



integration with integrity

User's Manual

Single Board Computer 2807860

Version 2.0, March 2008

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## Manual Revision Information

Reversion	Revision History	Date
2.0	Second Edition	March 2008

## Item Checklist

- AMD Geode LX800 & AMD CS5536 Chipset Based Motherboard
- Cable for IDE Port
- Optional USB Cable
- Optional Serial Port Cable
- CD for motherboard utilities
- AMD Geode LX800 & AMD CS5536 Chipset Based Motherboard User's Manual

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# Chapter 1

## Introduction of GEODE LX800 & AMD CS5536 Chipset Motherboards

### 1-1 Feature of motherboard

The GEODE LX800 & AMD CS5536 chipset motherboard series are designed for the new generation AMD Geode™ processor family guaranteed both of the performance and stability of general purpose IPC and dedicated IPC platform solutions. The GEODE LX800 & AMD CS5536 chipset is fully optimized to provide the variety IPC platform solutions by featuring the high compatibilities and cost-effective, low power consumption, high performance, and superior core graphics engine.

The motherboard AMD Geode™ LX 800@0.9W, with low power consumption never denies market segments. The embedded AMD Geode™ LX family processor has evolved to meet the specific requirements of extended temperature applications in telecommunications infrastructure (including wired, wireless, and BSC/MSC), single board computing, automotive and transportation systems and industrial control and monitoring.

The GEODE LX800 & AMD CS5536 chipset motherboard series support 133MHz Front Side Bus and provide 166MHz / 200MHz Memory clock frequency for DDR 333/400 system RAM Modules which is expandable to 1.0GB. The GEODE LX800 & AMD CS5536 chipset motherboard offers 2.5 inch ULTRA ATA 100 HDD that increases the performance of whole system. The Realtek RTL8110SC Gigabit Ethernet compatible PCI LAN which supports the Fast Ethernet LAN function of 10 / 100Mb/s data transfer rate for internet or intranet connections. The motherboard series are also integrated Realtek ALC655 AC'97 2-channel Audio CODEC on system which is fully compatible with Sound Blaster Pro® that gives you the best sound quality and compatibility.

The integrated superior core graphics engine supports MMX and AMD 3DNow! Technology instruction sets and offers exceptional playback and streaming of various digital video formats while maintaining ultra low power consumption and exerting minimal load on the processor. It also provides extensive display support with outputs to High-resolution CRT and TFT outputs (simultaneous operation) with support for High Definition (HD) and Standard Definition (SD) standards and support for 1920x1440 in CRT mode.

Embedded 4 USB2.0 functional ports delivering 480Mb/s data transfer rate, these motherboards meet USB2.0 demands data transport demands which are also equipped with hardware monitor function on system to monitor and protect your system and maintain your non-stop business computing.

#### **Targets at High Growth Markets: Digital Home / Digital Office / Digital World**

- Personal electronics such as personal video recorders (PVR), set top boxes, home theatres, digital audio centers, etc.
- Mini PCs / Green clients / Quiet desktop PCs / High density servers
- Home server appliances / Public information/entertainment kiosks / Point-of-Sales systems / Intelligent displays / Edge networking devices / Hospital monitoring systems / Municipal control & monitoring systems

## 1-1.1 Special Feature of motherboard

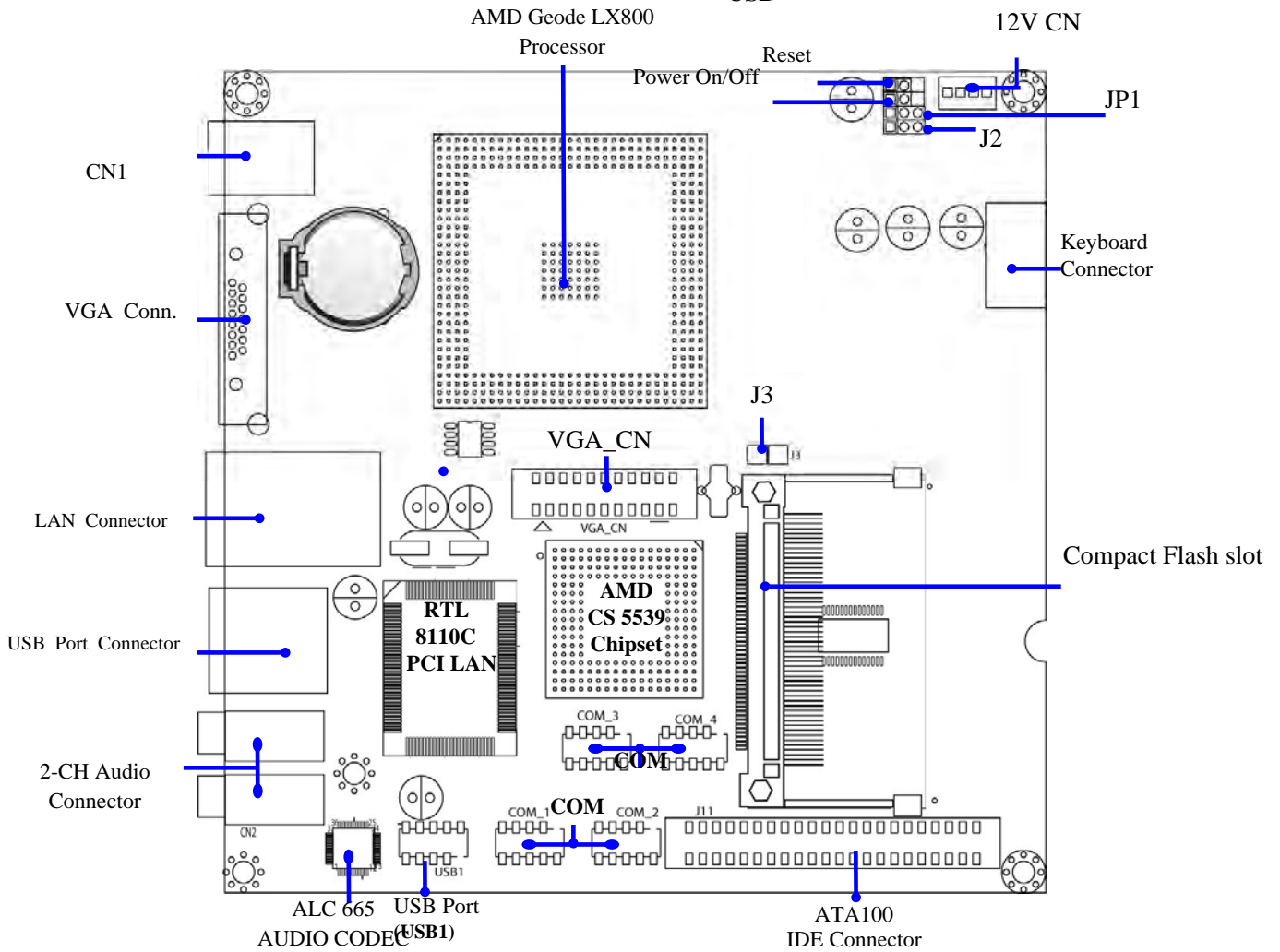
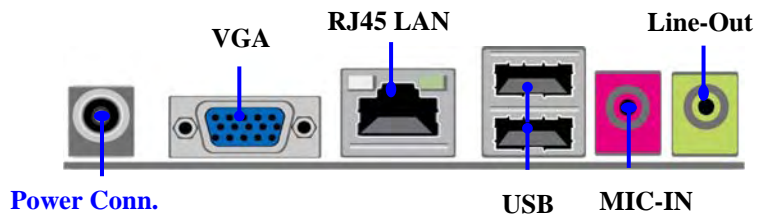
### OC-CON --- (High-polymer Solid Electrolysis Aluminum Capacitors)

