WAFER-5822

User Manual

Version 2.2

Low Power GLXV/GX1
With SVGA/LCD/TV
Ethernet and Audio SBC
Version 3.0

January 16, 2004

Support

For any questions regarding the content of this manual or related issues, email us at: support@iei.com.tw.

Contents

1. Introduction

WAFER-5822 is designed for space-limited applications with only the size of a 3½" hard drive. It supports all functions of an AT-compatible industrial computer on a single board. WAFER-5822 is equipped with a low-power consumption and high performance GXLV/GX1 processor on board. It also contains an SDRAM SODIMM socket that supports up to 512MB of RAM.
The WAFER-5822 provides an Ethernet interface, an audio interface, a socket for DiskOnChip, an EIDE interface, one parallel port, two RS232 serial ports, and a mini-DIN PS/2 keyboard/mouse interface. The built-in SVGA/LCD display controller supports both the CRT and LCD display simultaneously. It offers LCD screen resolution up to 1024 x 768 and CRT screen resolution up to 1280 x 1024 @ 256 colors. It also provides a TV-OUT interface for PAL or NTSC TV. The display type is configured with a software utility. The Flash ROM contains both the system BIOS and the VGA BIOS. When necessary, the Flash ROM could be reprogrammed to modify and upgrade the system BIOS and the VGA BIOS.

Finally, one PC/104 connector is included for future upgrades and applications.

1.1 Specifications

NS 233/266/300 MMX 32-Bit x86 PROCESSOR	Supports Intel MMX instruction set extension for the acceleration of multimedia applications 16 KB unified L1 cache Five-stage pipelined integer unit Integrated Floating Point Unit（FPU）
SYSTEM MEMORY	One 144-pin SODIMM socket support up to 512 MB SDRAM
BIOS	AWARD 256 KB Flash memory
DISPLAY CONTROLLER	MediaGx processor has applied the UMA technology that provides 1.5-4MB display memory, to be set up by BIOS Support CRT and TFT LCD displays simultaneously Support 18-bit TFT LCD panel resolution up

	to 1024x768 @ 18bpp Support non-interlaced CRT monitors resolutions up to 1280x1024 @ 256 colors or 1024x768 @ 16bpp
TV-OUT	Supports both NTSC and PAL
AUDIO	AC'97 compliant, support stereo Connector: Speaker, Mic-in, Line-in, Line-out, CD-ROM in.
IDE INTERFACE	The IDE supports two PCI Enhanced IDE hard drives
FDD INTERFACE	Supports up to two floppy disk drives, 5.25"（360KB and 1.2MB）and/or 3.5"（720KB, 1.44MB, and 2.88MB）
SERIAL PORTS	Two RS232 ports.
PARALLEL PORT	One Parallel port, supports SPP/EPP/ECP mode.
PS/2 MOUSE AND KEYBORD CONNECTOR	A 6-pin mini DIN connector is located on the mounting bracket for easy connection to a keyboard or PS/2 mouse
USB INTERFACE	Two USB ports, USB 1.0 compliant
WATCHDOG TIMER	Can be set by 1-255 seconds period. Reset or NMI generated when CPU did not periodically trigger the timer.
10/100Mbps ETHERNET CONTROLLER	Realtek RTL8100BL IEEE802.3 10/100M BASE-T standard Dual auto-detecting interface to 10MBps or 100MBps networks. On board RJ45 connectors provide for easy connection.
DiskOnChip™ FLASH DISK	Supports one 32-pin socket for DiskOnChip™ Flash Disk
4 DIGITAL INPUT AND 4 DIGITAL OUTPUT PORTS	
POWER SUPPLY	+5V（4.75V to 5.25V）@2A（typical） +12v(11.75 to 12.25) @0.1A(typical)
OPEPRATING TEMPERATURE	0-60℃（32-140℉）
DIMENSIONS	5.9"（L）x4.2"（W）（145mmx102mm）

1.2 Package Contents

Before you begin installing the product, please ensure the following items are included in the package:

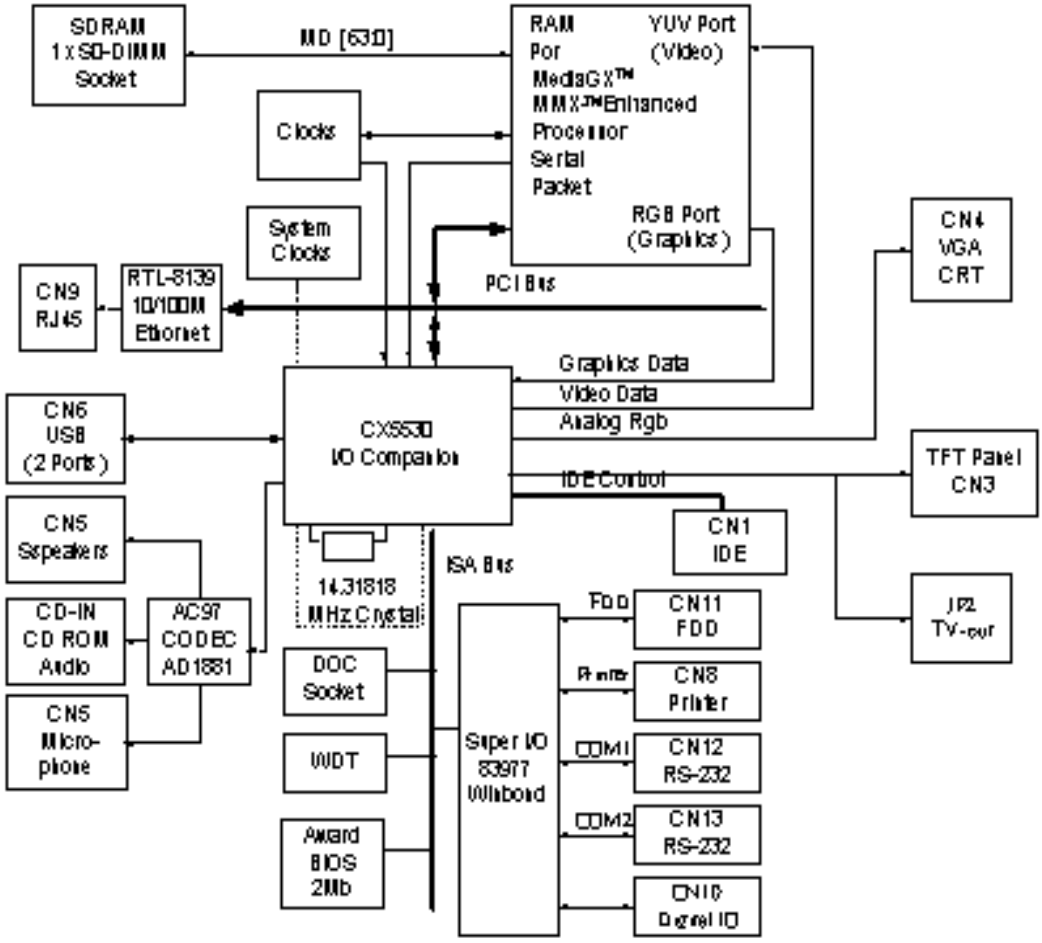
- WAFER-5822 all-in-one single board computer x 1
- Utility CD for utilities and drivers x 1
- 2.5" IDE flat cable (40-pin 2.0mm pitch to 40-pin 2.54mm pitch) x 1
- One to two 6-pin mini din connector for keyboard and mouse x 1
- Standard D25 connector for parallel cable x 1
- Serial port cable (RS-232) x 1
- Dual USB connector cable x 1
- Floppy cable (for 3.5" FDD only) x 1
- Audio cable set x 1
- Video cable set (Composite and S-video) x 2

If any of these items are missing or damaged, please contact your distributor or sales representative immediately.

