integration with integrity

2808000 User's Manual

Mini-ITX Motherboard with LGA 775 for Intel Pentium 4/Celeron D Processor

Version 1.1

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Revision History

Revision	Date	Comment
Rev.1.0	Dec. 2006	Initial release
Rev.1.1	Feb. 2007	1. GPIO information inserted. 2. PANEL1 signals modified. 3. DVI1 signals modified.

CHAPTER 1

1. Introduction

1.1 Description

The 2808000 all-in-one Mini ITX is designed to fit a high performance Pentium 4 LGA 775 based processor and compatible for high-end computer system application with PCI bus architecture. It is made to meet today's demanding pace, and keep complete compatibility with hardware and software designed for the IBM PC/AT. The on-board devices support one PCI slot and integrated graphics and on-board Dual Marvell Gigabit Ethernet controller. It's beneficial to build up a high performance and high data availability system for VARs, or system integrators.

2808000 SERIES support the following processors:

- Intel ® Pentium® 4 processor Socket LGA 775 supporting Hyper-Threading technology based on 0.90 and 0.65 micron (CPUID = 0xh).(only support 5 series and 6 series)
- Intel ® Celeron D® processor Socket LGA 775 supporting Hyper-Threading technology based on 0.90 and 0.65 micron (CPUID = 0xh). (only support 5 series and 6 series)

This Mini ITX can run with Intel Socket LGA 775 Pentium 4(HT) processors, and support DIMM up to 2GB dual-channel DDR Memory. The enhanced on-board one PCI-IDE interface can support 2 drives up to PIO mode 4 timing and Ultra ATA33/66/100 synchronous mode feature, and 4 Serial ATA connectors high-speed data transfers at up to 150 MB/s. The on-board Super I/O chipset support two serial ports, one SIR (Serial Infrared) port, and one parallel port. Two high performance 16C550-compatible UARTs provide 16-byte send/receive FIFOs and the multi-mode parallel port supports SPP/EPP/ECP function, two RS-232 serial port interface. Besides, H/W monitor function, and supports 4 Serial ATA interface , Intel High Definition Audio as 5.1 surround sound , Hi-Speed USB 2.0 x 8 ports offer up to 40X greater bandwidth over USB 1.1 Also provide dual display function by VGA and DVI interface..

The Mini-ITX standard makes the 2808000 SERIES work with the one slot PCI. One 6-pin Mini-DIN connectors are provided to connect PS/2 mouse and keyboard. The on-board Flash ROM is used to make the BIOS update easier. The high precision Real Time Clock /calendar is built to support Y2K for accurate scheduling and storing configuration information. One 24-pin standard connector is designed to support ATX power function. A feature of CPU overheat protection will give user more security and stability. All of these features make 2808000 SERIES excellent in stand-alone applications.

Note :

(1) The 2808000 series only support Intel Pentium 4 processor 5 series and 6 series for 0.90 and 0.65 micron.

(2) The 2808000 series only support DDR 400 memory module.

1.2 Packing Check List

The 2808000 package includes the following basic items accompany with this manual.

- One 2808000 Min-ITX
- One Quick Installation Guide for 2808000
- One 40-pin IDE cable
- Two Serial ATA cable
- One Serial port cable for COM2
- One USB 2.0 cable
- One I/O shield
- One DVI cable (Optional)
- One Supporting CD-ROM contains User's Manual and internal VGA display driver and Marvell Gigabit Ethernet network controller driver and on board devices drivers

If any of these items is damaged or missed, please contact your vendor and save all packing materials for future replacement and maintenance.

