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3308490 User's Manual

Half-Size PCISA SBC with Intel Atom N270 Processor

Version 1.0

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Packing List

The items listed below should all be included in the 3308490 package.

- 1 x 3308490 PCISA Motherboard
- 1 x LPT and RS-232 cable
- 2 x SATA cable
- 1 x USB cable
- 1 x Mini jumper pack
- 1 x Utility CD
- 1 x Manual

Images of the above items are shown in **Chapter 3**.

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Introduction

1.1 Introduction

Figure 1-1: 3308490

The 3308490 is a PCISA CPU card with an embedded 45 nm Intel® Atom™ processor. The embedded Intel® Atom™ N270 processor has a 1.60 GHz clock speed, 533 MHz FSB and 512 KB of L2 cache.

The 3308490 includes four graphics outputs. VGA on the rear panel provides basic output capabilities for use with most monitors. Internally, an LVDS header provides a connection to LCD displays for integrating the 3308490 into a system with built-in monitor. The TV header provides output to a standard TV or HDTV through the optional adapter cables, which provide a single cable connection on a card slot and a cable splitting the signal into the component parts. Finally, an SDVO connector provides a direct connection from the Northbridge SDVO port to an GAI SDVO graphics card.

512 MB of DDR2 memory is included with the 3308490 (a custom option with a DDR2 SO-DIMM slot is available). Permanent storage is provided through dual SATA ports, offering 300 MB/s transfer speeds, RAID 0 and RAID 1 support. Legacy IDE connectivity is available through an IDE port, and through a CompactFlash® card located on the solder side of the 3308490.

Other connectors on the 3308490 include six USB ports (two external, four internal), an RS-232 port, an RS-232/422/485 port, LPT and digital I/O. An HD Audio connector connects to an external audio kit, providing HD audio or AC'97 audio capabilities with the appropriate audio kit.

1.2 Overview Photo

The 3308490 has a wide variety of peripheral interface connectors.   **Figure 1-2** is a labeled photo of the peripheral interface connectors on the 3308490.
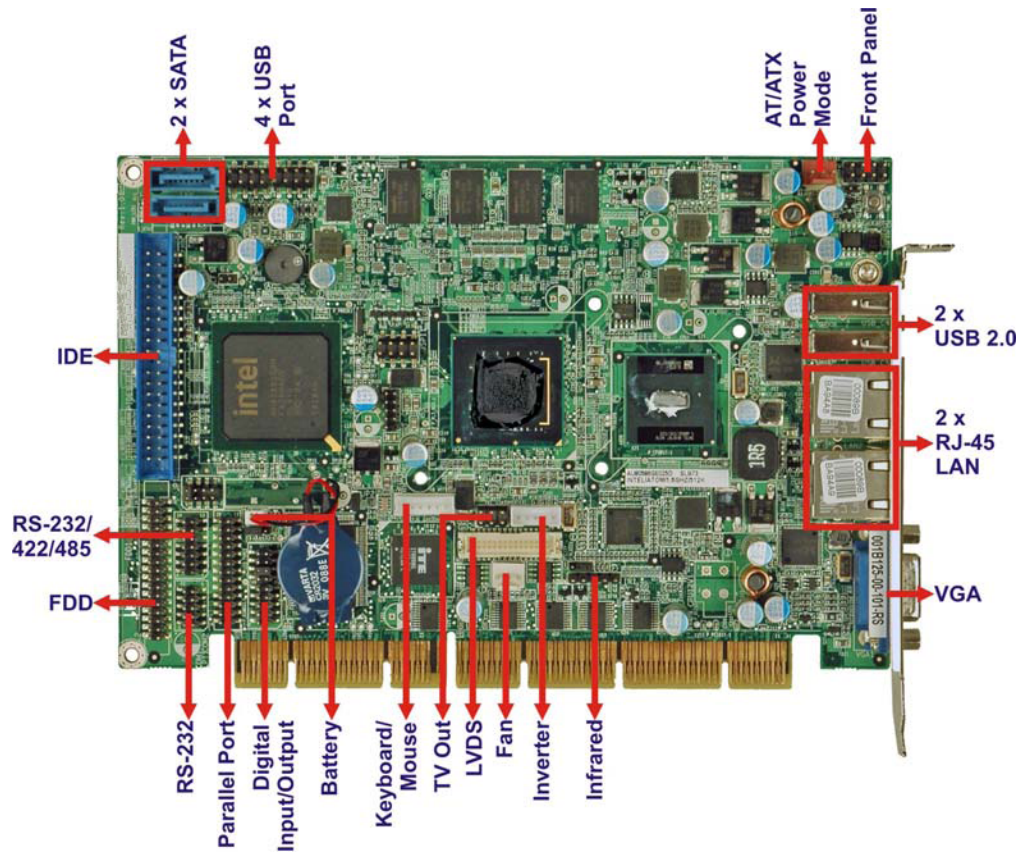
Figure 1-2: 3308490 Overview (Front)
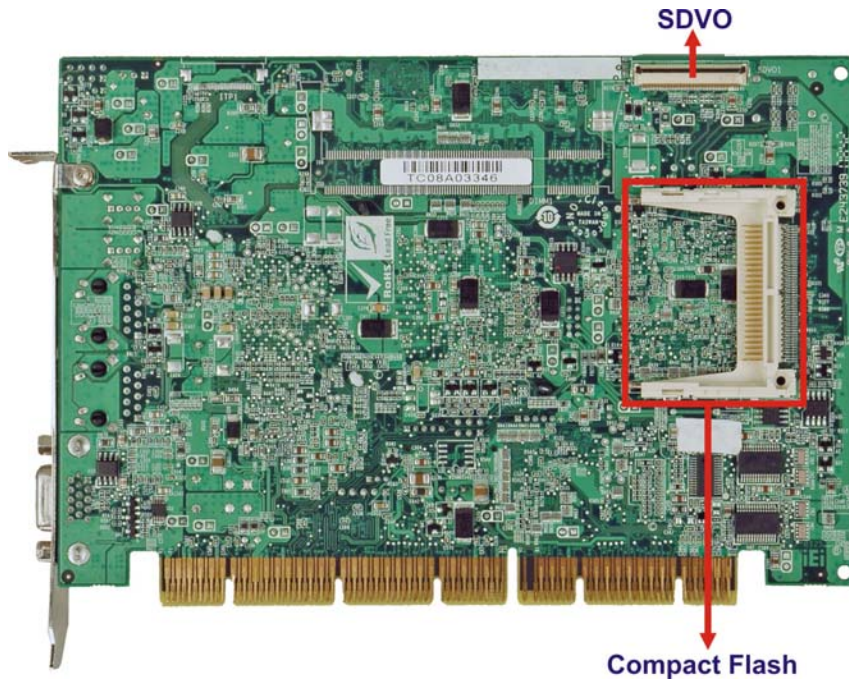
Figure 1-3: 3308490 Overview (Rear)

1.3 Peripheral Connectors and Jumpers

The 3308490 has the following connectors on-board:

- 1 x ATX power control connector
- 1 x Audio kit connector
- 1 x Backlight inverter connector
- 1 x Battery connector
- 1 x BIOS programming header
- 1 x CompactFlash® slot
- 1 x Digital I/O connector
- 1 x Edge connector
- 1 x Fan connector
- 1 x Floppy disk connector
- 1 x Front panel connector
- 1 x IDE connector
- 1 x Infrared connector
- 1 x Keyboard / mouse connector
- 1 x LVDS connector

- 1 x Parallel port connector
- 1 x RS-232 connector
- 1 x RS-232/422/485 connector
- 2 x SATA connectors
- 1 x SDVO connector
- 1 x TV connector
- 2 x USB connectors

The 3308490 has the following external peripheral interface connectors on the board rear panel.

- 2 x Network ports
- 2 x USB ports
- 1 x VGA port

The 3308490 has the following on-board jumpers:

- ATX power control
- Clear CMOS
- COM2 port mode
- CompactFlash® card setup
- LCD panel type selector
- LCD voltage selector

1.4 Technical Specifications

3308490 technical specifications are listed in **Table 1-1**. See **Chapter 2** for details.

Specification	3308490
Form Factor	PCISA
System CPU	45 nm 1.60 GHz Intel® Atom™ N270
Front Side Bus (FSB)	533 MHz
System Chipset	Northbridge: Intel® 945GSE Southbridge: Intel® ICH7M

Specification	3308490
Memory	512 MB of DDR2 RAM integrated (a DDR2 SO-DIMM slot is a custom option)
CompactFlash®	One CompactFlash® socket
Super I/O	iTE IT8718F
Display	VGA LVDS HDTV SDVO
BIOS	AMI BIOS label
Audio	Through HD Audio or AC'97 audio kit
LAN	Two Realtek RTL8111CP PCIe GbE controllers
COM	One RS-232 serial port One RS-232/422/485 serial port
USB2.0	Six USB 2.0 devices supported (four internal, two external)
Hard Drives	One 40-pin IDE connector
SATA	Two 3.0 Gb/s SATA drives supported
Keyboard/mouse	Internal PS/2 keyboard/mouse connector
Digital I/O	One 8-bit digital I/O connector
Watchdog Timer	Software programmable 1-255 sec.
Infrared	One infrared connector supports Serial Infrared (SIR) Amplitude Shift Keyed IR (ASKIR)
Power Supply	ATX and AT power supported
Power Consumption	5 V @ 2.89 A 12 V @ 0.22 A (with 512 MB DDR2 memory)
Temperature	0ºC – 60ºC (32ºF - 140ºF)
Humidity (operating)	5%~95% non-condensing

Specification	3308490
Dimensions (LxH)	185 mm x 127.6 mm
Weight (GW/NW)	1000 g / 252 g

Table 1-1: Technical Specifications

Detailed Specifications

2.1 Dimensions

2.1.1 Board Dimensions

The dimensions of the board are listed below:

- **Length**: 185 mm
- **Height**: 127.6 mm

Figure 2-1: 3308490 Dimensions (mm)

2.1.2 External Interface Panel Dimensions

External peripheral interface connector panel dimensions are shown in **Figure 2-2**.
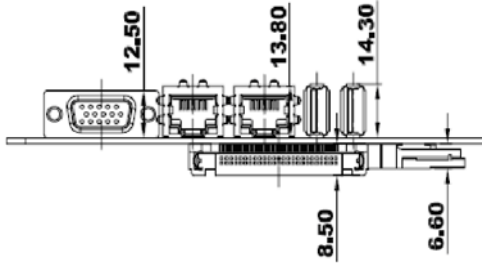
Figure 2-2: External Interface Panel Dimensions (mm)

2.2 Data Flow

Figure 2-3 shows the data flow between the two on-board chipsets and other components installed on the motherboard and described in the following sections of this chapter.
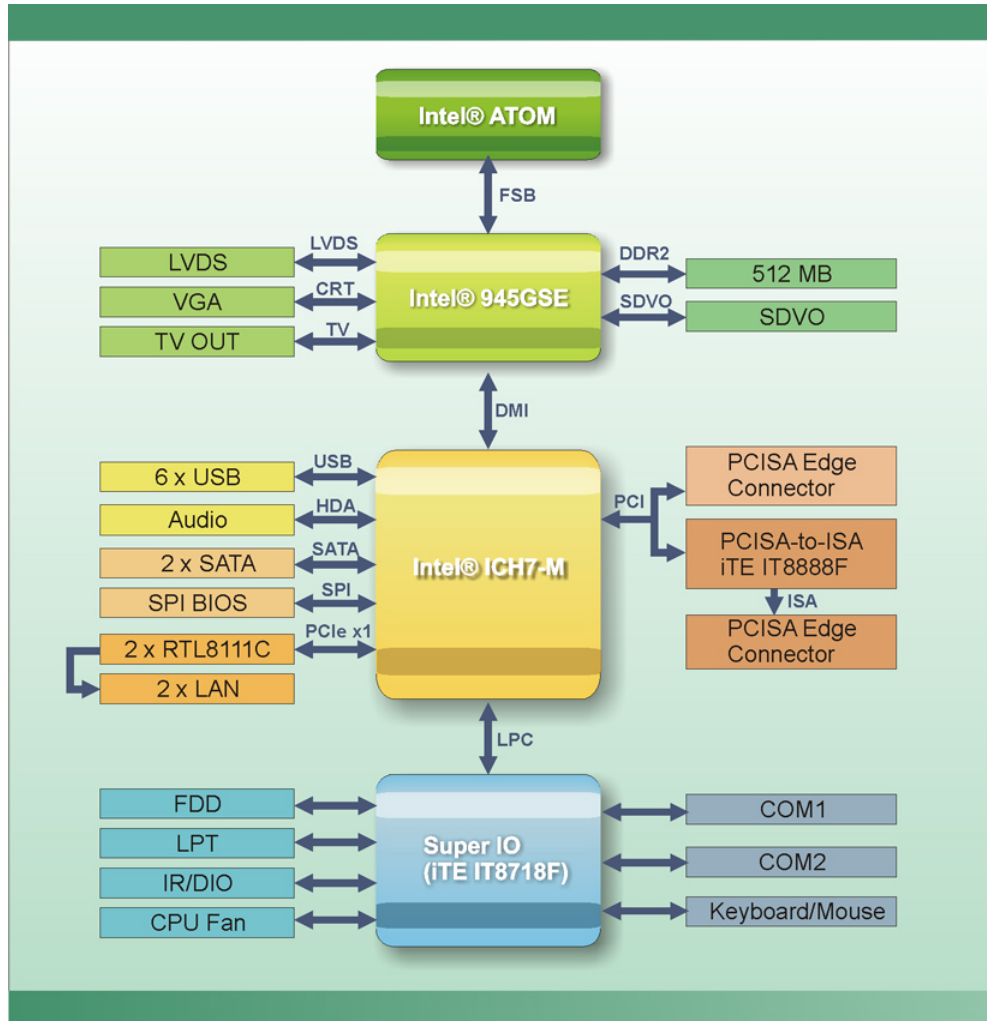
Figure 2-3: Data Flow Block Diagram