2. Installation

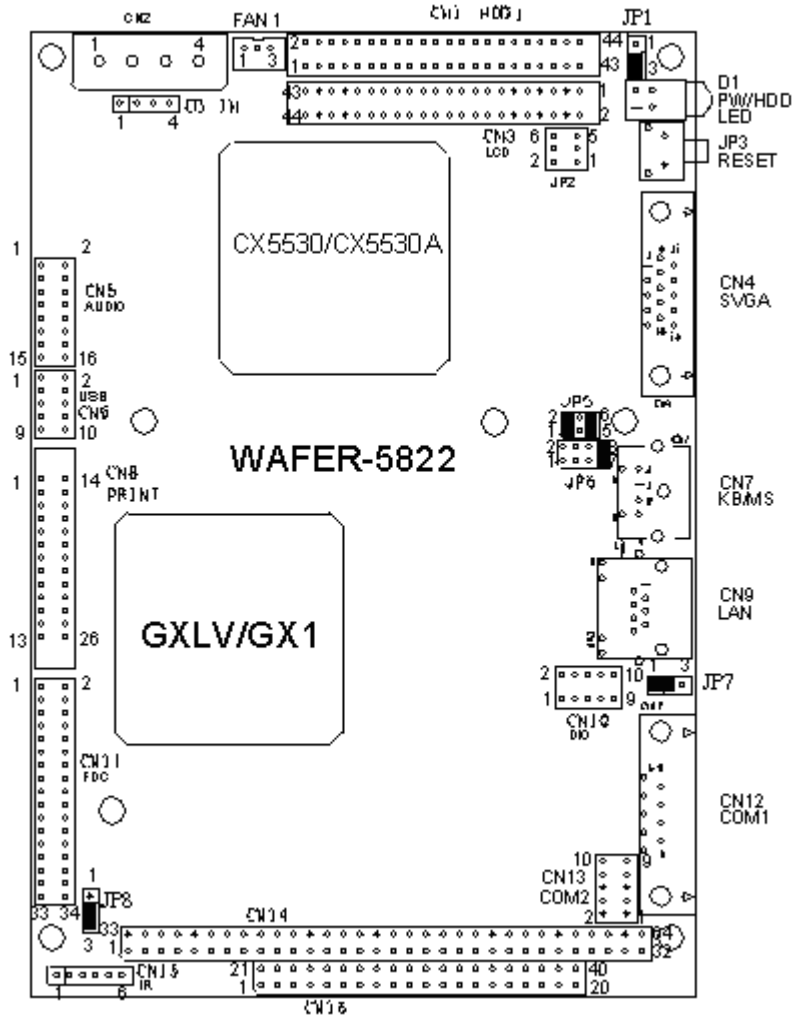
This chapter gives instructions about how to set up the WAFER-5822 hardware, including directions of setting jumpers and connecting peripherals, switches and indicators. Before installation, please pay attention to the unpacking precautions on the following page for safety.

2.1 Wafer-5822 Block Diagram, Board Layout and Dimensions

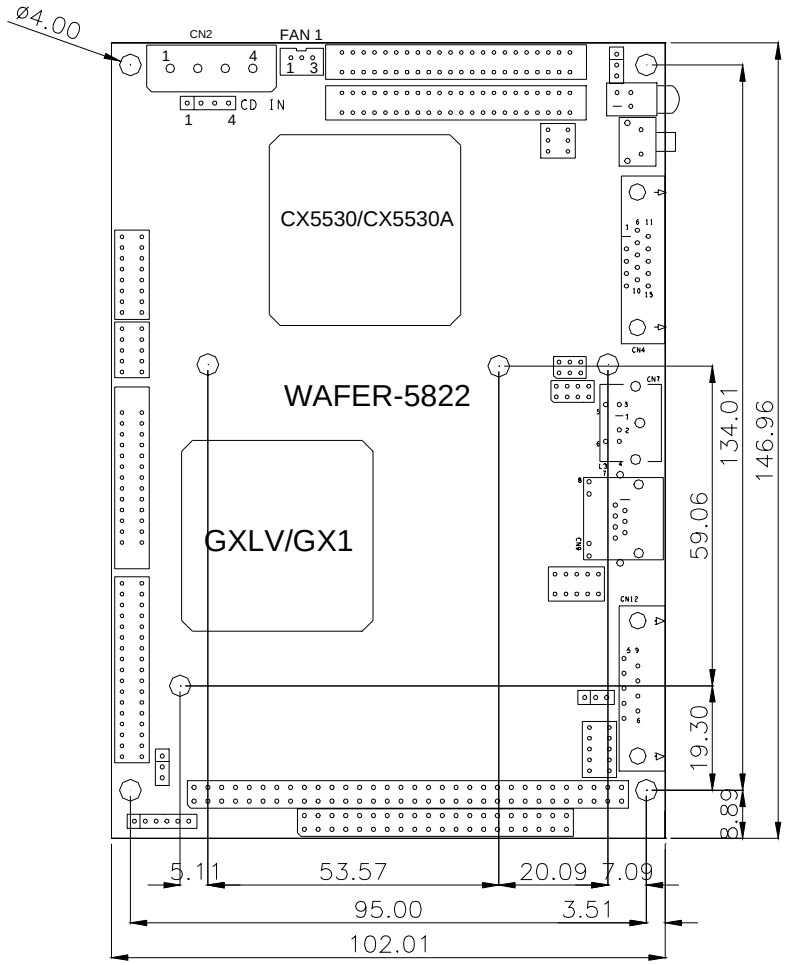


Wafer-5822 Block diagram

WAFER-5822 Board Layout



Wafer-5822 Board Dimensions



2.2 Unpacking Precautions

Some components of WAFER-5822 SBC are very sensitive to static electric charges and can be damaged by a sudden rush of power. To protect it from non-intentional damage, be sure to take these precautions:

Ground yourself to remove any static charge before touching Wafer-5822 SBC. You can do it by using a grounded wrist strap at all times or by frequently touching any conducting materials connected to the ground. Handle Wafer-5822 SBC by its edges. Don't touch IC chips, leads or circuitry unless necessary. Do not plug any connector or jumper while the power is on.

2.3 System Memory DRAM

There is one 144-pin SO-DIMM socket to accept 3.3V non-buffered SDRAM. The maximum memory size is 512MB.

2.4 Watchdog Timer Settings

Reading port 443H enables Watchdog Timer. It should be triggered before the time-out period ends, otherwise it will assume the program operation is abnormal and will issue a reset signal to start again. Reading port 043/843H disables the Watchdog Timer. Refer to Appendix A for detailed information.

- JP8: Watchdog Active Type Setting

JP8	DESCRIPTION
1-2	DISABLE WDT
2-3	RESET WHEN WDT TIME-OUT

2.5 Clear CMOS Setup

If you need to clear the CMOS Setup (for example you forgot your CMOS password you should clear the setup and then set the password again.), you should close the JP7 about 3 seconds, then open it again. Open JP7 can set back to normal operation mode.