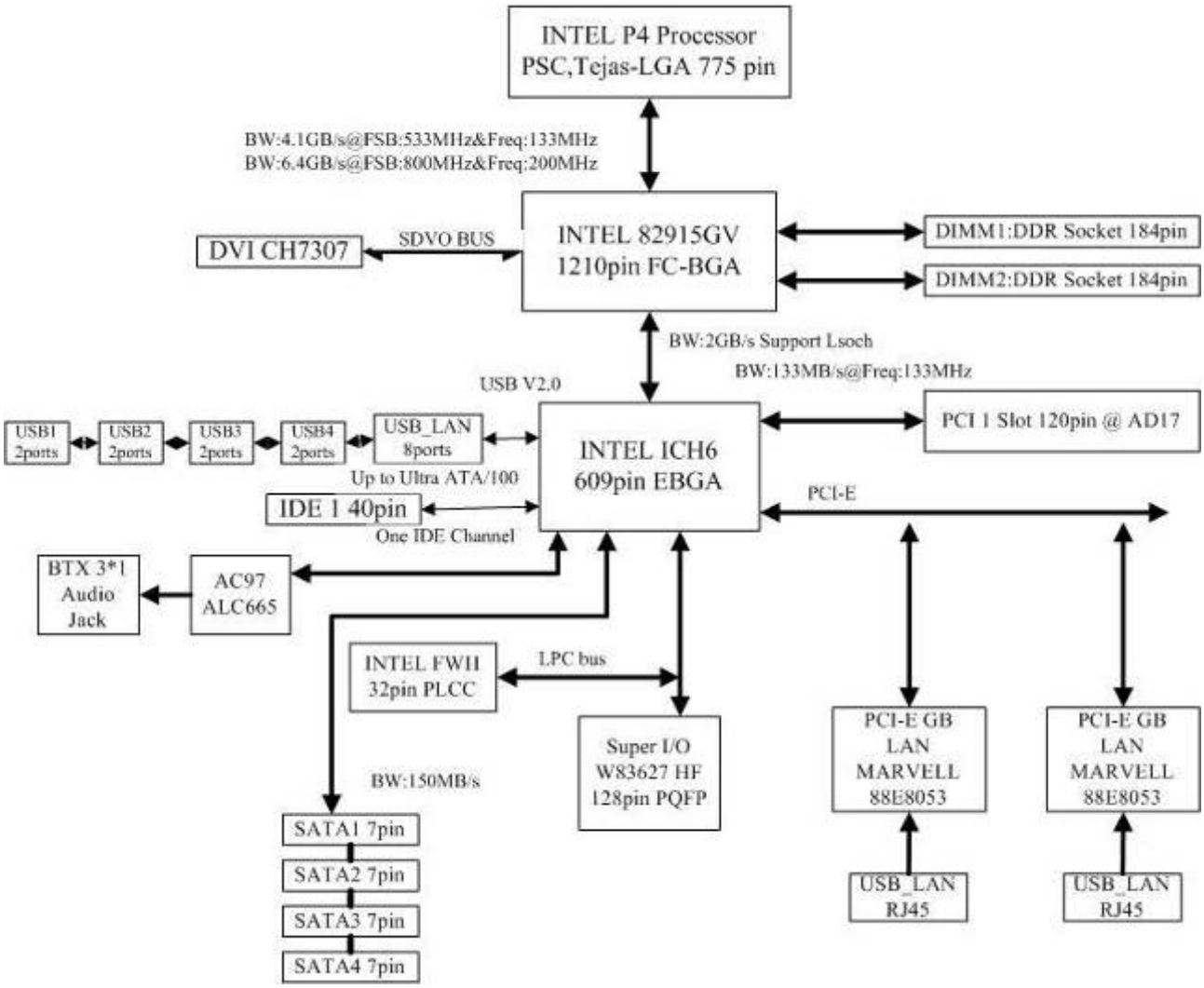
1.3 Specifications

System	
CPU	Intel® LGA775 Pentium® 4 / Celeron® D processor in the LGA775 package (600, 500, 300 sequences)
FSB	800/533 MHz
BIOS	Award BIOS with 4 Mb Flash EEPROM
System Chipset	Intel® 915GV + ICH6
I/O Chip	Winbond W83627THG I/O controller
System Memory	2 x 184-pin DIMM sockets support dual-channel DDR 400 SDRAM Max. up to 2 GB memory
Storage	1 x Parallel ATA IDE port with UDMA 33, ATA-66/100 support 4 x Serial ATA 150 ports
SSD	1 x CompactFlash socket with ejector at I/O side (shared Master IDE)
RAID	Optional ICH6R supports RAID 0, 1 and 0+1 function
H/W Status Monitor	Monitoring system temperature, voltage, and cooling fan status. Auto throttling control when CPU overheats.
Expansion	1 x PCI slot
MIO	
Internal	1 x RS-232, 4 x USB 2.0
External	1 x VGA, 1 x Audio jack, 2 x RJ-45, 1 x Parallel, 1 x RS-232, 4 x USB 2.0, 1 x KB, 1 x Mouse
Display	
Chipset	Intel® 915GV Integrated GMA 900 graphics
Display Memory	Intel® DVMT 3.0 supports up to 128 MB video memory
Resolution	Analog display : up to 2048 x 1536 @ 85Hz Digital display : up to 2048 x 1536 @ 85Hz
VGA/LCD Interface	DSUB-15 connector for VGA output
DVI	Chrontel CH7307 DVI transmitter
Audio	
AC97 Codec	Realtek® ALC655 5.1CH audio codec
Audio Interface	Mic in, Line in, CD Audio in, Line out, Rear out and Center/Subwoofer out

