



integration with integrity

User's Manual

3.5" Embedded Board 3308190

Version 1.0, Febuary 2008



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Packing List

Please check the package before you starting setup the system.

Hardware:

3308190 series motherboard x 1

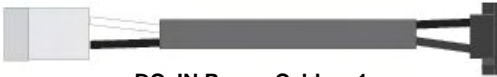
Cable Kit:



44-pin ATA33 IDE Cable x 1



Floppy Cable x 1



DC_IN Power Cable x 1



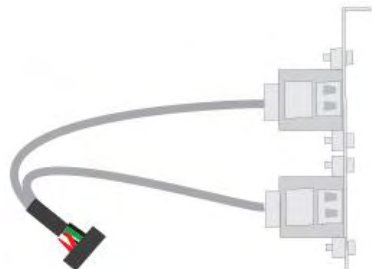
Power Cable x 1



PS2 keyboard & mouse cable



RS232 Cable x 1



USB Cable x 1

Printed Matters:

User's Manual x 1

Driver CD x 1

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Chapter 1 <Introduction>

1.1 <Product Overview>

3308190 is the Mini-ITX motherboard with AMD Geode LX800 platform, with onboard VGA, AC97 audio, GIGA LAN interface. Based on the AMD Geode LX800 processor, the board provides many advanced features for reduced power consumption, fan-less design and high cost/price rate of production.

Low Power Consumption

Based on the AMD Geode LX800@500MHz processor onboard, it only takes up to 3.8W at maximum powering, and is completely suitable for fan-less design. Without any cooling fan onboard, it can avoid the heat problem when the cooler failed in accident.

Onboard TFT/LVDS LCD interface

Based on the AMD Geode LX800@500Mhz of integrated graphics and 18-bit LVDS interfaces.

Embedded Component

Due to the low profile design, the board provides CF card socket for flash disk with porting embedded OS and up to DDR SDRAM.

Single Voltage Input

The board only requires DC 12V input. User's can easily connect the board with an adapter without the huge power supply.

1.2 <Product Specification>

General Specification

Form Factor	145 mm x 102 mm (5.7" x 4")
CPU	Up to AMD Geode LX 800 Processor
Memory	One So-DIMM slot support DDR 266/333/400 MHz SDRAM up to 1GB
Chipset	AMD Geode CS5536
BIOS	Phoenix-Award 4Mb PnP Flash
Green Function	ACPI 1.0 and APM 1.2 compliant
Watchdog Timer	PIT (Programmable Interval Timer) with 3 channels
Real Time Clock	AMD Geode CS5536 built in RTC with Lithium
Enhanced IDE	UDMA ATA 33 ATA IDE connection

Multi-I/O Port

Chipset	AMD Geode CS5536+Winbond W83627HG
Serial Port	1 external RS-232 port (COM1) 1 internal RS-232/422/485 port (COM2)
USB Port	2 external USB 2.0 ports 2 internal USB 2.0 ports
Floppy Port	One slim type Floppy port
K/B & Mouse	1 PS 2 port
GPIO	One 12-pin Digital I/O connector with 8-bit programmable I/O interface

VGA Display Interface

Chipset	Built in Geode LX Processor High performance 2D graphics controller
Memory	Shared system memory up to 4MB
Frame Buffer	Up to 256MB shared with system memory
Display Type	Support 1920x1440 in CRT mode and 1600x1200 in TFT mode VESA 1.1 and 2.0 VIP/VDA support
Connector	External DB15 female connector on rear I/O panel Onboard 30-pin LVDS connector

Ethernet Interface

Controller	1 x Realtek RTL8110S-32 Gigabit Ethernet controller
Type	Triple speed 10/100/1000Base-T Auto-switching Fast Ethernet Full duplex, IEEE802.3U compliant
Connector	One External RJ45 connector with LED on rear I/O panel

Audio Interface

Chipset	Realtek ® ALC203 AC97 Audio compliance
Interface	2 channels sound output

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Connector	External Audio phone jack for Line-out and MIC-in. Onboard audio connector with pin header
-----------	---

Expansive Interface

PCI	1 Mini-PCI slot V2.2 33/66 MHz 1 Compact Flash
-----	---

Power and Environment

Power Requirement	12V DC Jack power connector
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Temperature	Operating temperature with 0°C ~60°C (32°F ~ 140°F) Storage temperature with 20°C ~ 80°C (-68°F ~ 176°F)
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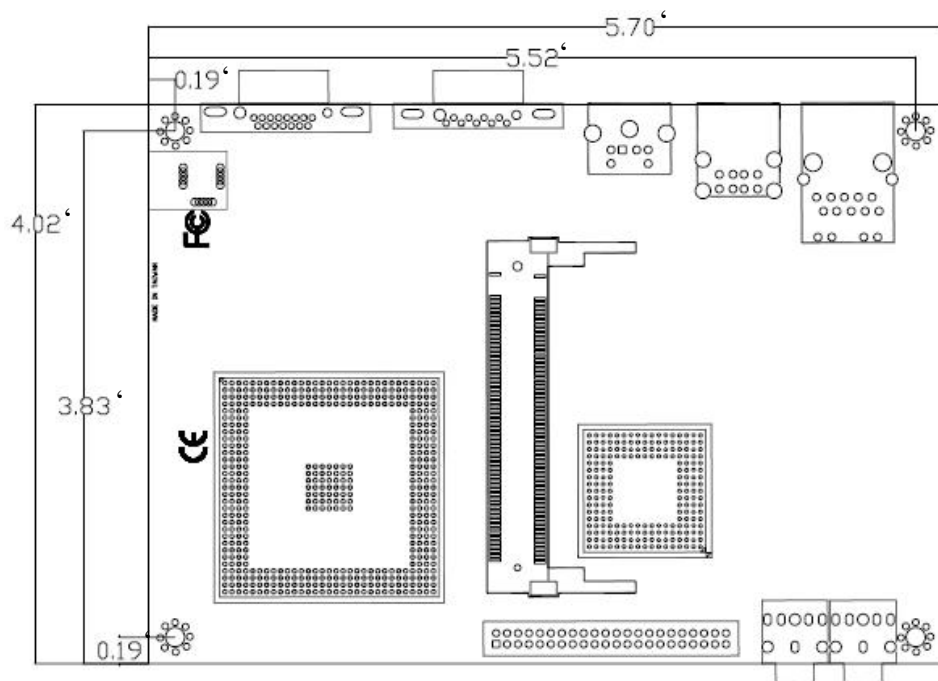
Ordering Code