- JP7: Clear CMOS Setup (Reserve Function)

JP7	DESCRIPTION
1-2	Normal Operation
2-3	Clear CMOS Setup

2.6 LCD Vcc Voltage Selector

The LCD interface connector CN3 can provide 5V or 3.3V power supply by selecting the JP1 to meet the different LCD interface requirements.

JP1	DESCRIPTION
1-2	5V
2-3	3.3V

2.7 DiskOnChip™ Flash Disk Memory Address Settings

DiskOnChip™ Flash Disk Chip (DOC) is produced by M-Systems. As DOC is 100% compatible to hard disk, no additional software utilities are needed. It is just “plug and play”, easy and reliable to use. Right now the DOC is available from 2MB to 144MB. The MD-2200-Xmb series DOC will share only 8 KB memory address.

- JP5 & JP6: DiskOnChip Memory Address Setting

ADDRESS	JP6				JP5		
	1-2	3-4	5-6	7-8	1-2	3-4	5-6
CC000	OPEN	OPEN	SHORT	OPEN	OPEN	SHORT	SHORT
CE000	OPEN	OPEN	OPEN	SHORT	OPEN	SHORT	SHORT
D0000	SHORT	OPEN	OPEN	OPEN	SHORT	OPEN	SHORT
D2000	OPEN	SHORT	OPEN	OPEN	SHORT	OPEN	SHORT
D4000	OPEN	OPEN	SHORT	OPEN	SHORT	OPEN	SHORT
D6000	OPEN	OPEN	OPEN	SHORT	SHORT	OPEN	SHORT
D8000	SHORT	OPEN	OPEN	OPEN	OPEN	OPEN	SHORT
DA000	OPEN	SHORT	OPEN	OPEN	OPEN	OPEN	SHORT
DC000	OPEN	OPEN	SHORT	OPEN	OPEN	OPEN	SHORT
DE000	OPEN	OPEN	OPEN	SHORT	OPEN	OPEN	SHORT

3. Connections

This chapter describes how to connect peripherals, switches and indicators to WAFER-5822 board.

3.1 Floppy Disk Drive Connector (CN11)

WAFER-5822 board is equipped with a 34-pin daisy-chain driver connector cable.

- **CN11: FDC Connector**

PIN	DESCRIPTION	PIN	DESCRIPTION
1	GROUND	2	REDUCE WRITE
3	GROUND	4	N/C
5	GROUND	6	N/C
7	GROUND	8	INDEX#
9	GROUND	10	MOTOR ENABLE A#
11	GROUND	12	DRIVE SELECT B#
13	GROUND	14	DRIVE SELECT A#
15	GROUND	16	MOTOR ENABLE B#
17	GROUND	18	DIRECTION#
19	GROUND	20	STEP#
21	GROUND	22	WRITE DATA#
23	GROUND	24	WRITE GATE#
25	GROUND	26	TRACK 0#
27	GROUND	28	WRITE PROTECT#
29	GROUND	30	READ DATA#
31	GROUND	32	SIDE 1 SELECT#
33	GROUND	34	DISK CHANGE#

3.2 PCI E-IDE Disk Drive Connector (CN1)

For IDE HDD connection, The WAFER-5822 was designed with one 2.0mm connector (CN1), which could be converted to two 2.54mm standard IDE connector via proprietary cable. Using this cable you can attach two IDE hard disk drives to the WAFER-5822.

- **CN1: 44-pin Primary Mini-pitched IDE Interface Connector**
- **CN1: Primary IDE Interface Connector**

PIN	DESCRIPTION	PIN	DESCRIPTION
1	RESET#	2	GROUND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GROUND	20	N/C
21	IDE DRQ	22	GROUND
23	IOW#	24	GROUND
25	IOR#	26	GROUND
27	IDE CHRDY	28	GROUND
29	IDE DACK	30	GROUND–DEFAULT
31	INTERRUPT	32	N/C
33	SA1	34	N/C
35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#
39	HDD ACTIVE#	40	GROUND
41	VCC	42	VCC
43	GROUND	44	N/C

3.3 Parallel Port (CN8)

This port is usually connected to a printer. WAFER-5822 includes an on-board parallel port (CN8), accessed through a 26-pin flat-cable connector.

- **CN8: Parallel Port Connector**

PIN	DESCRIPTION	PIN	DESCRIPTION
1	STROBE#	2	DATA 0
3	DATA 1	4	DATA 2
5	DATA 3	6	DATA 4
7	DATA 5	8	DATA 6
9	DATA 7	10	ACKNOWLEDGE
11	BUSY	12	PAPER EMPTY
13	PRINTER SELECT	14	AUTO FORM FEED #
15	ERROR#	16	INITIALIZE
17	PRINTER SELECT LN#	18	GROUND
19	GROUND	20	GROUND
21	GROUND	22	GROUND
23	GROUND	24	GROUND
25	GROUND	26	N/C

3.4 Serial Ports (CN12, CN13)

WAFER-5822 offers two high speeds NS16C550 compatible UARTs with Read/Receive 16 byte FIFO serial ports. These ports let you connect to serial devices or a communication network. One 9-pin D-SUB connector and one 10-pin header are provided by the WAFER-5822. The detailed pin assignment of the connectors are specified as following tables:

- **CN12: Serial Port1 Connector (9-pin DSUB)**

PIN	DESCRIPTION
1	DATA CARRIER DETECT (DCD)
2	RECEIVE DATA (RXD)
3	TRANSMIT DATA (TXD)
4	DATA TERMINAL READY (DTR)
5	GROUND (GND)
6	DATA SET READY (DSR)
7	REQUEST TO SEND (RTS)
8	CLEAR TO SEND (CTS)
9	RING INDICATOR (RI)

- **CN13: Serial Port2 Connector (10-pin Header)**

PIN	DESCRIPTION	PIN	DESCRIPTION
1	DCD	2	DSR
3	RX	4	RTS
5	TX	6	CTS
7	DTR	8	RI
9	GND	10	N/C

3.5 Audio Connectors (CD-IN, CN5)

The CX5530 I/O companion and the NS AD1881A CODEC organize the audio function, which is compliant with AC'97. You can use CD-IN as the input port (such as connecting to the output of a CD player), depending on the type of connector.

- **CD-in: CD_AUDIO INPUT Connector**

PIN	DESCRIPTION
1	JCD_R
2	GND
3	GND
4	JCD_L

- **CN5: Audio Output Connector**

This is the output port of your Sound System. Pin 1-2-3 can be connected to headsets and 5-6-7 can be connected to loudspeakers. Pin 9-10-11 can be used as input port if it is connected to the earphone jack of your CD. Pin 15-16 is used for microphone input.

PIN	DESCRIPTION	PIN	DDESCRIPTION
1	LINE OUT L	2	GND
3	LINE OUT R	4	GND
5	LINE OUT R	6	LINE OUT L
7	GND	8	GND
9	LINE IN R	10	LINE IN L
11	GND	12	GND
13	N/C	14	N/C
15	MIC IN	16	GND

3.6 Keyboard & PS/2 Mouse Connector (CN7)

A 6-pin mini DIN connector (CN7) is located on the mounting bracket for easy connection to a keyboard or PS/2 mouse. The card comes with a cable to convert from the 6-pin mini-DIN connector to two 6-pin mini-DIN connectors for keyboard and mouse connection.