2.3 Intel® Atom™ Processor

2.3.1 Overview

The 3308490 comes with an embedded 45 nm 1.60 GHz Intel® Atom™ N270 processor. The processor supports a 533 MHz FSB and has a 512 KB L2 cache. The low power processor has a maximum power of 2.5 W. The CPU is shown in **Figure 2-4** below.
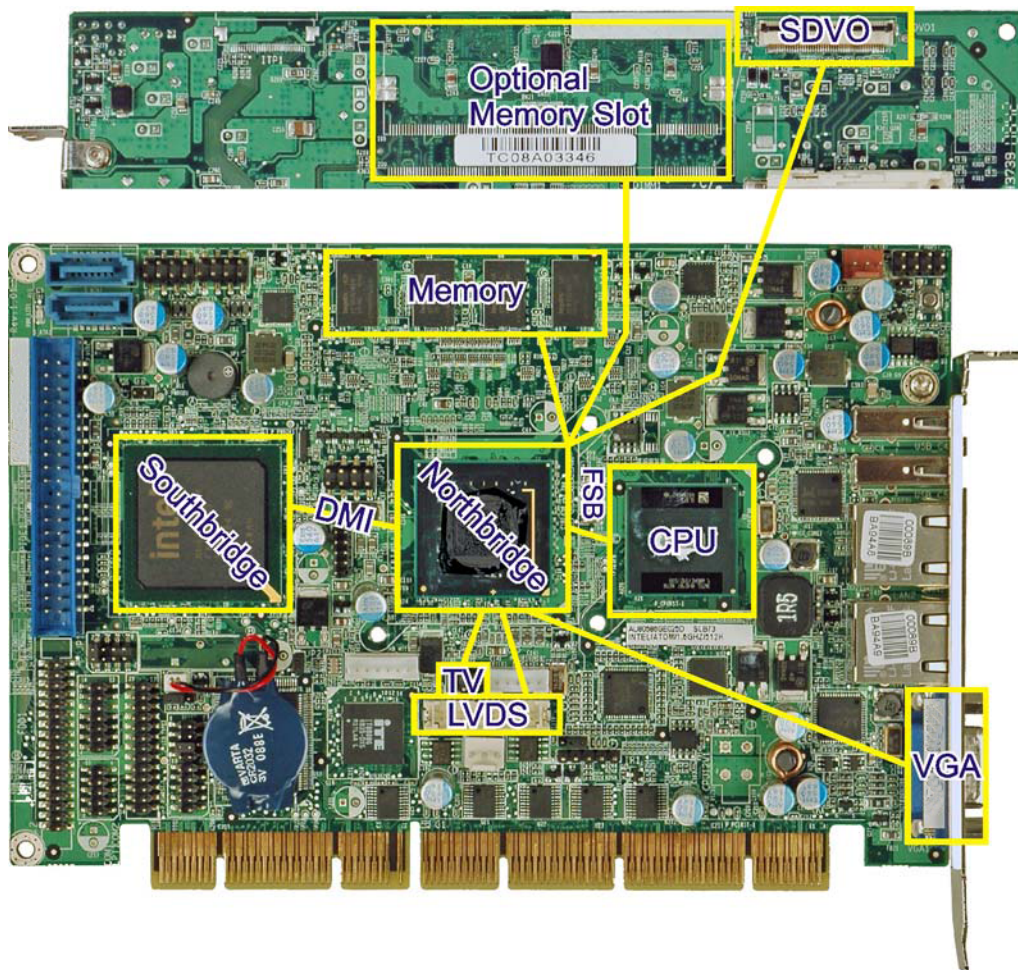
Figure 2-4: CPU and Northbridge Connections

2.3.2 Features

Some of the features of the Intel® Atom™ N270 are listed below

- On-die, primary 32-kB instructions cache and 24-kB write-back data cache
- 533 MHz source-synchronous front side bus (FSB)
- 2-Threads support
- On-die 512-kB, 8-way L2 cache
- Support for IA 32-bit architecture
- Intel® Streaming SIMD Extensions-2 and -3 (Intel® SSE2 and Intel® SSE3) support and Supplemental Streaming SIMD Extension 3 (SSSE3) support
- Micro-FCBGA8 packaging technologies
- Thermal management support via Intel® Thermal Monitor 1 and Intel Thermal Monitor 2
- FSB Lane Reversal for flexible routing
- Supports C0/C1(e)/C2(e)/C4(e)
- L2 Dynamic Cache Sizing
- Advanced power management features including Enhanced Intel SpeedStep® Technology
- Execute Disable Bit support for enhanced security

2.3.3 Front Side Bus (FSB)

The Intel® Atom™ processor on the 3308490 is interfaced to the Intel® 945GSE Northbridge through a 533 MHz front side bus (FSB). The FSB is shown in Figure 2-4 above.

2.4 Intel® 945GSE Northbridge Chip

The Intel® 945GSE Graphics and Memory Controller Hub (GMCH) supports the embedded Intel® Atom™ N270 processor. The Intel® 945GSE is interfaced to the processor through a 533 MHz FSB. The Northbridge connections are shown in Figure 2-4 and described below.

2.4.1 DDR2 Controller

There is 512 MB of memory on the 3308490. The memory has the following specifications:

- 512 MB embedded (up to 2.0 GB can be installed on customized board with SO-DIMM slot)

- Support for DDR2 at 400 MHz and 533 MHz
- No support for Dual-Channel Interleaved mode of operation
- Enhanced Addressing support (Swap only)

The embedded memory is shown in Figure 2-4 above.

2.4.2 Graphics

The Intel® 945GSE Northbridge chipset has an Intel® Gen. 3.5 integrated graphics engine that supports the following display devices:

- Analog CRT
- LVDS
- TV-Out
- SDVO ports

2.4.2.1 Analog CRT (VGA)

A DB-15 VGA connector on the external peripheral interface connector panel is interfaced to the Intel® 945GSE graphics engine. The Intel® 945GSE internal graphics engine, with an integrated 400 MHz RAMDAC and hot plug CRT support, supports analog CRT monitors up to QXGA.

2.4.2.2 LVDS

A 30-pin LVDS crimp connector is interfaced to the Intel® 945GSE graphics engine. The Intel® 945GSE internal graphics engine supports LVDS displays with the following features:

- Up to UXGA monitors with a maximum resolution of 1600 x 1200
- 18-bit 25 MHz to 112 MHz single-channel or dual-channel LVDS screens
- CPIS 1.5 compliant LVDS screens

2.4.2.3 TV Out

An external 7-pin DIN TV output connector is interfaced to the Intel® 945GSE graphics engine. The Intel® 945GSE internal graphics engine has the following TV output features:

- Three integrated 10-bit DACs

- Macrovision support
- Overscaling
- NTSC and PAL formats supported
- Supports RCA or S-VIDEO connectivity
- Supports HDTV with the following resolutions:
  - 480p
  - 720p
  - 1080i
  - 1080p

2.4.2.4 SDVO and DVI

The SDVO port on the solder side of the 3308490 connects directly to the SDVO output on the Intel® 945GSE. The SDVO connector is connected to an GAI SDVO graphics card.

- Concurrent operation of PCIe x 1 with SDVO
- Two SDVO ports supported
  - SDVO is muxed onto the PCIe pins
  - DVI 1.0 support for external digital monitor
  - Only Downstream HDCP support
  - Supports TV and DVD formats
  - Display hot plug support

2.5 Intel® ICH7M Southbridge Chipset

The Intel® ICH7M Southbridge chipset is connected to the Intel® 945GSE Northbridge GMCH through the chip-to-chip Direct Media Interface (DMI). Some of the features of the Intel® ICH7M are listed below.
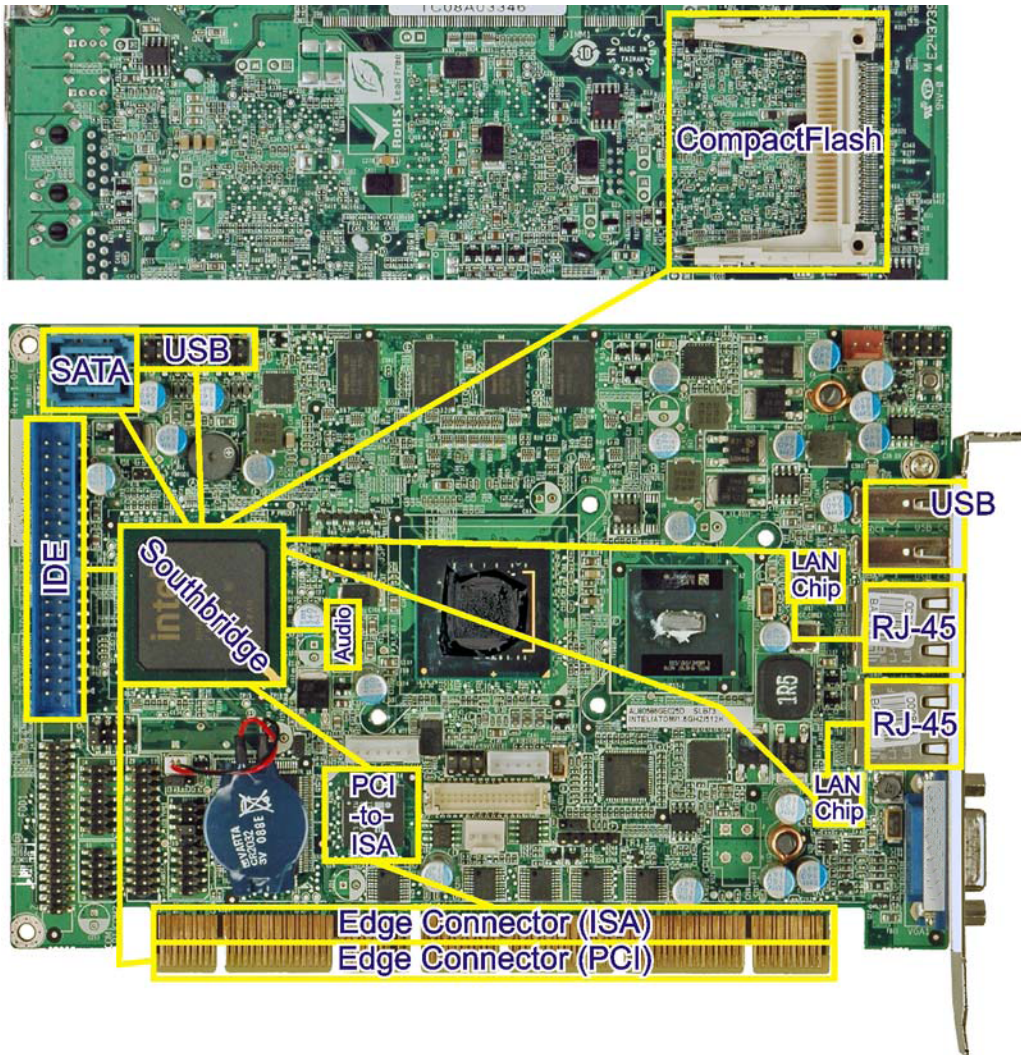
Figure 2-5: Intel® ICH7M Southbridge Connections

- Complies with PCI Express Base Specification, Revision 1.0a
- Complies with PCI Local Bus Specification, Revision 2.3 and supports 33 MHz PCI operations
- Supports ACPI Power Management Logic
- Contains:
  - Enhanced DMA controller
  - Interrupt controller
  - Timer functions
- Integrated SATA host controller with DMA operations interfaced to two SATA connectors on the 3308490
- Integrated IDE controller supports Ultra ATA 100/66/33

- Supports the four USB 2.0 devices on the 3308490 with four UHCI controllers and one EHCI controller
- Complies with System Management Bus (SMBus) Specification, Version 2.0
- Supports Audio Codec '97 (AC'97) Revision 2.3
- Supports Intel® High Definition Audio
- Contains Low Pin Count (LPC) interface
- Supports Firmware Hub (FWH) interface
- Serial peripheral interface support

2.5.1 HD Audio Controller

The audio connector on the 3308490 is connected to the HD Audio/AC'97 audio channel on the Intel® ICH7M. The audio connector connects to an HD Audio kit or an AC'97 audio kit, both available as optional extras from GAI.

The HD Audio kit provides the following connectors:

- 7.1 channel audio output
- Line input
- Microphone input

The AC'97 audio kit provides the following connectors:

- 5.1 channel audio output
- Line input
- Microphone input

2.5.2 IDE Interface

The IDE interface connects with

2.5.2.1 IDE Connector

The IDE connector on the Intel® ICH7M Southbridge connects to an IDE hard disk or other IDE device. PIO IDE transfers up to 16 MB/s and Ultra ATA transfers of 100 MB/s. The integrated IDE interface is able to support the following IDE HDDs:

- **Ultra ATA/100**, with data transfer rates up to 100 MB/s
- **Ultra ATA/66**, with data transfer rates up to 66 MB/s
- **Ultra ATA/33**, with data transfer rates up to 33 MB/s

Specification	Ultra ATA/100	Ultra ATA/66	Ultra ATA/33
IDE devices	2	2	2
PIO Mode	0 – 4	0 – 4	0 – 4
PIO Max Transfer Rate	16.6 MB/s	16.6 MB/s	16.6 MB/s
DMA/UDMA designation	UDMA 5	UDMA 4	UDMA 2
DMA/UDMA Max Transfer	100 MB/s	66 MB/s	33 MB/s
Controller Interface	5 V	5 V	5 V

Table 2-1: Supported HDD Specifications

2.5.2.2 CompactFlash® Slot

The CompactFlash® slot on the 3308490 is interfaced through the IDE interface on the Intel® ICH7M Southbridge. The CompactFlash® slot is on the solder side of the 3308490.

2.5.3 Real Time Clock

256 bytes of battery backed RAM is provided by the Motorola MC146818 A real time clock (RTC) integrated into the ICH7M. The RTC operates on a 3 V battery and 32.768 KHz crystal. The RTC keeps track of the time and stores system data even when the system is turned off.

2.5.4 SATA Controller

The integrated SATA controller on the Intel® ICH7M Southbridge supports two SATA drives with independent DMA operations. Two SATA controllers are connected to two SATA connectors on the 3308490. SATA controller specifications are listed below.

- Supports two SATA drives
- Supports 3.0 Gb/s data transfer speeds
- Supports Serial ATA Specification, Revision 1.0a

2.5.5 USB Controller

Up to six high-speed, full-speed or low-speed USB devices are supported by the Intel® ICH7M on the 3308490. High-speed USB 2.0, with data transfers of up to 480 MB/s, is enabled with the Intel® ICH7M integrated Enhanced Host Controller Interface (EHCI) compliant host controller. USB full-speed and low-speed signaling is supported by the Intel® ICH7M integrated Universal Host Controller Interface (UHCI) controllers.

The six USB ports implemented on the 3308490 are connected to four internal connectors (on two headers) and two external connectors.

2.5.6 iTE IT8718F Super I/O chipset

The iTE IT8718F Super I/O chipset is connected to the Intel® ICH7M Southbridge through the LPC bus. The iTE IT8718F is an LPC interface-based Super I/O device that comes with Environment Controller integration.
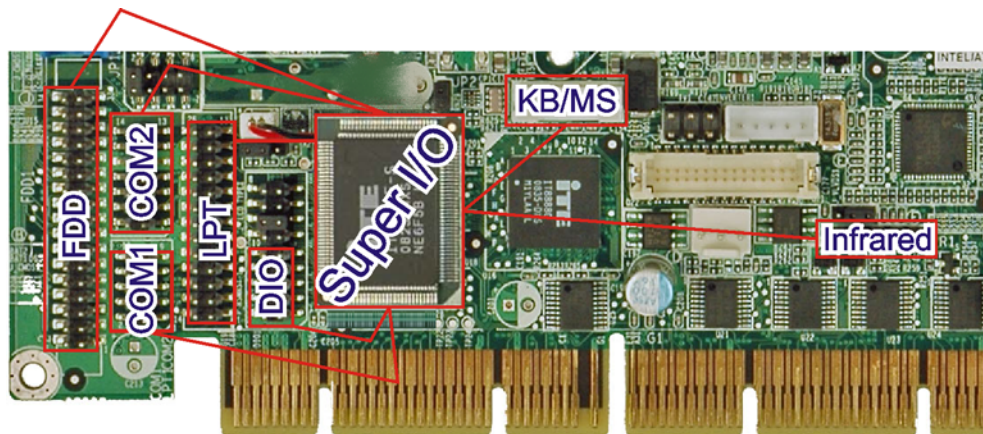
Figure 2-6: Super I/O Connections

Some of the features of the iTE IT8718F chipset are listed below:

- ACPI and LANDesk Compliant
- Enhanced Hardware Monitor
- Fan Speed Controller
- Two 16C550 UARTs for serial port control
- One IEEE 1284 Parallel Port
- Keyboard Controller
- Watchdog Timer

Some of the Super I/O features are described in more detail below:

2.5.6.1 LPC Interface

The LPC interface on the Super I/O complies with the Intel® Low Pin Count Specification Rev. 1.0. The LPC interface supports both LDRQ# and SERIRQ protocols as well as PCI PME# interfaces.