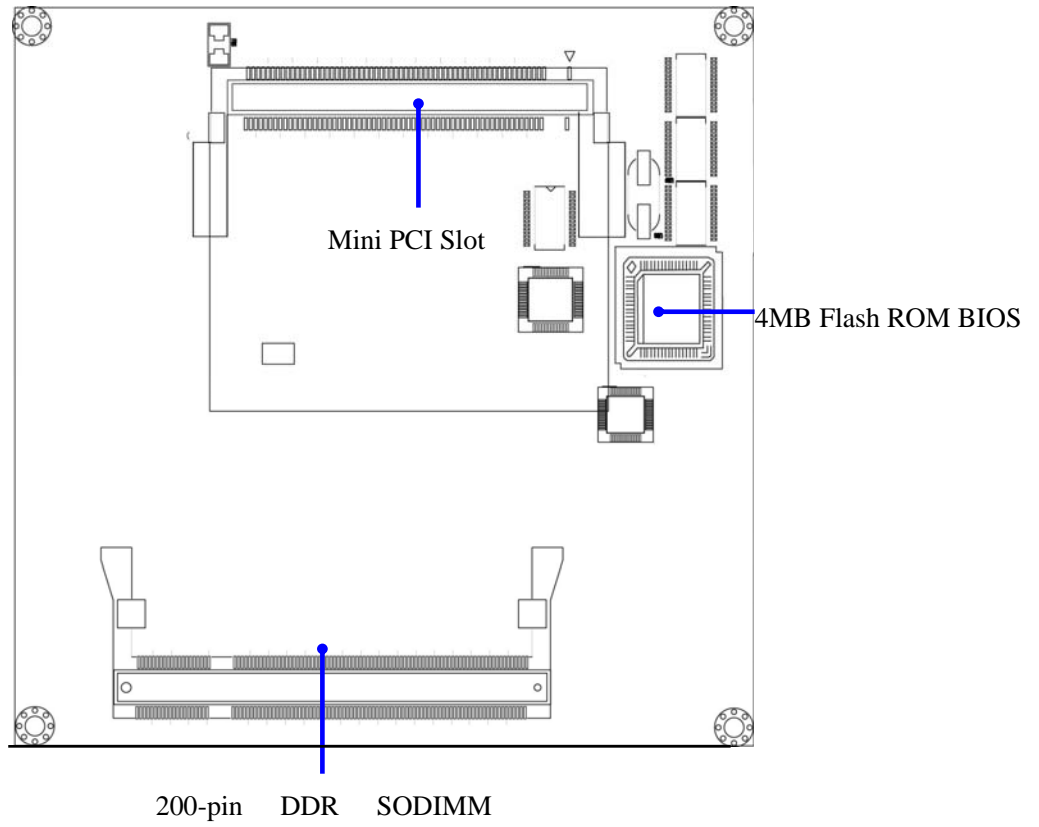
The working temperature is from 55 degrees Centigrade below zero to 125 degrees Centigrade, OC-CON capacitors possess superior physical characteristics that can be while reducing the working temperature between 20 degrees Centigrade each time, intact extension 10 times of effective product operation lives, at not rising degrees Centigrade of working temperatures each time a relative one, life of product decline 10% only too.

## 1-2 Specification

Spec	Description
<b>Design</b>	* Nano ITX form factor 6 layers PCB size: 12.0x12.0cm
<b>Chipset</b>	* Northbridge: AMD Geode LX800 * Southbridge: AMD CS5536 Chipset
<b>Embedded CPU</b>	* Support 133MHz Front Side Bus AMD Geode™ LX800 processor up to 533 MHz * Low Power Consumption and Fanless * Socket-A AMD Geode™ LX Series processor utilizing BGA481 package. * 64K L1 and 128K L2 Cache
<b>Memory Socket</b>	* 200-pin DDR SODIMM socket x1 * Support DDR 400/333 system RAM Modules DDR memory * Expandable to 1GB.
<b>Integrated VGA</b>	* Integrated FPU that support MMX and AMD 3DNow! Technology instructions sets * 9 GB/s internal Geode Link technology Interface Unit(GLIU) * High-resolution CRT outputs * VESA 1.1 and 2.0 VIP/VDA support
<b>Expansion Slots</b>	* 32-bit Mini-PCI slot x 1pcs
<b>Integrate IDE</b>	* One PCI IDE controller that supports PCI Bus Mastering, ATA PIO/DMA and the ULTRA DMA 33/66/100 functions that deliver the data transfer rate up to 100 MB/s;
<b>LAN</b>	* Integrated Realtek RTL8110SC PCI LAN. * Support Fast Ethernet LAN function of providing 10Mb/100Mb/s data transfer rate
<b>Audio</b>	* Realtek ALC655 AC97'4-channel Audio Codec integrated * Audio driver and utility included
<b>BIOS</b>	* Award 4MB LPC Flash ROM
<b>Multi I/O</b>	* PS/2 keyboard Connector * D-Sub 15-pin VGA Conn.x1 * USB 2.0 connector x 2, USB2.0 header x1 * Serial port header x4 * 2-channel Audio connector (Line-out, MIC)