- **CN7: 6-pin Mini-DIN Keyboard & Mouse Connector**

PIN	DESCRIPTON
1	KEYBOARD DATA
2	MOUSE DATA
3	GROUND
4	+5V
5	KEYBOARD CLOCK
6	MOUSE CLOCK

3.7 USB Port Connector (CN6)

WAFER-5822 provides two USB interfaces, which give complete plug and play support for up to 127 external devices.

- **CN6: Internal USB Connector**

PIN	DESCRIPTION	PIN	DESCRIPTION
1	USBVCC1	2	D1F-
3	D1F+	4	GND
5	USBVCC2	6	D2F-
7	D2F+	8	GND
9	GND	10	GND

3.8 IrDA Infrared Interface Port (CN15)

WAFER-5822 has a built-in IrDA port which supports Serial Infrared (SIR) or Amplitude Shift Keyed IR (ASKIR) interface. When using IrDA port, you have to set SIR or ASKIR model in the BIOS's Peripheral Setup's COM2. Then the normal RS-232 COM2 will be disabled.

- **CN15: IrDA Connector**

PIN	DESCRIPTION
1	VCC
2	FIRRX
3	IRRX
4	Ground
5	IR-TX
6	CIR

3.9 VGA Connector (CN4)

The WAFER-5822 has a built-in 15-pin VGA connector that accepts the CRT monitor.

- **CN4: 15-pin Female Connector**

PIN	DESCRIPTION	PIN	DESCRIPTION
1	RED	2	GREEN
3	BLUE	4	NC
5	GROUND	6	GROUND
7	GROUND	8	GROUND
9	NC	10	GROUND
11	NC	12	DDC DAT
13	HSYNC	14	VSYNC
15	DDCCLK		

3.10 LCD Interface Connector (CN3)

WAFER-5822 provides a 2x22-pin connector for the LCD flat panel interface. WAFER-5822 supports TFT LCD panels at following display options:

VIDEO DISPLAY TYPE	RESOLUTION	EXAMPLE
TFT VGA	640x480, 64K Color, 18 bits	Toshiba LTM10C209A
TFT SVGA	800x600, 64K Color, 18 bits	Toshiba LTM12C275A
TFT XVGA	1024x768, 64K Color, 18 bits	NEC NL10276AC30-04R

(This is for reference only, may support more panel types)

The TTL signal connecting interfaces is located on CN3. The display options need to be set up manually from BIOS. The BIOS "**Integrated Peripheral**" Setup will allow you to choose display resolution of 640X480 or 800X600 or 1024X768.

- **CN3: LCD Interface Connector**

This connector only supports up to 24-bit LCD. For better display quality, the length of LCD cable should be shorter than 35 cm.

esc

PIN	DESCRIPTION	PIN	DESCRIPTON
1	+12V	2	+12V
3	GND	4	GND
5	+5V	6	+5V
7	FPVEE	8	GND
9	GND	10	GND
11	BLUE0	12	BLUE1
13	BLUE2	14	BLUE3
15	BLUE4	16	BLUE5
17	GND	18	GND
19	GREEN0	20	GREEN0
21	GREEN2	22	GREEN2
23	GREEN4	24	GREEN4
25	GND	26	GND
27	RED0	28	RED1
29	RED2	30	RED3
31	RED4	32	RED5
33	GND	34	GND
35	SHFCLK	36	FLM
37	M	38	LP
39	GND	40	ENABLK
41	GND	42	N/C
43	+5V	44	5V

3.11 RJ45 LAN Connector (CN9)

WAFER-5822 has a built-in RJ45 LAN connector with 2 Led is for 10/100Mbps Ethernet (RTL8100BL).

- **CN9: LAN RJ45 Connector**

PIN	DESC.	PIN	DESC.
1	TX+	5	NC
2	TX-	6	RX-
3	RX+	7	NC
4	NC	8	NC

Ethernet LED setup

LED	SETTING
Green lamp	Rx
Orange lamp	Tx

3.12 Fan Connector (FAN1)

WAFER-5822 provides CPU cooling fan connector (FAN1) that can supply 12V & 5V to the cooling fan.

- **FAN1: Fan Connector**

PIN	DESCRIPTION
1	VCC5V
2	Ground
3	12V

3.13 External Power Connector (CN2)

WAFER-5822 has an on-board external power connector CN2. You can connect power directly to the CPU board.

- **CN2: External Power Connector**

PIN	DESCRIPTION
1	+12V
2	GROUND
3	GROUND
4	VCC5V

3.14 PC/104 Connection Bus (CN16, CN14)

WAFER-5822 PC/104 expansion bus lets you attach any kind of PC/104 modules. The PC/104 bus has already become the industrial embedded PC bus standard, so you can easily install over thousands of PC/104 modules from hundreds of vendors in the world. There are two PC/104 connectors on this board: PC/104-64 and PC/104-40.

- **CN16: PC/104-40 Connector**

PIN	DESCRIPTION	PIN	DESCRIPTION
1	GND	21	GND
2	MCS16#	22	SBHE#
3	IOCS16#	23	LA23
4	IRQ10	24	LA22
5	IRQ11	25	LA21
6	IRQ12	26	LA20
7	IRQ15	27	LA19
8	IRQ14	28	LA18
9	DACK0#	29	LA17
10	DRQ0	30	MEMR#
11	DACK5#	31	MEMW#
12	DRQ5	32	SD8
13	DACK6#	33	SD9
14	DRQ6	34	SD10
15	DACK7#	35	SD11
16	DRQ7	36	SD12
17	VCC	37	SD13
18	MASTER#	38	SD14
19	GND	39	SD15
20	GND	40	GND

- **CN14: PC/104-64 Connector**

PIN	DESCRIPTION	PIN	DESCRIPTION
1	IOCHCK#	33	GND
2	SD7	34	IRSTDRV
3	SD6	35	VCC
4	SD5	36	IRQ9
5	SD4	37	-5V
6	SD3	38	DRQ2
7	SD2	39	-12V
8	SD1	40	ZWS
9	SD0	41	+12V
10	IOCHRDY	42	GND
11	AEN	43	SMEMW#
12	LA19	44	SMEMR#
13	LA18	45	IOW#
14	LA17	46	IOR#
15	SA16	47	DACK3#
16	SA15	48	DRQ3
17	SA14	49	DACK1#
18	SA13	50	DRQ1
19	SA12	51	REFRESH#
20	SA11	52	SYSCLK
21	SA10	53	IRQ7
22	SA9	54	N/C
23	SA8	55	IRQ5
24	SA7	56	IRQ4
25	SA6	57	IRQ3
26	SA5	58	DACK2
27	SA4	59	TC
28	SA3	60	BALE
29	SA2	61	VCC
30	SA1	62	OSC
31	SA0	63	GND
32	GND	64	GND

3.15 Power/HDD LEDS (D1)

- **D1: Power/HDD Setup**

LED	Setting
Green lamp	Power
Orange lamp	HDD

3.16 Digital I/O (CN10)

One of digital circuit's characteristics is its fast response to high or low signal. This kind of response is highly needed for the critical but harsh industrial operating environment. That's why we design 4-bit digital inputs and 4-bit digital outputs on the WAFER-5822.

Digital Input and Output signals are generally control signals. You can use these signals to control external devices that needs On/Off circuit or TTL devices. The register address is 240H, 260H or 280H, which is selected in BIOS SETUP. You can read or write data to the selected address to enable the function of digital IO.