3308190	AMD LX800 processor Mini-ITX with onboard VGA, GigaLAN, RS232, USB2.0, Audio, LCD and DDR DIMM
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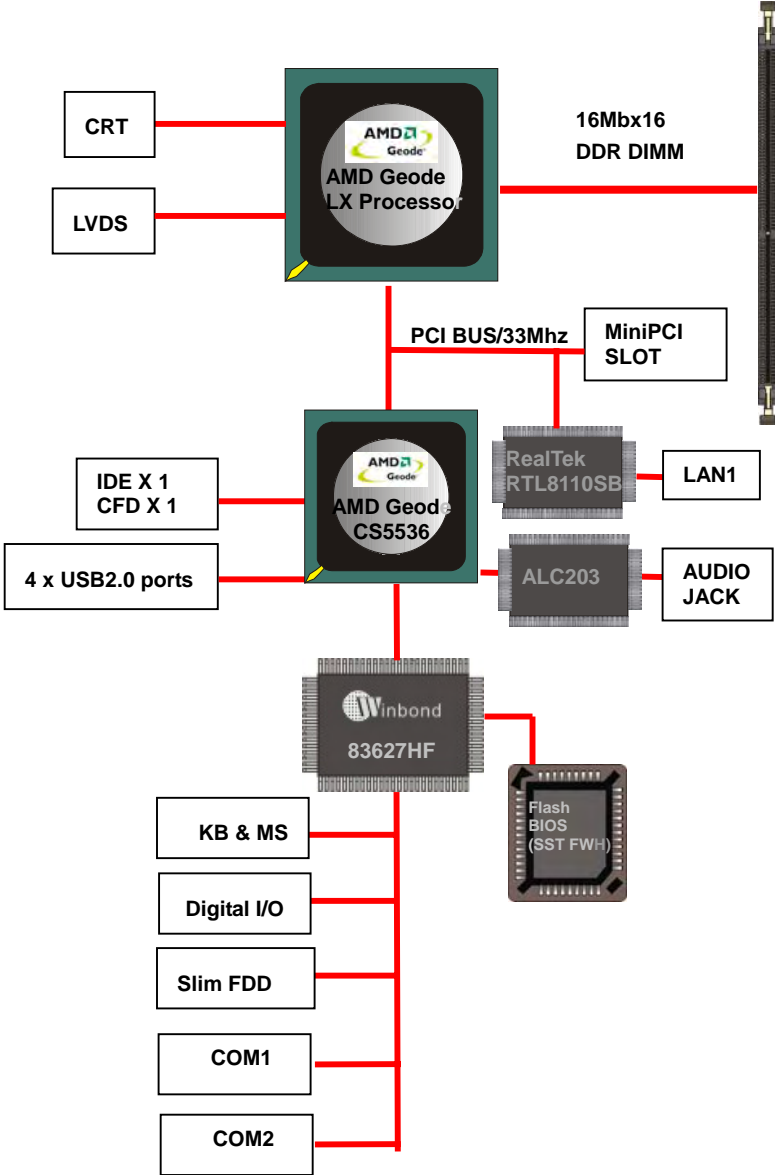
The specifications may be different as the actual production.

For further product information please visit the website at <http://www.globalamericaninc.com>

1.3 <Mechanical Drawing>

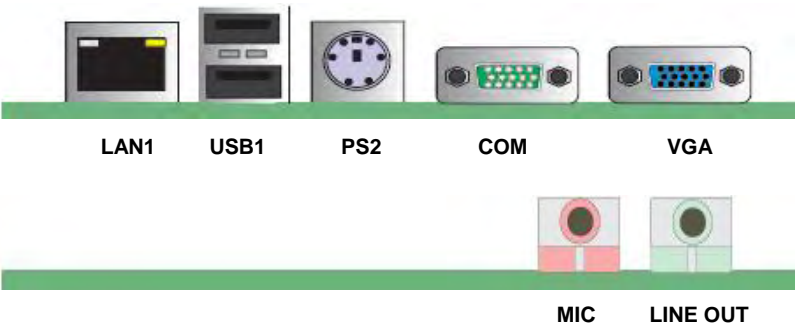
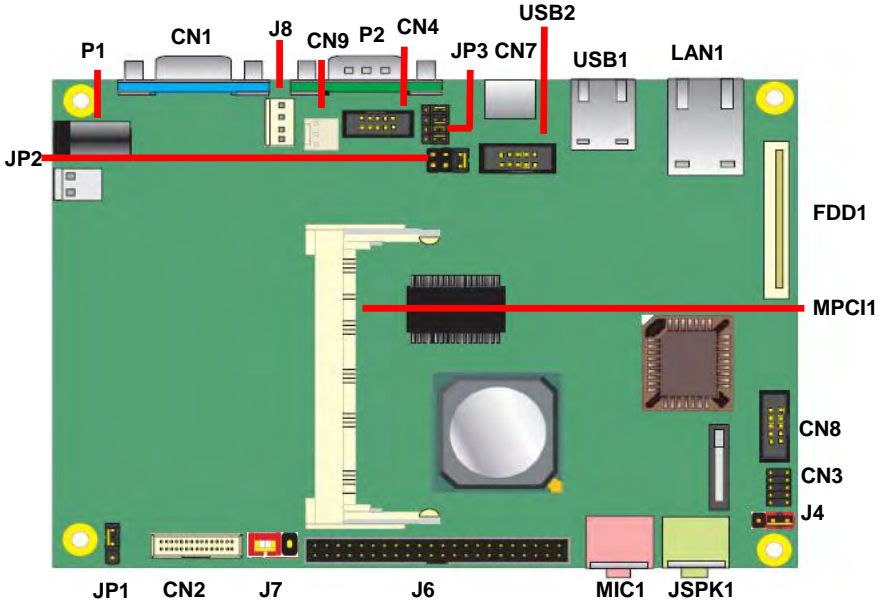


