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1. INTRODUCTION

1.1. PREFACE

Welcome to use the **6ZM7/6ZM7A** motherboard. It is a Celeron™ Socket 370 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 Celeron™ Socket 370 Processor based PC / AT compatible main board.

- Socket 370 Pins ZIF white socket on board.

- Built-in PCI **ESS SOLO-1 ES1938S** audio chip (Optional).

- Supports Celeron™ Socket 370 processor running at 366-533 MHz.

- Intel 440ZX chipset, Supports AGP / SDRAM / Ultra DMA/33 IDE / Keyboard and PS/2 Mouse Power On / ACPI features.

- Supports 2xDIMMs using 3.3V EDO or SDRAM DIMM module.

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

- Supports EDO 16MB~256 MB, SDRAM 16MB~256MB memory on board.

- Supports Wake-up on LAN.

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

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

- Supports 1x Line in, 1x Line Out, 1x Mic in, 2x CD Line in,1x GAME Port   1 x TEL. (Optional).

- Supports 2xCOM (16550), 1xLPT (EPP / ECP/ SPP), 1x1.44MB Floppy port.

- Supports 2XUSB port & PS/2 Mouse/ Keyboard port.

- Licensed AMI BIOS, 2M bits FLASH RAM.

- 24.3 cm x 20.5 cm Micro ATX SIZE 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   Intel® Celeron™ 366MHz Socket 370 processor
- DRAM   (128x 1) MB SDRAM (SEC KM48S8030BT-GH)
- CACHE SIZE   128 KB included in CPU
- DISPLAY   GA-630 VOODOO BANSHEE (16MB SGRAM)
- STORAGE   Onboard IDE (IBM DHEA 38451)
- O.S.   Windows NT™4.0 SPK4
- DRIVER   Display Driver at 1024 x 768 x 64k colors x 75Hz.

                    TRIONES Bus Master IDE Driver 3.60

Processor	Intel® Celeron™ (Socket 370) 366MHz (66x5.5)
Winbench99	
CPU mark32	713
FPU Winmark	1970
Business Disk	4100
Hi-End Disk	10300
Business Graphics	176
Hi-End Graphics	326
Winstone99	
Business	26.9

