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4. BIOS CONFIGURATION

1. INTRODUCTION

1.1. PREFACE

Welcome to use the **6VMA** motherboard. It is a Pentium® II / III / Celeron™ Processor based PC / AT compatible system with AGP/ PCI / ISA Bus, and has been designed to be the fastest PC / AT system. There are some new features allow you to operate the system with just the performance you want.

This manual also explains how to install the motherboard for operation, and how to set up your CMOS CONFIGURATION with BIOS SETUP program.

1.2. KEY FEATURES

- Intel Pentium® II / III / Celeron™ Processor based PC / AT compatible mainboard.

- Slot 1 supports Pentium® II / III / Celeron™ processor running at 233-650 MHz.

- VIA Apollo chipset, Supports AGP / SDRAM / Ultra DMA/33 IDE / Keyboard and PS/2 Mouse Power On / ACPI features.

- Built-in PCI **ESS SOLO-1** audio chip.(Optional)

- Supports external Modem Ring-On on COMA & COMB and internal Modem Ring-On.

- Supports Wake-up on LAN (JP7).

- Supports 3xDIMMs using 3.3V EDO or SDRAM DIMM module.

- Supports EDO 16MB ~ 384 MB, SDRAM 16MB ~ 768MB (128Mb DRAM technology) memory on board.

- 3xPCI Bus slots, 1xISA Bus slots, 1xAGP slot.

- Supports 2 channels Ultra DMA/33 IDE ports for 4 IDE Devices.

- Supports 2xCOM (16550), 1xLPT (EPP / ECP), 1x Floppy port.

- Supports1xLine in, 1xLine Out, 1xMicro in, 2xCD Line in(For PCB Ver:1.0) (Support 1x CD Line in for PCB version 1.2 and above) ,1x GAME Port.
  (Optional)

- Supports 2xUSB ports, 1xPS/2 Mouse, 1xPS/2 Keyboard.

❑ Licensed AWARD BIOS, 2Mbits FLASH RAM.

❑ 24.5 cm x 20 cm Micro-ATX form factor, 4 layers PCB.

1.3. PERFORMANCE LIST

The following performance data list is the testing results of some popular benchmark testing programs.

These data are just referred by users, and there is no responsibility for different testing data values gotten by users. (The different Hardware & Software configuration will result in different benchmark testing results.)

- CPU   Pentium® III 500MHz processor
- DRAM   (128x1)MB SDRAM (Winbond 902WB W986408BH-8H)
- CACHE SIZE   512 KB included in CPU
- DISPLAY   Onboard Intel Corporation 810 Graphics Controller Hub (4MB SDRAM)
- STORAGE   Onboard IDE (IBM DTTA-371800)
- O.S.   Windows NT™4.0 SPK5
- DRIVER   Display Driver at 1024 x 768 65536 colors 75Hz.

                      VIA Bus Master IDE Driver Ver2.3.15

Processor	Intel Pentium® III
	500MHz(100x5)
Winbench99	
CPU mark99	37.5
FPU Winmark 99	2560
Business Disk Winmark 99	4140
Hi-End Disk Winmark 99	9200
Business Graphics Winmark 99	196
Hi-End Graphics Winmark 99	370
Winstone99	