2.5.6.2 16C550 UARTs

The onboard Super I/O has two integrated 16C550 UARTs that can support the following:

- Two standard serial ports
- IrDa 1.0 and ASKIR protocols

2.5.6.3 Digital Input/Output

The input mode supports switch debouncing or programmable external IRQ routing. The output mode supports two sets of programmable LED blinking periods.

2.5.6.4 Enhanced Hardware Monitor

The Super I/O Enhanced Hardware Monitor monitors three thermal inputs, VBAT internally, and eight voltage monitor inputs. These hardware parameters are reported in the BIOS and can be read from the BIOS Hardware Health Configuration menu.

2.5.6.5 Fan Speed Controller

The Super I/O fan speed controller enables the system to monitor the speed of the fan. One of the pins on the fan connector is reserved for fan speed detection and interfaced to the fan speed controller on the Super I/O. The fan speed is then reported in the BIOS.

2.5.6.6 Keyboard/Mouse Controller

The Super I/O keyboard/mouse controller can execute the 8042 instruction set. Some of the keyboard controller features are listed below:

- The 8042 instruction is compatible with a PS/2 keyboard and PS/2 mouse
- Gate A20 and Keyboard reset output
- Supports multiple keyboard power on events
- Supports mouse double-click and/or mouse move power on events

2.5.6.7 Parallel Port

The multi-mode high-performance parallel port supports the bi-directional Standard Parallel Port (SPP), the Enhanced Parallel Port (EPP) and the Extended Capabilities Port (ECP) modes.

2.5.7 PCI Bus

The PCI interface on the Intel® ICH7M is compliant with the PCI Revision 2.3 implementation. The location of the edge connector is shown in Figure 2-5. Some of the features of the PCI interface are listed below.

- PCI Revision 2.3 compliant
- 33 MHz
- 5 V tolerant PCI signals (except PME#)
- Integrated PCI arbiter supports up to seven PCI bus masters

2.5.7.1 PCI Edge Connector

The PCI interface is connected directly to the PCI portion of the edge connector on the 3308490.

2.5.7.2 ISA Edge Connector

The PCI interface is connected to the ISA edge connector through the iTE IT8888G PCI-to-ISA chip.

2.5.8 PCIe Bus

The Intel® ICH7M provides four PCIe lanes. Some of these lanes are connected to the components listed below:

- Gigabit Ethernet Connector

The Gigabit Ethernet connections are shown in Figure 2-5.

2.5.8.1 Gigabit Ethernet Connector

Two of the four PCIe lanes on the Intel® ICH7M PCIe lanes are connected to the Realtek RTL8111CP PCIe GbE controllers.

The Realtek RTL8111CP PCIe GbE controllers combine a triple-speed IEEE 802.3 compliant Media Access Controller (MAC) with a triple-speed Ethernet transceiver, 32-bit PCIe bus controller, and embedded memory. With state-of-the-art DSP technology and mixed-mode signal technology, they offer high-speed transmission over CAT 5 UTP cable or CAT 3 UTP (10 Mb/s only) cable. Functions such as Crossover Detection & Auto-Correction, polarity correction, adaptive equalization, cross-talk cancellation, echo cancellation, timing recovery, and error correction are implemented to provide robust transmission and reception capability at high speeds.

Some of the features of the Realtek RTL8111CP PCIe GbE controllers are listed below.

- Integrated 10/100/1000 transceiver
- Auto-Negotiation with Next Page capability
- Supports PCI Express™ 1.1
- Supports pair swap/polarity/skew correction
- Crossover Detection & & Auto-Correction
- Wake-on-LAN and remote wake-up support
- Microsoft® NDIS5, NDIS6 Checksum Offload (IPv4, IPv6, TCP, UDP) and Segmentation Task-offload (Large send and Giant send) support
- Supports Full Duplex flow control (IEEE 802.3x)
- Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab
- Supports IEEE 802.1P Layer 2 Priority Encoding
- Supports IEEE 802.1Q VLAN tagging
- Serial EEPROM
- Transmit/Receive on-chip buffer support
- Supports power down/link down power saving
- Supports PCI MSI (Message Signaled Interrupt) and MSI-X
- Supports Receive-Side Scaling (RSS)

2.5.9 SPI Bus Components

The Intel® ICH7M SPI bus is connected to components listed below:

- BIOS chip

2.5.9.1 SPI BIOS

The 4-pin Serial Peripheral Interface (SPI) is connected to an SPI BIOS chip. A licensed copy of AMI BIOS is preinstalled on the SPI BIOS chip. A master-slave protocol is used for communication on the SPI bus. The slave is connected to the Intel® ICH7M and is implemented as a tri-state bus. The SPI BIOS is located on the reverse side of the JSPI1 jumper.

2.6 Environmental and Power Specifications

2.6.1 System Monitoring

Two thermal inputs on the 3308490 Super I/O Enhanced Hardware Monitor monitors the following temperatures:

- CPU temperature
- System temperature

The 3308490 Super I/O Enhanced Hardware Monitor also monitors the following fan speeds:

- CPU Fan speed

Voltage inputs on the 3308490 Super I/O Enhanced Hardware Monitor monitors the following voltages:

- CPU Core
- +1.05 V
- +3.30 V
- +5.00 V
- +12 V
- +1.5 V
- +1.8 V
- +5 VSB
- VBAT

The values for the above environmental parameters are all recorded in the BIOS Hardware Health Configuration menu.

2.6.2 Operating Temperature and Temperature Control

The maximum and minimum operating temperatures for the 3308490 are listed below.

- Minimum Operating Temperature: 0ºC (32°F)
- Maximum Operating Temperature: 60°C (140°F)

A cooling fan and heat sink must be installed on the CPU. Thermal paste must be smeared on the lower side of the heat sink before it is mounted on the CPU. Heat sinks are also mounted on the Northbridge and Southbridge chipsets to ensure the operating temperature of these chips remain low.

2.6.3 Power Consumption

Table 2-2 shows the power consumption parameters for the 3308490 running with a 1.60 GHz Intel® Atom™ with 2.0 GB DDR2 memory.

Voltage	Current
+5 V	2.89 A
+12 V	0.22 A

Table 2-2: Power Consumption

Chapter

3

Unpacking

3.1 Anti-static Precautions

 WARNING!

Failure to take ESD precautions during the installation of the 3308490 may result in permanent damage to the 3308490 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the 3308490. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the 3308490, or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- **Wear an anti-static wristband**: - Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- **Self-grounding**:- Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- **Use an anti-static pad**: When configuring the 3308490, place it on an antic-static pad. This reduces the possibility of ESD damaging the 3308490.
- **Only handle the edges of the PCB**:- When handling the PCB, hold the PCB by the edges.

3.2 Unpacking

3.2.1 Unpacking Precautions

When the 3308490 is unpacked, please do the following:

- Follow the anti-static precautions outlined in **Section 3.1**.
- Make sure the packing box is facing upwards so the 3308490 does not fall out of the box.
- Make sure all the components shown in **Section 3.3** are present.

3.3 Unpacking Checklist

3.3.1 Package Contents

The 3308490 is shipped with the following components:

Quantity	Item and Part Number	Image
1	3308490	
2	SATA cable	
1	LPT and RS-232 cable	
1	USB cable	
1	Mini jumper pack (2.0 mm)	
1	Utility CD	

3.3.2 Optional Items

The 3308490 is shipped with the following components:

Item and Part Number	Image
5.1 Channel AC'97 audio kit	
7.1 Channel HD Audio kit	
Dual USB cable (wo bracket)	
Dual RS-232 cable	
TV-out cable	
HDTV output cable	
KB/MS cable	

Item and Part Number	Image
FDD cable	
HDD cable	
IDE-cable	
SATA power cable	

Table 3-2: Power Consumption

Connectors

4.1 Peripheral Interface Connectors

This chapter outlines all internal and external connectors on the 3308490.

4.1.1 Layout

Figure 4-1 shows the on-board peripheral connectors, rear panel peripheral connectors and on-board jumpers.
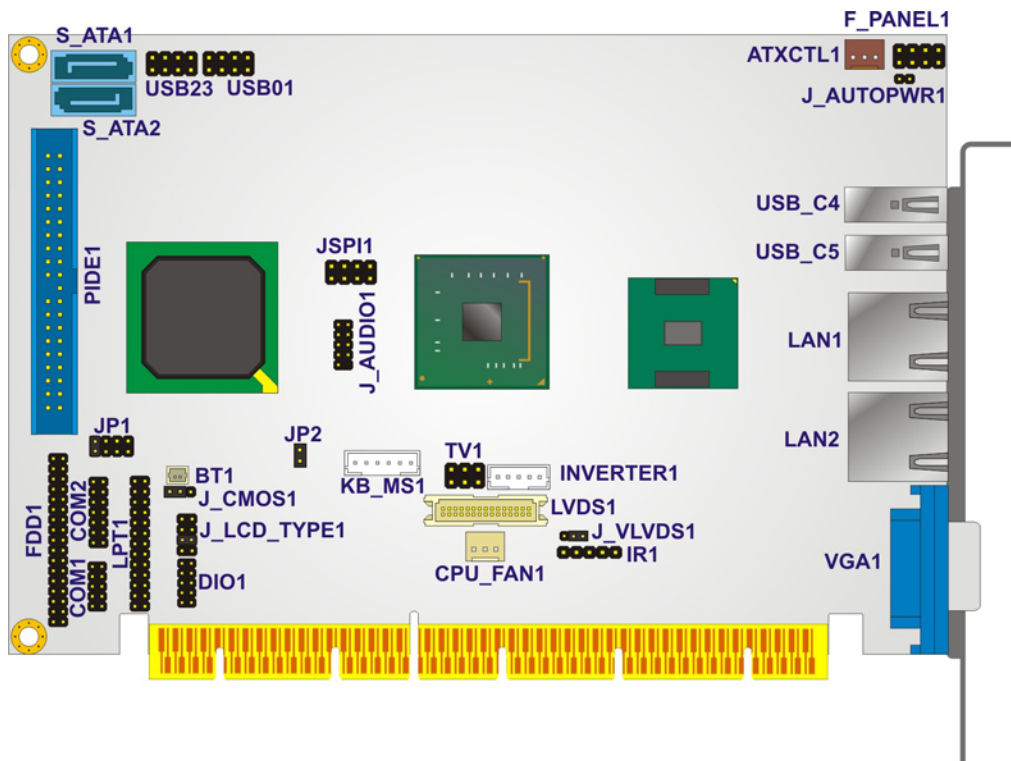
Figure 4-1: Connector and Jumper Locations [Front Side]

Figure 4-2 shows the connectors on the solder side of the 3308490.
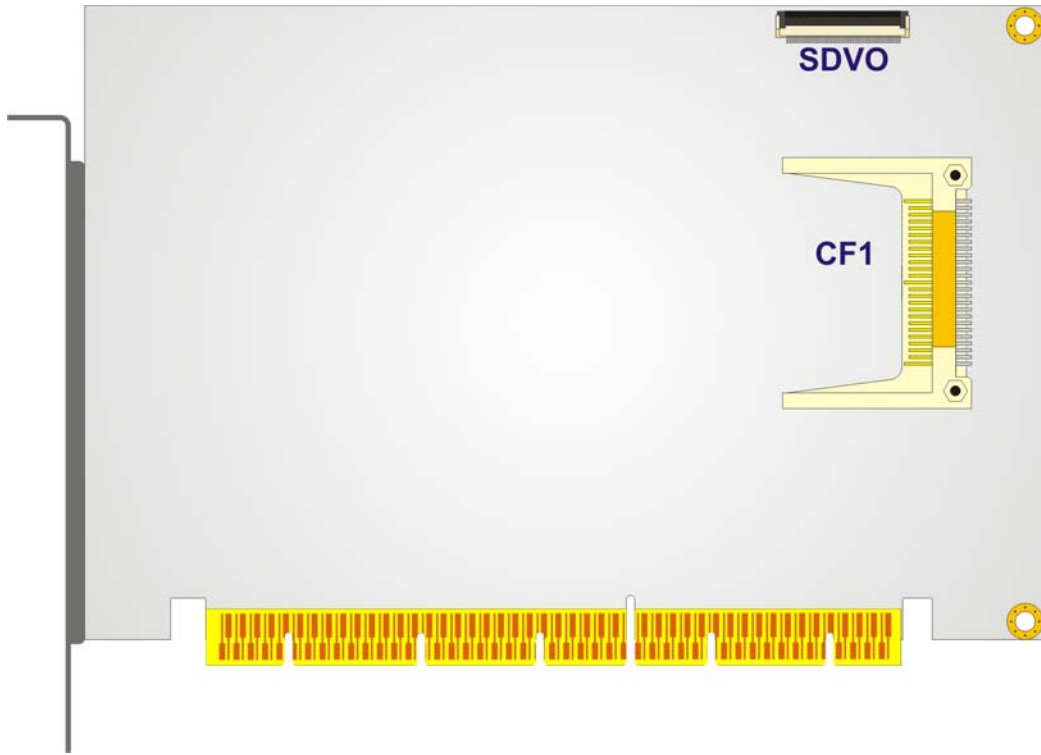
Figure 4-2: Connector and Jumper Locations [Solder Side]

4.1.2 Internal Peripheral Interface Connectors

Table 4-1 shows a list of the peripheral interface connectors on the 3308490. Detailed descriptions of these connectors can be found below.

Connector	Type	Label
ATX power control connector	3-pin wafer	ATXCTL1
Audio kit connector	9-pin header	J_AUDIO1
Backlight inverter connector	5-pin box header	INVERTER1
Battery connector	2-pin box header	BT1
BIOS programming connector	8-pin header	JSPI1
CompactFlash® slot	CF slot	CF1
Digital I/O connector	10-pin header	DIO1

Connector	Type	Label
Fan connector	3-pin wafer	CPU_FAN1
Floppy disk connector	34-pin header	FDD1
Front panel connector	8-pin header	F_PANEL1
IDE connector	40-pin IDE connector	PIDE1
Infrared connector	5-pin header	IR1
Keyboard/mouse connector	6-pin box header	KB_MS1
LVDS connector	30-pin crimp	LVDS1
Parallel port connector	26-pin header	LPT1
RS-232 connector	10-pin header	COM1
RS-232/422/485 connector	14-pin header	COM2
SATA connector	SATA port	SATA1, SATA2
SDVO connector	Flat cable connector	SDVO1
TV connector	6-pin header	TV1
USB connectors	8-pin header	USB01, USB23

Table 4-1: Peripheral Interface Connectors

4.1.3 External Interface Panel Connectors

Table 4-2 lists the rear panel connectors on the 3308490. Detailed descriptions of these connectors can be found in **Section 4.3** on **page 57**.

Connector	Type	Label
Network ports	RJ-45	LAN1, LAN2
USB ports	USB port	USB_C4, USB_C5
VGA port	VGA port	VGA1

Table 4-2: Rear Panel Connectors

4.2 Internal Peripheral Connectors

Internal peripheral connectors are found on the motherboard and are only accessible when the motherboard is outside of the chassis. This section has complete descriptions of all the internal, peripheral connectors on the 3308490.