1.4 <Block Diagram>



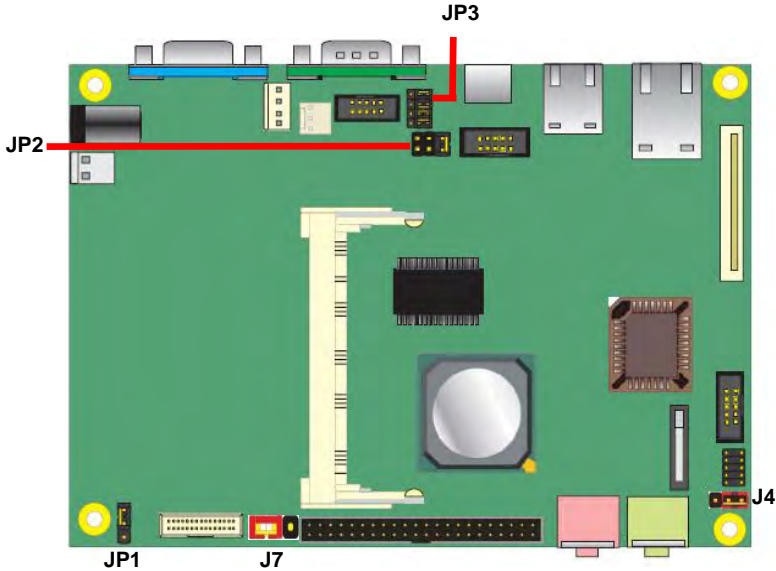
Chapter 2 <Hardware Setup>

2.1<Connector Location>



<Jumper Reference>

Jumper	Function
JP1	LVDS Panel Voltage Selection (+5V / + 3.3V)
JP2	COM2 RS232/422/485 Select
JP3	COM2 RS232/422/485 Select
J4	Clear CMOS Selection
J7	CFD Master/Slave Selection



	JP2	JP3
RS-232		
RS-485		
RS-422		

2.1.1 <Connector Reference>

Connector	Function	Remark
CN1	VGA Display / Audio Connector	Standard
CN2	Front Audio Connector LVDS Connector	Slim
CN3	Front Panel Connector	Slim
CN4	COM2 RS-232 / RS-422 / RS-485 Connector	Standard
CN7	PS2 Keyboard / Mouse Connector	Standard
CN8	GPIO Connector	Standard
CN9	SYSTEM Fan Connector	Standard
J6	EIDE Connector	Standard
J8	Little 4-Pin Power connector	Standard
USB2	USB2 Connector	Standard
FDD1	Slim Floppy Connector	Standard
P2	COM1 RS-232 Connector	Standard
LAN1	Gigabit LAN / USB Connector	Standard
MPCI1	Mini-PCI Slot	Standard
CFD1	Compact Flash Slot	Standard
J1	SO-DIMM Slot	Slim
P1	12V DC Connector	Standard
MIC1	Microphone Jack	Standard
JSPK1	Speaker out Jack	Standard

2.1.2 <External Connector>

Connector	Function	Remark
LAN1	1 external RJ – 45 ports with LED	Standard
USB1	2 external USB 2.0 ports 2 internal USB 2.0 ports	Standard
PS2	1 PS / 2 ports	Standard
COM	1 external RS – 232 port (COM1) 1 internal RS – 232 / 422 / 485 port (COM2)	Standard
VGA	1 VGA port	Standard
AUDIO	2 external jack for MIC – In / Line – Out	Standard

2.2 <CPU and Memory Setup>

2.2.1 <CPU Setup>

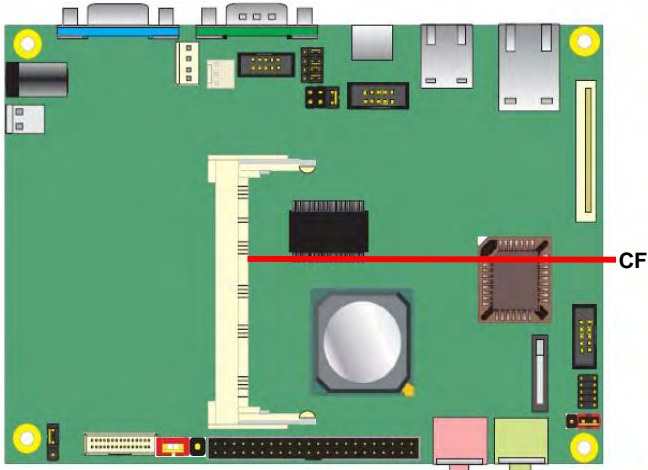
The board integrates AMD Geode LX800 500MHz processor with special design for power appliance. It requires only 3.8W power consumption at most, and is totally designed for fan-less system.