Business Winstone99	32.1
Hi-End Winstone99	27.9

1.4. BLOCK DIAGRAM
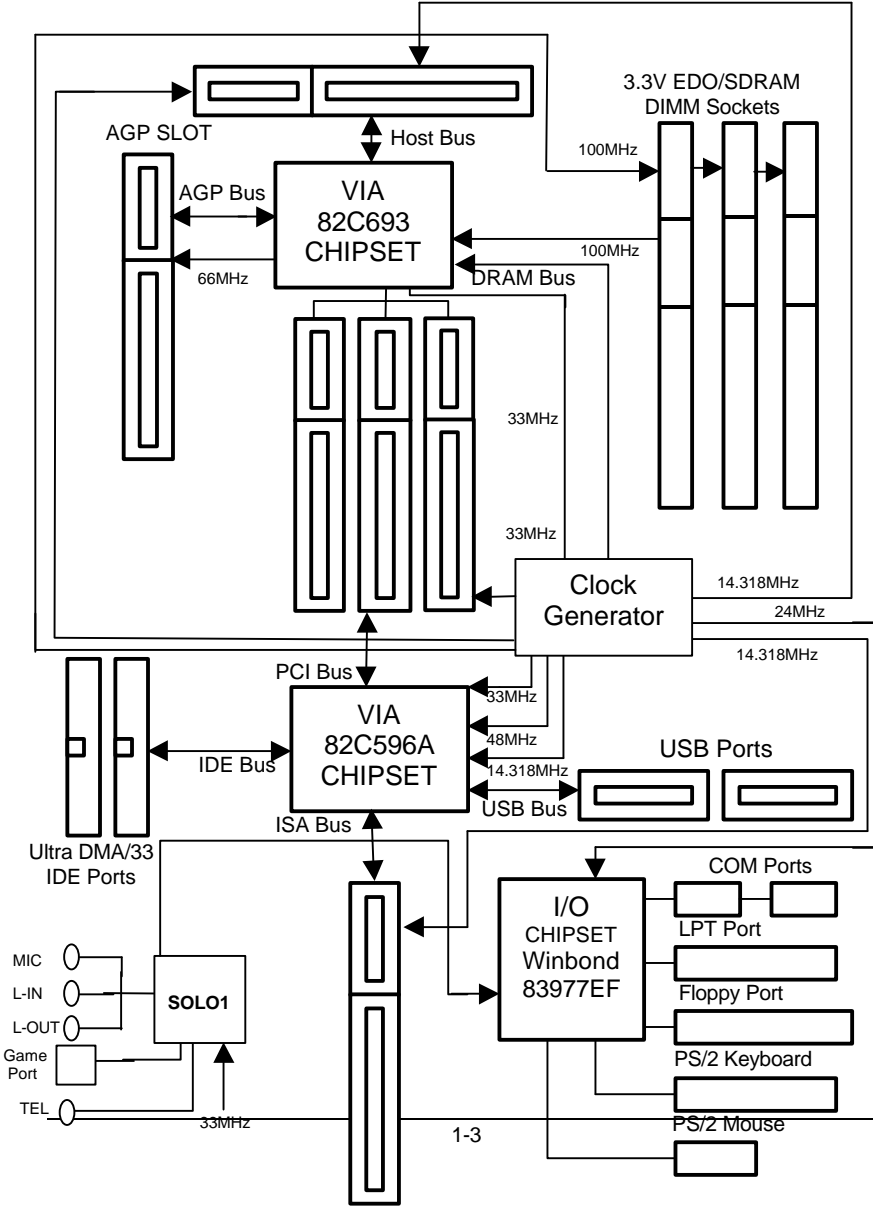
1.5. INTRODUCE THE Pentium**â** II / III Processor
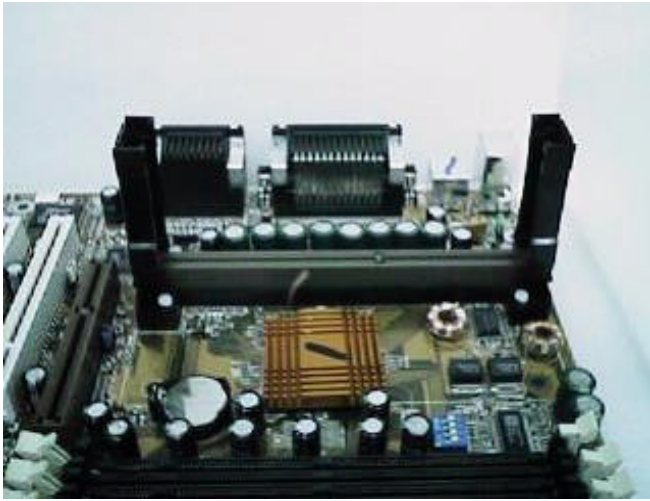
Figure 1:Universal Retention Mechanism & attach Mount

Figure 2:OEM Pentium® II Processor

Figure 3: OEM Pentium® III Processor

1.6 What is AGP?

The Accelerated Graphics Port (AGP) is a new port on the Host-To-PCI bridge device that supports an AGP port. The main purpose of the AGP port is to provide fast access to system memory.