4.2.1 ATX Power Control Connector

CN Label: **ATXCTL1**

CN Type: 3-pin wafer (1x3)

CN Location: See **Figure 4-3**

CN Pinouts: See **Table 4-3**

The ATX power supply enable connector enables the 3308490 to be connected to an ATX power supply. In default mode, the 3308490 can only us an AT power supply. To enable an ATX power supply the AT Power Select jumper must also be configured. Please refer to Chapter 3 for more details.
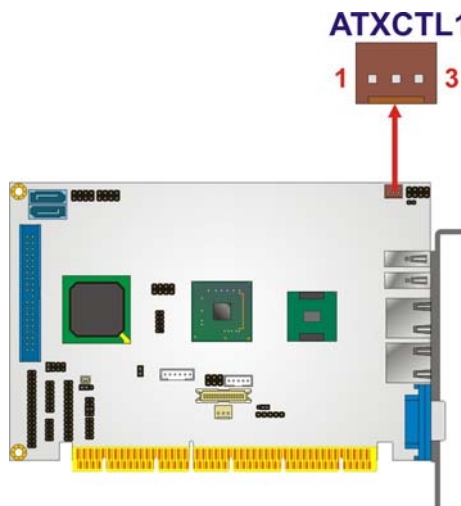
Figure 4-3: ATX Power Supply Enable Connector Location

PIN NO.	DESCRIPTION
1	GND
2	PS-ON

PIN NO.	DESCRIPTION
3	+5V Standby

Table 4-3: ATX Power Supply Enable Connector Pinouts

4.2.2 Audio Connector

CN Label: **J_AUDIO1**

CN Type: 9-pin header (2x5)

CN Location: See **Figure 4-4**

CN Pinouts: See **Table 4-4**

The 9-pin audio connector is connected to external audio devices including speakers and microphones for the input and output of audio signals to and from the system.
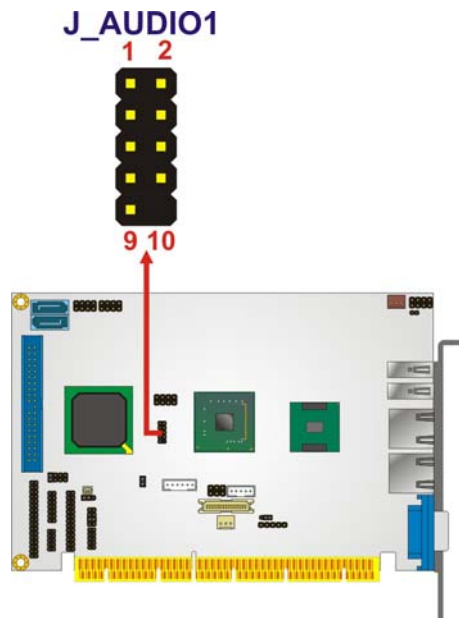
Figure 4-4: Audio Connector Location (9-pin)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	SYNC	2	BITCLK
3	SDOUT	4	PCBEEP
5	SDIN	6	RST#
7	VCC	8	GND

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
9	+12V		

Table 4-4: Audio Connector Pinouts (9-pin)

4.2.3 Backlight Inverter Connector

CN Label: **INVERTER1**

CN Type: 5-pin box header (1x5)

CN Location: See **Figure 4-5**

CN Pinouts: See **Table 4-5**

The backlight inverter connector provides the backlight on the LCD display connected to the 3308490 with +12V of power.
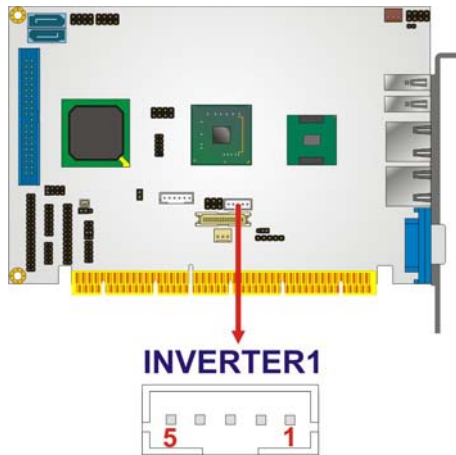
Figure 4-5: LCD Backlight Connector Pinout Locations

PIN NO.	DESCRIPTION
1	Brightness
2	GND
3	12 V
4	GND
5	Backlight enable

Table 4-5: LCD Backlight Connector Pinouts

4.2.4 Battery Connector

CN Label: **BT1**

CN Type: 2-pin wafer (1x2)

CN Location: See **Figure 4-6**

CN Pinouts: See **Table 4-6**

The battery connector is connected to a backup battery. The battery connector is also used to reset the CMOS memory if the incorrect BIOS settings have been made and the system cannot boot up.
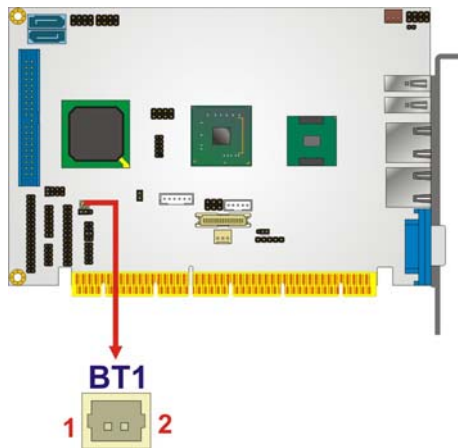
Figure 4-6: Battery Connector Location

PIN NO.	DESCRIPTION
1	Battery+
2	Battery-

Table 4-6: Battery Connector Pinouts

4.2.5 BIOS Programming Connector

CN Label: **JSPI1**

CN Type: 8-pin header (2x4)

CN Location: See **Figure 4-7**

CN Pinouts: See **Table 4-7**

The 8-pin SPI Flash connector is used for the BIOS.
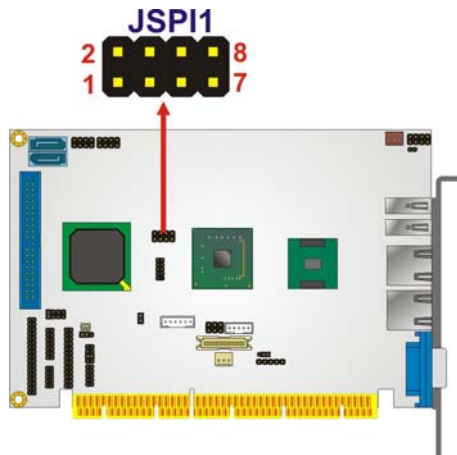
Figure 4-7: BIOS Programming Connector Pinouts

PIN	DESCRIPTION	PIN	DESCRIPTION
1	3.3 V	2	GND
3	CS#	4	CLOCK
5	SO	6	SI
7	N/C	8	N/C

Table 4-7: BIOS Programming Connector

4.2.6 CompactFlash® Socket

CN Label: **CF1**

CN Type: CompactFlash® slot

CN Location: See **Figure 4-8**

CN Pinouts: See **Table 4-8**

The CompactFlash® card slot allows a CompactFlash® type I or II card to be installed.
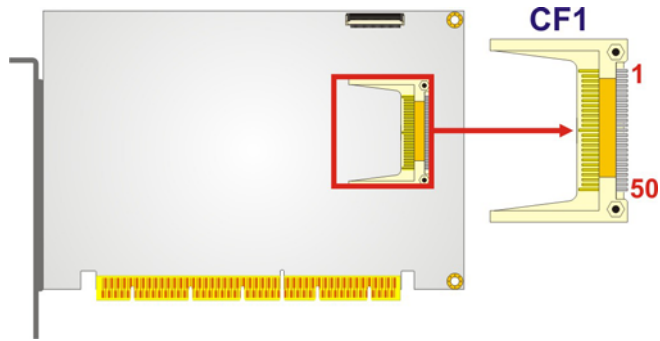
Figure 4-8: CF Card Socket Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GROUND	26	CD1#
2	DATA 3	27	DATA 11
3	DATA 4	28	DATA 12
4	DATA 5	29	DATA 13
5	DATA 6	30	DATA 14
6	DATA 7	31	DATA 15
7	CE#	32	CE2#
8	A10	33	VS1#
9	OE#	34	IOR#
10	A9	35	IOW#
11	A8	36	WE#
12	A7	37	IRQ
13	VCC1	38	VCC2
14	A6	39	CSEL#
15	A5	40	VS2#
16	A4	41	RESET#
17	A3	42	WAIT#
18	A2	43	INPACK#
19	A1	44	REG#
20	A0	45	BVD2
21	DATA 0	46	BVD1
22	DATA 1	47	DATA 8
23	DATA 2	48	DATA 9
24	IOCS16#	49	DATA 10

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
25	CD2#	50	GND2

Table 4-8: CF Card Socket Pinouts

4.2.7 Digital I/O Connector

CN Label: **DIO1**

CN Type: 10-pin header (2x5)

CN Location: See **Figure 4-9**

CN Pinouts: See **Table 4-9**

The digital input/output connector is managed through a Super I/O chip. The DIO connector pins are user programmable.
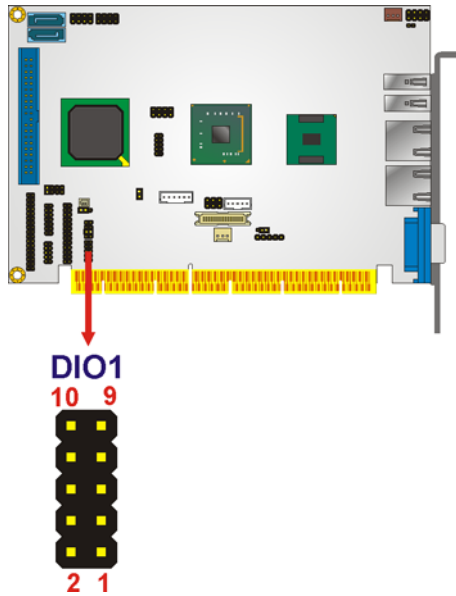
Figure 4-9: Digital I/O Connector Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	VCC
3	Output 3	4	Output 2
5	Output 1	6	Output 0
7	Input 3	8	Input 2

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
9	Input 1	10	Input 0

Table 4-9: DIO Connector Pinouts

4.2.8 Fan Connector

CN Label: **CPU_FAN1**

CN Type: 3-pin wafer (1x3)

CN Location: See **Figure 4-10**

CN Pinouts: See **Table 4-10**

The cooling fan connector provides a 12 V, 500mA current to the cooling fan. The connector has a "rotation" pin to get rotation signals from fans and notify the system so the system BIOS can recognize the fan speed. Please note that only specified fans can issue the rotation signals.
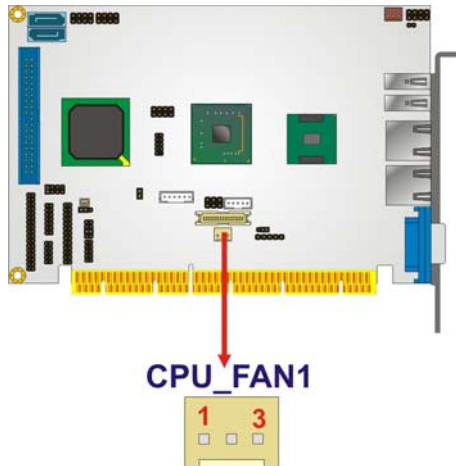
Figure 4-10: CPU Fan Connector Location

PIN NO.	DESCRIPTION
1	Ground
2	+12 V
3	Sense

Table 4-10: CPU Fan Connector Pinouts

4.2.9 Floppy Disk Connector

CN Label: **FDD1**

CN Type: 34-pin header (2x17)

CN Location: See **Figure 4-11**

CN Pinouts: See **Table 4-11**

The floppy disk connector is connected to a floppy disk drive.
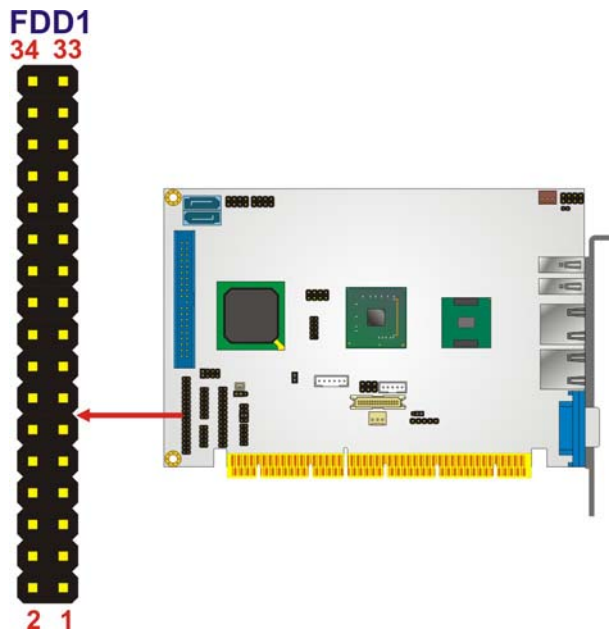
Figure 4-11: Floppy Disk Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	REDUCE WRITE
3	GND	4	N/C
5	N/C	6	N/C
7	GND	8	INDEX#
9	GND	10	MOTOR ENABLE A#
11	GND	12	DRIVE SELECT B#
13	GND	14	DRIVE SELECT A#
15	GND	16	MOTOR ENABLE B#
17	GND	18	DIRECTION#

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
19	GND	20	STEP#
21	GND	22	WRITE DATA#
23	GND	24	WRITE GATE#
25	GND	26	TRACK 0#
27	GND	28	WRITE PROTECT#
29	GND	30	READ DATA#
31	GND	32	SIDE 1 SELECT#
33	GND	34	DISK CHANGE#

Table 4-11: Floppy Disk Connector Pinouts

4.2.10 Front Panel Connector

CN Label: **F_PANEL1**

CN Type: 8-pin header (2x4)

CN Location: See **Figure 4-12**

CN Pinouts: See **Table 4-12**

The front panel connector connects to external switches and indicators to monitor and controls the motherboard. These indicators and switches include:

- Power button
- Reset
- Power LED
- HDD LED
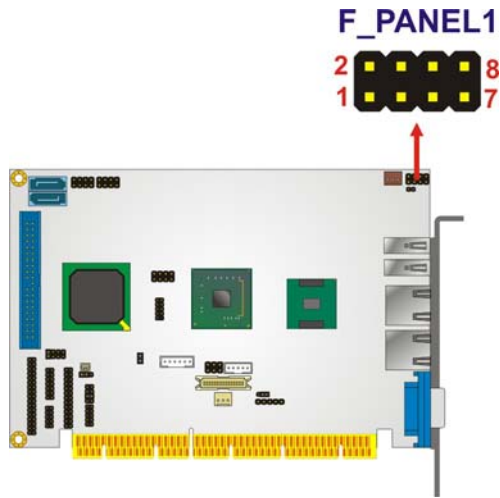
Figure 4-12: Front Panel Connector Pinout Locations

FUNCTION	PIN	DESCRIPTION	FUNCTION	PIN	DESCRIPTION
Power button	1	PWR_BTN+	Power LED	2	PWR_LED+
	3	PWR_BTN-		4	PWR_LED-
HDD LED	5	HDD_LED+	Reset button	6	RESET+
	7	HDD_LED-		8	RESET-

Table 4-12: Front Panel Connector Pinouts

4.2.11 IDE Connector

CN Label: **IDE1**

CN Type: 40-pin header (2x20)