READ		WRITE	
Bit0	DIN0	Bit0	DO0
Bit1	DIN1	Bit1	DO1
Bit2	DIN2	Bit2	DO2
Bit3	DIN3	Bit3	DO3

- **CN10: Digital I/O**

PIN	SIGNAL	PIN	SIGNAL
1	GND	2	VCC
3	DO3	4	DO2
5	DO1	6	DO0
7	DIN3	8	DIN2
9	DIN1	10	DIN0

3.17 TV-OUT (JP2)

Provides composite and S-video TV-OUT for NTSC or PAL.

- **JP2: TV-OUT**

PIN	SIGNAL	PIN	SIGNAL
1	GND	2	LUME
3	GND	4	CHROME
5	GND	6	COMPOSITE

4. AWARD BIOS Setup

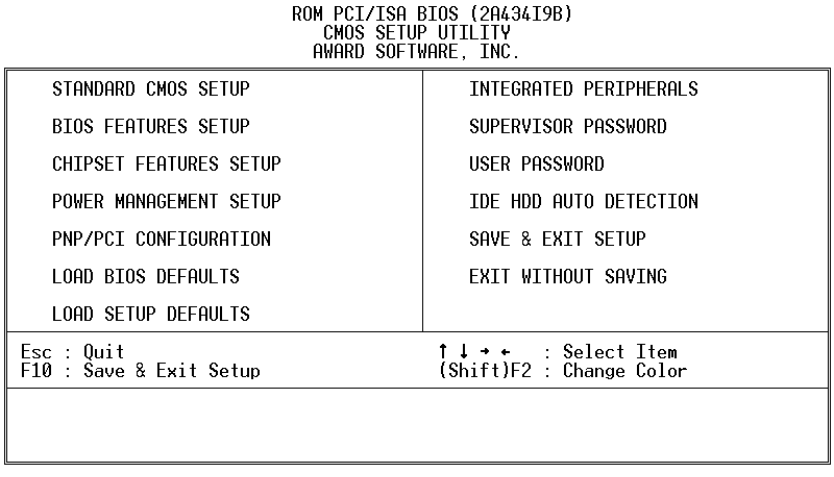
The WAFER-5822 uses the AWARD PCI/ISA BIOS for system configuration. The AWARD BIOS setup program is designed to provide maximum flexibility in configuring the system by offering various options that may be used to meet end-user requirements. This chapter is written to assist you in the proper usage of these features.

4.1 Getting Started

When you turn on the power button, BIOS will enter the Power-On-Self-Test (POST) routine. This routine will be executed for system initialization, test, and configuration verification. After the POST routines are completed, the following message appears:

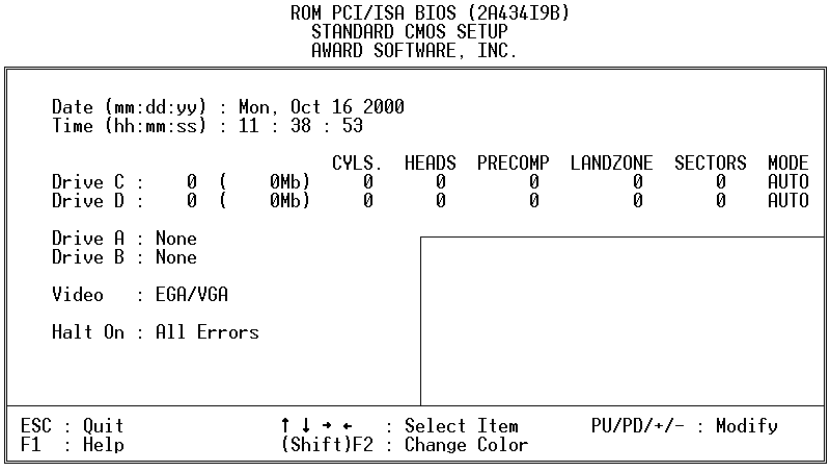
" Hit DEL if you want to run SETUP"

To access AWARD BIOS SETUP UTILITY, press <Del> key. The following screen will be displayed:



4.2 Standard CMOS Setup

Standard CMOS Setup is used for basic hardware system configuration. The main function is for Date/Time setting and Floppy/Hard Disk Drive setting. Please refer the following screen for this setup.



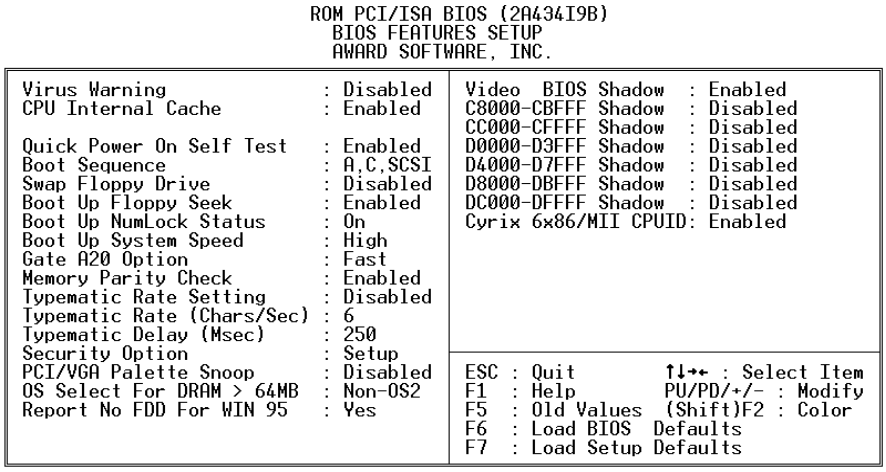
To set the Date, for example, press either the arrow or <Enter> button on your keyboard to select one of the fields (Month, Date or Year) then press either <PgUp> or <PgDn> to increase or decrease the value of that field. The time is also set in a similar fashion.

For IDE hard disk drive setup, please refer the following possible setup procedures:
Use the Auto setting for detection during boot-up.
Use the IDE HDD AUTO DETECTION in the main menu; the computer will automatically detect the HDD specifications.
Manually enter the specifications by yourself from the “User” option.

Note: If you need more information on any particular field, just highlight it then press <F1> button. A pop-up window will come out to give you more information on that field.

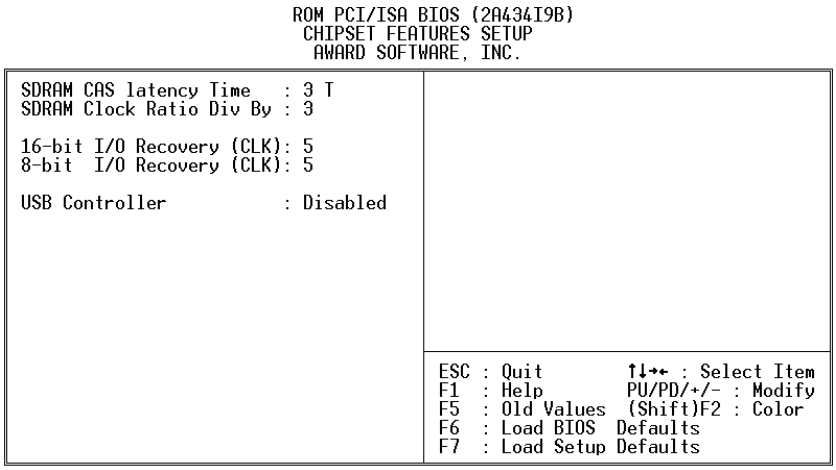
4.3 BIOS Features Setup

BIOS Features Setup is designed for the 'fine tuning' of your system in order to improve its performance. For normal operation, you don't have to change any default setting. The default settings are preset for most reliable operation.