# 1-3 Layout Diagram & Jumper Setting





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<b>Jumper</b>	<b>Name</b>	<b>Description</b>	<b>Page</b>
J1	ATX/AT Mode selecte	3-pin Block	p.9
J2	CMOS RAM Clear Function Setting	3-pin Block	p.9
J3	CF Card Master/Slave Mode Select	2-pin Block	p.10

### *Connectors*

<b>Connector</b>	<b>Name</b>	<b>Description</b>	<b>Page</b>
CN1	DC 12V Power Jack	DC Power Jack	p.13
12V CN	12V Power Connector	4-pin Block	p.13
VGA CN	LVDS Daughter Board Connector	22-pin Block	p.13
JUSB1	USB Port Connector	4-pin Connector	p.14
LAN1	RJ45 LAN Connector	4-pin Connector	p.14
VGA1	VGA Port Connector	15-pin Female	p.14
CN4	Line-Out /MIC Audio Connector	2 Phone Jack	p.14
PS2 KB	PS2 Keyboard Connector	5-Pin Connector	p.14
CF	Compact Flash Card	50-pin Expansion Socket	p.14

### *Headers*

<b>Header</b>	<b>Name</b>	<b>Description</b>	<b>Page</b>
USB1	USB2.0 Port Headers	9-pin Block	p.15
J11	44-Pin IDE Connector	44-pin IDE Block	p.15
RESET	Reset switch lead	2-pin Block	p.15
PWR BTN	Power Button Headers	2-pin Block	p.15
COM1/COM2 COM3/COM4	Serial Port Headers	9-pin header	p.16

### *Expansion Sockets*

<b>Socket/Slot</b>	<b>Name</b>	<b>Description</b>	<b>Page</b>
DDR	DDR SDRAM Module Socket	200-pin DDR SODIMM Module Expansion Socket	p.11
Mini PCI	Mini PCI Slot	124-Pin Mini PCI Local Bus Expansion slots	p.12

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## Chapter 2

### Hardware installation

#### 2-1 Hardware installation Steps

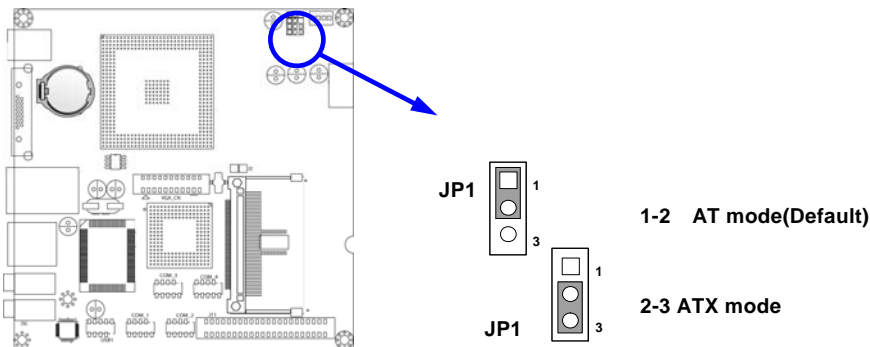
Before using your computer, you had better complete the following steps:

1. Check motherboard jumper setting
2. Install System Memory (DIMM)
3. Install Expansion cards
4. Connect IDE, Front Panel /Back Panel cable
5. Connect Power connector
6. Install Operating System
7. Install Driver and Utility

#### 2-2 Checking Motherboard's Jumper Setting

##### (1) ATX/AT Mode Selected (3-pin):JP1

J1 is used to select from ATX/ AT mode.



##### (2) CMOS RAM Clear (3-pin): J2

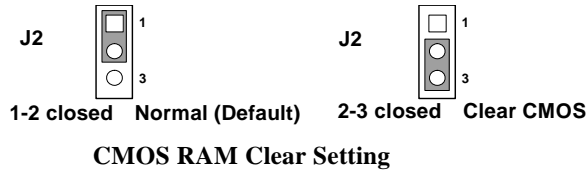
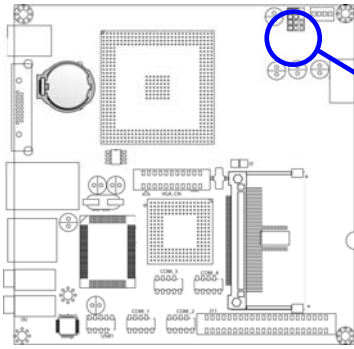
A battery must be used to retain the motherboard configuration in CMOS RAM short 1-2 pins of JPAT to store the CMOS data.

To clear the CMOS, follow the procedure below:

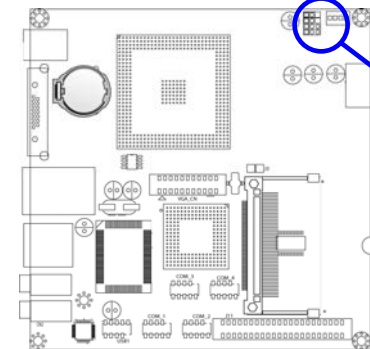
1. Turn off the system and unplug the AC power
2. Remove ATX power cable from ATX power connector
3. Locate JBAT and short pins 2-3 for a few seconds
4. Return JBAT to its normal setting by shorting pins 1-2
5. Connect ATX power cable back to ATX power connector

**Note: When should clear CMOS**

1. *Troubleshooting*
2. *Forget password*
3. *After over clocking system boot fail*



### (3) CF Card Master/Slave Mode(2-Pin) : J3



## 2-3 Glossary

**Chipset (core logic)** - two or more integrated circuits which control the interfaces between the system processor, RAM, I/O devices, and adapter cards.