The AGP port can be used either as fast PCI port (32-bits at 66MHz vs. 32-bits at 33MHz) or as an AGP port which supports 2x data-rate, a read queue, and side band addressing. When the 2x-data rate is used, the port can transmit data at 533MB/sec (66.6*2*4). The read-queue can be used to pipeline reads – removing the effects of the reads-latency. Side band addressing can be used to transmit the data address on a separate line in order to speed up the transaction.

2. SPECIFICATION

2.1. HARDWARE

- CPU
  - − Pentium® II / III / Celeron™ 233 − 650MHz.
  - − 242 pins 66/100 MHz slot1 on board.

- SPEED
  - − 66/100 MHz system speed.
  - − 66 MHz AGP bus speed. (2X mode 133MHz)
  - − 33 MHz PCI-Bus speed.
  - − 8 MHz AT bus speed.

- DRAM MEMORY
  - − 3 banks 168 pins DIMM module sockets on board.
  - − Use 16 / 32 / 64 / 128 / 256 MB DIMM module DRAM.(128Mb DRAM technology)
  - − Supports EDO 16MB ~ 384 MB,
    SDRAM 16MB~768MB.
    (128Mb DRAM technology)
  - − Supports 3.3V EDO / SDRAM.

- CACHE MEMORY
  - − 32 KB 1st cache memory included in CPU.
  - − 128KB 2nd cache in CPU.
  - − Supports DIB speed mode for L2 Cache.

- I/O BUS SLOTS
  - − 3 33MHz Master / Slave PCI-BUS.
  - − 1 8MHz 16 bits ISA BUS.
  - − 1 66MHz / 133MHz AGP bus.

- IDE PORTS
  - − 2 Ultra DMA 33 Bus Master IDE channels on board.(Using IRQ14,15)
  - − Support Mode 3,4 IDE & ATAPI CD − ROM.

- I/O PORTS
  - − Supports 2 16550 COM ports.
  - − Supports 1 LPT port.
  - − Supports 1 Floppy port.
  - − Supports 2 USB ports.
  - − Supports 1 PS/2 Mouse.
  - − Supports 1 PS/2 Keyboard.

● Audio Ports (Optional)	− 1x Line in − 1x Line out − 1x Micro in − 1x Game Port − 2x CD Line in (For PCB Ver :1.0) 1x CD Line in (For PCB version 1.2 and above)
● GREEN FUNCTION	− Suspend mode support. − Green switch & Green LED support. − IDE & Display power down support. − Monitor all IRQ / DMA / Display / I/O events.
● BIOS	− 2M bits FLASH RAM. − Supports Plug & Play, DMI Function.
● DIMENSION	− Micro ATX Form Factor, 4 layers PCB.

2.2. SOFTWARE

● DRIVER	− TUCD CD Driver.
● BIOS	− Licensed AWARD BIOS. − AT CMOS Setup, BIOS / Chipset Setup, Green Setup, Hard Disk Utility included.
● O.S.	− Operation with MS-DOS®, Windows®95, Windows®98, WINDOWS™ NT, OS/2, NOVELL and SCO UNIX.

2.3. ENVIRONMENT

● Ambient Temp.	− 0°C to +50°C (Operating).
● Relative Hum.	− 0 to +85% (Operating).
● Altitude	− 0 to 10,000 feet (Operating).
● Vibration	− 0 to 1,000 Hz.
● Electricity	− 4.9 V to 5.2 V. (Max. 20A current at 5V.)