CN Location: See **Figure 4-13**

CN Pinouts: See **Table 4-13**

One 40-pin IDE device connector on the 3308490 supports connectivity to two hard disk drives.
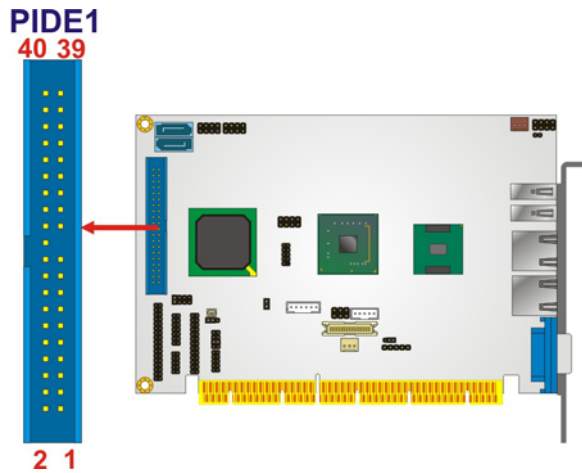
Figure 4-13: IDE Device Connector Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RESET#	2	GROUND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GROUND	20	N/C
21	IDE DRQ	22	GROUND
23	IOW#	24	GROUND
25	IOR#	26	GROUND
27	IDE CHRDY	28	BALE-DEFAULT
29	IDE DACK	30	GROUND–DEFAULT
31	INTERRUPT	32	N/C
33	SA1	34	PDIAG#
35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
39	HDD ACTIVE#	40	GROUND

Table 4-13: IDE Connector Pinouts

4.2.12 Infrared Interface Connector

CN Label: **IR1**

CN Type: 5-pin header (1x5)

CN Location: See **Figure 4-14**

CN Pinouts: See **Table 4-14**

The infrared interface connector supports both Serial Infrared (SIR) and Amplitude Shift Key Infrared (ASKIR) interfaces.
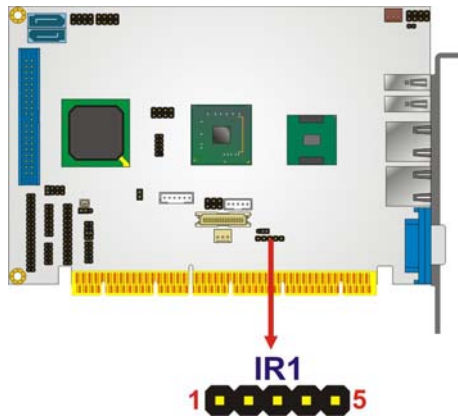
Figure 4-14: Infrared Connector Pinout Locations

PIN NO.	DESCRIPTION
1	VCC
2	NC
3	IR-RX
4	GND
5	IR-TX

Table 4-14: Infrared Connector Pinouts

4.2.13 Keyboard/Mouse Connector

    CN Label: **KB_MS1**

    CN Type: 6-pin box header (1x6)

    CN Location: See **Figure 4-15**

    CN Pinouts: See **Table 4-15**

The keyboard and mouse connector can be connected to a standard PS/2 cable or PS/2 Y-cable to add keyboard and mouse functionality to the system.
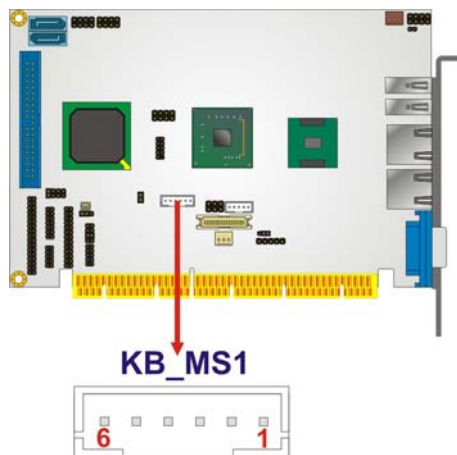
Figure 4-15: Keyboard/Mouse Connector Location

PIN NO.	DESCRIPTION
1	+5V
2	Mouse data
3	Mouse clock
4	Keyboard data
5	Keyboard clock
6	Ground

Table 4-15: Keyboard/Mouse Connector Pinouts

4.2.14 LVDS LCD Connector

    CN Label: LVDS1

CN Type: 30-pin crimp (2x15)

CN Location: See **Figure 4-16**

CN Pinouts: See **Table 4-16**

The 30-pin LVDS LCD connector can be connected to single channel or dual channel, 18-bit or 36-bit LVDS panel.
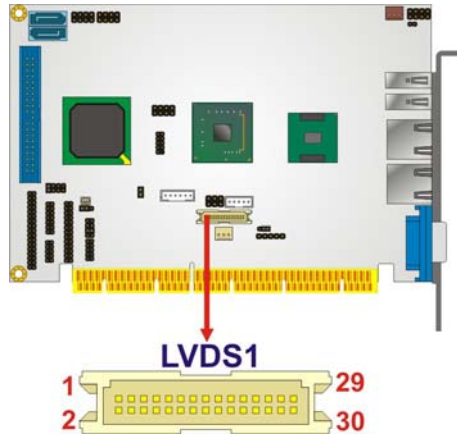
Figure 4-16: LVDS LCD Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GROUND	2	GROUND
3	LVDSA_Y0+	4	LVDSA_Y0-
5	LVDSA_Y1+	6	LVDSA_Y1-
7	LVDSA_Y2+	8	LVDSA_Y2-
9	LVDSA_CLK+	10	LVDSA_CLK-
11	LVDSA_Y3+	12	LVDSA_Y3-
13	GROUND	14	GROUND
15	LVDSB_Y0+	16	LVDSB_Y0-
17	LVDSB_Y1+	18	LVDSB_Y1-
19	LVDSB_Y2+	20	LVDSB_Y2-
21	LVDSB_CLK+	22	LVDSB_CLK-
23	LVDSB_Y3+	24	LVDSB_Y3-
25	GROUND	26	GROUND
27	VCC_LVDS	28	VCC_LVDS

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
29	VCC_LVDS	30	VCC_LVDS

Table 4-16: LVDS LCD Port Connector Pinouts

4.2.15 SATA Drive Connectors

CN Label: **SATA1, SATA2**

CN Type: 7-pin SATA drive connectors

CN Location: See **Figure 4-17**

CN Pinouts: See **Table 4-17**

The four SATA drive connectors are each connected to a first generation SATA drive. First generation SATA drives transfer data at speeds as high as 150 Mb/s. The SATA drives can be configured in a RAID configuration.
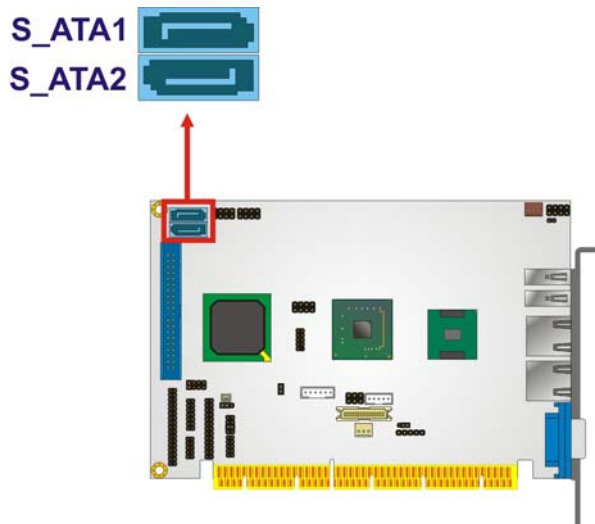
Figure 4-17: SATA Drive Connector Locations

PIN NO.	DESCRIPTION
1	GND
2	TX+
3	TX-
4	GND
5	RX-

PIN NO.	DESCRIPTION
6	RX+
7	GND

Table 4-17: SATA Drive Connector Pinouts

4.2.16 Parallel Port Connector

CN Label: **LPT1**

CN Type: 26-pin header (2x13)

CN Location: See **Figure 4-18**

CN Pinouts: See **Table 4-18**

The 26-pin parallel port connector connects to a parallel port connector interface or some other parallel port device such as a printer.
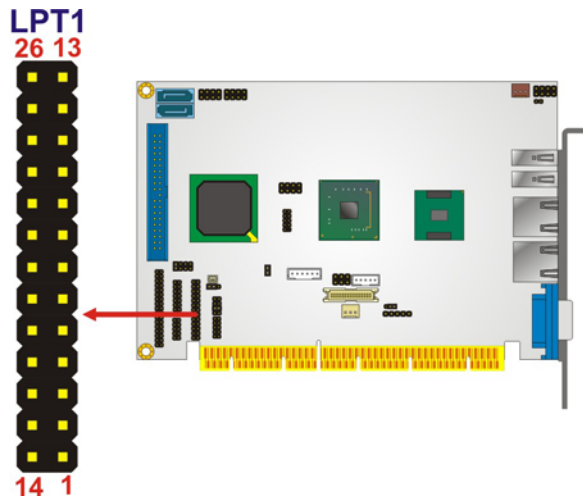
Figure 4-18: Parallel Port Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	STROBE#	2	DATA 0
3	DATA 1	4	DATA 2
5	DATA 3	6	DATA 4
7	DATA 5	8	DATA 6
9	DATA 7	10	ACKNOWLEDGE

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
11	BUSY	12	PAPER EMPTY
13	PRINTER SELECT	14	AUTO FORM FEED #
15	ERROR#	16	INITIALIZE
17	PRINTER SELECT LN#	18	GROUND
19	GROUND	20	GROUND
21	GROUND	22	GROUND
23	GROUND	24	GROUND
25	GROUND	26	NC

Table 4-18: Parallel Port Connector Pinouts

4.2.17 Serial Port Connector (RS-232)

CN Label: **COM1**

CN Type: 10-pin header (2x5)

CN Location: See **Figure 4-19**

CN Pinouts: See **Table 4-19**

The 10-pin serial port connector provides an RS-232 serial communications channel.
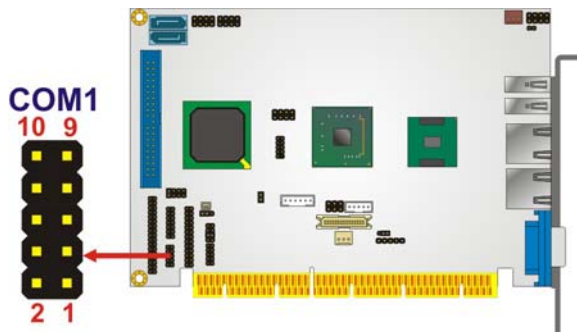
Figure 4-19: RS-232 Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Data Carrier Direct (DCD)	2	Data Set Ready (DSR)
3	Receive Data (RXD)	4	Request To Send (RTS)
5	Transmit Data (TXD)	6	Clear To Send (CTS)
7	Data Terminal Ready (DTR)	8	Ring Indicator (RI)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
9	Ground (GND)	10	N/C

Table 4-19: RS-232 Connector Pinouts

4.2.18 Serial Port Connector (RS-232/422/485)

CN Label: **COM2**

CN Type: 14-pin header (2x7)

CN Location: See Figure 4-20

CN Pinouts: See Table 4-20

The serial port connector provides an RS-232, RS-422 or RS-485 communications channel.
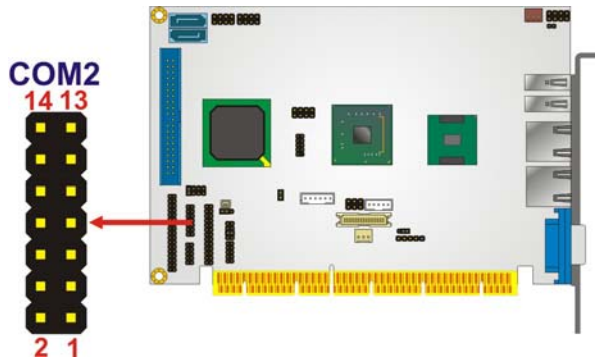
Figure 4-20: RS-232/422/485 Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Data Carrier Direct (DCD)	2	Data Set Ready (DSR)
3	Receive Data (RXD)	4	Request To Send (RTS)
5	Transmit Data (TXD)	6	Clear To Send (CTS)
7	Data Terminal Ready (DTR)	8	Ring Indicator (RI)
9	Ground (GND)	10	Ground (GND)
11	TXD485+	12	TXD485-
13	RXD485+	14	RXD485-

Table 4-20: RS-232/422/485 Connector Pinouts

4.2.19 SDVO Connector

CN Label: **SDVO1**

CN Type: FPC connector

CN Location: See Figure 4-21

CN Pinouts: See Table 4-21

The SDVO connector connects to an SDVO video card available from GAI. The SDVO connector interfaces directly to the SDVO port on the Intel® ICH7M
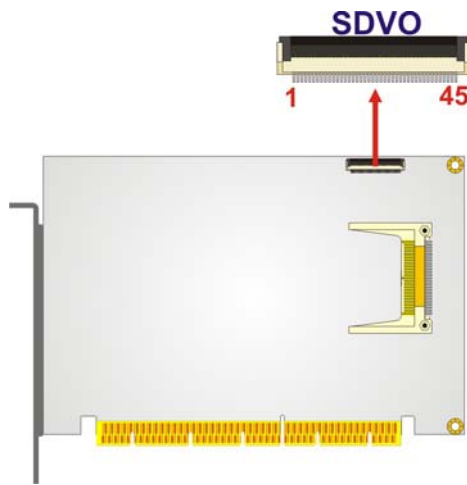
Figure 4-21: SDVO Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	SDVOC_CLK-
3	SDVOC_CLK+	4	GND
5	SDVOC_GREEN-	6	SDVOC_GREEN+
7	GND	8	SDVOB_CLK-
9	SDVOB_CLK+	10	GND
11	SDVOB_GREEN-	12	SDVOB_GREEN+
13	GND	14	SDVOC_INT+
15	SDVOC_INT+	16	GND
17	SDVOB_INT+	18	SDVOB_INT+
19	GND	20	SDVOC_BLUE-
21	SDVOC_BLUE+	22	GND

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
23	SDVOC_RED-	24	SDVOC_RED+
25	GND	26	SDVOB_BLUE-
27	SDVOB_BLUE+	28	GND
29	SDVOB_RED-	30	SDVOB_RED+
31	GND	32	SDVO1_STALL-
33	SDVO1_STALL+	34	GND
35	SDVO_TVCLKIN-	36	SDVO_
37	GND	38	SDVO_
39	SDVO_DATA	40	PCIRST
41	+5VS	42	+5VS
43	+5VS	44	N/C
45	N/C	46	GND
47	GND		

Table 4-21: SDVO Connector Pinouts

4.2.20 TV Out Connector

CN Label:　　**TV1**

CN Type:　　6-pin header (2x3)

CN Location:　　See **Figure 4-22**

CN Pinouts:　　See **Table 4-22**

The 2x3 pin TV out connector connects to a TV output by using an S-Video or RCA connector. The TV out connector makes displaying media data on a television easier.
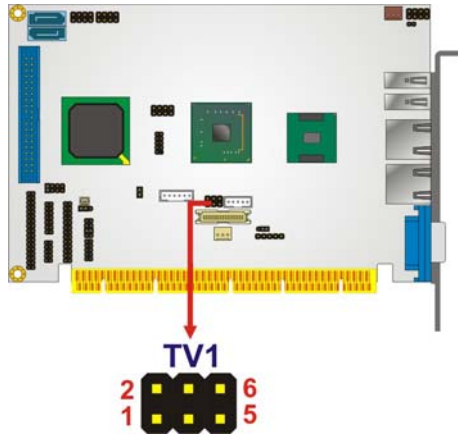
Figure 4-22: TV Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
S-Video Connector			
1	GND	2	AGREEN_Y
3	GND	4	ARED_C
RCA Connector (only video signal)			
5	GND	6	ABLUE_CVBS