Hi-End	24.4

1.4. BLOCK DIAGRAM

1-3
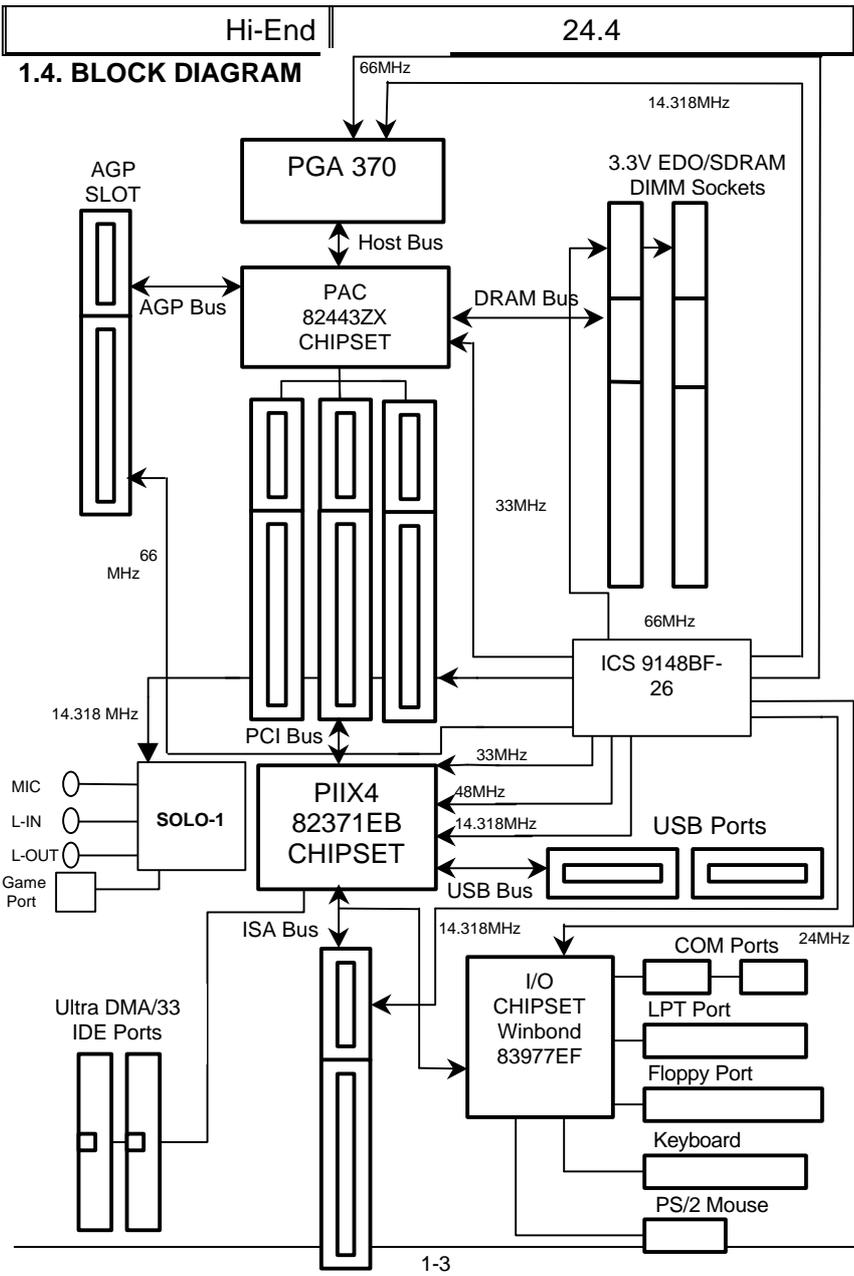
1.5. INTRODUCE THE INTEL$^{\hat{a}}$ Celeron^{TM} Socket 370 Processor

Figure 1: INTEL® Celeron^{TM} Socket370 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
  - − Celeron™ Socket 370 processor 366− 533 MHz.
  - − 66MHz Socket 370 on board.

- PROTECTION
  - − Speaker Alarm when detect "CPU FAN Failure" or "CPU Overheat".
  - − Automatically slow down CPU speed when "CPU Overheat".
  - − H/W monitor power status ($\pm$5V, $\pm$12V, VGTL,5VSB, CPU voltage & CMOS battery voltage).(Optional)

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

- DRAM MEMORY
  - − 2 banks 168 pins DIMM module sockets on board.
  - − Use 16 / 32 / 64 / 128 / 256 MB DIMM module DRAM.
  - − Supports EDO 16MB ~ 256MB, SDRAM 16MB~256MB.

- CACHE MEMORY
  - − 32 KB 1st cache memory included in CPU.
  - − 128KB L2 cache memory included 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)
  - − Supports Mode 3,4 IDE & ATAPI CD − ROM.

• I/O PORTS	− Supports 2 16550 COM ports.
	− Supports 1 EPP/ECP LPT port.
	− Supports 1 1.44/2.88 MB Floppy port.
	− Supports 2 USB ports.
	− Supports PS/2 Mouse & Keyboard.
• Audio Ports	− 1x Line in
(Optional)	− 1x Line out
	− 1x Mic in
	− 1x Game Port
	− 2x CD Line in
	− 1x TEL
• GREEN FUNCTION	− Suspend mode support.
	− Green switch & ACPI LED support.
	− IDE & Display power down support.
	− Monitors 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	− UUCD (Bus Master + Sound Driver + LDCM + Utility) (Optional)
• BIOS	− Licensed AMI 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	− 4.75 V to 5.25 V. (Max. 20A current at 5V.)

3. HARDWARE INSTALLATION

3.1. UNPACKING

The main board package should contain the following:

- The **6ZM7/6ZM7A** main board.