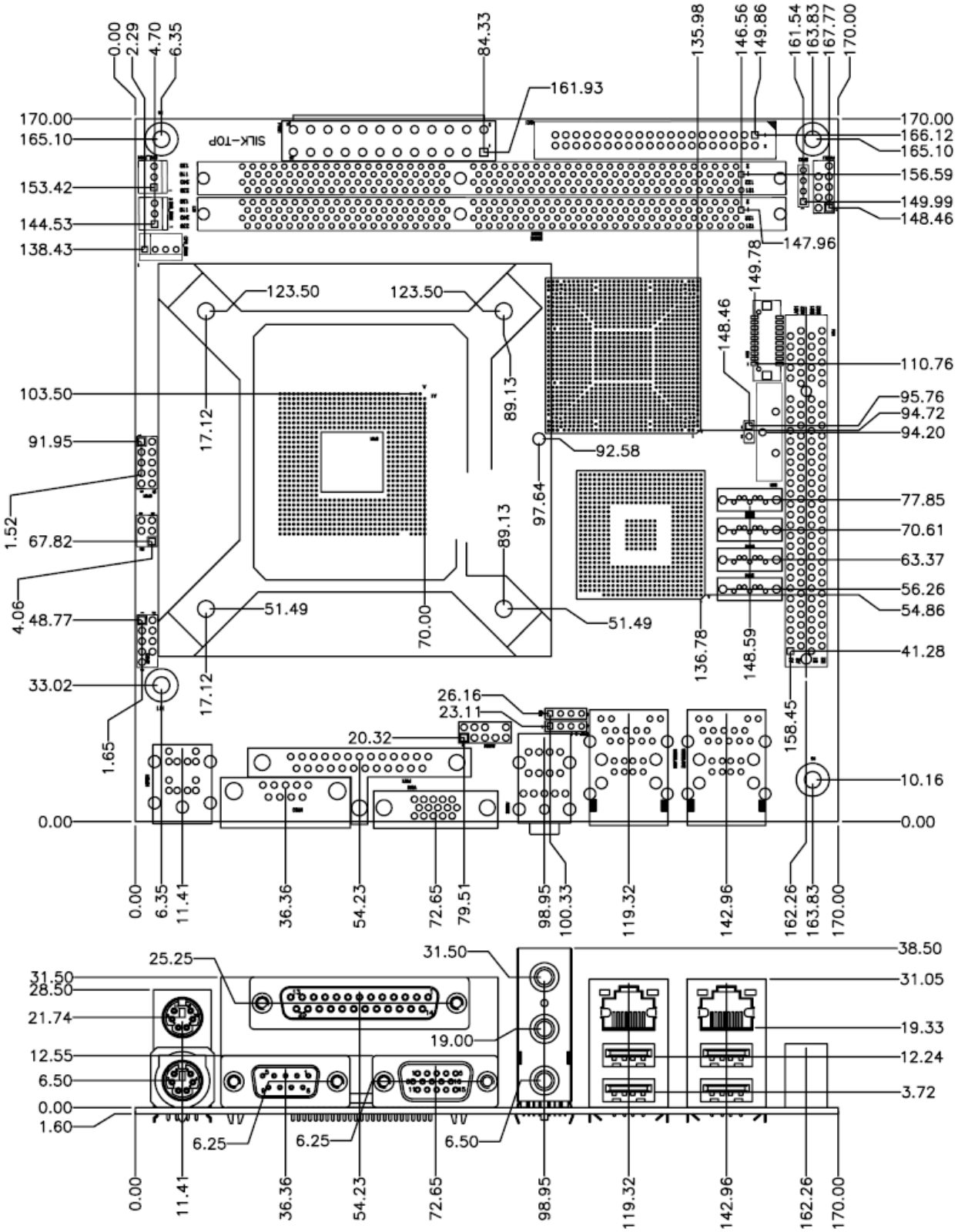
Ethernet	
Chipset	Dual MarvellR 88E8053 PCI ExpressTM Gigabit Ethernet controllers
Ethernet Interface	IEEE 802.3 10BASE-T/100BASE-TX/1000BASE-T
Mechanical & Environmental	
Power Requirement	76W (Intel 3.2 GHz CPU with 1 GB system memory in DOS V 6.22)
Power Type	24-pin ATX power connector, 1x 4-pin ATX 12V power connector
Operating Temperature	0~60°C (32~140°F)
Operating Humidity	0%~90% relative humidity, non-condensing
Size (L x W)	6.69" x 6.69" (170 mm x 170 mm)
Weight	0.94 lbs (0.43 Kg)

1.4 System Architecture

All of details operating relations are shown in 2808000 system block diagram.