**Processor socket** - the socket used to mount the system processor on the motherboard.

**Slot (AGP, PCI, ISA, RAM)** - the slots used to mount adapter cards and system RAM.

**PCI - Peripheral Component Interconnect** - a high speed interface for video cards, sound cards, network interface cards, and modems; runs at 33MHz.

**Serial Port** - a low speed interface typically used for mouse and external modems.

**Parallel Port** - a low speed interface typically used for printers.

**PS/2** - a low speed interface used for mouse and keyboards.

**USB - Universal Serial Bus** - a medium speed interface typically used for mouse, keyboards, scanners, and some digital cameras.

**Sound (interface)** - the interface between the sound card or integrated sound connectors and speakers, MIC, game controllers, and MIDI sound devices.

**BIOS (Basic Input/Output System)** - the program logic used to boot up a computer and establish the relationship between the various components.

**Driver** - software, which defines the characteristics of a device for use by another device or other software.

**Processor** - the "Central Processing Unit" (CPU); the principal integrated circuit used for doing the "computing" in "personal computer"

**Front Side Bus Frequency** - The working frequency of the motherboard, which is generated by the clock generator for CPU, DRAM and PCI BUS.

**CPU L2 Cache** - The flash memory inside the CPU, normally Pentium III CPU has 256K or above, while Celeron CPU will have 128K.

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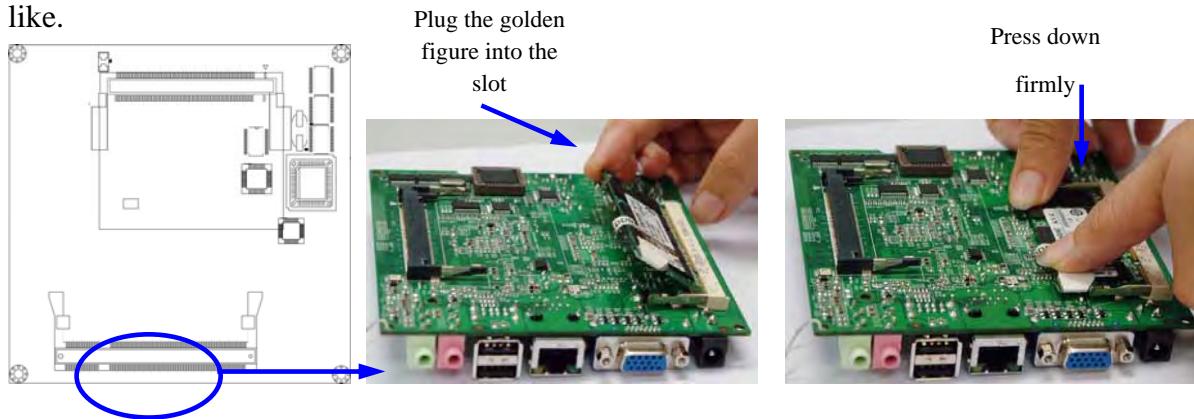
## 2-4 Install Memory

The motherboards provide one 200-pin SMALL OUTLINE DUAL INLINE MEMORY MODULES (SODIMM) sites for memory expansion available from minimum memory size of 64MB to maximum memory size of 1.0GB DDR SDRAM.

### Valid Memory Configurations

Bank	200-Pin DIMM	PCS	Total Memory
Bank 0, 1 (DDR1)	DDR 400 / DDR333/ DDR 266 DDR SDRAM Module	X1	64MB~1.0GB
Total	System Memory (Max. 1.0GB)	1	64MB~1.0GB

Generally, installing SODDDR SDRAM modules to your motherboard is very easy; you can refer to figure 2-4 to see what a 200-Pin DDR 333 / DDR 266 DDR SDRAM module looks like.



**NOTE!** When you install DIMM module fully into the DIMM socket the eject tab should be locked into the DIMM module very firmly and fit into its indentation on both sides.

**WARNING!** For the DDR SDRAM CLOCK is set at 166MHz, use only DDR333-compliant DDR Modules. When this motherboard operate at 133MHz, most system will not even boot if non-compliant modules are used because of the strict timing issues, if your SDR Modules are not DDR333-compliant, set the DDR SDRAM clock to 133MHz to ensure system stability.

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## 2-5 Expansion Cards

**WARNING!** Turn off your power when adding or removing expansion cards or other system components. Failure to do so may cause severe damage to both your motherboard and expansion cards.

### 2-5-1 Procedure For Expansion Card Installation

1. Read the documentation for your expansion card and make any necessary hardware or software setting for your expansion card such as jumpers.
2. Remove your computer's cover and the bracket plate on the slot you intend to use.
3. Align the card's connectors and press firmly.
4. Secure the card on the slot with the screen you remove above.
5. Replace the computer system's cover.
6. Set up the BIOS if necessary.
7. Install the necessary software driver for your expansion card.

### 2-5-2 Assigning IRQs For Expansion Card

Some expansion cards need an IRQ to operate. Generally, an IRQ must exclusively assign to one use. In a standard design, there are 16 IRQs available but most of them are already in use.

#### Standard Interrupt Assignments

IRQ	Priority	Standard function
0	N/A	System Timer
1	N/A	Keyboard Controller
2	N/A	Programmable Interrupt
3 *	8	Communications Port (COM2)
4 *	9	Communications Port (COM1)
5 *	6	Sound Card (sometimes LPT2)
6 *	11	Floppy Disk Controller
7 *	7	Printer Port (LPT1)
8	N/A	System CMOS/Real Time Clock
9 *	10	ACPI Mode when enabled
10 *	3	IRQ Holder for PCI Steering
11 *	2	IRQ Holder for PCI Steering
12 *	4	PS/2 Compatible Mouse Port
13	N/A	Numeric Data Processor
14 *	5	Primary IDE Channel
15 *	1	Secondary IDE Channel

\* These IRQs are usually available for ISA or PCI devices.

