, 64KB, 128KB, 256KB, 512KB, 1MB, 2MB.

Onboard Lan Boot ROM

Setting: Enabled, Disabled (Default).

Onboard Audio

Setting: Enabled (Default), Disabled.

3.7 Power Management Setup

```
Phoenix - AwardBIOS CMOS Setup Utility
Power Management Setup

x ACPI Function              Enabled          Item Help
  Power Management           [ACPI]
                                              Menu Level  ▶
        ** PM Timers **

  MODEM Use IRQ              [N/A]
  PME Event Function         [Enabled]
  Soft-Off by PWR-BTTN       [Instant-Off]
▶ IRQ Wakeup Events          [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
```

ACPI Function

It supports ACPI (Advance Configuration and Power Interface).
Setting: Enabled (Default), Disabled.

Power Management

It allows you to select the type of power saving management modes.

Setting:	APM	Advanced power management (APM)
	ACPI (Default)	Advanced Configuration and Power Interface (ACPI)

Modem Use IRQ

It sets the IRQ used by the Modem.
Setting: N/A (Default), 3, 4, 5, 7, 9, 10, 11.

PME Event Function

Setting: Disabled, Enabled (Default).

Soft-Off by PWR-BTTN

It defines the power-off mode when using an ATX power supply.
In the Instant Off mode, It allows powering off immediately upon pressing the power button.
In the Delay 4 Sec mode, the system powers off when the power button is pressed for more than 4 seconds or enters the suspend mode when pressed for less than 4 seconds.
Setting: Instant-off (Default), Delay 4 Sec. .

IRQ Wakeup Events

The HDD, FDD, COM, LPT Ports, and PCI PIRQ are I/O events that can prevent the system from entering a power saving mode or can awaken the system from such a mode. When an I/O device wants to gain the attention of the operating system, it signals this by causing an IRQ to occur. When the operating system is ready to respond to the request, it interrupts itself and performs the service.

