

WAFER – E668EV
VIA-Eden 667 Processor
VGA & Ethernet & Audio Board

Manual Revision 1.0

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Introduction

WAFER-E668EV ATX/AT main board is a high-performance computer mainboard based on the VIA® TwisterT PN133T VT8606 and VT8231 chipset. It is designed with VIA® EDEN processor, making it ideal for the cost-effective CPU board markets.

The VIA® TwisterT PN133T (VT8606) is a VIA® EDEN processor system logic north bridge with the addition of 133 MHz capability for both the CPU and SDRAM interfaces. VIA® TwisterT PN133T may be used to implement both desktop and notebook personal computer systems from 100MHz to 133MHz based on EDEN (EBGA packing). The primary features of the VIA® TwisterT PN133T-North Bridge are: VIA® EDEN CPU (Front Side Bus) Interface (100 / 133MHz), SDRAM Memory Interface (100 / 133MHz), 32-bit PCI with Integrated 2D / 3D graphics accelerator.

The VT8231 PSIPC (PCI Super-I/O Integrated Peripheral Controller) is a high integration, high performance, power-efficient, and high compatibility device that supports both Intel and non-Intel based processors to PCI bus bridge functionality, ensuring a complete Microsoft PC99-compliant PCI system.

1.1 Specifications

CPU	VIA Eden 667Mhz processor ,supports 133 MHz FSB
Bus interface	PCI bus
Bus speed	PCI: 33MHz
DMA channels	7
Interrupt levels	15
Chipset	VT8606 & VT8231
Main memory	One SO-DIMM socket supports 133Mhz SDRAM . The max. memory is up to 512MB.
Ultra DMA 100 IDE interface	Up to two PCI Enhanced IDE hard drives are supported. The Ultra DMA 100 IDE can handle data transfer up to 100MB/s. Compatible with existing ATA IDE specifications is best advantage, so there is no need to do any changes for users' current accessories.
Floppy disk drive 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	Three RS-232 ports with 16C550 UART (or compatible) with 16-byte FIFO buffer. Supports up to 115.2Kbps. Ports can be individually configured to COM1, COM2 ,COM3 or disabled.
Bi-directional parallel port	Configurable to LPT1or disabled. Supports EPP/ECP/SPP
Hardware monitor	Built-in to monitor power supply voltage and fan speed status
IrDA port	Supports Serial Infrared(SIR) and Amplitude Shift Keyed IR(ASKIR) interface

USB 1.1 port	Support USB1.1 ports for future expansion
Watchdog timer	Software Programmable, reset generated when watchdog timer is time-out. You can use I/O Port hex 6F02 to control the watchdog.
VGA controller	Built-in ProSavage4 AGP4X 256-bit 2D/3D graphics engine. 8~32MB share memory. Screen Resolution: up to 1920x1440.
Ethernet	Fast Ethernet controllers, IEEE 802.3u Auto-Negotiation supports 10BASE-T/100BASE-TX standard. The RJ45 connectors are located on the mounting bracket for easy connection.
Keyboard and PS/2 mouse connector	A 6-pin mini DIN connector is located on the mounting bracket for easy connection to a keyboard or PS/2 mouse.
Audio	AC'97 Audio CODEC
Power consumption	(VIA Eden 667Mhz, PC133 SDRAM) +5V @ 3.6A ,+12V @ 500mA Recommended: 350-watt power supply or higher
Operating temperature	0° ~ 60° C

1.2 WAFER-E668EV package contents

In addition to this *User's Manual*, the WAFER-E668EV package includes the following items:

- WAFER-E668EV Single Board Computer x 1
- IDE HDD Cable x 1
- Print Cable x 1
- Serial Port Cable x 2
- Y Cable x 1
- Audio Cable x 1
- Driver CD x 1

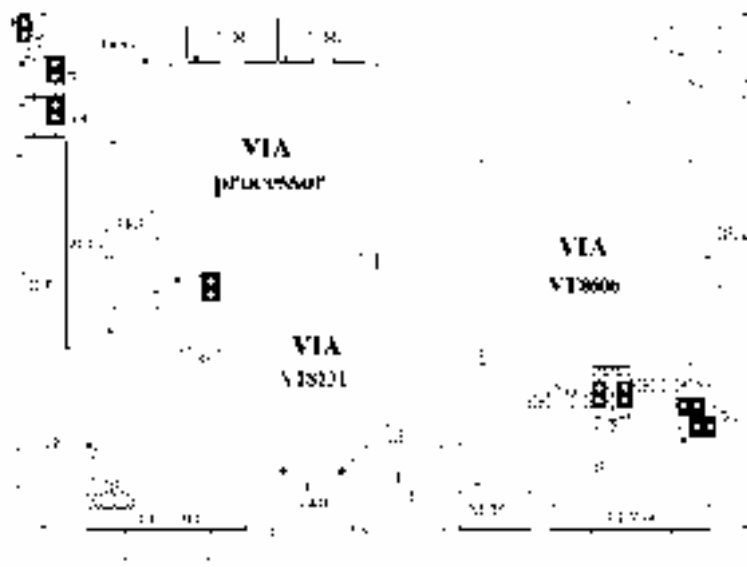
If any of these items are missing or damaged, please contact the dealer from whom you purchased the product. Be sure to save the shipping materials and carton in case you want to ship or store the product in the future.