1.5 Dimensions



Unit: mm

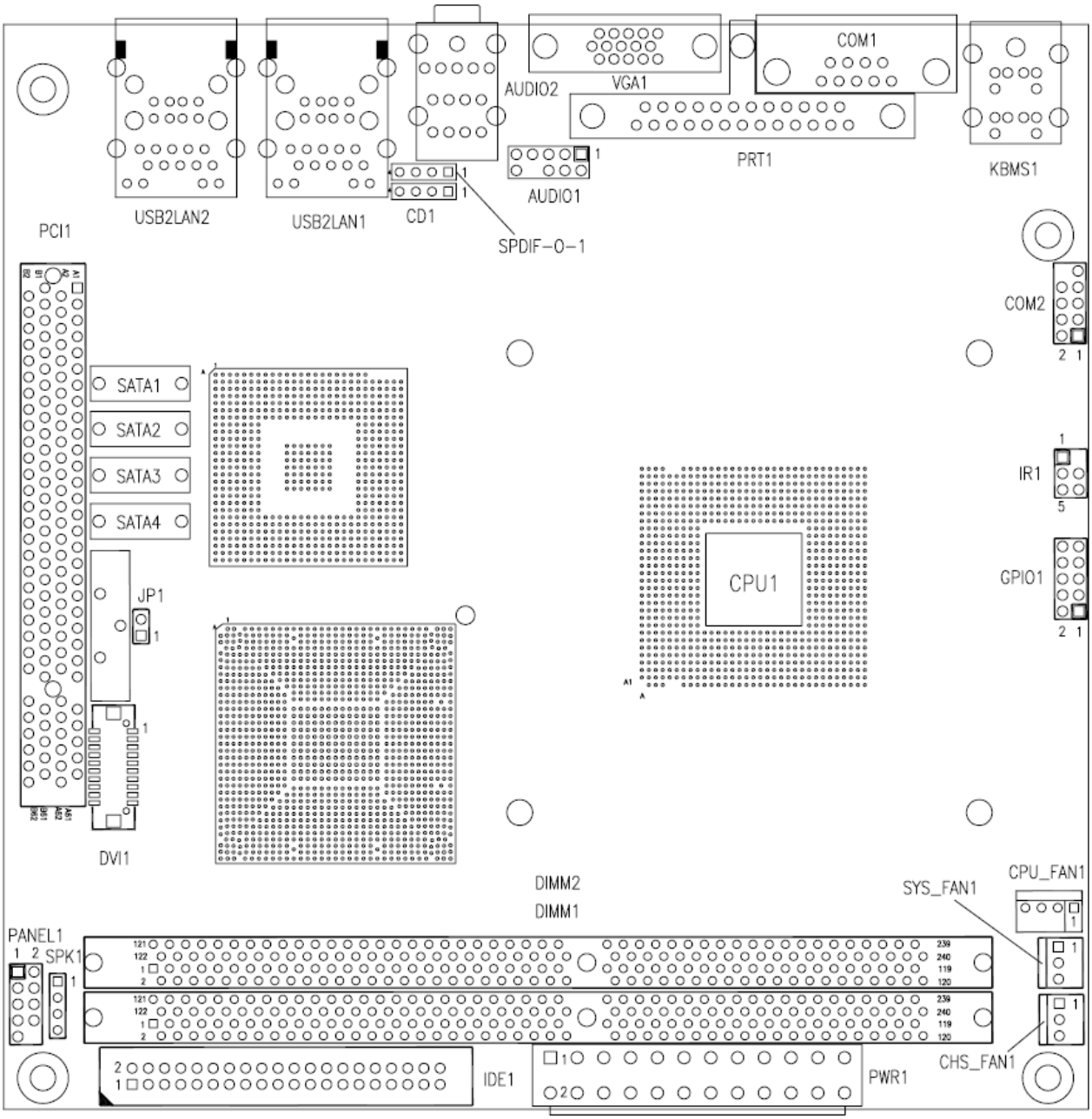
CHAPTER 2

2. Hardware Configuration Setting

This chapter gives the definitions and shows the positions of jumpers, headers and connectors. All of the configuration jumpers on 2808000 are in the proper position. The default settings shipped from factory are marked with an asterisk (★).

In general, jumpers on the Mini-ITX are used to select options for certain features. Some of the jumpers are designed to be user-configurable, allowing for system enhancement. The others are for testing purpose only and should not be altered. To select any option, cover the jumper cap over (SHORT) or remove (NC) it from the jumper pins according to the following instructions. Here, NC stands for "Not Connect".