3.8 PNP/PCI Configurations

```
Phoenix - AwardBIOS CMOS Setup Utility
PnP/PCI Configurations

  PNP OS Installed            [No]          Item Help
  Reset Configuration Data    [Disabled]
                                            Menu Level  ►
  Resources Controlled By     [Auto(ESCD)]
x IRQ Resources                Press Enter  Select Yes if you are
x Memory Resources             Press Enter  using a Plug and Play
                                            capable operating
  PCI/VGA Palette Snoop       [Disabled]    system Select No if
                                            you need the BIOS to
                                            configure non-boot
                                            devices

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

PNP OS Installed

It allows you to enable the PNP OS Install option if it is supported by the OS installed.
Setting: No (Default), Yes.

Reset Configuration Data

It allows you to determine whether to reset the configuration data or not.
Setting: Disabled (Default), Enabled.

Resources Controlled By

This PnP BIOS can configure all of the boot and compatible devices with the use of a PnP operating system.
Setting: Auto(ESCD) (Default), Manual.

IRQ Resources

It allows you to configure the IRQ Resources.

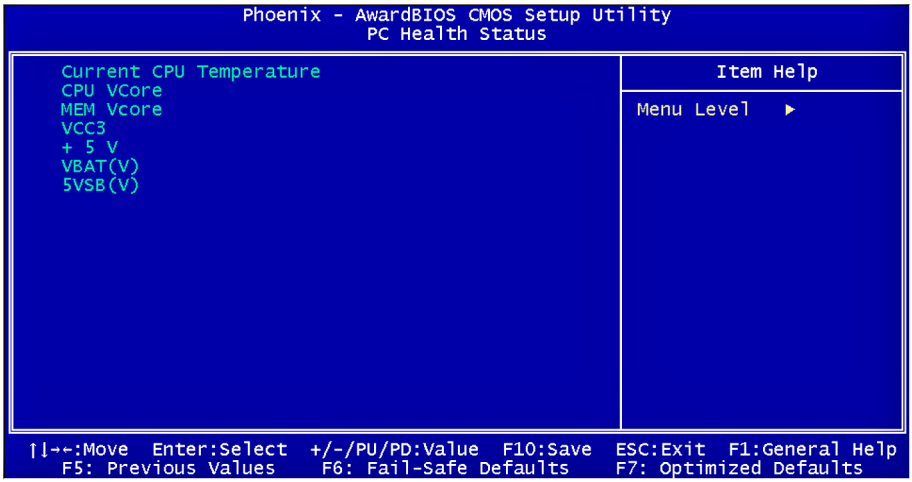
Memory Resources

It allows you to configure the Memory Resources.

PCI/VGA Palette Snoop

Some non-standard VGA display cards may not show colors properly.
It allows you to set whether or not MPEG ISA/VESA VGA cards can display with PCI/VGA.
When “Enabled”, a PCI/VGA can display with an MPEG ISA/VESA VGA card.
When “Disabled”, a PCI/VGA cannot display with an MPEG ISA/VESA VGA card.
Setting: Disabled (Default), Enabled.

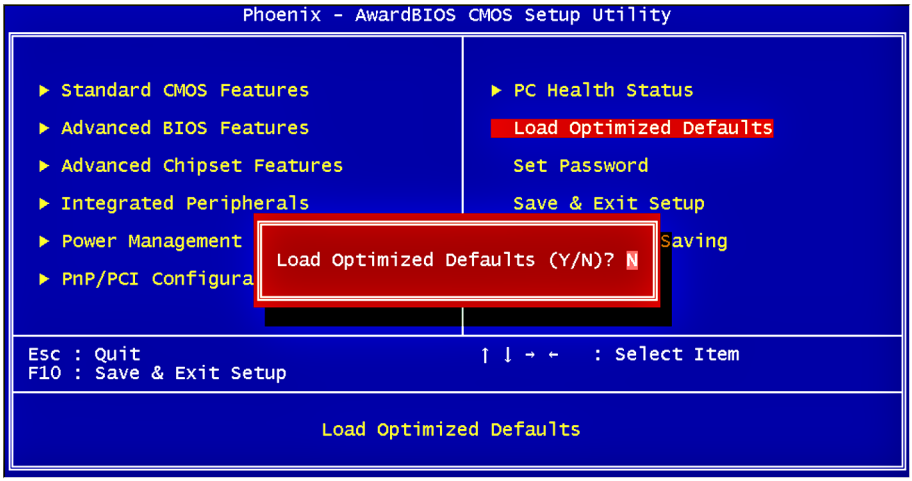
3.9 PC Health Status



Current CPU Temperature

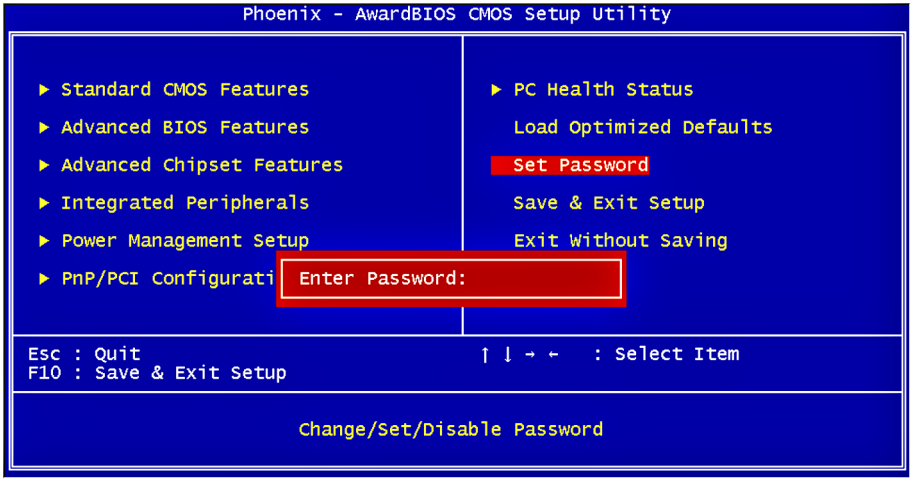
CPU/ MEM VCore

3.10 Load Optimized Defaults



It allows you to load the default values to your system configuration. The default setting is optimal and enabled all high performance features.

3.11 Set Password

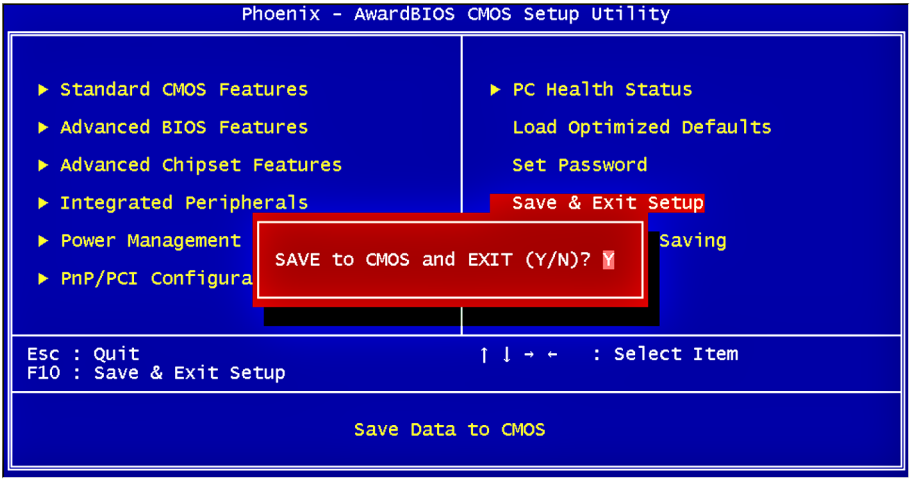


Using Password to set a password that will be used exclusively on the system. To specify a password, highlight the type you want and press <Enter>.

The Enter Password: message prompts on the screen. Type the password, up to eight characters in length, and press <Enter>. And the system confirms your password by asking you to type it again. After setting a password, the screen automatically returns to the main screen.

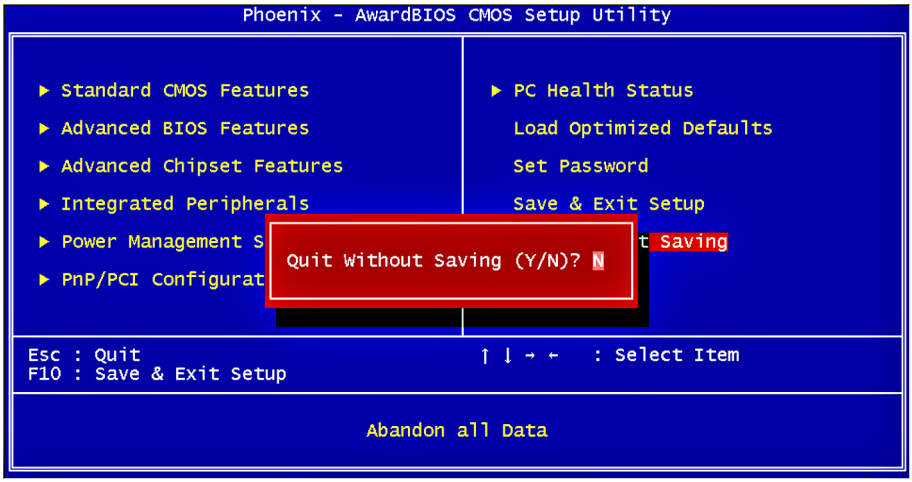
To disable a password, just press the <Enter> key when you are prompted to enter the password. A message will confirm the password to be disabled. Once the password is disabled, the system will boot, then you can enter BIOS Setup freely.

3.12 Save to CMOS and Exit



Typing “Y”, you will quit the setup utility and save all the changes into the CMOS memory.
Typing “N”, you will return to Setup utility.

3.13 Exit Without Saving



Typing “Y” will quit the Setup utility without saving the modifications.
Typing “N” will return you to Setup utility.

3.14 BIOS memory mapping

Address	Device Description
E000:0000h - F000:FFFFh	System BIOS Area
D000:2000h - D000:FFFFh	Free space
D000:0000h - D000:1FFFh	LAN ROM
C000:E000h - CF00:FFFFh	Free space
C000:0000h - C000:DFFFh	VGA BIOS
A000:0000h - B000:FFFFh	VGA RAM