### 2-5-3 Interrupt Request Table For This Motherboard

Interrupt request are shared as shown the table below:

	INT A	INT B	INT C	INT D	INT E	INT F	INT G	INT H
Slot 1		√						
Onboard VGA	√							
Onboard USB 1	√							
Onboard USB 2		√						

LAN			√					
AC97/MC97			√					

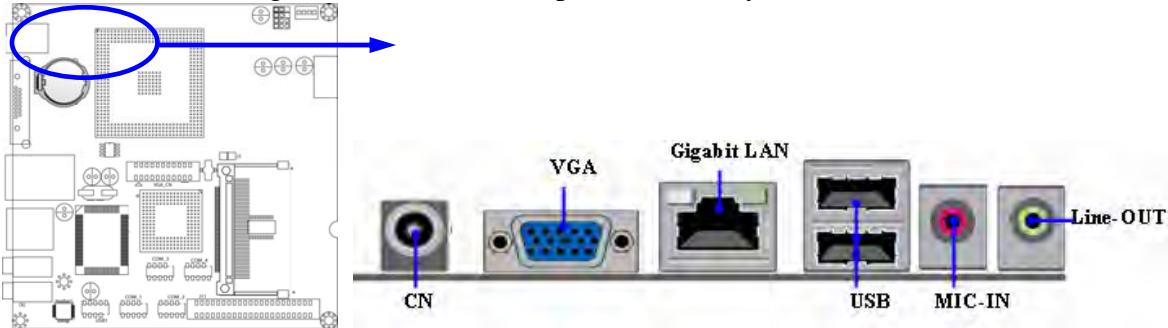
**IMPORTANT!** If using PCI cards on shared slots, make sure that the drivers support “Shared IRQ” or that the cards don’t need IRQ assignments. Conflicts will arise between the two PCI groups that will make the system unstable or cards inoperable.

## 2-6 Connectors and Headers

### 2-6-1 Connectors

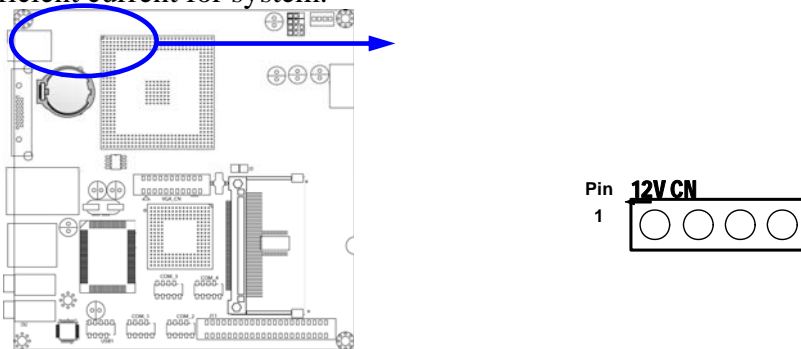
#### (1) CN1: Power Jack

The motherboard power is supplied from a power jack. This is a new defined connector connecting the power adaptor which provides DC12V +/- power for the motherboard. The Power Supply allows using soft power on momentary switch that connect from the front panel switch to 2-pins Power On jumper pole on the motherboard. When the power switch on the back of the power supply turned on, the full power will not come into the system board until the front panel switch is momentarily pressed. Press this switch again will turn off the power to the system board.



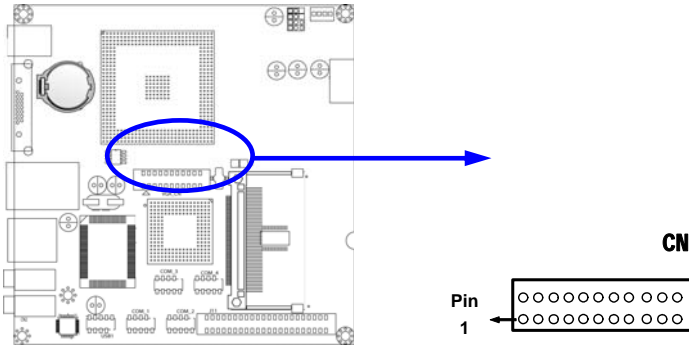
#### (2) 12V Power Connector (4-pin block):12VCN

This is a new defined 1-pin connector support extra 12V voltage to maintain system power consumption in the case that an AD-Scalar daughter board is used. Without this connector might cause system unstable because the power supply can not provide sufficient current for system.



#### (3) AD-Scalar Daughter Board Connector: VGA\_CN

This connector is ready for a AD-Scalar daughter board.



**(4) USB Port connector: JUSB1**

The connectors are 4-pins connector that connect USB devices to the system board, and standard RJ45 connector for Network supports 10/100Mb/s data transfer rate.

**(5) LAN Port connector: LAN1**

This connector is standard RJ45 over USB connectors for Network devices connection. LAN1 supports 10M/100Mb/1G b/s data transfer rate.

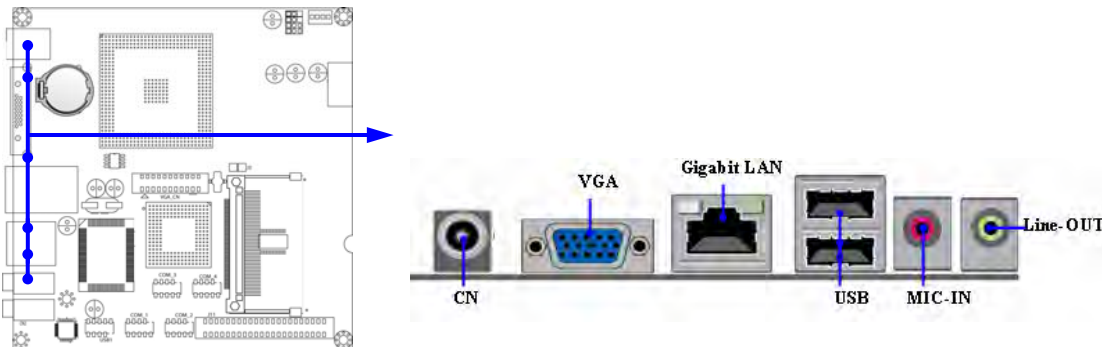
**(6) VGA Connector (15-pin female): VGA1**

VGA Connector is a 15-pin D-Subminiature Receptacle connector. This connector is for connection Monitor and System to display.