2.2.2 <Memory Setup>

The board supports one 200-pin DDR266/333/400 SDRAM up to 1GB of capacity, and supports non-ECC unbuffered memory modules.

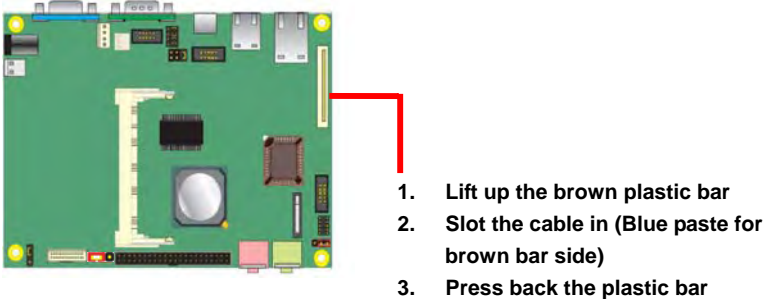
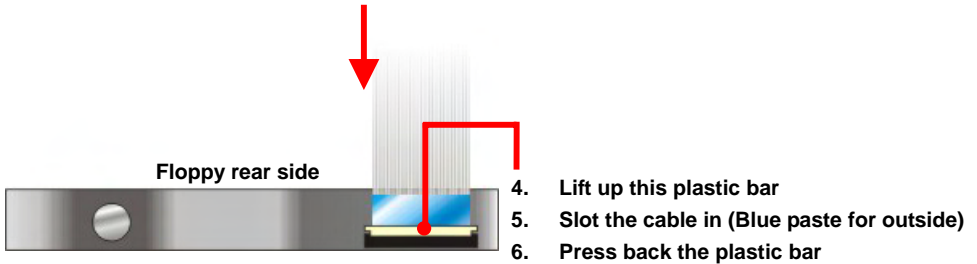
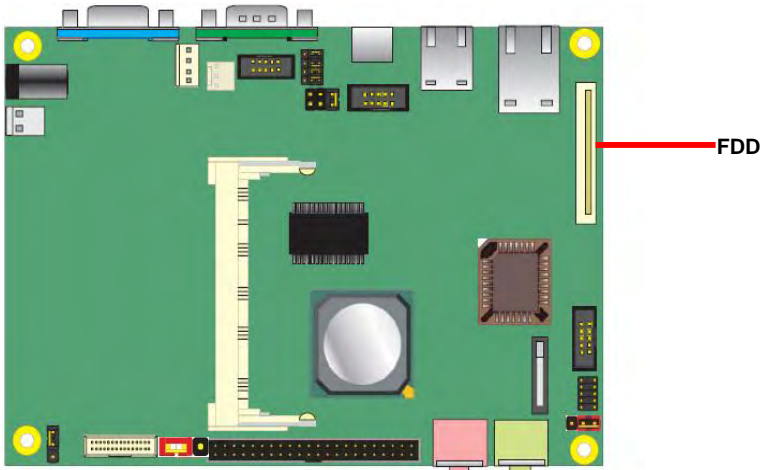
2.3 <Enhanced IDE & CF Interface>

The board has one Ultra DMA33 IDE interface to support up to 2 ATAPI devices, and one Compact Flash Type II socket on the solder side.



2.4 <Floppy Port>

The board provides a slim type floppy port; please use the 26-pin FPC cable in the package to connect the floppy device.



2.5 <Onboard Display Interface>

The board integrates AMD Geode LX800 processor with built-in 2D video engine, to provide onboard DB15 VGA connector, 18-bit LVDS interface. The built-in 2D video engine supports following specified functions:

- High-performance 2D graphics controller
- Alpha BLT
- Integrated dot clock PLL

2.5.1 <Analog VGA Interface>

Please connect your CRT or LCD monitor with DB15 male connector to the onboard DB15 female connector on rear I/O port.



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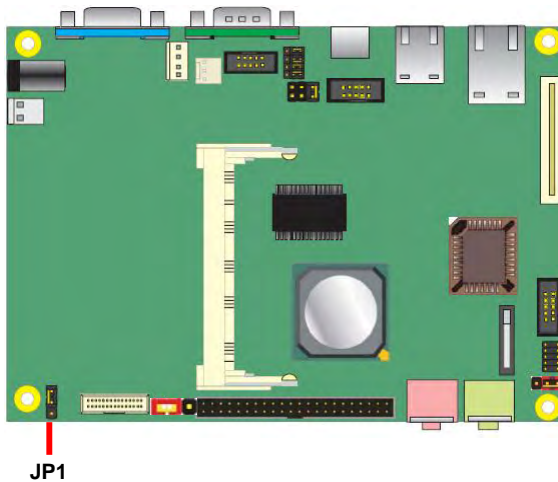
2.5.2 <Digital Display>

The board provides one 30-pin LVDS connector for 18-bit single channel panel, supports up to 1024 x 768 of resolution, with one LCD backlight inverter connector and one jumper for panel voltage setting

Connector: **JP1**

Type: 3-pin Power select Header

Pin	Description
1	VCC (5V)
2	LCDVCC
3	VCC3 (3.3V)



Connector: **CN_LVDS (CN2) (for 18 bit Single channel LVDS panel)**

Type: 30-pin header (15 x 2 pitch 2.0 mm)