Table 4-22: TV Port Connector Pinouts

4.2.21 USB Connectors

CN Label: **USB01, USB23**

CN Type: 8-pin header (2x4)

CN Location: See **Figure 4-23**

CN Pinouts: See **Table 4-23**

The 2x4 USB pin connectors provide connectivity to four USB 1.1 or USB 2.0 devices. Each USB connector can support two USB devices. Additional external USB ports are found on the rear panel. The USB ports are used for I/O bus expansion.
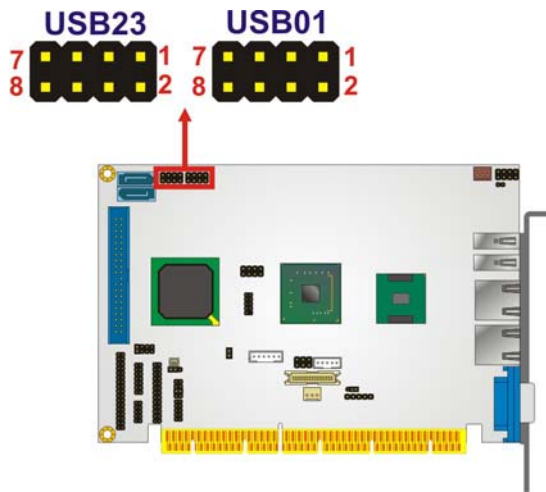
Figure 4-23: USB Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
USB Connector 1		USB Connector 2	
1	VCC	2	GND
3	DATA1-	4	DATA2+
5	DATA1+	6	DATA2-
7	GND	8	VCC

Table 4-23: USB Port Connector Pinouts

4.3 External Peripheral Interface Connector Panel

Figure 4-24 shows the 3308490 external peripheral interface connector (EPIC) panel. The 3308490 EPIC panel consists of the following:

- 2 x RJ-45 LAN connectors
- 2 x USB connectors
- 1 x VGA connector
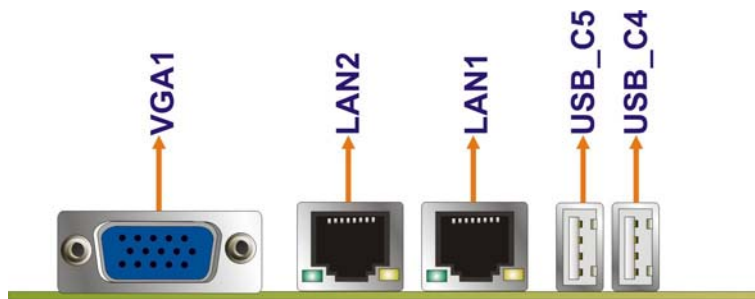
Figure 4-24: 3308490 External Peripheral Interface Connector

4.3.1 LAN Connectors

CN Label:	**LAN1 and LAN2**	
CN Type:	RJ-45	
CN Location:	See **Figure 4-24**	
CN Pinouts:	See **Table 4-24**	

The 3308490 is equipped with two built-in RJ-45 Ethernet controllers. The controllers can connect to the LAN through two RJ-45 LAN connectors. There are two LEDs on the connector indicating the status of LAN. The pin assignments are listed in the following table:

PIN	DESCRIPTION	PIN	DESCRIPTION
1	MDIA3-	5	MDIA1+
2	MDIA3+	6	MDIA2+
3	MDIA2-	7	MDIA0-
4	MDIA1-	8	MDIA0+

Table 4-24: LAN Connector Pinouts
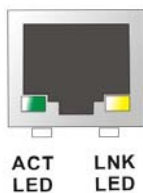
Figure 4-25: LAN Connector

The RJ-45 Ethernet connector has two status LEDs, one green and one yellow. The green LED indicates activity on the port and the yellow LED indicates the port is linked. See **Table 4-25**.

STATUS	DESCRIPTION	STATUS	DESCRIPTION
GREEN	Activity	YELLOW	Linked

Table 4-25: LAN Connector LEDs

4.3.2 USB Connectors

CN Label: **USB_C4 and USB_C5**

CN Type: USB port

CN Location: See **Figure 4-24**

CN Pinouts: See **Table 4-26**

The 3308490 has two external USB 2.0 ports. The ports connect to both USB 2.0 and USB 1.1 devices.

PIN NO.	DESCRIPTION
1	VCC
2	DATA-
3	DATA+
4	GND

Table 4-26: USB Port Pinouts

4.3.3 VGA Connector

CN Label: **VGA1**

CN Type: 15-pin Female

CN Location: See **Figure 4-24**

CN Pinouts: See **Figure 4-26** and **Table 4-27**

The 3308490 has a single 15-pin female connector for connectivity to standard display devices.
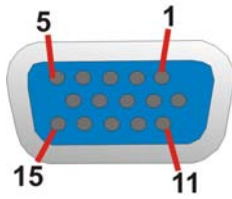
Figure 4-26: VGA Connector

PIN	DESCRIPTION	PIN	DESCRIPTION
1	RED	2	GREEN
3	BLUE	4	NC
5	GND	6	CRT_PLUG-
7	GND	8	GND
9	VCC	10	GND
11	NC	12	DDC DAT
13	HSYNC	14	VSYNC
15	DDCCLK		

Table 4-27: VGA Connector Pinouts

Installation

5.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the 3308490 may result in permanent damage to the 3308490 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the 3308490. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the 3308490, or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- *Wear an anti-static wristband*: - Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- *Self-grounding*:- Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- *Use an anti-static pad*: When configuring the 3308490, place it on an antic-static pad. This reduces the possibility of ESD damaging the 3308490.
- *Only handle the edges of the PCB*:-: When handling the PCB, hold the PCB by the edges.

5.2 Installation Considerations

 NOTE:

The following installation notices and installation considerations should be read and understood before the 3308490 is installed. All installation notices pertaining to the installation of the 3308490 should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the 3308490 and injury to the person installing the motherboard.

5.2.1 Installation Notices

 WARNING:

The installation instructions described in this manual should be carefully followed in order to prevent damage to the 3308490, 3308490 components and injury to the user.

Before and during the installation please **DO** the following:

- Read the user manual:
  - The user manual provides a complete description of the 3308490 installation instructions and configuration options.
- Wear an electrostatic discharge cuff (ESD):
  - Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
- Place the 3308490 on an antistatic pad:
  - When installing or configuring the motherboard, place it on an antistatic pad. This helps to prevent potential ESD damage.
- Turn all power to the 3308490 off:
  - When working with the 3308490, make sure that it is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the 3308490 **DO NOT:**

- ▪ **DO NOT** remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- ▪ **DO NOT** use the product before verifying all the cables and power connectors are properly connected.
- ▪ **DO NOT** allow screws to come in contact with the PCB circuit, connector pins, or its components.

5.2.2 Installation Checklist

The following checklist is provided to ensure the 3308490 is properly installed.

- ▪ All the items in the packing list are present
- ▪ A compatible memory module is properly inserted into the slot
- ▪ The CF Type I or CF Type II card is properly installed into the CF socket
- ▪ The jumpers have been properly configured
- ▪ The 3308490 is inserted into a chassis with adequate ventilation
- ▪ The correct power supply is being used
- ▪ The following devices are properly connected
  - ○ Primary and secondary IDE device
  - ○ SATA drives
  - ○ Power supply
  - ○ USB cable
  - ○ Serial port cable
- ▪ The following external peripheral devices are properly connected to the chassis:
  - ○ VGA screen
  - ○ Keyboard
  - ○ Mouse
  - ○ USB devices
  - ○ LAN cable

5.3 Unpacking

When the 3308490 is unpacked, please check all the unpacking list items listed in Chapter 3 are indeed present. If any of the unpacking list items are not available please

contact the 3308490 vendor reseller/vendor where the 3308490 was purchased or contact an GAI sales representative.

5.4 CF Card Installation

![NOTE icon] **NOTE:**

> The 3308490 can support both CF Type I cards and CF Type II cards. For the complete specifications of the supported CF cards please refer to Chapter 2.

To install the a CF card (Type 1 or Type 2) onto the 3308490, please follow the steps below:

Step 1: **Locate the CF card socket**. Place the 3308490 on an anti-static pad with the solder side facing up. Locate the CF card.

Step 2: **Align the CF card**. Make sure the CF card is properly aligned with the CF socket.

Step 3: **Insert the CF card**. Gently insert the CF card into the socket making sure the socket pins are properly inserted into the socket. See **Figure 5-1**.
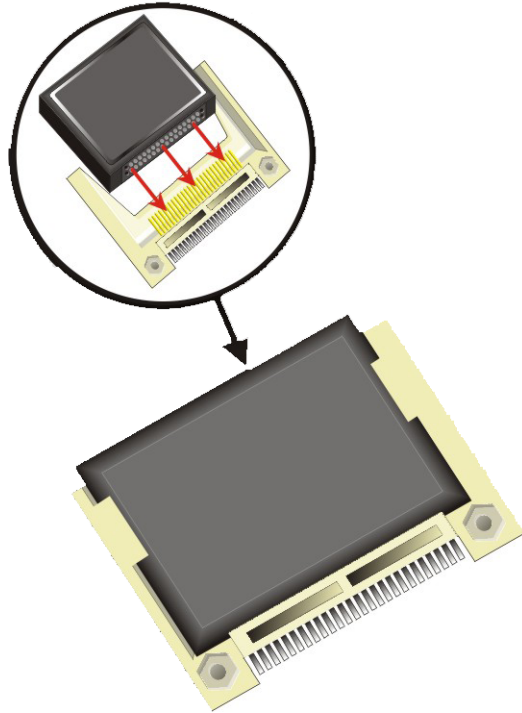
Figure 5-1: CF Card Installation

5.5 ATX Power Control Connector

The ATX power control connector is required when using an ATX power source. To setup the 3308490 for ATX power, follow the steps below.

Step 1: **Set the ATX jumpers (there are two)** as shown in **AT/ATX Power Selection** in **Section 5.6.1**.

Step 2: **Connect the ATX control cable**. Connect the ATX control cable to ATXCTL1 on the 3308490 and to the ATX control connector on the backplane. (Figure 5-2)
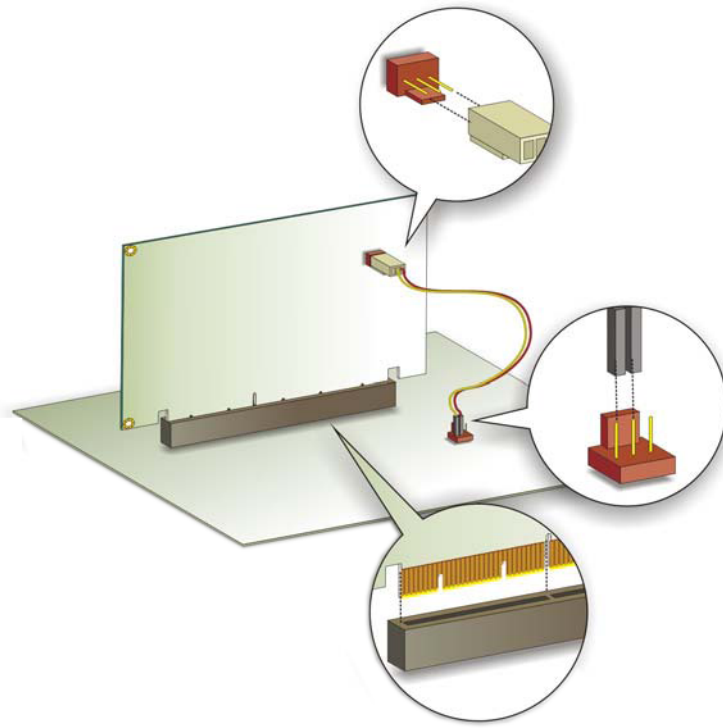
Figure 5-2: ATX Power Control Connector

Step 3: **Turn on with the front panel connector**. The system is turned on using the

Front Panel Connector described in **Section 4.2.10**.

5.6 Jumper Settings

NOTE:

A jumper is a metal bridge used to close an electrical circuit. It consists of two or three metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.

PLASTIC CLIP   OPEN   CLOSED

1-2-3 OPEN   2-3 CLOSED
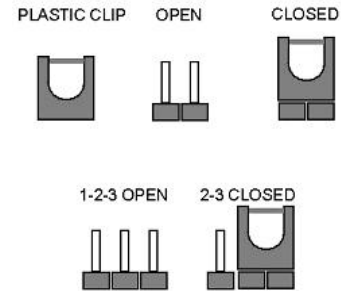
Jumper Locations

Before the 3308490 is installed in the system, the jumpers must be set in accordance with the desired configuration. The jumpers on the 3308490 are listed in Table 5-1.

Description	Label	Type
AT/ATX power selection	ATXCTL1	3-pin wafer
	J_AUTOPWR1	2-pin header
CF card setup	JCF1	2-pin header
Clear CMOS	J_CMOS	3-pin header
COM 2 function select	JP1	8-pin header
LCD panel resolution selection	J_LCD_TYPE1	6-pin header
LVDS voltage selection	J_VLVDS	3-pin header

Table 5-1: Jumpers
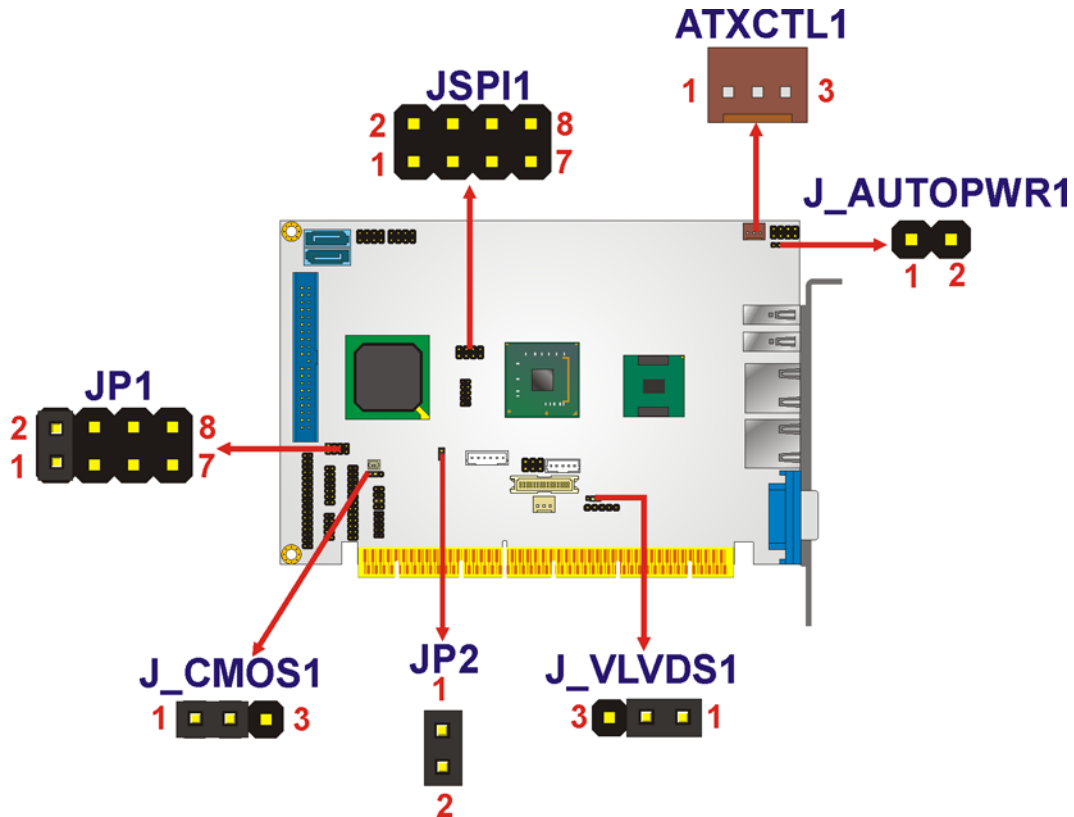
Figure 5-3: Jumper Location

5.6.1 AT/ATX Power Selection

Jumper Label:	**ATXCTL1 and J_AUTOPWR1**
Jumper Type:	3-pin wafer and 2-pin header
Jumper Settings:	See Table 5-2
Jumper Location:	See Figure 5-3

The AT/ATX power selection jumpers set the system power mode as AT or ATX. Jumper settings are shown below.