- USER'S MANUAL for main board.

- Cable set for IDE, Floppy devices.

- CD for main board Utility. (Bus Master + Sound Driver + LDCM + Utility)

The main board contains sensitive electric components, which can be easily damaged by static electricity, so the main board 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 main board 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 main board 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. MAIN BOARD LAYOUT

◁Figure 3.1▷
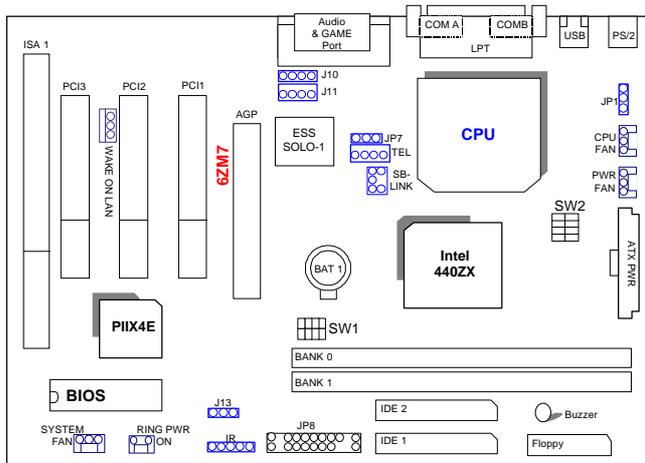
3.3. QUICK REFERENCE FOR JUMPERS & CONNECTORS

♦ I/O Ports Connector	
USB	USB port.
IDE1	For Primary IDE port.
IDE2	For Secondary IDE port.
PS/2	For PS/2 Mouse & Keyboard port.
FLOPPY	For Floppy port.
COMB	For Serial port2 (COM B){Support Modem Ring On}.
COMA	For Serial port1 (COM A){Support Modem Ring On}.
LPT	For LPT port.
ATX Power	For ATX Power Connector.
GAME & Audio	For GAME & MIC LINE-IN, LINE-OUT,TEL Port (Optional).

♦ Socket 370
For Celeron^{TM} Socket 370 Processor installed

♦ IR : INFRARED Connector (IR) -- Function Option	
Pin No.	Function
1	IR Data Output
2	GND
3	IR Data Input
4	NC
5	POWER (+)

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

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

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

♦ RING PWR ON	
Pin No.	Function
1	Signal
2	GND

♦ JP1 : Keyboard Power On Selection	
Pin No.	Function
1-2	Enabled Keyboard power on.
2-3	Disabled Keyboard power on(Default).

♦ J13 : CLEAR CMOS	
Pin No.	Function
1-2 Close	Clear CMOS
2-3 Close	Normal operation (Default).

♦ JP7 : Onboard Sound Function (Optional)	
Pin No.	Function
1-2 short	Onboard Sound Enabled.(Default)
2-3 short	Onboard Sound Disabled.

♦ Wake on LAN	
Pin No.	Function
1	+5V SB
2	GND
3	Signal

♦ SB-LINK : For PCI Audio / Sound Card use only--Optional	
Pin No.	Function
1	Signal
2	GND
3	NC
4	Signal
5	GND
6	Signal

JP8 : For 2X11 PINs Jumper

GN HD S P K R RES GD

JP8

P−P−P+ PWR
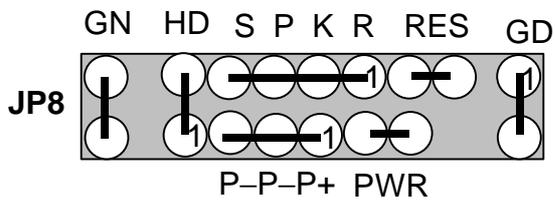
Soft PWR: Soft Power Connector

Open: Normal Operation
Short: Power On/Off

RES: Reset Switch
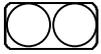
Open: Normal Operation
Short: For Hardware Reset System