Connector model: Hirose DF13-40DP-1.25V

Pin	Assignment	Pin	Assignment
1	BKL_EN	2	BKL_CTL
3	LVDS_VCC	4	GND
5	LVDS_CH1_CLK-	6	LVDS_CH1_CLK+
7	LVDS_VCC	8	GND
9	LVDS_CH1_DATA0-	10	LVDS_CH1_DATA0+
11	LVDS_CH1_DATA1-	12	LVDS_CH1_DATA1+
13	LVDS_CH1_DATA2-	14	LVDS_CH1_DATA2+
15	N/C	16	N/C
17	N/C	18	N/C
19	N/C	20	N/C
21	N/C	22	N/C
23	N/C	24	N/C
25	LVDS_DDCPDATA	26	LVDS_DDCPCLK
27	LVDS_VCC	28	GND
29	N/C	30	N/C

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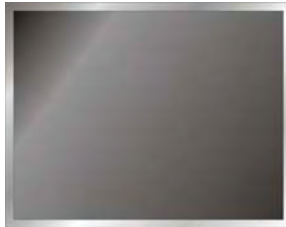
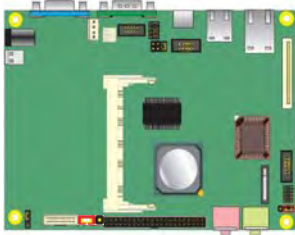
To setup the LCD, you need the component below:

1. A panel with LVDS interfaces.
2. An inverter for panel's backlight power.
3. A LCD cable and an inverter cable.

For the cables, please follow the pin assignment of the connector to make a cable, because every panel has its own pin assignment, so we do not provide a standard cable; please find a local cable manufacture to make cables.

LCD Installation Guide:

1. Preparing the **3308190, LCD panel** and the **backlight inverter**.

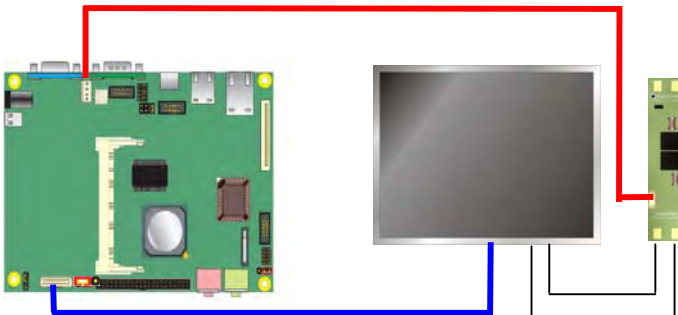


2. Please check the datasheet of the panel to see the voltage of the panel, and set the jumper JP1 to +5V or +3.3V.

3. You would need a LVDS type cable.

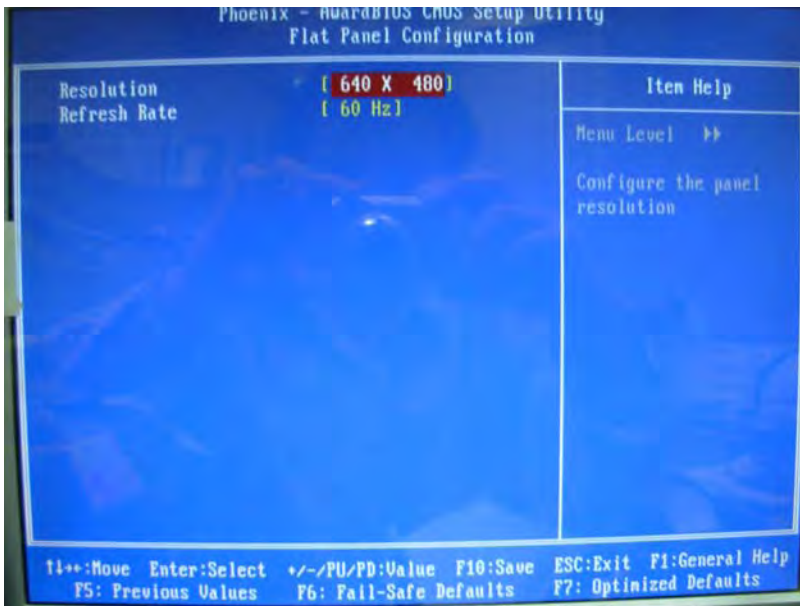


4. To connect all of the devices well.



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After setup the devices well, you need to select the LCD panel type in the BIOS.



The panel type mapping is list below:

	Panel Number	Resolution
1		640 x 480
2		800 x 600
3		1024x 768

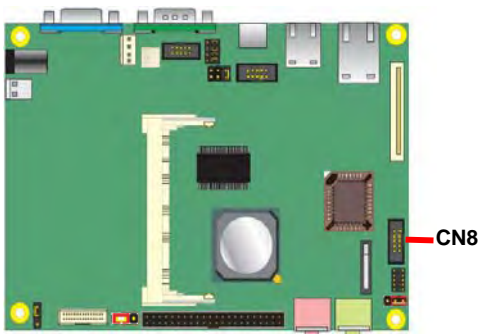
2.6 <GPIO Interface>

The board provides a programmable 8-bit digital I/O interface; you can use this general purpose I/O port for system control like POS or KIOSK.