2

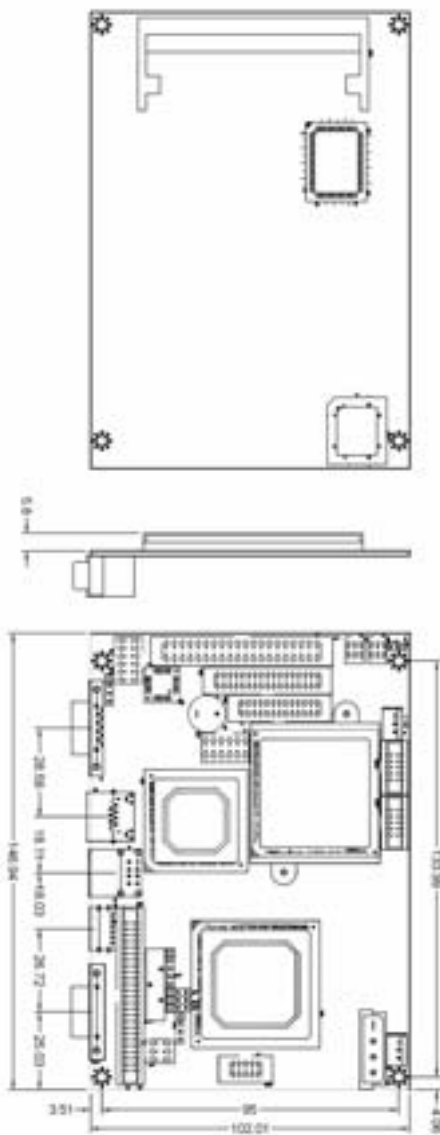
Installation

This chapter describes how to install the WAFER-E668EV. A layout diagram of the WAFER-E668EV is first presented, followed by the unpacking instructions that should be followed carefully. Also included is information on jumpers and settings to change WAFER-E668EV's configurations such as the CPU type, the system clock setting, and the watchdog timer..

2.1 WAFER-E668EV's Layout



2.2 WAFER-E668EV'S Dimension (Unit : mm)



2.3 Clear CMOS Setup

To clear the CMOS Setup (for example, if you forget the password, you have to clear the CMOS and then re-set the password), you should close the JP3 (2-3) for about 3 seconds, then open it. This will bring the system back to normal operation mode.

- **JP3: Clear CMOS Setup**

JP3	DESCRIPTION
1-2 (default)*	Keep CMOS Setup (Normal Operation)
Short 2-3	Clear CMOS Setup

2.4 Buzzer Function Setting

- **CN6(2-4): Enabled/Disabled Onboard Buzzer Function**

2 - 4	DESCRIPTION
SHORT *	Enabled
OPEN	Disabled

2.5 TFT LCD Setting

- **JP1: TFT LCD type (5V / 3V & FPCLK / #FPCLK) Setting**

JP1	DESCRIPTION
2 - 4	3V TFT LCD
3 - 5	FPCLK
1 - 3	#FPCLK
4 - 6	5V TFT LCD

2.6 RS232 or RS422/485 Selection

- **JP2: RS232 or RS422/485 Selection for COM1**

JP2	DESCRIPTION
-----	-------------

1-2 Short	RS232
2-3 Short	RS422/485

Caution: If RS422/485 is in use, the RS232 port on the main board will be disabled.

2.7 ATX/AT Power Selection

This setting is for power supply selection. If you don't set this selection correctly, the system may work improperly.

- **JP7 : ATX/AT Power Selection**

JP7	DESCRIPTION
1-2 Short	ATX
2-3 Short	AT

2.8 COM2 RI Function Setting

- **JP5 : COM2 RI Function Setting**
Short 2 – 4 pin, normal RS232 RI Function
Short 4 – 6, 1 – 3 pin, RI is 5V output
Short 4 – 6, 3 – 5 pin, RI is 12V output

JP5	DESCRIPTION
2 – 4	Normal RI Function
1 – 3 4 – 6	RI is 5Voltage output
3 – 5 4 – 6	RI is 12Voltage output

2.9 COM3 RI Function Setting

- **JP4 : COM3 RI Function Setting**
Short 2 – 4 pin, normal RS232 RI Function
Short 4 – 6, 1 – 3 pin, RI is 5V output
Short 4 – 6, 3 – 5 pin, RI is 12V output

JP4	DESCRIPTION
2 – 4	Normal RI Function
1 – 3 4 – 6	RI is 5Voltage output
3 – 5 4 – 6	RI is 12Voltage output

3

Connection

This chapter describes how to connect peripherals, switches and indicators to the WAFER-E668EV board.

3.1 Audio Connectors

The on board AC'97 CODEC supports several audio functions. The audio connectors are described below.

• **CN7 : Audio Connector (Line-Out, Line-In, MIC-In)**

PIN	DESCRIPTION	PIN	DESCRIPTION
1	NC	2	NC
3	GROUND	4	GROUND
5	LINE OUT (LEFT)	6	LINE OUT (RIGHT)
7	LINE IN (LEFT)	8	LINE IN (RIGHT)
9	GROUND	10	GROUND
11	MIC IN	12	GROUND

• **CN5: Audio CD-In Connector**

PIN	DESCRIPTION
1.	CD SIGNAL (LEFT)
2.	GROUND
3.	GROUND
4.	CD SIGNAL (RIGHT)

3.2 PCI E-IDE Disk Drive Connector

You can attach up to two IDE(Integrated Device Electronics) devices.

IDE1: Primary IDE Connector (40-pin, 2.54mm)

• **IDE1: 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	DRQ	22	GROUND
23	IOW#	24	GROUND
25	IOR#	26	GROUND
27	CHRDY	28	REV. PULL LOW
29	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

3.3 Parallel Port

A printer is usually connected to the parallel port. WAFER-E668EV includes an on-board parallel port, accessed via a 26-pin flat-cable.

- **PRN1: 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	NC

3.4 USB Port Connectors

WAFER-E668EV is equipped with two USB 1.1 ports for the future I/O bus expansion.

- **P3: USB Connector (2 ports)**

PIN	DESCRIPTION	PIN	DESCRIPTION
1.	VCC	5.	VCC
2.	DATA0-	6.	DATA1-
3.	DATA0+	7.	DATA1+
4.	GROUND	8.	GROUND

3.5 I2C Connector

- **CN8: I2C Connector**

PIN	DESCRIPTION
1	SMCLK
2	GROUND
3	SMDATA

3.6 Serial Ports

WAFER-E668EV offers three high speed NS16C550 compatible UART's serial ports with 16-byte Read/Receive FIFO.