4.4 Chipset Features Setup

This setup function works mostly on the chipset of the board. This option is used to change the chipset's configuration. Please take care when you change the default settings, as any incorrect settings may cause the system to become unstable.



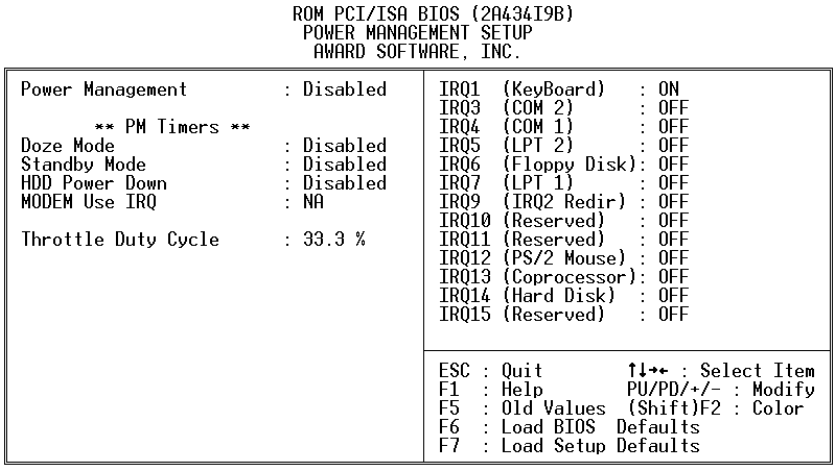
SDRAM Clock Ratio Div By: To select the operating clock of SDRAM module. If you have GX1-300 CPU on board, the ratio is set to 4, then the clock frequency would be:

300 / 4 = 75 MHz

In order to maintain the stability of CPU board, remember not to set the clock over 80 MHz, even though higher clock frequency brings better system performance.

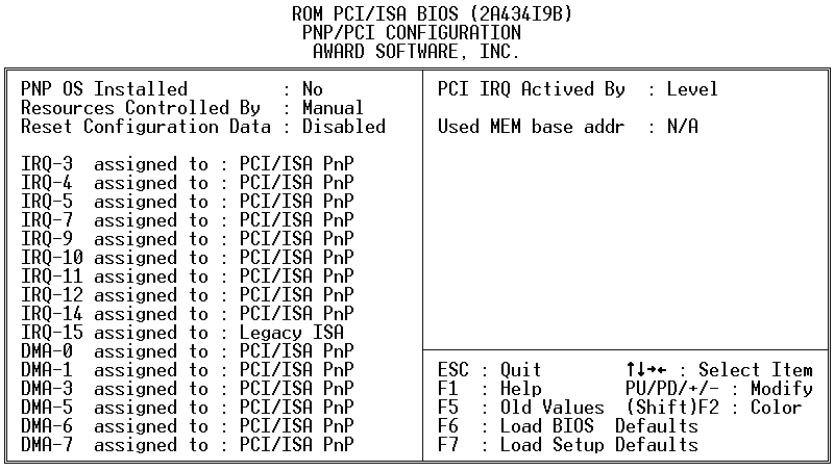
4.5 Power Management Setup

Power Management Setup helps the user to utilize the WAFER-5822's environment-friendly features. For example, this feature can shut down the video display and hard disk to save energy. The power management setup screen is as follows:



4.6 PNP / PCI Configuration

This menu is used to assign certain IRQs to your PNP/PCI devices manually.



PNP OS Installed: if you install a Plug and Play operating system (OS), the OS will reassign the interrupt if you select “Yes” in this field. If you install a non-Plug and Play OS or if you want to prevent reassigning of interrupt settings, select *No* in this field.

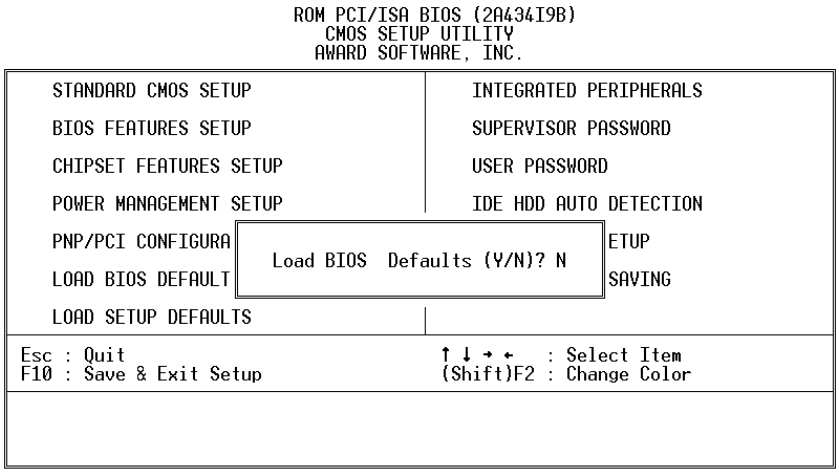
Resources Controlled By: Select *Auto* if you want the computer to assign the IRQs automatically, otherwise select *Manual* if you want to assign the IRQs by yourself.

Reset Configuration Data: *Enabling* this field would allow the configuration data to reset.

IRQ-xx assigned to: These fields indicate which type of device (Legacy ISA or PCI/ISA PnP) is using a certain IRQ.

4.7 Load BIOS Defaults

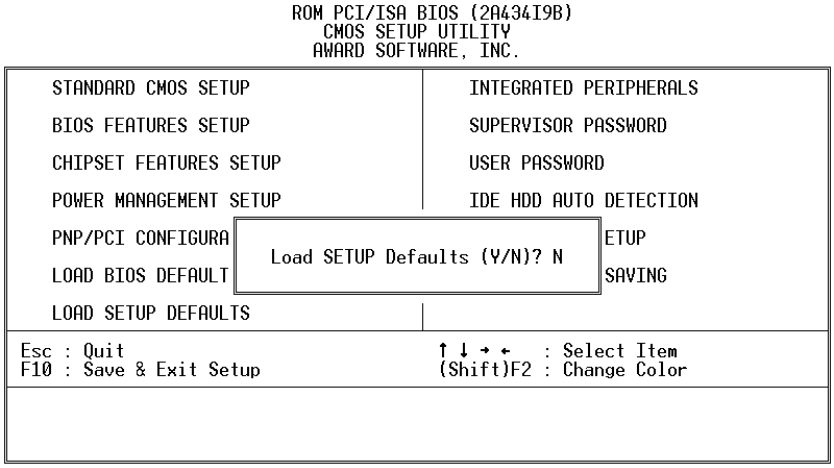
If you select 'Y' to this field, the BIOS Defaults will be loaded except Standard CMOS SETUP. The default settings are not optimal and will disable all optimization options. Select 'N' to abort.



Note: For the first time or for our primary user, we suggest you to use LOAD SETUP DEFAULTS because it is the safest mode for your system.