P+P− P− : Power LED
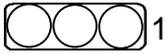
PIN 1 : anode (+)
PIN 2 : cathode (−)
PIN 3 : cathode (−)

SPKR: Speaker Connector

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

SPKR : Internal Speaker Connector (Default)

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

HD: IDE Hard Disk Active LED

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 (-)

3.4. DRAM INSTALLATION

The main board can be installed with 16 / 32 / 64 / 128 / 256 MB 168 pins DIMM module DRAM, and the DRAM speed must be 50 or 60 ns for EDO & 67MHz for SDRAM when system bus speed is set to 66MHz. The DRAM memory system on main board consists of bank 0 and bank 1.

Since 168 pins DIMM module is 64 bits width, therefore 1 piece of DIMM module may match a 64 bits system. The total memory size is 16 MB ~ 256MB SDRAM, EDO DRAM size is 16MB ~ 256MB. 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 DIMM module into the DIMM socket at Vertical angle. If there is a wrong direction of Pin 1, the SDRAM DIMM module could not be inserted into socket completely.

3.5. CPU SPEED SETUP

The system bus frequency can be switched between 66MHz and 133MHz by adjusting DIP SW2. The CPU frequency ratio can be switched from X3 to X9.5 by adjusting DIP SW1. The user can set up CPU speed for 366~533MHz processors by adjusting SW1 and SW2 properly.

SW1: (O:ON / X:OFF)

FREQ. RATIO	DIP SWITCH (SW)			
	1	2	3	4
X 3	O	X	O	O
X 3.5	X	X	O	O
X 4	O	O	X	O
X 4.5	X	O	X	O
X 5	O	X	X	O
X 5.5	X	X	X	O
X 6	O	O	O	X
X 6.5	X	O	O	X
X 7	O	X	O	X

X 7.5	X	X	O	X
X 8	O	O	X	X
X 8.5	X	O	X	X
X 9	O	X	X	X
X 9.5	X	X	X	X

Set System Bus Speed

SW2: (O:ON / X:OFF)

CPU	AGP	1	2	3	4
66	66	O	X	X	O
75	75	O	O	X	O
83	83	O	X	O	O
100	66	X	X	X	X
112	75	X	O	X	X
133	89	X	X	O	X

🔹**Please set the CPU host frequency in accordance with your processor's specifications. We don't recommend you to set the system bus frequency over the CPU's specification because these specific bus frequencies are not the standard specifications for CPU, chipset and most of the peripherals. Whether your system can run under these specific bus frequencies properly will depend on your hardware configurations, including CPU, Chipsets, SDRAM, Cards..etc.**

🔹**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 main board.**

3.6. CMOS RTC & ISA CFG CMOS RAM

There're RTC & CMOS RAM 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 after it cannot work.

🔹 Danger of explosion if battery is incorrectly replaced.

🔹 Replace only with the same or equivalent type recommended by the manufacturer.

✆※ Dispose of used batteries according to the manufacturer's instructions.

3.7. SPEAKER CONNECTOR INSTALLATION

There is a speaker in AT system for sound purpose. The 4 - Pins connector **SPKR** is used to connect speaker. Pin2-3 short is internal speaker (Default value).

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 pushed and released by user. The RESET switch is a 2 PIN connector and should be installed to **RST** on main board.

3.9. POWER LED CONNECTOR INSTALLATION

System has power LED lamp on the panel of chassis. The power LED will light on off or flash to indicate which step on the system. The connector should be connected to **P+P-P-** of main board in a correct direction.

3.10. IDE & ATAPI DEVICE INSTALLATION

There are two-Enhanced PCI IDE ports (**IDE1, IDE2**) on board, which following ATAPI standard SPEC. Each IDE port can connected to two ATAPI devices (IDE Hard Disk, CD-ROM or 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 main board can be mounted into the chassis and fixed by screw. To complete the main board 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. KEYBOARD & PS/2 MOUSE INSTALLATION

The main board 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 ready power-on the system.