- **P4 (COM1): Serial Port 9-pin D-Type Connector**

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)

- **COM2, COM3: Serial Port Connector**

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)

3.7 Keyboard/Mouse Connector

WAFER-E668EV has a 6-pin DIN keyboard/mouse connector.

- **KB/MS1: 6-pin DIN Keyboard/Mouse Connector**

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

3.8 IrDA Infrared Interface Port

WAFER-E668EV comes with an integrated IrDA port which supports either a Serial Infrared(SIR) or an Amplitude Shift Keyed IR(ASKIR) interface.

- **CN11: IrDA connector**

PIN	DESCRIPTION
1	VCC
2	IR-RX2
3	IR-RX
4	Ground
5	IR-TX

3.9 Fan Connector

WAFER-E668EV also has a CPU with cooling fan connector, which can supply 12V/500mA to the cooling fan. There is a “rotation” pin in the fan connector, which transfers the fan’s rotation signal to the system BIOS in order to recognize the fan speed. Please note that only specific fans offer a rotation signal.

- **FAN1: CPU Fan Connector**

PIN	DESCRIPTION
1	Rotation Signal
2	+12V
3	Ground

3.10 VGA Connector

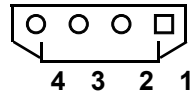
- **P1: 15-pin Female Connector**

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

3.11 Power Connector

The WAFER-E668EV is equipped with one standard power connector

- **CN1: 4-pin Connector**



PIN	DESCRIPTION
1	+12V
2	GND
3	GND
4	+5V

3.12 External Switches and Indicators

There are several external switches and indicators for monitoring and controlling your CPU board. All functions are in the CN6 connector.

- **CN6: Pin Assignment and Functions**

FUNCTION	PIN	DESCRIPTION	
SPEAKER	2	SPK SIGNAL	Jump for Buzzer
	4	Buzzer-	
	6	NC	
	8	VCC	
RESET	10	RESET	
	12	GROUND	
HDD LED	9	IDE_LED+	
	11	IDE_LED-	
POWER LED	1	LED+	
	3	LED-(GROUND)	
POWER BUTTON	5	ATX SW PIN1	
	7	ATX SW PIN2	

3.13 PS-ON Connector

This connector is used to control the ATX power supply.

- **CN2: PS-ON Connector (refer to Appendix D for details)**

PIN	DESCRIPTION
1	+5V Standby
2	PS-ON
3	Ground

3.14 LAN RJ45 Connector

WAFER-E668EV is equipped with a 10/100Mbps Ethernet controller, which is connected to the LAN via a RJ45 connector. The pin assignment is as follows.

- **P2: LAN RJ45 Connector (10/100M)**

PIN	DESCRIPTION	PIN	DESCRIPTION
1	TX+	7	N/C
2	TX-	8	N/C
3	RX+	9	Speed +
4	N/C	10	Speed -
5	N/C	11	Active/LINK +
6	RX-	12	Active/LINK -

3.15 RS422 / 485 Connector

This connector is for the RS422/485 port of COM1. The RS485 port of WAFER-E668EV is half-duplex with auto direction. So you do not have to switch the transfer mode while sending or receiving data.

- **CN9: RS422/485 Connector**

PIN	DESCRIPTION
1	TX+
2	TX-
3	RX+
4	RX-

3.16 TFT LCD Connector

The WAFER-E668EV is equipped with a TFT LCD (50pin 2.0mm) controller, which is connected to the LCD via CN3 connector. The pin assignment is as follows.

• **CN3 : TFT LCD Connector**

PIN	DESCRIPTION	PIN	DESCRIPTION
1	N/C	2	FP33
3	FP34	4	FP31
5	FP35	6	FP32
7	FP30	8	FP28
9	FP29	10	FP27
11	FP25	12	FP26
13	FP24	14	FP21
15	FP23	16	FP22
17	FP16	18	FP20
19	FP17	20	FP18
21	FP19	22	FP14
23	FP13	24	FP12
25	FP15	26	FP11
27	FP7	28	FP10
29	+LCD	30	+LCD
31	FP9	32	FP8
33	FP4	34	FP6
35	FP3	36	FP5
37	FP2	38	FP1
39	FPDEN	40	FP0
41	FPCLK	42	VEEON
43	ENVDD	44	FPVS
45	ENVEE	46	FPHS
47	GND	48	GND
49	+12V	50	+12V

3.17 Floppy Connector

WAFER-E668EV board is equipped with a 34-pin floppy drive connector.

- **FDD1: Floppy Connector**

PIN	DESCRIPTION	PIN	DESCRIPTION
1	GROUND	2	RWC0-
3	GROUND	4	NC
5	GROUND	6	RWC1-
7	GROUND	8	INDEX-
9	GROUND	10	MO-A
11	GROUND	12	DS-B
13	GROUND	14	DS-A
15	GROUND	16	MO-B
17	GROUND	18	DIR-
19	GROUND	20	STEP-
21	GROUND	22	WD-
23	GROUND	24	WGATE-
25	GROUND	26	TRK0-
27	GROUND	28	WP-
29	GROUND	30	RDATA-
31	GROUND	32	HEAD-
33	GROUND	34	DSKCHG-

3.18 Digital IO Connector

WAFER-E668EV has a 4-bit IN and 4-bit OUT built-in digital I/O connector. The DIO is 5V CMOS signal. Internal pull-up is existed on the output.