**(7) Audio Connector (Line-Out/ MIC): CN4**

This Connector is 2 phone Jack for LINE-OUT/ MIC.

**Line-out: (Green)** Audio output to speaker  
**MIC: (Pink)** Microphone Connector

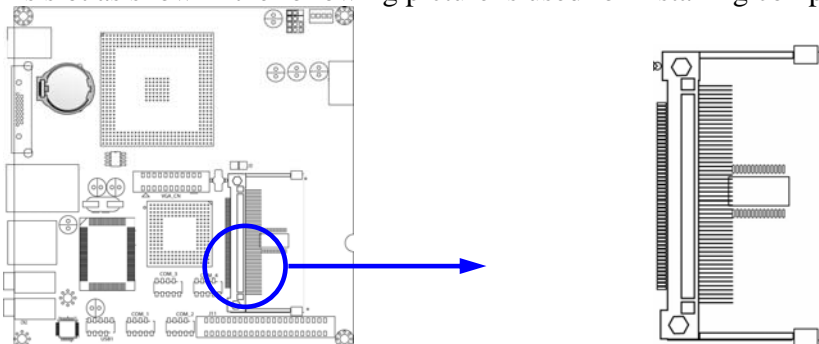


**(8) PS/2 Keyboard Connector: PS2KB**

The connectors are for PS/2 keyboard device.

**(9) Compact Flash Slot (50-pin): CF1**

This slot as show in the following picture is used for installing compact flash card.



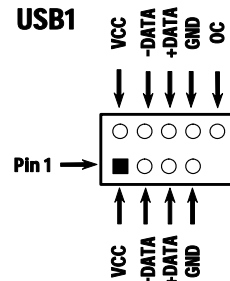
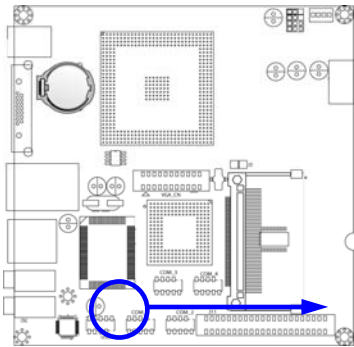
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## 2-6-2 Headers

### (1) USB Port Headers (9-pin): USB1

These headers are used for connecting the additional USB port plug. By attaching an option USB cable, you can be provided with two additional USB plugs affixed to the back panel.



USB Port Header

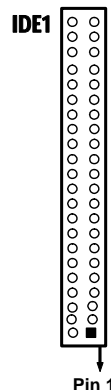
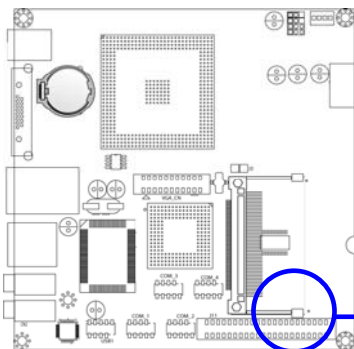
### (2) IDE Connector (44-pin block): J11

This connector supports the provided IDE hard disk ribbon cable. After connecting the single plug end to motherboard, connect the two plugs at other end to your hard disk(s).

You may also configure two hard disks to be both Masters using one ribbon cable on the primary IDE connector and another ribbon cable on the secondary IDE connector.

- Two hard disks can be connected to each connector. The first HDD is referred to as the “Master” and the second HDD is referred to as the “Slave”.

For performance issues, we strongly suggest you don’t install a CD-ROM or DVD-ROM drive on the same IDE channel as a hard disk. Otherwise, the system performance on this channel may drop.

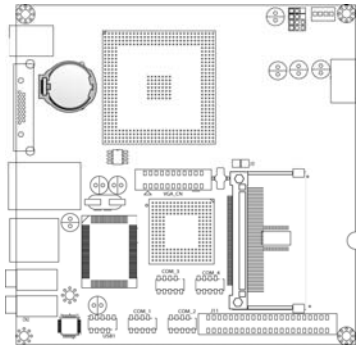


### (3) Reset switch lead: RESET

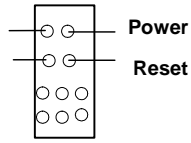
This 2-pin connector connects to the case-mounted reset switch for rebooting your computer without having to turn off your power switch. This is a preferred method of rebooting in order to prolong the life of the system’s power supply. See the figure below.

### (4) Power switch: PWR BTN

This 2-pin connector connects to the case-mounted power switch to power ON/OFF the system.



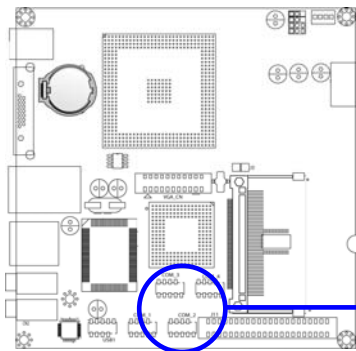
JW FP



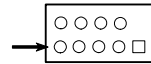
System Case Connections

**(5) Serial Port Connector (9-pin female): COM1/COM2/COM3/COM4**

COM1~COM4 are 9-pin block headers. The on-board serial port can be disabled through BIOS SETUP. Please refer to Chapter 3 “INTEGRATED PERIPHERALS SETUP” section for more detail information.



Pin1



Serial COM Port 9-pin Block

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## 2-7 Starting Up Your Computer

1. After all connections are made, close your computer case cover.
2. Be sure all the switch are off, and check that the power supply input voltage is set to proper position, usually in-put voltage is 220V~240V or 110V~120V depending on your country's voltage used.
3. Connect the power supply cord into the power supply located on the back of your system case according to your system user's manual.
4. Turn on your peripheral as following order:
  - a. Your monitor.
  - b. Other external peripheral (Printer, Scanner, External Modem etc...)
  - c. Your system power. For ATX power supplies, you need to turn on the power supply and press the ATX power switch on the front side of the case.
5. The power LED on the front panel of the system case will light. The LED on the monitor may light up or switch between orange and green after the system is on. If it complies with green standards or if it is has a power standby feature. The system will then run power-on test. While the test is running, the BIOS will alarm beeps or additional message will appear on the screen.