Connector: **CN8**

Type: onboard 2 x 6-pin header, pitch=2.0mm

Pin	Assignment
1	GPI
2	GPO
3	GPI
4	GPO
5	GPI
6	GPO
7	GPI
8	GPO
9	5V
10	GND



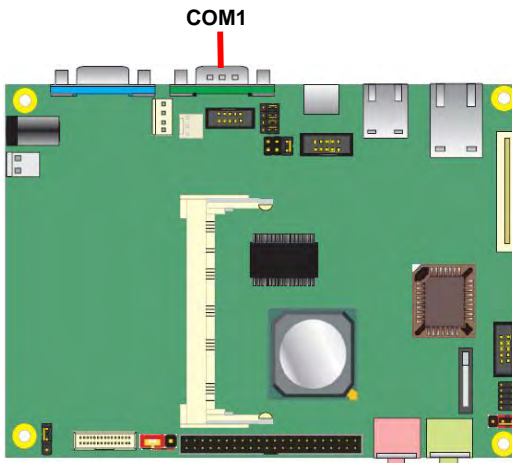
2.7 <Serial Port Jumper Setting >

The COM1 RS232 serial port, with jumper selectable RS232/422/485 for CN_COM2

Connector: **COM1**

Type: 9-pin Dip male connector on I/O Panel

Pin	Assignment	Pin	Assignment
1	DCD1#	2	RXD1
3	TXD1	4	DTR1#
5	GND	6	DSR1#
7	RTS1#	8	CTS1#
9	RI1#		

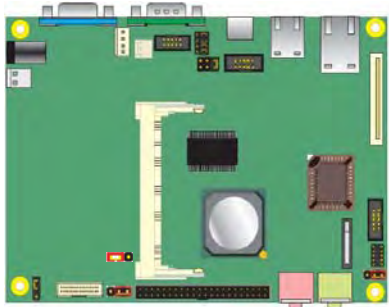


2.8 <USB2.0 Interface>

Based on AMD CS5536, the board provides 2 x USB2.0 ports.

The USB2.0 interface provides up to 480Mbps of transferring rate.

Interface	USB2.0
Controller	CS5536
Transfer Rate	Up to 480Mb/s
Output Voltage	500mA



2.9 <Power and Fan Connector>

The 3308190 provides a standard ATX power supply with 20-pin ATX connector, and the board provides one 4-pin P4 additional use power connector for internal power supply and one 3-pin cooler fan connector for system.

2.9.1 <Power Input>

Connector: **ATX**

Type: 20-pin ATX power connector

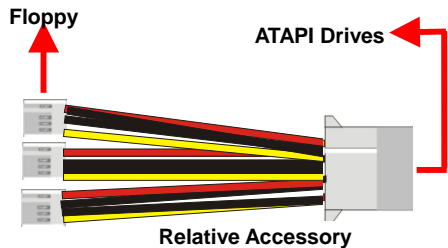
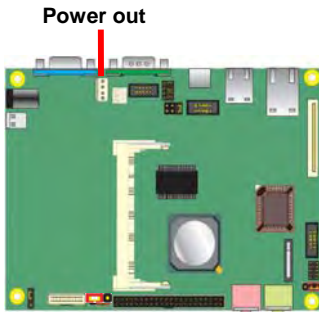
PIN assignment			
1	3.3V	11	3.3V
2	3.3V	12	-12V
3	GND	13	GND
4	5V	14	PS_ON
5	GND	15	GND
6	5V	16	GND
7	GND	17	GND
8	5V	18	-5V
9	5V	19	5V
10	12V	20	5V

2.9.2 <Power Output>

Connector: **DC_OUT**

Type: 4-pin P-type connector for +5V/+12V output

Pin	Assignment
1	12V
2	GND
3	GND
4	5V



2.9.3 <Fan Connector>

Connector: **SYSFAN**

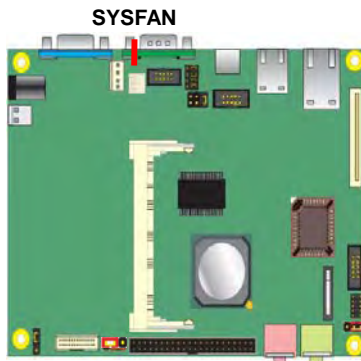
Type: 3-pin fan wafer connector

Pin	Description	Pin	Description	Pin	Description
1	Ground	2	+12V	3	Fan Control

Connector: **DC_IN**

Type: 2-pin DC power connector

Pin	Description	Pin	Description
1	+12V	2	+12V
3	Ground	4	Ground



2.10 <Indicator and Switch>

The **JFRNT** provides front control panel of the board, such as power button, reset and beeper, etc. Please check well before you connecting the cables on the chassis.

Connector: **CN3**

Type: onboard 14-pin (2 x 7) 2.54-pitch header

Pin	Assignment	Pin	Assignment
1	GND	2	Power Switch
3	BUZZER-	4	BUZZER+
5	HD_LED-	6	HD_LED+
7	POWER LED-	8	Power LED+
9	GND	10	Reset

2.11 <CMOS Setup>

The board's data of CMOS can be setting in BIOS. If the board refuses to boot due to inappropriate CMOS settings, here is how to proceed to clear (reset) the CMOS to its default values.

Jumper: J4

Type: Onboard 3-pin jumper

J4	Mode
1-2	Normal Operation
2-3	Clear CMOS

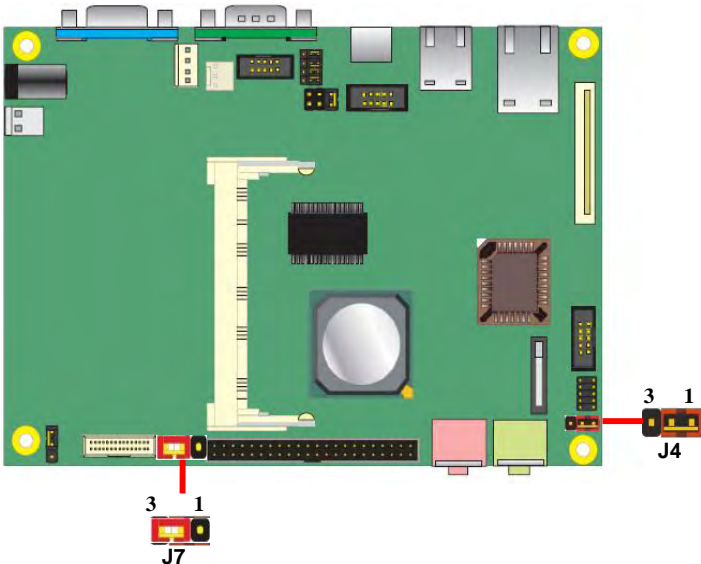
Default setting

Jumper: J7

Type: Onboard 3-pin jumper

J7	Mode
1-2	Master
2-3	Slave

Default setting



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Appendix A <I/O Port Pin Assignment>