Jumper	ATXCTL1	J_AUTOPWR1
AT	1-2	Short

Jumper	ATXCTL1	J_AUTOPWR1
ATX	Connect to PS_ON# and 5VSB	Open

Table 5-2: AT/ATX Power Selection Jumper Settings

5.6.2 Clear CMOS Jumper

Jumper Label: **J_CMOS1**

Jumper Type: 3-pin header

Jumper Settings: See Table 5-3

Jumper Location: See Figure 5-3

If the 3308490 fails to boot due to improper BIOS settings, the clear CMOS jumper clears the CMOS data and resets the system BIOS information. To do this, use the jumper cap to close pins 2 and 3 for a few seconds then reinstall the jumper clip back to pins 1 and 2.

If the "CMOS Settings Wrong" message is displayed during the boot up process, the fault may be corrected by pressing the F1 to enter the CMOS Setup menu.   Do one of the following:

- Enter the correct CMOS setting
- Load Optimal Defaults
- Load Failsafe Defaults.

After having done one of the above, save the changes and exit the CMOS Setup menu.

The clear CMOS jumper settings are shown in **Table 5-3**.

AT Power Select	Description
1-2	Keep CMOS Setup
2-3	Clear CMOS Setup

Table 5-3: Clear CMOS Jumper Settings

5.6.3 CF Card Setup

Jumper Label: **JCF1**

Jumper Type: 2-pin header

Jumper Settings: See Table 5-4

Jumper Location: See Figure 5-3

The CF Card Setup jumper sets the CF Type I card or CF Type II cards as either the slave device or the master device. CF Card Setup jumper settings are shown in Table 5-4.

CF Card Setup	Description
Open	Slave
Closed	Master

Table 5-4: CF Card Setup Jumper Settings

5.6.4 COM2 RS-232/422/485 Selection Jumper

Jumper Label: **JP1**

Jumper Type: 8-pin header

Jumper Settings: See Table 5-5

Jumper Location: See Figure 5-3

The RS-232/422/485 Serial Port Select jumper sets the communication protocol used by COM3. The RS-232/422/485 Serial Port Select settings are shown in **Table 5-5**.

RS-232/422/485	Description
1-2	RS-232
3-4	RS-422
5-6	RS-485
7-8	RS-485 with RTS Control

Table 5-5: COM2 RS-232/422/485 Selection Jumper Pinouts

5.6.5 LCD Panel Type Selection

Jumper Label: **J_LCD_TYPE1**

Jumper Type: 6-pin header

Jumper Settings: See Table 5-6

Jumper Location: See Figure 5-3

The **LCD Panel Type Selection** jumper allows the LVDS screen voltage to be set. The **LCD Panel Type Selection** jumper settings are shown in **Table 5-7**.

LCD Panel Selection	Description
Open	640 x 480 (18-bit)
1-2	800 x 600 (18-bit)
3-4	800 x 600 (18-bit)
1-2 and 3-4	1024 x 768 (18-bit)
5-6	1280 x 1024 (36-bit)
1-2 and 5-6	1400 x 1050 (36-bit)
3-5 and 5-6	1400 x 900 (36-bit)
1-2, 3-4 and 5-6	1600 x 1200 (36-bit)

Table 5-6: LCD Panel Type Selection Jumper Settings

5.6.6 LVDS Voltage Selection

![Warning icon] **WARNING:**

Permanent damage to the screen and 3308490 may occur if the wrong voltage is selected with this jumper. Please refer to the user guide that came with the monitor to select the correct voltage.

Jumper Label: **J_VLVDS1**

Jumper Type: 3-pin header

Jumper Settings: See Table 5-7

Jumper Location: See Figure 5-3

The **LVDS Voltage Selection** jumper allows the LVDS screen voltage to be set. The **LVDS Voltage Selection** jumper settings are shown in **Table 5-7**.

LCD Voltage Select	Description
1-2	3.3 V
2-3	5 V

Table 5-7: LVDS Voltage Selection Jumper Settings

5.7 Chassis Installation

5.7.1 Airflow WARNING:

Airflow is critical to the cooling of the CPU and other onboard components. The chassis in which the 3308490 must have air vents to allow cool air to move into the system and hot air to move out.

The 3308490 must be installed in a chassis with ventilation holes on the sides allowing airflow to travel through the heat sink surface. In a system with an individual power supply unit, the cooling fan of a power supply can also help

5.7.2 Motherboard Installation

To install the 3308490 motherboard into the chassis please refer to the reference material that came with the chassis.

5.8 Internal Peripheral Device Connections

The cables listed in **Table 5-8** are shipped with the 3308490.

Quantity	Type
1	Parallel port and serial port cable
2	SATA cables
1	USB cable

Table 5-8: GAI Provided Cables

Some optional items that can be purchased separately and installed on the 3308490 include:

- 5.1 channel audio kit
- 7.1 channel audio kit
- ATX power cable
- Dual port USB cable
- Dual serial port cable
- IDE cable
- HDTV out cable

distributor,

The optional 5.1 channel audio kit connects to the 10-pin audio connector on the 3308490. The audio kit consists of three audio jacks. One audio jack, Mic In, connects to a microphone. The remaining two audio jacks, Line-In and Line-Out, connect to two speakers. To install the audio kit, please refer to the steps below:

Step 1: **Connect the audio kit cable.** The audio kit is shipped with a cable that connects the audio kit to the 3308490. Connect the cable to the connector on the back of the audio kit. Make sure the pins are properly aligned (i.e. pin 1 connects to pin 1).

Step 2: **Locate the audio connector**. The location of the 10-pin audio connector is shown in **Chapter 3**.

Step 3: **Align pin 1**. Align pin 1 on the on-board connector with pin 1 on the audio kit cable connector. Pin 1 on the audio kit cable connector is indicated with a white dot. See Figure 5-4.

Figure 5-4: 5.1 Channel Audio Kit

Step 4: **Mount the audio kit onto the chassis**. Once the audio kit is connected to the 3308490, secure the audio kit bracket to the system chassis.

Step 5: **Connect the audio devices**. Connect one speaker to the line-in audio jack, one speaker to the line-out audio jack and a microphone to the mic-in audio jack.

Step 6: **Install the driver**. If the 5.1 channel audio kit is used, the ALC655 Realtek codec driver must be installed.

5.8.2 7.1 Channel Audio Kit Installation

The optional 7.1 channel audio kit connects to the 10-pin audio connector on the 3308490. The audio kit consists of five audio jacks. One audio jack, Mic In, connects to a microphone. The remaining four audio jacks, Line-In, Front-Out, Rear-Out, and Center Subwoofer, connect to speakers. To install the audio kit, please refer to the steps below:

Step 1: **Connect the audio kit cable.** The audio kit is shipped with a cable that connects the audio kit to the 3308490. Connect the cable to the connector on the back of the audio kit. Make sure the pins are properly aligned (i.e. pin 1 connects to pin 1).

Step 2: **Locate the audio connector**. The location of the 10-pin audio connector is shown in **Chapter 3**.

Step 3: **Align pin 1**. Align pin 1 on the on-board connector with pin 1 on the audio kit cable connector. Pin 1 on the audio kit cable connector is indicated with a white dot. See Figure 5-5.
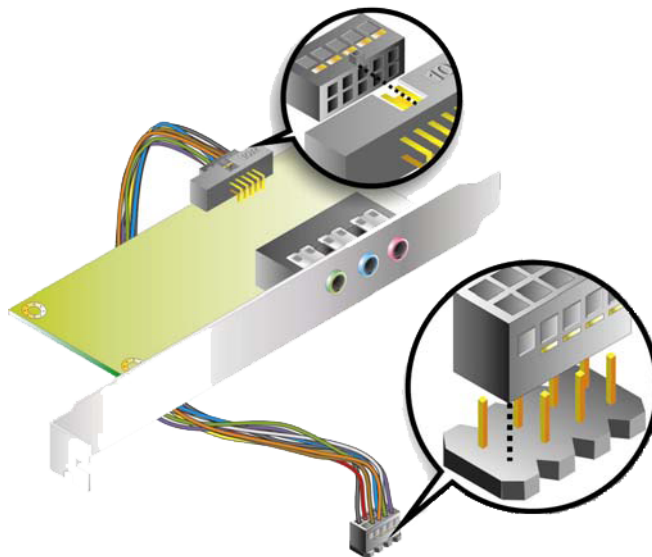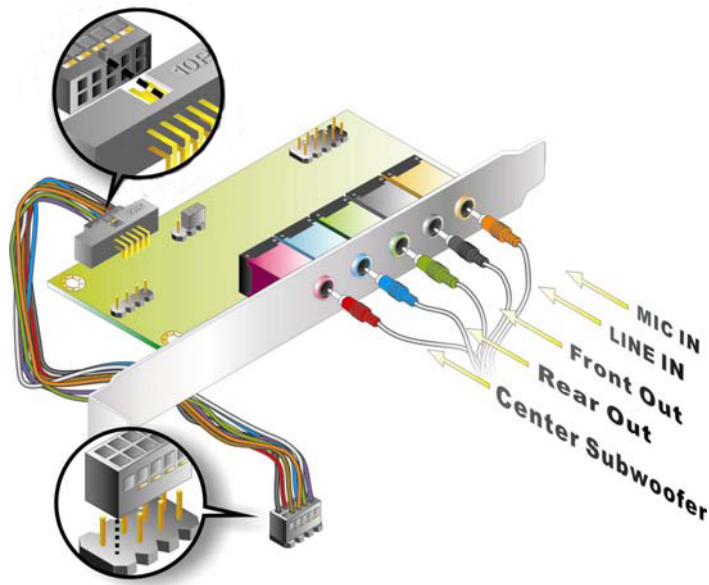
Figure 5-5: 7.1 Channel Audio Kit

Step 4: **Mount the audio kit onto the chassis**. Once the audio kit is connected to the 3308490, secure the audio kit bracket to the system chassis.

Step 5: **Connect the audio devices**. Connect one speaker to the line-in audio jack, one speaker to the line-out audio jack and a microphone to the mic-in audio jack.

Step 6: **Install the driver**. If the 7.1 channel audio kit is used, the ALC883 Realtek codec driver must be installed. Refer to **Chapter 7** for driver installation instructions.

Step 1: corresponds to pin 1 on the connector.

5.8.3 ATA Flat Cable Connection

The ATA 66/100 flat cable connects to the 3308490 to one or two IDE devices. To connect an IDE HDD to the 3308490 please follow the instructions below.

Step 1: **Locate the IDE connector**. The location/s of the IDE device connector/s is/are shown in **Chapter 3**.

Step 2:   **Insert the connector**. Connect the IDE cable connector to the onboard
connector. See **Figure 5-6**. A key on the front of the cable connector ensures it
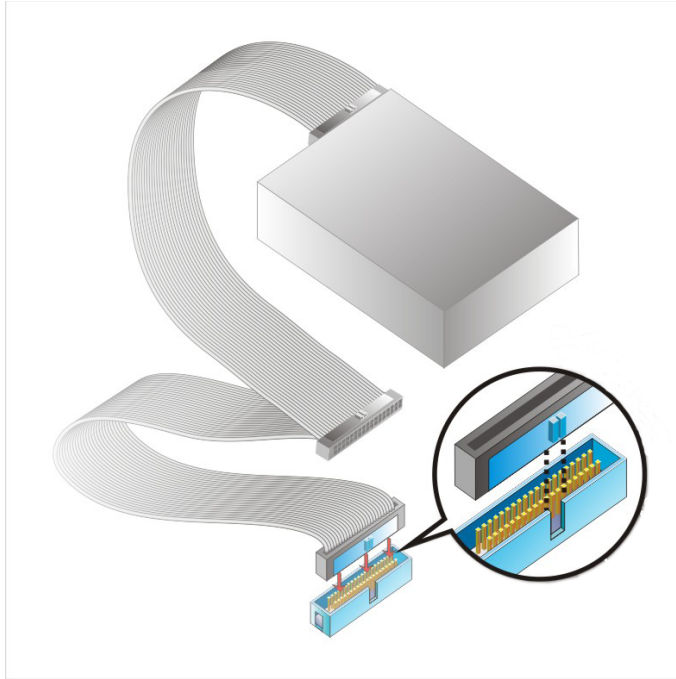can only be inserted in one direction.

Figure 5-6: IDE Cable Connection

Step 3:   **Connect the cable to an IDE device**. Connect the two connectors on the other
side of the cable to one or two IDE devices. Make sure that pin 1 on the cable
corresponds to pin 1 on the connector.

5.8.4 Dual RS-232 Cable with Slot Bracket

The dual RS-232 cable slot connector consists of two connectors attached to two
independent cables. Each cable is then attached to a D-sub 9 male connector that is
mounted onto a slot. To install the dual RS-232 cable, please follow the steps below.

Step 1:   **Locate the connectors**. The locations of the RS-232 connectors are shown in
Chapter 3.

Step 2: **Insert the cable connectors**. Insert one connector into each serial port box headers. See **Figure 5-7**. A key on the front of the cable connectors ensures the connector can only be installed in one direction.
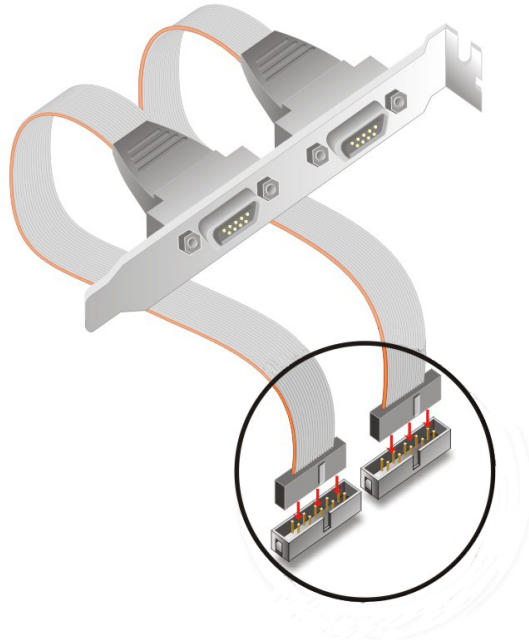

Figure 5-7: Dual RS-232 Cable Installation

Step 3: **Secure the bracket**. The dual RS-232 connector has two D-sub 9 male connectors secured on a bracket. To secure the bracket to the chassis please refer to the reference material that came with the chassis.