3. HARDWARE INSTALLATION

3.1. UNPACKING

The mainboard package should contain the following:

- The **6VMA** mainboard.

- Universal Retention Mechanism & Attach Mount

- USER'S MANUAL for mainboard.

- Cable set for IDE, Floppy devices.

- CD for Mainboard.(TUCD)

The mainboard contains sensitive electric components, which can be easily damaged by static electricity, so the mainboard should be left in its original packing until it is installed.

Unpacking and installation should be done on a grounded anti-static mat. The operator should be wearing an anti static wristband, grounded at the same point as the anti-static mat.

Inspect the mainboard carton for obvious damage. Shipping and handling may cause damage to your board. Be sure there are no shipping and handling damages on the board before proceeding.

After opening the mainboard carton, extract the system board and place it only on a grounded anti-static surface component side up. Again inspect the board for damage. Press down on all of the socket IC's to make sure that they are properly seated. Do this only on with the board placed on a firm flat surface.

☻※**DO NOT APPLY POWER TO THE BOARD IF IT HAS BEEN DAMAGED.**

3.2. MAINBOARD LAYOUT

PCB Ver : 1.0
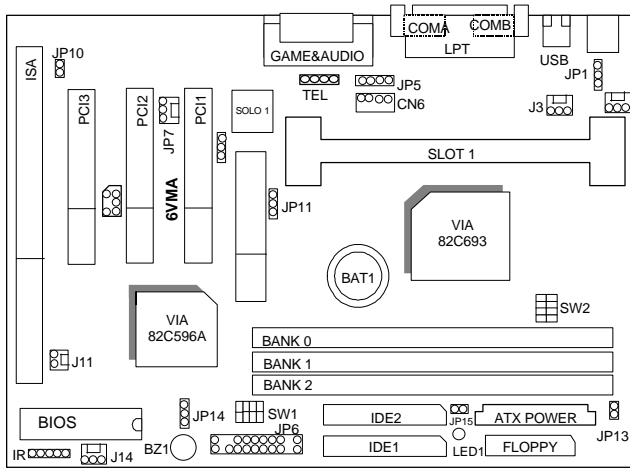
≮**Figure 3.1**≯

PCB Ver : 1.2

≮Figure 3.2≯

3.3. QUICK REFERENCE FOR JUMPERS & CONNECTORS

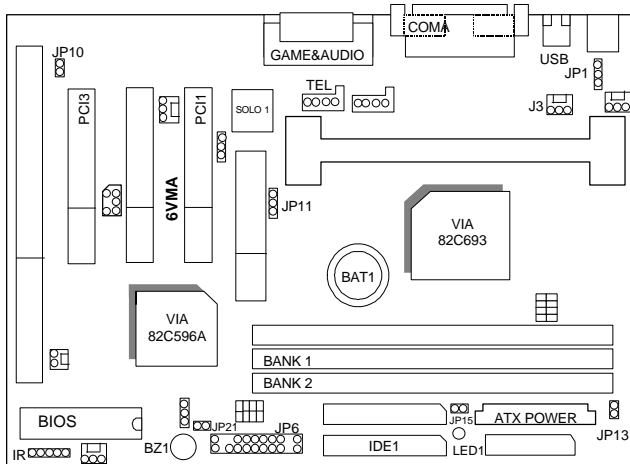| ♦ I/O Ports Connector	
USB	USB port.
IDE1	For Primary IDE port.
IDE2	For Secondary IDE port.
FLOPPY	For Floppy port
PS/2	For PS/2 Keyboard / Mouse port.
COMB	For Serial port2 (COM B).[Support External Modem Ring On.]
COMA	For Serial port1 (COM A).[Support External Modem Ring On.]
LPT	For LPT port.
GAME	For GAME port.(Optional)
AUDIO	For MIC,LINE-IN,LINE-OUT port.(Optional)