A.1 <IDE Port>

Connector: **J6**

Type: 44-pin (22 x 2) box header



Pin	Assignment	Pin	Assignment
1	IDERST#	2	GND
3	PID7	4	PID8
5	PID6	6	PID9
7	PID5	8	PID10
9	PID4	10	PID11
11	PID3	12	PID12
13	PID2	14	PID13
15	PID1	16	PID14
17	PID0	18	PID15
19	GND	20	N/C
21	PDREQ	22	GND
23	PIOR#	24	GND
25	PIOR#	26	GND
27	PRDY	28	ICS16#
29	PACK#	30	GND
31	PIRQ14	32	N/C
33	PPDA1	34	ATA66_DET
35	PPDA0	36	PPDA2
37	PPCS1#	38	PPCS3#
39	N/C	40	GND
41	+5V	42	+5V
43	GND	44	N/C

A.2 <Floppy Port>

Connector: **FDD1**

Type: 26-pin connector

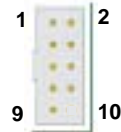


Pin	Assignment	Pin	Assignment
1	VCC	2	INDEX#
3	VCC	4	DRV_SEL#
5	VCC	6	DSK_CH#
7	N/C	8	N/C
9	N/C	10	MOTOR#
11	N/C	12	DIR#
13	DENSEL#	14	STEP#
15	GND	16	WDATA#
17	GND	18	WGATE#
19	GND	20	TRACK#
21	GND	22	WOROT#
23	GND	24	RDATA#
25	GND	26	SIDE#

A.3 <Serial Port>

Connector: **COM2 (CN4)**

Type: 9-pin D-sub male connector on bracket

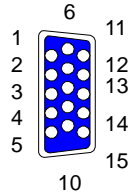


Pin	Assignment	Pin	Assignment
1	DCD2# (422TXD-/485DATA-)	2	RXD2 (422RXD+)
3	TXD2 (422TXD+/485DATA+)	4	DTR2# (422RXD-)
5	GND	6	DSR2#
7	RTS2#	8	CTS2#
9	RI2#		

A.4 <CRT Port>

Connector: **CRT**

Type: 15-pin D-sub female connector on I/O Panel

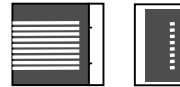


Pin	Description	Pin	Description	Pin	Description
1	RED	6	Ground	11	N/C
2	GREEN	7	Ground	12	CRT_DDCDATA
3	BLUE	8	Ground	13	HSYNC
4	N/C	9	VGA_VCC	14	VSYNC
5	Ground	10	Ground	15	CRT_DDCCLK

A.5 <LAN Port>

Connector: **RJ45**

Type: RJ45 connector with LED on I/O Panel



Pin	1	2	3	4	5	6	7	8
Description	MI0+	MI0-	MI1+	MI2+	MI2-	MI1-	MI3+	MI3-

A.6 < USB Port >

Connector: **CN_USB2**

Type: 10-pin (5 x 2) header for dual USB Ports



Pin	Description	Pin	Description
1	USB_VCC	2	GND
3	Data0-	4	GND
5	Data0+	6	Data1+
7	Ground	8	Data1-
9	Ground	10	USB_VCC

A.7 <PS/2 Keyboard & Mouse Port>

Connector: **Mouse / Keyboard**

Type: 6-pin Mini-DIN connector on bracket



Pin	Assignment	Pin	Assignment
1	KB_DATA	2	MS_DATA
3	GND	4	KB_VCC
5	KB_CLK	6	MS_CLK

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Appendix B <System Resources>

B1. <I/O Port Address Map>

[00000000 - 0000000F]	Direct memory access controller
[00000000 - 00000CF7]	PCI bus
[00000010 - 0000001F]	Motherboard resources
[00000020 - 00000021]	Programmable interrupt controller
[00000022 - 0000002D]	Motherboard resources
[00000030 - 0000003F]	Motherboard resources
[00000040 - 00000043]	System timer
[00000044 - 0000005F]	Motherboard resources
[00000060 - 00000060]	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
[00000061 - 00000061]	System speaker
[00000062 - 00000063]	Motherboard resources
[00000064 - 00000064]	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
[00000065 - 0000006F]	Motherboard resources
[00000070 - 00000073]	System CMOS/real time clock
[00000074 - 0000007F]	Motherboard resources
[00000080 - 00000090]	Direct memory access controller
[00000091 - 00000093]	Motherboard resources
[00000094 - 0000009F]	Direct memory access controller
[000000A0 - 000000A1]	Programmable interrupt controller
[000000A2 - 000000BF]	Motherboard resources
[000000C0 - 000000DF]	Direct memory access controller
[000000E0 - 000000EF]	Motherboard resources
[000000F0 - 000000FF]	Numeric data processor
[00000170 - 00000177]	Secondary IDE Channel
[000001F0 - 000001F7]	Primary IDE Channel
[00000274 - 00000277]	ISAPNP Read Data Port
[00000279 - 00000279]	ISAPNP Read Data Port
[00000294 - 00000297]	Motherboard resources