2.1 Board Layout



2.2 Jumpers & Connectors

JUMPERS	FUNCTION	REMARK
JP1	RTC CMOS clear select	2 x 1 header

CONNECTORS	FUNCTION	REMARK
AUDIO1	Audio connector 1	5 x 2 header
AUDIO2	Audio connector 2	Audio jack x 3
CD1	CD-In from CD-ROM	4 x 1 header
CHS_FAN1	Chassis fan connector	3 x 1 wafer
COM1	D-sub 9-pin serial port 1 connector	
COM2	Serial port 2 connector	5 x 2 header
CPU_FAN1	CPU fan connector	4 x 1 header
DIMM1, DIMM2	184-pin DDR DIMM socket	
DVI1	DVI connector	HIROSE
GPIO1	GPIO connector	5 x 2 header
IDE1	Primary IDE connector	20 x 2 box header
IR1	IrDA connector	3 x 2 header
KBMS1	PS/2 keyboard & mouse	2 x 6-pin Mini-DIN
PANEL1	Front side indicators: IDE1 active LED (1-3) System power on LED (2-4) System reset (5-7) System power on switch (6-8)	2 x 5 header
PCI1	PCI slot	
PRT1	D-sub 25-pin Parallel port connector	
PWR1	24-pin ATX power connector	
PWR2	4-pin ATX power connector	For CPU power
SATA1, SATA2, SATA3, SATA4	Serial ATA connector 1, 2, 3 & 4	
SPDIF-O-1	SPDIF I/O connector	4 x 1 header
SPK1	Internal speaker connector	4 x 1 header
SYS_FAN1	System fan connector	3 x 1 wafer
USB2LAN1	USB 1, 2 & RJ-45 LAN 1 connectors	
USB2LAN2	USB 3, 4 & RJ-45 LAN 2 connectors	
USB3	Internal USB connector 5 & 6	
USB4	Internal USB connector 7 & 8	
VGA1	D-sub 15-pin VGA conenctor	

2.3 Jumpers/Connectors Setting

2.3.1 RTC CMOS Clear Select (JP1)

PIN No.	Description
Open	Normal operation ★
Short	Clear CMOS

2.3.2 Internal Audio for Chassis (AUDIO1)

PIN No.	Description
1	F_MIC1
2	Ground
3	F_MIC2
4	+5V
5	LOUTR
6	F_R
7	NC
8	NC
9	LOUTL
10	F_L

2.3.3 Audio Connector (AUDIO2)

PIN No.	Description
1 (Blue)	Line-in
2 (Green)	Speaker out
3 (Red)	MIC-in

2.3.4 CD-In from CD-ROM (CD1)

PIN No.	Description
1	CD-L
2	CD-Ground
3	CD-Ground
4	CD-R

2.3.5 Chassis/CPU/System Connectors (CHS_FAN1, CPU_FAN1, SYS_FAN1)

PIN No.	Description
1	GND
2	+12V
3	SENSE
4	Control (CPU_FAN1 only)

2.3.6 Serial Port 1/2 Connector (COM1, COM2)

PIN No.	Description
1	Data Carrier Detect
2	Received Data
3	Transmit Data
4	Data Terminal Ready
5	Ground
6	Data Set Ready
7	Request To Send
8	Clear To Send
9	Ring Indicator
10	Not used

2.3.7 DVI Connector (DVI1)

Description	PIN No.	PIN No.	Description
TDC0#	1	2	+5V
TDC0	3	4	GND
NC	5	6	NC
NC	7	8	NC
TDC1#	9	10	HPDET
TDC1	11	12	MDVIDATA
NC	13	14	MDVICLK
NC	15	16	Ground
TDC2#	17	18	TLC#
TDC2	19	20	TLC

Signal	Type	Description
TDC0,TDC0#	O	**DVI Data Channel 0 Output**: These pins provide the DVI differential output for data channel 0 (Blue).
TDC1,TDC1#	O	**DVI Data Channel 1 Output**: These pins provide the DVI differential output for data channel 1 (Green).
TDC2,TDC2#	O	**DVI Data Channel 2 Output**: These pins provide the DVI differential output for data channel 2 (Red).
HPDET	I	**Hot Plug Detect (internal pull-down)**: This input determines whether the DVI is connected to a DVI monitor. When terminated , the monitor is required to apply a voltage greater than 2.4 volts. Changes on the status of this pin will be relayed to the graphics controller via the P-OUT/TLDET* or GPIO(1)/TLDET* pin pulling low.
TMDSDATA	I/O	**DVI I2C Data**: This signal is used as the I2C DOC clock for a digital display connector (i.e. TV-Out Encoder , TMDS transmitter). This signal is tri-stated during a hard reset.
TMDSDCLK	I/O	**DVI DOC Clock**: This signal is used as the DOC clock for a digital display connector (i.e. primary digital monitor). This signal is tri-stated during a hard reset.
TLC,TLC#	O	**DVI Clock Output:** These pins provide the differential clock outputs to the DVI interface corresponding a data on TDC(0:2) outputs.