5.8.5 Floppy Drive Cable Connection

The FDD flat cable connects to the 3308490 to one FDD device. To connect an FDD to the 3308490 please follow the instructions below.

Step 1: **Locate the FDD connector**. The location of the FDD device connector is shown in **Chapter 3**.

Step 2: **Insert the connector**. Connect the FDD cable connector to the on-board connector. See **Figure 5-8**. A key on the front of the cable connector ensures it can only be inserted in one direction.
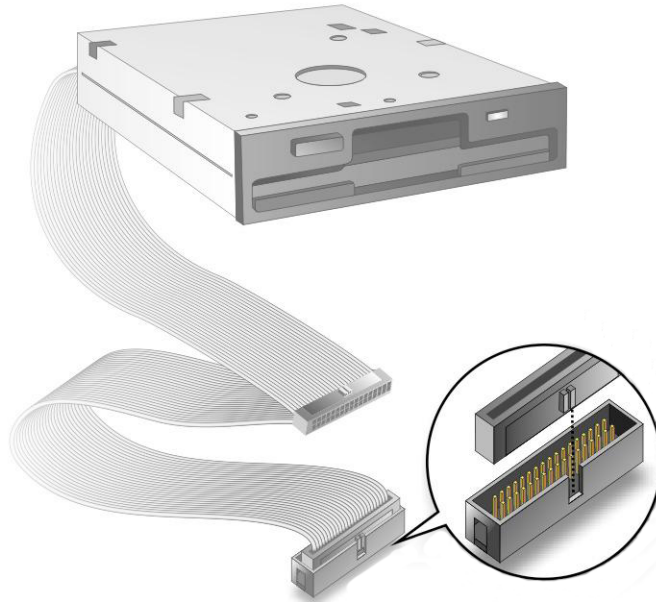

Figure 5-8: FDD Cable Connection

Step 3: **Connect the cable to an FDD device**. Connect the connector at the other end of the cable to an FDD device. Make sure that pin 1 on the cable corresponds to pin 1 on the connector.

5.8.6 Parallel Port Cable without Bracket

The optional parallel port (LPT) cable respectively connects the on-board LPT 26-pin box header to an external LPT device (like a printer). The cable comprises a 26-pin female header, to be connected to the on-board LPT box-header, on one side and on the other side a standard external LPT connector. To connect the LPT cable, please follow the steps below.

Step 1: **Locate the connector**. The LPT connector location is shown in **Chapter 4**.

Step 2: **Align the connectors**. Correctly align pin 1 on the cable connector with pin 1 on the 3308490 LPT box-header connector. See Figure 5-9.

Step 3: **Insert the cable connectors** Once the cable connector is properly aligned with the 26-pin box-header connector on the 3308490, connect the cable connector to the on-board connector. See **Figure 5-9.**
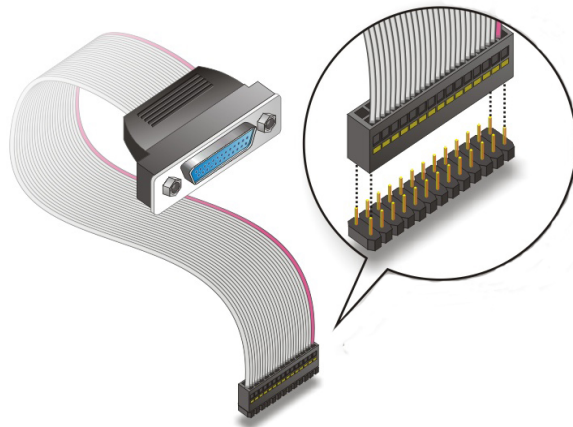

Figure 5-9: LPT Cable Connection

Step 4: **Attach the LPT connector to the chassis**. To secure the LPT interface connector to the chassis please refer to the installation instructions that came with the chassis.

Step 5: **Connect LPT device**. Once the LPT interface connector is connected to the chassis, the LPT device can be connected to the LPT interface connector. See **Figure 5-13**

5.8.7 SATA Drive Connection

The 3308490 is shipped with two SATA drive cables and one SATA drive power cable. To connect the SATA drives to the connectors, please follow the steps below.

Step 1: **Locate the connectors**. The locations of the SATA drive connectors are shown in **Chapter 3**.

Step 2: Insert the cable connector. Press the clip on the connector at the end of the SATA cable and insert the cable connector into the onboard SATA drive connector. See **Figure 5-10**.
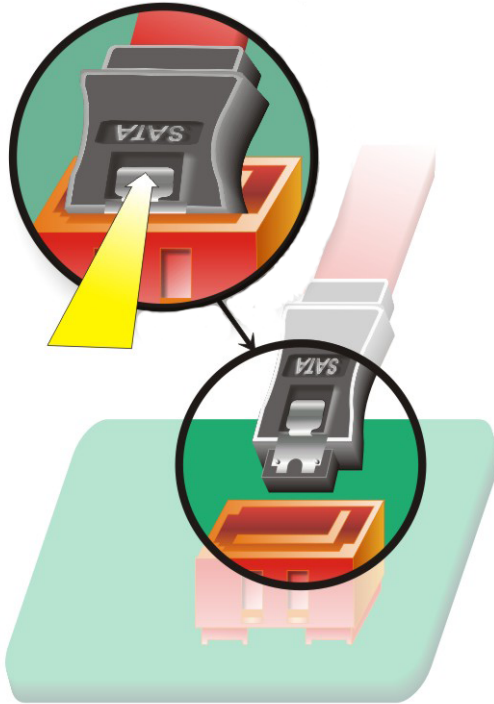

Figure 5-10: SATA Drive Cable Connection

Step 3: Connect the cable to the SATA disk. Connect the connector on the other end of the cable to the connector at the back of the SATA drive. See **Figure 5-11**.

Step 4: Connect the SATA power cable. Connect the SATA power connector to the back of the SATA drive. See **Figure 5-11**.

Figure 5-11: SATA Power Drive Connection

5.8.8 USB Cable (Dual Port) with Slot Bracket

The 3308490 is shipped with a dual port USB 2.0 cable. To connect the USB cable connector, please follow the steps below.

Step 1: **Locate the connectors**. The locations of the USB connectors are shown in **Chapter 3**.

 WARNING:

If the USB pins are not properly aligned, the USB device can burn out.

Step 2: **Align the connectors**. The cable has two connectors. Correctly align pin 1on each cable connector with pin 1 on the 3308490 USB connector.

Step 3: **Insert the cable connectors.** Once the cable connectors are properly aligned with the USB connectors on the 3308490, connect the cable connectors to the on-board connectors. See **Figure 5-12**.
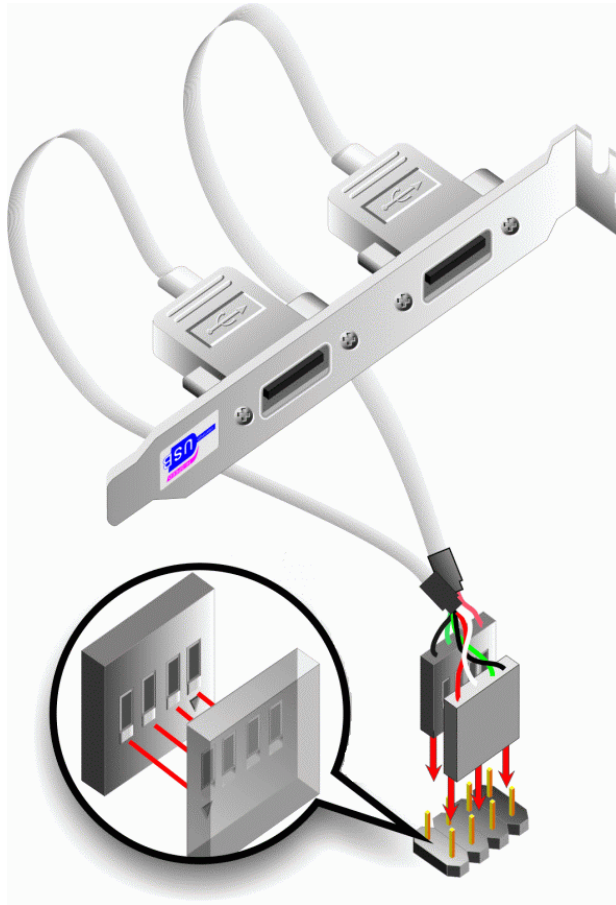
Figure 5-12: Dual USB Cable Connection

Step 4: **Attach the bracket to the chassis**. The USB 2.0 connectors are attached to a bracket. To secure the bracket to the chassis please refer to the installation instructions that came with the chassis.
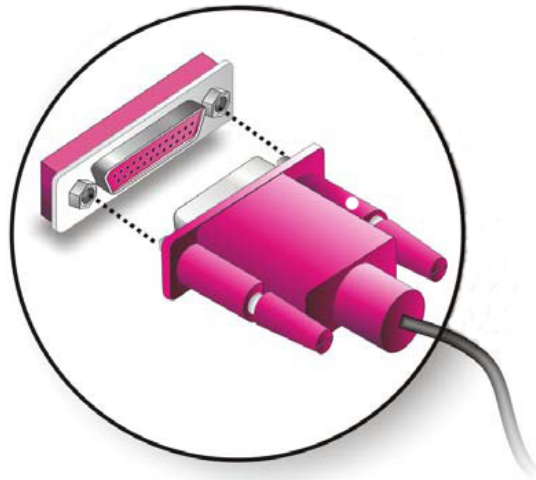
Figure 5-13: Connect the LPT Device

5.9 External Peripheral Interface Connection

The following external peripheral devices can be connected to the external peripheral interface connectors.

- RJ-45 Ethernet cable connectors
- PS/2 devices
- Serial port devices
- USB devices
- VGA monitors

To install these devices, connect the corresponding cable connector from the actual device to the corresponding 3308490 external peripheral interface connector making sure the pins are properly aligned.

5.9.1 LAN Connection

There are two external RJ-45 LAN connectors. The RJ-45 connectors enable connection to an external network. To connect a LAN cable with an RJ-45 connector, please follow the instructions below.

Step 1: **Locate the RJ-45 connectors**. The locations of the LAN connectors are shown in **Chapter 4**.

Step 2: **Align the connectors.** Align the RJ-45 connector on the LAN cable with one of

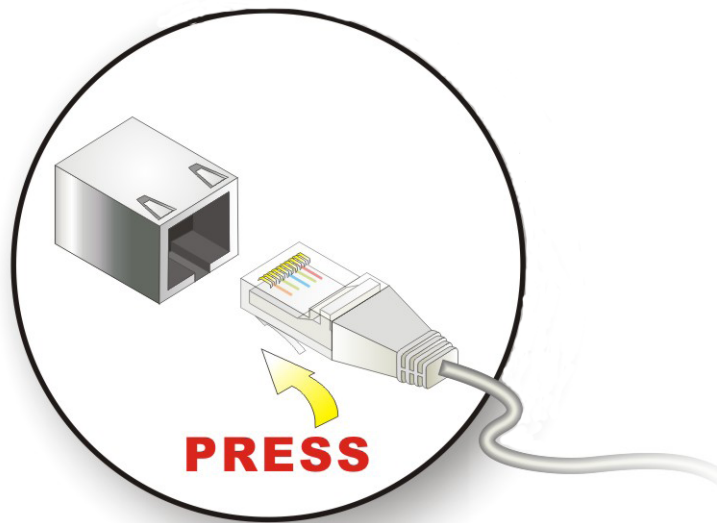the RJ-45 connectors on the 3308490. See   **Figure 5-14**.

Figure 5-14: LAN Connection

Step 3: **Insert the LAN cable RJ-45 connector.** Once aligned, gently insert the LAN

cable RJ-45 connector into the onboard RJ-45 connector.

5.9.2 USB Device Connection (Single Connector)

There are two external USB 2.0 connectors. Both connectors are perpendicular to the
3308490. To connect a USB 2.0 or USB 1.1 device, please follow the instructions
below.

Step 1: **Located the USB connectors**. The locations of the USB connectors are shown

in **Chapter 4**.

Step 2: **Align the connectors.** Align the USB device connector with one of the

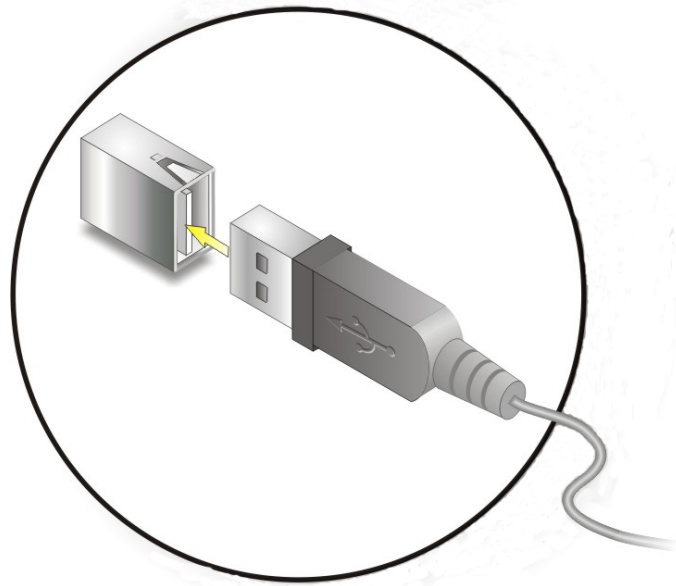connectors on the 3308490. See Figure 5-15.

Figure 5-15: USB Device Connection

Step 3: **Insert the device connector.** Once aligned, gently insert the USB device connector into the on-board connector.

5.9.3 VGA Monitor Connection

The 3308490 has a single female DB-15 connector on the external peripheral interface panel. The DB-15 connector is connected to a CRT or VGA monitor. To connect a monitor to the 3308490, please follow the instructions below.

Step 1: **Locate the female DB-15 connector**. The location of the female DB-15 connector is shown in **Chapter 3**.

Step 2: **Align the VGA connector**. Align the male DB-15 connector on the VGA screen cable with the female DB-15 connector on the external peripheral interface.

Step 3: **Insert the VGA connector**. Once the connectors are properly aligned with the insert the male connector from the VGA screen into the female connector on the 3308490. See **Figure 5-16**.
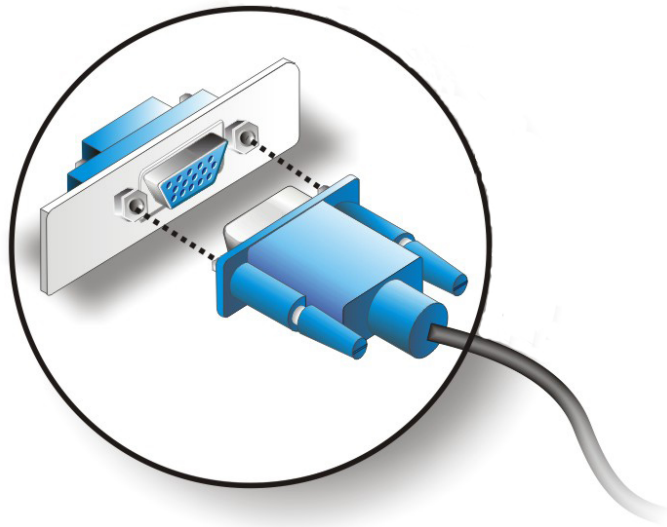
Figure 5-16: VGA Connector

Step 4: **Secure the connector**. Secure the DB-15 VGA connector from the VGA monitor to the external interface by tightening the two retention screws on either side of the connector.

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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