0000:0000h - 9000:FFFFh	DOS 640K

3.15 Award BIOS Post Codes

CFh	Test CMOS read/write functionality
C0h	Early chipset initialization: Disable shadow RAM, L2 cache (socket 7 and below), program basic chipset registers
C1h	Detect memory: Auto detection of DRAM size, type and ECC, auto detection of L2 cache (socket 7 and below)
C3h	Expand compressed BIOS code to DRAM
C5h	Call chipset hook to copy BIOS back to E000 & F000 shadow RAM
01h	Expand the Xgroup codes located in physical memory address 1000:0
02h	Reserved
03h	Initial Superio_Early_Init switch
04h	Reserved
05h	Blank out screen; Clear CMOS error flag
06h	Reserved
07h	Clear 8042 interface; Initialize 8042 self test
08h	Test special keyboard controller for Winbond 977 series Super I/O chips; Enable keyboard interface
09h	Reserved
0Ah	Disable PS/2 mouse interface (optional); Auto detect ports for keyboard & mouse followed by a port & interface swap (optional); Reset keyboard for Winbond 977 series Super I/O chips
0Bh	Reserved
0Ch	Reserved
0Dh	Reserved
0Eh	Test F000h segment shadow to see whether it is read/write capable or not. If test fails, keep beeping the speaker
0Fh	Reserved
10h	Auto detect flash type to load appropriate flash read/write codes into the run time area in F000 for ESCD & DMI support
11h	Reserved
12h	Use walking 1's algorithm to check out interface in CMOS circuitry. Also set real time clock power status and then check for overide
13h	Reserved
14h	Program chipset default values into chipset. Chipset default values are MODBINable by OEM customers
15h	Reserved
16h	Initial Early_Init_Onboard_Generator switch
17h	Reserved
18h	Detect CPU information including brand, SMI type (Cyrix or Intel) and CPU level (586 or 686)
19h	Reserved
1Ah	Reserved
1Bh	Initial interrupts vector table. If no special specified, all H/W interrupts are directed to SPURIOUS_INT_HDLR & S/W interrupts to SPURIOUS_soft_HDLR
1Ch	Reserved
1Dh	Initial EARLY_PM_INIT switch
1Eh	Reserved
1Fh	Load keyboard matrix (notebook platform)

20h	Reserved
21h	HPM initialization (notebook platform)
22h	Reserved
23h	Check validity of RTC value; Load CMOS settings into BIOS stack. If CMOS checksum fails, use default value instead; Prepare BIOS resource map for PCI & PnP use. If ESCD is valid, take into consideration of the ESCD's legacy information; Onboard clock generator initialization. Disable respective clock resource to empty PCI & DIMM slots; Early PCI initialization - Enumerate PCI bus number, assign memory & I/O resource, search for a valid VGA device & VGA BIOS, and put it into C000:0
24h	Reserved
25h	Reserved
26h	Reserved
27h	Initialize INT 09 buffer
28h	Reserved
29h	Program CPU internal MTRR (P6 & PII) for 0-640K memory address; Initialize the APIC for Pentium class CPU; Program early chipset according to CMOS setup; Measure CPU speed; Invoke video BIOS
2Ah	Reserved
2Bh	Reserved
2Ch	Reserved
2Dh	Initialize multilanguage; Put information on screen display, including Award title, CPU type, CPU speed, etc...
2Eh	Reserved
2Fh	Reserved
30h	Reserved
31h	Reserved
32h	Reserved
33h	Reset keyboard except Winbond 977 series Super I/O chips
34h	Reserved
35h	Reserved
36h	Reserved
37h	Reserved
38h	Reserved
39h	Reserved
3Ah	Reserved
3Bh	Reserved
3Ch	Test 8254
3Dh	Reserved
3Eh	Test 8259 interrupt mask bits for channel 1
3Fh	Reserved
40h	Test 9259 interrupt mask bits for channel 2
41h	Reserved
42h	Reserved
43h	Test 8259 functionality
44h	Reserved