• CN12 : Digital IO Connector

PIN	DESCRIPTION	PIN	DESCRIPTION
1	GROUND	2	+5V
3	Digital Out_3	4	Digital Out_2
5	Digital Out_1	6	Digital Out_0
7	Digital In_3	8	Digital In_2
9	Digital In_1	10	Digital In_0

AMI BIOS SETUP

4.1 Introduction

This chapter discusses AMI's Setup program built into the ROM BIOS. The Setup program allows users to modify the basic system configuration. This special information is then stored in battery-backed RAM so that it retains the Setup information when the power is turned off.

4.2 Starting Setup

The AMI BIOS is immediately activated when you first boot up the computer. The BIOS reads the system information contained in the CMOS and begins the process of checking out the system and then configures it. When it finishes, the BIOS will seek an operating system on one of the disks and then launch and pass the control over to the operating system.

While the BIOS is in charge, the Setup program can be activated in one of the following ways:

1. By pressing immediately after switching the system on, or
2. by pressing the key when the following message appears briefly at the bottom of the screen during the POST.

Press DEL to enter SETUP.

If the message disappears before you respond and you still wish to enter Setup, press the "RESET" button on the chassis or turn the power off then turn it back on to restart the system then you can try again. You may also restart by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys. If you do not press the keys at the correct moment and the system does not boot, an error message will be displayed and you will again be asked to...

PRESS F2 TO CONTINUE, DEL TO ENTER SETUP

4.3 Using Setup

In general, you use the arrow keys to highlight options, press <Enter> to select, use the PageUp and PageDown keys to change entries, press <F1> for help and press <Esc> to quit. The following table provides more detail about how to navigate in the Setup program using the keyboard.

Up arrow	Move to previous option
Down arrow	Move to next option
Left arrow	Move to the option in the left column
Right arrow	Move to the option in the right column
Esc key	Main Menu -- Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
PgUp key	Increase the numeric value or make changes
PgDn key	Decrease the numeric value or make changes
+ key	Increase the numeric value or make changes
- key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2 /F3 key	Change color from total 16 colors. F2 to select color forward, (Shift) F2 to select color backward
F4 key	Reserved
F5 key	Reserved
F6 key	Reserved
F7 key	Reserved
F8 key	Reserved
F9 key	Reserved
F10 key	Save all the CMOS changes, only for Main Menu

4.4 Getting Help

Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window press <Esc> or the F1 key again.

If, after making and saving system changes with Setup, you discover that your computer is no longer able to boot, the AMI BIOS supports an override to the CMOS settings which can reset your system to its defaults.

The best advice is to alter only the settings which you thoroughly understand. To this end, we strongly recommend not to make any changes to the chipset defaults. These defaults have been carefully chosen by both AMI and the system manufacturer to provide the optimum performance and reliability. Even a seemingly little change to the chipset setup may shut the system down and need the override program to reset it.

4.5 Main Menu

Once you enter the AMIBIOS™ CMOS Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from several setup functions and two exit choices. Use the arrow keys to select among



the option and press <Enter> to accept and enter the sub-menu. Note that a brief description of each highlighted selection appears at the bottom of the screen.

The main menu includes the following main setup categories.
Recall that some systems may not include all entries.

Standard CMOS Setup

Use this menu for basic system configuration.

Advanced CMOS Setup

Use this menu to set the Advanced Features available on your system.

Advanced Chipset Setup

Use this menu to change the values in the chipset registers and optimize the system's performance.

Power Management Setup

When Disabled, SMI will not be initialized, and complete power management functionality is removed unless this option is set to Enabled.

PCI / Plug and Play Setup

This entry appears if your system supports PnP / PCI.

Peripheral Setup

Use this menu to specify your settings for integrated peripherals.

Hardware Monitor Setup

Use this menu to monitor your hardware.

Auto-detect Hard Disks

Use this menu to specify your settings for hard disks control.

Change Supervisor Password

Use this menu to set User and Supervisor Passwords.

Auto Configuration with Optimal Settings

Use this menu to load the BIOS factory settings for optimal system performance. While AMI has been designed the custom BIOS to optimize performance, the factory has the right to change these defaults to meet its needs.

Auto Configuration with Fail-Safe Settings

Use this menu to load the BIOS default values for the safe and stable system performance.

Save Settings and Exit

Save CMOS value changes to CMOS and exit setup.

Exit Without Saving

Abandon all CMOS value changes and exit setup.

4.6 Standard CMOS Setup

The options in Standard CMOS Setup Menu are divided into 10 categories. Each category includes none, one or more than one setup options. Use the arrow keys to highlight the option and then use the <PgUp> or <PgDn> keys to select the value you want for

each option.

AMIBIOS SETUP - STANDARD CMOS SETUP							
(C)2001 American Megatrends, Inc. All Rights Reserved							
Date (mm/dd/yyyy):	Wed 09/23/2002			Base Memory:	0 KB		
Time (hh/mm/ss):	15:21:49			Ext'd Memory:	0 MB		
Floppy Drive A:	1.44 MB 3 1/2"						
Floppy Drive B:	Not Installed						
	Type	Size	Cyl'n	Head	W/Com	Sec	LBA-81k PIO 32Bit
Pri Master:	Auto						On
Pri Slave:	Auto						On
Sec Master:	Auto						On
Sec Slave:	Auto						On
Boot Sector Virus Protection				Disabled			
Months:	Jan - Dec			ESC:Exit I:Sel			
Day:	01 - 31			PgUp/PgDn:Modify			
Year:	1980 - 2099			F2/F3:Color			

Main Menu Selections

Item	Options	Description
Date	MM DD YYYY	Set the system date.
Time	HH : MM : SS	Set the system time
IDE Primary Master	Options are in its sub menu (described in Table 3)	Press <Enter> to enter the sub menu for more options
IDE Primary Slave	Options are in its sub menu (described in Table 3)	Press <Enter> to enter the sub menu for more options
IDE	Options are in its sub	Press <Enter> to enter

Secondary	menu (described in Table 3)	the sub menu for more options
IDE Secondary	Options are in its sub menu (described in Table 3)	Press <Enter> to enter the sub menu for more options
Drive A Drive B	None 360K, 5.25 in 1.2M, 5.25 in 720K, 3.5 in 1.44M, 3.5 in 2.88M, 3.5 in	Select the type of floppy disk drive installed in the system
Halt On	All Errors No Errors All, but Keyboard All, but Diskette All, but Disk/Key	Select the status in which you want the BIOS to stop the POST processes and notify you
Base Memory	N/A	Displays the amount of conventional memory detected during boot up
Extended Memory	N/A	Displays the amount of extended memory detected during boot up

4.7 Advanced CMOS Setup

This section allows you to configure your system for basic operation. You have the opportunity to select the system's default speed, boot-up sequence, keyboard operation, shadowing and security.