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[000002F8 - 000002FF]	Communications Port (COM2)
[00000376 - 00000376]	Secondary IDE Channel
[00000378 - 0000037F]	ECP Printer Port (LPT1)
[000003B0 - 000003BA]	Advanced Micro Devices Win XP Graphics Driver
[000003C0 - 000003DF]	Advanced Micro Devices Win XP Graphics Driver
[000003F0 - 000003F5]	Standard floppy disk controller
[000003F6 - 000003F6]	Primary IDE Channel
[000003F7 - 000003F7]	Standard floppy disk controller
[000003F8 - 000003FF]	Communications Port (COM1)
[000004D0 - 000004D1]	Motherboard resources
[00000778 - 0000077B]	ECP Printer Port (LPT1)
[00000A78 - 00000A7B]	Motherboard resources
[00000B78 - 00000B7B]	Motherboard resources
[00000BBC - 00000BBF]	Motherboard resources
[00000D00 - 0000AC17]	PCI bus
[00000E78 - 00000E7B]	Motherboard resources
[00000F78 - 00000F7B]	Motherboard resources
[00000FBC - 00000FBF]	Motherboard resources
[0000AC20 - 0000FFFF]	PCI bus
[0000FC00 - 0000FCFF]	Realtek RTL8169/8110 Family Gigabit Ethernet NIC
[0000FE00 - 0000FE7F]	GeodeLX Audio Driver (WDM)
[0000FF00 - 0000FF0F]	Standard Dual Channel PCI IDE Controller

B2. <Memory Address Map>

[00000000 - 0009FFFF]	System board
[000A0000 - 000BFFFF]	Advanced Micro Devices Win XP Graphics Driver
[000A0000 - 000BFFFF]	PCI bus
[000C8000 - 000DFFFF]	PCI bus
[000F0000 - 000F3FFF]	System board
[000F4000 - 000F7FFF]	System board
[000F8000 - 000FBFFF]	System board
[000FC000 - 000FFFFF]	System board
[00100000 - 0F7AFFFF]	System board
[0F7B0000 - 0F7BFFFF]	System board
[0F7C0000 - FEBFFFFF]	PCI bus
[EE000000 - EFFFFFFF]	Advanced Micro Devices Win XP Graphics Driver
[EFFE8000 - EFFEBFFF]	Advanced Micro Devices Win XP Graphics Driver
[EFFEC000 - EFFFFFFF]	Advanced Micro Devices Win XP Graphics Driver
[EFFF0000 - EFFF3FFF]	Advanced Micro Devices Win XP Graphics Driver
[EFFF4000 - EFFF7FFF]	Advanced Micro Devices Win XP Graphics Driver
[EFFF8000 - EFFFBFFF]	Geode LX AES Crypto Driver
[EFFF0000 - EFFF0FFF]	OHCI Compliant IEEE 1394 Host Controller
[EFFF0000 - EFFF0FFF]	Standard Enhanced PCI to USB Host Controller
[EFFF0000 - EFFF0FFF]	Standard OpenHCD USB Host Controller
[EFFF0000 - EFFF0FFF]	Realtek RTL8169/8110 Family Gigabit Ethernet NIC
[FEE00000 - FEE00FFF]	System board
[FFFF0000 - FFFFFFFF]	System board

B3. <System IRQ Resources>

- (ISA) 0 System timer
- (ISA) 1 Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
- (ISA) 3 Communications Port (COM2)
- (ISA) 4 Communications Port (COM1)
- (ISA) 6 Standard floppy disk controller
- (ISA) 8 System CMOS/real time clock
- (ISA) 9 Microsoft ACPI-Compliant System
- (ISA) 13 Numeric data processor
- (ISA) 14 Primary IDE Channel
- (PCI) 5 GeodeLX Audio Driver (WDM)
- (PCI) 10 Advanced Micro Devices Win XP Graphics Driver
- (PCI) 10 Geode LX AES Crypto Driver
- (PCI) 11 OHCI Compliant IEEE 1394 Host Controller
- (PCI) 11 Realtek RTL8169/8110 Family Gigabit Ethernet NIC
- (PCI) 11 Standard Enhanced PCI to USB Host Controller
- (PCI) 11 Standard OpenHCD USB Host Controller

Appendix C <Programming GPIO's>

The GPIO can be programmed with the MSDOS debug program using simple IN/OUT commands. The following lines show an example how to do this.

GPIO0...GPIO7 bit0.....bit7

```
-o 4E 87                ;enter configuration
-o 4E 87
-o 4E 2A
-o 4F FD                ;enable GPIO function
-o 4E 07
-o 4F 07                ;enable GPIO configuration
-o 4E F0
-o 4F xx                ;set GPIO as input/output; set '1' for input,'0'for output
-o 4E F1
-o 4F xx                ;if set GPIO's as output, in this register its value can be set
```

Optional :

```
-o 4E F2
-o 4F xx                ; Data inversion register ; '1' inverts the current value of the
                        bits ,'0' leaves them as they are
-o 4E 30
-o 4F 01                ; active GPIO's
```

For further information, please refer to Winbond W83627HG datasheet.

Appendix D <Watch Dog timer Setting >

The watchdog timer makes the system auto-reset while it stops to work for a period. The integrated watchdog timer can be setup as system reset mode by program.

Timeout Value Range

- 1 to 255
- Second or Minute

Program Sample

Watchdog timer setup as system reset with 10 second of timeout

```

2E, 87
2E, 87
2E, 07
2F, 08      Logical Device 8
2E, 30      Activate
2F, 01
2E, F5      Set as Second*
2F, 00
2E, F6      Set as 5
2F, 05
    
```

* Minute: bit 3 = 0; Second: bit 3 = 1

You can select Timer setting in the BIOS, after setting the time options, the system will reset according to the period of your selection.



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