45h	Reserved
46h	Reserved

47h	Initialize EISA slot
48h	Reserved
49h	Calculate total memory by testing the last double last word of each 64K page; Program writes allocation for AMD K5 CPU
4Ah	Reserved
4Bh	Reserved
4Ch	Reserved
4Dh	Reserved
4Eh	Program MTRR of M1 CPU; initialize L2 cache for P6 class CPU & program cacheable range; Initialize the APIC for P6 class CPU; On MP platform, adjust the cacheable range to smaller one in case the cacheable ranges between each CPU are not identical
4Fh	reserved
50h	Initialize USB
51h	Reserved
52h	Test all memory (clear all extended memory to 0)
53h	Reserved
54h	Reserved
55h	Display number of processors (multi-processor platform)
56h	Reserved
57h	Display PnP logo; Early ISA PnP initialization and assign CSN to every ISA PnP device
58h	Reserved
59h	Initialize the combined Trend Anti-Virus code
5Ah	Reserved
5Bh	Show message for entering AWDFLASH.EXE from FDD (optional feature)
5Ch	Reserved
5Dh	Initialize Init_Onboard_Super_IO switch; Initialize Init_Onboard_AUDIO switch
5Eh	Reserved
5Fh	Reserved
60h	Okay to enter Setup utility
61h	Reserved
62h	Reserved
63h	Reserved
64h	Reserved
65h	Initialize PS/2 mouse
66h	Reserved
67h	Prepare memory size information for function call: INT 15h ax=E820h
68h	Reserved
69h	Turn on L2 cache
6Ah	Reserved
6Bh	Program chipset registers according to items described in Setup & Auto-Configuration table
6Ch	Reserved
6Dh	Assign resources to all ISA PnP devices; Auto assign ports to onboard COM ports if the corresponding item in Setup is set to “AUTO”
6Eh	Reserved
6Fh	Initialize floppy controller; Setup floppy related fields in 40:hardware

70h	Reserved
71h	Reserved
72h	Reserved
73h	Enter AWDFLASH.EXE if: AWDFLASH.EXE is found in floppy drive and ALT+F2 is pressed
74h	Reserved
75h	Detect and install all IDE devices: HDD, LS120, ZIP, CDROM...
76h	Reserved
77h	Detect serial ports and parallel ports
78h	Reserved
79h	Reserved
7Ah	Detect and install coprocessor
7Bh	Reserved
7Ch	Reserved
7Dh	Reserved
7Eh	Reserved
7Fh	Switch back to text mode if full screen logo is supported: if errors occur, report errors & wait for keys, if no errors occur or F1 key is pressed continue - Clear EPA or customization logo
80h	Reserved
81h	Reserved
82H	Call chipset power management hook: Recover the text fond used by EPA logo (not for full screen logo), If password is set, ask for password
83H	Save all data in stack back to CMOS
84h	Initialize ISA PnP boot devices
85h	Final USB initialization; NET PC: Build SYSID structure; Switch screen back to text mode; Set up ACPI table at top of memory; Invoke ISA adapter ROM's; Assign IRQ's to PCI devices; Initialize APM; Clear noise of IRQ's
86h	Reserved
87h	Reserved
88h	Reserved
89h	Reserved
90h	Reserved
91h	Reserved
92h	Reserved
93h	Read HDD boot sector information for Trend Anti-Virus code
94h	Enable L2 cache; Program boot up speed; Chipset final initialization; Power management final initialization; Clear screen and display summary table; Program K6 write allocation; Program P6 class write combining
95h	Program daylight saving; Update keyboard LED and typematic rate
96h	Build MP table; Build and update ESCD; Set CMOS century to 20h or 19h; Load CMOS time into DOS timer tick; Build MSIRQ routing table
FFh	Boot attempt (INT 19h)

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Appendix

Appendix-A I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses which also becomes the identity of the device.