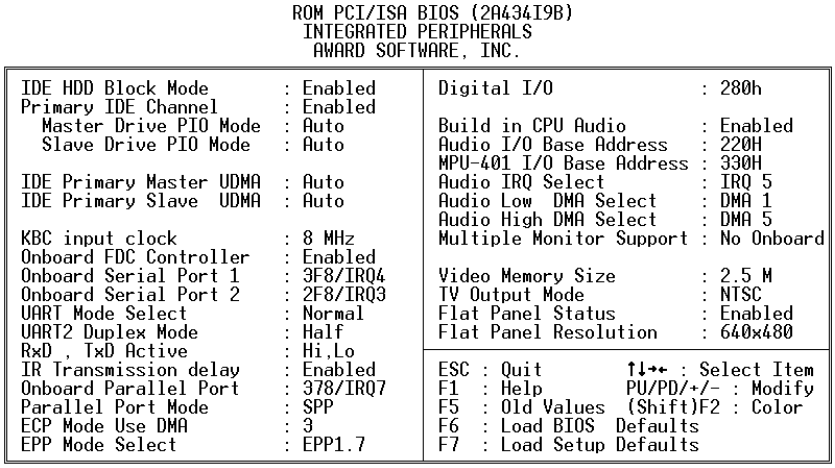
4.8 Load Setup Defaults

If you select 'Y' to this field, the Setup Defaults will be loaded except Standard CMOS SETUP. The default settings are optimal configuration settings for your system.



4.9 Integrated Peripherals

This option is used to assign Onboard I/O, IRQ, and DMA etc. If you don't know how to configure them, just press <F7> to load the Setup Defaults.
The flat panels will then be applied with two resolution modes: 640x480 or 800x600, as it needs to set up from BIOS for proper flat panel resolution.



The following describes the remaining setting options on the “Integrated Peripherals” screen.

- Digital I/O Base Address -- 240H, 260H, 280H, Disabled
  Select the I/O address for digital I/O function.
- Build in CPU Audio -- Enabled, Disabled
  Disables/enables the audio function.
- Audio I/O Base Address -- 220H, 240H, 260H, 280H
  Select the I/O address for audio function.
- MPU-401 I/O Base Address -- 300H, 330H, Disabled
  Select the I/O address for MPU-401 (midi interface).
- Audio IRQ Select -- 5, 7, 10, Disabled
  Select the interrupt for audio function.
- Audio Low DMA Select -- DMA0, DMA1, DMA3, Disabled
  Select the high DMA channel.
- Audio High DMA Select -- DMA5, DMA6, DMA7, Disabled
  Select the high DMA channel.
- Multiple Monitor Support -- No Onboard, PCI first, M/B first
  Select the primary VGA for multiple monitor support in WINDOWS.
- Video Memory Size -- 1.5M, 2.5M, 4.0M
  Select the size of video memory. It makes use of system memory for display.
- TV-OUT Mode – NTSC, PAL
  Select the TV-OUT mode.

4.10 Supervisor Password and User Password

Supervisor Password sets a password that is used to protect your system and Setup Utility. The Supervisor Password has priority over the User Password. Once you set the password, the system will ask you to enter your password every time you enter the BIOS SETUP. If you enter the BIOS SETUP with Supervisor Password, you can choose every setup/option on the main menu. With User Password, however, you can only choose three setup/options (USER PASSWORD, SAVE & EXIT SETUP and EXIT WITHOUT SAVING). To disable these passwords, enter the BIOS SETUP room with Supervisor Password and then just press the <Enter> key instead of entering a new password when the 'Enter Password' prompt pops up.

N.B.: if you forget the password, do the Clear/Reset CMOS procedure (see Section 2.5 Clear CMOS Setup).

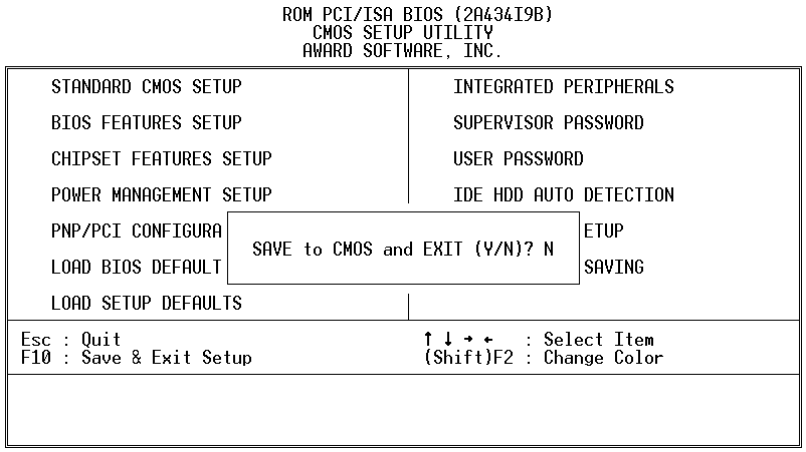
4.11 IDE HDD Autodetection

This option allows the auto-detection of the parameters of an IDE hard disk drive (HDD sector, cylinder, head, etc) automatically and puts the parameters into the Standard CMOS Setup screen. Up to 2 IDE drives can be detected and the parameters will be listed in the box. Press <Y> if you accept these parameters. Press <N> to skip this IDE device and continue with the next IDE device.

Note: If your IDE HDD was formatted in an older system, incorrect parameters may be detected. In this case, you need to either enter the correct parameters manually or low-level format the disk before auto-detection

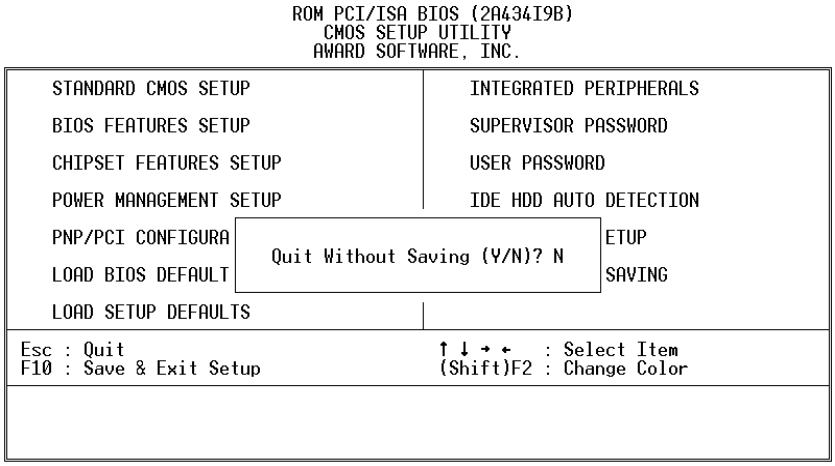
4.12 Save and Exit Setup

Select this option when you finish setting all the parameters and want to save the settings into CMOS. Simply press <Enter> and all the configuration changes will be saved.



4.13 Quit Without Saving

Select this option if you want to exit the Setup without saving the changes that you made. Simply press <Enter> and you will exit the BIOS SETUP without saving the changes.



5. SVGA Setup

5.1 Introduction

WAFER-5822 is equipped with an on-board LCD/VGA interface. The description below is its specifications and features:

Chipset

WAFER-5822 uses the NS CX5530 chipset as its SVGA controller. It is compatible with many common 18-bit LCD displays and traditional analog CRT monitors. While maintaining complete IBM VGA compatibility, the VGA BIOS supports LCD, interlaced and non-interlaced analog monitors (color and monochrome VGA) in high-resolution. However, digital monitors (i.e. MDA, CGA, and EGA) are NOT supported. Multiple frequency (multisync) monitors are treated as analog monitors.

Display memory

Having 1.5 ~ 4 MB UMA memory, the VGA controller can support resolutions up to 1024 x 768 at 64 K colors on CRT displays or color panel displays. Up to 4 MB of display memory can be allocated in the BIOS to support true-color resolution of 1024 x 768.