♦ Slot 1
For Pentium® II / III / Celeron™ processor installed

♦ J3 : CPU FAN : CPU cooling FAN Power Connector	
Pin No.	Function
1	GND.
2	+12V
3	Signal

♦ J13 : Power FAN :Power FAN Power Connector	
Pin No.	Function
1	GND.
2	+12V
3	Signal

♦ J14 : System FAN : System FAN Power Connector	
Pin No.	Function
1	GND.
2	+12V
3	Signal

♦ JP7 : Wake on Lan	
Pin No.	Function
1	+5V SB
2	GND

3	Signal

♦ IR : INFRARED Connector (IR) --(Optional)

Pin No.	Function
1	IR Data Output
2	GND
3	IR Data Input
4	Signal
5	POWER (+)

♦ JP18 : Onboard Sound Function Selection (Optional)

Pin No.	Function
1-2 Close	Onboard Sound Function Enabled(Default).
2-3 Close	Onboard Sound Function Disabled.

♦ JP1 : Keyboard Power On Selection

Pin No.	Function
1-2 Close	Enabled Keyboard power on.
2-3 Close	Disabled Keyboard power on (Default).

♦ JP14: CLEAR CMOS Function

Pin No.	Function
1-2 Close	Clear CMOS
2-3 Close	Normal operation (Default).

♦ JP13: Suspend To RAM Function (Optional).

Pin No.	Function
OPEN	Normal operation(Default).
Close	Enabled Suspend To RAM.

♦ JP11: System Acceleration

Pin No.	Function
1-2 short	For 100MHz Turbo and other frequencies
2-3 short	For 100MHz Normal (Default).

♦ J11: Internal Modem Card RING PWR ON

Pin No.	Function
1	Signal

2	GND

♦ SB-LINK (For PCI Sound Card Connector) (Optional)

Pin No.	Function
1	Signal
2	GND
3	NC
4	Signal
5	GND
6	Signal

♦ JP10 : CASE OPEN Function (Optional)

Pin No.	Function
1	Signal
2	GND

♦ TEL:The Connector is for Modem with internal Voice connector(Optional)

Pin No.	Function
1	Signal-In
2	GND
3	GND
4	Signal-Out

♦ CN6 : CD Audio Line In (Optional)

Pin No.	Function
1	GND
2	Right
3	GND
4	Left

♦ JP5 : CD Audio Line In (Optional)

Pin No.	Function
1	Right
2	GND
3	GND
4	Left

♦ JP5 : CD Audio Line In (Optional)	
(This function is support in PCB version 1.2 and above)	
Pin No.	Function
1	Left
2	GND
3	GND
4	Right

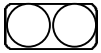| ♦ JP21 : Internal Buzzer Connector	
(This function is support in PCB version 1.2 and above)	
Pin No.	Function
1-2 Short	BZ1 Enable(Default)
Open	BZ1 Disable

JP6 : For 2X11 PINs Jumper
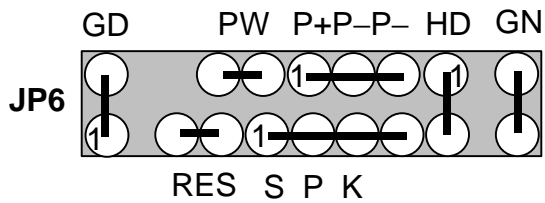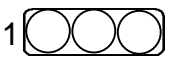

PW: Soft Power Connector
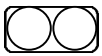
Open: Normal Operation
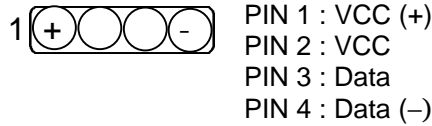Short: Power On/Off

RES: Reset Switch

Open: Normal Operation
Short: For Hardware Reset System
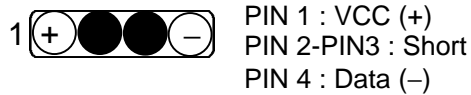
P+P- P- : Power LED