AMIBIOS SETUP - ADVANCED CMOS SETUP (C)2001 American Megatrends, Inc. All Rights Reserved		
Quick Boot	Enabled	Available Options: Disabled ▶ Enabled
1st Boot Device	Floppy	
2nd Boot Device	IDE-0	
3rd Boot Device	CDROM	
Try Other Boot Devices	Yes	
S.M.A.R.T. For Hard Disks	Disabled	
BootUp Num-Lock	On	
Floppy Drive Swap	Disabled	
Floppy Drive Seek	Disabled	
PS/2 Mouse Support	Enabled	
System Keyboard	Present	
Primary Display	VGA/EGA	
Password Check	Setup	
Boot To OS/2	No	
Wait For 'F1' IF Error	Enabled	
Hit 'DEL' Message Display	Enabled	
CPU MicroCode Updation	Enabled	
L1 Cache	Enabled	
L2 Cache	Enabled	
System BIOS Cacheable	Enabled	ESC:Exit F1:Set PgUp/PgDn:Modify F2/F3:Color
AMIBIOS SETUP - ADVANCED CMOS SETUP (C)2001 American Megatrends, Inc. All Rights Reserved		
Floppy Drive Swap	Disabled	Available Options: ▶ Disabled Enabled Cached
Floppy Drive Seek	Disabled	
PS/2 Mouse Support	Enabled	
System Keyboard	Present	
Primary Display	VGA/EGA	
Password Check	Setup	
Boot To OS/2	No	
Wait For 'F1' IF Error	Enabled	
Hit 'DEL' Message Display	Enabled	
CPU MicroCode Updation	Enabled	
L1 Cache	Enabled	
L2 Cache	Enabled	
System BIOS Cacheable	Enabled	
C000,12k Shadow	Cached	
C800,16k Shadow	Disabled	
CC00,16k Shadow	Disabled	
D000,16k Shadow	Disabled	
D400,16k Shadow	Disabled	
D800,16k Shadow	Disabled	
EC00,16k Shadow	Disabled	ESC:Exit F1:Set PgUp/PgDn:Modify F2/F3:Color

Quick Boot

When this option is set to enable, DRAM testing function will be

disable. Warning

1st /2nd /3rd Boot Device

This option sets the type of device for the first boot drives that the AMIBIOS attempts to boot from after AMIBIOS POST completes. The settings are Disabled, IDE-0, IDE-1, IDE-2, IDE-3, Floppy, ARMD-FDD, ARMD-HDD, CDROM, SCSI.

Try Other Boot Devices

The options are Yes or No. Set this setting to Yes to instruct AMIBIOS to attempt to boot from any other drive in the system if it cannot find a boot drive among the drives specified in the 1st Boot Device, 2nd Boot Device, 3rd Boot Device, 4th Boot Device options.

Floppy Access Control

This setting specifies the assigned read/write access that when booting from a floppy drive. The options are Read/Write or Read-Only.

Hard Disk Access Control

This setting specifies the assigned read/write access that when booting from a hard disk drive. The options are Read/Write or Read-Only.

S.M.A.R.T. for Hard Disks

S.M.A.R.T. stands for Self-Monitoring, Analysis and Reporting Technology. This setting can help BIOS to warn the user of the

possible device failure and let the user back up the device before actual failure happens. The options are Disabled, Enabled.

Boot Up Num-Lock

If the user wants the Num-Lock function to be turned on during the boot-up period so that the user can use the key pad on the keyboard right after the system starts, please select ON to do so. Otherwise, select OFF..

Floppy Drive Swap

This setting decides whether drives A: and B: can be swapped or not. The options are Enabled or Disabled.

Floppy Drive Seek

This setting is whether to enable floppy drives A: to perform a Seek operation at system boot process. The options are Enabled or Disabled.

PS/2 Mouse Support

When this setting is enabled, BIOS support a PS/2- type mouse.

System Keyboard

This won't be specified if a keyboard is attached to the computer. Otherwise, when there's no keyboard detected and an error message is displayed, this setting can be marked as needed. This setting permits you to configure workstation with no keyboard. The options are Absent, Present.

Primary Display

This setting is to configure the type of monitor attached to the computer. The settings are Monochrome, Color 40x25, Color 80x25, VGA/PGA/EGA, or Not Install.

Password Check

This option enables the password check option every time the system boots or the end user runs Setup. If always is chosen a user password prompt appears every time the computer is turned on. If setup is chosen, the password prompt appears if BIOS is executed.

Boot To OS/2

Set this option to YES if running OS/2 operating system and using more than 64MB of system memory on the motherboard. The options are YES or NO.

Wait For 'F1' If Error

If this setting is enabled, AMIBIOS waits for the end user to press <F1> before continuing. If this option is disabled, AMIBIOS continues the boot process without waiting for <F1> to be pressed. The options are Disabled or Enabled.

Hit 'DEL' Message Display

Disabling this setting prevents "Hit if you want to run Setup" from appearing when the system boots. The options are Disabled or Enabled.

Internal Cache

The setting enabled or disabled the internal cache memory in the processor.