Display drivers

The display drivers are included in the following folders on the utility CD:

Win95, 98 drivers (VGA & Audio):
\ Vga \ MediaGX \ Win9x

WinNT4.0 drivers:
\ Vga \ MediaGX \ Nt40

5.2 Further Information

For more detailed information about the PCI/SVGA installation in your WAFER-5822, including driver updates, troubleshooting instructions, please refer to the following website that provide some resources you may need. If you do not find the information needed, please contact your local contributor, ICP support team or visit the ICP web site: www.iei.com.tw.

6. Audio

With an on-board audio interface, the WAFER-5822 can output high-quality stereo sound and perform FM music synthesis (ESFM) by using the CX5530 audio controller. The audio interface supports recording, compressing, and playing back voice, sound, and music with a built-in mixer control. In addition, the on board audio interface supports Plug and Play (PnP) and provides PnP capabilities for audio, FM, and MPU-104 logical devices. It is compatible with AC'97 version 2.0, voice, and music functions. The ESFM synthesizer is compatible with the OPL3 and has extended capabilities.

Audio drivers

The driver is included in the utility CD.

1. Installing software driver in Windows NT

WinNT4.0 Audio drivers are found in the following folder on the utility CD:
Drivers \ Audio \ MediaGX \ Nt40Audio \

2. Installing software driver in Win95/98

The audio driver will be installed along with the VGA driver.

7. PCI Bus Ethernet Interface

WAFER-5822 provides a high performance 32-bit Ethernet chipset, RTL8100BL, which is completely compliant with the IEEE 802.3 100 Mbps CSMA/CD standards. It is compatible with both 100Base-T and 10Base-T. Major network operating systems supports this Ethernet chipset. The medium type can be set up via the RSET8139.exe program included in the utility CD.

A standard RJ-45 connector is built into the Ethernet port. To utilize the network boot feature, the boot ROM image files are incorporated for the corresponding network operating systems. The boot ROM BIOS files are combined with system BIOS, which is an option you can enable/disable in the BIOS setup.

The 8139x utility and tools can be found on the utility CD in:
\ Lan \ Realtek \ 8139c \

Appendix A Watchdog Timer

The Watchdog Timer is a device to ensure that standalone systems can always recover from catastrophic conditions that cause the system to crash. This condition may have occurred by external EMI or a software bug. When the system stops working normally, hardware on the board will perform hardware reset (cold boot) to bring the system back to a known state.

Three I/O ports control the Watchdog Timer, which is described in the following table.

I/O PORT	READ/WRITE	DESCRIPTION
443	Write	Set Watchdog Time period
443 (hex)	Read	Enable and refresh the Watchdog Timer
043/843 (hex)	Read	Disable the Watchdog Timer

Prior to using the Watchdog Timer, user has to define the Timer first. The output data is a value of time interval and the range of the value is from 01 (hex) to FF (hex) and time interval 1 sec to 255 sec.

DATA	TIME INTERVAL
01	1 sec
02	2 sec
03	3 sec
04	4 sec
.	.
.	.
.	.
FF	255 sec

This will enable and activate the countdown timer which will eventually time out and reset the CPU to ensure that this reset condition does not occur, the Watchdog Timer must be periodically refreshed by reading the same I/O port 043/843H and 443H. This must be done within the time out period that is selected by software, please refer to the sample assembly program on the next page.

A tolerance of at least 5% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O, which can be very time consuming. Therefore if the time-out period is set to 10 seconds, the I/O port 443H must be read within 7 seconds.

Note: When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system will reset unconditionally.

Sample assembly program:

```
TIMER_PORT = 443H
TIMER_START = 443H
TIMER_STOP = 843H

;;INITIALIZE TIME PERIOD COUNTER
MOV DX, TIME_PORT
MOV AL,8:    ;;8 SECONDS
OUT DX,AL

;;ADD YOUR APPLICATION HERE
MOV DX, TIMER_START
IN AL, DX.     ;;START COUNTER


;ADD YOUR APPLICATION HERE
W_LOOP:
MOV DX, TIMER_STOP
IN AL, DX
MOV DX, TIMER_START
IN AL, DX.          ;; RESTART COUNTER

;; ADD YOUR APPLICATION HERE
CMP EXIT_AP, 0
JNE W_LOOP
MOV DX, TIMER_STOP
IN AL, DX
;;EXIT AP, AND STOPS THE WATCHDOG TIMER
```

Appendix B I/O Address Map

System I/O Address Map

I/O ADDRESS MAP	DESCRIPTION
000-01F	DMA Controller #1
020-021	Interrupt Controller # 1, Master
022-023	Chipset address
040-05F	System Timer
060-06F	Standard 101/102 keyboard Controller
070-07F	Real time Clock, NMI Controller
080-0BF	DMA Page Register
0A0-0BF	Interrupt Controller # 2
0C0-0DF	DMA Controller # 2
0F0-0F0	Clear Math Coprocessor Busy
0F1-0F1	Reset Math Coprocessor
0F8-OFF	Math Coprocessor
1F0-1F8	VIR BUS Master PCI IDE Controller
200-207	Game I/O
240/260/280	Digital I/O
278-27F	Reserved
2F8-2FF	Serial Port 2
378-37F	Parallel Printer Port 1
3B0-3DF	Cyrix Graphic Adapter
3F0-3F7	Floppy Disk Controller
3F8-3FF	Serial Port 1
443	Watch dog timer enable
043/843	Watch dog timer disable

PNP audio I/O map ranges from 220~250H (16 bytes).

MPU-401 I/O map ranges from 300~330H (2 bytes).

Digital I/O can be mapped at 240H, 260H or 280H.

BDMA Channel Assignments

CHANNEL	FUNCTION
0	Available
1	Audio*
2	Floppy disk (8-bit transfer)
3	Parallel**
4	Cascade for DMA controller 1
5	Audio*
6	Available
7	Available

*Audio DMA defaults setting: DMA 1.5

Audio High DMA select: DMA 1.3

Audio Low DMA select: DMA 5.6.7

**Parallel port DMA default setting: DMA 3

Parallel port DMA select: DMA 1.3

Interrupt Assignments

INTERRUPT	DESCRIPTION
NMI	Parity error detected
IRQ 0	System timer
IRQ 1	Keyboard
IRQ 2	Interrupt from controller 2 (cascade)
IRQ 8	Real-time clock
IRQ 9	Available
IRQ 10	Available
IRQ 11	Available
IRQ 12	PS/2 mouse
IRQ 13	Numeric data processor
IRQ 14	Fixed disk controller
IRQ 15	Available
IRQ 3	Serial communication port 2
IRQ 4	Serial communication port 1
IRQ 5	Audio*
IRQ 6	Diskette controller (FDC)
IRQ 7	Parallel port 1 (print port)

* Audio is assigned IRQ5 by default.

The IRQ used by the Ethernet controller is automatically assigned by the system.

1st MB Memory Map

ADDRESS	DESCRIPTION
F000h-FFFFh	System BIOS
EF00h-EFFFh	Expansion ROM*
C800h-EEFFh	Unused
C000h-C7FFh	VGA BIOS*
B000h-BFFFh	VGA DRAM
A000h-AFFFh	VGA DRAM
A000h-AFFFh	EGA/VGA graphics
0000h-9FFFh	Base memory

*Default setting