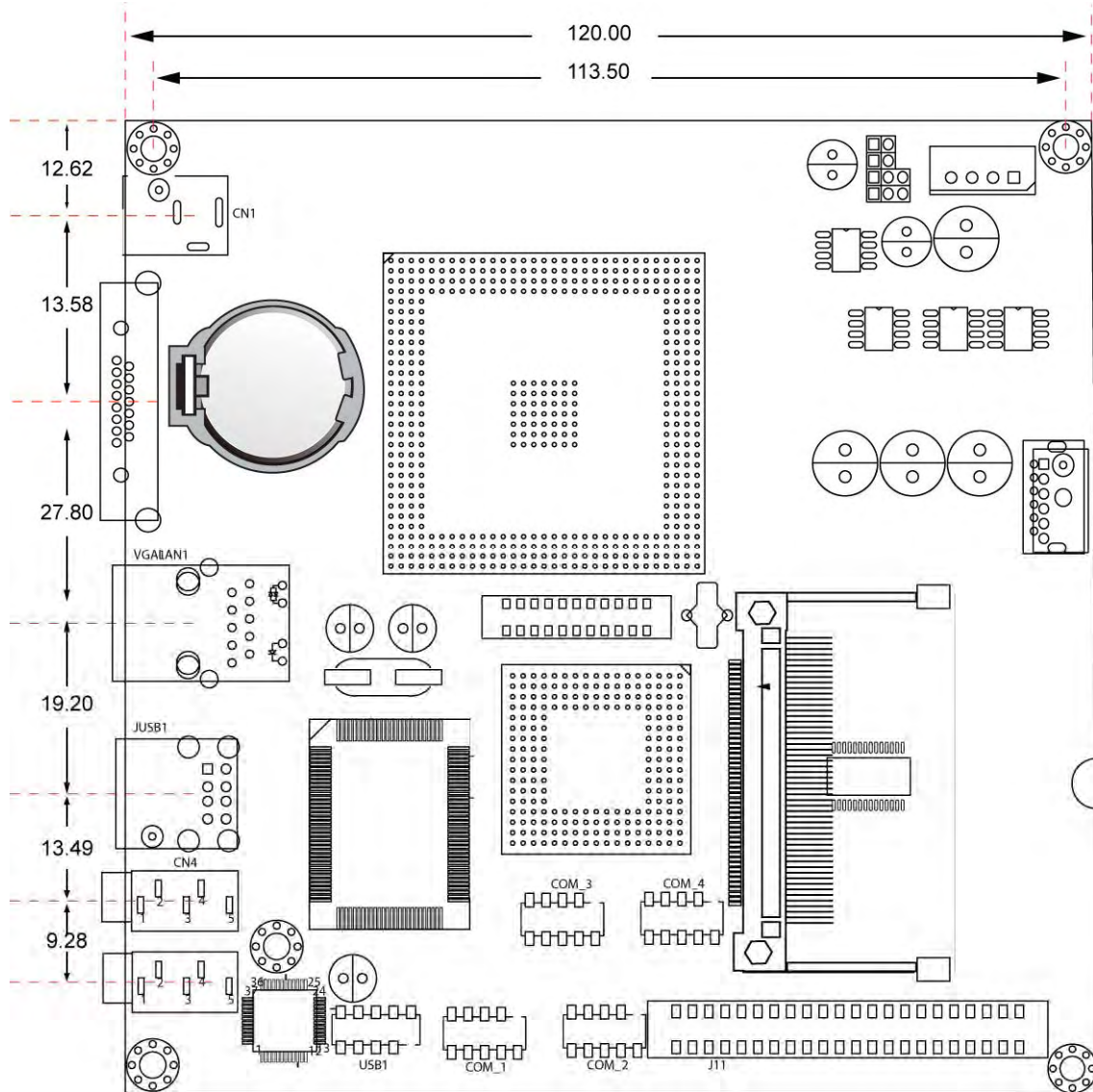
If you do not see any thing within 30 seconds from the time you turn on the power. The system may have failed on power-on test. Recheck your jumper settings and connections or call your retailer for assistance.

Beep	Meaning
One short beep when displaying logo	No error during POST
Long beeps in an endless loop	No DRAM install or detected
One long beep followed by three short beeps	Video card not found or video card memory bad
High frequency beeps when system is working	CPU overheated System running at a lower frequency

6. During power-on, press <Delete> key to enter BIOS setup. Follow the instructions in BIOS SETUP.
7. **Power off your computer:** You must first exit or shut down your operating system before switch off the power switch. For ATX power supply, you can press ATX power switching after exiting or shutting down your operating system. If you use Windows 9X, click “**Start**” button, click “**Shut down**” and then click “**Shut down the computer?**” The power supply should turn off after windows shut down.