External Cache

The setting enables secondary cache memory. If Enabled is

selected, external cache memory is enabled. If disabled is select, external cache memory is disabled.

System BIOS Cacheable

When this setting is set to enabled, the System ROM area from F0000-FFFFF is copied (shadowed) to RAM for faster execution.

C000,32k Shadow

This setting is about the contents inside the Video ROM area from C000-C7FFF, which influences the speed of execution.

Disabled: The contents of the video ROM are not copied to RAM.

Cached: The contents of the video ROM area from C0000h - C7FFFh are copied from ROM to RAM and can be written to or read from cache memory.

Enabled: The contents of the video ROM area from C0000h - C7FFFh are copied (shadowed) from ROM to RAM for faster execution.

C800,16k Shadow

These settings enable shadowing of the contents of the ROM area named in the option title. The options are Enable Disable, Cached. The ROM area that is not used by ISA adapter cards will be allocated to PCI adapter cards.000,32k Shadow

CC00,16k Shadow

These settings enable shadowing of the contents of the ROM area named in the setting title. The settings are Enable Disable, Cached. The ROM area that is not used by ISA adapter cards will be allocated to PCI adapter cards.800,16k Shadow

D000,16k Shadow

These settings enable shadowing of the contents of the ROM area named in the setting title. The options are Enable, Disable, and Cached. The ROM area that is not used by ISA adapter cards will

be allocated to PCI adapter cards.C00,16k Shadow

D400,16k Shadow

These settings enable shadowing of the contents of the ROM area named in the setting title. The options are Enable, Disable, and Cached. The ROM area that is not used by ISA adapter cards will be allocated to PCI adapter cards.000,16k Shadow

D800,16k Shadow

These settings enable shadowing of the contents of the ROM area named in the setting title. The options are Enable, Disable, and Cached. The ROM area that is not used by ISA adapter cards will be allocated to PCI adapter cards.400,16k Shadow

DC00,16k Shadow

These settings enable shadowing of the contents of the ROM area named in the setting title. The options are Enable, Disable, and Cached. ISA adapter cards will be allocated to PCI adapter cards.800,16k Shadow

4.8 Advanced Chipset Setup



This section allows you to configure the system based on the specific features of the installed chipset. This chipset manages bus speeds and access to system memory resources, such as DRAM and the external cache. It also coordinates communications between the conventional ISA bus and the PCI bus. It must be stated that these items should never need to be altered. The default settings have been chosen because they provide the best operating conditions for your system.

DRAM Frequency

This setting is decided by Memory frequency.

SDRAM CAS# Latency

This setting is decided by Memory CAS latency

AGP Aperture Size

This is about the size of AGP aperture. The aperture is a portion of the PCI Memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation

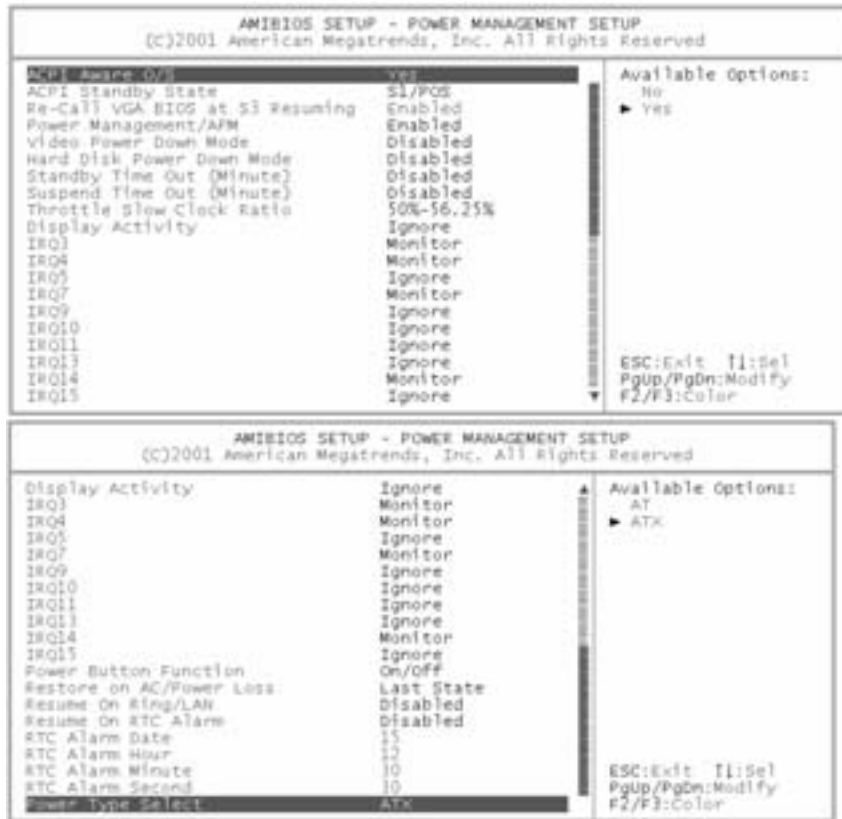
USB Controller

Select enable if your system contains a USB controller and you have USB Peripherals. Otherwise, select disable.

USB Device Legacy support

Enable or Disable the USB device legacy support.

4.9 Power Management Setup



ACPI Aware O/S

This feature is the switch of ACPI function. Configuration options :
[No] [Yes]

ACPI Standby State

This feature is the switch of STR (S3) or POS (S1) function.
Configuration options : [S3/STR] [S1/POS]

Power Management

When Disabled, SMI will not be initialized, and the complete power management functionality is removed unless this option is set to Enabled.

Suspend Time Out

If no activity occurs during this time period, the BIOS will place the system into the suspend low power state.