The following table lists the I/O port addresses used.

Address	Device Description
EE000000 - EEFFFFFF	Advanced Micro Devices Win 2K/XP Graphics Driver
EFD00000 - EFDFFFFF	PCI standard PCI-to-PCI bridge
EFE00000 - EFEFFFFF	PCI standard PCI-to-PCI bridge
EFFC0000 - EFFDFFFF	Intel(R) PRO/100 M Desktop Adapter
EFFE8000 - EFFEBFFF	Advanced Micro Devices Win 2K/XP Graphics Driver
EFFEC000 - EFFEFFFF	Advanced Micro Devices Win 2K/XP Graphics Driver
EFFF0000 - EFFF3FFF	Advanced Micro Devices Win 2K/XP Graphics Driver
EFFF4000 - EFFF7FFF	Geode LX AES Crypto Driver
EFFF8000 - EFFFBFFF	Advanced Micro Devices Win 2K/XP Graphics Driver
EFFFD000 - EFFFDFFF	Standard Enhanced PCI to USB Host Controller
EFFFE000 - EFFFEFFF	Standard OpenHCD USB Host Controller
EFFFF000 - EFFFFFFF	Intel(R) PRO/100 M Desktop Adapter
000A0000 - 000BFFFF	PCI bus
000A0000 - 000BFFFF	Advanced Micro Devices Win 2K/XP Graphics Driver
000C8000 - 000DFFFF	PCI bus
0F7C0000 - FEBFFFFF	PCI bus
00000000 - 00000CF7	PCI bus
00000000 - FFFFFFFF	ISAPNP Read Data Port
00000060 - 00000060	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
00000064 - 00000064	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard

00000070 - 00000073	System CMOS/real time clock
00000170 - 00000177	Secondary IDE Channel
000001F0 - 000001F7	Primary IDE Channel
00000274 - 00000277	ISAPNP Read Data Port
00000279 - 00000279	ISAPNP Read Data Port
000002F8 - 000002FF	Communications Port
00000376 - 00000376	Secondary IDE Channel
00000378 - 0000037F	Printer Port
000003B0 - 000003BA	Advanced Micro Devices Win 2K/XP Graphics Driver
000003C0 - 000003DF	Advanced Micro Devices Win 2K/XP Graphics Driver
000003F0 - 000003F5	Standard floppy disk controller
000003F6 - 000003F6	Primary IDE Channel
000003F7 - 000003F7	Standard floppy disk controller
000003F8 - 000003FF	Communications Port
00000778 - 0000077B	Printer Port
00000D00 - 0000AC17	PCI bus
0000AC20 - 0000FFFF	PCI bus
0000E000 - 0000EFFF	PCI standard PCI-to-PCI bridge
0000FD00 - 0000FD7F	GeodeLX Audio Driver (WDM)
0000FE00 - 0000FE0F	Standard Dual Channel PCI IDE Controller
0000FF00 - 0000FF3F	Intel(R) PRO/100M Desktop Adapter

Appendix-B Interrupt Request Lines (IRQ)

Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

Level	Function
IRQ 01	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
IRQ 03	Communications Port
IRQ 04	Communications Port
IRQ 05	Standard Enhanced PCI to USB Host Controller
IRQ 05	Standard OpenHCD USB Host Controller
IRQ 06	Standard floppy disk controller
IRQ 08	System CMOS/real time clock
IRQ 09	Microsoft ACPI-Compliant System
IRQ 10	Advanced Micro Devices Win 2K/XP Graphics Driver
IRQ 10	Geode LX AES Crypto Driver
IRQ 11	Intel(R) PRO/100 M Desktop Adapter
IRQ 11	GeodeLX Audio Driver (WDM)
IRQ 12	PS/2 Compatible Mouse
IRQ 14	Primary IDE Channel

Appendix-C Watchdog Timer (WDT) Setting

WDT is widely used for industry application to monitoring the activity of CPU. Application software depends on its requirement to trigger WDT with adequate timer setting. Before WDT time out, the functional normal system will reload the WDT. The WDT never time out for a normal system. Then, WDT will time out and reset the system automatically to avoid abnormal operation.

This board supports 255 levels watchdog timer by software programming. Below are the source codes written in assembly & C, please take them for WDT application examples.

Assembly Code