2.3.8 GPIO Connector (GPIO1)

PIN No.	Description
1	+3.3V
2	General Purpose I/O bit 3
3	General Purpose I/O bit 5
4	General Purpose I/O bit 0
5	General Purpose I/O bit 7
6	General Purpose I/O bit 2
7	General Purpose I/O bit 4
8	General Purpose I/O bit 1
9	General Purpose I/O bit 6
10	Ground

2.3.9 IrDA Connector (IR1)

PIN No.	Description
1	NC
2	NC
3	+5V
4	Infrared transmitter output
5	Ground
6	Infrared receiver input

2.3.10 PS/2 Keyboard & Mouse (KBMS1)

PIN No.	Description
1	Keyboard Data
2	Mouse Data
3	Ground
4	+5V
5	Keyboard Clock
6	Mouse Clock

2.3.11 Front Side Indicators (PANEL1)

IDE1 Active LED

PIN No.	Signal Description
1	+5V (Pull-up for HDD LED)
3	HDD active# (LED cathode terminal)

System Reset

PIN No.	Signal Description
5	Ground
7	Reset

System Power On Button

PIN No.	Signal Description
6	Power button control signal
8	Ground

2.3.12 24-pin ATX Power Connector (PWR1)

Description	PIN No.	PIN No.	Description
+3.3V	13	1	+3.3V
-12V	14	2	+3.3V
Ground	15	3	Ground
PS_ON	16	4	+5V
Ground	17	5	Ground
Ground	18	6	+5V
Ground	19	7	Ground
-5V	20	8	PW_OK
+5V	21	9	5VSB
+5V	22	10	+12V
+5V	23	11	+12V
Ground	24	12	+3.3V

2.3.13 24-pin ATX Power Connector (PWR2)

PIN No.	Description
1	+12V
2	Ground
3	+12V
4	Ground

2.3.14 Serial ATA 1/2/3/4 Connectors (SATA1, SATA2, SATA3, SATA4)

These SATA connectors support Serial ATA 150. Each SATA connector can only support one serial ATA device.

Note: With most storage devices, there is a power cable that you need attach to a power source (power supply).

2.3.15 SPDIF I/O Connector (SPDIF-O-1)

PIN No.	Description
1	SPO
2	+5V
3	NC
4	Ground

2.3.16 Internal Speaker Connector (SPK1)

PIN No.	Description
1	SPK Active#
2	SPK Active#
3	Key
4	+5V

2.3.17 LAN 1/2 & USB 1/2/3/4 Connectors (USB2LAN1, USB2LAN2)

LAN 1/2

PIN No.	Description	PIN No.	Description
1	TX+	5	NC
2	TX-	6	RX-
3	RX+	7	NC
4	NC	8	NC

USB 1/2/3/4

PIN No.	Description	PIN No.	Description
1	+5 V (fused)	5	+5 V (fused)
2	USBP0-/2-	6	USBP1+/3-
3	USBP0-/2+	7	USBP1+/3+
4	Ground	8	Ground

2.3.18 Internal USB 5/6/7/8 Connectors (USB3, USB4)

PIN No.	Description
1	5VSB
2	5VSB
3	DATA_5- / DATA_7-
4	DATA_4- / DATA_6-
5	DATA_5+ / DATA_7+
6	DATA_4+ / DATA_6+
7	Ground
8	Ground
9	NC
10	NC

Note :

1) This mainboard provides 2 USB headers on the board allowing for 4 additional USB ports. To make use of these headers, you must attach a USB bracket/cable with USB ports (some models will come packaged with a USB 4-port bracket-cable). The optionally packaged bracket will have two connectors that you can connect to the headers (USB3, USB4). The other end (bracket containing the USB ports) is attached to the computer casing.

If you are using a USB 2.0 device with Windows 2000/XP, you will need to install the USB 2.0 driver from the Microsoft® website. If you are using Service pack 1 (or later) for Windows® XP, and using Service pack4 (or later) for Windows® 2000, you will not have to install the driver.

2.3.19 VGA Connector (VGA1)

VGA

Description	PIN No.	PIN No.	Description
Green Signal	2	1	Red Signal
NC	4	3	Blue Signal
Ground	6	5	Ground
Ground	8	7	Ground
Ground	10	9	+5V
DCC_DATA	12	11	NC
VSYNC	14	13	HSYNC
		15	DCC_CLK

CHAPTER 3

3. System Installation

This chapter provides you with instructions on how to setup your system. The additional information shows you how to install CPU and memory.

3.1 Intel® LGA775 Processor

1) Lift the handling lever of CPU socket outwards and upwards to the other end.
2) Align the processor pins with pin hones on the socket. Make sure that the notched corner or dot mark (pin 1) of the CPU corresponds to the socket's bevel end. Then press the CPU gently until it fits into place. If this operation is not easy or smooth, don't do it forcibly. You need to check and rebuild the CPU pin uniformly.
3) Push down the lever to lock processor chip into the socket.
4) Follow the installation guide of cooling fan or heat sink to mount it on CPU surface and lock it on the socket 775.
5) Be sure to follow particular CPU speed and voltage type to adjust the jumper settings properly.

Having figured out in general what you get, the next job is to bite the bullet and build your PC.