IRQ3 ,4 ,5 ,7 , 9, 10, 11, 14, 15

The factory defaults assigned IRQ3, 4, 7, and 14 to the Monitor. When other external devices using the same IRQ numbers as of the Monitor start, the Monitor will be waked up from the power saving state by these devices.

The user can assign the other IRQ numbers available here to the Monitor. Just highlight the IRQ number and set the value to Monitor.

Resume on Ring/LAN

Allows the user to decide to resume the system From Soft Off state by either LAN or Modem Ring

Resume On RTC Alarm

When this setting is enabled, system will wakeup from soft off mode according to the time you set.

Power Type Select

This setting allows the user to choose the power type for AT or ATX.

4.10 PCI / Plug and Play Setup



Plug and Play Aware O/S

If enabled, BIOS will configure only PnP ISA boot devices(i.e. all PnP ISA cards which has boot flag set). And PnP aware OS will configure all other devices. If disabled, BIOS will configure all devices.

Clear NVRAM

When set to Yes, system can clear NVRAM automatically. The options are No, Yes.

On Chip VGA Frame Buffer Size

This is for selecting frame buffer size (2~32MB) for VGA

PCI Latency Timer (PCI Clocks)

This setting specifies the latency timings(in PCI clocks) for PCI devices installed in the PCI expansion slots. The options are 32, 64, 96, 128, 160 , 192, 224, or 248.

Boot Screen Select

This setting is to specify Boot Screen, Select Auto will Boot from either CRT or LCD .Select Both will Boot from CRT and LCD Both

Boot Screen Select

This setting is to choose LCD Panel Type

Allocate IRQ to PCI VGA

Choose Yes to allocate an IRQ to the VGA device on the PCI bus. The other option is No.

PCI Slot1 / Slot2 / Slot3 / Slot4 IRQ Priority

The setting specify the IRQ priority for PCI device installed in the PCI expansion slot. The options are Auto, (IRQ) 3, 4, 5, 7, 9, 10, and 11, in priority order.

4.11 Peripheral Setup

The Peripheral Setup allows the user to configure the system to the most effectively power saving mode while operating in a consistent manner with your own style of computer use.

AMIBIOS SETUP - PERIPHERAL SETUP (C)2001 American Megatrends, Inc. All Rights Reserved		
OnBoard Serial Port 2	2FS/COM2	Available Options: Disabled 1FS/COM1 2FS/COM2 3FS/COM3 4FS/COM4
Serial Port 2 IRQ	3	
OnBoard Serial Port 3	3ES/COM3	
Serial Port 3 IRQ	11	
Serial Port 3 Mode	Normal	
IR Duplex Mode	Half Duplex	
IR Pin Select	IRRX/IRTX	
OnBoard FDC	Enabled	
OnBoard Serial Port1	3FS/COM1	
OnBoard Parallel Port	378	
Parallel Port Mode	Normal	
EPP Version	N/A	
Parallel Port DMA	N/A	
Parallel Port IRQ	7	
OnBoard IDE	Both	
OnBoard LAN	Enabled	
OnBoard LAN P.M.E	Enabled	
OnBoard AC'97 Audio	Enabled	
		ESC:Exit F1:Sel PgUp/PgDn:Modify F2/F3:Color

OnBoard Serial Port 1/Port 2/Port 3

This setting specifies the base I/O port address of serial port 1. The options are Auto (AMIBIOS automatically determines the correct base I/O port address), Disabled, 3F8h, 2F8h, 2E8h, or 3E8h.

Serial Port3 Mode

This setting specifies the IR active pulse or inverting clock of serial port B.

IR Pin Select

There is only one type of connector being activated at a time between the Serial Port 3 and the IRRX/IRTX. When the user selects one of these two, the other will become invalid. If the external device is non-IR type, please select Serial Port 3 (default). Otherwise, select the IR Pin.

OnBoard Parallel Port

This setting specifies the base I/O port address of parallel port on the motherboard. The options are Disabled, 378h, 278h, or 3BCh.

Parallel Port Mode

This setting specifies the parallel port mode. The options are Normal, Bi-Dir, EPP, ECP.

Normal: The normal parallel port mode is used.

Bi-Dir: To support bidirectional transfers on the parallel port.

EPP: The parallel port can be used with devices that adhere to the Enhanced Parallel Port (EPP) specification. EPP uses the existing parallel port signals to provide asymmetric bidirectional data transfer driven by the host device.

ECP: The parallel port can be used with devices that adhere to the Extended Capabilities Port (ECP) specification. ECP uses the DMA protocol to achieve data transfer rates up to 2.5 Megabits per second. ECP provides symmetric bidirectional communication.

EPP Version

EPP data or address read cycle 1.9 or 1.7

Parallel Port IRQ

This setting specifies the IRQ used by the parallel port. The options are Auto , (IRQ)5, (IRQ)7.

Parallel Port DMA Channel

This setting is available only if the setting for the Parallel Port Mode option is ECP. This setting makes the DMA channel used by the parallel port. The options are DMA Channel 0, 1, or 3.

On Board LAN

This setting is to Enable or Disable LAN Function.

On Board LAN P.M.E

Enable or Disable P.M.E Function for LAN Wake up.

On Board AC'97 Audio

Enable or Disable AC'97 Audio Function.

4.12 Hardware Monitor Setup



4.13 Change Supervisor Password

You can set passwords for either supervisor or user password, or for both of them. The differences between them are:

supervisor password:

can enter and change the settings of the setup menus.

user password:

can only access the setup menus, but can't change anything of it. When you select this option, the following message will appear at the center of the screen to assist you in creating a password.

ENTER PASSWORD:

Type the password, up to eight characters in length, and press <Enter>. The password typed now will clear any previously existing password within CMOS memory. You will be prompted to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and not to enter a password.

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

PASSWORD DISABLED.

When a password has been enabled, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized user from changing any bit of your system configuration.