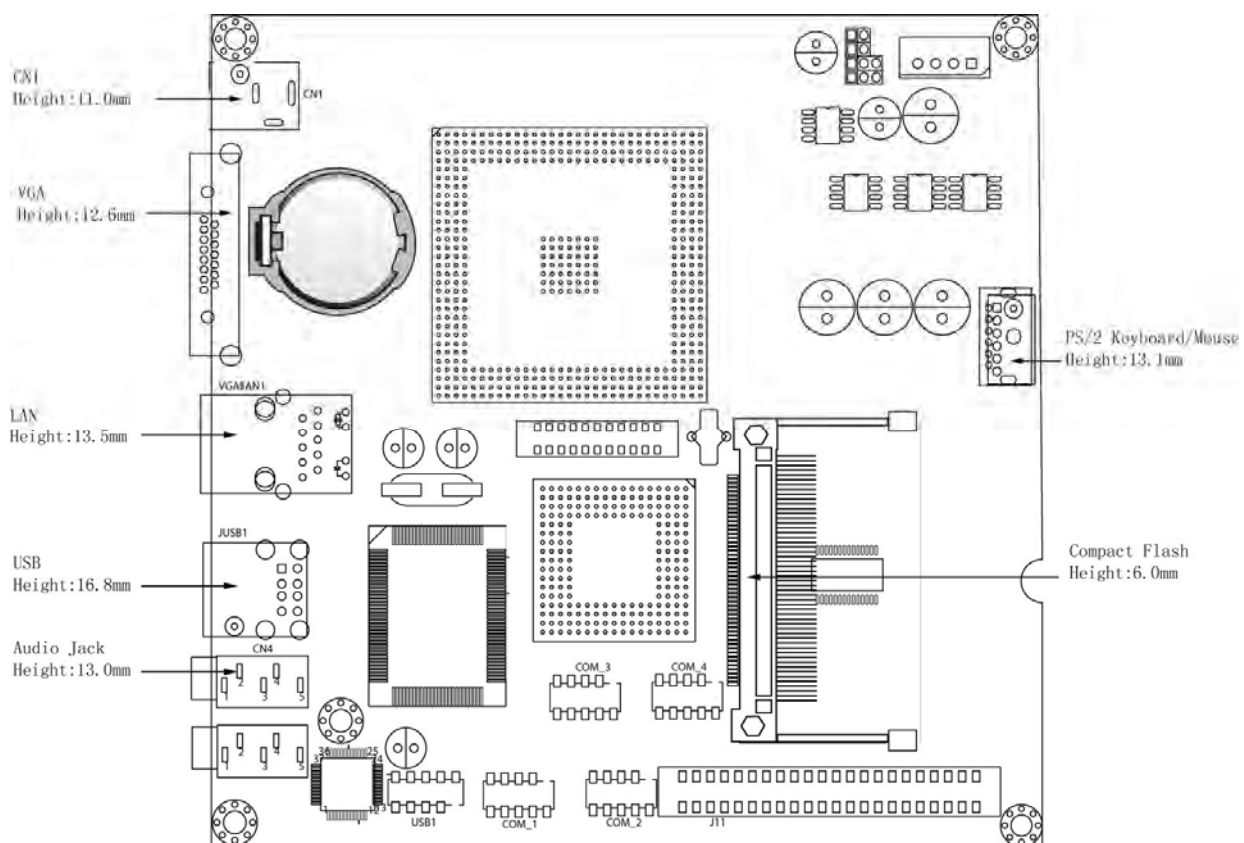
# Appendix

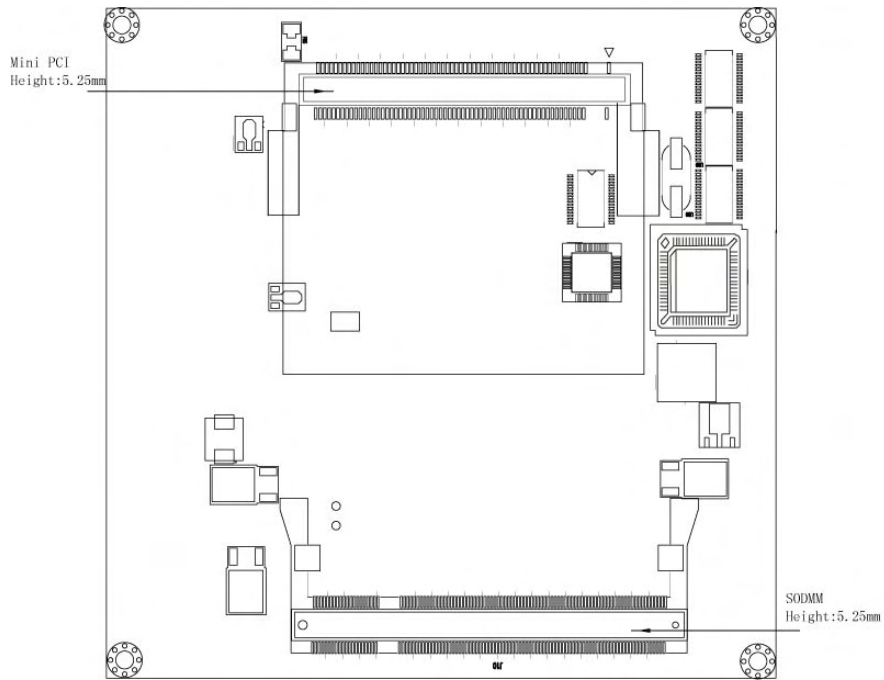
## 1. Motherboard Dimensions



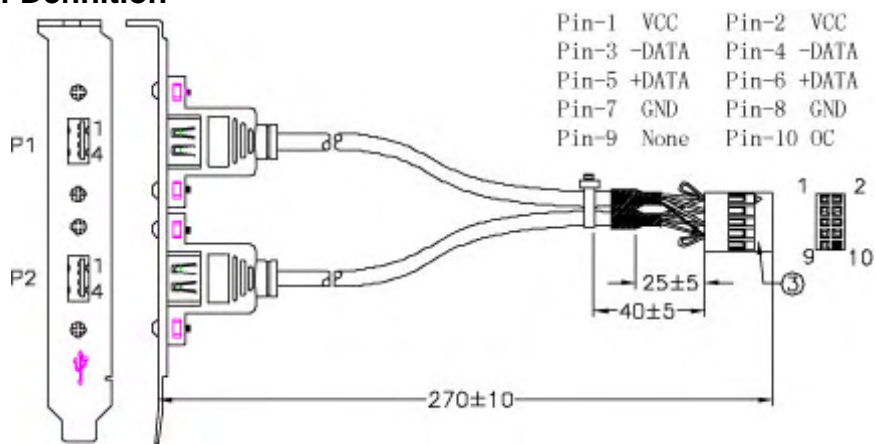
\*\*For highly integrated all the features of this motherboard, we can not avoid that some problems of interference occur in some particular situation. Please note that if you need to utilize PCI cards, make sure that the length of them will be limited in 125 mm with the bracket. And if you need the PCI riser card for standard chassis with this motherboard installed under the space-support holders, please contact with your reseller.

## 2. Motherboard Height Distribution





### USB Cable Pin-Definition



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Any advice or comments about our products and service, or anything we can help you with please don't hesitate to contact with us. We will do our best to support your products, projects and business.



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