3.1.1 Precautions

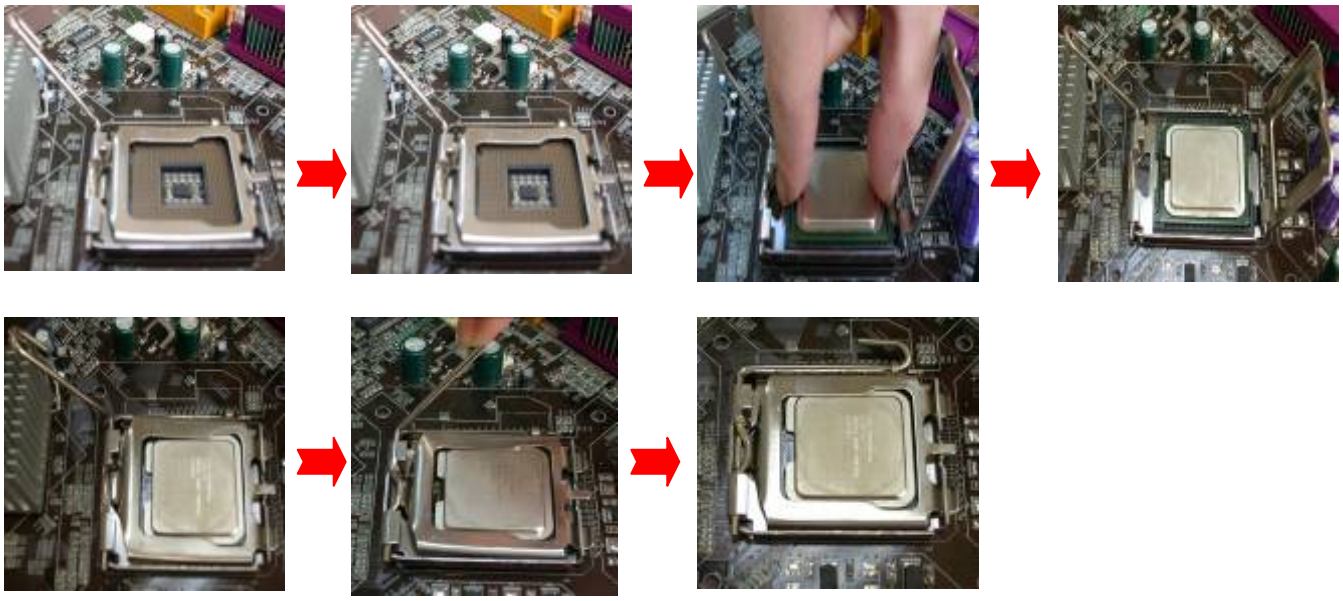
When integrating a Pentium 4 processor-based system, be sure to take the proper electrostatic discharge (ESD) precautions. Consider using ground straps, gloves, ESD mats, or other protective measures to avoid damaging the processor and other electrical components in the system.

Warning

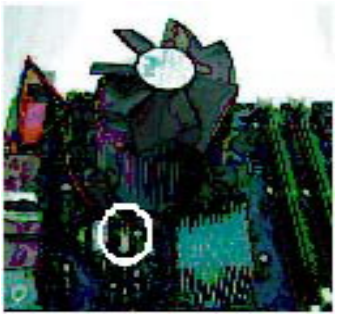
Do not touch socket sensitive contacts. Chain tech assumes no responsibility for the potential damages caused by this action and therefore the warranty we provide may be invalid.

3.1.2 Installing CPU

1) Disengage Load Lever by depressing down and out on the hook to clear retention tab. Rotate Load Lever to fully open position at approximately 135°
2) Rotate Load Plate to fully open position at approximately 100°. Remove Socket Protective Cover. With left hand index finger and thumb to support the load plate edge, engage protective cover finger tab with right hand thumb and peel the cover from LGA775 Socket while pressing on center of protective cover to assist in removal.
3) Locate the two orientation key notches.
4) Grasp the processor with thumb and index finger. (Grasp the edges without the orientation notches.) The socket has cutouts for your fingers to fit into. Carefully place the package into the socket body using a purely vertical motion. (Tilting the processor into place or shifting it into place on the socket can damage the sensitive socket contacts.)
5) Verify that package is within the socket body and properly mated to the orientation keys
6) Close the socket by
   A) Close the Load Plate
   B) While pressing down lightly on Load Plate, engage the Load Lever.
   C) Secure Load Lever with Load Plate tab under retention tab of Load Lever.



3.1.3 Installing Cooler Fan



Warning

For a safety landing, avoid leaving prongs on hard surface.