Additionally, when a password is enabled, you can also require the BIOS to request a password every time the system is booting. This would prevent unauthorized uses of your computer.

The user can determine whether the password is needed for entering BIOS Setup Program or other Security options (see Section 4.5). Once the Password has been set, The user will be prompted to enter the password at the beginning of booting and at the entry to Setup Menu.

This chapter discusses the Setup program built into the BIOS; it allows users to configure the system. This configuration is then stored in battery-backed CMOS RAM so that Setup information is retained whilst the power is off.

Appendix A. Watchdog Timer

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

A BIOS function call (INT 15H) is used to control the Watchdog Timer:

INT 15H:

AH – 6FH	
<u>Sub-function:</u>	
AL – 2	: Set the Watchdog Timer's period
BL	: Time-out value(the time unit--second or minute, is dependent on the item "Watchdog Timer unit selected in BIOS setup).

You have to call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer will start counting down. When the timer value reaches zero, the system will reset. To ensure that this reset condition does not occur, the Watchdog Timer must be periodically refreshed by calling sub-function 2. However the Watchdog timer will be disabled if you set the time-out value to be zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

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

Example program:

```
; INITIAL TIMER PERIOD COUNTER
;
;
W_LOOP:

    MOV  AX, 6F02H    ;setting the time-out value
    MOV  BL, 30      ;time-out value is 48 seconds
    INT  15H

;
; ADD YOUR APPLICATION PROGRAM HERE
;
    CMP  EXIT_AP, 1  ;is your application over?
    JNE  W_LOOP      ;No, restart your application

    MOV  AX, 6F02H    ;disable Watchdog Timer
    MOV  BL, 0        ;
    INT  15H

;
; EXIT
;
```

Appendix B. Address Mapping

IO Address Map

I/O address Range	Description
000-01F	DMA Controller #1
020-021	Interrupt Controller #1, Master
040-05F	8254 timer
060-06F	8042 (Keyboard Controller)
070-07F	Real time Clock, NMI Mask
080-09F	DMA Page Register
0A0-0BF	Interrupt Controller #2
0C0-0DF	DMA Controller #2
0F0	Clear Math Coprocessor Busy
0F1	Reset Math Coprocessor
0F2	Core logic programming configuration
0F8-0FF	Math Coprocessor
1F0-1F8	Fixed Disk
200-207	Game I/O
278-27F	Parallel Printer Port 2 (LPT3)
2F8-2FF	Serial Port 2
300-31F	Prototype Card
360-36F	Reserved
378-37F	Parallel Printer Port 1 (LPT2)
3B0-3BF	Monochrome Display and Printer Adapter (LPT1)
3C0-3CF	Reserved
3D0-3DF	Color/Graphics Monitor Adapter
3E8-3EF	Serial Port 3
3F0-3F7	Diskette Controller
3F8-3FF	Serial Port 1

1st MB Memory Address Map

Memory address	Description
00000-9FFFF	System memory
A0000-BFFFF	VGA buffer
C0000-C7FFF	VGA BIOS
F0000-FFFFF	System BIOS
1000000-	Extend BIOS

*Default setting

IRQ Mapping Table

IRQ0	System Timer	IRQ8	RTC clock
IRQ1	Keyboard	IRQ9	Available
IRQ2	Cascade to IRQ Controller	IRQ10	AC'97 CODEC
IRQ3	COM2	IRQ11	COM3
IRQ4	COM1	IRQ12	PS/2 mouse
IRQ5	USB	IRQ13	FPU
IRQ6	FDC	IRQ14	Primary IDE
IRQ7	Printer	IRQ15	Secondary IDE

DMA Channel Assignments

Channel	Function
0	Available
1	Available
2	Floppy disk (8-bit transfer)
3	Available
4	Cascade for DMA controller 1

5	Available
6	Available
7	Available

Appendix C.

How to use the Wake-Up Function

The WAFER-E668EV provides two kind of Wake Up Function. This page describes how to use the Modem Wake-Up and LAN Wake-Up functions.

Wake-Up function works whilst using ATX power supply,

Wake-Up By Modem Ring On:

In CMOS SETUP, the user must set the option **Wake Up On LAN/Ring** to enabled. The ATX power supply will be switched on when there is a ring signal detected on the pin "RI" of the serial port.

Wake-Up On LAN:

In CMOS SETUP, the user must set the option **Wake Up On LAN/Ring** to enabled. When the computer is in power-down status, a LAN Link/Active LED is flashing. This status indicates that the LAN chip has entered standby mode and is waiting for a Wake-Up signal. You can use other computers to wake up your computer by sending ID to it.

ID: ID is the address of your system LAN. Every LAN chip has a factory-

set ID which you can find it from network information in WINDOWS.

ID's format is xx-xx-xx-xx-xx-xx

Example ID: 00905C21D4

Appendix D. Digital I/O

One characteristic of digital circuit is its fast response to high or low signal. This kind of response is highly needed for harsh and critical industrial operating environment. That's why we design 4-bit digital inputs and 4-bit digital outputs on the WAFER-E668EV.

There are two kinds of signals (Input and Output) used by the Digital I/O function. These signals are used to control external devices that need On/Off circuit or TTL devices. When one of the signals has been selected, The user can read or write data to the system through the Digital I/O function.

A BIOS function call (INT 15H) is used to control the Watchdog Timer:

INT 15H :

AH – 6FH
<u>Sub-function:</u> AL – 8 : Set the Digital port as INPUT AL : Digital I/O input value

Example program:

```
MOV AX, 6F08H ;setting the Digital port is input
INT 15H ;
```

AL low byte = value

AH – 6FH
<u>Sub-function:</u> AL – 9 : Set the Digital port as OUTPUT BL : Digital I/O output value

Example program:

```
MOV AX, 6F09H ;setting the Digital port is output
MOV BL, 09H ;Digital value is 09H
INT 15H ;
```

Digital Output is 1001b