```
;-- Initial W83627 --
        mov     AX, 2Eh
        mov     DX, AX
        mov     AL, 87h
        out     DX, AX          ;
        out     DX, AX          ; initial W83627 start
;--
        mov     AX, 2Eh
        mov     DX, AX
        mov     AL, 2Bh
        out     DX, AL          ; Select CR2B
        mov     AL, 00h
        inc     DX
        out     DX, AL          ; Set CR2B bit 4=0, PIN89=WDTO
;--
        mov     AX, 2Eh
        mov     DX, AX
        mov     AL, 07h
        out     DX, AL          ; Point to Logical Device Selector
        mov     AL, 08h
        inc     DX
        out     DX, AL          ; Select Logical Device 8
;--
        mov     AX, 2Eh
        mov     DX, AX
        mov     AL, 30h
        out     DX, AL          ; select CR30
        mov     AL, 01h
        inc     DX
        out     DX, AL          ; update CR30 to 01h
```

```
;--
        mov     AX, 2Eh
        mov     DX, AX
        mov     AL, 0F0h
        out     DX, AL          ; select CRF0
        mov     AL, 00h
        inc     DX
        out     DX, AL          ; set CRF0=00h, output
;--
        mov     AX, 2Eh
        mov     DX, AX
        mov     AL, 0F5h
        out     DX, AL          ; select CRF5, WDT Timer unit
        mov     AL, 00h         ; bit2 =0 ->second ; bit2 =1 -> minute
        inc     DX
        out     DX, AL          ; update CRF5 bit2 to 00h
;--
        mov     AX, 2Eh
        mov     DX, AX
        mov     AL, 0F6h
        out     DX, AL          ; select CRF6, WDT Timer
        mov     AL, 05h
        inc     DX
        out     DX, AL          ; update CRF6 to 5 unit
;---
        mov     AX, 2Eh
        mov     DX, AX
        mov     AL, AAh
        out     DX, AX
;-- end
```

C Language Code