Instructions

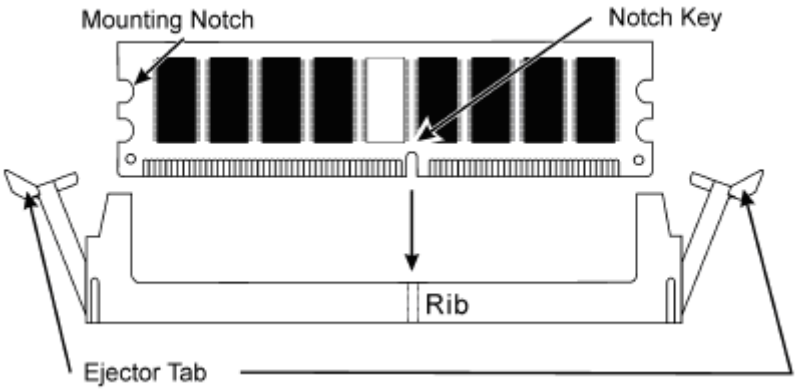
Smear thermal grease on the top of the CPU. Lower the CPU fan onto the CPU/CPU socket and secure it using the attachments or screws provided on the fan. Finally, attach the fan power cable to the CPUFAN adapter. For more details on this, go to http://www.intel.com

3.2 Main Memory

2808000 provides two DDR DIMM (184-pin Dual In-line Memory Module) to support 2.6V DDRAM (Synchronized DRAM) as on-board main memory. The maximum memory size is 256 MB ~2 GB with using 256MB/512MB/1GB technology. Supports up to 2 double sided DIMMs at DDR 400 Hz. The memory architecture adopts 128-bit data interface to support for x8 and x16 DDRAM (DDR1) device width. In addition, it only supports Non-ECC memory.

For system compatibility and stability, don't use memory module without brand. You can also use the single or double-side DIMM.

Without out the contact and lock integrity of memory module with socket, it will impact on the system reliability. Follow normal procedure to install your DDRAM module into memory socket. Before locking, make sure that the module has been fully inserted into the SODIMM slot.



NOTE: For maintaining system stability, do not change any of DDR**2** memory parameters in BIOS setup to upgrade your system performance without acquiring technical information.

3.3 Installing the Mini-ITX

To install your 2808000 into standard chassis or proprietary environment, you need to perform the following steps:

1. Check all jumpers setting on proper position
2. Install and configure CPU and memory module on right position.
3. Place 2808000 into the dedicated position in your system
4. Attach cables to existing peripheral devices and secure it

WARNING: Please ensure that your ESB properly inserted and fixed by mechanism. Otherwise, the system might be unstable or do not work from bad contact of golden finger.

3.2.1 Intel 915GV Integrated Graphics Controller

The on-board graphics controller integrated in 915GV(GMCH) chipset that integrates high performance memory technology for the PCI Express x16, the on-board operates at a frequency of 2.5Gb/s on each lane while employing 8b/10b encoding, and supports a maximum theoretical bandwidth of 4Gb/s each direction, the 82915GV GMCH multiplexes the PCI Express interface with DVI & CRT support.

Resolution	**Bits Per Pixel (frequency in Hz)**		
	256 Color	**16-bit**	**32-bit**
640x480	60,70,72,75,85,100,120	60,70,72,75,85,100,120	60,70,72,75,85,100,120
800x600	60,70,72,75,85,100,120	60,70,72,75,85,100,120	60,70,72,75,85,100,120
1024x768	60,70,72,75,85,100,120	60,70,72,75,85,100,120	60,70,72,75,85,100,120
1152x864	60,75,85,100	60,75,85,100	60,75,85,100
1280x600	60	60	60
1280x720	60,75,85,100	60,75,85,100	60,75,85,100
1280x768	60,75,85	60,75,85	60,75,85
1280x960	60,75,85	60,75,85	60,75,85
1280x1024	60,75,85,100,120	60,75,85,100,120	60,75,85,100,120
1400x1050	60,75,85	60,75,85	60,75,85
1600x900	60,75,85,100,120	60,75,85,100,120	60,75,85,100,120
1600x1200	60,75,85,100,120	60,75,85,100,120	60,75,85,100,120
1856x1392	60,75	60,75	60,75
1920x1080	60,75,85,100	60,75,85,100	60,75,85,100
1920x1200	60,75,85	60,75,85	60,75,85
1280x1024	60,75	60,75	60,75
1920x1440	60,75,85	60,75,85	60,75,85
2048x1536	60,75	60,75	60,75

3.2.2 Dual Marvell Gigabit Ethernet Controllers

The 2808000 provides two LED indicators on RJ-45 connectors to show LAN interface status. These messages will give you a guide for troubleshooting.

Yellow LED indicates transmit and receive activity.

Blinking: indicates transmit/receive activity

On: indicates no activity but link is valid

Off: link is invalid

Green LED indicates Link speed

On: link speed at 100/1000Mbps

Off: link speed at 10Mbps

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