PIN 1 : anode (+)
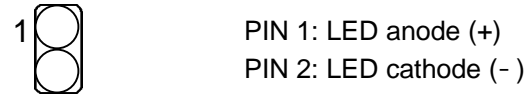PIN 2 : cathode (−)
PIN 3 : cathode (−)

SPK: Speaker Connector

1 (+ ◯ ◯ -)
PIN 1 : VCC (+)
PIN 2 : VCC
PIN 3 : Data
PIN 4 : Data (−)

SPK : Internal Speaker Connector (Default)

1 (+ ● ● −)
PIN 1 : VCC (+)
PIN 2-PIN3 : Short
PIN 4 : Data (−)

HD: IDE Hard Disk Active LED

1
PIN 1: LED anode (+)
PIN 2: LED cathode (-)

GN: Green Function Switch

Open : Normal operation
Short : Entering Green Mode

GD: Green LED

PIN 1 : LED anode (+)
PIN 2 : LED cathode (-)
1
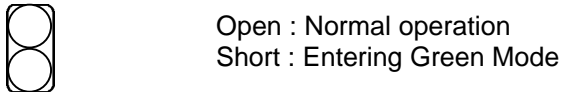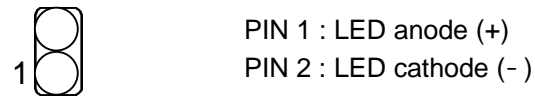
3.4. DRAM INSTALLATION

The main board can be installed with 16 / 32 / 64 / 128 / 256 MB (128Mb Technology) 168 pins DIMM module DRAM, and the DRAM speed must be 67~100 MHz for SDRAM when system bus speed is set to 66MHz. The DRAM memory system on main board consists of bank 0, 1& bank 2.

Since 168 pins DIMM module is 64 bits width, using 1 PCS which can match a 64 bits system. The total memory size is 16MB ~ 256MB SDRAM. The DRAM installation position refer to Figure 3.1, and notice the Pin 1 of DIMM

module must match with the Pin 1 of DIMM socket. Insert the DRAM DIMM module into the DIMM socket at Vertical angle. If there is a wrong direction of Pin 1, the DRAM DIMM module couldn't be inserted into socket completely.

3.5. CPU SPEED SETUP

The default system bus speed is 66 / 100MHz **(SW2)**. The user can change the DIP SWITCH **(SW1)** selection to set up the CPU speed for 233 - 650MHz processor. The CPU speed must match with the frequency RATIO. It will cause system hanging up if the frequency RATIO is higher than CPU's.

SW1:

CLK RATIO	1	2	3	4
X3	ON	OFF	ON	ON
X3.5	OFF	OFF	ON	ON
X4	ON	ON	OFF	ON
X4.5	OFF	ON	OFF	ON
X5	ON	OFF	OFF	ON
X5.5	OFF	OFF	OFF	ON
X6	ON	ON	ON	OFF
X6.5	OFF	ON	ON	OFF
X 7	ON	OFF	ON	OFF
X 7.5	OFF	OFF	ON	OFF
X 8	ON	ON	OFF	OFF
X 8.5	OFF	ON	OFF	OFF
X 9	ON	OFF	OFF	OFF
X 9.5	OFF	OFF	OFF	OFF

SW2:

CPU	1	2	3	4
66	ON	OFF	OFF	ON
75	ON	ON	OFF	ON
83	ON	OFF	ON	ON
100	OFF	OFF	OFF	OFF
112	OFF	ON	OFF	OFF
133	OFF	OFF	ON	OFF

DIP SWITCH (SW1)				FREQ.	EXT.CLK.	INT.CLK.	CPU Type
1	2	3	4	RATIO	MHz	MHz	
OFF	OFF	ON	ON	3.5	**66**	233	Pentium® II 233 MHz (Celeron 233MHz)
ON	ON	OFF	ON	4	**66**	266	Pentium® II 266 MHz (Celeron 266MHz)
OFF	ON	OFF	ON	4.5	**66**	300	Pentium® II 300 MHz (Celeron 300MHz)
ON	OFF	OFF	ON	5	**66**	333	Pentium® II 333 MHz (Celeron 333MHz)
OFF	OFF	OFF	ON	5.5	**66**	366	Pentium® II 366 MHz (Celeron 366MHz)
ON	ON	ON	OFF	6	**66**	400	Pentium® II 400 MHz (Celeron 400MHz)
OFF	ON	ON	OFF	6.5	**66**	433	Pentium® II 433 MHz (Celeron 433MHz)
OFF	OFF	ON	ON	3.5	**100**	350	Pentium® II 350 MHz
ON	ON	OFF	ON	4	**100**	400	Pentium® II 400 MHz
OFF	ON	OFF	ON	4.5	**100**	450	Pentium® III 450 MHz
ON	OFF	OFF	ON	5	**100**	500	Pentium® III 500 MHz
OFF	OFF	OFF	ON	5.5	**100**	550	Pentium® III 550 MHz
ON	ON	ON	OFF	6	**100**	600	Pentium® III 600 MHz
OFF	ON	ON	OFF	6.5	**100**	650	Pentium® III650 MHz

¨ **The CPU is a sensitive electric component and it can be easily damaged by static electricity, so users must keep it away from metal surface when the CPU is installed onto mainboard.**

¨ **Note: It's strongly recommended that set the system speed according to your hardware configuration: CPU, SDRAM, Cards, etc.**

3.6. CMOS RTC & ISA CFG CMOS SRAM

The mainboard contains RTC & CMOS SRAM on board. They have a power supply from external battery to keep the DATA inviolate & effective. The RTC is a REAL-TIME CLOCK device, which provides the DATE & TIME to system. The CMOS SRAM is used for keeping the information of system configuration, so the system can automatically boot OS every time. Since

the lifetime of internal battery is 5 years, the user can change a new Battery to replace old one when it has consumed.

3.7. SPEAKER CONNECTOR INSTALLATION

There is a speaker in AT system for sound purpose. The 4 - Pins connector **SPK** is used to connect speaker. Anode connects +, Cathode connects –.

3.8. HARDWARE RESET SWITCH CONNECTOR INSTALLATION

The RESET switch on panel provides users with HARDWARE RESET function. The system will do a cold start after the RESET switch is press and released by user. The RESET switch is a 2 PINS connector and should be installed to **RES** on mainboard.

3.9. POWER LED CONNECTOR INSTALLATION

System has power LED lamp on the panel of case. The power LED will light on off or flash to indicate which step on the system. The connector should be connected to **LED** of mainboard in correct direction.

3.10. IDE & ATAPI DEVICE INSTALLATION

There are two-Enhanced PCI IDE ports (**IDE1, IDE2**) on board, which following ATAPI standard SPEC. Any one IDE port can connected to two ATAPI devices (IDE Hard Disk, CD-ROM & Tape Driver), so total four ATAPI devices can exist in a system. The **HD** is the active LED port for ATAPI devices.

3.11. PERIPHERAL DEVICE INSTALLATION

After the I/O device installation and jumpers setup, the mainboard can be mounted into the case and fixed by screw. To complete the mainboard installation, the peripheral device could be installed now. The basic system needs a display interface card. If the PCI - Bus device is to be installed in the system, any one of three PCI - Bus slots can be used.

3.12.PS/2 KEYBOARD & MOUSE INSTALLATION

The mainboard supports PS/2 Mouse. The BIOS will auto detect whether the PS/2 Mouse is installed or not & assign IRQ12 for PS/2 Mouse port if it is installed. After installing the peripheral device, the user should check everything again, and prepare to power-on the system.