```
/*-----     Include Header Area -----*/
#include "math.h"
#include "stdio.h"
#include "dos.h"

/*-----     routing, sub-routing -----*/

void main()

{
          outportb(0x2e, 0x87);     /* initial IO port twice */
          outp ortb(0x2e, 0x87);

          outportb(0x2e, 0x2B);     /* select CR2B */
          outportb(0x2e+1, 0x00);/* update CR2B bit4 to 00h */
                                    /* Set PIN89 as WDTO */

          outportb(0x2e, 0x07);     /* point to logical device selector */
          outportb(0x2e+1, 0x08);/* select logical device 8 */
          outportb(0x2e, 0x30);     /* select CR30 */
          outportb(0x2e+1, 0x01);/* update CR30 to 01h */
          outportb(0x2e, 0xf0);     /* select CRF0 */
          outportb(0x2e+1, 0x00);/* update CRF0 to 00h */
          outportb(0x2e, 0xf5);     /* select CRF5 to set timer unit */
          outportb(0x2e+1, 0x00);/* update CRF5 bit2, 0:sec; 1:Min. */
          outportb(0x2e, 0xF6);     /* select CRF6 */
          outportb(0x2e+1, 0x05);/* update CRF6 to 05h (5 sec) */

          outportb(0x2e, 0xAA);     /* stop program W83627, Exit */
}
```

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